STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

September 16, 2020

US Army Corps of Engineers
Washington Regulatory Field Office
2407 West 5th Street
Washington, North Carolina 27889-1000

ATTN: Mr. Tom Steffens, NCDOT Regulatory Coordinator

Subject: **Application for Section 404 Individual Permit and Section 401 Water Quality Certification for the proposed US 70 Improvements in James City, Craven County. TIP No. U-5713/R-5777A&B. USACE Action ID 2018-01012**
Debit $570 from WBS 50111.3.1

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to upgrade the existing US 70 through James City, North Carolina within Craven County. The Preferred Alternative originates at the eastern approach to the Neuse River bridge and extends to approximately one mile east of SR 1116 (Thurman Road).

The purpose of this letter is to request approval for a Section 404 Individual Permit and Section 401 Water Quality Certification. In addition to this cover letter, this application package includes the following: ENG Form 4345, stormwater management plan, permit drawings, roadway plans, Division of Mitigation Services (DMS) Acceptance Letter, USFWS Concurrence Letter, and 4B/4C meeting minutes.

Purpose and Need

This project is one of several that NCDOT is working on to improve the US 70/Future I-42 corridor, with the intent to improve regional mobility and provide better connectivity between Raleigh and the seaport at Morehead City, as well as to the military bases in Havelock and Goldsboro and to the Global Transpark in Kinston. The 2015 Fixing America's Surface Transportation Act designated US 70 from I-40 in Garner to the port at Morehead City as a high-priority corridor and future interstate (I-42). The intent of the I-42 designation is to benefit military interconnectivity, aid in economic development, create jobs and stimulate growth in travel and tourism. In addition, US 70 is a designated hurricane evacuation route between the coast and the I-95 interchange in Johnston County.

The purpose of this project is to add additional capacity and access management improvements to the US 70 corridor through James City, with the goal of providing local and regional benefits in traffic operations and economic development. In addition, the project will address local community concerns related to connectivity, access, and modal choice, including walking and biking.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 2
2815 ROUSE ROAD EXTENSION
KINSTON, NC 28504

Telephone: (252) 775-6100
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Project Description

The US 70 Improvements project is the combination of NCDOT TIP projects U-5713 and R-5777 sections A and B. The project begins at the eastern approach to the Neuse River bridge and continues southeast along US 70 to approximately one mile southeast of SR 1116 (Thurman Road).

NCDOT proposes to add two additional travel lanes (one in each direction) along US 70 from Garner Road (SR 1121) to the Neuse River bridge. The project would build interchanges to provide full access to US 70 at Grantham Road (SR 1124), Airport Road, Williams Road (SR 1167), Thurman Road (SR 1116) and Taberna Way (SR 1922). The project would construct new connecting roads to extend Taberna Way and Day Star Lane on new location between US 70 and Old Cherry Point Road (SR 1113). The rail spur that crosses US 70 at grade between Williams Road and the Neuse River bridge will be removed as part of this improvement project. Control of access will be maintained along US 70 throughout the project length. Additionally, the project will provide wider paved shoulders or wider outside travel lanes on several service roads to accommodate cyclists and sidewalks along several cross streets that currently lack these facilities; refer to the Categorical Exclusion (CE) and Construction Consultation (CC) documents for further details.

Project Schedule

U-5713/R-5777A&B was let in September of 2019. The project is anticipated to be completed by September 7, 2023. Right-of-way acquisition began in April of 2020 and construction is scheduled to begin in the first quarter of 2021.

Summary of Impacts

The CE anticipated that the Preferred Alternative would result in 1,903 linear feet of permanent impact to jurisdictional streams and 2.3 acres of permanent impact to jurisdictional wetlands. The current design prepared by the NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable. Through avoidance and minimization efforts the proposed design has reduced stream impacts by 338 feet. With the addition of the service road SRY21B, and completion of the drainage and utility design plans since the preliminary design used in the CE, the proposed permanent wetland impacts have increased by 1.29 acres. The addition of service road SRY21B has added 1.32 acres of impact. Additionally, there are two wetland features that are not being directly impacted in their entirety but are being counted as total takes due to loss of function for a total of 0.033 acre of wetland impact that is in addition to the direct impacts. Excluding the added impacts from SRY21B the proposed design would reduce the wetland impact totals by 0.03 acre compared to impact totals reported in the CE. Proposed permanent impacts to jurisdictional areas total 3.59 acres of permanent wetland impacts which include 0.03 acre of additional impacts associated with the total take of two features. There will be 1,565 linear feet of permanent stream impacts (including 419 feet of intermittent streams and 1,146 of perennial streams), 244 feet of permanent stream impact is due to bank stabilization. Additionally, there will be 0.02 acre of permanent surface water impacts to tributaries. There will be a total of 3.59 acres of permanent wetland impacts and 1,321 feet of permanent stream impacts that will require mitigation. Additionally, there will be 0.15 acre of hand clearing and 0.08 acre temporary excavation for utilities. There are 108,632 sq. ft. of riparian buffer impacts requiring mitigation (including 68,718 sq. ft. in Zone 1 and 39,914 sq. ft. in Zone 2.

Summary of Mitigation

Compensatory mitigation for the unavoidable impacts to freshwater wetlands, streams, and riparian buffers will be provided by the North Carolina Department of Environmental Quality (NCDEQ)-Division of Mitigation Services (DMS).

NEPA Document Status

The Type III CE was approved on July 2, 2018 for the combined U-5713/R-5777A&B project. An update to the CE was provided through a Project Environmental Consultation, i.e., Right-of-Way Consultation, on August 8, 2019. NCDOT has also completed a CC in order to update the CE with the revisions that occurred in final design and confirm the findings of the CE. The CC document was submitted to FHWA for signature on August 31, 2020 and was signed on September 3, 2020. It was determined that the proposed project is essentially the same as the proposed action described in the original CE. While this project was not in the merger process, 4B and 4C interagency meetings were completed during the design process. These documents are available at https://xfer.services.ncdot.gov/pdea/EnvironmentalDocs.

Resource Status

The project is located in the Neuse River Basin {Hydrologic Unit Code (HUC) 03020204}. The project crosses numerous streams, unnamed tributaries, and wetlands. Drainages within the northern part of the project study area are part of the Northwest Creek-Neuse River sub-watershed and drainages in the southern part of the project study area are part of the Outlet Brice Creek sub-watershed. There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), WS-I waters, or WS-II waters within 12 miles upstream or downstream of the project study area. No stream that flows through the project study area is designated as a National Wild and Scenic River or a State Natural and Scenic River.

Wetland and stream delineations were performed for TIP U-5713 on July 20-24, and August 18-19, 2015. A Preliminary Jurisdictional Determination Package was submitted to the USACE on April 19, 2016. Additionally, an area was added in the Scotts Creek area near the Neuse River bridge onramp which was delineated December 11, 2019 and subsequently verified by the USACE.

Wetland and stream delineations were performed for TIP R-5777A&B on November 28-30, 2017; December 1, 6-7, 2017; January 3-4, 2018; and February 19-20, and 23, 2018. The detailed study corridor for the Preferred Alternative was field verified by the USACE on February 20, 2018, and the Preliminary Jurisdictional Determination Package was submitted to the USACE on March 27, 2018. A Natural Resource Technical Report was prepared detailing these jurisdictional areas in March 2018.

Impacts to Jurisdictional Resources

Final proposed impacts to jurisdictional wetlands and surface waters associated with road construction for US 70 are summarized in Tables 1 and 2, respectively. The project is located within the Lower Trent River watershed, HUC 0302020403 and the Upper Broad Creek – Neuse River watershed HUC 0302020404 which are both part of the Neuse River Drainage Basin HUC 03020204.

Table 1. Wetland Impacts

Permit Drawing Site Number	NRTR Label	Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)	Mitigation Required[4]
2	WAU	Riparian	0.52		Yes
3	WAG	Non-riparian	1.33		Yes
3	WAG	Non-riparian	< 0.01		Yes
3	WAG	Non-riparian		0.14[2]	No
5	WJ	Riparian	0.02		Yes
5	WJ	Riparian	0.07		Yes
5	WJ	Riparian	0.04		Yes
5	WJ	Riparian	0.10		Yes
5	WJ	Riparian	< 0.01		Yes
5	WJ	Riparian	< 0.01		Yes
5	WJ	Riparian	< 0.01		Yes
5	WJ	Riparian	0.03		Yes
5	WJ	Riparian	< 0.01		Yes
5	WJ	Riparian	0.02		Yes
5	WJ	Riparian	0.32		Yes
5	WJ	Riparian	0.05		Yes
9	WAT	Riparian	0.01[1]		Yes
11	WAW	Riparian	0.38		Yes
15	WAB	Riparian	<0.01[1]		Yes
16	WM	Riparian	0.08		Yes
19	WT	Riparian	0.06		Yes
20	WU	Riparian	0.01		Yes
21	WAF	Riparian	0.15		Yes
21	WAF	Riparian	< 0.01		Yes
21	WAF	Riparian	< 0.01		Yes
21	WAF	Riparian	0.15		Yes
21	WAF	Riparian		0.01[2]	No
23	WA	Non-riparian	0.14		Yes
24	WB	Non-riparian	< 0.01		Yes
25	WD	Non-riparian		0.08[3]	No
		Total:[5]	3.56	0.23	

Note: 1 - Total take (0.03 acre additional impact for the total take of wetlands not included in impact site totals)

2 - Hand clearing

3 - Temporary excavation

4 - Mitigation required for permanent impacts

5 – Rounded totals are the sum of the actual impacts

Table 2. Surface Water Impacts

Permit Drawing Site Number	NRTR Label	Type	Permanent Impacts (lf)	Temporary Impacts (lf)	Permanent Impacts (ac.)	Temporary Impacts (ac.)	Mitigation Required[3]
1	SAB	Perennial	75	10	<0.01	<0.01	Yes
1	SAB	Perennial	21				No
4	SA	Perennial	14	10	<0.01	<0.01	Yes
4	SA	Perennial	28				No
4	SA	Perennial	101		0.01		Yes
4	SA	Perennial	51		<0.01		Yes
4	SA	Perennial	46	10	<0.01	<0.01	Yes
4	SA	Perennial	42				No
4	SA	Perennial	174	10	0.03	<0.01	Yes
4	SA	Perennial	40				No
4	SA	Perennial	32	11	0.03	<0.01	Yes
6	SD	Intermittent	138	9	0.01	<0.01	Yes
6	SD	Intermittent	18				No
7	SE	Intermittent	119	19	0.01	<0.01	Yes
7	SE	Intermittent	6				No
8	TS	Tributary			<0.01		No
8	TS	Tributary			<0.01		No
8	TS	Tributary			0.01		No
10	TE	Tributary			<0.01	<0.01	No
12	TK	Tributary			<0.01	<0.01	No
13	SI	Perennial	123		<0.01		Yes
13	SI	Perennial	107	22	0.03	<0.01	Yes
13	SI	Perennial	34		<0.01		Yes
14	SF	Intermittent	100		<0.01		Yes
17	TL	Tributary			0.01	<0.01	No
18	SJ	Perennial	78	10	<0.01	<0.01	Yes
18	SJ	Perennial	35				No
18	SJ	Perennial	116	16	0.02	<0.01	Yes
18	SJ	Perennial	29				No
22	SD[1]	Intermittent	14	10	<0.01	<0.01	Yes
22	SD[1]	Intermittent	25				No
		Totals[2]:	1,565	137	0.22	0.02	

Note: 1 – Feature located in section U-5713

2 – Rounded totals are sum of actual impacts

3 – Mitigation for permanent stream impacts only, excluding bank stabilization.

Table 3 presents the impacts to Neuse River riparian buffers based on stream segments within the construction limits. The table indicates Zone 1 and Zone 2 buffer impacts for each individual stream.

Table 3. Riparian Buffer Impacts

	Allowable			Mitigable			Wetlands in Buffer	
Buffer Drawing Site Number	Zone 1 (sq. ft.)	Zone 2 (sq. ft.)	Total (sq. ft.)	Zone 1 (sq. ft.)	Zone 2 (sq. ft.)	Total (sq. ft.)	Zone 1 (sq. ft.)	Zone 2 (sq. ft.)
4				4,401	3,007	7,408		
4				7,693	1,254	8,947		
4				6,298	1,684	7,982		
4				7,506	6,282	13,788	554	335
4				14,198	7,696	21,894	4,849	2,402
13				9,124	5,417	14,541		
13				9,733	5,569	15,302	7,968	2,617
18				13,437	8,112	21,549	528	411
18				10,800	7,134	17,934	573	476
21	254	1,857	2,111					
22	2,766	2,130	4,896					

Table 4. Buffer Impacts Requiring Mitigation

Excluding the impacts of wetland in buffers, NCDOT will mitigate for 68,718 sq. ft. of Zone 1 buffers and 39,914 sq. ft. of Zone 2 buffers. See Table 4 below.

Buffer Drawing Site Number	Zone 1 (sq. ft.)	Zone 2 (sq. ft.)	Total (sq. ft.)
4	34,693	17,186	51,879
13	10,889	8,369	19,258
18	23,136	14,359	37,495
Total:	68,718	39,914	108,632

Utility Impacts

Project construction will entail the relocation of various utilities. A separate set of Utility Permit Impact Drawings are attached, and the totals are included in Table 1 above. Underground utilities that cross features and are not accounted for at an impact site will be installed through trenchless installation methods in order to not impact these features.

Federally Protected Species

The table below lists the federally protected species for Craven County as of June 24, 2020. Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (PT) for such listing, are protected under Section 7 of the Endangered Species Act (ESA) of 1973, as amended. Species listed as Threatened due to Similarity of Appearance [T(S/A)], such as the American alligator, are not subject to Section 7 consultation. The bald eagle is protected by the Bald and Golden Eagle Protection Act and is also not subject to Section 7 consultation.

Table 5. Federally Protected Species Listed for Craven County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Acipenser brevirostrum	Shortnose sturgeon	E	No	No Effect
Acipenser oxyrinchus	Atlantic sturgeon	T	No	No Effect
Aesychynomene virginica	Sensitive joint-vetch	T	No	No Effect
Alligator mississippiensis	American alligator	T (S/A)	Yes	Not Required
Calidris canutus rufa	Red knot	T	No	No Effect
Chelonia mydas	Green sea turtle	T	No	No Effect
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Haliaeetus leucocephalus	Bald eagle	NA	Yes	No Effect
Laterallus jamaicensis jamaicensis	Black rail	T (P)	No	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	No Effect
Myotis septentrionalis	Northern long-eared bat	T	Yes	MA-LAA
Necturus lewisi	Neuse River waterdog	T (P)	Yes	MA-NLAA
Noturus furiosus	Carolina madtom	E (P)	No	No Effect
Picoides borealis	Red-cockaded woodpecker	E	No	No Effect
Trichechus manatus	West Indian manatee	T	No	No Effect

E – Endangered , T – Threatened, T(S/A) – Threatened due to Similarity of Appearance, E(P) – Proposed endangered, T(P) – Proposed threatened, MA-LAA - May Affect, Likely to Adversely Affect, MA-NLAA - May Affect, Not Likely to Adversely Affect, NA- Not applicable.

Biological Conclusions for ESA Listed Species

The CE addressed the analysis of potential effects on federally protected species. Since the CE was approved several species have been listed in Craven County or are currently proposed for listing in Craven County or within the watershed including Neuse River waterdog, Carolina madtom, black rail, shortnose sturgeon, and green sea turtle. It was determined that the project will have No Effect on all the species listed except for northern long-eared bat which had a biological conclusion of May Affect, Likely to Adversely Affect (MA-LAA) and Neuse River waterdog which had a biological conclusion of May Affect, Not Likely to Adversely Affect (MA-NLAA); see Table 5.

The USFWS has developed a Programmatic Biological Opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the NLEB in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is May Affect, Likely to Adversely Affect. The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Craven County, where U-5713/R-5777A&B is located. This level of incidental take is authorized from the effective date of a final listing determination through December 31, 2020 (the USFWS, FHWA, USACE, and NCDOT are coordinating to reinitiate Section 7 to extend the PBO beyond this date).

Currently the Neuse River waterdog is listed as Proposed Threatened in Craven County. A Neuse River Waterdog Survey Report was completed for these projects in March 2020. Based on the survey results, a Biological Conclusion of May Affect, Not Likely to Adversely Affect was rendered for this species. Due to this MANLAA designation, a request for informal Section 7 concurrence for Neuse River waterdog was

submitted to USFWS by NCDOT – Environmental Coordination and Permitting (ECAP) on August 26, 2020. USFWS concurred with the Biological Conclusion in a response dated August 26, 2020.

Bald and Golden Eagle Protection Act (BGPA)

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the federal list of threatened and endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) became the primary law protecting bald eagles. Field surveys were conducted on December 11, 2019 and January 17, 2020 for U-5713 and on January 3, 2018 for R-5777A&B. Surveys concluded that the proposed project has potential foraging areas within 1.0 mile from the study area but will have no impact on the bald eagle due to the absence of nest sites.

Moratoria

No streams are subject to the anadromous fish construction moratorium within the proposed project construction limits.

Essential Fish Habitat

The project will not impact any Essential Fish Habitat (EFH) identified by the National Marine Fisheries Service (NMFS), and NMFS has not requested further consultation regarding EFH.

Cultural Resources

During NEPA documentation, it was determined that no properties listed in or eligible for listing in the National Register of Historic Places (NRHP) will be impacted in the U-5713 portion of the project area by the Preferred Alternative. For R-5777A&B, it was determined that a portion of the New Bern Battlefield Site (CV2055) is located within the US 70 ROW. The proposed construction is anticipated to impact the earthworks associated with the New Bern Battlefield Site. Project commitments have been generated to ensure that areas outside the proposed ROW are protected. Data recovery investigations have been performed within the ROW to comply with commitments in the CE and were summarized in a report dated July 2019 which has been forwarded to SHPO. The New Bern Battlefield Earthworks will be indicated on the design plans (Sheet 10) as an "Environmentally Sensitive Area" that cannot be disturbed by construction, staging, or any other project related activities. The area not to be disturbed will include the earthwork berm, as well as a minimal buffer of 100 feet along the north side of the earthworks berm. This protected area will be fenced using High Visibility Fencing (HVF) prior to any construction related activities.

Borrow

Several potential borrow sites are under consideration, but a borrow site has not currently been selected. Any borrow site will be evaluated to ensure no impacts to streams or wetlands would occur directly or indirectly through drainage. Impacts to jurisdictional resources associated with obtaining borrow are not anticipated.

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.

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 planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Avoidance and Minimization: NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Avoidance and minimization measures for U-5713/R-5777A&B were further discussed during the 4B and 4C meetings and are being implemented to the maximum extent practicable. All stream, wetland, and riparian buffer areas not affected by the project will be protected from unnecessary encroachment. Additional Avoidance and Minimization measures are listed below.

- A Stormwater Management Plan (SMP) has been created for the project and is included in this package with the permit drawings.
- All major structures have been designed to minimize environmental and surface water impacts as much as practicable.
- Key elements of the SMP included the construction of permanent basins and the use of grassed swales for stormwater treatment.
- Seven detention basins were used throughout the project and primarily designed to provide stormwater treatment and minimize pre/post impacts.
- Grassed swales were used for treatment when BMP design standards could be met.
- Grassed swales were used to reduce flow velocity, promote sedimentation infiltration and runoff attenuation; discharge velocities at jurisdictional features are non-erosive.
- Following the identification of two AECs along with the Neuse River Buffer, design revisions were made to a proposed drainage outfall which avoided the AECs and the Neuse River Buffer.
- Utilities will be installed through trenchless installation methods where practicable.
- Where possible, utilities were placed within the proposed roadway fill limits to avoid additional impacts.

Compensation: The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable.

The proposed construction of U-5713/R-5777A&B will result in unavoidable impacts to 3.59 acres of freshwater wetlands, 1,321 linear feet of jurisdictional stream and 108,632 sq.ft. of riparian buffers that will require mitigation. The wetland, stream, and buffer impacts are in the 8 digit hydrologic unit 03020204 of the Neuse River Basin.

Compensatory mitigation for the unavoidable impacts to freshwater wetlands, streams, and riparian buffers will be provided by the North Carolina Department of Environmental Quality (NCDEQ)-Division of Mitigation Services (DMS).

Indirect and Cumulative Effects

Potential indirect and cumulative effects (ICE) attributable to the US 70 Improvements project were analyzed in the CE. The project is anticipated to lead to a reduction in travel time along the mainline, US 70. Population and employment within the project area are expected to grow, but at modest rates, and local planners anticipate that available land will be developed over time, whether the project is constructed or not. The City of New Bern and Craven County have plans and ordinances in place to effectively manage growth and development, while protecting natural resources within the project area.

It is anticipated that the project will not notably contribute to cumulative impacts to environmental resources in the project area. The potential for the degradation of water quality does exist through erosion and stream sedimentation. The stormwater management plan details measures taken to avoid and minimize these potential project related impacts.

The notable natural environmental features found within the project area are provided multiple protections under state and federal laws and local permitting ordinances. The cumulative effect of this project when considered in the context of other past, present, and future actions, and the resulting impact on the notable human and natural features, will not notably contribute to cumulative impacts to environmental resources in the project area. Direct natural environmental impacts by NCDOT are minimized to the maximum extent practicable while still serving the purpose of the project. All future development will be required to follow local, state, and federal guidelines and permitting regulations. No significant indirect or cumulative impacts to water quality are anticipated due to the construction of U-5713/R-5777A&B project.

Regulatory Approvals

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

Section 401: We are requesting a Section 401 Water Quality Certification from NCDWR. We are providing this application to NCDEQ, for their approval. Authorization to debit the $570 Permit Application Fee from WBS Element 50111.3.1 is hereby given.

CAMA: Under separate cover, NCDOT is submitting a request for a CAMA Federal Consistency Review from the N. C. Division of Coastal Management for U-5713/R-5777AB.

A copy of this permit request and its distribution list will be posted on the NCDOT website at: https://connect.ncdot.gov/resources/Environmental

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Chris Rivenbark at crivenbark@ncdot.gov or (919) 707-6152.

Sincerely,

DocuSigned by:
Preston Hunter
5433AB43E6E9415...

Preston Hunter, P.E.
Division Engineer

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	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Preston Middle - Last - Hunter	First - Middle - Last -
Company - NCDOT - Division 2	Company -
E-mail Address -	E-mail Address -
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 2815 Rouse Road Extension	Address-
City - Kinston State - NC Zip - 28504 Country -	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 252-775-6100 c. Fax	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)

USACE Action ID 2018-01012 U-5713/R-5777A&B (US 70 Improvements in James City, Craven County)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
UTs to Scotts Creek, UTs to Brice Creek, UT to Neuse River	Address
15. LOCATION OF PROJECT	City - State- Zip-
Latitude: ◦N 35.056207 Longitude: ◦W -77.017673	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE
Please see attached vicinity map.

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

Construction of US 70 Improvements in James City, North Carolina in Craven County. The Preferred Alternative originates at the eastern approach to the Neuse River bridge and extends to approximately one mile southeast of S.R. 1116 (Thurman Road) along US 70. Interchanges will be constructed at Williams Road, Airport Road, Grantham Road, Taberna Way, and Thurman Road. Full control of access is proposed.

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

The purpose of the project is to improve the traffic operations along the US 70 corridor and enhance regional connectivity in eastern North Carolina.

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

20. Reason(s) for Discharge

Wetlands and streams will be impacted by construction activities, i.e., widening of road, interchanges, new locations, and installation of drainage structures.

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.		

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

Acres See attached cover letter.

or

Linear Feet See attached cover letter.

23. Description of Avoidance, Minimization, and Compensation (see instructions)
See attached cover letter.

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

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

a. Address- See attached list

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.

DocuSigned by:
Preston Hunter
5433AB43E8E9415...

9/14/2020

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.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726
August 26, 2020

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

Dear Mr. Harris:

This letter is in response to your letter of August 26, 2020 which provided the U.S. Fish and Wildlife Service (Service) with the biological conclusion of the North Carolina Department of Transportation that the proposed upgrade of U.S. 70 from the Neuse River Bridge to the Havelock Bypass in Craven County, North Carolina (STIP U-5713 and R-5777 A, B, & C) may affect, but is not likely to adversely affect the federally proposed threatened Neuse River Waterdog (*Necturus lewisi*). The following response is provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

According to information provided, surveys for Neuse River Waterdogs were conducted at multiple sites throughout the project area January 27-31 and February 25-27, 2020. No Neuse River Waterdogs were observed, and some sites were deemed likely unsuitable habitat due to brackish conditions. Based on available information, the Service concurs with your biological conclusion that the action is not likely to adversely affect the Neuse River Waterdog. Although the Neuse River Waterdog is currently only a proposed species, this concurrence will be valid if and when the species is officially listed. We believe that the requirements of Section 7(a)(2) of the ESA have been satisfied. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered in this review; (2) this action is subsequently modified in a manner that was not considered in this review; or (3) a new species is listed or critical habitat determined that may be affected by this identified action.

The Service appreciates the opportunity to review this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520 (Ext. 32).

Sincerely,

Gary Jordan for

Pete Benjamin
Field Supervisor

Electronic copy:

Tom Steffens, USACE, Washington, NC
Travis Wilson, NCWRC, Creedmoor, NC
Chris Rivenbark, NCDOT, Raleigh, NC

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

September 8, 2020

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

Dear Mr. Harris:

Subject: DMS Mitigation Acceptance Letter:

U-5713 / R-5777A / R-5777B, US 70 Improvements from the Neuse River Bridge to East of SR 1116, (Thurman Road), Craven County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream, wetland and buffer mitigation for the subject project. Based on the information supplied by you on September 8, 2020, the impacts that DMS will provide mitigation are located in CU 03020204 of the Neuse River basin in the Southern Outer Coastal Plain (SOCP) Eco-Region, and are as follows:

Stream and Wetlands	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
Impacts	Neuse	03020204	SOCP	0	0	1,321.0	2.11	1.48	0

*Some of the impacts may be proposed to be mitigated at various ratios. See permit application for details.

All buffer mitigation requests and approvals are administrated through the Riparian Restoration Buffer Fund. The NCDOT will be responsible to ensure that appropriate compensation for the buffer mitigation will be provided in the agreed upon method of fund transfer. Upon receipt of the NCDWR's Buffer Authorization Certification, DMS will transfer the appropriate amount of funds from the NCDOT 2984 Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its riparian buffer mitigation responsibility for TIP Numbers U-5713 / R-5777A / R-5777B. Subsequently, DMS will conduct a review of current NCDOT ILF Program mitigation projects in the river basin to determine if available buffer mitigation credits exist. If there are buffer mitigation credits available, then the Riparian Restoration Buffer Fund will purchase the appropriate amount of buffer mitigation credits from NCDOT ILF Program. The buffer impacts are listed in the following table:

Buffer	River Basin	CU	Eco-Region	Buffer Impacts		
				Zone 1	Zone 2	TOTAL
Impacts	Neuse	03020204	SOCP	68,718.0	39,914.0	108,632.0

The impacts and associated mitigation needs were under projected by the NCDOT in the 2020 impact data. DMS will commit to implement sufficient compensatory stream and wetland mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies using the delivery timeline listed in Section F.3.c.iii of the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts increase, 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 Ms. Beth Harmon at 919-707-8420.

Sincerely,

Elizabeth Harmon

James B. Stanfill
DMS Asset Management Supervisor

Cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Mr. Amy Chapman, NC Division of Water Resources
Ms. Linda Fitzpatrick, NCDOT - EAU
File: U-5713 / R-5777A / R-5777B

Minutes from the Interagency 4B Hydraulic Design and Permit Review Meeting
U-5713/R-5777 - Craven County
NCDOT Structure Design Conf. Room C
January 17, 2020

Team Members:

Tom Steffens, USACE	(present)
Garcy Ward, NCDWR	(present)
Robert Patterson, NCDWR	(present)
Stephen Lane, NCDCM	(present)
Cathy Brittingham, NCDCM	(present)
Amanetta Somerville, EPA	(not present)
John Mintz, NCDCR	(not present)
Lindsay Ferrante, NCDCR	(not present)
Renee Gledhill-Earley, NCDRC	(not present)
Curtis Weychert, NCDENR	(not present)
Travis Wilson, NC WRC	(not present)

Participants:
Preston Hunter, NCDOT Division Engineer
Cadmus Capehart, NCDOT Division 2 DCE
Heather Lane, NCDOT Division 2 Assist. DCE
David Kramer, NCDOT Division 2 Utilities
Chris Rivenbark, NCDOT EAU
Mike Sanderson, NCDOT EPU
Wendi Johnson, Gannett Fleming
Eddie Bunn, Gannett Fleming
Jamie Byrd, HNTB
Matt Foster, HNTB
Josh Sommer, Balfour Beatty
Kevin Bailey, STV
Adam Freeman, STV
Michael Iagnocco, STV
Joshua Kotheimer, STV
Josh Dalton, Sungate Design Group
Eric Leonhart, Sungate Design Group
David Talbert, Sungate Design Group

Minutes:

Josh Dalton opened the meeting and introductions were made by all in attendance.

Kevin Bailey provided an overview of the project limits and roadway design. The current project schedules have the 4C Meeting on April 15, 2020 and June 5, 2020 as the target date for submittal of the USACOE 404 permit application.

Due to the accelerated design-build project schedule, drainage design continued after plans were uploaded to the Agency members. After plans were uploaded, revisions to the drainage were necessary due to existing field conditions and revisions to roadway layout. Areas where drainage was revised were noted during the meeting. Hard copies of the revised plans were provided to the Agency members at the meeting.

Eric Leonhart proceeded through the project plan sheets 4 through 11 and David Talbert proceeded through plan sheets 12 through 22:

General

- Tom Steffens requested showing JD nomenclature on the permit drawings for all wetland and jurisdictional streams.
- Garcy Ward/Robert Patterson – The design must provide some level of pre-treatment prior to discharge to any blue line stream. Provide diffuse flow outside the Zone 2 buffer wherever possible. In those instances, the buffer provides the treatment. For grassed swales, the criteria is 100' of grassed swale per acre of drainage area. All alternatives for treatment should be exhausted as the state looks at each discharge separately. Josh Dalton asked if it was acceptable to overtreat stormwater with larger basins on other portions of the project where additional right-of-way was available in order to offset areas where treatment would require taking of homes. Garcy stated that this provided little benefit as the state looks at each discharge point separately. *Post meeting discussion with Garcy Ward - if design cannot meet treatment requirements, it could trigger the need for a variance; wider swale bottoms could gain additional treatment capacity.*
- "Skull and crossbones" symbols were noted throughout the plans. Kevin Bailey explained that the symbol meant that there were potential contaminated soils located somewhere on that parcel. The mapping and determination of the contaminated soils is ongoing and will be completed prior to the right-of-way phase. If excavation occurs within a contaminated soils area, the soils must be handled according to the RFP and Green Sheet commitments. If a drainage system is located within the contaminated soils area, the system must be sealed.
- The project will require a DCM Consistency Review. Cathy Brittingham agreed the Team could use the previous Havelock Coastal Consistency Determination submittal as an example. *The Consistency Review will not be required if the project qualifies for a General Permit 31 instead of an Individual Permit.*
- Heather Lane noted the CE document will be updated prior to the permit application to address any updates to protected species and any other required updates.
- Chris Rivenbark noted that mitigation would likely be provided through DMS.
- Label pipes inverts that will be buried and the depth.

Plan Sheet 4:

- No comments.

Plan Sheet 5:

- Eric Leonhart – Existing 66" RCP will be retained and extended. The inverts are not buried and therefore the extended inverts will not be buried. Garcy Ward – Make sure this does not result in a perched pipe. This needs to be noted in the permit application.
- Tom Steffens – Why is toe protection being used in the wetlands? Eric stated that the toe protection will only be placed on the slope.

- Robert Patterson – Can 36” pipe outlet to the wetlands instead of a direct connection to the 66” pipe? Eric stated the Team would investigate.

Plan Sheet 6:

- Tom Steffens asked if the 48” pipe outlet could be shifted away from the wetland right of station 35+50 -SRY21C-. Eric noted that this ditch may need to be piped due to the size of the ditch and impact to homes. Robert Patterson asked how far the system would be piped. Garcy Ward stated that treatment will be needed prior to the buffer. After much discussion, it was agreed that the ditch would remain from station 35+50 to approximately station 46+50. The pipe system will outlet at station 59+50 to a ditch to the culvert inlet. This will provide the maximum amount of grass swale treatment practicable without additional taking of homes.

Plan Sheet 7:

- No comments.

Plan Sheet 8:

- Tom Steffens asked what the purpose of the toe protection on Y21 was. Eric stated that the toe protection will only be placed on the slope. Tom asked if equalizer pipes were needed. Eric said cover may be an issue. NCDOT agreed the Team could use multiple 24” pipes for equalizer conditions if needed. Eric noted the ditch within the wetland limits along Y21 would be eliminated.
- Tom asked about ditch impacts to the wetland left of station 16+00 -Y21RPB-. Josh Dalton noted the Team would reduce the ditch depth if possible or use a pipe across the wetland limits.
- Robert Patterson asked how the existing stormwater pond in quadrant B would drain. Josh stated the Team would investigate further and tie pond outlet to system as needed.
- Tom noted the fill slope lines cross the stream at the box culverts. Eric noted slope stake line would tie to the wing walls in the final plans.
- Josh Dalton noted that the 18” pipe in quadrant C would be connected to the side wall of the box culvert. Garcy said that was acceptable as long as treatment is provided.
- Josh noted the class II rip rap would be removed in the straight portions of the culvert channel relocations with coir fiber matting used instead.
- Tom asked why the equalizer pipe was removed from the wetland in quadrant D on -SRY21D-. Eric noted that the 36” pipe would not fit under the road. NCDOT said it was acceptable to use two 24” pipes if needed.
- Garcy asked that the buffer lines downstream of quadrant A be shown further downstream.
- Garcy questioned what feature was at the 48” pipe left of station 279+00 -L-. Mike Iagnocco noted this was stream SD on the west side of Highway 70 and tributary TE on the east side and that neither feature should have buffers.

Plan Sheet 9:

- Eric noted the box culvert inverts will be buried 1' with sills and baffles.
- Joshua Kotheimer noted that stream SF should not have buffers.
- Tom requested the 6' base ditch include a bend with rip rap on the banks at the box culvert inlet.
- Garcy asked about treatment for the system that outlets left of station 287+00 -L-. Eric noted that treatment will be provided prior to the buffer.
- Tom reminded the Team to include fill in wetland impacts for rip rap pads in wetland limits.

Plan Sheet 10:

- Tom asked about the 60" pipe and what was draining to the box culvert. Eric noted there is a proposed lateral ditch along the service road with a cross pipe (on the matchline which is difficult to see) that drains to an inlet and then connects to the proposed box culvert.
- Garcy asked if the system outlet left of station could be moved outside the buffers. Eric stated the drainage would be revised to move the outlet beyond the buffer limits.

Plan Sheet 11:

- Joshua Kotheimer noted that the JS line in wetland WAF should be removed.
- Tom stated the 2' lateral based ditch along SRY22A needs to have non-erosive velocities at the wetland limits.

Plan Sheet 12:

- Tom asked how treatment would be provided for the direct connection to the 54" cross pipe. David Talbert noted the Team would try to redirect these inlets to swales along the service road if possible.
- Garcy asked about the pipe along the service road -SR1- that connects to the 54" cross pipe. Eric explained that the existing ditch left of station 17+60 -SR1- flow toward the road (not away like the flow arrow indicates) and this pipe was picking up that drainage.

Plan Sheet 13:

- No JS or wetland features on this plan sheet. No comments.

Plan Sheet 14:

- Tom noted the 42" pipe in quadrant C goes nowhere in his set of plans. Josh Dalton explained some issues with the railroad outfalls that were found during

field visits. The drainage design in this area is being reworked to avoid potential increases to the railroad outfalls. Stormwater basins are likely in quadrants A and B to provide stormwater quality treatment and stormwater quantity control.

Plan Sheet 15:

- No comments.

Plan Sheet 16:

- Joshua Kotheimer noted that stream SG is mapped west of the railroad and does not extend to the east side of the railroad. The buffers should be removed from the plans left of station 406+00 -L-.

Plan Sheet 17:

- No comments.

Plan Sheet 18:

- Garcy field reviewed and concurs with the JD package. Stream SA is buffered to the limits shown in the JD package which ends at the driveway.
- Scott's Creek is an AEC – CAMA jurisdiction ends at Williams Road. No impacts are currently anticipated to Scott's Creek.

Plan Sheet 19:

- No comments.

Plan Sheet 20:

- A new wetland and AEC has been identified left of -RPC55-. Joshua Kotheimer explained that the shoreline and associated buffer was an inland water (30' buffer) and not coastal and not subject to the CAMA 75' buffer
  Note: post meeting, DCM confirmed that Scott's Creek is designated as Inland Waters, therefore, the Public Trust Shoreline AEC extends 30' from the normal water level of the creek. DCM made a field visit to the site post meeting with Nathan Howell of Three Oaks Engineering. It was determined during the meeting that the outlet of the existing 24" pipe under the off ramp from US 70 to US 17 is located approximately 15' from Scott's Creek and is within the Public Trust Shoreline AEC. Replacing or upsizing the 24" pipe in the existing location as part of the project would require a CAMA Major Permit, however, the proposed pipe location, as shown in the updated plans provided at the meeting, would be outside of the AEC and would not trigger a CAMA Major Permit.

- David Talbert explained efforts to move discharge formerly associated with the existing 24" pipe to outside of the AEC buffer. Stephen Lane stated the pipe as shown shouldn't require a CAMA permit.
- Need to show buffer zones associated with the AEC and wetland limits on plans.
- DCM questioned whether sturgeon issues are a concern.

Plan Sheet 21:

- Tom noted the ditch left of station 19+50 -SRY21C2- will impact the wetlands. Eric stated this section of ditch can be piped to avoid the impact.

Plan Sheet 22:

- No comments.

-Meeting Adjourned.

Minutes from the Interagency 4C Permit and Buffer Review Meeting
U-5713/R-5777 - Craven County
Conference Call
June 17, 2020

Team Members:

Tom Steffens, USACE	(present)
Garcy Ward, NCDWR	(present)
Stephen Lane, NCDCM	(present)
Cathy Brittingham, NCDCM	(present)
Kimberly Maxey, New Bern MPO	(present)
Matthew Wilkerson, NCDOT	(present)
Steve Hamilton, NCDOT	(present)
Kim Urban, NCDNCR	(present)
Wes Cartner, NCDOT	(present)
Caleb Smith, NCDOT	(present)

Participants:
Cadmus Capehart, NCDOT Division 2 DCE
Heather Lane, NCDOT Division 2 Assist. DCE
Chris Rivenbark, NCDOT EAU
Mike Sanderson, NCDOT EPU
Wendi Johnson, Gannett Fleming
Jamie Byrd, HNTB
Roy Tellier, HNTB
Jessica Kuse, HNTB
Keith Nixon, Balfour Beatty
Kevin Bailey, STV
Adam Freeman, STV
Michael Iagnocco, STV
Joshua Kotheimer, STV
Eric Leonhart, Sungate Design Group
David Talbert, Sungate Design Group

Minutes:

Eric Leonhart opened the meeting and introductions were provided in the GoToMeeting participants tab.

Kevin Bailey provided an overview of the project limits and roadway design. The current project schedule has July 17th, 2020 as the target date for submittal of the USACOE 404 permit application.

All drainage design reviewed during the 4C meeting has been approved by HNTB prior to review and no changes were made to the plans prior to the distribution of plans to Agency members. Prior to beginning the meeting, PDF distribution was offered to any Agency members that did not have copies of plans.

Eric Leonhart proceeded through the 'Wetland and Surface Water Impacts Permit', the 'Utility Wetland and Surface water Impacts Permit', and the 'Buffer Impacts Permit' drawing plan sets.

General

- From 4B Minutes: Tom Steffens requested showing JD nomenclature on the permit drawings for all wetland and jurisdictional streams. All JD nomenclature has been included on 4C plan sheets.
- From 4B Minutes: Garcy Ward/Robert Patterson – The design must provide some level of pre-treatment prior to discharge to any blue line stream. Provide diffuse flow outside the Zone 2 buffer wherever possible. In those instances, the buffer

provides the treatment. For grassed swales, the criteria is 100' of grassed swale per acre of drainage area. All alternatives for treatment should be exhausted as the state looks at each discharge separately. Q10 and V10 have been provided on 4C plans. Treatment was discussed throughout the call and Eric Leonhart stated that in the areas where treatment was not met, the Design-Build Team has looked into every possible solution to treat water prior to entering the buffer.

- Mike Iagnocco asked if a General Permit can be utilized for this project. Tom Steffens responded by saying that it is possible, and he is willing to evaluate the possibility of using a General Permit. *After the meeting, Heather Lane emailed to state that an Individual Permit along with a CAMA Consistency Determination will be required for this project.*
- Mike Iagnocco asked if the impacts at the proposed jug handles would be counted as part of the interchange impact values. Tom Steffens stated that he will investigate further and choose an option that is easiest for all parties involved. For the time being an Individual Permit will be called for unless otherwise noted.
- Mike Iagnocco asked which format should be used for property owner lists. Tom Steffens stated that an excel format should be used and in the case of multiple parcels being owned by a single owner, those parcels should be combined.

Wetland and Stream Impact Drawings

Plan Sheet 5:

- Sheet 5 of 54 – Site 1 – Station 13+47 -SRY21C- RT:
    - Eric Leonhart – Existing 66" RCP will be retained and extended. The inverts are not buried and therefore the extended inverts will not be buried. Garcy Ward – Brought up perched condition in 4B Meeting and asked if this had been addressed. Eric Leonhart stated that the invert of the 66" RCP extension will tie to the bed and bed conditions will help to prevent additional scouring.

Plan Sheet 8:

- Sheet 11 of 54 – Site 4 – Station 17+45 -SRY21A-:
    - Tom Steffens – Will sills in Reinforced Concrete Box Culverts be backfilled? Eric stated that all culverts will be backfilled with native material to a depth of 1' to match the depth of the sills.
    - Garcy Ward – Riprap in stream bed is to be keyed in below the existing streambed. Eric Leonhart stated Sungate will revise detail to include note that all riprap in the streambed is to be installed beneath the existing streambed elevation will be keyed-in.
- Sheet 12 of 54 – Site 9 – Station 19+00 -Y21RPD- LT:
    - Chris Rivenbark stated that the 'Total Take' note should be removed from this plan sheet and all remaining plan sheets throughout the project. He recommended only including a note for total takes on the summary sheets at the end of the package.

- Wendi Johnson stated she would like the total take areas shaded on construction plans. Eric Leonhart yielded decision to Agency members. Chris Rivenbark stated this would not be typical and should be avoided for consistency with other projects. Thomas Steffens agreed with Chris and it was decided not to shade areas of total takes.

- Sheet 14 of 54 – Site 12 – Station 12+55 -SRY21A-:
  - Stephen Lane asked if 42" RCP will be buried on upstream side or just on downstream side. Eric Leonhart stated the entire pipe will be buried 1'.

<u>Plan Sheet 9:</u>

- Sheet 25 of 54 – Site 15 – Station 10+25 -SRY21D- RT:
  Site 16 – Station 38+47 -SRY21A- LT:
  - Chris Rivenbark asked to remove 'Total Take' notes from plan sheets but leave notes on summary sheets. Eric Leonhart stated Sungate would remove these notes from plan sheets and only denote total takes on the summary sheets.
- Sheet 25 of 54 – Site 13 – Station 285+66 -L-:
  - Tom Steffens asked if 1@6'x6' RCBC will be backfilled. Eric Leonhart stated the culvert will be backfilled with native material and the detail on Sheet 30 of 54 will be changed to call for backfill.
  - Garcy Ward asked if the baffles would alternate between the left and right side of the 1@6'x6' RCBC or if they would span the whole width of the culvert. Eric Leonhart responded that the baffles would span the entire width of the culvert.
  - An unknown caller asked how deep the culvert will be backfilled. Eric Leonhart stated the culvert will be backfilled 1' with native material and the baffles will essentially be buried.
  - Eric Leonhart stated that based on discussion from previous plan sheets, Detail 9-8 will be revised and a note will be added to key-in the CL 'I' riprap beneath the existing streambed.
- Sheet 30 of 54 – Site 13 – Station 285+66 -L-:
  - Tom Steffens stated to revise the detail to call for the culvert to be backfilled with native material. Eric Leonhart stated the detail would be revised.

<u>Plan Sheet 10:</u>

- Sheet 35 of 54 – Site 18 – Station 308+46 -L-:
  - Tom Steffens stated to revise the detail to call for the culvert to be backfilled with native material. Eric Leonhart stated the detail would be revised.

- Sheet 38 of 54 – Site 21 – Station 14+79 -SRY22A- LT:
    - Chris Rivenbark asked if ditches discharging into buffer are being utilized as grass swales to achieve treatment at site 21. Eric Leonhart stated that these ditches, along with others draining into cross pipes and storm drain systems, are being utilized to achieve sufficient treatment of water prior to discharging into the buffer.

Plan Sheet 12:

- Sheet 44 of 54 – Site 22 – Station 13+53 -SR1- LT:
    - Jamie Byrd asked if Sungate would add rip rap pad at outlet of the 36" drive pipe just to the south of Site 22. Eric Leonhart responded that Sungate will add a rip rap pad at the outlet of the proposed 36" drive pipe.

Plan Sheet 21:

- Sheet 47 of 54 – Site 24 – Station 19+50 -SRY21C2- LT:
    - Chris Rivenbark asked if mechanized clearing can be changed to hand clearing if there is not direct disturbance of wetland at Site 24, specifically, but throughout the project length as a whole. Eric Leonhart responded that this is something that can be looked into, but would require Division and full agency approval.
    - Wendi Johnson stated that all mechanized and hand clearing should extend 10' outside of the toe of slope or any excavation/fill.

Utility Permit Impact Drawings

Plan Sheet 6:

- Sheet 2 of 11 – Site 25 – Station 36+00 -SRY21C- RT:
    - Eric Leonhart noted that hand clearing is being shown at the Brice's Creek Bible Church property even though the Design-Build team has not received guidance on whether or not this is still a wetland area.
    - Chris Rivenbark stated that utility impacts should be noted as excavation and a note should be added that this would be a temporary impact as the area will be filled back in after the water lines are installed. Wendi Johnson and Tom Steffens agreed with Chris' comment.
    - Wendi Johnson asked if the water lines are being installed by open cutting. Eric Leonhart responded that the water lines were being installed by open cutting.

Plan Sheet 8:

- Sheet 5 of 11 – Site 3 – Station 16+20 -Y21RPB- LT:
    - Wendi Johnson asked why hand clearing was needed. Eric Leonhart responded that hand clearing was being provided for the installation of overhead utilities.

Buffer Impact Drawings

Plan Sheet 8:

- Sheet 2 of 12 – Site 4 – Station 61+20 -SRY21C- RT:
    - Garcy Ward asked if we can outlet proposed 42" pipe network into ditches prior to its current outfall to achieve additional treatment. The proposed ditch only provides 250 LF of treatment. Eric Leonhart responded that each network discharging into buffered streams has been analyzed to provide cumulative totals of treatment throughout the entire drainage area. This specific site has approximately 4,170 LF of grassed swales treating runoff prior to entering closed pipe systems.
    - Garcy Ward asked if there was a way to note cumulative treatment length for each outfall in the Stormwater Management Plan. Eric Leonhart responded that Sungate would investigate ways to incorporate cumulative treatment length in the Stormwater Management Plan for each buffer site to provide clarity to the agencies.

Plan Sheet 10:

- Sheet 6 of 12 – Site NA – Station 39+60 -SRY21D- RT:
    - Caleb Smith went into extensive detail about the New Bern Battlefield Earthworks existing on the southernmost part of plan sheet 10. Caleb stated that the earthworks are staked and marked in the field, but requested the earthworks be marked as an Environmentally Sensitive Area (ESA) on the plan sheets. Caleb also asked for an appropriately sized buffer to be provided in both directions (50'-100') leading away from the earthworks outline. Caleb mentioned that the original request was that all proposed roadway improvements be kept within the existing NCDOT Right-of-Way and stated the Design-Build Team has met those requirements.
    - Kim Maxey stated that the last set of plans she received showed impacts extending approximately 10' outside of the existing NCDOT Right-of-Way, but the current 4C plans have avoided creating impacts outside of the ROW and the team is currently staying within the current ROW.
    - Tom Steffens asked if the proposed toe protection along -Y22RPC- bordering the archeological site/NCDOT Right-of-Way was a concern for Caleb Smith. Caleb responded that the proposed drainage presented no problems near Site 18.

Plan Sheet 11:

- Sheet 8 of 12 – Site 21 – Station 14+79 -SRY22A- LT
    - Garcy Ward asked if the ditches at site 21 can be daylighted prior to buffer zone 2. Eric Leonhart responded that due to the elevations of proposed systems and natural ground elevations, tying the proposed ditch to the existing wetland was the only option. An option of piping was considered

but would have reduced the amount of treatment provided and would have ultimately increased velocities of discharge into the buffer zone.

Plan Sheet 20:

- Station 16+53 -RPC55- LT:
  - Tom Steffens and Stephen Lane both requested that a buffer sheet be included to show the proposed 36" Welded Steel Pipe beneath RPC55 to show no impacts to the CAMA buffer. Eric Leonhart stated that an additional buffer sheet can be added to provide clarity to the agencies about the work occurring in this area.
  - Cathy Brittingham noted that the label in the final survey file incorrectly shows this body of water as the Neuse River. This label should be changed to Scotts Creek. Josh Kotheimer agreed this body of water should be designated at Scotts Creek. Eric Leonhart responded the final survey file will be revised to correctly show this body of water as Scotts Creek.

-Meeting Adjourned.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

General Project Information

WBS Element:	50111.3.1	**TIP Number:**	U-5713/R-5777	**Project Type:**	Roadway Widening
NCDOT Contact:	Matt Foster, PE, PLS	**Contractor / Designer:**	Joshua G. Dalton, PE	**Date:**	7/13/2020
Address:	343 E. Six Forks Road Suite 200 Raleigh, NC 27609	**Address:**	Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606		
Phone:	919-546-8997	**Phone:**	919-859-2243		
Email:	mfoster@HNTB.com	**Email:**	jdalton@sungatedesign.com		
City/Town:	New Bern	**County(ies):**	Craven		
River Basin(s):	Neuse	**CAMA County?**	Yes		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	4.46	**Surrounding Land Use:**	Commercial, Residential

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	132.7 ac.	74.5 ac.
Typical Cross Section Description:	US 70: Grassed ditch median with 6:1 max side slopes. 4 paved lanes (total 48' wide). 12' shoulder on each side (15' with guardrail). 10' paved shoulder. Varying fill and cut slopes. US 70: Type T concrete barrier median. 6 paved lanes (total 72' wide). 12' shoulder on each side (15' with guardrail). See project XSC's for detailed information.	US 70: Grassed ditch median. 4 paved lanes (total 48' wide). 4' paved shoulders (2' grassed). Varying fill and cut slopes.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 62,000 Year: 2040	Existing: 45,200 Year: 2015
General Project Narrative: (Description of Minimization of Water Quality Impacts)	The North Carolina Department of Transportation (NCDOT) has proposed the widening and improvements of existing US 70 in Craven County between the Eastern Approach of the Neuse River Bridge and approximately one mile east of S.R. 1116 (Thurman Road). The U-5713/R-5777 project includes 5 proposed culverts at stream crossings along US 70. All major structures have been designed to have as little environmental and surfacewater impacts as possible. The first proposed location is at the US 70 and Thurman Road interchange. Three consecutive culverts will be used at this interchange. The first proposed structure is a 1@9'x6' RCBC (buried 1') under a service road (SRY21C) adjacent to US 70 WB branching directly from E. Thurman Road. The next structure is also a 1@9'x6' RCBC (buried 1') approximately 200' downstream of the previous culvert outlet. The culvert is a RCBC that crosses Thurman Road, US 70, and the exit ramp from US 70 EB onto W. Thurman Road. The third structure is a 1@10'x7' RCBC (buried 1') at the new stream crossing of the proposed service road (SRY21A) SW of US 70. The culvert empties into the wetland west of the interchange. The fourth major strucutre is a 1@6'x6' RCBC (1' sills and baffles) that is replacing a 1@48" RCP under US 70, transporting drainage from unnamed tributary on the east side of US 70 to the wetland on the west side of US 70. The last major structure is a 1@7'x7' RCBC (buried 1') at an unnamed tributary crossing of US 70. The structure is just southeast of the proposed US 70 and Taberna Way interchange and replaces a 54" RCP. Seven detention basins were used throughout the project and primarily designed to provide stormwater treatment and minimum pre/post impacts. Grassed swales were used for treatment when BMP design standards could be met. Grassed swales were used to reduce flow velocity, promote sedimentation infiltration and runoff attenuation. Velocities at jurisdictional and wetland features are non-erosive.	

Waterbody Information

Surface Water Body (1):	Brice Creek	**NCDWR Stream Index No.:**	27-101-40-(1)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Swamp Waters (Sw)	(NSW)	
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	Brice Creek			**Buffer Rules in Effect:**	Neuse
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)					

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

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WBS Element:	50111.3.1	TIP No.:	U-5713/R-5777	County(ies):	Craven	Page	2	of	14

Additional Waterbody Information

Surface Water Body (2):	Scotts Creek		**NCDWR Stream Index No.:**	27-102		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class SC			
		Supplemental Classification:	Swamp Waters (Sw)	(NSW)		
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	Scotts Creek			**Buffer Rules in Effect:**	Neuse	
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):	Trent River		**NCDWR Stream Index No.:**	27-101-(39)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class SB			
		Supplemental Classification:	Swamp Waters (Sw)	(NSW)		
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	Trent River			**Buffer Rules in Effect:**	Neuse	
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 (4):	Neuse River		**NCDWR Stream Index No.:**	27-(96)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class SC			
		Supplemental Classification:	Swamp Waters (Sw)	(NSW)		
Other Stream Classification:	None					
Impairments:	copper (Cu)					
Aquatic T&E Species?	Yes	Comments:	Neuse River Waterdog			
NRTR Stream ID:	Neuse River			**Buffer Rules in Effect:**	Neuse	
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)						

Submitted 9/16/2020

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WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
5	13+00 - 17+06 -SRY21C- LT 35.025257°/ -76.999989°	(1)Brice Creek	0.0	4.0	3.0	0.5	53	406	0.30%	1.6	1.0	2.1	1.0	No	No
5	17+06 - 22+00 -SRY21C- LT 35.026368°/ -77.000625°	(1)Brice Creek	0.0	4.0	3.0	0.6	60	494	0.80%	2.0	1.5	2.6	1.6	No	No
5	17+66 - 25+00 -SRY21C- RT 35.026572°/ -77.000441°	(1)Brice Creek	2.0	3.0	3.0	7.7	768	734	0.33%	17.2	1.9	22.3	2.0	No	No
5/6	23+00 - 26+26 -SRY21C- LT 35.028566°/ -77.001844°	(1)Brice Creek	0.0	4.0	3.0	0.4	43	326	0.14%	1.4	0.7	1.8	0.7	No	No
6	26+26 - 34+14 -SRY21C- LT 35.030601°/ -77.002953°	(1)Brice Creek	0.0	4.0	3.0	0.9	91	788	0.14%	2.9	0.8	3.7	0.9	No	No
6	34+14 - 34+50 -SRY21C- LT 35.030601°/ -77.002953°	(1)Brice Creek	0.0	4.0	3.0	0.1	14	36	0.56%	0.4	0.9	0.6	0.9	No	No
6	36+00 - 38+85 -SRY21C- RT 35.031881°/ 77.003345°	(1)Brice Creek	0.0	3.0	3.0	0.3	32	285	2.82%	0.9	2.0	1.2	2.2	No	No
6/7	36+00 - 40+00 -SRY21C- LT 35.032085°/ -77.003733°	(1)Brice Creek	0.0	4.0	3.0	0.5	55	400	0.30%	2.0	1.0	2.6	1.1	No	No
6/7	14+50 - 27+50 -SRY21B- LT 35.033650°/ -77.005507°	(1)Brice Creek	4.0	3.0	3.0	26.5	2648	1300	0.20%	20.1	1.6	28.6	1.8	No	No
6/7	15+00 - 22+68 -SRY21B- RT 35.032593°/ -77.004548°	(1)Brice Creek	0.0	4.0	3.0	0.8	84	768	0.13%	2.6	0.8	3.3	0.9	No	No
6/7	38+85 - 46+70 -SRY21C- RT 35.033857°/-77.004399°	(1)Brice Creek	4.0	3.0	3.0	19.4	1944	785	0.18%	30.3	1.7	42.3	1.9	No	No
7	40+00 - 43+00 -SRY21C- LT 35.032085°/ -77.003733°	(1)Brice Creek	0.0	4.0	3.0	0.5	48	300	0.17%	1.7	0.8	2.3	0.9	No	No
7	22+68 - 25+00 -SRY21B- RT 35.032593°/ -77.004548°	(1)Brice Creek	0.0	4.0	3.0	0.3	33	232	0.30%	1.1	0.9	1.4	0.9	No	No
7	249+00 - 252+00 -L- RT 35.033842°/ -77.004684°	(1)Brice Creek	0.0	4.0	3.0	0.5	47	300	0.10%	1.8	0.7	2.3	0.7	No	No
7	250+00 - 253+00 -L- LT 35.033900°/ -77.005343°	(1)Brice Creek	0.0	4.0	3.0	0.5	52	300	1.60%	1.7	1.8	2.1	2.0	No	No
7	28+50 - 31+50 -SRY21B- RT 35.034069°/ -77.005458°	(1)Brice Creek	0.0	3.0	3.0	1.0	101	300	0.90%	3.2	1.8	4.2	1.9	No	No
7/8	253+00 -L- LT -20+00 -Y21RPB- LT 35.036415°/ -77.006904°	(1)Brice Creek	6.0	4.0	3.0	40.9	4088	1030	0.10%	42.7	1.5	60.7	1.6	No	No
8	36+00 - 39+42 -SRY21B- LT 35.035996°/ -77.008249°	(1)Brice Creek	0.0	3.0	3.0	1.5	150	342	0.20%	4.8	1.1	6.2	1.2	No	No
8	12+50 - 14+26 -Y21- RT 35.037316°/ -077.007899°	(1)Brice Creek	0.0	3.0	3.0	1.4	144	176	0.32%	5.3	1.4	6.8	1.5	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

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Highway Stormwater Program

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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
8	14+26 - 15+00 -Y21- RT 35.037316°/ -77.007897°	(1)Brice Creek	0.0	3.0	3.0	0.6	60	74	3.20%	2.0	2.4	2.6	2.6	No	No
8	12+50 -Y21- LT-25+00 -Y21RPA- RT 35.037997°/ -77.008017°	(1)Brice Creek	2.0	3.0	3.0	3.0	302	337	2.00%	10.7	3.7	13.7	4.0	No	No
8	18+00 - 24+00 -Y21RPB- RT 35.037494°/ -077.007346°	(1)Brice Creek	0.0	4.0	3.0	0.6	61	600	0.40%	1.5	1.1	2.0	1.1	No	No
8	16+50 - 23+35 -Y21RPA- LT 35.038560°/ -77.007817°	(1)Brice Creek	0.0	4.0	3.0	0.8	79	700	0.30%	1.6	1.0	2.1	1.0	No	No
8	23+80 - 25+50 -Y21RPA- LT 35.038560°/ -77.007817°	(1)Brice Creek	0.0	4.0	3.0	0.3	35	200	0.90%	0.7	1.2	0.9	1.3	No	No
8	16+00 - 24+50 -Y21RPC- LT 34.946864°/ -084.092253°	(1)Brice Creek	0.0	4.0	3.0	1.2	124	850	0.80%	3.8	1.8	4.9	1.9	No	No
8	19+00 - 25+50 -Y21RPD- RT 35.038345°/ -77.007097°	(1)Brice Creek	0.0	4.0	3.0	0.5	51	650	0.31%	1.2	0.9	1.5	1.0	No	No
8	20+50 - 24+70 -Y21RPD- LT 35.038527°/ -77.006465°	(1)Brice Creek	2.0	4.0	3.0	4.0	403	420	0.30%	8.4	1.5	10.9	1.6	No	No
8	20+35 - 22+45 -Y21- LT 35.038527°/ -77.006465°	(1)Brice Creek	3.0	3.0	3.0	7.2	715	200	0.50%	12.1	2.0	16.5	2.2	No	No
8	20+14 - 22+32 -Y21- RT 35.038093°/ -77.006321°	(1)Brice Creek	3.0	3.0	3.0	5.0	500	218	0.40%	9.5	1.4	12.9	1.5	No	No
8	64+50 - 66+00 -SRY21C- RT 35.038705°/ -77.005471°	(1)Brice Creek	0.0	3.0	3.0	0.5	47	150	0.40%	1.2	1.1	1.6	1.1	No	No
8	66+00 -SRY21C- RT - 27+00 -Y21- RT 35.038705°/ -77.005471°	(1)Brice Creek	2.0	4.0	3.0	3.2	315	376	1.54%	9.0	2.7	11.6	2.9	No	No
8	10+74 -SRY21D- RT-27+50 -Y21- LT 35.039057°/ -77.005765°	(1)Brice Creek	2.0	4.0	3.0	4.2	425	429	0.26%	7.6	1.4	10.4	1.5	No	No
8	10+74 - 13+00 -SRY21D- RT 35.039057°/ -77.005765°	(1)Brice Creek	0.0	3.0	3.0	1.0	104	226	0.93%	3.3	1.8	4.2	2.0	No	No
8	15+00 - 18+64 -SRY21D- RT 35.040535°/ -77.007688°	(1)Brice Creek	0.0	4.0	3.0	1.0	103	364	0.42%	3.0	1.3	3.8	1.4	No	No
8	16+50 - 19+50 -SRY21D- LT 35.040361°/ -77.008055°	(1)Brice Creek	0.0	4.0	3.0	2.3	235	300	2.40%	7.9	3.2	10.2	3.4	No	No
8	17+79 - 20+00 -Y21RPD- LT 35.040361°/ -77.008055°	(1)Brice Creek	0.0	4.0	3.0	1.2	121	221	0.33%	4.1	1.3	5.3	1.4	No	No
8	58+70 - 61+20 -SRY21C- RT 35.037453°/ -77.005907°	(1)Brice Creek	4.0	3.0	3.0	22.4	2245	250	0.12%	35.9	1.5	50.0	1.7	No	Yes
8	61+60 - 63+00 -SRY21C- LT 35.037689°/ -77.006183°	(1)Brice Creek	0.0	3.0	3.0	0.2	16	146	1.07%	0.6	1.2	0.7	1.3	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.
23+33 -Y21RPA- RT: Site 4 L culvert outlet treatment length provided 7476 LF;24+55 -Y21RPD- LT: Site 4 L culvert inlet treatment length provided 1500 LF; 23+47 -Y21RPA- RT: Site 4 L culvert outlet treatment length provided 855 LF; 20+50 - 24+70 -Y21RPD- LT: Site 4 US L culvert treatment length provided 420 LF; 20+35 - 22+45 -Y21- LT: Site 4 DS Y21 culvert treatment length provided 836 LF; 20+14 - 22+12 -Y21- RT: Site 4 US Y21 culvert treatment length provided 744 LF; 58+70 - 61+20 -SRY21C- LT: Site 4 US SRY21C culvert treatment length provided 4170 LF; 61+60 - 63+00 -SRY21C- LT: Site 4 DS SRY21C culvert treatment length provided 140 LF

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Swales

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8	278+67 - 279+50 -L- RT 35.040553°/ -77.008284°	(1)Brice Creek	0.0	4.0	3.0	0.1	12	83	1.69%	0.5	1.4	0.6	1.5	No	No
8	284+00 - 285+00 -L- RT 35.042079°/ -77.009290°	(1)Brice Creek	0.0	4.0	3.0	0.6	65	100	0.20%	2.4	0.9	3.0	1.0	No	No
8	39+45 -SRY21B- RT 35.036102° -77.007972°	(1)Brice Creek	2.0	3.0	3.0	1.7	170	123	0.76%	4.0	1.7	5.1	1.9	No	No
8	39+45 -SRY21B- LT 35.035911°/ -77.008395°	(1)Brice Creek	2.0	3.0	3.0	3.2	323	60	0.93%	8.4	2.3	10.8	2.5	No	No
8	42+75 -SRY21B- LT 35.036736°/ -77.008852°	(1)Brice Creek	2.0	3.0	3.0	0.9	88	55	0.26%	3.1	1.1	4.0	1.2	No	No
8/9	284+50 - 285+50 -L- LT 35.042014°/ -77.009863°	(1)Brice Creek	0.0	4.0	3.0	0.2	18	100	0.30%	0.7	0.8	0.8	0.8	No	No
9	285+50 - 287+00 -L- LT 35.042014°/ -77.009863°	(1)Brice Creek	0.0	4.0	3.0	0.3	26	150	0.45%	0.9	1.0	1.2	1.1	No	No
9	287+00 - 287+50 -L- LT 35.042386°/ -77.010078°	(1)Brice Creek	0.0	4.0	3.0	0.7	68	50	0.45%	2.6	1.3	3.3	1.4	No	No
9	285+00 - 286+50 -L- RT 35.042085°/ -77.009293°	(1)Brice Creek	0.0	4.0	3.0	0.4	37	150	0.20%	1.4	0.8	1.7	0.9	No	No
9	286+50 - 288+00 -L- RT 35.042459°/ -77.009503°	(1)Brice Creek	0.0	4.0	3.0	0.5	50	150	0.20%	1.8	0.9	2.3	0.9	No	No
9	291+50 - 294+50 -L- LT 35.043505°/ -77.010719°	(1)Brice Creek	0.0	4.0	3.0	0.5	51	300	0.45%	1.9	1.2	2.5	1.3	No	No
9	294+50 - 297+00 -L- LT 35.044248°/ -77.011152°	(1)Brice Creek	0.0	4.0	3.0	0.4	42	250	0.45%	1.6	1.1	2.0	1.2	No	No
9	293+50 - 294+50 -L- RT 35.044446°/ -77.010646°	(1)Brice Creek	0.0	4.0	3.0	0.2	17	100	0.10%	0.6	0.5	0.8	0.5	No	No
9	294+50 - 297+00 -L- RT 35.045075°/ -77.010982°	(1)Brice Creek	0.0	4.0	3.0	0.4	43	250	3.20%	1.6	2.4	2.1	2.5	No	No
9	26+99 - 28+44 -SRY21D- RT 35.042304°/ -77.009092°	(1)Brice Creek	6.0	3.0	3.0	83.6	8364	145	0.35%	101.7	3.0	144.5	3.2	No	No
9	34+00 - 36+04 -SRY21D- RT 35.044527°/ -77.010438°	(1)Brice Creek	0.0	3.0	3.0	1.2	123	204	0.40%	4.3	1.4	5.6	1.5	No	No
9	36+04 - 38+00 -SRY21D- RT 35.044527°/ -77.010438°	(1)Brice Creek	0.0	3.0	3.0	1.0	102	196	0.50%	3.8	1.5	4.9	1.6	No	No
9	297+00 - 297+50 -L- RT 35.045208°/ -77.011032°	(1)Brice Creek	4.0	4.0	3.0	10.0	1000	50	3.40%	14.7	4.0	19.8	4.3	No	No
9/10	297+50 - 299+00 -L- RT 35.045208°/ -77.011032°	(1)Brice Creek	4.0	4.0	3.0	9.9	986	150	2.73%	13.3	3.6	18.2	3.9	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.
28+03 -SRY21D- LT: Site 13 US L culvert treatment length provided 7476 LF; 285+52 L RT: Site 13 culvert inlet treatment length provided 704 LF; 285+63 L: Site 13 culvert treatment length 642 LF; 285+74 L LT: Site 13 culvert outlet treatment length provided 350 LF; 31+00 SRY21A LT: DS L culvert treatment length provided 850 LF;

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WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
9/10	40+60 - 43+00 -SRY21A- LT 35.044680°/ -77.011680°	(1)Brice Creek	0.0	3.0	3.0	1.2	124	240	0.42%	4.5	1.5	5.8	1.6	No	No
9/10	297+00 - 299+00 -L- LT 35.045362°/ -77.011805°	(1)Brice Creek	0.0	4.0	3.0	0.3	34	200	0.30%	1.3	0.9	1.7	1.0	No	No
10	299+00 - 301+00 -L- LT 35.045856°/ -77.012097°	(1)Brice Creek	0.0	4.0	3.0	0.3	34	200	0.65%	1.3	1.2	1.6	1.3	No	No
10	305+50 - 308+00 -L- MED 35.047697°/ -77.012836°	(1)Brice Creek	0.0	4.0	4.0	0.9	91	250	0.20%	2.1	0.9	2.7	0.9	No	No
10	308+00 - 309+00 -L- MED 35.047697°/ -77.012836°	(1)Brice Creek	0.0	4.0	4.0	0.1	9	100	1.93%	0.2	1.1	0.3	1.2	No	No
10	309+00 - 309+50 -L- MED 35.047945°/ -77.012979°	(1)Brice Creek	0.0	4.0	4.0	0.2	22	50	1.93%	0.5	1.4	0.7	1.5	No	No
10	306+50 - 307+50 -L- LT 35.047462°/ -77.013049°	(1)Brice Creek	0.0	4.0	3.0	0.5	54	100	0.30%	1.8	1.0	2.3	1.1	No	No
10	307+50 - 309+00 -L- LT 35.047462°/ -77.013049°	(1)Brice Creek	0.0	4.0	3.0	0.4	45	150	1.13%	1.5	1.6	2.0	1.7	No	No
10	51+50 - 52+22 -SRY21A- LT 35.047496°/ -77.013488°	(1)Brice Creek	2.0	3.0	3.0	3.0	298	72	0.41%	10.8	1.8	14.0	1.9	No	Yes
10	52+66 - 53+68 -SRY21A- LT 35.047599°/ -77.013571°	(1)Brice Creek	3.0	3.0	3.0	5.5	546	102	1.47%	17.6	3.2	22.7	3.5	Yes	Yes
10	13+07 - 15+00 -Y22RPC- RT 35.047728°/ -77.012274°	(1)Brice Creek	4.0	4.0	3.0	7.1	709	193	3.11%	14.5	3.8	19.0	4.1	No	No
11	18+00 - 25+69 -Y22RPC- RT 35.048463°/ -77.012752°	(1)Brice Creek	4.0	4.0	3.0	25.7	2569	769	0.24%	33.4	1.9	46.6	2.1	No	No
11	25+69 -Y22RPC- RT-20+00 -Y22- RT 35.050786°/ -77.013472	(1)Brice Creek	4.0	3.0	3.0	21.6	2157	131	0.24%	33.2	2.0	45.9	2.1	No	No
11	20+00 - 21+22 -Y22- RT 35.050786°/ -77.013472	(1)Brice Creek	2.0	3.0	3.0	1.3	132	122	3.28%	3.1	2.8	4.0	3.0	No	No
11	19+50 - 25+50 -Y22RPC- LT 35.050323°/ -77.013802°	(1)Brice Creek	0.0	4.0	3.0	0.7	70	600	0.10%	1.6	0.7	2.1	0.7	No	No
11	20+50 - 23+00 -Y22RPB- RT 35.049639°/ -77.014212°	(1)Brice Creek	0.0	4.0	3.0	0.3	27	250	0.80%	0.8	1.2	1.0	1.3	No	No
11	23+00 -25+00 -Y22RPB- RT 35.049639°/ -77.014212°	(1)Brice Creek	0.0	4.0	3.0	0.4	36	200	1.05%	1.0	1.4	1.3	1.5	No	No
11	21+00 - 23+00 -Y22RPB- LT 35.049559°/ -77.014408°	(1)Brice Creek	0.0	4.0	3.0	0.4	41	200	0.70%	1.3	1.3	1.6	1.3	No	No
11	23+00 - 25+00 -Y22RPB- LT 35.049559°/ -77.014408°	(1)Brice Creek	0.0	4.0	3.0	0.4	41	200	0.65%	1.3	1.2	1.6	1.3	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer. Where diffuse flow was not achieved, rock checks were utilized to promote pooling and reduce velocities.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
11	61+00 - 64+50 -SRY21A- LT 35.049901°/ -77.015962°	(1)Brice Creek	0.0	3.0	3.0	1.0	103	350	0.32%	3.6	1.3	4.7	1.3	No	No
11	13+00 -14+70 -Y22- RT 35.050123°/ -77.015113°	(1)Brice Creek	0.0	3.0	3.0	0.6	60	170	0.59%	1.4	1.3	1.8	1.3	No	No
11	13+00 - 14+50 -Y22- LT 35.050303°/ -77.015762°	(1)Brice Creek	2.0	3.0	3.0	2.8	280	200	0.40%	5.4	1.5	7.0	1.6	No	No
11	21+50 - 24+00 -Y22RPA- RT 35.050614°/ -77.015162°	(1)Brice Creek	0.0	4.0	3.0	1.2	120	250	0.80%	3.6	1.7	4.7	1.8	No	No
11	16+62 - 23+50 -Y22RPA- LT 35.050704°/ -77.014902°	(1)Brice Creek	0.0	4.0	3.0	0.5	54	688	0.41%	1.3	1.1	1.7	1.1	No	No
11	16+62 - 19+14 -Y22RPA- RT 35.051710°/ -77.015795°	(1)Brice Creek	6.0	4.0	3.0	28.4	2838	252	0.20%	40.3	1.8	55.6	2.0	No	No
11	18+50 - 20+50 -Y22RPD- RT 35.051926°/ -77.015013°	(1)Brice Creek	0.0	4.0	3.0	0.2	21	200	1.10%	0.4	1.2	0.6	1.2	No	No
11	20+50 - 22+00 -Y22RPD- RT 35.051561°/ -77.014782°	(1)Brice Creek	0.0	4.0	3.0	0.3	30	150	0.47%	0.7	0.9	0.9	1.0	No	No
11	22+00 - 25+00 -Y22RPD- RT 35.050808°/ -77.014284°	(1)Brice Creek	0.0	4.0	3.0	0.6	60	300	0.20%	1.5	0.8	1.9	0.9	No	No
11	17+70 - 20+00 -Y22RPD- LT 35.052132°/ -77.014889°	(1)Brice Creek	0.0	4.0	3.0	0.3	28	230	1.80%	0.8	1.6	1.1	1.7	No	No
11	20+00 -Y22RPD- LT-20+00 -Y22- LT 35.050968°/ -77.013683°	(1)Brice Creek	0.0	4.0	3.0	2.1	212	650	0.40%	6.4	1.5	8.2	1.6	No	No
11	20+00 -Y22- LT-15+00 -SRY22D- LT 35.050968°/ -77.013683°	(1)Brice Creek	0.0	3.0	3.0	1.2	118	524	0.27%	3.8	1.2	4.9	1.3	No	No
11	15+12 -Y22RPA- RT-335+50 -L- LT 35.054423°/ -77.017046°	(1)Brice Creek	0.0	4.0	3.0	1.5	147	500	0.33%	5.2	1.4	6.7	1.4	No	No
11	335+50 - 337+50 -L- LT 35.054423°/ -77.017046°	(1)Brice Creek	0.0	4.0	3.0	1.6	164	200	1.35%	5.8	2.4	7.5	2.5	No	No
11/12	337+50 - 341+50 -L- LT 35.054943°/ -077.017271°	(1)Brice Creek	0.0	4.0	3.0	1.1	110	400	0.20%	3.9	1.0	5.0	1.1	No	No
11	10+80 - 14+50 -SRY22A- LT 35.051190°/ -77.016661°	(1)Brice Creek	2.0	3.0	3.0	3.8	378	200	0.32%	11.4	1.7	14.7	1.8	No	Yes
11	13+00 - 18+46 -SRY22D- RT 35.052772°/ -77.015024°	(1)Brice Creek	4.0	3.0	3.0	9.7	971	546	0.33%	17.9	1.9	24.0	2.0	No	No
11/12	18+46 -SRY22D- RT-16+82 -Y1- RT 35.052772°/ -77.015024°	(1)Brice Creek	4.0	3.0	3.0	14.6	1464	1532	0.20%	20.9	1.6	29.2	1.8	No	No
11	335+50 -L- LT 35.054399°/ -77.017118°	(1)Brice Creek	2.0	3.0	3.0	3.3	330	23	0.45%	12.7	2.0	16.4	2.1	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer. 14+50 -SRY22A- LT:
Site 21 DS LT 72" RCP treatment length provided 1120 LF; 15+10 -SRY22A- LT: Site 21 DS LT 72" RCP treatment length provided 2741 LF

Submitted 9/16/2020

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Highway Stormwater Program

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Swales

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11	15+10 -19+50 -SRY22A- LT 35.051332°/ -77.016776°	(1)Brice Creek	4.0	3.0	3.0	9.7	975	440	0.18%	35.5	1.8	45.7	1.9	No	No
11	19+50 - 28+00 -SRY22A- LT 35.052701°/ -77.017462°	(1)Brice Creek	3.0	3.0	3.0	8.7	869	850	0.18%	31.6	1.7	40.7	1.8	No	No
11/12	28+00 - 32+51 -SRY22A- LT 35.054632°/ -77.017384°	(1)Brice Creek	0.0	3.0	3.0	1.3	129	451	0.18%	4.3	1.1	5.6	1.1	No	No
12	16+35 - 16+75 -Y1- LT 35.056580°/ -77.017314°	(1)Brice Creek	2.0	3.0	3.0	3.7	371	40	0.50%	11.2	2.0	14.4	2.1	No	No
12	10+10 -10+84 -SR1- LT 35.056173°/ -77.018175°	(1)Brice Creek	0.0	3.0	3.0	0.2	16	74	0.41%	0.6	0.9	0.7	0.9	No	No
12	10+84 - 14+45 -SR1- LT 35.057068°/ -77.018702°	(1)Brice Creek	3.0	3.0	3.0	6.6	660	361	0.31%	18.9	1.9	24.9	2.0	No	Yes
12	341+00 - 342+70 -L- RT 35.056417°/ -77.017509°	(1)Brice Creek	0.0	4.0	3.0	1.4	138	170	1.32%	4.9	2.2	6.3	2.4	No	No
12	343+50 - 346+10 -L- RT 35.057565°/ -77.018128°	(1)Brice Creek	0.0	4.0	3.0	0.4	40	375	0.23%	1.5	0.8	1.9	0.9	No	No
12	345+64 - 346+40 -L- LT 35.056987°/ -77.018376°	(1)Brice Creek	0.0	4.0	3.0	0.1	10	136	0.66%	0.3	0.9	0.4	0.9	No	No
12	346+40 - 347+50 -L- LT 35.057453°/ -77.018630°	(1)Brice Creek	0.0	4.0	3.0	0.1	10	50	0.30%	0.3	0.7	0.4	0.7	No	No
12/13	346+10 - 353+00 -L- RT 35.057786°/ -77.018264°	(1)Brice Creek	0.0	4.0	3.0	0.7	70	385	0.20%	2.5	0.9	3.3	0.9	No	No
13	349+00 - 350+65 -L- LT 35.058242°/ -77.019071°	(2)Scotts Creek	0.0	4.0	3.0	0.2	23	165	0.30%	0.8	0.8	1.0	0.9	No	No
13	350+65 - 353+15 -L- LT 35.058242°/ -77.019071°	(2)Scotts Creek	0.0	4.0	3.0	0.3	32	250	0.60%	1.1	1.2	1.4	1.2	No	No
13	353+15 - 355+35 -L- LT 35.059414°/ -77.019723°	(2)Scotts Creek	0.0	4.0	3.0	0.2	20	220	0.41%	0.6	0.9	0.8	0.9	No	No
13	20+10 - 21+25 -SR1- LT 35.058776°/ -77.019616°	(2)Scotts Creek	0.0	3.0	3.0	1.1	105	115	0.70%	3.8	1.7	4.9	1.8	No	No
13	24+50 - 26+30 -SR1- LT 35.060048°/ -77.020307°	(2)Scotts Creek	0.0	3.0	3.0	0.3	26	180	0.30%	0.8	0.8	1.0	0.9	No	No
14	33+00 - 36+46 -SR7- RT 35.063063° / -77.020901°	(2)Scotts Creek	3.0	3.0	3.0	4.6	460	346	0.20%	15.5	1.5	20.0	1.6	No	No
14	10+30 - 10+90 -SR8- RT 35.063943°/ -77.021357°	(2)Scotts Creek	3.0	3.0	3.0	10.9	1085	60	0.10%	20.2	1.2	27.4	1.3	No	No
14	13+80 -20+00 -SR8- RT 35.064594°/ -77.020495°	(2)Scotts Creek	2.0	3.0	3.0	6.9	687	620	0.36%	11.7	1.8	16.1	1.9	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.
14+45 -SR1- LT: Site 22 DS LT 48" RCP treatment length provided 721 LF

Submitted 9/16/2020

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Swales

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14	14+10 16+00 -SR8- LT 35.064805°/ -77.020581°	(2)Scotts Creek	2.0	3.0	3.0	2.9	288	190	0.29%	9.0	1.5	11.6	1.6	No	No
14	16+00 - 18+00 -SR8- LT 35.065138°/ -77.020092°	(2)Scotts Creek	0.0	3.0	3.0	1.2	122	200	0.29%	3.8	1.2	4.9	1.3	No	No
14	21+50 -SR8- LT - 27+30 -Y2- RT 35.066275°/ -77.020302°	(2)Scotts Creek	0.0	3.0	3.0	0.3	27	79	0.43%	1.0	1.0	1.3	1.1	No	No
14	22+50 - 26+90 -Y2- RT 35.065386°/ -77.021537°	(2)Scotts Creek	0.0	3.0	3.0	1.5	150	440	0.32%	3.9	1.3	5.0	1.4	No	No
14	26+15 -27+90 -Y2- LT 35.066219°/ -77.020801°	(2)Scotts Creek	2.0	3.0	3.0	1.3	130	175	0.25%	3.4	1.1	3.0	1.0	No	No
14	22+50 - 25+75 -Y2RPD- LT 35.065470°/ -77.022155°	(2)Scotts Creek	0.0	3.0	3.0	1.3	134	325	0.32%	4.2	1.2	5.4	1.3	No	No
14	13+75 - 14+20 -Y2- LT 35.064039°/ -77.023942°	(2)Scotts Creek	0.0	3.0	3.0	0.4	40	45	0.89%	1.1	1.4	1.4	1.5	No	No
14	14+15 - 20+30 -SR2- LT 35.065211°/ -77.024166°	(2)Scotts Creek	0.0	3.0	3.0	1.1	108	615	0.36%	3.9	1.3	5.1	1.4	No	No
14	22+00 - 24+50 -Y2RPC- RT 35.064596°/ -77.021756°	(2)Scotts Creek	2.0	4.0	3.0	2.2	220	250	0.20%	7.4	1.2	9.6	1.3	No	No
14	24+50 -Y2RPC- LT 35.064905°/ -77.022169°	(2)Scotts Creek	3.0	3.0	3.0	5.2	520	66	0.15%	14.5	1.3	18.9	1.4	No	No
14	24+50 - 25+89 -Y2RPC- RT 35.064717° / -77.021770°	(2)Scotts Creek	0.0	3.0	3.0	2.8	280	263	0.49%	7.2	1.8	9.4	1.9	No	No
14	14+15 -SR2- LT 35.065031°/ -77.024441°	(2)Scotts Creek	0.0	3.0	3.0	1.1	111	105	0.29%	4.0	1.3	5.2	1.3	No	No
14	13+75 -SR2- LT 35.065018°/ -77.024482°	(2)Scotts Creek	4.0	3.0	3.0	10.4	1040	75	0.10%	23.0	1.3	30.2	1.4	No	No
14/15	11+25 - 13+55 -SR5- RT 35.066916°/ -77.023025°	(2)Scotts Creek	0.0	3.0	3.0	1.2	120	230	0.13%	4.4	0.9	5.6	1.0	No	No
14/15	21+00 - 30+40 -SR2- LT 35.069136°, -77.025311°	(2)Scotts Creek	0.0	3.0	3.0	1.3	132	940	0.57%	4.4	1.7	5.7	1.8	No	No
15	30+40 - 34+60 -SR2- LT 35.069136°, -77.025311°	(2)Scotts Creek	0.0	3.0	3.0	1.2	124	420	0.95%	4.6	2.0	6.0	2.2	No	No
16	37+56 - 41+70 -SR2- LT 35.071940°/ -77.026924°	(2)Scotts Creek	0.0	3.0	3.0	0.9	91	414	0.65%	3.8	1.7	4.9	1.8	No	No
16	41+77 - 41+81 -SR2- LT 35.071765°, -77.027402°	(2)Scotts Creek	4.0	3.0	3.0	13.7	1370	166	0.45%	36.8	2.5	48.5	2.7	No	No
16	41+91 - 43+50 -SR2- LT 35.071995°/ -77.026952°	(2)Scotts Creek	0.0	3.0	3.0	0.1	9	159	1.07%	0.4	1.1	0.5	1.2	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

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16	30+20 - 31+75 -SR5- RT 35.071455°/ -77.025575°	(2)Scotts Creek	0.0	3.0	3.0	0.6	60	155	0.97%	1.9	1.6	2.4	1.7	No	No
16	35+10 -35+80 -SR5- RT 35.072904°/ -77.026343°	(2)Scotts Creek	0.0	3.0	3.0	0.6	60	70	0.30%	1.9	1.1	2.4	1.1	No	No
16	38+15 - 38+50 -SR5- RT 35.073204°/ -77.026344°	(2)Scotts Creek	2.0	3.0	3.0	5.5	550	35	0.31%	11.2	1.7	15.2	1.8	No	No
16	38+50 -SR5- RT-15+00 -Y3LPC- RT 35.074583°, -77.026258°	(2)Scotts Creek	2.0	3.0	3.0	10.7	1070	528	0.10%	17.3	1.2	24.4	1.3	No	No
16	28+58 - 30+66 -Y3- RT 35.074605°/ -77.026255°	(2)Scotts Creek	0.0	3.0	3.0	1.8	180	208	2.38%	3.2	2.6	4.4	2.8	No	No
16	46+50 - 49+00 -SR2- RT 35.073214°/ -77.028339°	(2)Scotts Creek	2.0	3.0	3.0	3.7	371	250	1.34%	12.7	2.9	16.4	3.1	No	No
16	49+00 - 50+04 -SR2- RT 35.073214°/ -77.028339°	(2)Scotts Creek	4.0	3.0	3.0	19.6	1960	104	0.10%	34.3	1.4	46.6	1.5	No	No
16	47+00 - 48+95 -SR2- LT 35.072999°/ -77.028555°	(2)Scotts Creek	0.0	3.0	3.0	1.0	103	195	0.44%	3.7	1.4	4.8	1.5	No	No
16	49+00 -SR2- LT 35.072862°/ -77.028665°	(2)Scotts Creek	4.0	3.0	3.0	34.6	3460	69	0.32%	60.6	2.5	82.3	2.7	No	No
16	49+07 - 50+42 -SR2- LT 35.073031°/ -77.028589°	(2)Scotts Creek	0.0	3.0	3.0	0.3	28	135	1.35%	1.0	1.6	1.2	1.7	No	No
16	51+47 - 54+10 -SR2- RT 35.073790°/ -77.028620°	(2)Scotts Creek	3.0	3.0	3.0	29.0	2900	263	0.10%	52.8	1.6	71.1	1.7	No	No
16	12+50 -SR3- RT - 20+60 -Y3- LT 35.074792°/ -77.028960°	(2)Scotts Creek	0.0	3.0	3.0	0.5	50	60	0.33%	1.8	1.1	2.3	1.1	No	No
16	20+60 - 22+75 -Y3- LT 35.074792°/ -77.028960°	(2)Scotts Creek	0.0	3.0	3.0	1.2	120	215	0.30%	4.4	1.3	5.6	1.4	No	No
16	12+50 - 15+40 -SR3- RT 35.076168°/ -77.029773°	(2)Scotts Creek	0.0	3.0	3.0	1.2	120	200	1.00%	4.7	2.1	6.0	2.2	No	No
16	15+40 - 17+86 -SR3- RT 35.076168°/ -77.029773°	(2)Scotts Creek	0.0	3.0	3.0	1.9	190	246	0.38%	4.6	1.4	6.0	1.5	No	No
16	10+37 - 11+81 -DR1- RT 35.076386°/ -77.029350°	(2)Scotts Creek	0.0	3.0	3.0	1.0	95	144	0.67%	3.0	1.6	3.8	1.7	No	No
16	417+00 - 419+75 -L- LT 35.074865°/ -77.028261°	(2)Scotts Creek	0.0	3.0	3.0	0.2	20	275	1.26%	0.5	1.3	0.7	1.4	No	No
16	419+75 - 422+50 -L- LT 35.076205°/ -77.029024°	(2)Scotts Creek	0.0	3.0	3.0	0.4	37	275	0.35%	1.1	1.0	1.4	1.0	No	No
16	11+50 - 14+50 -SR6- RT 35.076367°/ -77.028316°	(2)Scotts Creek	0.0	3.0	3.0	3.1	310	300	0.27%	8.5	1.5	11.4	1.6	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
16	14+50 - 16+40 -SR6- RT 35.076458°/ -77.028371°	(2)Scotts Creek	2.0	3.0	3.0	2.2	220	190	0.27%	6.2	1.4	8.3	1.5	No	No
16	10+80 - 15+30 -SR3- LT 35.076343°/ -77.030002°	(2)Scotts Creek	0.0	3.0	3.0	0.8	80	450	0.31%	2.5	1.1	3.2	1.2	No	No
16/17	16+52 - 20+10 -SR3- LT 35.076348°/ -77.029995°	(2)Scotts Creek	3.0	3.0	3.0	4.0	400	358	0.15%	16.8	1.4	21.7	1.5	No	No
17	20+60 - 24+70 -SR3- LT 35.078157°/ -77.030283°	(2)Scotts Creek	0.0	3.0	3.0	1.2	120	410	1.00%	3.6	1.9	4.8	2.1	No	No
17	24+70 - 27+50 -SR3- LT 35.078870°/ -77.030651°	(2)Scotts Creek	2.0	3.0	3.0	3.2	320	280	1.57%	8.9	2.8	11.8	3.0	No	No
17/18	27+50 - 33+00 -SR3- LT 35.080080°/ -77.031373°	(2)Scotts Creek	4.0	3.0	3.0	11.3	1130	550	0.74%	29.8	2.9	39.8	3.1	No	No
18	21+75 - 23+75 -Y4RPD- LT 35.083279° / -77.031206°	(2)Scotts Creek	0.0	3.0	3.0	1.4	140	200	0.20%	5.1	1.2	6.6	1.2	No	No
18	16+00 - 19+20 -Y4RPC- RT 35.081201°/ -77.030487°	(2)Scotts Creek	4.0	3.0	3.0	9.6	960	320	0.31%	35.9	2.2	46.3	2.3	No	No
18	20+50 - 21+12 -Y4RPC- RT 35.081624°/ -77.030434°	(2)Scotts Creek	0.0	3.0	3.0	0.2	20	62	0.65%	0.8	1.1	1.0	1.2	No	No
18	21+12 -Y4RPC- RT-26+00 -Y4- RT 35.081624°/ -77.030434°	(2)Scotts Creek	0.0	3.0	3.0	0.3	28	53	1.03%	1.0	1.4	1.3	1.5	No	No
18	27+00 -Y4- RT-11+00 -Y7- LT 35.0815865°, -77.0298061°	(2)Scotts Creek	0.0	3.0	3.0	0.2	24	84	0.72%	0.9	1.2	1.1	1.3	No	No
18	33+00 - 36+60 -SR3- RT 35.080738°/ -77.032039°	(2)Scotts Creek	2.0	3.0	3.0	2.9	287	360	0.31%	8.8	1.5	11.3	1.6	No	No
18	22+10 -Y4RPB- LT-36+60 -SR3- RT 35.080738°/ -77.032039°	(2)Scotts Creek	0.0	3.0	3.0	1.1	114	382	0.31%	3.7	1.3	4.7	1.3	No	No
18	38+25 -SR3- LT 35.080682°/ -77.033067°	(2)Scotts Creek	5.0	3.0	3.0	28.6	2860	232	0.00%	79.5	1.8	105.7	1.9	No	No
18	16+40 -19+30 -Y4- LT 35.081336°/ -77.033444°	(2)Scotts Creek	3.0	3.0	2.0	3.2	319	290	0.05%	11.9	0.9	15.4	0.9	No	No
18	25+50 - 26+60 -Y4RPD- LT 35.082514°/ -77.030975°	(2)Scotts Creek	2.0	4.0	2.0	8.3	828	110	0.10%	22.4	1.2	29.5	1.3	No	No
18	26+60 - 27+50 -Y4RPD- LT 35.082514°/ -77.030975°	(2)Scotts Creek	0.0	4.0	2.0	1.1	109	90	0.44%	4.0	1.5	5.1	1.6	No	No
18	10+41 - 11+16 -Y4RPA- RT 35.085498°/ -77.032876°	(2)Scotts Creek	2.0	3.0	3.0	1.1	108	75	2.00%	4.2	2.5	5.4	2.7	No	No
18	14+46 - 16+89 -SR10- RT 35.085783° / -77.032138°	(2)Scotts Creek	0.0	3.0	3.0	0.8	80	243	1.93%	3.0	2.4	3.9	2.5	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
18/19	16+89 - 19+00 -SR10- RT 35.085783° / -77.032138°	(2)Scotts Creek	4.0	3.0	3.0	9.8	980	211	0.33%	32.6	2.2	42.0	2.3	No	No
19	27+23 - 29+23 -SR10- RT 35.088196° / -77.033998°	(2)Scotts Creek	0.0	3.0	3.0	0.2	20	200	0.40%	0.8	1.0	1.1	1.0	No	No
19	460+00 - 470+50 -L- LT 35.085913°/ -77.033071°	(2)Scotts Creek	3.0	3.0	3.0	11.2	1118	1050	0.37%	30.0	2.3	39.2	2.4	No	No
20	10+75 - 13+25 -RPC55- RT 35.089852°/ -77.035327°	(4)Neuse River	0.0	3.0	3.0	2.1	210	250	0.79%	7.1	2.1	9.1	3.0	No	No
20	13+25 - 15+75 -RPC55- RT 35.090492°/ -77.035412°	(4)Neuse River	2.0	3.0	3.0	4.1	410	250	0.68%	12.8	2.3	16.5	2.4	No	No
20	12+55 - 14+05 -RPB55- LT 35.089093°/ -77.035856°	(2)Scotts Creek	0.0	3.0	3.0	3.0	299	150	0.30%	10.0	1.6	12.8	1.7	No	No
21	15+50 - 21+00 -SRY21C2- LT 35.031194°/ 77.001158°	(1)Brice Creek	0.0	3.0	3.0	3.5	350	550	0.20%	7.6	1.3	9.7	1.4	No	No
21	17+50-22+00 -SRY21C2- RT 35.031115°/ -76.998972°	(1)Brice Creek	0.0	4.0	3.0	0.5	45	450	0.24%	1.4	0.9	1.8	0.9	No	No
21	22+00 -SRY21C2- RT 35.030878°/ -76.998948°	(1)Brice Creek	0.0	3.0	3.0	1.3		91	0.00%	3.4	0.8	4.5	0.9	No	No
11/22	24+00 - 24+78 -Y22- RT 35.051712°/ -77.012324°	(1)Brice Creek	0.0	4.0	3.0	1.0	105	78	2.56%	2.4	2.5	3.2	2.7	No	No
22	24+78 - 26+00 -Y22- RT 35.051712°/ -77.012324°	(1)Brice Creek	2.0	4.0	3.0	8.8	879	122	0.21%	12.7	1.4	17.3	1.5	No	No
22	26+00 - 36+00 -Y22- RT 35.051976°/ -77.012058°	(1)Brice Creek	0.0	4.0	3.0	1.7	169	1000	0.21%	3.6	1.0	4.7	1.1	No	No
22	24+78 - 31+50 -Y22- LT 35.051870°/ -77.012536°	(1)Brice Creek	2.0	4.0	3.0	5.3	533	672	0.21%	9.1	1.4	12.3	1.5	No	No
22	31+50 - 36+00 -Y22- LT 35.053282°/ -77.011089°	(1)Brice Creek	0.0	4.0	3.0	2.5	250	450	0.21%	6.1	1.2	7.9	1.3	No	No
04/05	10+50 - 12+30 -SRY21C- LT 35.025137°/ -76.999956°	(2)Scotts Creek	0.0	3.0	4.0	2.6	260	180	1.06%	10.0	2.4	10.8	2.5	No	No
6	237+00 - 239+14 -L- MED 35.030537° / -77.003147°	(1)Brice Creek	0.0	4.0	4.0	1.0	100	214	0.51%	3.4	1.4	4.4	1.5	No	No
6	239+14 - 240+70 -L- MED 35.030537° / -77.003147°	(1)Brice Creek	0.0	4.0	4.0	0.2	20	156	0.10%	0.7	0.5	0.9	0.5	No	No
6	240+70 - 244+00 -L- MED 35.0309283°, -077.0033598°	(1)Brice Creek	0.0	4.0	4.0	0.7	70	330	0.10%	2.3	0.7	3.0	0.7	No	No
12	12+65 - 13+95 -SR7- RT 35.057414° / -77.017843°	(1)Brice Creek	2.0	3.0	3.0	3.8	380	130	1.39%	9.8	2.8	12.8	3.0	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
12	13+95 - 17+15 -SR7- RT 35.057414° / -77.017843°	(1)Brice Creek	4.0	3.0	3.0	30.8	3080	320	0.31%	45.3	2.3	62.8	2.5	No	No
13	20+70 - 23+90 -SR7- RT 35.059100° / -77.018774°	(1)Brice Creek	4.0	3.0	3.0	15.8	1580	320	0.13%	29.0	1.5	40.1	1.6	No	No
13	24+70 - 25+00 -SR7- RT 35.060183° / -77.019356°	(1)Brice Creek	2.0	3.0	3.0	2.0	200	30	0.08%	4.3	0.8	5.6	0.8	No	No
13	25+00 - 25+75 -SR7- RT 35.060183° / -77.019356°	(1)Brice Creek	2.0	3.0	3.0	3.0	300	75	0.93%	6.4	2.1	8.4	2.3	No	No
13	353+00 - 357+45 -L- RT 35.059763° / -77.019373°	(1)Brice Creek	0.0	4.0	3.0	0.6	60	445	0.18%	2.2	0.9	2.8	1.0	No	No
13	357+45 - 360+00 -L- RT 35.060106° / -77.019565°	(1)Brice Creek	0.0	4.0	3.0	0.2	20	255	0.12%	0.7	0.6	0.9	0.6	No	No
13	19+25 - 20+70 -SR7- RT 35.059100° / -77.018774°	(1)Brice Creek	0.0	3.0	3.0	0.2	20	145	0.35%	0.7	0.9	0.9	0.9	No	No
14	27+90 - 28+70 -Y2- LT 35.066522° / -77.020339°	(2)Scotts Creek	2.0	3.0	3.0	6.2	620	80	0.25%	16.0	1.7	21.2	1.8	No	No
14	39+80 - 43+10 -SR1- LT 35.063547° / -77.023269°	(1)Brice Creek	5.0	3.0	3.0	26.6	2660	330	0.00%	45.6	1.5	63.3	1.7	No	No
14	10+25 - 11+45 -SR8- LT 35.064136° / -77.021595°	(1)Brice Creek	0.0	3.0	3.0	1.2	120	120	0.83%	4.1	1.9	5.2	2.0	No	No
14	36+46 - 39+95 -SR7- RT 35.063063° / -77.020901°	(1)Brice Creek	4.0	3.0	3.0	12.3	1230	349	0.10%	21.0	1.3	28.8	1.4	No	No
14	17+05 -Y2- LT 35.065061° / -77.023900°	(2)Scotts Creek	3.0	3.0	3.0	10.4	1040	250	0.00%	26.9	1.3	35.3	1.4	No	No
14	25+90 -Y2RPB- LT 35.063729° / -77.023024°	(2)Scotts Creek	3.0	3.0	3.0	8.0	800	230	0.00%	24.1	1.3	31.4	1.4	No	No
14/15	15+30 - 19+40 -SR5- RT 35.068365° / -77.023874°	(2)Scotts Creek	2.0	3.0	3.0	3.7	370	410	0.21%	13.1	1.5	16.9	1.6	No	No
16	15+30 -SR3- LT 35.075951° / -77.030174°	(2)Scotts Creek	2.0	3.0	3.0	3.9	390	100	0.50%	11.6	2.0	15.5	2.1	No	No
17	26+00 - 26+29 -SR6- RT 35.078940° / -77.029696°	(2)Scotts Creek	0.0	3.0	3.0	0.3	30	29	0.35%	1.2	1.0	1.6	1.1	No	No
18	10+85 - 12+00 -SR10- RT 35.084519° / -77.031553°	(2)Scotts Creek	0.0	3.0	3.0	0.2	20	115	0.35%	0.7	0.9	0.9	0.9	No	No

Additional Comments

Diffuse flow (V10 < 2 fps) has been achieved when discharging into the buffer.

Submitted 9/16/2020

North Carolina Department of Transportation

Highway Stormwater Program

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WBS Element: 50111.3.1 **TIP No.:** U-5713/R-5777 **County(ies):** Craven

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?
14	41+28 -SR1- RT 35.063842 / -77.022578	(2)Scotts Creek	Dry Detention Basin	1.5	0.4	0.7	21.04	No
14	43+96 -SR1- RT 35.064095 / -77.023066	(2)Scotts Creek	Dry Detention Basin	0.9	0.4	0.37	12.29	No
14	12+42 -SR2- RT 35.065261 / -77.023414	(2)Scotts Creek	Dry Detention Basin	1.1	0.5	0.48	11.65	No
14	15+48 -SR2- RT 35.064672 / -77.023583	(2)Scotts Creek	Dry Detention Basin	1.7	0.7	1.06	19.98	No
16	26+75 -Y3- RT 35.074440 / -77.026903	(2)Scotts Creek	Dry Detention Basin	2.1	0.7	0.47	8.86	No
16	52+46 -SR2- RT 35.074207 / -77.028417	(2)Scotts Creek	Dry Detention Basin	2.2	0.2	0.83	45.56	No
18	37+28 -SR3- LT 35.080615 / -77.032484	(2)Scotts Creek	Dry Detention Basin	4.5	1.0	0.097	1.22	No

Additional Comments

Submitted 9/16/2020

TIP PROJECT: U-5713 /R-5777A&B

CONTRACT: C204225

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PERMIT DRAWING
SHEET 1 OF 55
DATE: 06-03-2020

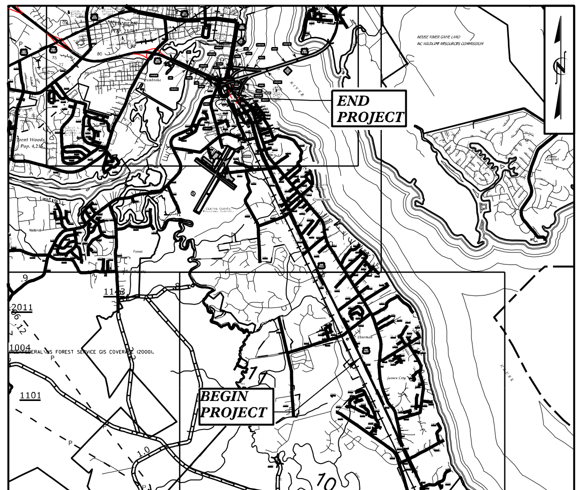
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5713/R-5777A&B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50111.3.1	N/A	DESIGN-BUILD

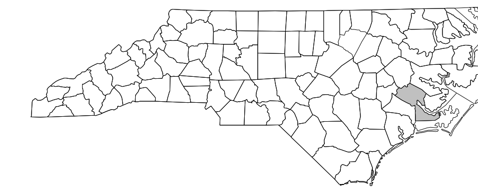
CRAVEN COUNTY

LOCATION: *U.S. 70 FROM EASTERN APPROACH OF THE NEUSE RIVER BRIDGE TO APPROXIMATELY ONE (1) MILE EAST OF S.R. 1116 (THURMAN ROAD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNING, ITS AND STRUCTURES*



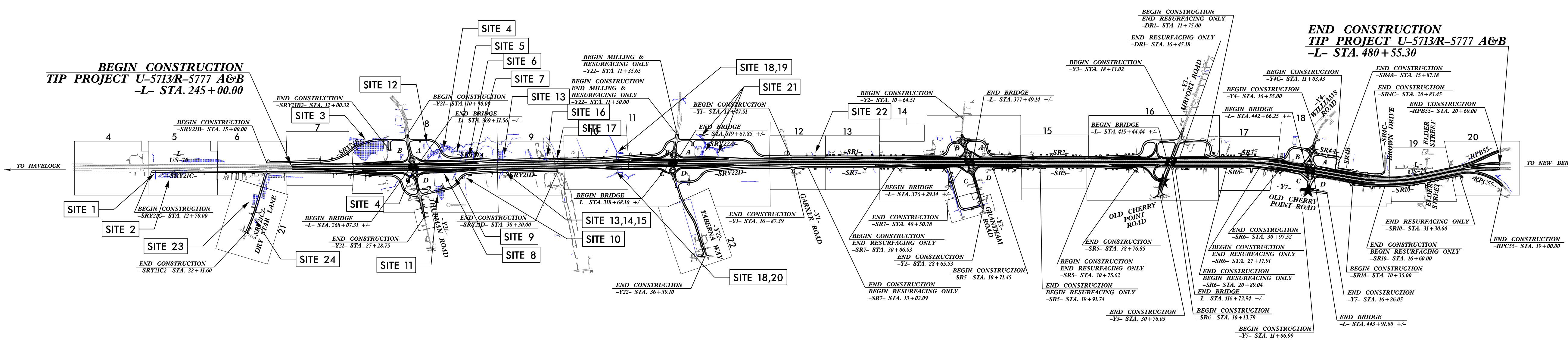
VICINITY MAP N.T.S.



DESIGN CRITERIA AND STRUCTURE RECOMMENDATIONS
SUBMITTED: 02-20-20

NAD 83/ NA 2011

WETLAND AND SURFACE WATER IMPACTS PERMIT



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARY OF THE CITY OF NEW BERN
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.

★ *PROPOSED TRAFFIC SIGNAL*

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
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

ADT 2015 = 45,200
ADT 2040 = 62,000
K = 8%
D = 50%
T = 7%*
V = 60 MPH
* (TTST = 2% + DUAL 5%)
FUNC. CLASSIFICATION = INTERSTATE STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5713 /R-5777A&B = 4.350 MILES
LENGTH STRUCTURE TIP PROJECT U-5713 /R-5777A&B = 0.111 MILES
TOTAL LENGTH OF TIP PROJECT U-5713 /R-5777A&B = 4.461 MILES

NCDOT CONTACT: CADMUS CAPEHART, PE
DIVISION 2 - DIVISION CONSTRUCTION ENGINEER

PLANS PREPARED FOR THE NCDOT BY:
Balfour Beatty Infrastructure Inc.
STV 100 Years

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 17, 2019

LETTING DATE: SEPTEMBER 17, 2019

J. ADAM FREEMAN, PE
PROJECT ENGINEER

NARONG PHAL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

$$$$$$SYSTIME$$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$$ $$$$$USERNAME$$$$

Submitted 9/16/2020

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

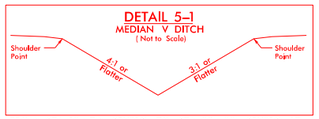
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

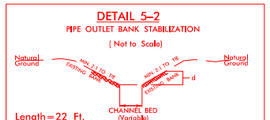
PERMIT DRAWING
SHEET 2 OF 55

DETAIL 5–1
MEDIAN V DITCH
(Not to Scale)



FROM STA. 12+74 –SRY21C– TO STA. 22+00 –SRY21C– LT
FROM STA. 23+00 –SRY21C– TO STA. 25+50 –SRY21C– LT

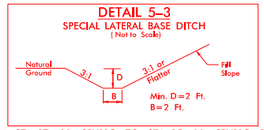
DETAIL 5–2
PIPE OUTLET BANK STABILIZATION
(Not to Scale)



Length = 22 Ft.
d = 4.0 Ft.
Est. = 42 Tons of Class II RIP RAP

STA. 13+47 –SRY21C– RT

DETAIL 5–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



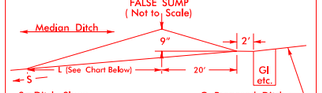
FROM STA. 17+66 –SRY21C– TO STA. 25+00 –SRY21C– RT

DETAIL 5–4
TOE PROTECTION
(Not to Scale)

Type of Liner = CL B RIPRAP

FROM STA. 14+39 –SRY21C– TO STA. 17+65 –SRY21C– RT

DETAIL 5–5
FALSE SUMP
(Not to Scale)

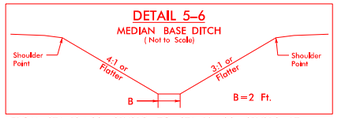


S = Ditch Slope
℄ Proposed Ditch

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'

STA. 12+50 –SRY21C– LT
STA. 17+06 –SRY21C– LT

DETAIL 5–6
MEDIAN BASE DITCH
(Not to Scale)



FROM STA. 12+00 –SRY21C– TO STA. 12+30 –SRY21C– LT

NAD 83/NA 2011

50' 25' 0 50' 100'
SCALE: 1"=100'

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

MATCHLINE –L– STA 217+00 SEE SHEET 4

MATCHLINE –L– STA 230+50 –SRY21C– STA 25+50 SEE SHEET 6

220

225

EMMA F. FORD TRUSTEES

US 70 EB

-L-

US 70 WB

RETAIN 66" RCP
RETAIN 30" RCP
RETAIN DI
MEDIAN '2' BASE DITCH SEE DETAIL 5–6
MEDIAN 'V' DITCH SEE DETAIL 5–1
FALSE SUMP SEE DETAIL 5–5
REMOVE 12 LF 30" RCP
REMOVE 20 LF 66" RCP
COLLAR
JB WRAP
24" RCP–III
66" RCP–IV
15" RCP–IV
30" RCP–IV
30" RCP–III
15" RCP–III
18" RCP–IV
18" RCP–III
PROP. 2'-6" C&G
REMOVE
S
TS
SITE 1
SITE 2
STREAM SAB
WETLAND WAU
BEGIN CONSTRUCTION -SRY21C- STA. 12+70.00
FIRE OUTLET BANK STABILIZATION SEE DETAIL 5–2
TOE PROTECTION ON FILL SLOPE ONLY EST. 88 TONS CL B RIPRAP EST. 420 SY GEOTEXTILE SEE DETAIL 5–4
CL B RIPRAP EST. 8 TONS EST. 21 SY GF
DAYLIGHT DITCH
Q10 = 22.3 CFS
V10 = 2.0 FPS
CL B RIPRAP EST. 2 TONS EST. 7 SY GF
SPEC. LATERAL 2' BASE DITCH SEE DETAIL 5–3
PUE
DUE
TDE
REUBEN JULIUS LOGAN & SANDRA MCCLEASE LOGAN
MICHAEL HUFFMAN & WALTER HUFFMAN
NICK ARNOLD
TAURINO PEREZ SANTOS
COOPER STREET PARTNERS, LLC

PAVEMENT REMOVAL

FOR -SRY21C- PROFILE SEE SHEET 68
SEE SHEET 3A-1TO 3A-3 FOR CURVE DATA

$$SYSTIME$$ $$USERNAME$$

Submitted 9/16/2020

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

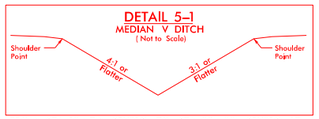
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

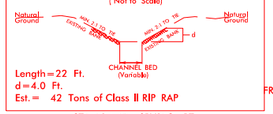
PERMIT DRAWING
SHEET 3 OF 55

DETAIL 5–1
MEDIAN V DITCH
(Not to Scale)



FROM STA. 12+74 –SRY21C– TO STA. 22+00 –SRY21C– LT
FROM STA. 23+00 –SRY21C– TO STA. 25+50 –SRY21C– LT

DETAIL 5–2
PIPE OUTLET BANK STABILIZATION
(Not to Scale)



Length = 22 Ft.
d = 4.0 Ft.
Est. = 42 Tons of Class II RIP RAP

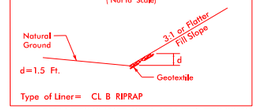
STA. 13+47 –SRY21C– RT

DETAIL 5–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D = 2 Ft.
B = 2 Ft.

FROM STA. 17+66 –SRY21C– TO STA. 25+00 –SRY21C– RT

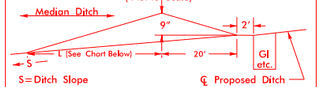
DETAIL 5–4
TOE PROTECTION
(Not to Scale)



Type of Liner = CL B RIPRAP

FROM STA. 14+39 –SRY21C– TO STA. 17+65 –SRY21C– RT

DETAIL 5–5
FALSE SUMP
(Not to Scale)

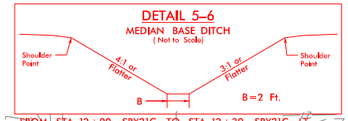


S = Ditch Slope
℄ Proposed Ditch

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'

STA. 12+50 –SRY21C– LT
STA. 17+06 –SRY21C– LT

DETAIL 5–6
MEDIAN BASE DITCH
(Not to Scale)



B = 2 Ft.

FROM STA. 12+00 –SRY21C– TO STA. 12+30 –SRY21C– LT

NAD 83/NA 2011

50' 25' 0 50' 100'
SCALE: 1" = 100'

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

E E DENOTES EXCAVATION IN WETLAND

MATCHLINE –L– STA 217+00 SEE SHEET 4

MATCHLINE –L– STA 230+50 SEE SHEET 6

–SRY21C– STA 25+50

US 70 EB

US 70 WB

–L–

–SRY21C–

RETAIN 66" RCP

RETAIN 30" RCP

RETAIN DI

REMOVE 12 LF 30" RCP

MEDIAN 2' BASE DITCH SEE DETAIL 5–6

MEDIAN 'V' DITCH SEE DETAIL 5–1

FALSE SUMP SEE DETAIL 5–5

COLLAR, REMOVE 20 LF 66" RCP

24" RCP–III

66" RCP–IV

15" RCP–IV

30" RCP–IV

30" RCP–III

15" RCP–III

18" RCP–IV

18" RCP–III

PROP. 2'-6" C&G

REMOVE

CB

DUE

TDE

PUE

S

TS

BEGIN CONSTRUCTION –SRY21C– STA. 12+70.00

SITE 1

SITE 2

STREAM SAB

WETLAND WAU

PIPE OUTLET BANK STABILIZATION SEE DETAIL 5–2

TOE PROTECTION ON FILL SLOPE ONLY EST. 88 TONS CL B RIPRAP EST. 420 SY GEOTEXTILE SEE DETAIL 5–4

CL B RIPRAP EST. 8 TONS EST. 21 SY GF

DAYLIGHT DITCH

Q10 = 22.3 CFS
V10 = 2.0 FPS

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

SPEC. LATERAL 2' BASE DITCH SEE DETAIL 5–3

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

EMMA F. FORD TRUSTEES

REUBEN JULIUS LOGAN & SANDRA MCCLEASE LOGAN

MICHAEL HUFFMAN & WALTER HUFFMAN

NICK ARNOLD

TAURINO PEREZ SANTOS

COOPER STREET PARTNERS, LLC

PAVEMENT REMOVAL

FOR –SRY21C– PROFILE SEE SHEET 68
SEE SHEET 3A-1TO 3A-3 FOR CURVE DATA

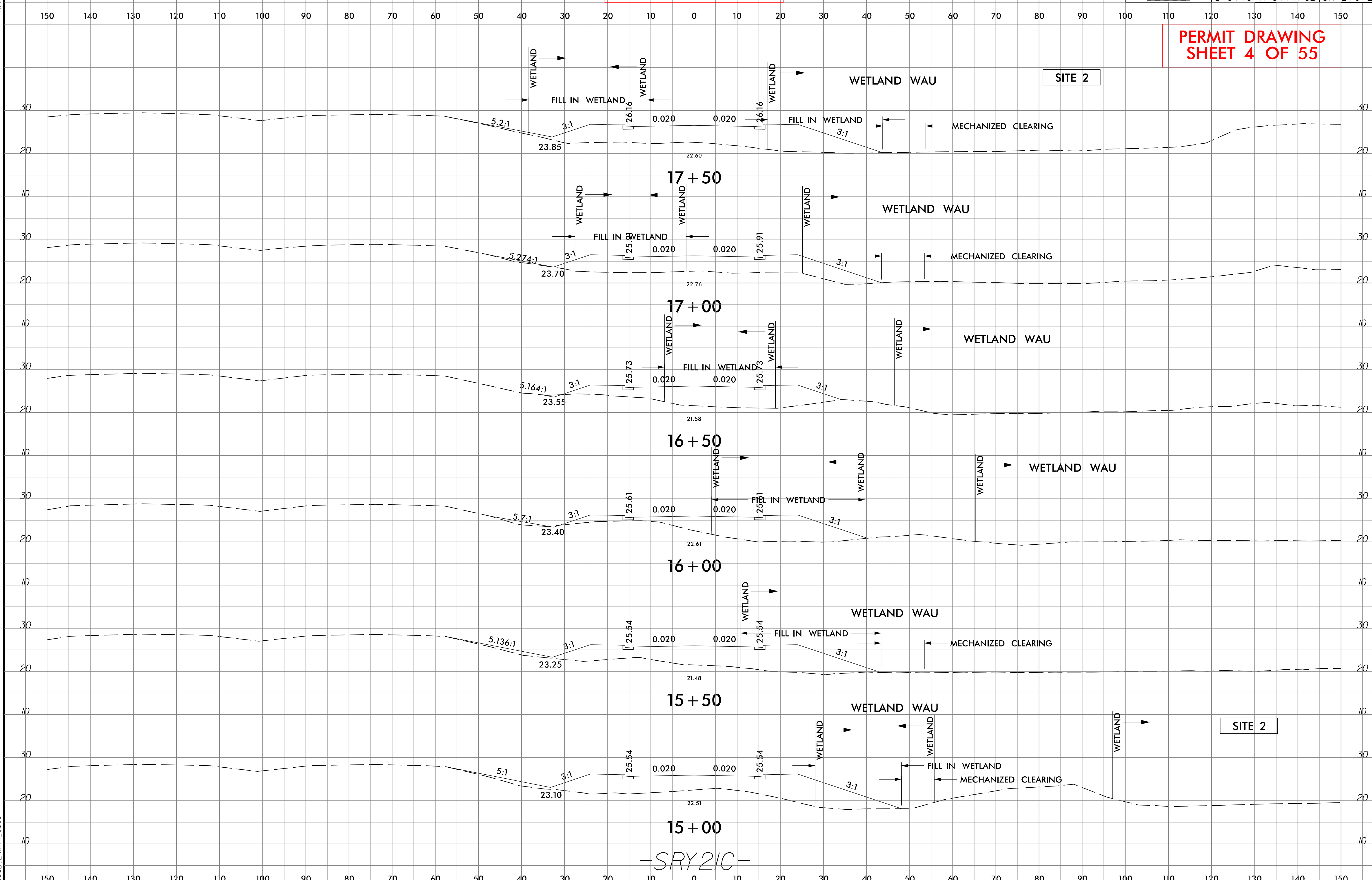
$$SYSTIME$$ $$JOBNUMBER$$ $$USERNAME$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21C-2

PERMIT DRAWING
SHEET 4 OF 55



5/14/99

Submitted 9/16/2020

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 5 OF 55

SITE 1

300 200 100 0 100 200 300

30
20
10
0

CL STA 13+44 –SRY21C–
66" RCP

CB
CB
3:1
3:1
TB RT
TB LT
66" RCP
WSE ON 1–8–2020=16.9
WSE ON 1–8–2020=14.5
TB RT
TB LT
66" RCP
S=0.94%
24" RCP
66" RCP
S=0.94%
15" RCP
66" RCP
S=0.94%

$$$$$$SYSTIME$$$$
$$$$$$SYSNAME$$$$
$$$$$$FILENAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure, Inc. | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 6 OF 55

PROJECT REFERENCE NO. U-5713/R-5777 A&B | SHEET NO. 8

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

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

NAD 83/NA 2011

ENLARGEMENT VIEW SEE SHEET 14 OF 55
ENLARGEMENT VIEW SEE SHEET 11 OF 55
ENLARGEMENT VIEW SEE SHEET 13 OF 55
ENLARGEMENT VIEW SEE SHEET 8 OF 55
ENLARGEMENT VIEW SEE SHEET 10 OF 55
ENLARGEMENT VIEW SEE SHEET 9 OF 55
ENLARGEMENT VIEW SEE SHEET 12 OF 55
ENLARGEMENT VIEW SEE SHEET 15 OF 55

WETLAND WJ
WETLAND WAG
WETLAND WAT
TRIBUTARY TK
TRIBUTARY TS
TRIBUTARY TE
STREAM SA
STREAM SD
STREAM SE
SITE 3
SITE 4
SITE 5
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
SITE 11
SITE 12

Q10=69.7 CFS
V10=1.8 FPS
Q10=7.7 CFS
V10=1.4 FPS
Q10=16.5 CFS
V10=9.4 FPS
Q10=17.8 CFS
V10=11.1 FPS

MECH
THURMAN ROAD
US 70 EB
US 70 WB

DETAIL 8-1 SPECIAL CUT DITCH
DETAIL 8-2 TOE PROTECTION
DETAIL 8-3 STANDARD V BASE DITCH
DETAIL 8-4 STANDARD TRAP DITCH
DETAIL 8-5 TOE PROTECTION
DETAIL 8-6 SPECIAL LATERAL BASE DITCH
DETAIL 8-7 SPECIAL LATERAL V DITCH
DETAIL 8-8 HIDDEN V DITCH
DETAIL 8-9 SPECIAL CUT DITCH
DETAIL 8-10 SPECIAL LATERAL V DITCH
DETAIL 8-11 HIDDEN V DITCH
DETAIL 8-12 RIP RAP CHANNEL
DETAIL 8-13 RIP RAP BANK STABILIZATION
DETAIL 8-14 SPECIAL CUT BASE DITCH
DETAIL 8-15 SPECIAL LATERAL BASE DITCH
DETAIL 8-16 SPECIAL CUT BASE DITCH
DETAIL 8-17 SPECIAL CUT BASE DITCH
DETAIL 8-18 SPECIAL CUT DITCH
DETAIL 8-19 SPECIAL LATERAL V DITCH
DETAIL 8-20 CHANNEL CHANGE
DETAIL 8-21 RIP RAP BANK STABILIZATION
DETAIL 8-22 RIP RAP BANK STABILIZATION
DETAIL 8-23 CULVERT OUTLET CHANNEL W RIP RAP
DETAIL 8-24 CULVERT OUTLET CHANNEL W RIP RAP
DETAIL 8-25 FALSE SUMP
DETAIL 8-26 RIP RAP BANK STABILIZATION
DETAIL 8-27 RIP RAP BANK STABILIZATION
DETAIL 8-28 FALSE SUMP
DETAIL 8-29 ASPHALT V DITCH
DETAIL 8-30 RIP RAP BANK STABILIZATION
DETAIL 8-31 RIP RAP BANK STABILIZATION

BRICK STAMPED/RED STAINED MONOLISTHIC
PAVEMENT REMOVAL

INSET A -Y21- STA 25+50

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y21- (THURMAN RD) / -L-
TIP NO.: U-5713/R-5777 A&B | COUNTY: CRAVEN
DESIGNED BY: NP | DATE: 11/05/19
CHECKED BY: JAF | DATE: 11/05/19

6/2/99

Submitted 9/16/2020

6/2/99

DATE: 06-03-2020

PROJECT REFERENCE NO. U-5713/R-5777 A&B | SHEET NO. 8

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure, Inc. | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 7 OF 55

NAD 83/NSRS 2011

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

ENLARGEMENT VIEW SEE SHEET 14 OF 55

ENLARGEMENT VIEW SEE SHEET 11 OF 55

ENLARGEMENT VIEW SEE SHEET 13 OF 55

ENLARGEMENT VIEW SEE SHEET 8 OF 55

ENLARGEMENT VIEW SEE SHEET 10 OF 55

ENLARGEMENT VIEW SEE SHEET 9 OF 55

ENLARGEMENT VIEW SEE SHEET 12 OF 55

ENLARGEMENT VIEW SEE SHEET 15 OF 55

WETLAND WJ
WETLAND WAG
WETLAND WAT
STREAM SA
STREAM SD
STREAM SE
TRIBUTARY TK
TRIBUTARY TS
TRIBUTARY TE
SITE 3
SITE 4
SITE 5
SITE 6
SITE 7
SITE 8
SITE 9
SITE 10
SITE 11
SITE 12
MECH

-SRY21A- STA 29+00
-SRY21B- STA 25+50
-SRY21C- STA 52+00
-SRY21D- STA 26+50
-Y21RPA-
-Y21RPB-
-Y21RPC-
-Y21RPD-
-Y21- STA 25+50
-L- STA 285+00
-L- STA 257+00
-L- STA 10+00
-L- STA 13+50
-Y21RPA- STA 10+50
-Y21RPD- STA 10+50

MATCHLINE -L- STA 257+00 SEE SHEET 7
MATCHLINE -L- STA 285+00 -Y21RPA- STA 10+00 SEE SHEET 7

INSET A -Y21- STA 25+50

THURMAN ROAD -Y2-

BRICK STAMPED/RED STAINED MONOLISLAND

PAVEMENT REMOVAL

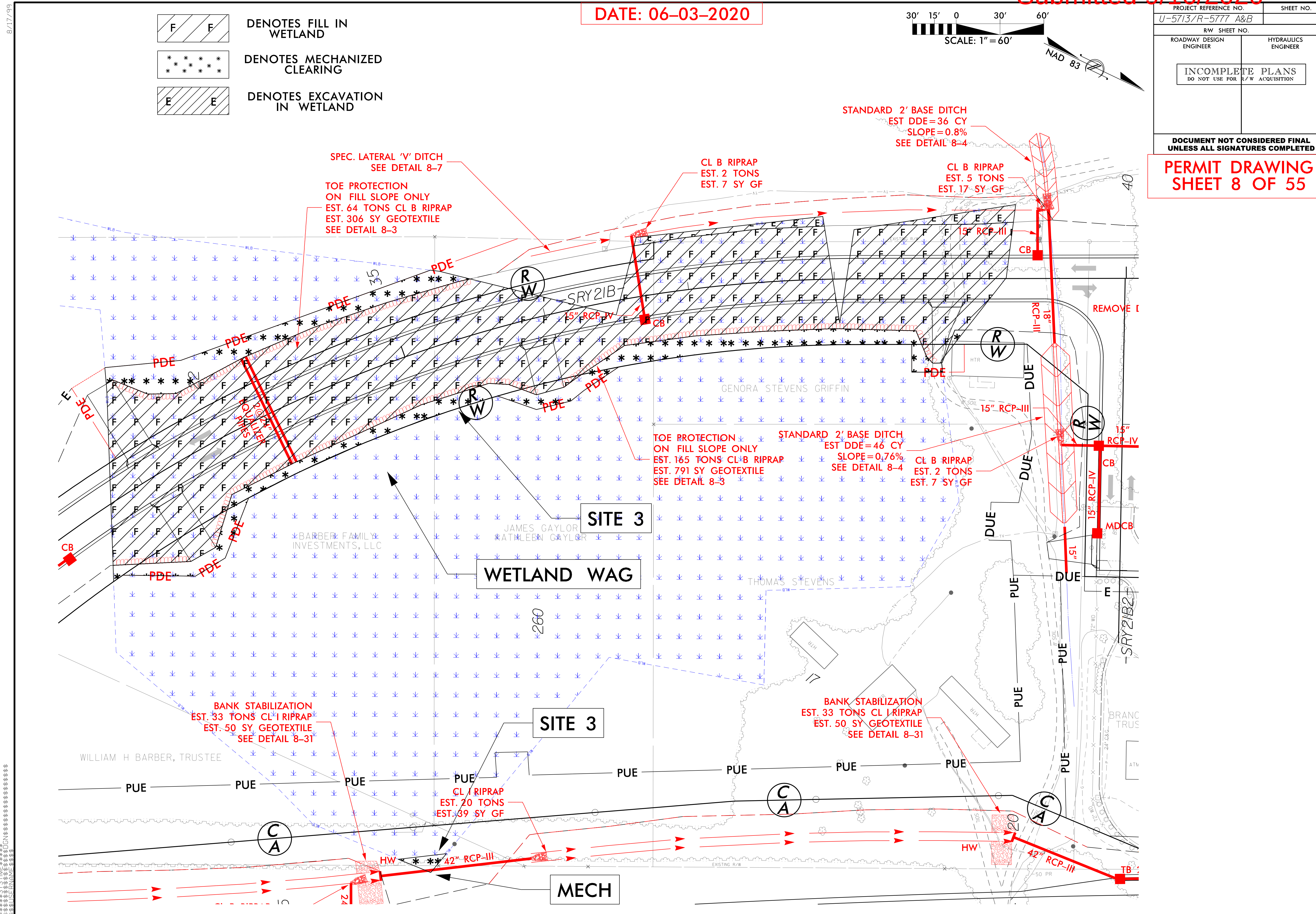
GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y21- (THURMAN RD.) / -L-

TIP NO.	U-5713/R-5777 A&B	COUNTY: CRAVEN
DESIGNED BY:	NP	DATE: 11/05/19
CHECKED BY:	JAF	DATE: 11/05/19

$$$$$$SYSTIME$$$$$$
$$$$$$ACTIONNAME$$$$$$

Submitted 9/16/2020



Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

10′ 5′ 0 10′ 20′
SCALE: 1″=20′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 9 OF 55

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

CHANNEL CHANGE
EST. 2,475 CY DDE
SLOPE = 0.43%
SEE DETAIL 8–20

SPEC. LATERAL 4′ BASE DITCH
SEE DETAIL 8–19
1FT SILL

SRY21C

BZ 2

15″ RCP–IV

CB

1@9′X6′ RCBC
(BURIED 1FT)

1FT
SILL

BZ 1

Q10 = 50.0 CFS
V10 = 1.7 FPS

TEMPORARY IMPACTS IN SURFACE WATER

STREAM SA

DUE PUE

SITE 4

WD RETAINING WALL

IMPACTS IN SURFACE WATER

RIP RAP BANK
STABILIZATION
W/CL 'I' RIP RAP
SEE DETAIL 8–22

BST

48″ RCP

Q10 = 0.7 CFS
V10 = 1.3 FPS

SPEC. LATERAL
'V' DITCH
SEE DETAIL 8–7

$$$$SYSTIME$$$$
$$$$SYSTIME$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

S S DENOTES IMPACTS IN SURFACE WATER

10' 5' 0 10' 20'
SCALE: 1"=20'

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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PERMIT DRAWING
SHEET 10 OF 55

STREAM SA

SITE 4

CB

18" RCP–IV

BZ 2

BZ 1

18" RCP–III

IMPACTS IN SURFACE WATER

REMOVE 72" RCP & JB

FLOWABLE FILL

REMOVE

2GI–D

15" RCP–IV

RAISED TIMBER LANDSCAPE BOX

Y2IRPC

Y2IRAB2

Y2IRPD

CB

OUTLET

1FT SIL

STREAM SA

Submitted 9/16/2020

8/17/99

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 11 OF 55

SCALE: 1" = 40'

NAD 83

TOE PROTECTION ON FILL SLOPE ONLY
EST. 34 TONS CL B RIPRAP
EST. 162 SY GEOTEXTILE
SEE DETAIL 8-3

CULVERT OUTLET CHANNEL W/RIP RAP
EST. 106 TONS CL I RIPRAP
EST. 175 SY GEOTEXTILE
SEE DETAIL 8-24

WETLAND WJ

SITE 12

JB w/MH

RIPRAP

RCP-III

TRIBUTARY TK

PIPE OUTLET CHANNEL
BANK STABILIZATION
SEE DETAIL 8-9

SITE 5

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 13 TONS CL B RIPRAP
EST. 61 SY GEOTEXTILE
SEE DETAIL 8-3
BANK STABILIZATION
EST. 40 TONS CL I RIPRAP
EST. 72 SY GEOTEXTILE
SEE DETAIL 8-23

15" RCP-IV

1FT SILL

1@10'x7' RCBC

SITE 4

STREAM SA

TEMPORARY IMPACTS IN SURFACE WATER

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 9 TONS CL B RIPRAP
EST. 43 SY GEOTEXTILE
SEE DETAIL 8-3

IMPACTS IN SURFACE WATER

WETLAND WJ

MECHANIZED CLEARING

SITE 5

SPEC. CUT
6' BASE DITCH
SEE DETAIL 8-1

EXCAVATION

CULVERT OUTLET CHANNEL
W/CL 'I' RIP RAP (BANKS ONLY)
EST. 35 TONS CL I RIPRAP
EST. 60 SY GEOTEXTILE
SEE DETAIL 8-32

TOE PROTECTION
EST. 12 TONS CL B RIPRAP
EST. 55 SY GEOTEXTILE
SEE DETAIL 8-5

15" RCP-III

CB

Q10 = 69.7 CFS
V10 = 1.8 FPS

15" RCP-IV

SITE 4

IMPACTS IN SURFACE WATER

FILL IN WETLAND

TB 2GI

REMOVE

1@10'x6' RCBC W/1FT SILLS

STREAM SA

SITE 5

-Y21RPA-

-SRY21A-

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES EXCAVATION IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

30′ 15′ 0 30′ 60′
SCALE: 1″ = 60′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 12 OF 55

RCP–III
E SUMP
TAIL 8–28
SPEC. CUT 'V' DITCH
SEE DETAIL 8–6
10 IN, PVC
8 IN, MD
96 STR
84 STR
US 70 EB 32' BST
REMOVE DI
15" RCP–IV
SIGN W7 LT
2GI
15" RCP–IV
FALSE SUMP
SEE DETAIL 8–25
18" RCP–IV
US 70 EB
-L-
US 70 WB
IMPACTS IN SURFACE WATER
US 70 WB 31' BST
SPEC. LATERAL 'V' DITCH
SEE DETAIL 8–10
600 PR
3 IN, PVC
36 STR
SR 1960 19' BST 100 PR
-Y21RPD-
SERVICE RD 20' BST
SITE 8
SITE 9
SITE 10
REMOVE
REMOVE RIPRAP 18" RCP
REMOVE 15" HDPE
REMOVE 18" CMP
FILL IN WETLAND
SPEC. CUT 2' BASE DITCH
SEE DETAIL 8–17
REMOVE 20 LF
15" HDPE
TRIBUTARY TS
WETLAND WAT
TRIBUTARY TE
MECHANIZED CLEARING
SPEC. LATERAL 'V' DITCH
SEE DETAIL 8–10
CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF
CL B RIPRAP
EST. 2 TONS
EST. 7 SY GF
2GI–A
REMOVE DI
FALSE SUMP
SEE DETAIL 8–25
24" RCP–IV
REMOVE HW
48" RCP–IV
MEDIAN 'V' DITCH
SEE DETAIL 8–11
MD2GI–A
24" RCP–III
18" RCP–III
CB
HW
PDE
DUE
TEMPORARY IMPACTS IN SURFACE WATER
STABILIZATION
AP
-26
BLUE WATER PROPERTIES OF NEW BERN, LLC
DEVELOPMENT, LLC
WILLIAM D GORGES
LYNN L GORGES
10
ISMTLBUS
-SRY21D-

$$$$SYSTIME $$$$
$$$$DGN $$$$
$$$$USERNAME $$$$

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

30′ 15′ 0 30′ 60′
SCALE: 1″ = 60′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 13 OF 55

AUDREY P WARD

WETLAND WJ

SITE 5

TEMPORARY IMPACTS IN SURFACE WATER

PIPE OUTLET CHANNEL
BANK STABILIZATION
SEE DETAIL 8–12

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 9 TONS CL B RIPRAP
EST. 43 SY GEOTEXTILE
SEE DETAIL 8–3

MECHANIZED CLEARING

STREAM SD

WETLAND WJ

MEDIA
SEE

SITE 5

PUE

DUE

CL B RIPRAP
EST. 2 TONS
EST. 7 SY GF

15″ RCP–III

CB

15″ RCP–IV

2GI

FILL IN WETLAND

IMPACTS IN SURFACE WATER

SITE 6

JB w/MH

48″ RCP–III

CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF

18″ RCP–III

STREAM SE

SITE 7

-SRY21A-

-Y21RPA-

-L-

US 70 EB

US 70 WB

FALSE SUMP
SEE DETAIL 8–25

18″ RCP–IV

24″ RCP–IV

48″ RCP–IV

2GI–A

REMOVE DI

REMOVE

MEDIAN 'V' DITCH
SEE DETAIL 8–11

FLOWABLE FILL

MEDIAN 'V'
SEE DETA

48 STR. EOI

BST VARIES

4′ BST

3′ BST

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

10′ 5′ 0 10′ 20′
SCALE: 1″=20′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 14 OF 55

13

14

HW

TRIBUTARY TK

SITE 12

RW

IMPACT IN SURFACE WATER

DUE

PUE

REMOVE 27 LF
15″ CMP
RETAIN

42″ RCP–III

15″ CMP

JB w/MH

S

TS

DUE

RIPRAP

DUE

RW

PUE

PROPANE TANK

TEMPORARY IMPACT IN SURFACE WATER

SRY 21A

PIPE OUTLET CHANNEL
BANK STABILIZATION
SEE DETAIL 8–9

$$$$$$$$SYSTIME$$$$
$$$$$$$$USERNAME$$$$
$$$$$$$$DGN$$$$

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

10′ 5′ 0 10′ 20′
SCALE: 1″ = 20′

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 15 OF 55

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

TOE PROTECTION
EST. 38 TONS CL B RIPRAP
EST. 183 SY GEOTEXTILE
SEE DETAIL 8–3

WETLAND WAW

SITE 11

PDE

PDE

2@24" EQUALIZER PIPES

CB

SRY 21D

CB

TOE PROTECTION
EST. 37 TONS CL B RIPRAP
EST. 174 SY GEOTEXTILE
SEE DETAIL 8–3

DUE

DUE

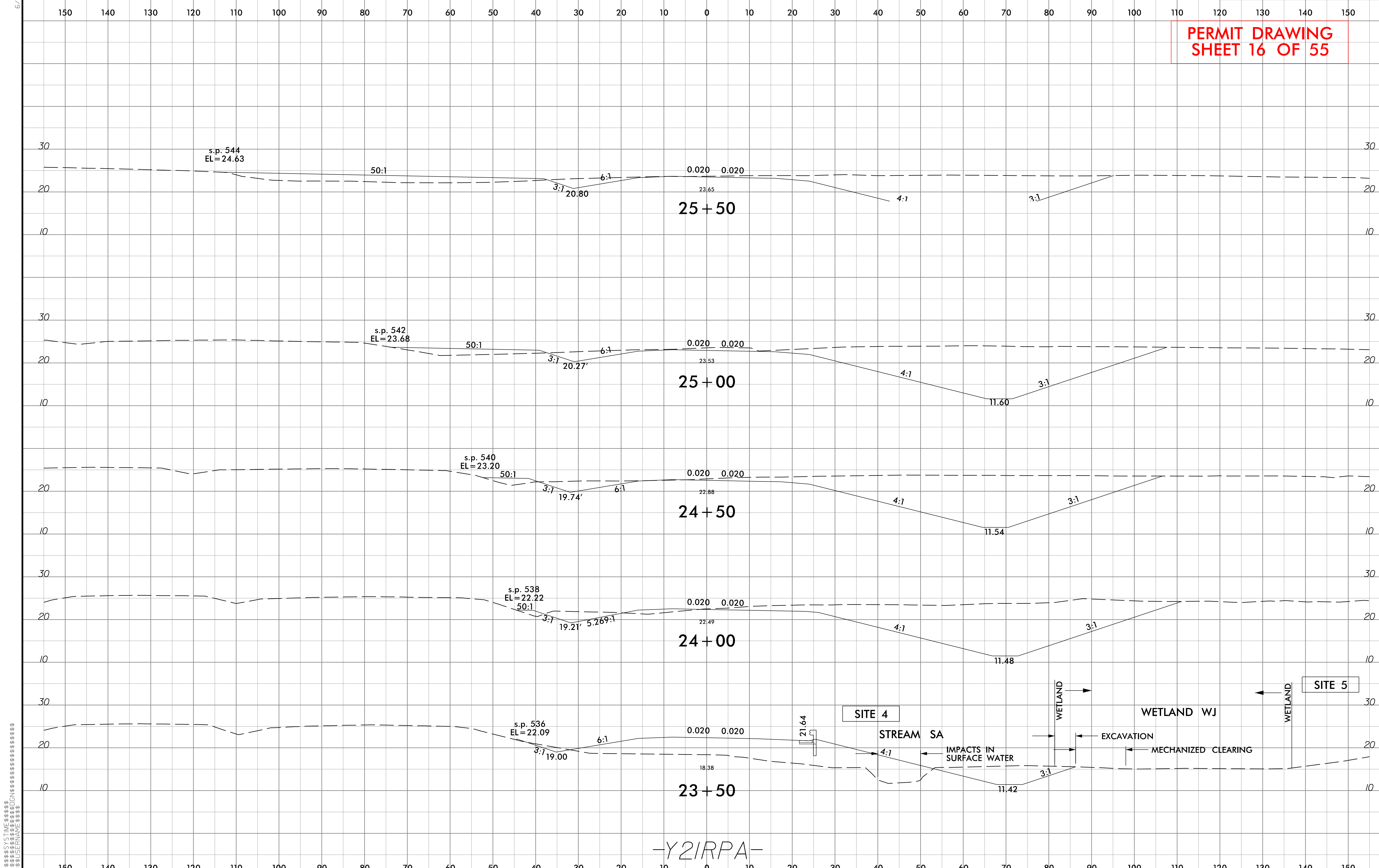
$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	Y21RPA-5

PERMIT DRAWING
SHEET 16 OF 55



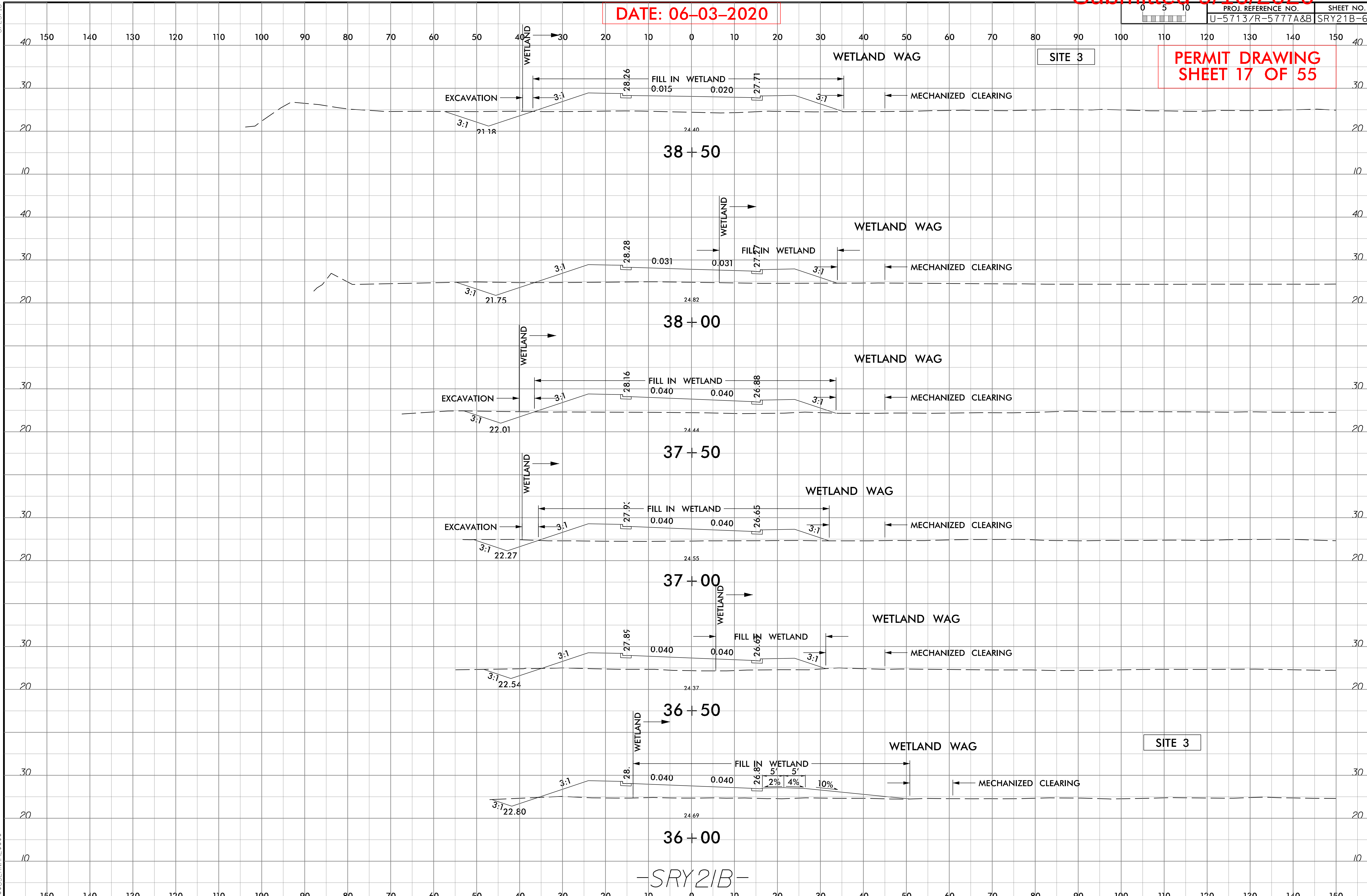
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO. U-5713/R-5777A&B

SHEET NO. SRY21B-6

PERMIT DRAWING
SHEET 17 OF 55



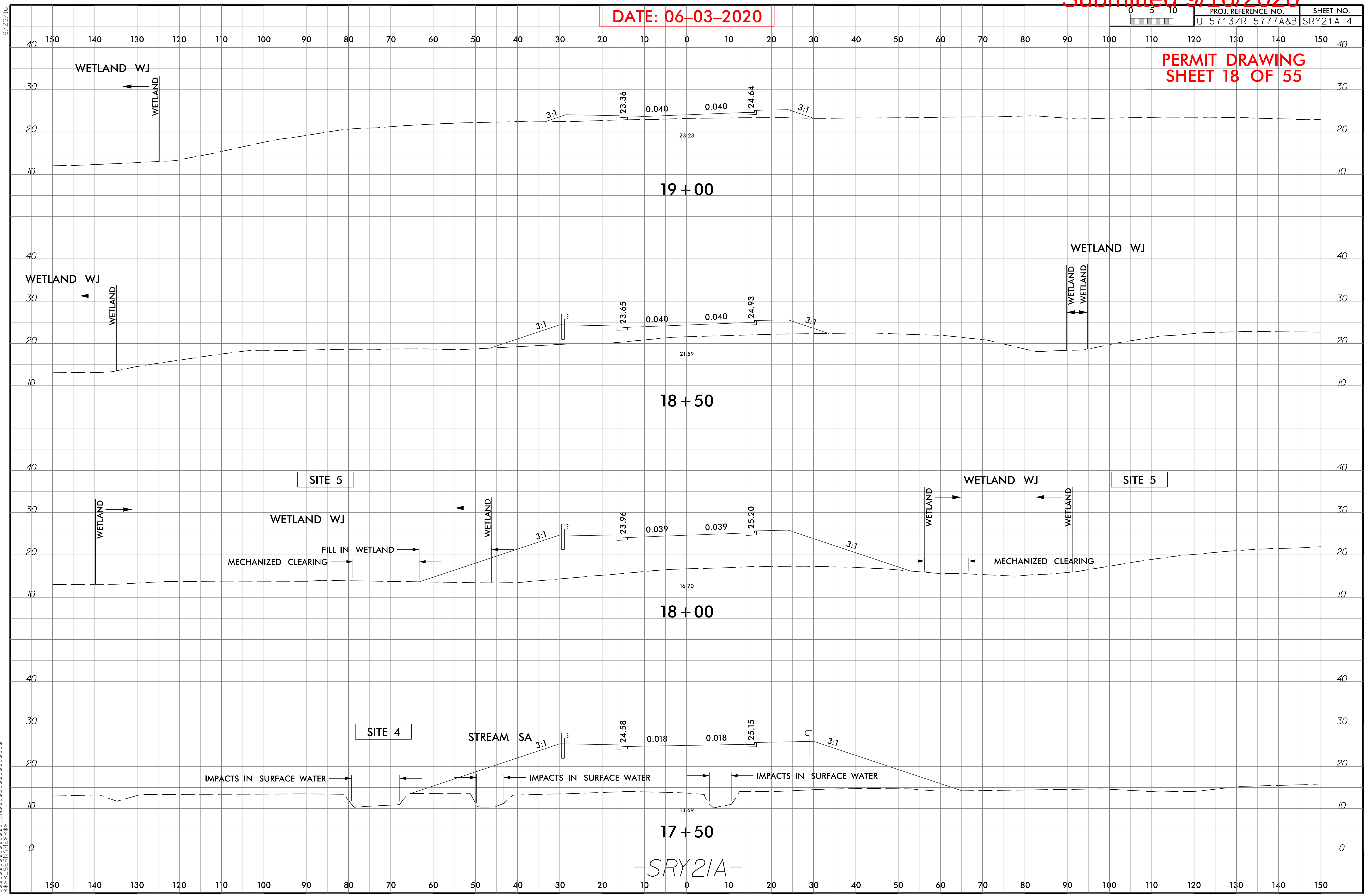
6/23/16

$$$$$$SYSTIME$$$$ $$$$$$$$$$DGN$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PERMIT DRAWING
SHEET 18 OF 55

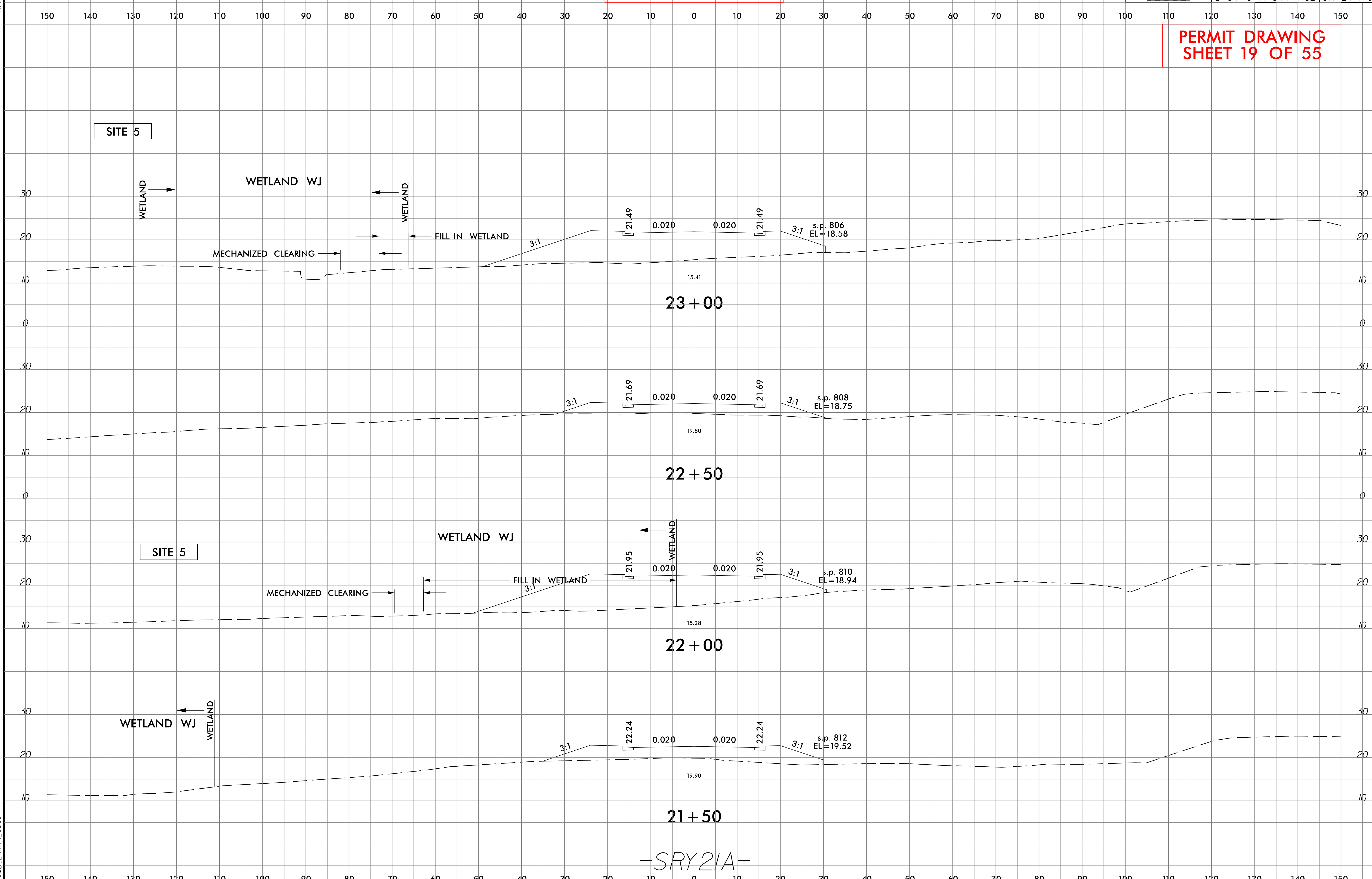


Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21A-6

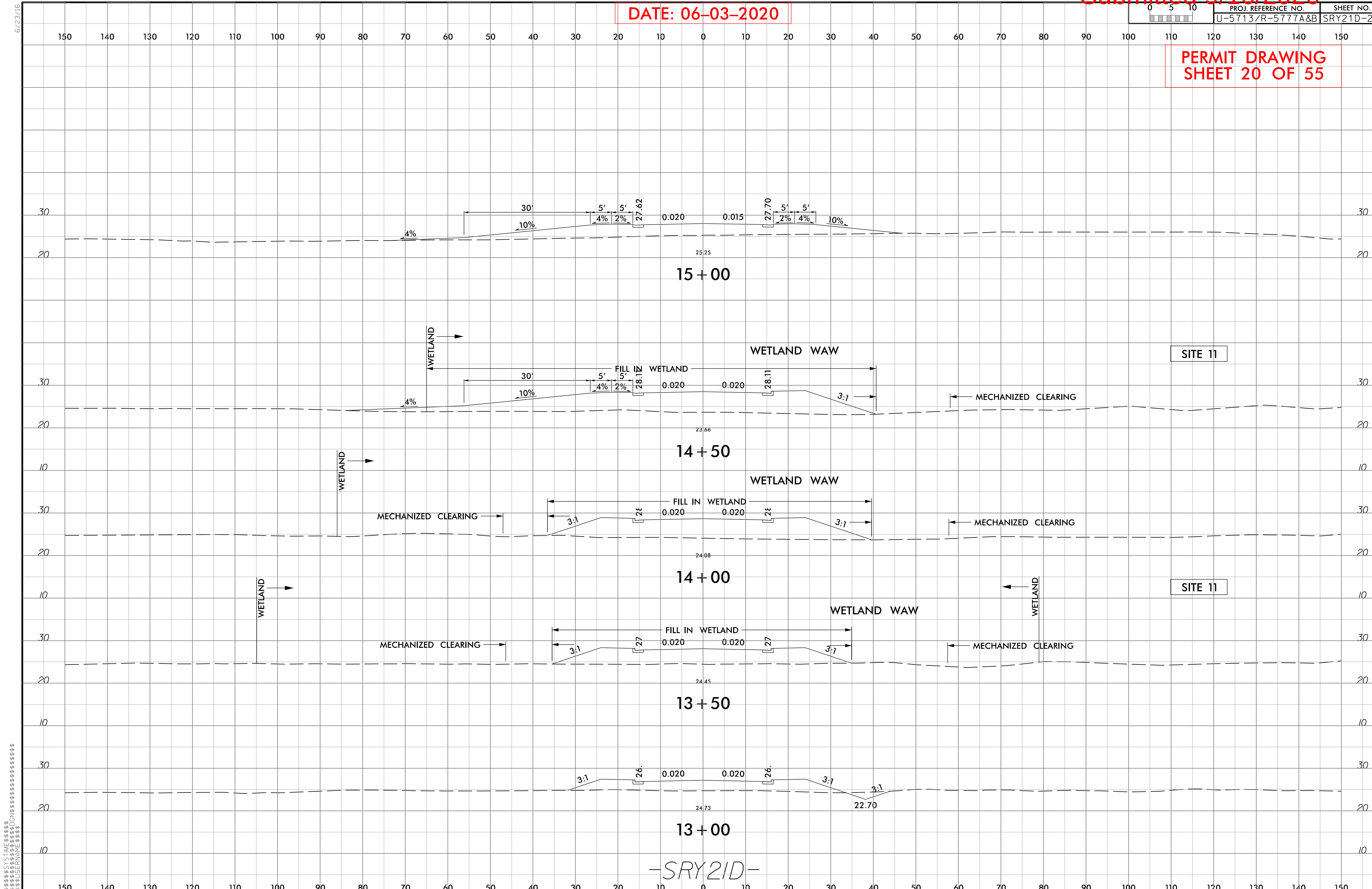
PERMIT DRAWING
SHEET 19 OF 55



6/23/16

$$$$$SYSTIME$$$$ $$$$$$$$DGN$$$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

Submitted 9/16/2020



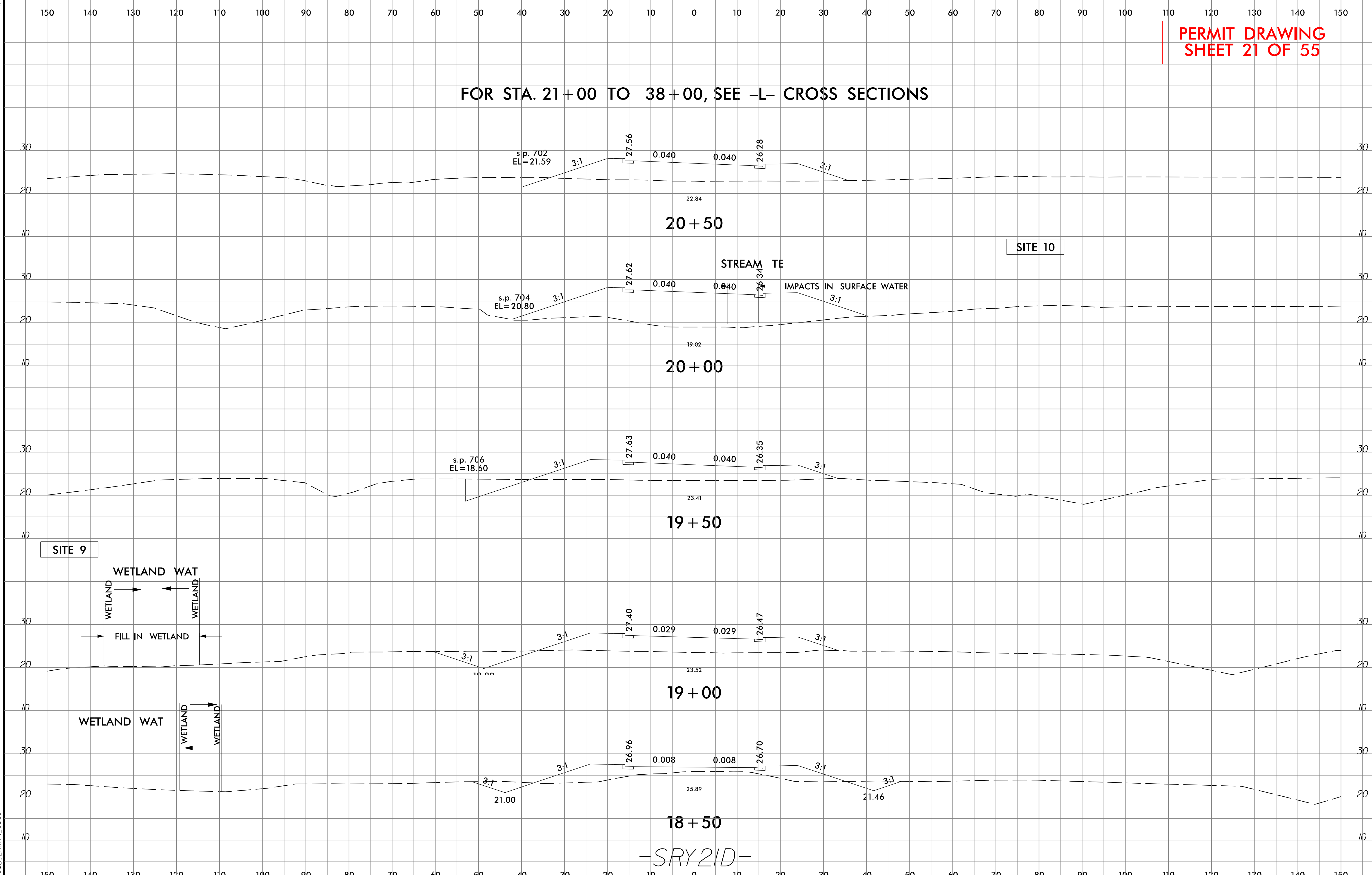
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21D-4

PERMIT DRAWING
SHEET 21 OF 55

FOR STA. 21+00 TO 38+00, SEE -L- CROSS SECTIONS



Submitted 9/16/2020

DATE: 06-03-2020

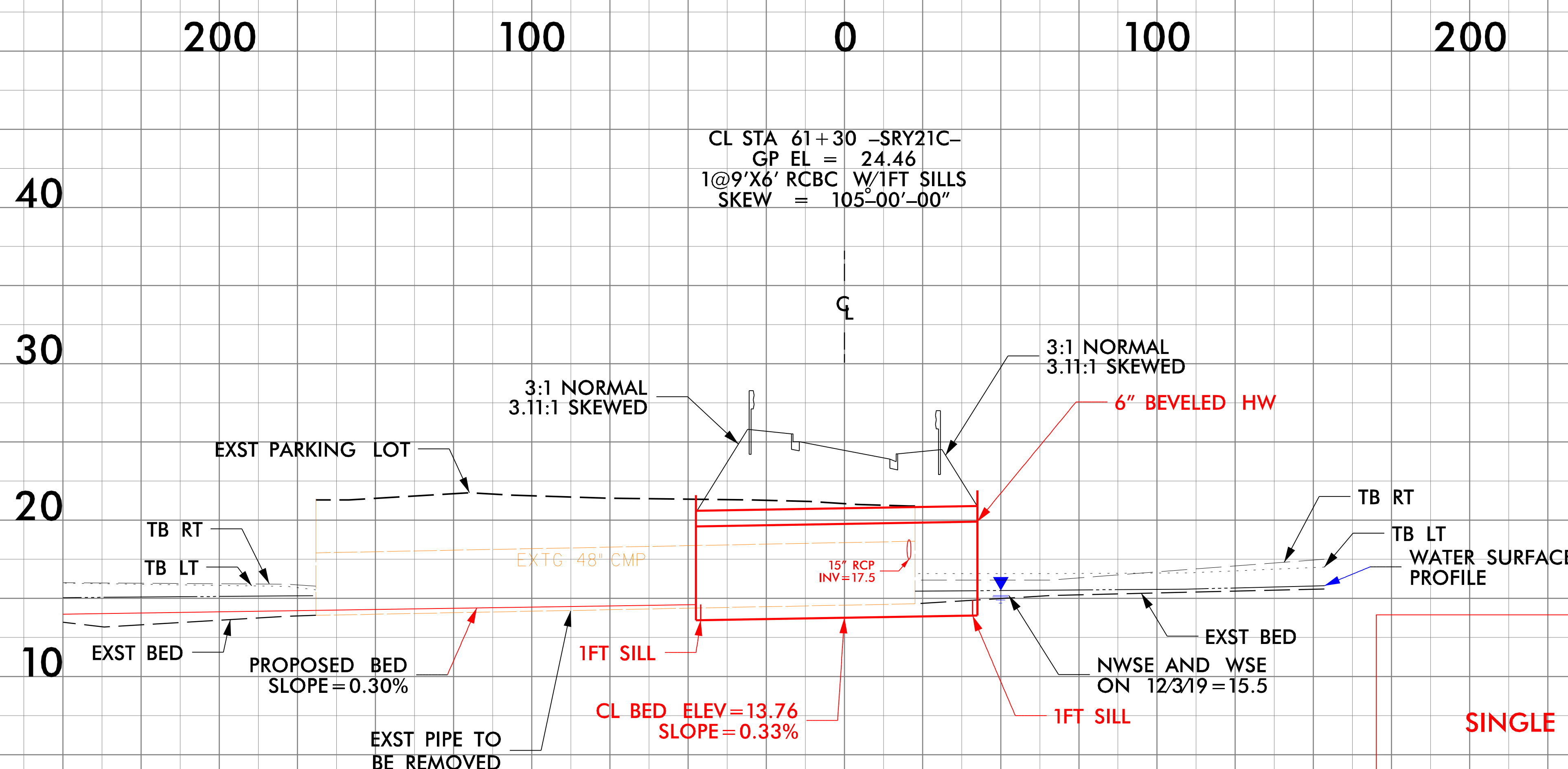
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 22 OF 55

SITE 4



DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS

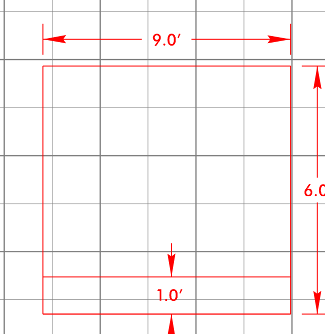
*NOTES:

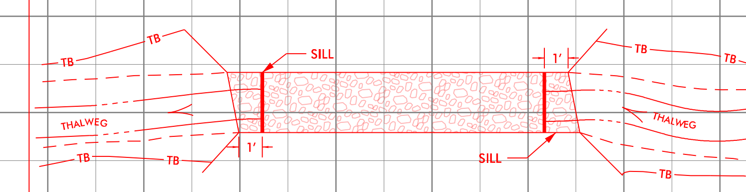
1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) DO NOT SET ELEVATION OF SILL ABOVE BANK FULL.

4) NUMBER OF SILLS DETERMINED BY THE ENGINEER.

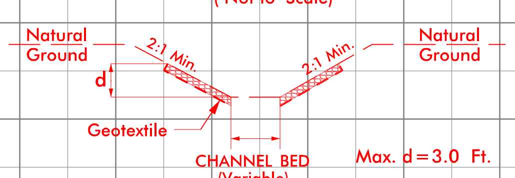




PLAN VIEW

9/13

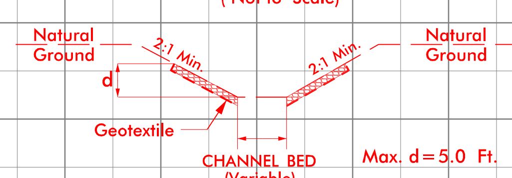
DETAIL
RIP RAP BANK STABILIZATION (UPSTREAM)
(Not to Scale)



Max. d=3.0 Ft.

Length = 30 Ft.
Type of Liner= Class 'I' Rip-Rap
Est. 25 Tons, Est. 33 SY GF

DETAIL
RIP RAP BANK STABILIZATION (DOWNSTREAM)
(Not to Scale)



Max. d=5.0 Ft.

Length = 65 Ft.
Type of Liner= Class 'I' Rip-Rap
Est. 150 Tons, Est. 180 SY GF

5/14/99

$$$$$$$$SYSTIME$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$USERNAME$$$$$

Submitted 9/16/2020

DATE: 06-03-2020

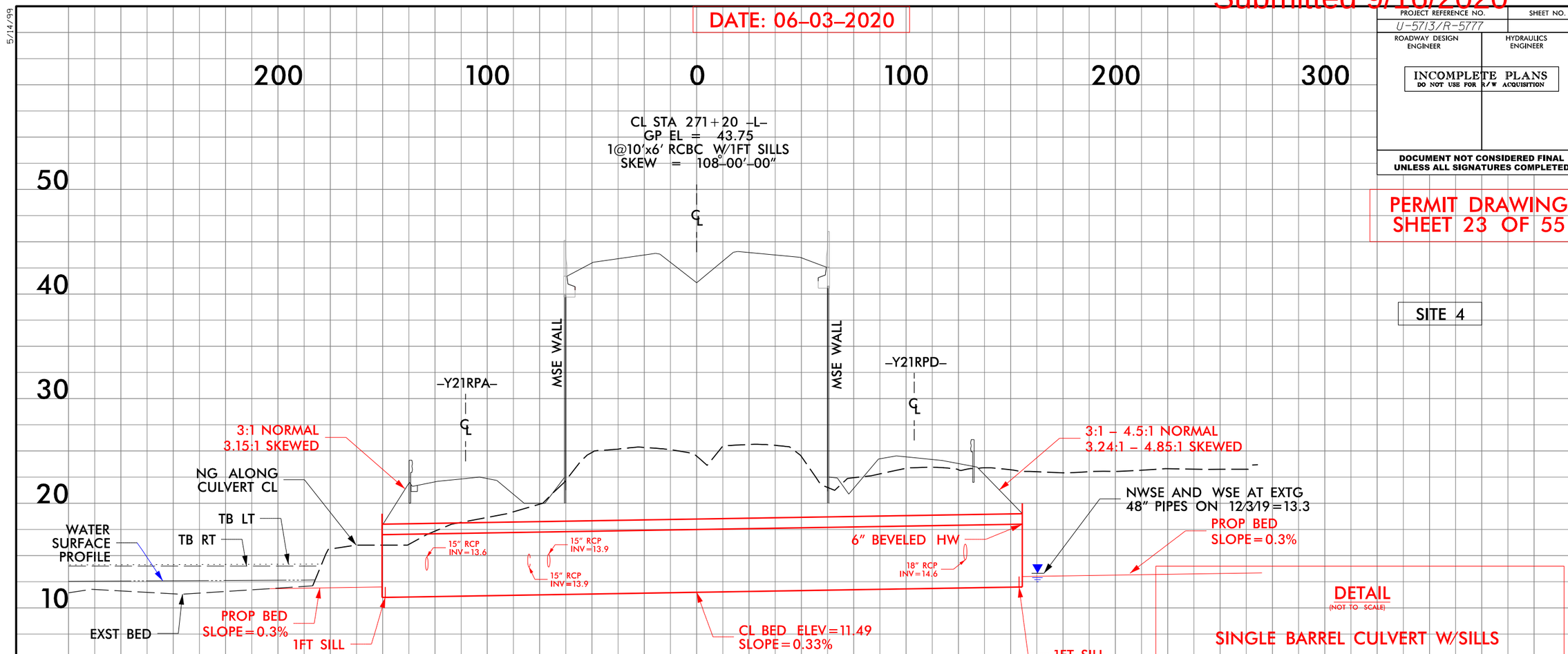
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

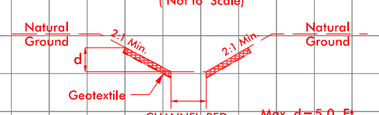
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 23 OF 55

SITE 4

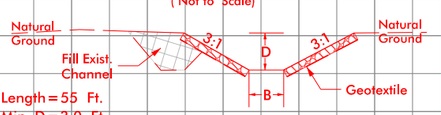


DETAIL
RIP RAP BANK STABILIZATION (UPSTREAM)
(Not to Scale)



Length = 40 Ft.
Type of Liner = Class 'I' Rip-Rap
Est. 80 Tons, Est. 96 SY GF

DETAIL
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)



Length = 55 Ft.
Min. D = 3.0 Ft.
B = 9.0 Ft. (VARIABLE AT CHANNEL TIE)
Type of Liner = Class 'I' Rip Rap (BANKS ONLY)
Est. 35 Tons, Est. 60 SY GF

DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS

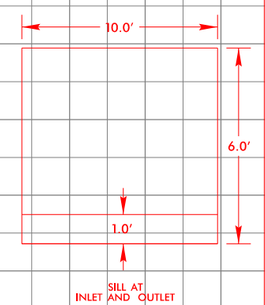
*NOTES:

1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) DO NOT SET ELEVATION OF SILL ABOVE BANK FULL.

4) NUMBER OF SILLS DETERMINED BY THE ENGINEER.



PLAN VIEW

9/13

5/14/99
$$$$$$$$SYSTIME$$$$$$$$
$$$$$$$$USERNAME$$$$$$$$

Submitted 9/16/2020

5/14/99

DATE: 06-03-2020

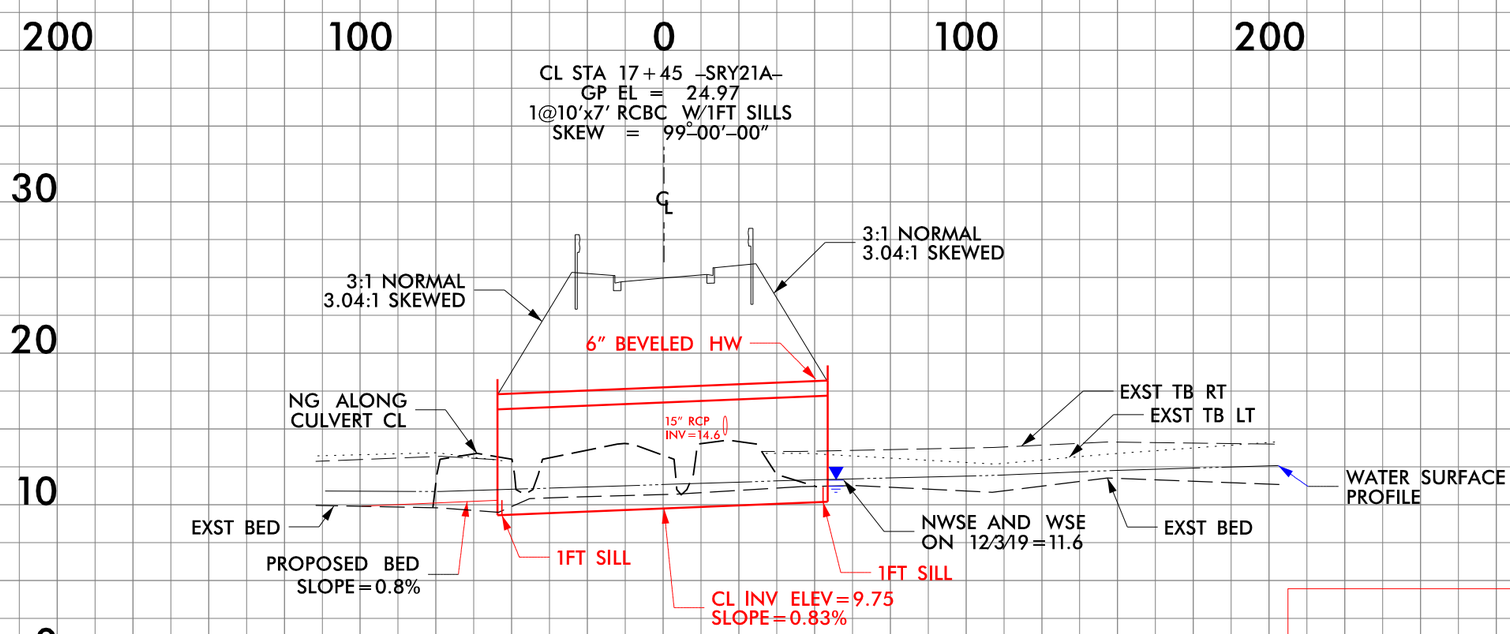
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 24 OF 55

SITE 4



DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS

*NOTES:

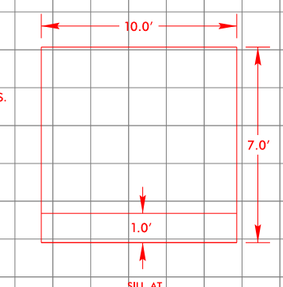
1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

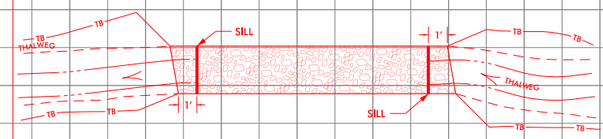
2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF HIGH SILL ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.

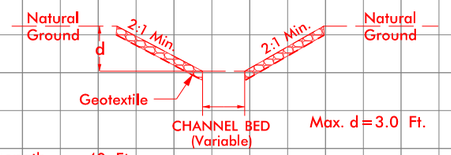




PLAN VIEW

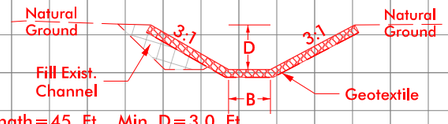
9/13

DETAIL
RIP RAP BANK STABILIZATION
(Not to Scale)



Length = 40 Ft.
Type of Liner= Class 'I' Rip-Rap
Est. 40 Tons, Est. 72 SY GF

DETAIL
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)



Length=45 Ft., Min. D=3.0 Ft.
B=9.0 Ft. (Variable at Channel Tie)
Type of Liner= Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 106 Tons, Est. 175 SY GF

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$FILENAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 25 OF 55

NAD 83/NA 2011

50' 25' 0 50' 100'

SCALE: 1" = 100'

DETAIL 9-9
FALSE SUMP
(Not to Scale)

Median Ditch, 9", 2', L (See Chart Below), 20', GI etc., S

S=Ditch Slope ℄ Proposed Ditch

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'

DETAIL 9-10
TOE PROTECTION
(Not to Scale)

Natural Ground, 3:1 or Flatter Fill Slope, d, d=1.5 Ft., Geotextile

Type of Liner= CL B RIPRAP

FROM STA. 29+98 -SRY21A- TO STA. 30+61 -SRY21A- LT

STA. 286+87 -L- MED
STA. 286+37 -L- RT
STA. 286+87 -L- LT
STA. 289+34 -L- RT
STA. 291+37 -L- MED
STA. 291+37 -L- LT
STA. 294+37 -L- LT
STA. 294+63 -L- RT

CULVERT OUTLET CHANNEL W/CL 'L' RIP RAP
EST. 130 TONS CL I RIPRAP
EST. 214 SY GEOTEXTILE
SEE DETAIL 9-8

FILL EXISTING CHANNEL TOE PROTECTION WITH SUITABLE MATERIAL ON FILL SLOPE ONLY
EST 120 CY

EST. 17 TONS CL B RIPRAP
EST. 95 SY GEOTEXTILE
SEE DETAIL 9-10

CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF

TOE PROTECTION
EST. 30 TONS CL B RIPRAP
EST. 135 SY GEOTEXTILE
SEE DETAIL 9-4

CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF

CL I RIPRAP
EST. 11 TONS
EST. 22 SY GF

CL I RIPRAP
EST. 20 TONS
EST. 39 SY GF

PT Sta. 30+10.48

-Y21RPA- PC Sta. 10+00.00 =
-L- POT Sta. 285+50.00, 47.00' RT =
-SRY21D- PT Sta. 27+03.88

MATCHLINE -L- STA 285+00 -Y21RPA- STA 10+00 SEE SHEET 8

MATCHLINE -L- STA 298+00 SEE SHEET 10

-SRY21A- STA 29+00

-SRY21A- STA 42+00

-SRY21D- STA 26+50 -Y21RPD- STA 10+50

-SRY21D- STA 39+50

SITE 5
SITE 13
SITE 14
SITE 15
SITE 16
SITE 17
WETLAND WJ
WETLAND WM
WETLAND WAB
STREAM SI
STREAM SF
TRIBUTARY TL
MECH

AUDREY P WARD
WILVEN, LLC
CARLSON & WILLIAMS HOMES, LLC
CRAVEN COUNTY JUNIOR CHAMBER OF COMMERCE, INC
MATTIE A MIDGETTE
JOEL DAVID HORNE & FRANCES C HORNE JR

US 70 EB
US 70 WB
-L-
-SRY21A-
-SRY21D-

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

DETAIL 9-1
MEDIAN 'V' DITCH
(Not to Scale)

Shoulder Point, 3:1 or Flatter, 4:1 or Flatter, Shoulder Point

FROM STA. 285+00 -L- TO STA. 287+50 -L- LT
FROM STA. 291+50 -L- TO STA. 297+00 -L- LT
FROM STA. 297+00 -L- TO STA. 298+00 -L- LT

DETAIL 9-2
MEDIAN 'V' DITCH
(Not to Scale)

Shoulder Point, 4:1 or Flatter, 3:1 or Flatter, Shoulder Point

FROM STA. 285+00 -L- TO STA. 288+00 -L- RT
FROM STA. 293+50 -L- TO STA. 297+00 -L- RT

DETAIL 9-3
LATERAL BASE DITCH
(Not to Scale)

Natural Ground, 3:1, D, 3:1, b, 1'-6", Fill Slope

Min. D=3 Ft.
B=6 Ft.
b=5 Ft.

FROM STA. 26+99 -SRY21D- TO STA. 28+43.88 -SRY21D- RT

DETAIL 9-4
TOE PROTECTION
(Not to Scale)

Natural Ground, b, 3:1 or Flatter Fill Slope, d, Geotextile

d=1.5 Ft.
b=2.0 Ft.

Type of Liner= CL B RIPRAP

FROM STA. 30+61 -SRY21A- TO STA. 31+50 -SRY21A- LT

DETAIL 9-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope

Min. D=2 Ft.

FROM STA. 34+00 -SRY21D- TO STA. 38+00 -SRY21D- RT
FROM STA. 40+60 -SRY21A- TO STA. 42+00 -SRY21A- LT

DETAIL 9-6
SPECIAL CUT BASE DITCH
(Not to Scale)

Natural Ground, 3:1, D, 4:1 or Flatter, Front Ditch Slope, B

Min. D=2 Ft.
B=4 Ft.

FROM STA. 297+00 -L- TO STA. 298+00 -L- RT

DETAIL 9-7
RIP RAP BANK STABILIZATION
(Not to Scale)

Natural Ground, 2:1 Min., d, 2:1 Min., Natural Ground, Geotextile, CHANNEL BED (Variable), Max. d=3.0 Ft.

Length = 30 FT. (JS) 40 FT. Channel Relocation
Type of Liner= CL I RIPRAP
Est. 55 TONS, Est. 100 SY GF

DETAIL 9-8
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)

Natural Ground, 3:1, D, 3:1, Natural Ground, Geotextile, B, Fill Exist. Channel

Length = 55 Ft.
B = 6.0 Ft., Min. D = 3.0 Ft.
Type of Liner= Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 130 Tons, Est. 214 SY GF

STA. 29+88 -SRY21A- LT (61 LT TO 118 LT)

FOR -L- PROFILE SEE SHEET 26
FOR -Y21RPD- PROFILE SEE SHEET 46
FOR -Y21RPD- PROFILE SEE SHEETS 64 & 65
FOR -SRY21D- PROFILE SEE SHEETS 71 & 72
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

USERNAME = $USERNAME
DGN = $DGN
FILE = $FILE
TIME = $TIME

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV | 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 26 OF 55

NAD 83/NA 2011
50' 25' 0 50' 100'
SCALE: 1" = 100'

DETAIL 9-9
FALSE SUMP
(Not to Scale)

S=Ditch Slope				
Ditch Grade	L	To	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'

DETAIL 9-10
TOE PROTECTION
(Not to Scale)

Type of Liner= CL B RIPRAP
FROM STA. 29+98 -SRY21A- TO STA. 30+61 -SRY21A- LT

STA. 286+87 -L- MED
STA. 286+37 -L- RT
STA. 286+87 -L- LT
STA. 289+34 -L- RT
STA. 291+37 -L- MED
STA. 291+37 -L- LT
STA. 294+37 -L- LT
STA. 294+68 -L- RT

SITE 5
SITE 13
WETLAND WJ
STREAM SI
WETLAND WJ
SITE 5
WETLAND WM
MECH
TRIBUTARY TL
SITE 16
SITE 17
STREAM SI
STREAM SF
SITE 13
SITE 14
SITE 15
WETLAND WAB

PT Sta. 30+10.48

CULVERT OUTLET CHANNEL W/ CL I RIP RAP
EST. 139 TONS CL I RIPRAP
EST. 214 SY GEOTEXTILE
SEE DETAIL 9-8

FILL EXISTING CHANNEL TOE PROTECTION WITH SUITABLE MATERIAL ON FILL SLOPE ONLY
EST. 120 CY

EST. 17 TONS CL B RIPRAP
EST. 9.2 SY GEOTEXTILE
CL B RIPRAP SEE DETAIL 9-10
EST. 3 TONS
EST. 10 SY GF

TOE PROTECTION
EST. 30 TONS CL B RIPRAP
EST. 135 SY GEOTEXTILE
SEE DETAIL 9-4

CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF

CL I RIPRAP
EST. 11 TONS
EST. 22 SY GF

CL I RIPRAP
EST. 20 TONS
EST. 39 SY GF

CL I RIPRAP
EST. 2 TONS
EST. 7 SY GF

CL I RIPRAP
EST. 4 TONS
EST. 10 SY GF

RIP RAP BANK STABILIZATION W/CL I RIP RAP SEE DETAIL 9-7

LATERAL 6' BASE DITCH SEE DETAIL 9-3

SPEC. LATERAL 'V' DITCH SEE DETAIL 9-5

SPEC. CUT 4' BASE DITCH SEE DETAIL 9-6

MEDIAN 'V' DITCH SEE DETAIL 9-1

FALSE SUMP SEE DETAIL 9-9

REMOVE HEADWALL

REMOVE 56 LF 42" RCP

-SRY21A- STA 29+00
-SRY21A- STA 42+00
-Y21RPA- STA 10+00
-Y21RPD- STA 10+50
-SRY21D- STA 26+50
-SRY21D- STA 39+50

MATCH LINE -L- STA 285+00 SEE SHEET 8
MATCH LINE -L- STA 298+00 SEE SHEET 10

-Y21RPD- PC Sta. 10+00.00 =
-L- POT Sta. 285+50.00, 47.00' RT =
-SRY21D- PT Sta. 27+03.88

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DETAIL 9-1
MEDIAN V DITCH
(Not to Scale)

FROM STA. 285+00 -L- TO STA. 287+50 -L- LT
FROM STA. 291+50 -L- TO STA. 297+00 -L- LT
FROM STA. 297+00 -L- TO STA. 298+00 -L- LT

DETAIL 9-2
MEDIAN V DITCH
(Not to Scale)

FROM STA. 285+00 -L- TO STA. 288+00 -L- RT
FROM STA. 293+50 -L- TO STA. 297+00 -L- RT

DETAIL 9-3
LATERAL BASE DITCH
(Not to Scale)

Min. D=3 Ft.
B=6 Ft.
b=2.0 Ft.

FROM STA. 26+99 -SRY21D- TO STA. 28+43.88 -SRY21D- RT

DETAIL 9-4
TOE PROTECTION
(Not to Scale)

d=1.5 Ft.
b=2.0 Ft.

Type of Liner= CL B RIPRAP

FROM STA. 30+61 -SRY21A- TO STA. 31+50 -SRY21A- LT

DETAIL 9-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D=2 Ft.

FROM STA. 34+00 -SRY21D- TO STA. 38+00 -SRY21D- RT
FROM STA. 40+60 -SRY21A- TO STA. 42+00 -SRY21A- LT

DETAIL 9-6
SPECIAL CUT BASE DITCH
(Not to Scale)

Min. D=2 Ft.
B=4 Ft.

FROM STA. 297+00 -L- TO STA. 298+00 -L- RT

DETAIL 9-7
RIP RAP BANK STABILIZATION
(Not to Scale)

Length = 30 FT. (IS) 40 FT. Channel Relocation
Type of Liner= CL I RIPRAP
Est. 55 TONS, Est. 100 SY GF

DETAIL 9-8
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)

Length=55 Ft.
B=6.0 Ft., Min. D=3.0 Ft.
Type of Liner= Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 130 Tons, Est. 214 SY GF

STA. 29+88 -SRY21A- LT (61 LT TO 118 LT)

FOR -L- PROFILE SEE SHEET 26
FOR -Y21RPD- PROFILE SEE SHEET 46
FOR -Y21RPD- PROFILE SEE SHEETS 64 & 65
FOR -SRY21D- PROFILE SEE SHEETS 71 & 72
SEE SHEET 3A-3 TO 3A-3 FOR CURVE DATA

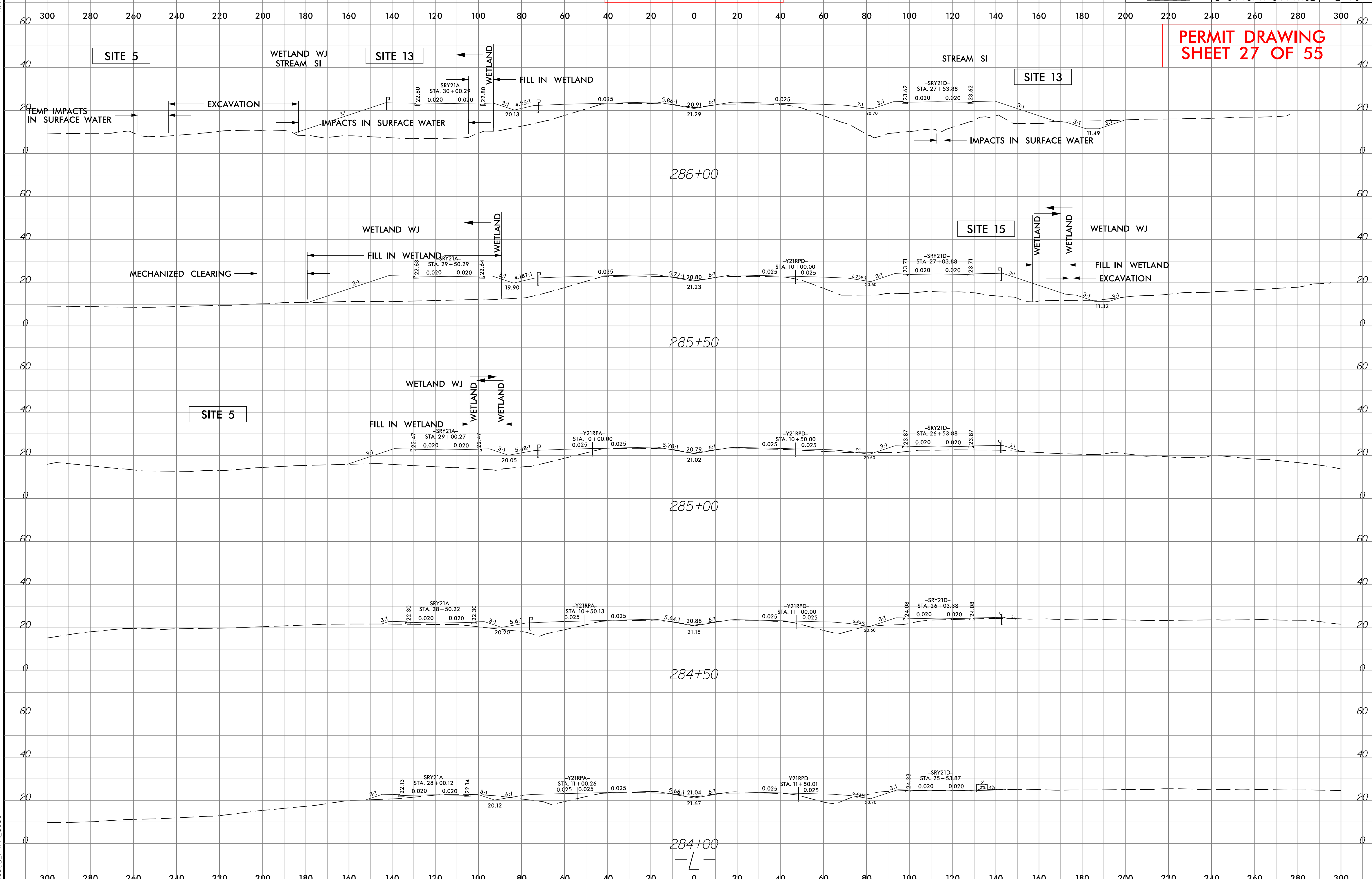
SYSTIMEs$$$$ SYSTEMNAMEs$$$$ USERNAMEs$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-18

PERMIT DRAWING
SHEET 27 OF 55



6/23/16

$$$$$$SYSTIME$$$$$ $$$$$$$DGN$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

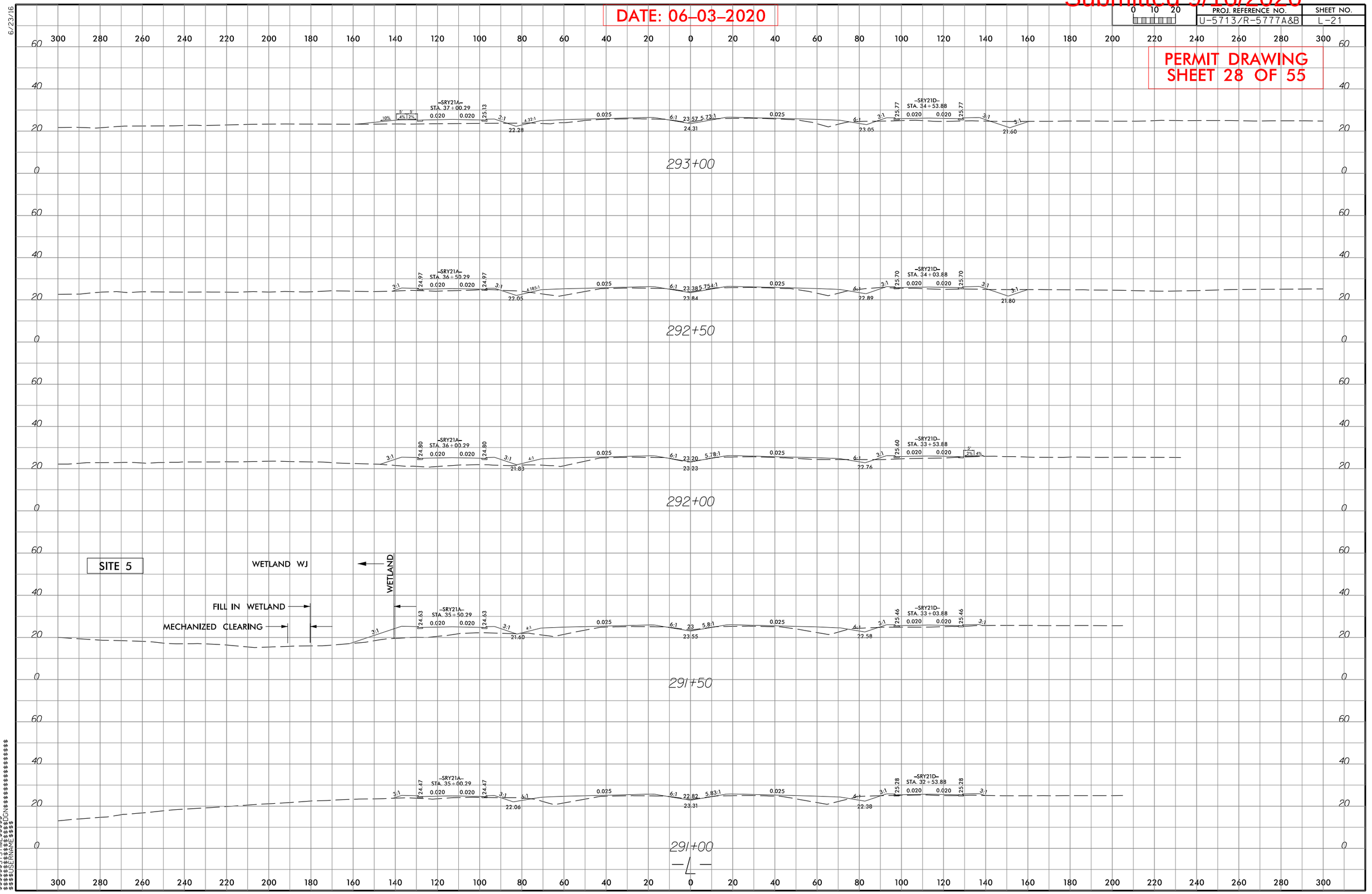
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-21

PERMIT DRAWING
SHEET 28 OF 55

6/23/16



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$$$$$$SSHEETNAME$$$$$
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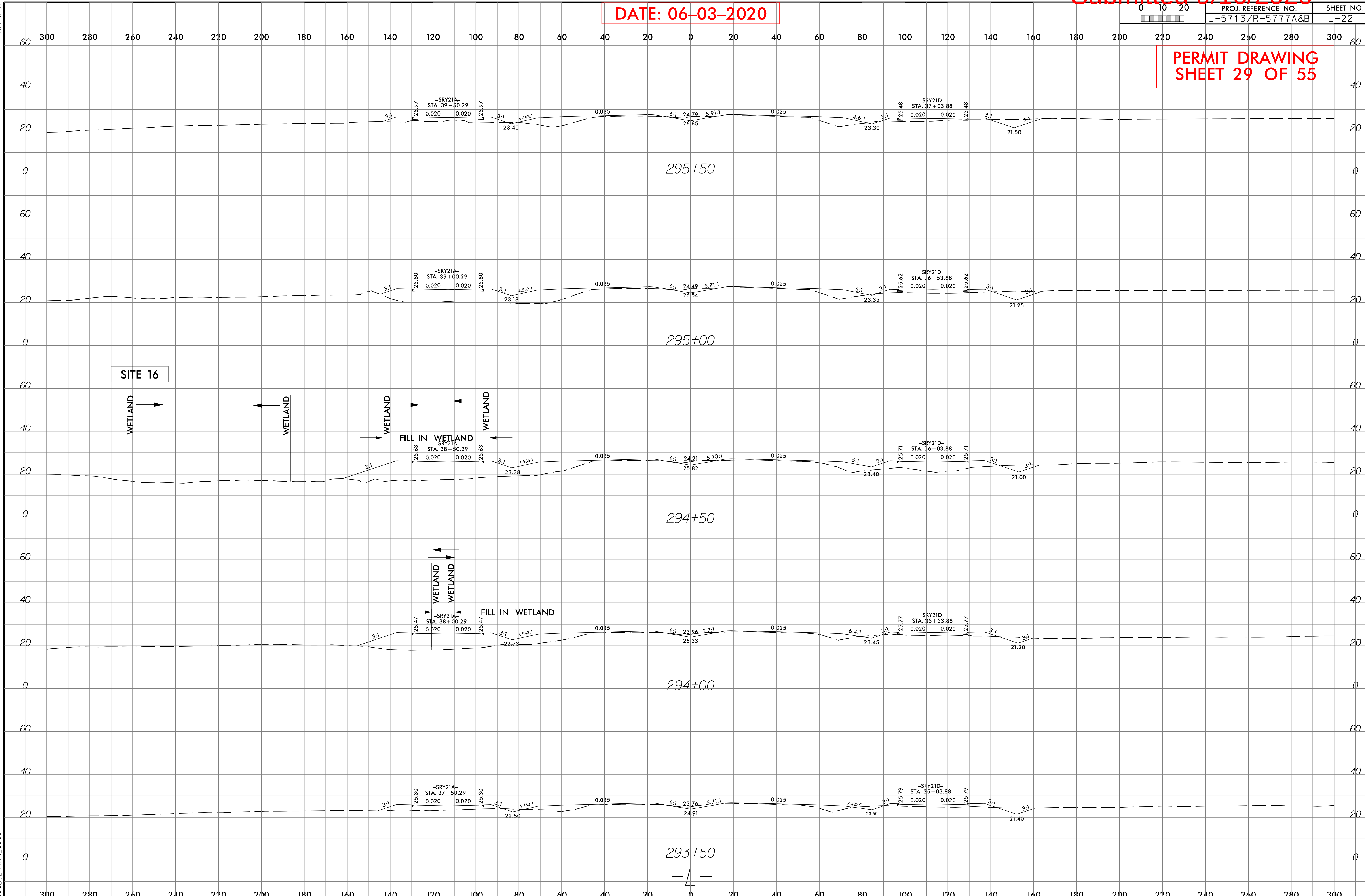
Submitted 9/16/2020



Submitted 9/16/2020

DATE: 06-03-2020

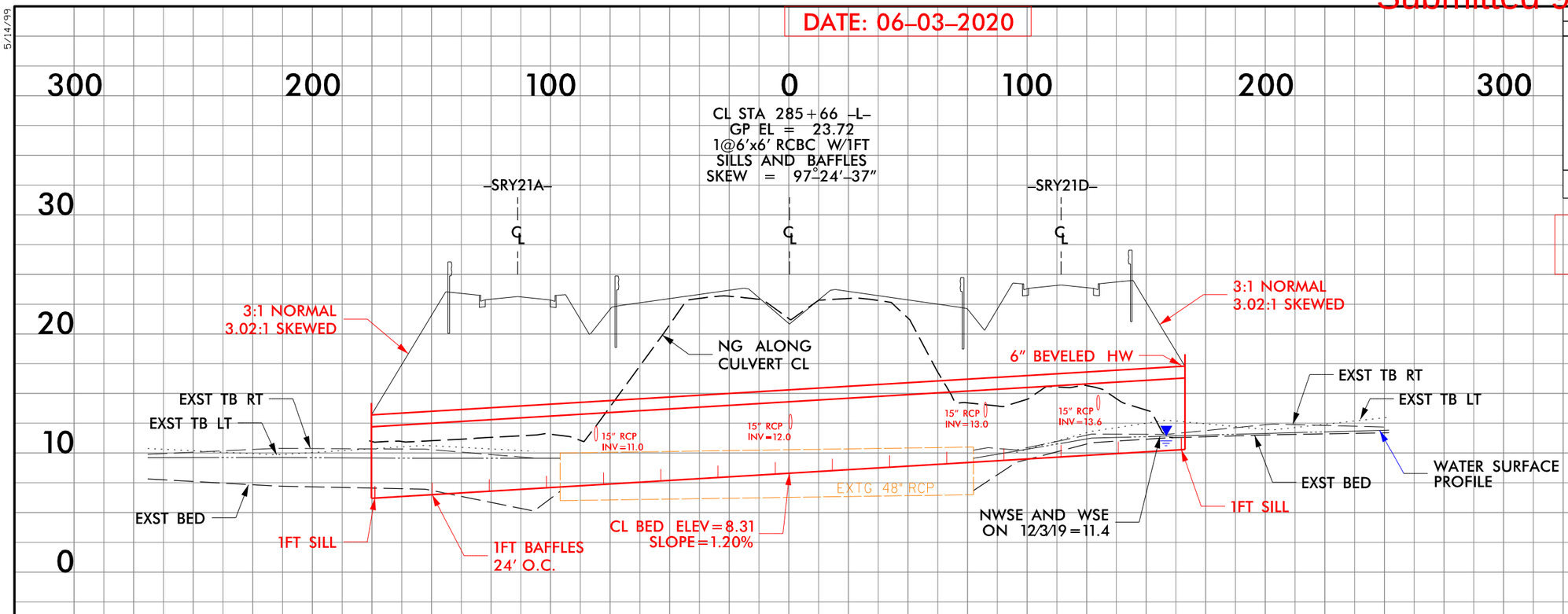
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

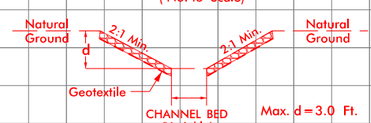
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 30 OF 55

SITE 13



DETAIL
RIP RAP BANK STABILIZATION
(Not to Scale)



Length = 30 Ft. (JS), 40 Ft. (Channel Relocation)
Type of Liner= Class 'I' Rip-Rap
Est. =55 Tons, Est. 100 SY GF

DETAIL
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)

Length=55 Ft.
B=6.0 Ft., Min. D=3.0 Ft.
Type of Liner= Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 130 Tons, Est. 214 SY GF

DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS AND BAFFLES

*NOTES:

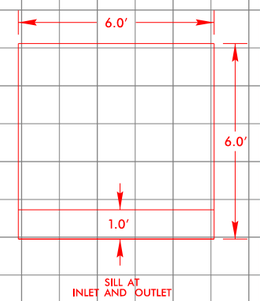
1) NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

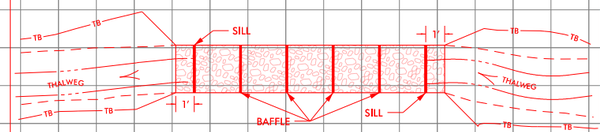
2) SILLS/BAFFLES ARE TO BE 1.0 FT. WIDE CAST SEPARATELY AND ATTACHED BY DOWELS.

3) TOP OF SILLS/BAFFLES SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

4) DO NOT SET ELEVATION OF SILL/BAFFLES ABOVE BANK FULL.

5) NUMBER OF SILL/BAFFLES DETERMINED BY THE ENGINEER.





NUMBER OF BAFFLES=13
ON 24 FT CENTERS FROM DOWNSTREAM SILL
(SEE STRUCTURE PLANS)

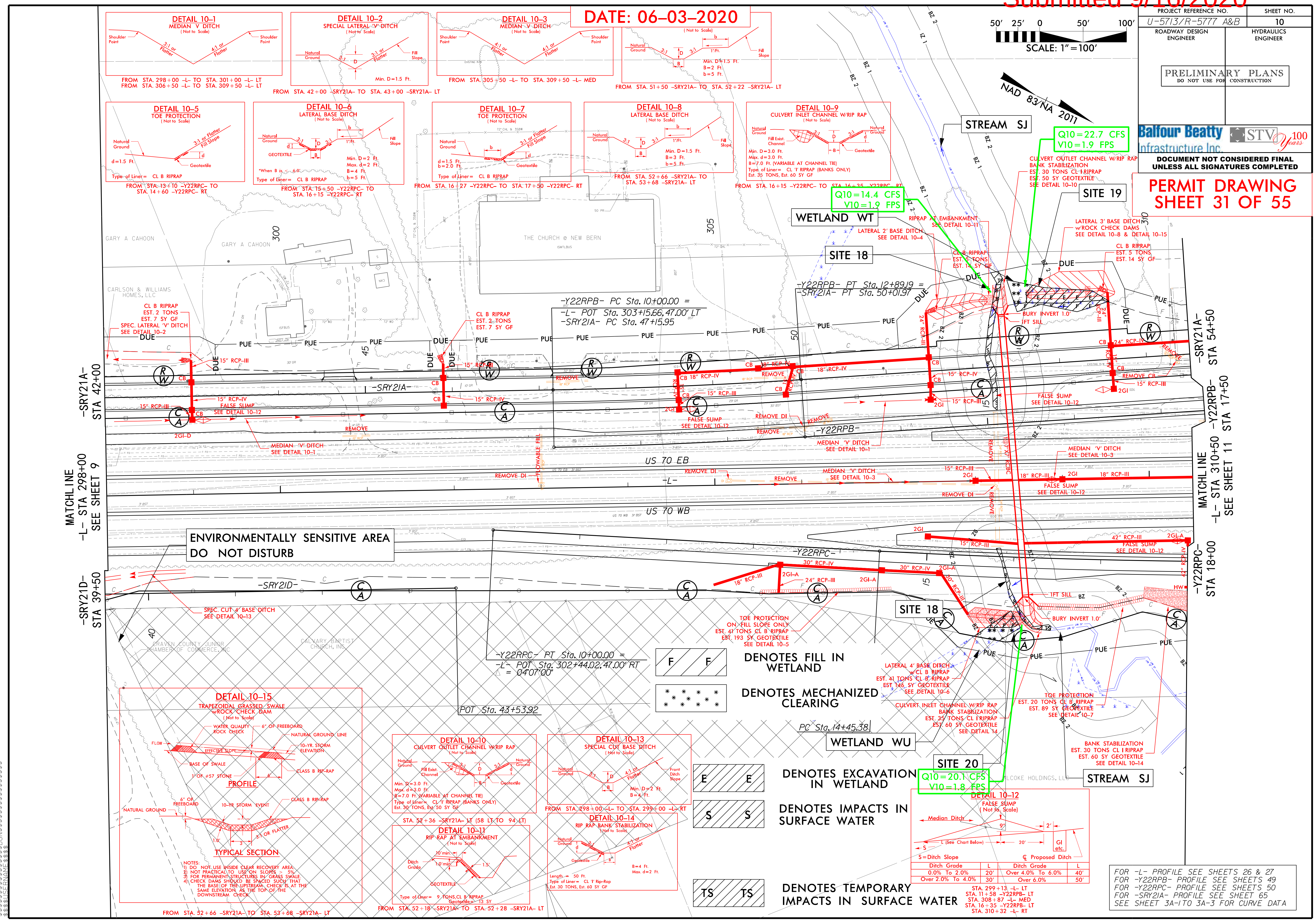
PLAN VIEW

9/13

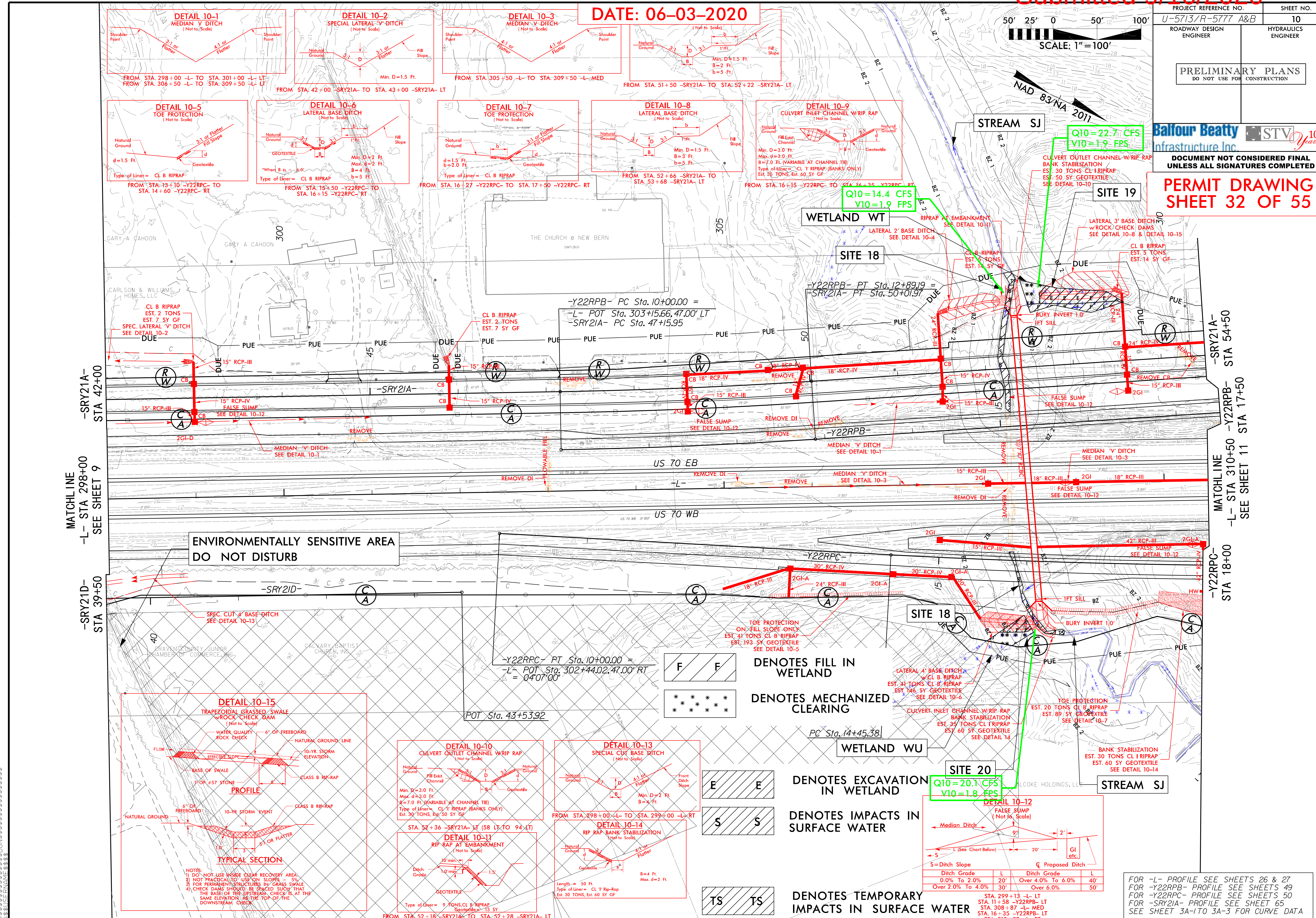
5/14/99

$$$$$$SYSTIME$$$$$$
$$$$$$DESIGN$$$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$$$

Submitted 9/16/2020



Submitted 9/16/2020



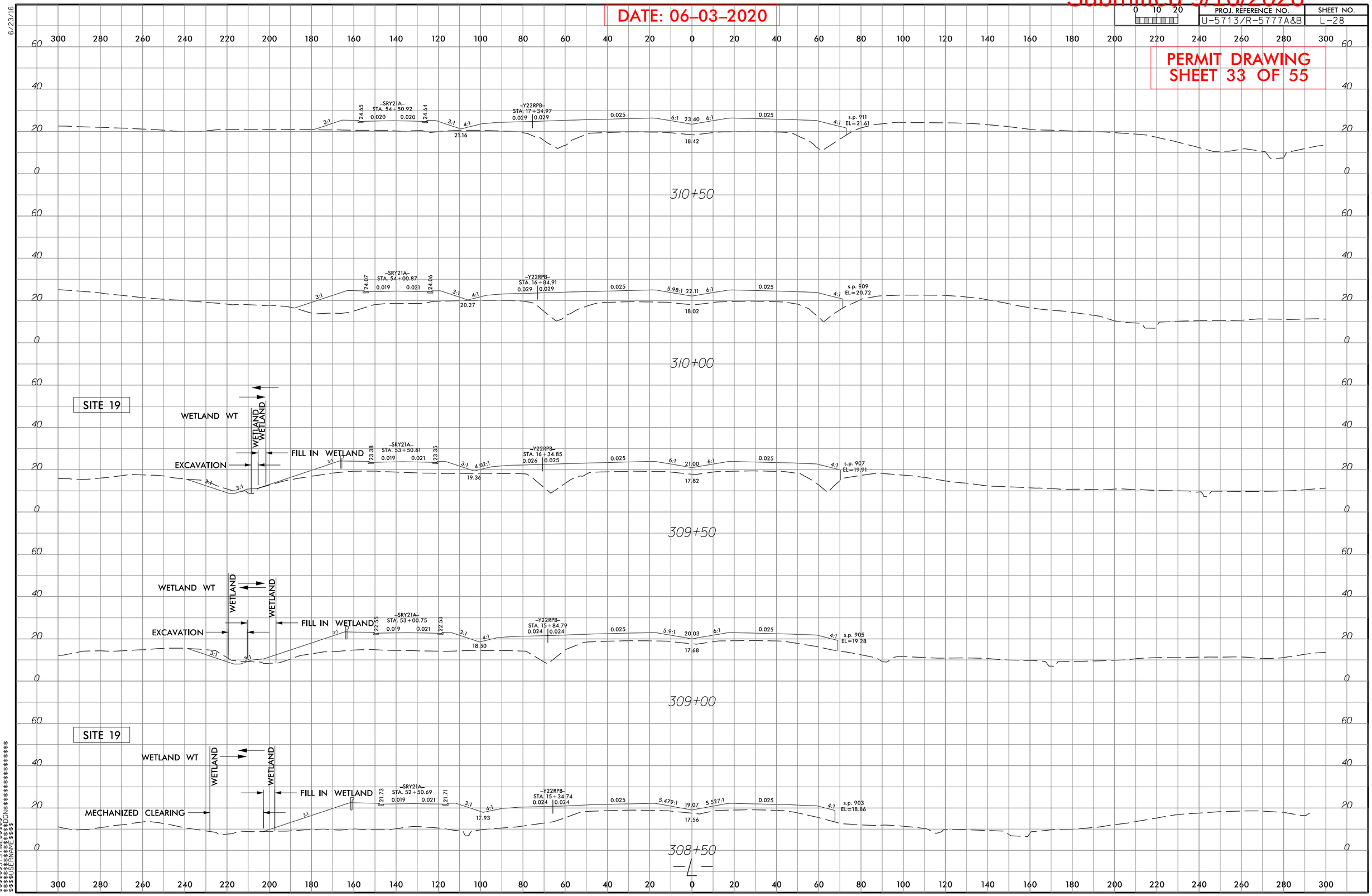
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-28

PERMIT DRAWING
SHEET 33 OF 55

6/23/16



$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$

Submitted 9/16/2020

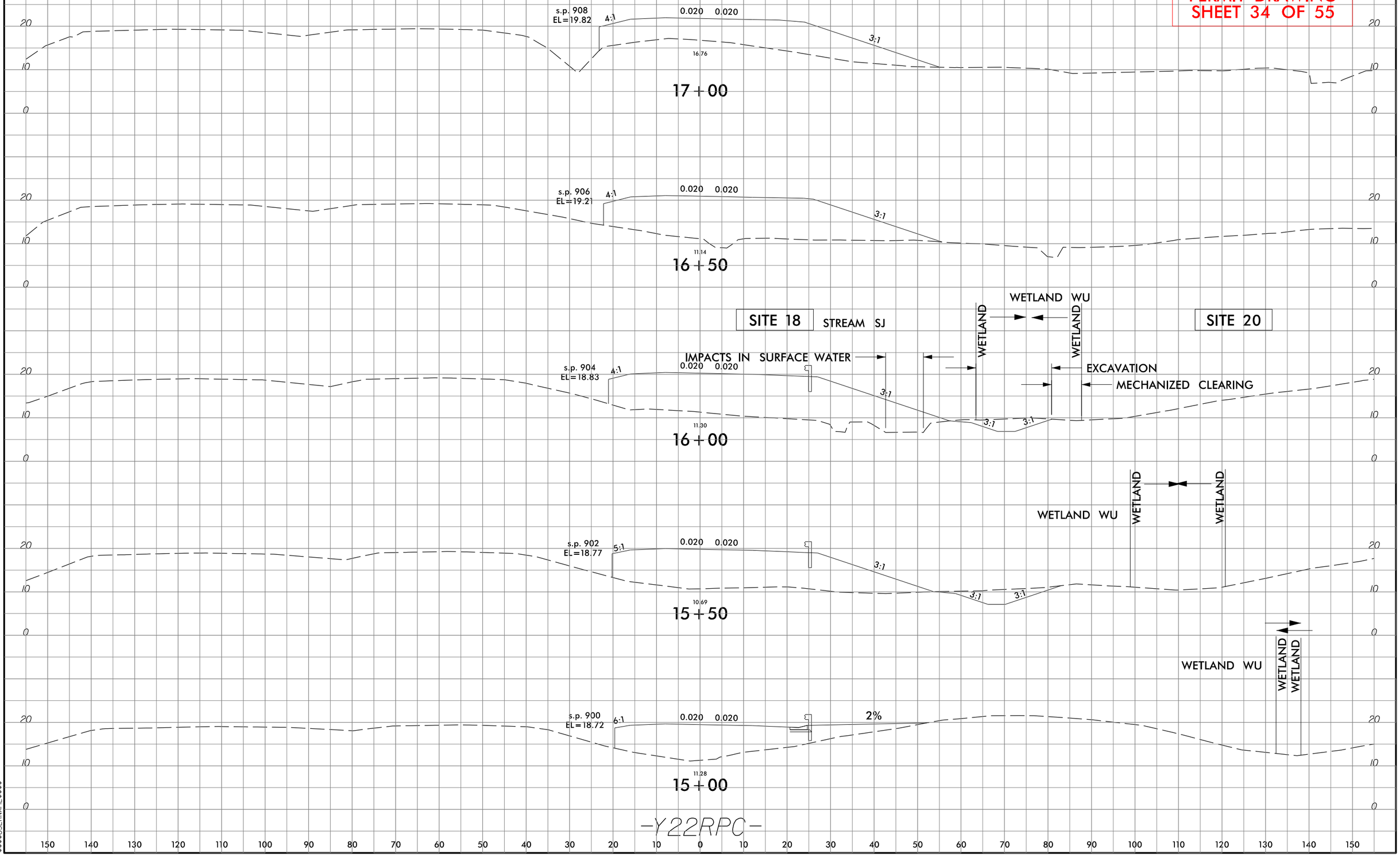
DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	Y22RPC-1

PERMIT DRAWING
SHEET 34 OF 55

6/23/16

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



-Y22RPC-

$$$$$$$SYSTIME$$$$$
$$$$$$$SYSNAME$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.

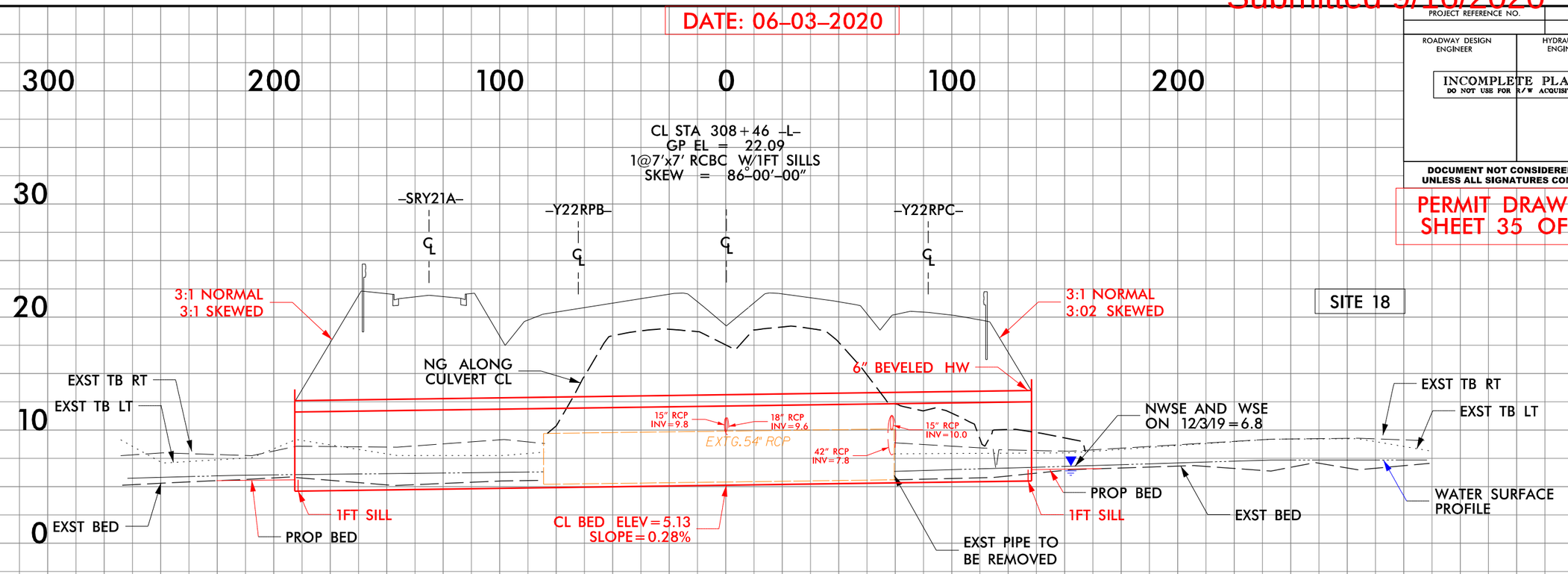
ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

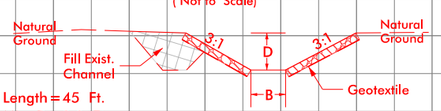
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 35 OF 55

5/14/99

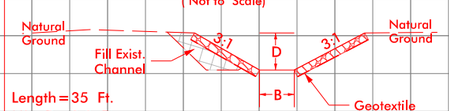


DETAIL
CULVERT INLET CHANNEL W/RIP RAP
(Not to Scale)



Length = 45 Ft.
Min. D = 3.0 Ft.
B = 7.0 Ft. (VARIABLE AT CHANNEL TIE)
Type of Liner = Class 'I' Rip Rap (BANKS ONLY)
Est. 35 Tons, Est. 60 SY GF

DETAIL
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)



Length = 35 Ft.
Min. D = 3.0 Ft.
B = 7.0 Ft. (VARIABLE AT CHANNEL TIE)
Type of Liner = Class 'I' Rip Rap (BANKS ONLY)
Est. 30 Tons, Est. 50 SY GF

DETAIL
(NOT TO SCALE)

SINGLE BARREL CULVERT W/SILLS

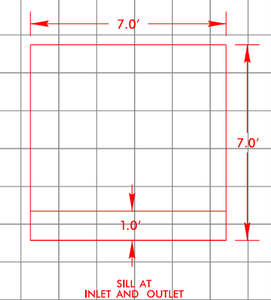
*NOTES:

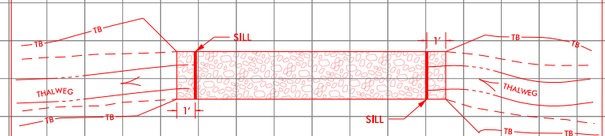
1) NATIVE MATERIAL BETWEEN SILLS IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

2) SILLS ARE TO BE 1.0 FT. WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.

3) DO NOT SET ELEVATION OF SILL ABOVE BANK FULL.

4) NUMBER OF SILLS DETERMINED BY THE ENGINEER.



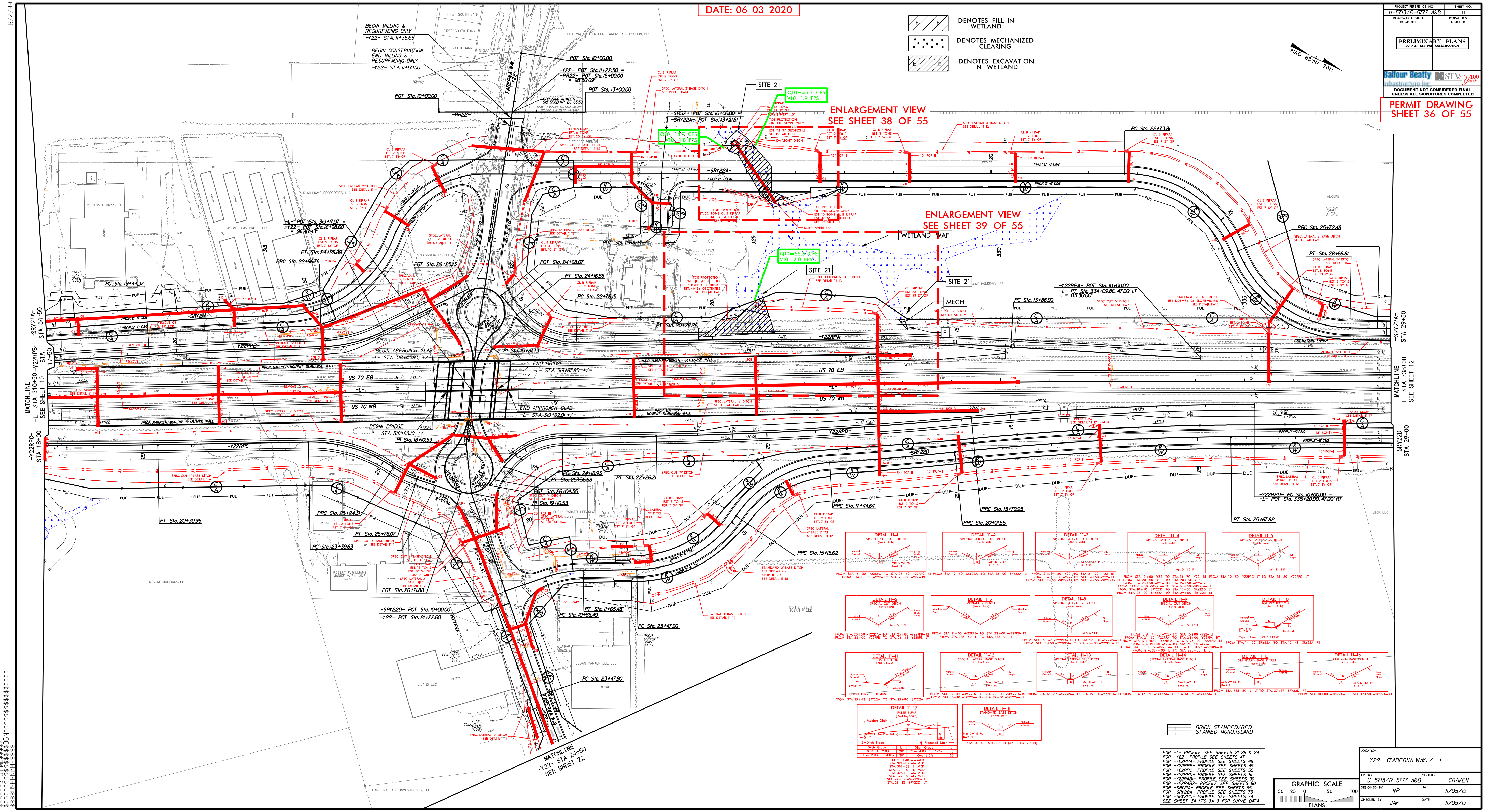


PLAN VIEW

9/13

$$$$$$SYSTIME$$$$$$
$$$$$$DESIGN$$$$$$
$$$$$$USERNAME$$$$$$

Submitted 9/16/2020



Submitted 9/16/2020

DATE: 06–03–2020

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES EXCAVATION IN WETLAND

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	11

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO RIGHT OF WAY OR CONSTRUCTION

Balfour Beatty Infrastructure, Inc. | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 37 OF 55

ENLARGEMENT VIEW
SEE SHEET 38 OF 55

ENLARGEMENT VIEW
SEE SHEET 39 OF 55

SITE 21 — Q10=45.7 CFS, V10=1.9 FPS

SITE 21 — Q10=53.4 CFS, V10=2.0 FPS

WETLAND WAF

MECH

-SR21A- STA 54+50

-SR22A- STA 29+50

-SR22D- STA 29+00

-Y22RPC- STA 18+00

-Y22RPD- STA 33+00

MATCHLINE -L- STA 310+50 SEE SHEET 10

MATCHLINE -L- STA 338+00 SEE SHEET 12

MATCHLINE -Y22- STA 24+50 SEE SHEET 22

BEGIN MILLING & RESURFACING ONLY -Y22- STA. 11+35.65

BEGIN CONSTRUCTION END MILLING & RESURFACING ONLY -Y22- STA. 11+50.00

BEGIN APPROACH SLAB STA. 316+43.93 +/-

BEGIN BRIDGE STA. 318+68.10 +/-

END BRIDGE STA. 319+67.85 +/-

END APPROACH SLAB STA. 319+92.01 +/-

US TO EB

US TO WB

BRICK STAMPED/RED STAINED MONOLITHIC ISLAND

FOR -L- PROFILE SEE SHEETS 21,28 & 29
FOR -Y22- PROFILE SEE SHEETS 47
FOR -Y22RPA- PROFILE SEE SHEETS 48
FOR -Y22RPB- PROFILE SEE SHEETS 49
FOR -Y22RPC- PROFILE SEE SHEETS 50
FOR -Y22RPD- PROFILE SEE SHEETS 51
FOR -Y22RAB- PROFILE SEE SHEETS 90
FOR -Y22RABD- PROFILE SEE SHEETS 90
FOR -SR21A- PROFILE SEE SHEETS 65
FOR -SR22A- PROFILE SEE SHEETS 73
FOR -SR22D- PROFILE SEE SHEETS 74
SEE SHEET 3A-1 TO 3A-5 FOR CURVE DATA

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y22- (TABERNA WAY) / -L-

TIP NO.	COUNTY:
U-5713/R-5777 A&B	CRAVEN
DESIGNED BY: NP	DATE: 11/05/19
CHECKED BY: JAF	DATE: 11/05/19

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

8/17/99

DATE: 06-03-2020

SCALE: 1" = 20'

NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 38 OF 55

SITE 21

CL I RIPRAP
EST. 48 TONS
EST. 89 SY GF

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 15 TONS CL B RIPRAP
EST. 72 SY GEOTEXTILE
SEE DETAIL 11-11

WETLAND WAF

SPEC. LATERAL
2' BASE DITCH
SEE DETAIL 11-14

BZ 1

BZ 2

DAYLIGHT DITCH

DAYLIGHT DITCH

SPEC. LATERAL 4' BASE DITCH
SEE DETAIL 11-12

CL B RIPRAP
EST. 2 TONS
EST. 7 SY GF

Q10 = 45.7 CFS
V10 = 1.9 FPS

15" RCP-III

CB

12" RCP-IV

-SRY 22A-

PROP. 2'-6" C&G

Q10 = 14.7 CFS
V10 = 1.8 FPS

15" RCP-IV

CB

MECHANIZED CLEARING

PDE

PDE

PDE

PUE

TOE PROTECTION
EST. 32 TONS CL B RIPRAP
EST. 141 SY GEOTEXTILE
SEE DETAIL 11-10

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 10 TONS CL B RIPRAP
EST. 48 SY GEOTEXTILE
SEE DETAIL 11-11

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

SITE 21

$$$$USERNAME$$$$ $$$$SYSTIME$$$$

Submitted 9/16/2020

DATE: 06–03–2020

8/17/99

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

E E DENOTES EXCAVATION IN WETLAND

20′ 10′ 0 20′ 40′
SCALE: 1″ = 40′
NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 39 OF 55

+62.17
125.07′

RAMLICO-CRAVEN PROPERTIES, LLC

325

WETLAND WAF

Q10 = 55.6 CFS
V10 = 2.0 FPS

SITE 21

MECHANIZED CLEARING

TOE PROTECTION ON FILL SLOPE ONLY
EST. 9 TONS CL B RIPRAP
EST. 40 SY GEOTEXTILE
SEE DETAIL 11–11

C A

EXCAVATION

FILL IN WETLAND

SPEC. LATERAL 6′ BASE DITCH
SEE DETAIL 11–13

CL I RIPRAP
EST. 33 TONS
EST. 62 SY GF

PUE

16 IN, DI, City of New Bern

54″ RCP–IV

–Y22RPA–

10 IN, PVC, City of New Bern

96 STR

3 IN, PVC, City of New Bern

48 STR

8 IN, MD, Piedmont Natural Gas Company Inc.

OUTLET NOT FOUND (POSSIBLY BURIED)

2GI–A

2GI

15″ RCP–IV

24 STR, EOI

144 STR

24 STR

4′ BST

US 70 EB 31′ BST

US 70 EB

:RAL 'V' DITCH
L 11–8

REMOVE 24″ RCP

REMOVE DI

5″ RCP–IV

DI

1 CONC

3′ BST

–L–

18″ RCP–IV 3′ BST

15″ RCP–III

FALSE SUMP
SEE DETAIL 11–17

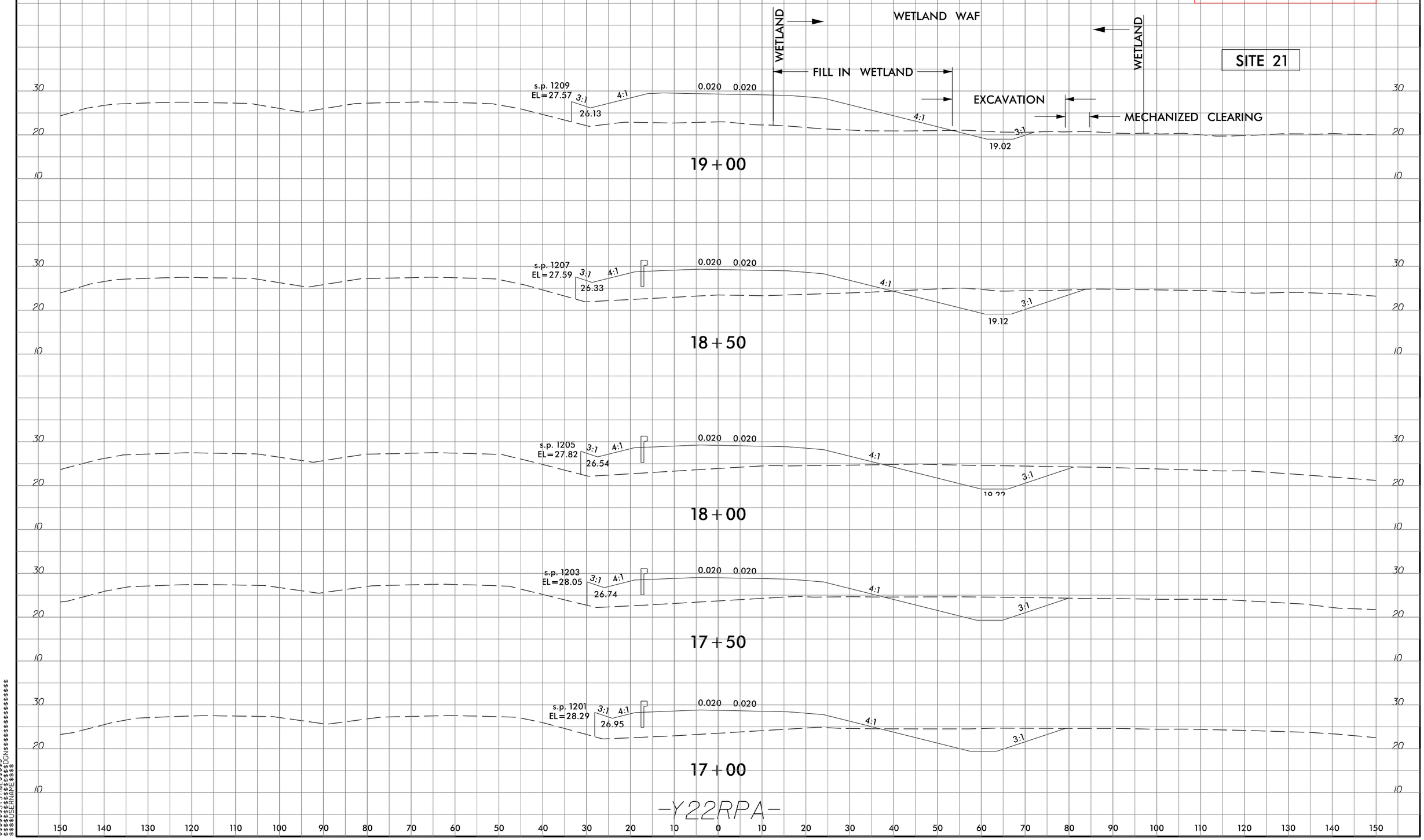
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	Y22RPA-1

PERMIT DRAWING
SHEET 40 OF 55

SITE 21



-Y22RPA-

6/23/16

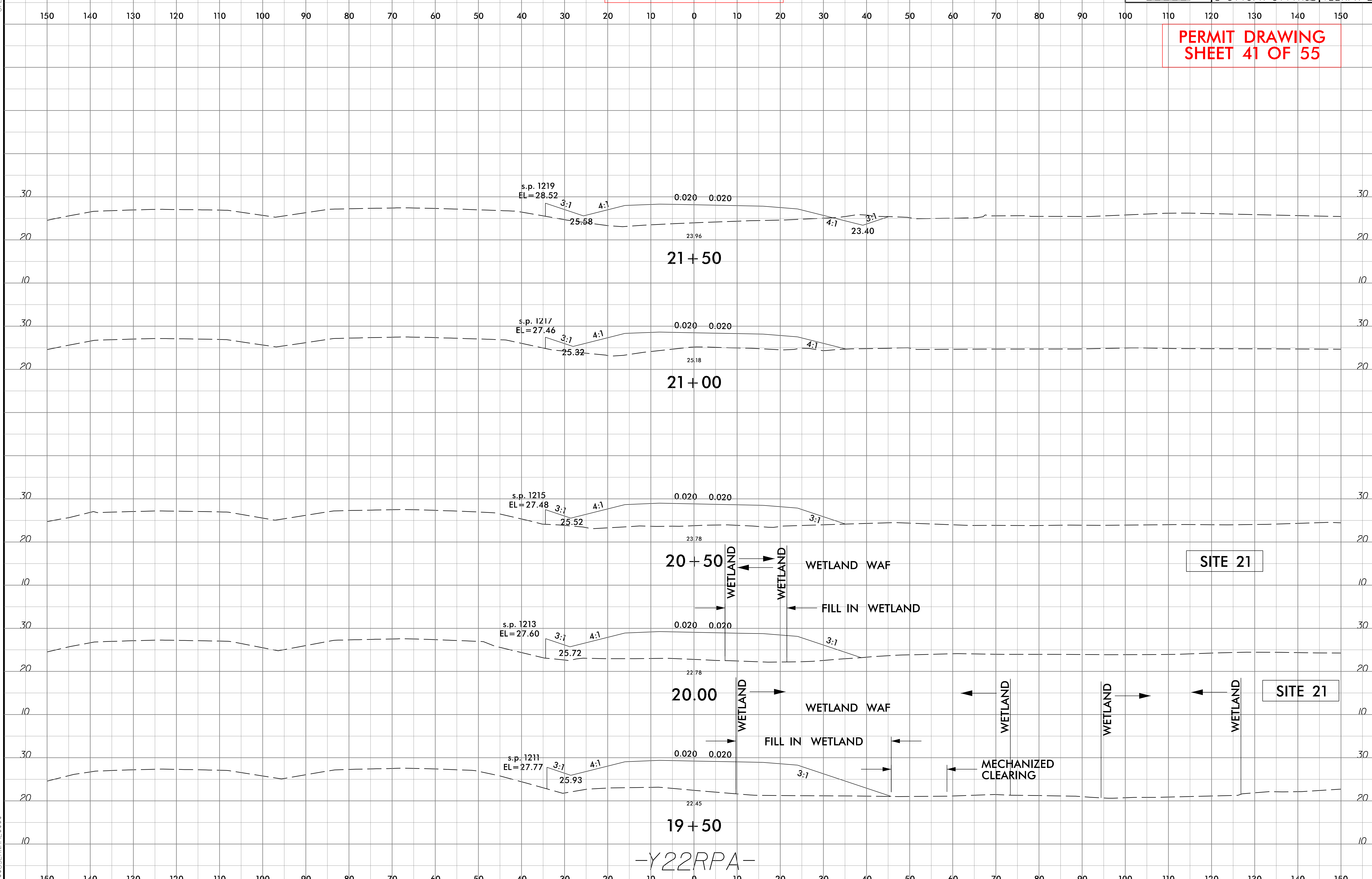
$$$$$$CYCTIME$$$$$$
$$$$$$TIME$$$$$$
$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	Y22RPA-2

PERMIT DRAWING
SHEET 41 OF 55



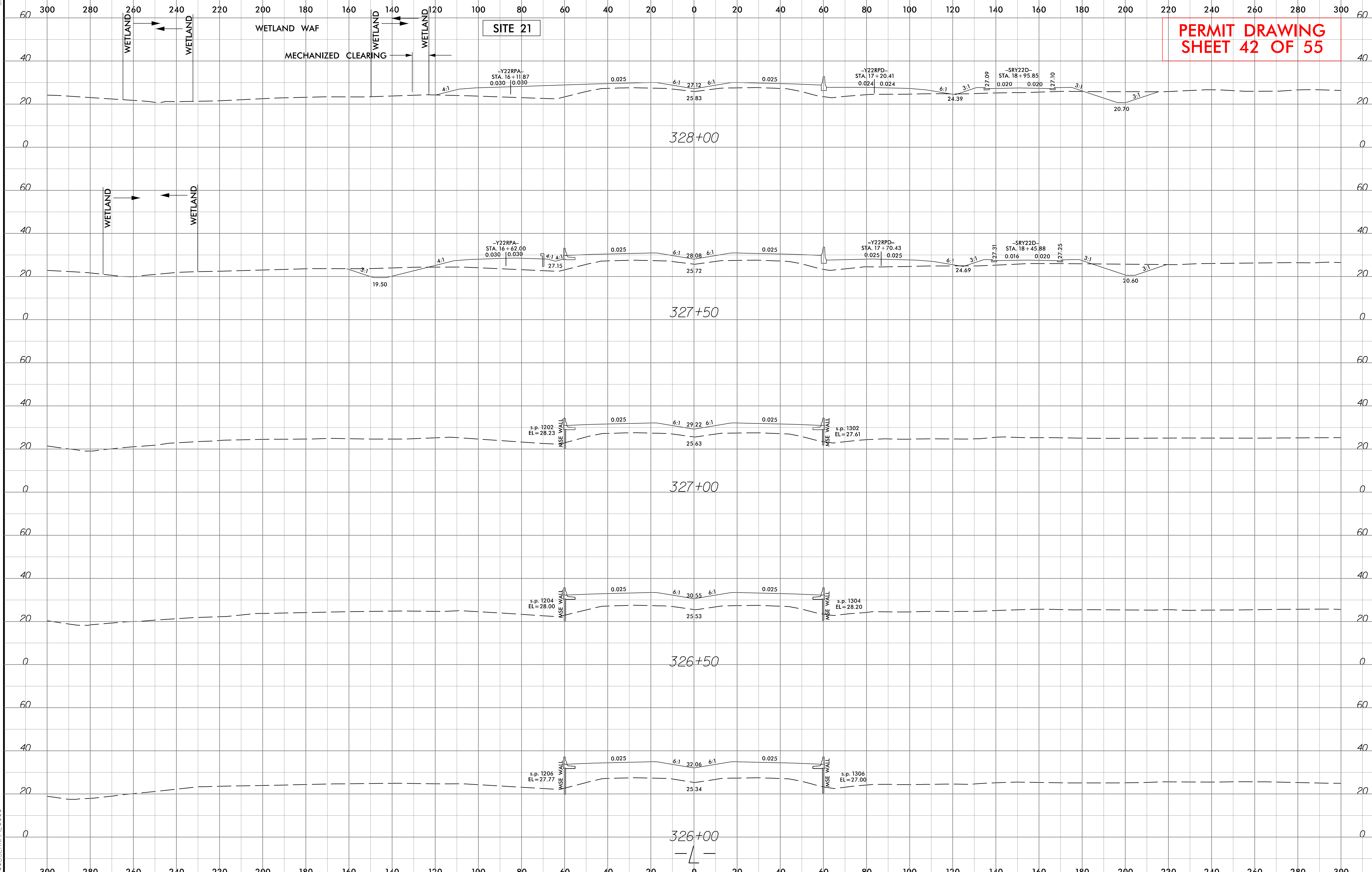
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-35

PERMIT DRAWING
SHEET 42 OF 55

SITE 21

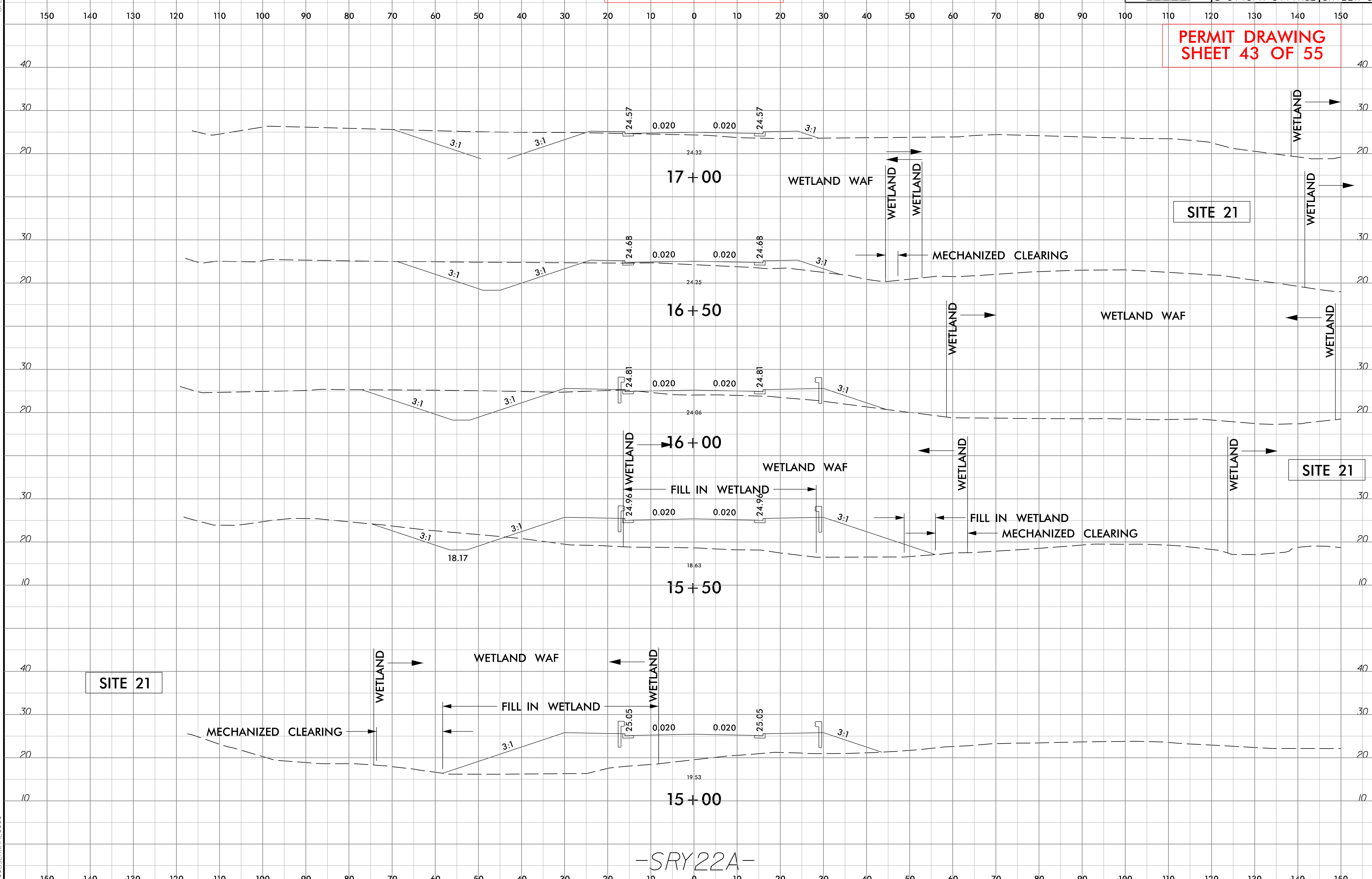


Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY22A-3

PERMIT DRAWING
SHEET 43 OF 55



Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV | 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

PERMIT DRAWING
SHEET 44 OF 55

50' 25' 0 50' 100'
SCALE: 1"=100'

DETAIL 12-1
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point, 3:1 or Flatter, 4:1 or Flatter, Shoulder Point
FROM STA. 345+64 TO STA. 347+50 -L- LT
FROM STA. 338+00 TO STA. 341+50 -L- RT

DETAIL 12-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1 or Flatter, Fill Slope
Min. D=2.0 Ft.
B=3.0 Ft.
FROM STA. 10+84 TO STA. 14+45 -SR1- LT
FROM STA. 15+55 TO STA. 16+50 -SR7- RT

DETAIL 12-3
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1 or Flatter, Fill Slope
Min. D=2.0 Ft.
B=2.0 Ft.
FROM STA. 16+35 TO STA. 16+75 -Y1- LT
FROM STA. 12+65 TO STA. 13+95 -SR7- RT

DETAIL 12-4
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point, 4:1 or Flatter, 3:1 or Flatter, Shoulder Point
FROM STA. 341+00 TO STA. 342+70 -L- RT
FROM STA. 343+50 TO STA. 349+00 -L- RT

DETAIL 12-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope
Min. D=1.5 Ft.
FROM STA. 10+10 TO STA. 10+84 -SR1- LT
FROM STA. 29+50 TO STA. 32+51 -SRY22A- LT

DETAIL 12-6
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground, Min. 3:1 TO 1ft, Existing Ditch, Existing RCP, d, CHANNEL BED (Variable), Natural Ground
Length=25 Ft.
d=3.0 Ft.
Est.= 40 Tons of Class I Rip-Rap
STA. 14+53 -SR1- LT

DETAIL 12-7
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1 or Flatter, Fill Slope
Min. D=1.5 Ft.
B=4 Ft.
FROM STA. 29+00 -SRY22D- TO STA. 32+95.76 -SRY22D- RT
FROM STA. 16+00 -Y1- TO STA. 16+82 -Y1- RT

DETAIL 12-8
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, B, 3:1 or Flatter, Fill Slope
Min. D=2.5 Ft.
B=4.0 Ft.
FROM STA. 13+95 TO STA. 15+55 -SR7- RT

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 29 & 30
FOR -Y1- PROFILE SEE SHEET 52
FOR -SRY2IA- PROFILE SEE SHEET 73
FOR -SRY2ID- PROFILE SEE SHEET 74
FOR -SR1- PROFILE SEE SHEET 75
FOR -SR7- PROFILE SEE SHEET 85
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

POT Sta. 10+00.00
-Y1- POT Sta. 14+65.65 =
-L- POT Sta. 342+13.52
Δ = 74°36'02.04"
-SRY22A- POT Sta. 33+36.45 =
-SR1- PC Sta. = 10+00.00 =
-Y1- POT Sta. 13+59.92
PT Sta. 11+10.09
PC Sta. 14+62.47
PT Sta. 15+32.85
PC Sta. 30+11.25
PT Sta. 31+78.67
-SRY22D- PT Sta. 33+41.34 =
-SR7- PC Sta. 10+00.00 =
-Y1- PT Sta. 15+90.53
PRC Sta. 10+86.99
PT Sta. 13+45.74
POT Sta. 20+00.00

Q10=24.9 CFS
V10=2.0 FPS

STREAM SD

SITE 22

ENLARGEMENT VIEW
SEE SHEET 46 OF 55

-SRY22A- STA 29+50
-SRY22D- STA 29+00
-SR1- STA 17+00
-SR7- STA 16+50

MATCHLINE -L- STA 338+00 SEE SHEET 11
MATCHLINE -L- STA 349+00 SEE SHEET 13

ALCOKE
FINCH
GARNER ROAD -Y1-
US 70 EB
US 70 WB
BEREAN COMMUNTIY CHURCH
JBGF, LLC
ALCOKE HOLDINGS, LLC
JOSSING, LLC

USER NAME = $$$$$$$$ DGN = $$$$$$$$ SYSTIME = $$$$$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Balfour Beatty Infrastructure Inc. | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

PERMIT DRAWING SHEET 45 OF 55

50' 25' 0 50' 100'
SCALE: 1" = 100'

DETAIL 12-1
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point — 3:1 or Flatter — 4:1 or Flatter — Shoulder Point
FROM STA. 345+64 TO STA. 347+50 -L- LT
FROM STA. 338+00 TO STA. 341+50 -L- LT

DETAIL 12-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 or Flatter — Fill Slope — B
Min. D=2.0 Ft.
B=3.0 Ft.
FROM STA. 10+84 TO STA. 14+45 -SR1- LT
FROM STA. 15+55 TO STA. 16+50 -SR7- RT

DETAIL 12-3
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 or Flatter — Fill Slope — B
Min. D=2.0 Ft.
B=2.0 Ft.
FROM STA. 16+35 TO STA. 16+75 -Y1- LT
FROM STA. 12+65 TO STA. 13+95 -SR7- RT

DETAIL 12-4
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point — 4:1 or Flatter — 3:1 or Flatter — Shoulder Point
FROM STA. 341+00 TO STA. 342+70 -L- RT
FROM STA. 343+50 TO STA. 349+00 -L- RT

DETAIL 12-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 or Flatter — Fill Slope
Min. D=1.5 Ft.
FROM STA. 10+10 TO STA. 10+84 -SR1- LT
FROM STA. 29+50 TO STA. 32+51 -SRY22A- LT

DETAIL 12-6
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground — Min. 3:1 to 1:1 — Existing Slope — Existing Pipe — d — Natural Ground — CHANNEL BED (Variable)
Length=25 Ft.
d=3.0 Ft.
Est.= 40 Tons of Class I Rip-Rap
STA. 14+53 -SR1- LT

DETAIL 12-7
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 or Flatter — Fill Slope — B
Min. D=1.5 Ft.
B=4 Ft.
FROM STA. 29+00 -SRY22D- TO STA. 32+95.76 -SRY22D- RT
FROM STA. 16+00 -Y1- TO STA. 16+82 -Y1- RT

DETAIL 12-8
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground — 3:1 — D — 3:1 or Flatter — Fill Slope — B
Min. D=2.5 Ft.
B=4.0 Ft.
FROM STA. 13+95 TO STA. 15+55 -SR7- RT

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 29 & 30
FOR -Y1- PROFILE SEE SHEET 52
FOR -SRY2IA- PROFILE SEE SHEET 73
FOR -SRY2ID- PROFILE SEE SHEET 74
FOR -SR1- PROFILE SEE SHEET 75
FOR -SR7- PROFILE SEE SHEET 85
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

POT Sta. 10+00.00
-SRY22A- POT Sta. 33+36.45 = -SR1- PC Sta. = 10+00.00 = -Y1- POT Sta. 13+59.92
-Y1- POT Sta. 14+65.65 = -L- POT Sta. 342+13.52 = 74°36'02.04"
PT Sta. 11+10.09
PC Sta. 14+62.47
PT Sta. 15+32.85
PC Sta. 30+11.25
PT Sta. 31+78.67
-SRY22D- PT Sta. 33+41.34 = -SR7- PC Sta. 10+00.00 = -Y1- PT Sta. 15+90.53
PRC Sta. 10+86.99
PT Sta. 13+45.74
POT Sta. 20+00.00

Q10=24.9 CFS
V10=2.0 FPS

STREAM SD

SITE 22

ENLARGEMENT VIEW EST. 72 SY GF
SEE SHEET 46 OF 55
SEE DETAIL 12-6

BANK STABILIZATION
EST. 40 TONS

MATCHLINE -L- STA 338+00
SEE SHEET 11

MATCHLINE -L- STA 349+00
SEE SHEET 13

-SRY22A- STA 29+50

-SRY22D- STA 29+00

-SR1- STA 17+00

-SR7- STA 16+50

ALCOKE

FINCH

CARNER ROAD

-Y1-

-L-

-SRY22A-

-SRY22D-

-SR1-

-SR7-

US 70 EB

US 70 WB

JOSSING, LLC

ALCOKE HOLDINGS, LLC

BEREAN COMMUNTIY CHURCH

JBGF, LLC

CL B RIP RAP EST. 2 TONS EST. 7 SY GF SPEC. LAT. 'V' DITCH SEE DETAIL 12-5

CL B RIP RAP EST. 11 TONS EST. 28 SY GF

SPEC. LAT. 3' BASE DITCH SEE DETAIL 12-2

CL B RIP RAP EST. 15 TONS EST. 30 SY GF

CL B RIP RAP EST. 3 TONS EST. 10 SY GF

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

SPEC. LATERAL 'V' DITCH SEE DETAIL 12-5

SPEC. LATERAL 4' BASE DITCH SEE DETAIL 12-7

SPEC. LAT. 2' BASE DITCH SEE DETAIL 12-3

SPEC. LAT 4' BASE DITCH SEE DETAIL 12-8

SPEC. LAT 3' BASE DITCH SEE DETAIL 12-2

RETAIN

MEDIAN 'V' DITCH SEE DETAIL 12-4

REMOVE DI & 5 LF 24" RCP

FLOWABLE FILL

REMOVE

GTD

MDCB

TB 2GI

TB 2GI-A

CB

DUE

PUE

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING SHEET 46 OF 55

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

10' 5' 0 10' 20'
SCALE: 1" = 20'

BANK STABILIZATION
EST. 40 TONS
EST. 72 SY GF
SEE DETAIL 12–6
SPEC. LAT. 3'
BASE DITCH
SEE DETAIL 12–2

TEMPORARY IMPACTS IN SURFACE WATER

STREAM SD

SITE 22

Q10 = 24.9 CFS
V10 = 2.0 FPS

IMPACTS IN SURFACE WATER

DUE

DUE

DUE

DUE

DUE

PUE

PUE

BZ 1

BZ 2

BZ 1

BZ 2

BZ 1

BZ 2

BZ 1

BZ 2

BST

24" C&G

24" C&G

24" CMP

FLOW

36"
REMOVE

48" RCP–III

18" RCP–III

15" RCP–IV

15" RCP–III

2GI

CB

CB

CB

CB

CB

18" RCP

24' BST

REMOVE
24" RCP–IV

FLOWABLE FILL

DUE
GTD

DI

2GI

C
A

SRI

FSS T FO

T FO

W

FSS

T FO

$$$$$$SYSTIME$$$$$$
$$$$$$TIME$$$$$$
$$$$$$USERNAME$$$$$$

Submitted 9/16/2020

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

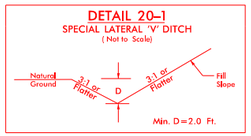
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 47 OF 55

NAD 83/NA 2011

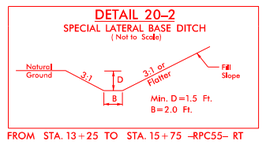
50' 25' 0 50' 100'
SCALE: 1" = 100'

DETAIL 20–1
SPECIAL LATERAL "V" DITCH
(Not to Scale)



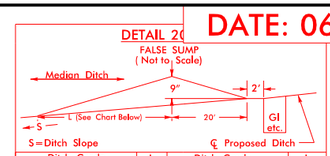
FROM STA. 12+55 TO STA. 14+05 –RPB55– LT
FROM STA. 10+75 TO STA. 13+25 –RPC55– RT

DETAIL 20–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 13+25 TO STA. 15+75 –RPC55– RT

DETAIL 20
FALSE SUMP
(Not to Scale)



S=Ditch Slope

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'

STA. 479+80 –L– MED

PI Sta. 11+26.39
POT Sta. 10+00.00
SC Sta. 12+00.00
SC Sta. 472+72.59
CS Sta. 15+87.47
ST Sta. 17+87.47
TS Sta. 18+04.96
SC Sta. 20+04.96
PT Sta. 21+35.37
SC Sta. 475+84.16
TS Sta. 473+84.16
SC Sta. 474+91.68
CS Sta. 477+37.15
CS Sta. 477+09.33
CS Sta. 478+91.39
ST Sta. 480+91.39
ST Sta. 480+12.15
ST Sta. 479+29.33
CS Sta. 18+02.84
ST Sta. 19+52.84
POT Sta. 21+13.51
POT Sta. 484+31.47

-LLT2- POT Sta. 482+80.84 =
-L- POT Sta. 482+76.44, 34.00' LT

-LRT2- POT Sta. 482+71.85 =
-L- POT Sta. 482+76.44, 34.00' RT

-RPC55- PC Sta. 10+00.00 =
-L- POC Sta. 472+74.08, 49.35' RT

-L- POT Sta. 471+01.08 =
-RR- POT Sta. 12+28.88
△ = 106°21'31"

MATCHLINE
-L- STA 471+00
SEE SHEET 19

CL B RIP RAP
EST. 2 TONS
EST. 7 SY GF

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

CL B RIP RAP
EST. 3 TONS
EST. 10 SY GF

CL B RIP RAP
EST. 11 TONS
EST. 28 SY GF

SPEC. LAT. 'V' DITCH
SEE DETAIL 20–1

SPEC. LAT. 2' BASE DITCH
SEE DETAIL 20–2

15" W/
2 ELBOWS

15" RCP-IV
18" RCP-IV
24" RCP-IV
15" RCP-III
18" RCP-III
REMOVE
2GI
TB 2GI
RETAIN
FLOWABLE FILL
TRENCHLESS INSTALLATION 36" WIDER SHEET PILE
GTD
PDE-1
HW

-RPB55-
-RPC55-
-LRT2-
-L- FS
SR10
US 70 EB
US 70 WB

THERE ARE NO IMPACTS TO WETLAND OR CAMA BUFFERS

FOR -L- PROFILE SEE SHEET 39
FOR -LLT2- PROFILE SEE SHEET 40
FOR -LRT2- PROFILE SEE SHEET 40
FOR -RPB55- PROFILE SEE SHEET 41
FOR -RPC55- PROFILE SEE SHEET 41
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

LINDA C MIDGETT
JB JOYNER
EARL W MOORE
MAMIE H MOORE
HAROLD SPELLMAN
SHIRLEY S SMART
NCDOT
JAMES CITY COMMUNITY ORGANIZATION, INC
ANNIE E FOY
KENNETH WALSTON
LOUISE WALSTON
INDIA H BLANGO FOY
SHILOH MISSIONARY BAPTIST CHURCH
WHITECO OUTDOOR ADVERTISING
TIDEWATER MARINE COMPANY, INC
RHEM S BELL TRUSTEE

$$$$USERNAME$$$$ $$$$SYSTIME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

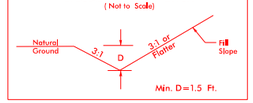
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 48 OF 55

50' 25' 0 50' 100'
SCALE: 1" = 100'

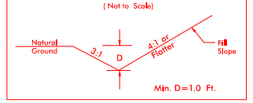
NAD 83/NA 2011

DETAIL 21-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



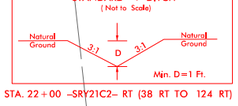
FROM STA. 15+50 TO STA. 21+00 -SRY21C2- LT

DETAIL 21-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



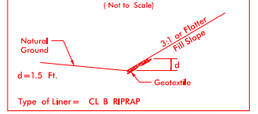
FROM STA. 17+50 TO STA. 22+00 -SRY21C2- RT

DETAIL 21-3
STANDARD 'V' DITCH
(Not to Scale)



STA. 22+00 -SRY21C2- RT (38 RT TO 124 RT)

DETAIL 21-4
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP

FROM STA. 17+74 -SRY21C2- TO STA. 16+73 -SRY21C2-

MATCH LINE -SRY21C2- STA 13+00 SEE SHEET 6

SITE 24

SITE 23

WETLAND WB

WETLAND WA

MECHANIZED CLEARING

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-1

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-2

STANDARD CUT 'V' DITCH EST. DDE=10 CY SLOPE=0.11% SEE DETAIL 21-3

TOE PROTECTION ON FILL SLOPE ONLY EST. 54 TONS CL B RIPRAP EST. 256 SY GEOTEXTILE SEE DETAIL 21-4

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

24" RCP-III
24" RCP-IV
18" RCP-III
15" RCP-IV
15" RCP-III
PDE
REMOVE
RETAIN
CB
MDCB
-SRY21C2-
DAY STAR LANE

BRICE'S CREEK BIBLE CHURCH
THEODORE R. CAMPBELL & VERA KAY CAMPBELL
RONALD ALAN YOUNG
RIVERDALE METHODIST CHURCH
ADVANTAGE MACHINERY SERVICES, INC
GARY GARERA
GARY GARERA
CAREY & SHELBY R. WILLIS
DONNIE G. & PAMELIA P FESPERMAN
SYLVIA HEATH
ROBERT G. & PHYLLIS H. WILLIAMS
JOHN HENRY WILLIAMS, JR.
JOHN HENR WILLIAMS, JR.

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

FOR -SRY21C2- PROFILE SEE SHEET 7D
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

$$SYSTIME$$ $$SYSTIME$$
$$USERNAME$$ $$USERNAME$$
$$DGNFILENAME$$ $$DGNFILENAME$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

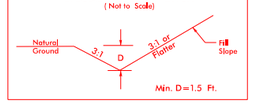
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 49 OF 55

50' 25' 0 50' 100'
SCALE: 1" = 100'

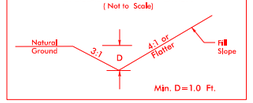
NAD 83/NA 2011

DETAIL 21-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



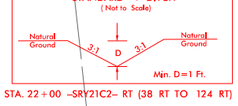
FROM STA. 15+50 TO STA. 21+00 -SRY21C2- LT

DETAIL 21-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



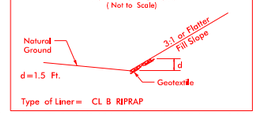
FROM STA. 17+50 TO STA. 22+00 -SRY21C2- RT

DETAIL 21-3
STANDARD 'V' DITCH
(Not to Scale)



STA. 22+00 -SRY21C2- RT (38 RT TO 124 RT)

DETAIL 21-4
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP

FROM STA. 17+74 -SRY21C2- TO STA. 16+73 -SRY21C2-

MATCHLINE -SRY21C2- STA 13+00 SEE SHEET 6

SITE 24

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-1

WETLAND WB

MECHANIZED CLEARING

BRICE'S CREEK BIBLE CHURCH

THEODORE R. CAMPBELL, & VERA KAY CAMPBELL

RONALD ALAN YOUNG

RIVERDALE METHODIST CHURCH

24" RCP-III

24" RCP-IV

CB

-SRY21C2-

DAY STAR LANE

PDE

REMOVE

18" RCP-III

RETAIN

MDCB

15" RCP-IV

15" RCP-III

TOE PROTECTION ON FILL SLOPE ONLY EST. 54 TONS CL B RIPRAP EST. 256 SY GEOTEXTILE SEE DETAIL 21-4

SITE 23

WETLAND WA

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-2

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

STANDARD CUT 'V' DITCH EST. DDE=10 CY SLOPE=0.11% SEE DETAIL 21-3

ADVANTAGE MACHINERY SERVICES, INC

GARY GARERA

GARY GARERA

CAREY , & SHELBY R. WILLIS

DONNIE C. & PAMELIA P FESPERMAN

SYLVIA HEATH

ROBERT G. & PHYILLIS H. WILLIAMS

JOHN HENRY WILLIAMS, JR.

JOHN HENR WILLIAMS, JR.

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

FOR -SRY21C2- PROFILE SEE SHEET 7O
SEE SHEET 3A-1TO 3A-3 FOR CURVE DATA

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

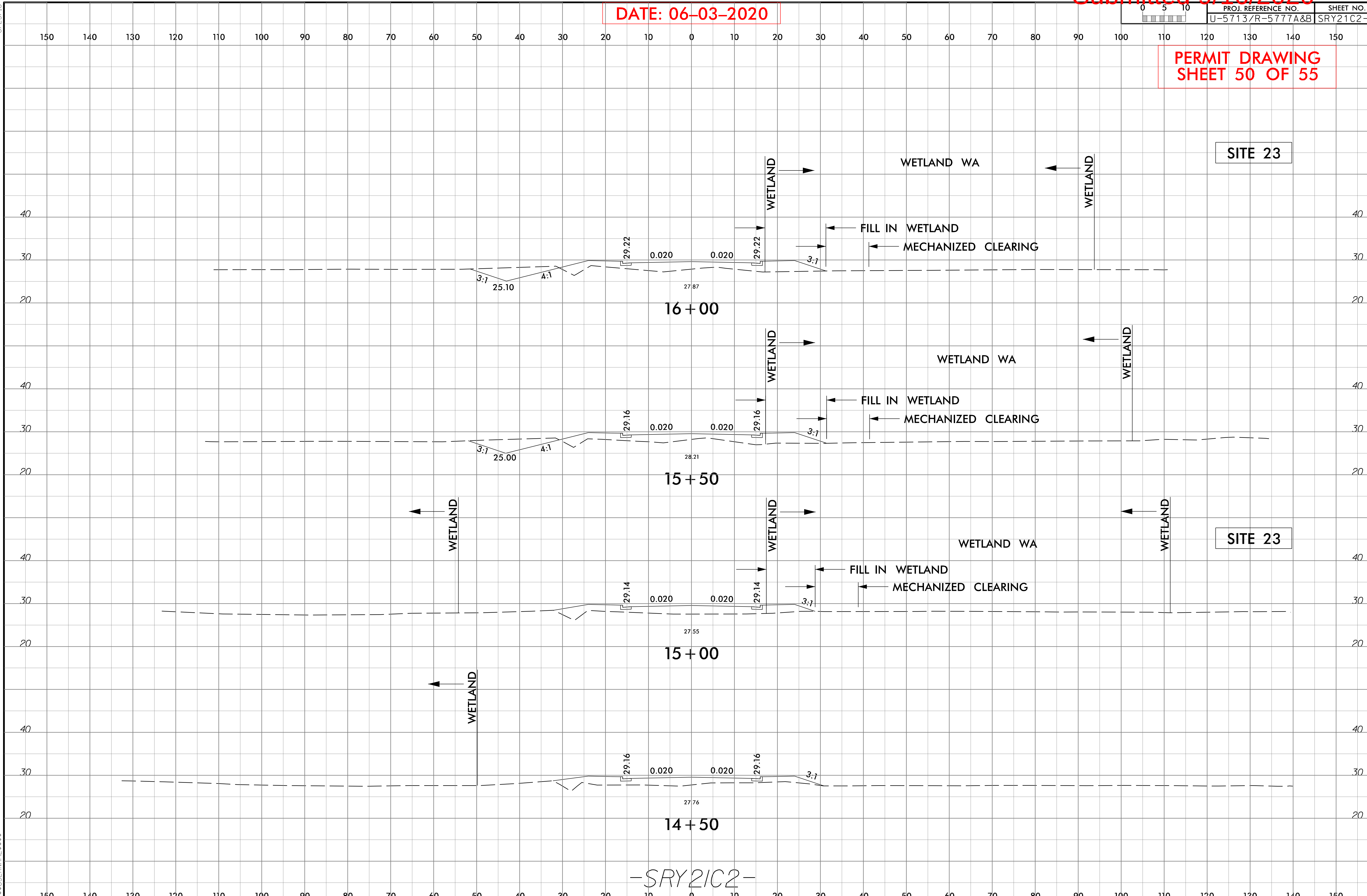
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21C2-3

PERMIT DRAWING
SHEET 50 OF 55

6/23/16



$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

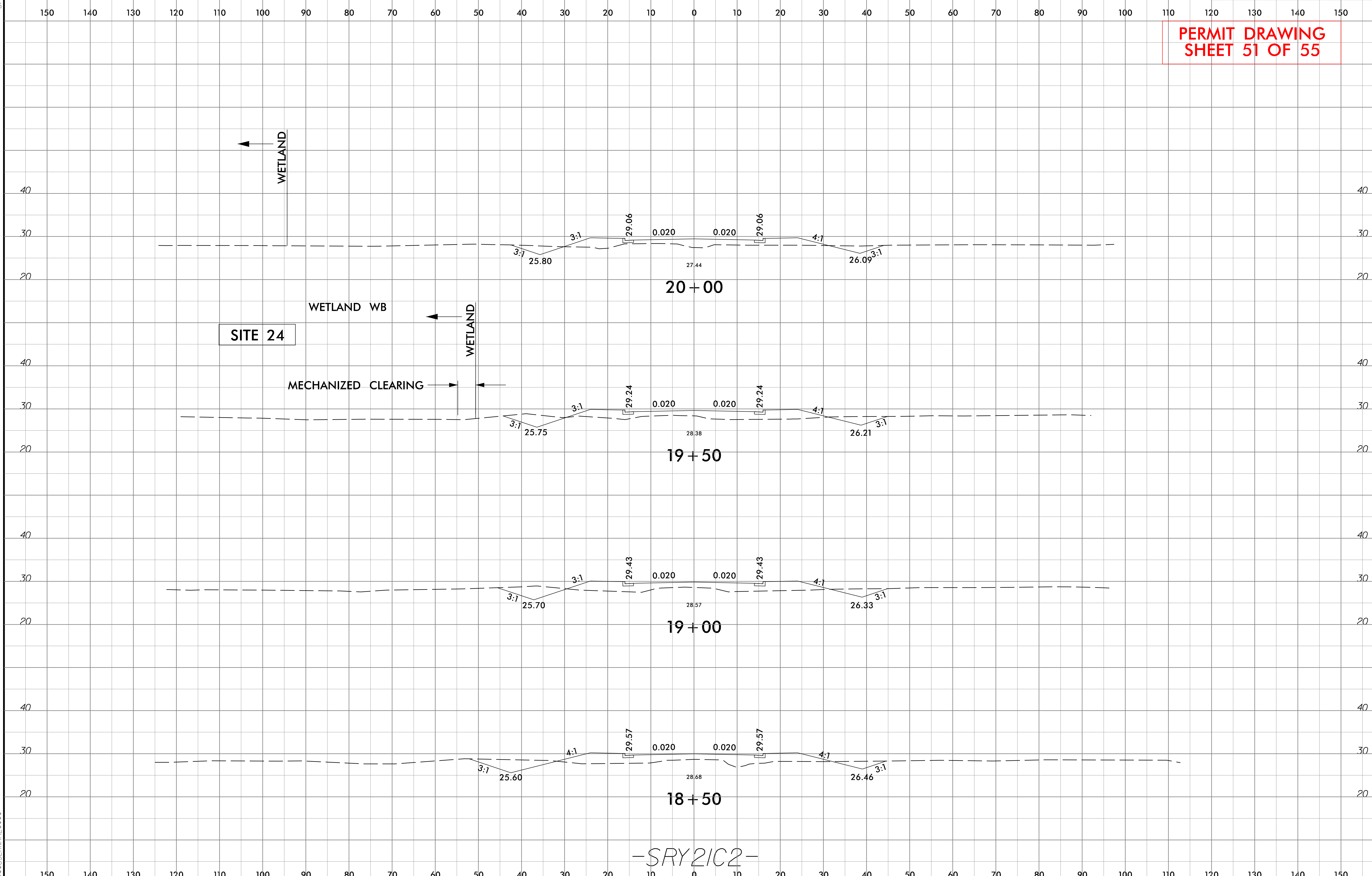
Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21C2-5

0 5 10

PERMIT DRAWING
SHEET 51 OF 55



6/23/16

$$$$$$SYSTIME$$$$ $$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

Submitted 9/16/2020

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	13+39 to 13+49-SRY21C-	66' RCP						< 0.01	< 0.01	75	10	
		OUTLET BANK STABILIZATION								21		
2	14+35 to 19+63-SRY21C-	ROADWAY FILL/2' BASE DITCH	0.43		0.04	0.05						
3	32+45 to 39+24-SRY21B-	ROADWAY FILL/'V' DITCH	1.08		0.03	0.22						
	15+81 to 16+14-Y21RPB-LT	ROADWAY FILL				< 0.01						
4	61+15 to 61+39-SRY21C-RT	1 at 9'x6' RCBC						< 0.01	< 0.01	14	10	
		INLET BANK STABILIZATION								28		
	24+30 to 25+01-Y21RPC-	ROADWAY FILL						0.01		101		
	269+16 to 269+53-L-RT	ROADWAY FILL						< 0.01		51		
	22+78 to 23+72-Y21RPA-RT	ROADWAY FILL						< 0.01	< 0.01	46	10	
		OUTLET BANK STABILIZATION								42		
	17+24 to 17+69-SRY21A-	1 at 10'x7' RCBC						0.03	< 0.01	174	10	
	17+38-SRY21A-RT	INLET BANK STABILIZATION								40		
	17+61-SRY21A-LT	OUTLET CHANNEL						0.03	< 0.01	32	11	
5	23+21 to 23+64-Y21RPA-RT	ROADWAY FILL/6' BASE DITCH			< 0.01	0.02						
	16+14 to 17+01-SRY21A-LT	ROADWAY FILL	0.03			0.04						
	16+96 to 17+20-SRY21A-RT	ROADWAY FILL	0.01			0.03						
	17+50 to 18+07-SRY21A-	ROADWAY FILL	0.07			0.03						
TOTALS*:			1.62		0.07	0.39		0.09	< 0.01	624	51	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1

Submitted 9/16/2020

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
5	21+50 to 21+64-Y21RPA-RT	ROADWAY FILL	< 0.01			< 0.01						
	20+88 to 20+94-Y21RPA-RT	ROADWAY FILL				< 0.01						
	20+26 to 20+33-SRY21A-LT	ROADWAY FILL				< 0.01						
	21+52 to 22+09-SRY21A-	ROADWAY FILL	0.03			< 0.01						
	22+82 to 22+99-SRY21A-LT	ROADWAY FILL	< 0.01			< 0.01						
	25+60 to 25+83-SRY21A-	ROADWAY FILL	0.02			< 0.01						
	28+90 to 30+88-SRY21A-	1 at 6'x6' RCBC	0.22		0.02	0.08						
	35+37 to 35+84-SRY21A-	ROADWAY FILL	0.04			0.01						
6	22+71 to 22+99-SRY21A-	48" RCP						0.01	< 0.01	138	9	
	22+95-SRY21A-LT	OUTLET BANK STABILIZATION								18		
7	24+24 to 24+48-SRY21A-	ROADWAY FILL						0.01	< 0.01	119	19	
	24+30-SRY21A-LT	OUTLET BANK STABILIZATION								6		
8	21+96 to 23+01-Y21RPD-LT	ROADWAY FILL						< 0.01				
	20+48 to 21+09-Y21RPD-LT	ROADWAY FILL						< 0.01				
	17+99 to 20+16-Y21RPD-LT	ROADWAY FILL						0.01				
9	18+81 to 19+15-SRY21D-LT	ROADWAY FILL	0.01			< 0.01						
10	19+74 to 20+16-SRY21D-	48" RCP						< 0.01	< 0.01			
TOTALS*:			0.32		0.02	0.12		0.04	< 0.01	281	28	0

*Rounded totals are sum of actual impacts

NOTES:
Site 8 & 10: JS Non-Mit
Site 9-There will be an additional 0.02 ac of wetland impacts considered as a "total take".

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1
SHEET 53 OF 55

Submitted 9/16/2020

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
11	13+25 to 14+69-SRY21D-	ROADWAY FILL	0.26			0.12						
12	13+57 To 13+85-SRY21A-RT	42" RCP						< 0.01	< 0.01			
13	27+60 to 28+56-SRY21D-	ROADWAY FILL						< 0.01		123		
	29+88 to 3011-SRY21A-	1 at 6'x6' RCBC						0.03	< 0.01	107	22	
		OUTLET CHANNEL						< 0.01		34		
14	27+04 to 27+60-SRY21D-	1 at 6'x6' RCBC						< 0.01		100		
15	26+88 to 27+07-SRY21D-RT	ROADWAY FILL/ 6' BASE DITCH	< 0.01		< 0.01	< 0.01						
16	37+88 to 38+86-SRY21A-	ROADWAY FILL	0.08			< 0.01						
17	40+43 to 41+01-SRY21A-	42" RCP						0.01	< 0.01			
18	15+58 to 16+45-Y22RPC-	1 at 7'x7' RCBC						< 0.01	< 0.01	78	10	
	16+08 to 16+34-Y22RPC-RT	INLET BANK STABILIZATION								35		
	52+15 to 52+41-SRY21A-	1 at 7'x7' RCBC						0.02	< 0.01	116	16	
	52+30 to 52+38-SRY21A-LT	OUTLET BANK STABILIZATION								29		
19	52+45 to 53+60-SRY21A-LT	ROADWAY FILL/3' BASE DITCH	0.02		0.03	0.01						
TOTALS*:			0.36		0.03	0.14		0.09	0.01	621	48	0

*Rounded totals are sum of actual impacts

NOTES:
Site 12: JS Non-Mit
Site 15-There will be an additional 0.01 ac of wetland impacts considered as a "total take".
Site 17: JS Non-Mit

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1

Submitted 9/16/2020

WETLAND AND SURACE WATER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
20	15+58 to 16+10-Y22RPC-RT	DITCH			< 0.01	0.01						
21	14+56 to 15+95-SRY22A-	72" RCP	0.12			0.03						
	16+37 to 16+90-SRY22A-RT	ROADWAY FILL				< 0.01						
	16+00 to 16+21-Y22RPA-RT	ROADWAY FILL	< 0.01			< 0.01						
	18+73 to 20+28-Y22RPA-RT	ROADWAY FILL/6' BASE DITCH	0.11		0.02	0.02						
22	14+36 to 14+62-SR1-LT	48" RCP						< 0.01	< 0.01	14	10	
	14+40 to 14+56-R1-LT	OUTLET BANK STABILIZATION								25		
23	14+74 to 16+76-SRY21C2-RT	ROADWAY FILL	0.06			0.08						
24	19+15 to 19+78-SRY21C2-RT	ROADWAY FILL				< 0.01						
		SHEET 55 OF 55	0.29		0.03	0.16		< 0.01	< 0.01	39	10	
		SHEET 52 OF 55	1.62		0.07	0.39		0.09	< 0.01	624	51	
		SHEET 53 OF 55	0.32		0.02	0.12		0.04	< 0.01	281	28	
		SHEET 54 OF 55	0.36		0.03	0.14		0.09	0.01	621	48	
TOTALS*:			2.59		0.15	0.82		0.22	0.02	1565	137	0

*Rounded totals are sum of actual impacts

NOTES:
There will be an additional 0.03 acres of permanent wetland impact due to total take of wetlands at Site 9 and 15.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1
SHEET 55 OF 55

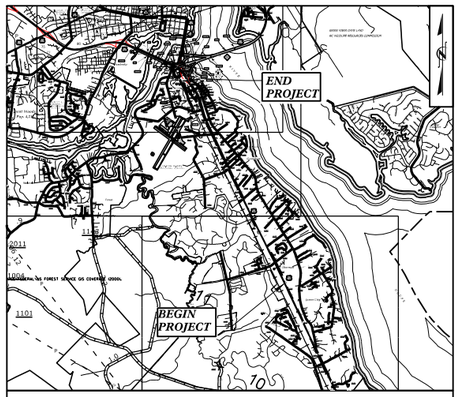
Submitted 9/16/2020

PROJECT: U-5713 /R-5777A&B

CONTRACT: C204225

$$$$SYSTIME$$$$ $$$$USERNAME$$$$ $$$$DGN$$$$

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

BUFFER DRAWING
SHEET 1 OF 14
DATE: 06-03-2020

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5713/R-5777A&B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50111.3.1	N/A	DESIGN-BUILD

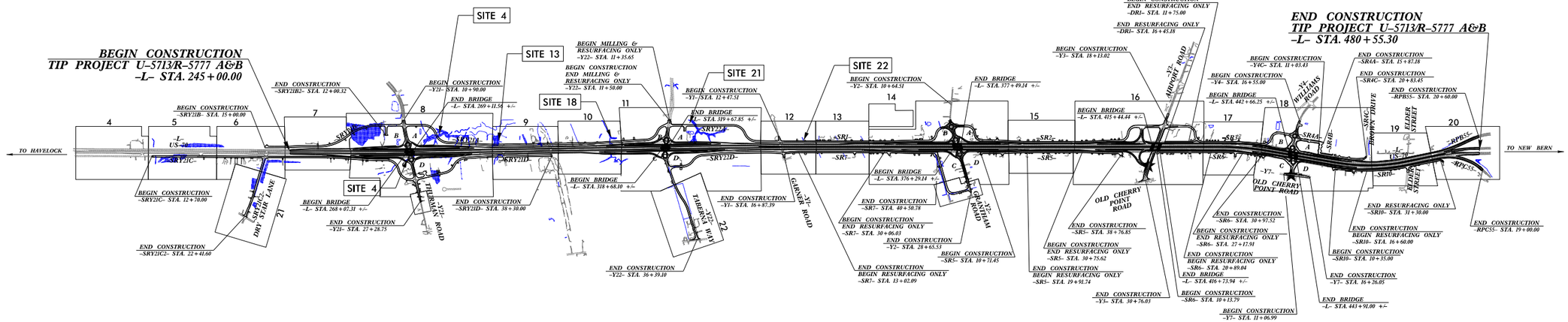
LOCATION: ***U.S. 70 FROM EASTERN APPROACH OF THE NEUSE RIVER BRIDGE TO APPROXIMATELY ONE (1) MILE EAST OF S.R. 1116 (THURMAN ROAD)***

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, ITS AND STRUCTURES

NAD 83/ NA 2011

BUFFER IMPACTS PERMIT

DESIGN CRITERIA AND STRUCTURE RECOMMENDATIONS
SUBMITTED: 02-20-20



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARY OF THE CITY OF NEW BERN
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.

★ *PROPOSED TRAFFIC SIGNAL*

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
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

ADT 2015 = 45,200
ADT 2040 = 62,000
K = 8%
D = 50%
T = 7%*
V = 60 MPH
* (TTST=2%+DUAL 5%)
FUNC. CLASSIFICATION = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5713 /R-5777A&B = 4.350 MILES

LENGTH STRUCTURE TIP PROJECT U-5713 /R-5777A&B = 0.111 MILES

TOTAL LENGTH OF TIP PROJECT U-5713 /R-5777A&B = 4.461 MILES

NCDOT CONTACT: CADMUS CAPEHART, PE
DIVISION 2 - DIVISION CONSTRUCTION ENGINEER

PLANS PREPARED FOR THE NCDOT BY:

Balfour Beatty Infrastructure Inc.

STV 100 Years

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 17, 2019

LETTING DATE: SEPTEMBER 17, 2019

J. ADAM FREEMAN, PE
PROJECT ENGINEER

NARONG PHAL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

Submitted 9/16/2020

DATE: 06-03-2020

PRELIMINARY PLANS
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Balfour Beatty Infrastructure, Inc. | STV

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BUFFER DRAWING
SHEET 2 OF 14

PROJECT REFERENCE NO. U-5713/R-5777 A&B | SHEET NO. 8 | ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

NAD 83/NA 2011

ENLARGEMENT VIEW
SEE SHEET 3 OF 14

ENLARGEMENT VIEW
SEE SHEET 4 OF 14

MATCHLINE -Y21RPB- / -Y21RPC- STA 13+50 SEE SHEET 7

MATCHLINE -L- STA 285+00 / -Y21RPA- / -Y21RPD- STA 10+50 SEE SHEET 7

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

INSET A
-Y21- STA 25+50

BRICK STAMPED/RED STAINED MONOLISLAND

PAVEMENT REMOVAL

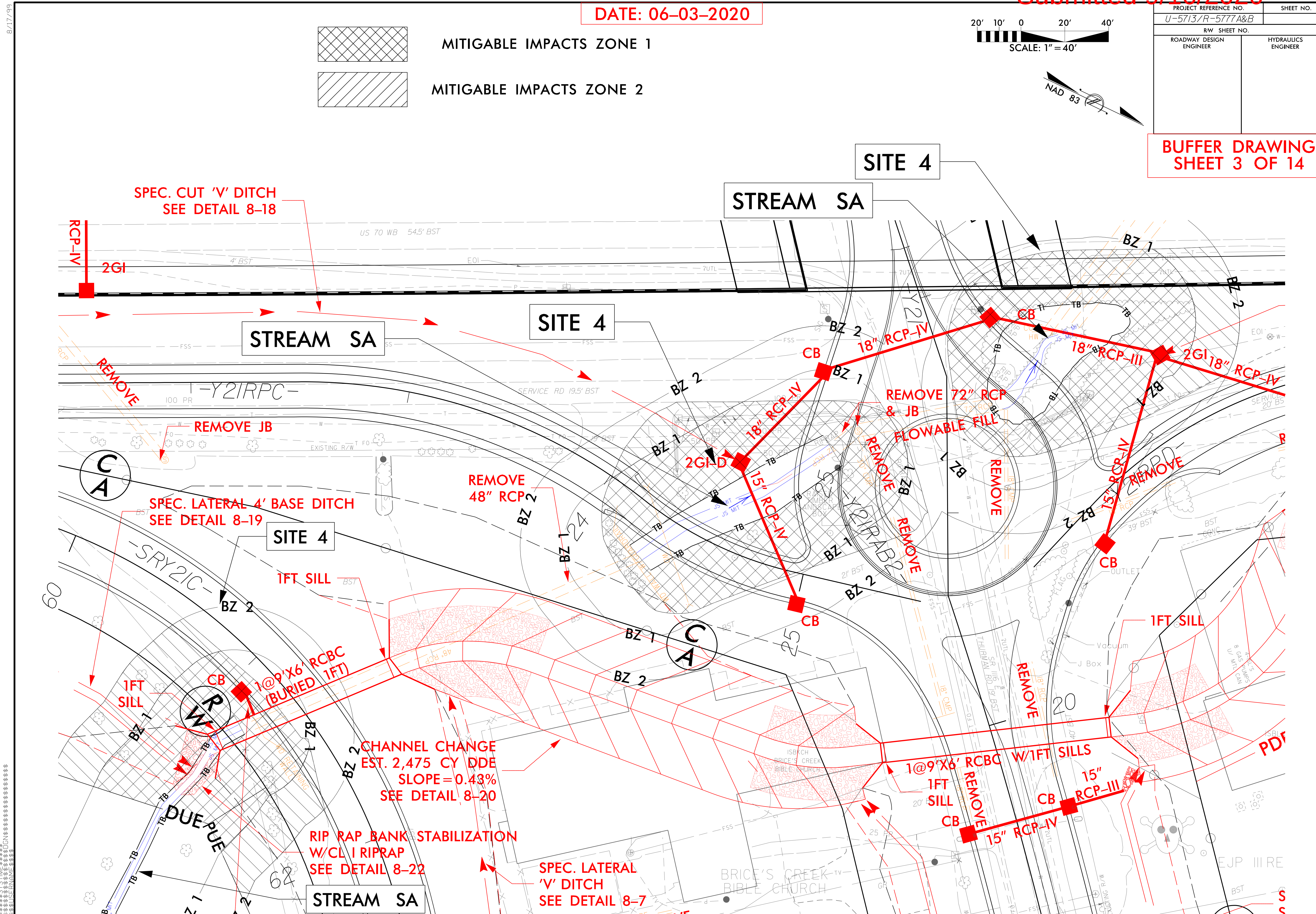
GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y21- (THURMAN RD) / -L-

TIP NO.	COUNTY:
U-5713/R-5777 A&B	CRAVEN
DESIGNED BY: NP	DATE: 11/05/19
CHECKED BY: JAF	DATE: 11/05/19

6/2/99

Submitted 9/16/2020



Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING SHEET 4 OF 14

20' 10' 0 20' 40'
SCALE: 1" = 40'

NAD 83

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

RCP–III

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 34 TONS CL B RIPRAP
EST. 169 SY GEOTEXTILE
SEE DETAIL 8–3

CB
15" RCP–IV
CB

CULVERT OUTLET CHANNEL
W/RIP RAP
EST. 106 TONS CL I RIPRAP
EST. 175 SY GEOTEXTILE
SEE DETAIL 8–24

SITE 4

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 13 TONS CL B RIPRAP
EST. 61 SY GEOTEXTILE
SEE DETAIL 8–3

1FT SILL

RIP RAP
BANK STABILIZATION
W/CL 'I' RIP RAP
SEE DETAIL 8–23

1@10'x7' RCBC

STREAM SA

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 9 TONS CL B RIPRAP
EST. 43 SY GEOTEXTILE
SEE DETAIL 8–3

1FT SILL

CULVERT OUTLET CHANNEL
W/CL 'I' RIP RAP (BANKS ONLY)
EST. 35 TONS CL I RIPRAP
EST. 60 SY GEOTEXTILE
SEE DETAIL 8–32

SPEC. CUT
6' BASE DITCH
SEE DETAIL 8–1

15" RCP–III

CB
15"
RCP–IV

TOE PROTECTION
EST. 17 TONS CL B RIPRAP
EST. 73 SY GEOTEXTILE
SEE DETAIL 8–5

15" RCP–IV

REMOVE

REMOVE

TB 2GI

TB
2GI

1@10'x7' RCBC
W/1FT SILLS

1FT SILL

SITE 4

STREAM SA

2GI

15" RCP–III

2GI

15" RCP–III

2GI

-Y2IRPA-

BZ 1

BZ 2

PUE

DUE

RW

CA

275

20

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

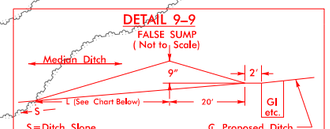
Balfour Beatty Infrastructure Inc. | STV | 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING
SHEET 5 OF 14

NAD 83/NA 2011
50' 25' 0 50' 100'
SCALE: 1" = 100'

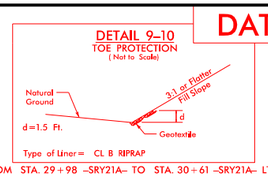
DETAIL 9-9
FALSE SUMP
(Not to Scale)



S=Ditch Slope ℄ Proposed Ditch

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'

DETAIL 9-10
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP
FROM STA. 29+98 -SRY21A- TO STA. 30+61 -SRY21A- LT

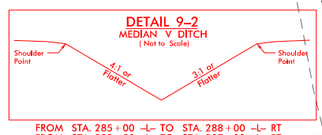
STA. 286+87 -L- MED
STA. 286+37 -L- RT
STA. 286+87 -L- LT
STA. 289+34 -L- RT
STA. 291+37 -L- MED
STA. 291+37 -L- LT
STA. 294+37 -L- LT
STA. 294+63 -L- RT

STREAM SI
SITE 13
PT Sta. 30+10.48
CULVERT OUTLET CHANNEL W/CL I RIP RAP
EST. 130 TONS CL I RIPRAP
EST. 214 SY GEOTEXTILE
SEE DETAIL 9-8
FILL EXISTING CHANNEL TOE PROTECTION WITH SUITABLE MATERIAL ON FILL SLOPE ONLY
EST 120 CY
EST. 17 TONS CL B RIPRAP
EST. 95 SY GEOTEXTILE
SEE DETAIL 9-10
CL B RIPRAP EST. 3 TONS EST. 10 SY GF
TOE PROTECTION
EST. 30 TONS CL B RIPRAP
EST. 135 SY GEOTEXTILE
SEE DETAIL 9-4
CL B RIPRAP EST. 3 TONS EST. 10 SY GF
CL I RIPRAP EST. 11 TONS EST. 22 SY GF
CL I RIPRAP EST. 20 TONS EST. 39 SY GF
-SRY21A- STA 29+00
-SRY21A- STA 42+00
-Y21RPA- STA 10+00
-Y21RPD- STA 10+50
-SRY21D- STA 26+50
-SRY21D- STA 39+50
MATCHLINE -L- STA 285+00 SEE SHEET 8
MATCHLINE -L- STA 298+00 SEE SHEET 10
-Y21RPD- PC Sta. 10+00.00 = -L- POT Sta. 285+50.00, 47.00' RT = -SRY21D- PT Sta. 27+03.88
US 70 EB -L-
US 70 WB -L-
-SRY21D-
-SRY21A-
WILVEN, LLC
CARLSON & WILLIAMS HOMES, LLC
GARY A CAHOON
CRAVEN COUNTY JUNIOR CHAMBER OF COMMERCE, INC
MATTIE A MIDGETTE
JOEL DAVID HORNE & FRANCES C. HORNE JR
SPEC. LATERAL 'V' DITCH SEE DETAIL 9-5
MEDIAN 'V' DITCH SEE DETAIL 9-1
MEDIAN 'V' DITCH SEE DETAIL 9-2
FALSE SUMP SEE DETAIL 9-9
SPEC. CUT 4' BASE DITCH SEE DETAIL 9-6
REMOVE 56 LF 42" RCP
42" RCP-III
CL I RIPRAP EST. 4 TONS EST. 10 SY GF
CL I RIPRAP EST. 20 TONS EST. 89 SY GF
RIP RAP BANK STABILIZATION W/CL 'I' RIP RAP SEE DETAIL 9-7
LATERAL 6' BASE DITCH SEE DETAIL 9-3
CL B RIPRAP EST. 2 TONS EST. 7 SY GF
RETAIN
1FT SILL BURY INVERT 1.0'
REMOVE HEADWALL
REMOVE 30" RCP
30" RCP-III
15" RCP-IV
18" RCP-IV
15" RCP-III
24" RCP
36" RCP
42" RCP
60" RCP
72" RCP
MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

DETAIL 9-1
MEDIAN 'V' DITCH
(Not to Scale)

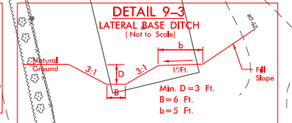
FROM STA. 285+00 -L- TO STA. 287+50 -L- LT
FROM STA. 291+50 -L- TO STA. 297+00 -L- LT
FROM STA. 297+00 -L- TO STA. 298+00 -L- LT

DETAIL 9-2
MEDIAN 'V' DITCH
(Not to Scale)



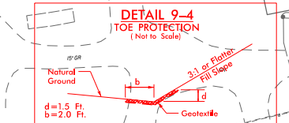
FROM STA. 285+00 -L- TO STA. 288+00 -L- RT
FROM STA. 293+50 -L- TO STA. 297+00 -L- RT

DETAIL 9-3
LATERAL BASE DITCH
(Not to Scale)



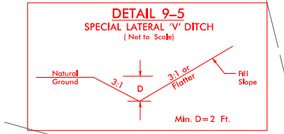
Min. D=3 Ft.
B=6 Ft.
b=5 Ft.
FROM STA. 26+99 -SRY21D- TO STA. 28+43.88 -SRY21D- RT

DETAIL 9-4
TOE PROTECTION
(Not to Scale)



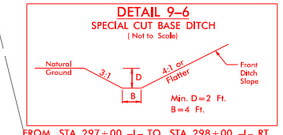
d=1.5 Ft.
b=2.0 Ft.
Type of Liner= CL B RIPRAP
FROM STA. 30+61 -SRY21A- TO STA. 31+50 -SRY21A- LT

DETAIL 9-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



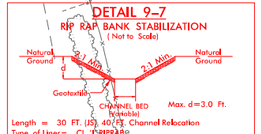
Min. D=2 Ft.
FROM STA. 34+00 -SRY21D- TO STA. 38+00 -SRY21D- RT
FROM STA. 40+60 -SRY21A- TO STA. 42+00 -SRY21A- LT

DETAIL 9-6
SPECIAL CUT BASE DITCH
(Not to Scale)



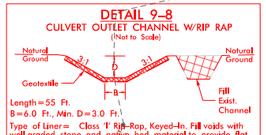
Min. D=2 Ft.
B=4 Ft.
FROM STA. 297+00 -L- TO STA. 298+00 -L- RT

DETAIL 9-7
RIP RAP BANK STABILIZATION
(Not to Scale)



Length = 30 FT. (JS) 40 FT. Channel Relocation
Type of Liner= CL I RIPRAP
Est. 55 TONS, Est. 100 SY GF

DETAIL 9-8
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)

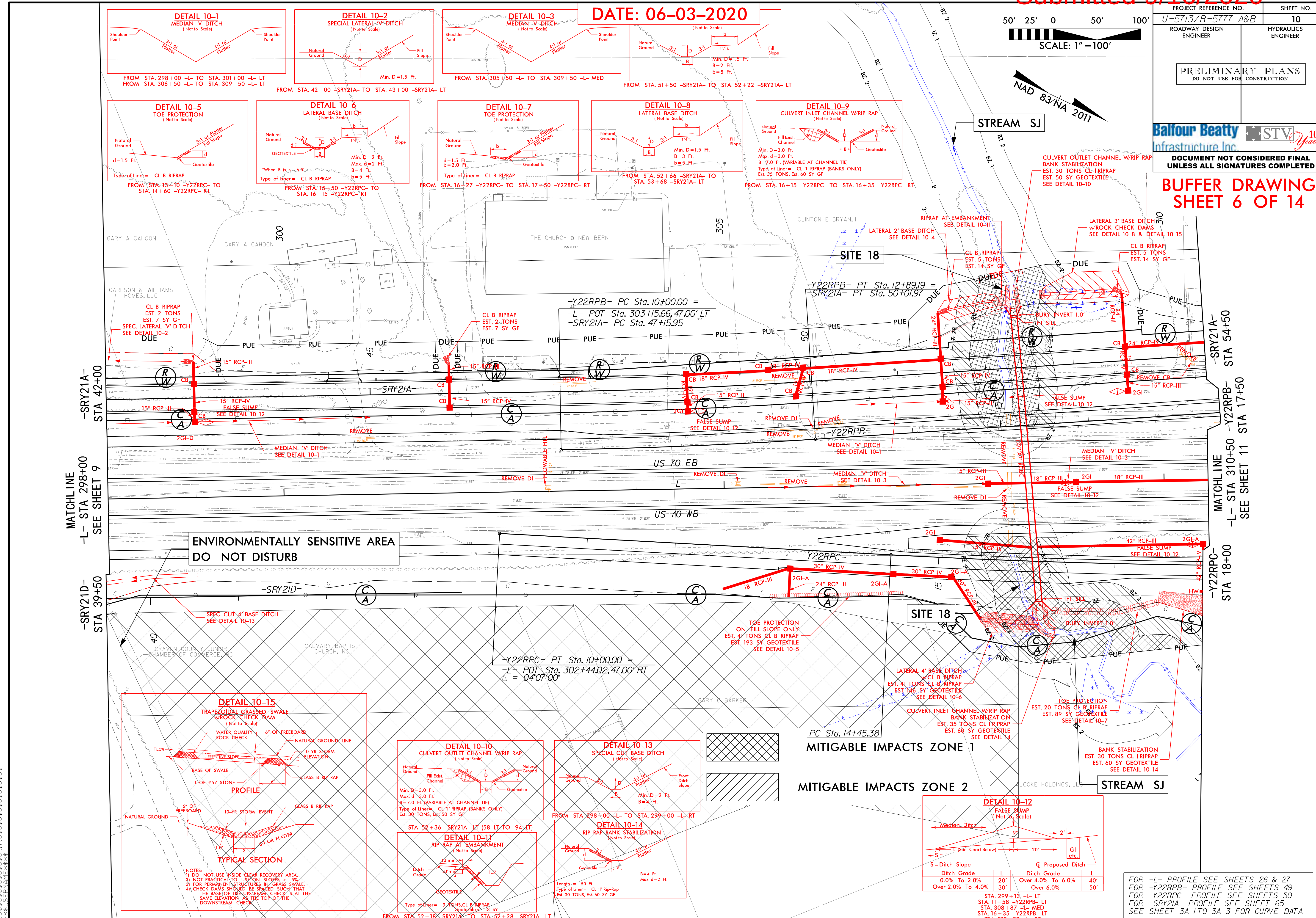


Length=55 Ft.
B=6.0 Ft., Min. D=3.0 Ft.
Type of Liner= Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 130 Tons, Est. 214 SY GF
STA. 29+88 -SRY21A- LT (61 LT TO 118 LT)

FOR -L- PROFILE SEE SHEET 26
FOR -Y21RPD- PROFILE SEE SHEET 46
FOR -Y21RPD- PROFILE SEE SHEETS 64 & 65
FOR -SRY21D- PROFILE SEE SHEETS 71 & 72
SEE SHEET 3A-3 TO 3A-3 FOR CURVE DATA

USERNAME=$$USERNAME$$
DGN=$$DGN$$
WF=$$WF$$
SYSTIME=$$SYSTIME$$

Submitted 9/16/2020



Submitted 9/16/2020

6/2/99

DATE: 06-03-2020

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO RIGHT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure, Inc. | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING SHEET 7 OF 14

ENLARGEMENT VIEW
SEE SHEET 8 OF 14

STREAM SR
SITE 21
WETLAND WAF

-RR22-
-SR21A-
-SR22A-
-SR22D-
-Y22RPA-
-Y22RPB-
-Y22RPC-
-Y22RPD-

MATCHLINE -L- STA 310+50 -Y22RPB- STA 17+50 SEE SHEET 10

MATCHLINE -L- STA 338+00 SEE SHEET 12

MATCHLINE -Y22- STA 24+50 SEE SHEET 22

-SR21A- STA 54+50

-SR22A- STA 29+50

-SR22D- STA 29+00

-Y22RPC- STA 18+00

US 70 EB

US 70 WB

TABERNA MASTER HOMEOWNERS ASSOCIATION, INC

J.K. WILLIAMS PROPERTIES, LLC

CLINTON E. BRYAN, III

SYI ASSOCIATES, LLC

RAMCO-GERVEN WOMBLES, LLC

ALCOKE HOLDINGS, LLC

SUSAN PARKER LEE, LLC

CAROLINA EAST INVESTMENTS, LLC

ROBERT F. WILLIAMS/ JANICE N. WILLIAMS

LILAND LLC

DON E. LEE & SUSAN P. LEE

JBGF, LLC

Ditch Grade	
0.0% to 2.0%	30'
Over 2.0% to 4.0%	50'

Ditch Grade	
Over 4.0% to 6.0%	70'
Over 6.0%	90'

S=Ditch Slope

STA 311+60 -L- MED
STA 312+50 -L- MED
STA 313+34 -L- MED
STA 322+63 -L- MED
STA 323+13 -L- MED
STA 326+50 -L- MED
STA 327+87 -SR22D- LT
STA 28+13 -SR22D- LT

BRICK STAMPED/RED STAINED MONO.ISLAND

FOR -L- PROFILE SEE SHEETS 21,28 & 29
FOR -Y22- PROFILE SEE SHEETS 47
FOR -Y22RPA- PROFILE SEE SHEETS 48
FOR -Y22RPB- PROFILE SEE SHEETS 49
FOR -Y22RPC- PROFILE SEE SHEETS 50
FOR -Y22RPD- PROFILE SEE SHEETS 51
FOR -Y22RAB- PROFILE SEE SHEETS 90
FOR -Y22RAD- PROFILE SEE SHEETS 90
FOR -SR21A- PROFILE SEE SHEETS 65
FOR -SR22A- PROFILE SEE SHEETS 73
FOR -SR22D- PROFILE SEE SHEETS 74
SEE SHEET 34+70 TO 36+3 FOR CURVE DATA

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y22- (TABERNA WAY) / -L-

BY NO.: U-5713/R-5777 A&B	COUNTY: CRAVEN
DESIGNED BY: NP	DATE: 11/05/19
CHECKED BY: JAF	DATE: 11/05/19

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

10' 5' 0 10' 20'
SCALE: 1" = 20'
NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING
SHEET 8 OF 14

STREAM SR

BZ 1
BZ 2
BZ

48" BRICK ARCH

NORTH CAROLINA RAILROAD (OWNER)
NORFOLK SOUTHERN (LESSEE)

SITE 21

TB
JS MIT
WLB

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

CL I RIPRAP
EST. 48 TONS
EST. 89 SY GF

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 15 TONS CL B RIPRAP
EST. 72 SY GEOTEXTILE
SEE DETAIL 11–11

DAYLIGHT DITCH

SPEC. LATERAL
2' BASE DITCH
SEE DETAIL 11–14

SPEC. LATERAL 4' BASE DITCH
SEE DETAIL 11–12

EXISTING R/W

72" RCP–IV

BLW

–SRY22A–

WETLAND WAF

R/W

DUE

PDE

$$$$SYSTIME$$$$
$$$$SIGNS$$$$
$$$$FILENAME$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV | 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

BUFFER DRAWING
SHEET 9 OF 14

50' 25' 0 50' 100'
SCALE: 1" = 100'

DETAIL 12-1
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point, 3:1 or Flatter, 4:1 or Flatter, Shoulder Point
FROM STA. 345+64 TO STA. 347+50 -L- LT
FROM STA. 338+00 TO STA. 341+50 -L- RT

DETAIL 12-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope, B
Min. D=2.0 Ft.
B=3.0 Ft.
FROM STA. 10+84 TO STA. 14+45 -SR1- LT
FROM STA. 15+55 TO STA. 16+50 -SR7- RT

DETAIL 12-3
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope, B
Min. D=2.0 Ft.
B=2.0 Ft.
FROM STA. 16+35 TO STA. 16+75 -Y1- LT
FROM STA. 12+65 TO STA. 13+95 -SR7- RT

DETAIL 12-4
MEDIAN 'V' DITCH
(Not to Scale)
Shoulder Point, 4:1 or Flatter, 3:1 or Flatter, Shoulder Point
FROM STA. 341+00 TO STA. 342+70 -L- RT
FROM STA. 343+50 TO STA. 349+00 -L- RT

DETAIL 12-5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope
Min. D=1.5 Ft.
FROM STA. 10+10 TO STA. 10+84 -SR1- LT
FROM STA. 29+50 TO STA. 32+51 -SRY22A- LT

DETAIL 12-6
PIPE OUTLET CHANNEL
(Not to Scale)
Natural Ground, MIN. 3:1 TO 1ft, EXISTING SLOPE, RIP RAP, d, CHANNEL BED (Variable), Natural Ground
Length=25 Ft.
d=3.0 Ft.
Est.= 40 Tons of Class I Rip-Rap
STA. 14+53 -SR1- LT

DETAIL 12-7
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope, B
Min. D=1.5 Ft.
B=4 Ft.
FROM STA. 29+00 -SRY22D- TO STA. 32+95.76 -SRY22D- RT
FROM STA. 16+00 -Y1- TO STA. 16+82 -Y1- RT

DETAIL 12-8
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Natural Ground, 3:1, D, 3:1 or Flatter, Fill Slope, B
Min. D=2.5 Ft.
B=4.0 Ft.
FROM STA. 13+95 TO STA. 15+55 -SR7- RT

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 29 & 30
FOR -Y1- PROFILE SEE SHEET 52
FOR -SRY2IA- PROFILE SEE SHEET 73
FOR -SRY2ID- PROFILE SEE SHEET 74
FOR -SR1- PROFILE SEE SHEET 75
FOR -SR7- PROFILE SEE SHEET 85
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

USER NAME = $$USERNAME$$
FILE NAME = $$FILENAME$$
DGN = $$DGN$$
SYSTIME = $$SYSTIME$$

Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

BUFFER DRAWING
SHEET 10 OF 14

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

NAD 83

10′ 5′ 0 10′ 20′
SCALE: 1″ = 20′

BANK STABILIZATION
EST. 40 TONS
EST. 72 SY GF
SEE DETAIL 12–6

CL B RIP RAP
EST. 6 TONS
EST. 10 SY GF

STREAM SD

SITE 22

DUE

DUE

DUE

DUE

DUE

PUE

PUE

BZ 1

BZ 2

BZ 1

BZ 2

BZ 1

BZ 2

BZ 1

BZ 2

36″
REMOVE

48″ RCP–III

18″ RCP–III

15″
RCP–IV

CB

CB

CB

CB

15″ RCP–III

2GI

48″ RCP–IV

REMOVE
24″ RCP–IV

FLOWABLE FILL

DUE
GTD

DI

2GI

C
A

24″ C&G

24″ CMP

18" RCP

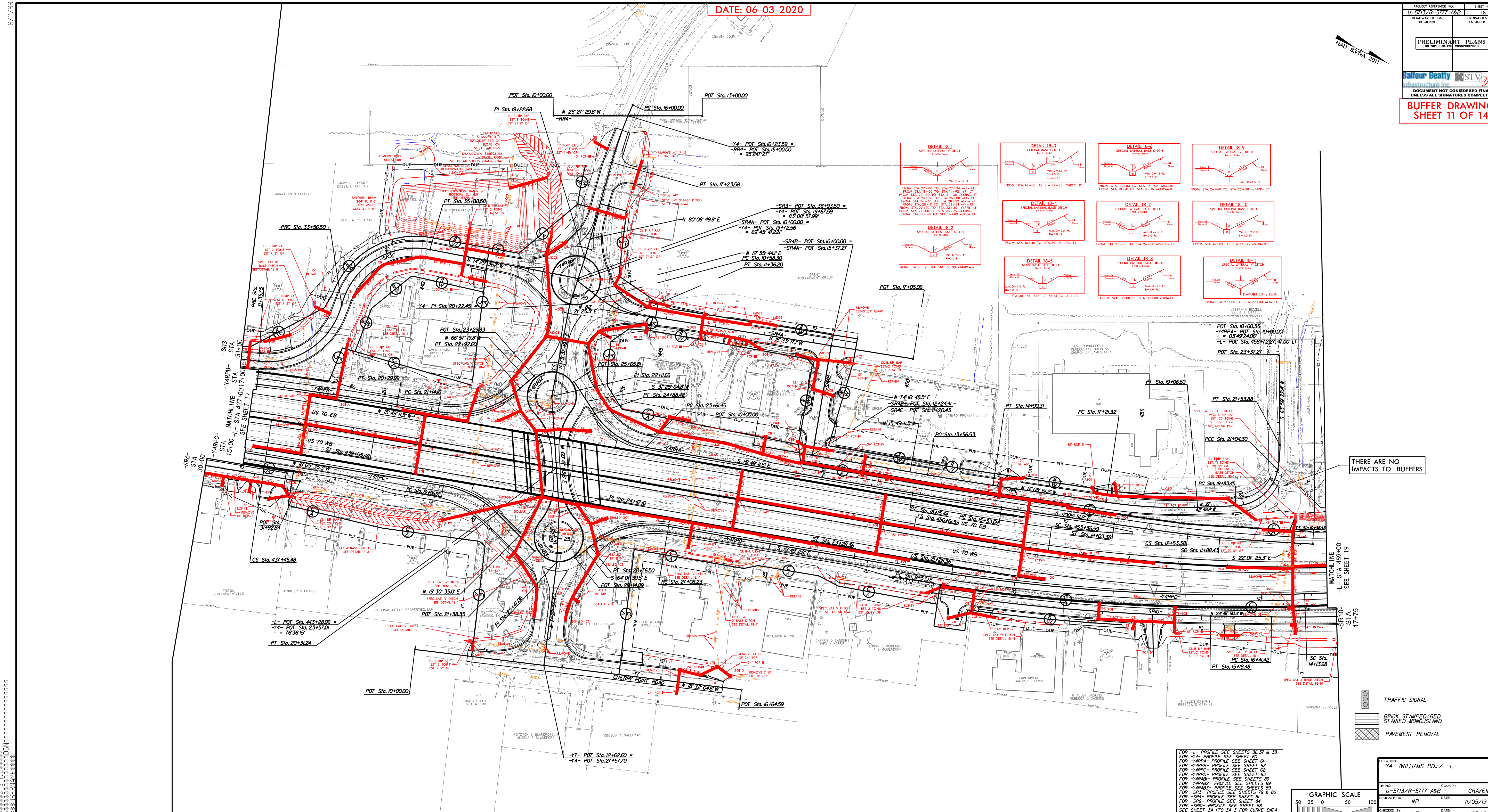
24′ BST

HTR

BST

FLO

Submitted 9/16/2020



Submitted 9/16/2020

DATE: 06–03–2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Balfour Beatty Infrastructure Inc. | STV 100 Years

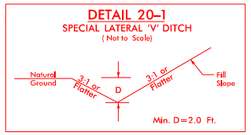
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BUFFER DRAWING SHEET 12 OF 14

NAD 83/NA 2011

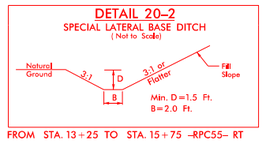
SCALE: 1" = 100'

DETAIL 20–1
SPECIAL LATERAL "V" DITCH
(Not to Scale)



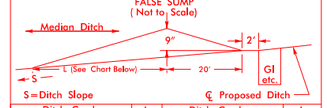
FROM STA. 12+55 TO STA. 14+05 –RPB55– LT
FROM STA. 10+75 TO STA. 13+25 –RPC55– RT

DETAIL 20–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 13+25 TO STA. 15+75 –RPC55– RT

DETAIL 20
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

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'

STA. 479+80 –L– MED

PI Sta. 11+26.39
POT Sta. 10+00.00
SC Sta. 12+00.00
CS Sta. 15+87.47
ST Sta. 17+87.47
TS Sta. 18+04.96
SC Sta. 20+04.96
PT Sta. 21+35.37
TS Sta. 473+84.16
SC Sta. 475+84.16
SC Sta. 474+91.68
CS Sta. 477+37.15
CS Sta. 477+09.33
ST Sta. 480+91.39
CS Sta. 478+91.39
ST Sta. 480+12.15
ST Sta. 479+29.33
POT Sta. 484+31.47
PC Sta. 30+86.32
SC Sta. 472+72.59
PCC Sta. 31+36.58
PT Sta. 32+02.88
POT Sta. 32+22.24
CS Sta. 18+02.84
ST Sta. 19+52.84
POT Sta. 21+13.51

-LLT2- POT Sta. 482+80.84 =
-L- POT Sta. 482+76.44, 34.00' LT

-LRT2- POT Sta. 482+71.85 =
-L- POT Sta. 482+76.44, 34.00' RT

-RPC55- PC Sta. 10+00.00 =
-L- POC Sta. 472+74.08, 49.35' RT

-L- POT Sta. 471+01.08 =
-RR- POT Sta. 12+28.88
△ = 106°21'31"

MATCH LINE -L- STA 471+00 SEE SHEET 19

CL B RIP RAP EST. 2 TONS EST. 7 SY GF
CL B RIP RAP EST. 5 TONS EST. 14 SY GF
CL B RIP RAP EST. 3 TONS EST. 10 SY GF
CL B RIP RAP EST. 11 TONS EST. 28 SY GF
CL B RIP RAP EST. 2 TONS EST. 7 SY GF
SPEC. LAT. 'V' DITCH SEE DETAIL 20–1
SPEC. LAT. 2' BASE DITCH SEE DETAIL 20–2
15" W/ 2 ELBOWS
15" RCP-IV
18" RCP-IV
24" RCP-IV
15" RCP-III
18" RCP-III
REMOVE
RETAIN
TRENCHLESS INSTALLATION 36" WIDER SHEET
FLOWABLE FILL
GTD
2GI
TB 2GI
PDE-1
HW

-RPB55-
-RRB-
-LLT2-
-LRT2-
-RPC55-
-L-
-RR-
SR10-

THERE ARE NO IMPACTS TO WETLAND OR CAMA BUFFERS

FOR -L- PROFILE SEE SHEET 39
FOR -LLT2- PROFILE SEE SHEET 40
FOR -LRT2- PROFILE SEE SHEET 40
FOR -RPB55- PROFILE SEE SHEET 41
FOR -RPC55- PROFILE SEE SHEET 41
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

EARL W MOORE MAMIE H MOORE
LINDA C MIDGETT
JB JOYNER
HAROLD P SPELLMAN
SHIRLEY S SMART
NCDOT
JAMES CITY COMMUNITY ORGANIZATION, INC
ANNIE E FOY
KENNETH WALSTON LOUISE WALSTON
INDIA H BLANGO FOY
SHILOH MISSIONARY BAPTIST CHURCH
WHITECO OUTDOOR ADVERTISING
TIDEWATER MARINE COMPANY, INC
RHEM S BELL TRUSTEE
GLORIA ROBBINS FLORENCE DB 3455 PG 47
CAROLYN JONES DIXIE DB 1792 PG 47
SARAH BIGGS DB 2540 PG 423 MB 1992 47
DONNIE WELLMAN DB 1792 PG 47 MB 1792 47
BARBARA A OTHER DB 1792 PG 47 MB 1792 47
DUE
ISFD
HTB
US 70 EB
US 70 WB
OR RAMP
NB RAMP
SB RAMP
SB SERVICE RD
NB SERVICE RD
EB SERVICE RD
WB SERVICE RD
RR

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
4	60+54 to 62+09-SRY21C-RT	1 at 9'x6' RCBC	X						4,401	3,007	7,408		
	24+00 to 25+49-Y21RPC-		X						7,693	1,254	8,947		
	25+14 to 26+28-Y21RPD-RT	ROADWAY FILL			X				6,298	1,684	7,982		
	22+64 to 24+26-Y21RPA-	1 at 10'x6' RCBC	X						7,506	6,282	13,788		
	16+72 to 18+41-SRY21A-	1 at 10'x7' RCBC	X						14,198	7,696	21,894		
13	26+94 to 28+57-SRY21D-	1 at 6'x6' RCBC			X				9,124	5,417	14,541		
	29+35 to 30+63-SRY21A-		X						9,733	5,569	15,302		
18	16+28 to 17+43-Y22RPC-	1 at 7'x7' RCBC	X						13,437	8,112	21,549		
	51+63 to 52+96-SRY21A-		X						10,800	7,134	17,934		
21	13+45 to 14+55-SRY22A-LT	1 at 72" RCP	X			254	1,857	2,111					
22	13+73 to 15+26-SR1-LT	1 at 54" RCP	X			2,766	2,130	4,896					
TOTALS*:						**3020**	**3987**	**7007**	**83190**	**46155**	**129345**	**0**	**0**

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1
SHEET 13 OF 14

Revised 2018 Feb

Submitted 9/16/2020

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
4	22+64 to 24+26-Y21RPA-		554	335
	16+72 to 18+41-SRY21A-		4,849	2,402
13	29+35 to 30+63-SRY21A-		7,968	2,617
18	16+28 to 17+43-Y22RPC-		528	411
	51+63 to 52+96-SRY21A-		573	476
TOTAL:			**14472**	**6241**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1
SHEET 14 OF 14

Revised 2018 Feb

Rev. Jan 2009

Submitted 9/16/2020

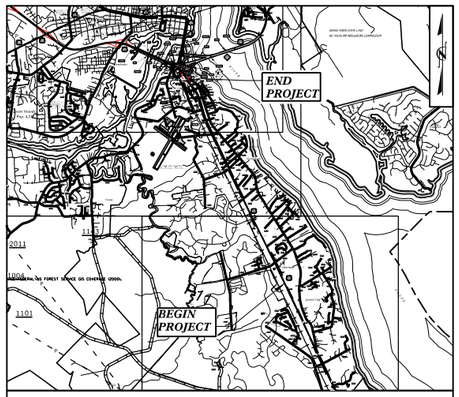
PROJECT: U-5713 /R-5777A&B

CONTRACT: C204225

TIP PROJECT

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CRAVEN COUNTY

PERMIT DRAWING SHEET 1 OF 11

DATE: 06–03–2020

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–5713/R–5777A&B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50111.3.1	N/A	DESIGN–BUILD

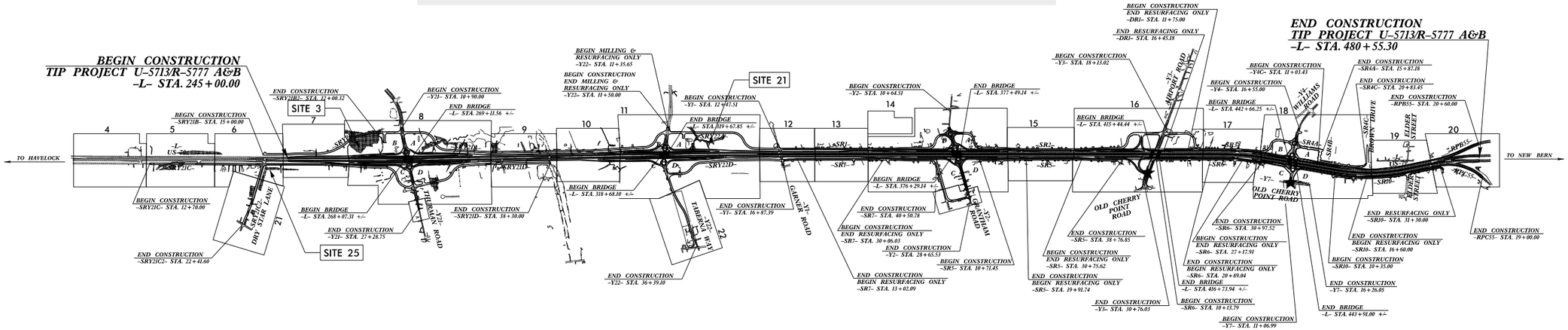
LOCATION: ***U.S. 70 FROM EASTERN APPROACH OF THE NEUSE RIVER BRIDGE TO APPROXIMATELY ONE (1) MILE EAST OF S.R. 1116 (THURMAN ROAD)***

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, ITS AND STRUCTURES

DESIGN CRITERIA AND STRUCTURE RECOMMENDATIONS
SUBMITTED: 02–20–20

NAD 83/ NA 2011

UTILITY WETLAND AND SURFACE WATER IMPACTS PERMIT



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARY OF THE CITY OF NEW BERN
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.

★ *PROPOSED TRAFFIC SIGNAL*

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
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

ADT 2015 = 45,200
ADT 2040 = 62,000
K = 8%
D = 50%
T = 7%*
V = 60 MPH
* (TTST=2%+DUAL 5%)
FUNC. CLASSIFICATION = INTERSTATE STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–5713 /R–5777A&B = 4.350 MILES

LENGTH STRUCTURE TIP PROJECT U–5713 /R–5777A&B = 0.111 MILES

TOTAL LENGTH OF TIP PROJECT U–5713 /R–5777A&B = 4.461 MILES

NCDOT CONTACT: CADMUS CAPEHART, PE
DIVISION 2 – DIVISION CONSTRUCTION ENGINEER

PLANS PREPARED FOR THE NCDOT BY:

Balfour Beatty Infrastructure Inc.

STV 100 Years

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 17, 2019

LETTING DATE: SEPTEMBER 17, 2019

J. ADAM FREEMAN, PE
PROJECT ENGINEER

NARONG PHAL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

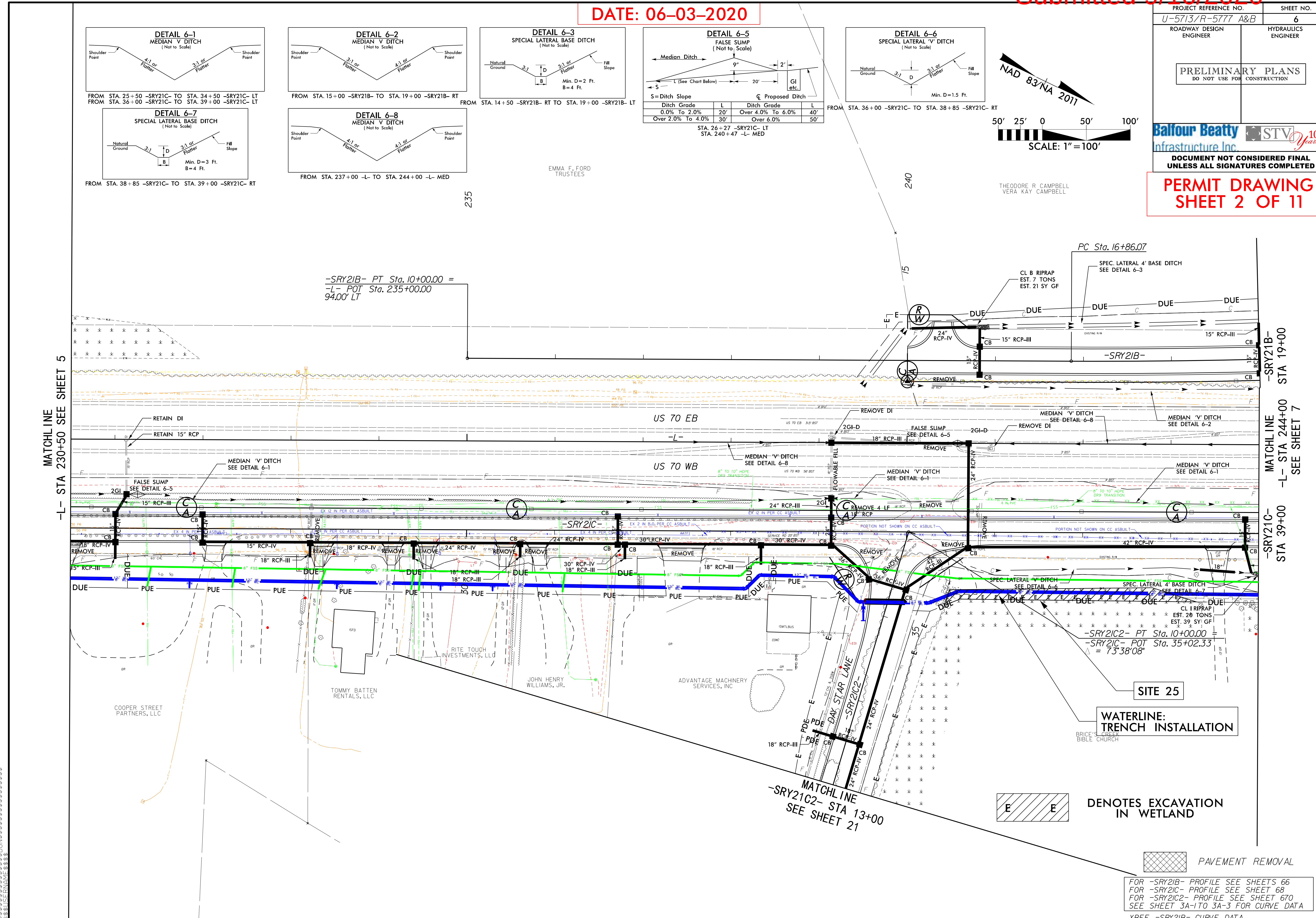
ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

Submitted 9/16/2020

DATE: 06-03-2020

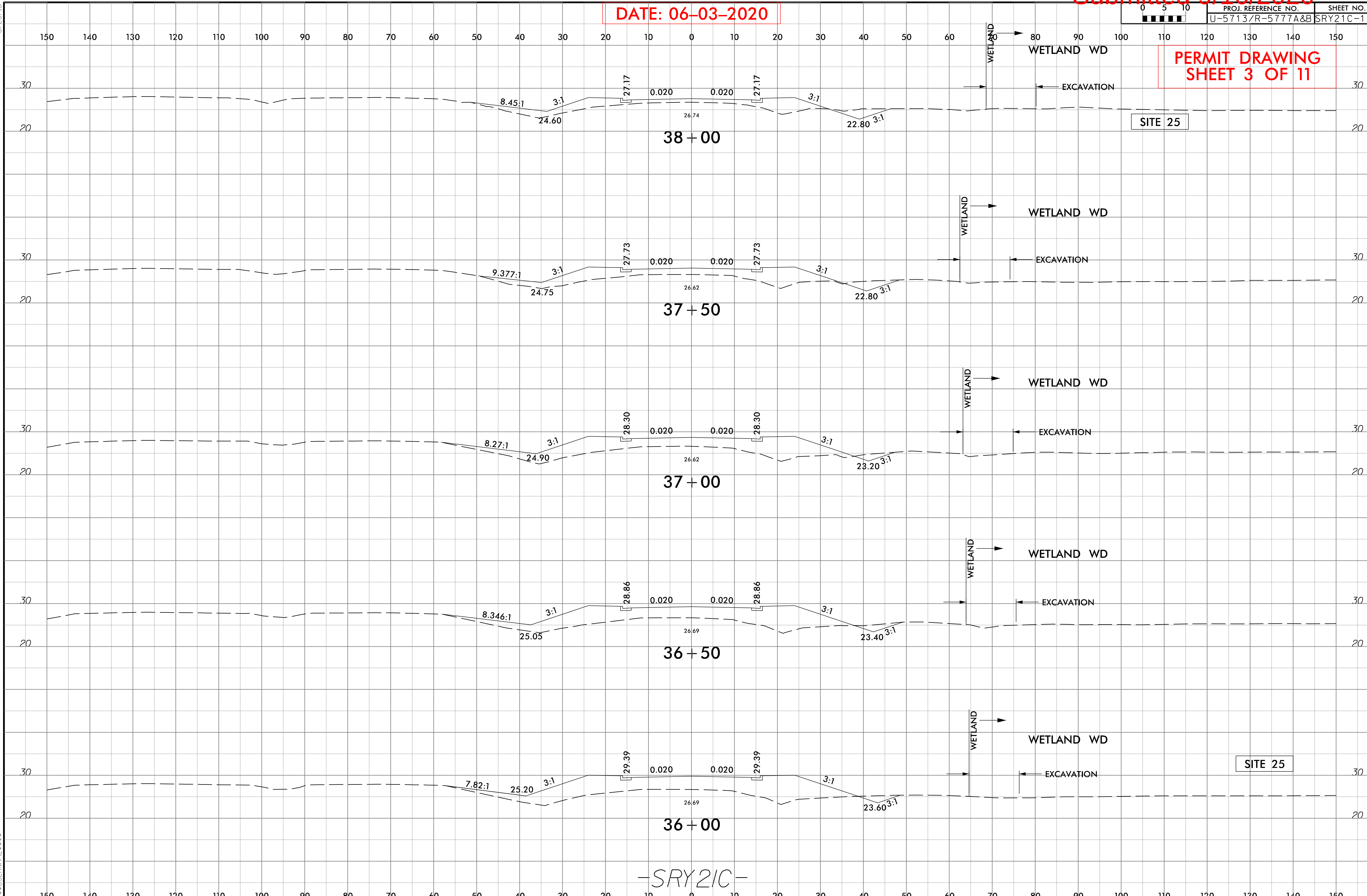


Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	SRY21C-11

PERMIT DRAWING
SHEET 3 OF 11



Submitted 9/16/2020

DATE: 06-03-2020

PROJECT REFERENCE NO. U-5713/R-5777 A&B | SHEET NO. 8

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

PRELIMINARY PLANS
NO WAY USE FOR CONSTRUCTION

Balfour Beatty Infrastructure, Inc. | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 4 OF 11

NAD 83/NA 2011

6/2/99

HC HC DENOTES HAND CLEARING

ENLARGEMENT VIEW
SEE SHEET 5 OF 11

WETLAND WAG

SITE 3

THURMAN ROAD

INSET A
-Y21- STA 25+50

SYSTIME=$$$$$$
SYSDATE=$$$$$$
SYSUSERNAME=$$$$$$

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y21- (THURMAN RD) / -L-
COUNTY: CRAVEN
DESIGNED BY: NP | DATE: 11/05/19
CHECKED BY: JAF | DATE: 11/05/19

Submitted 9/16/2020

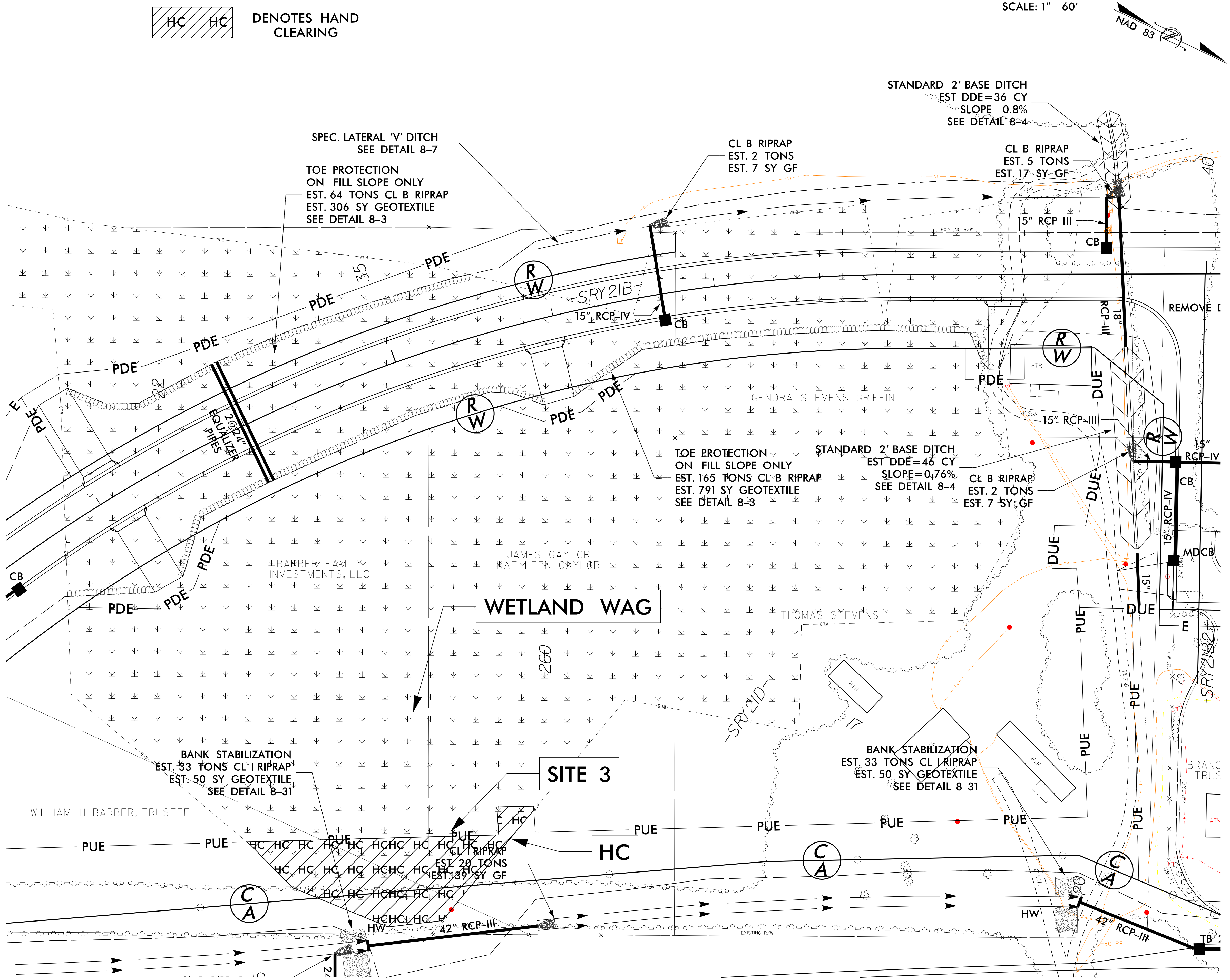
DATE: 06-03-2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 5 OF 11

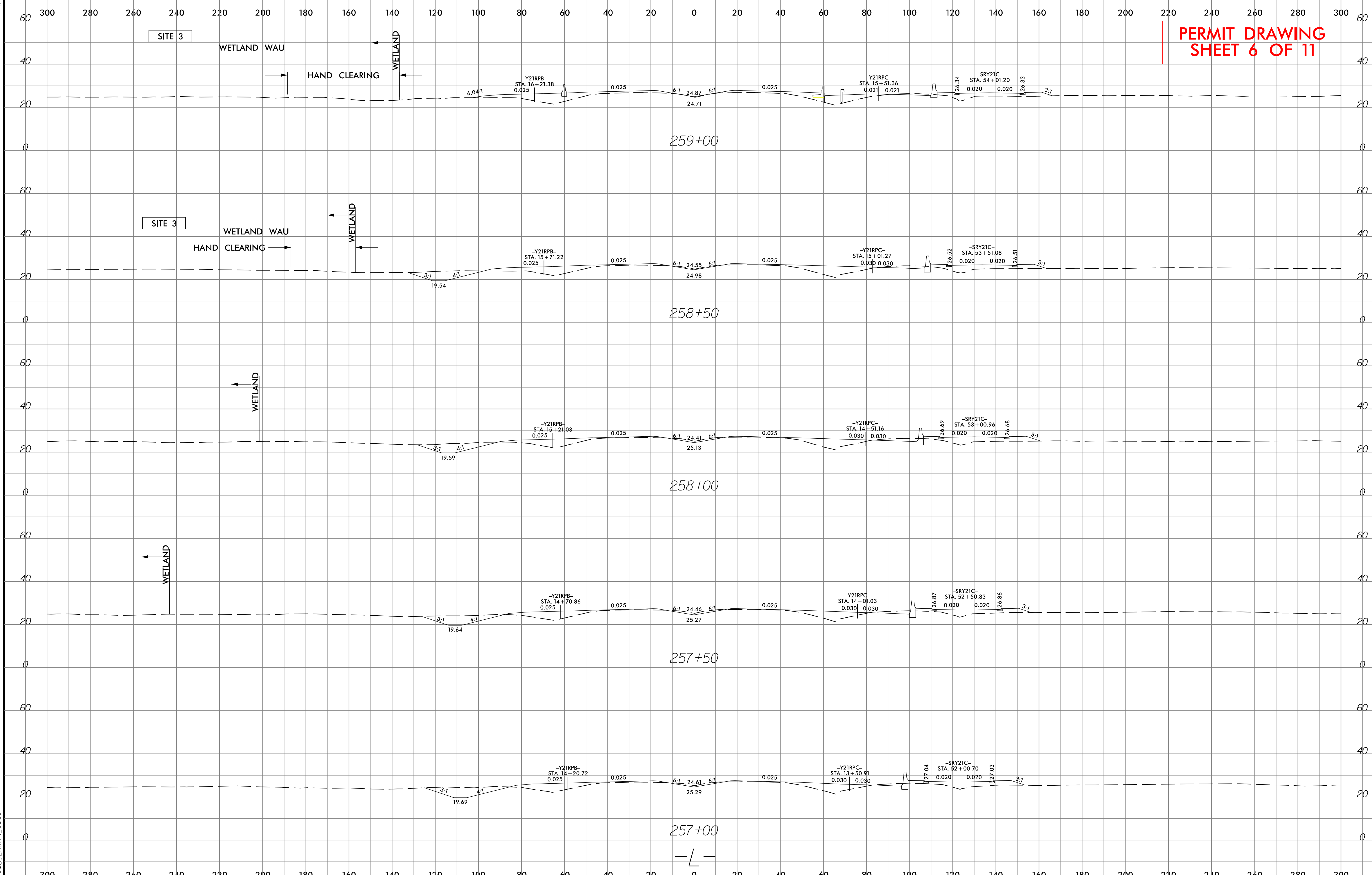


Submitted 9/16/2020

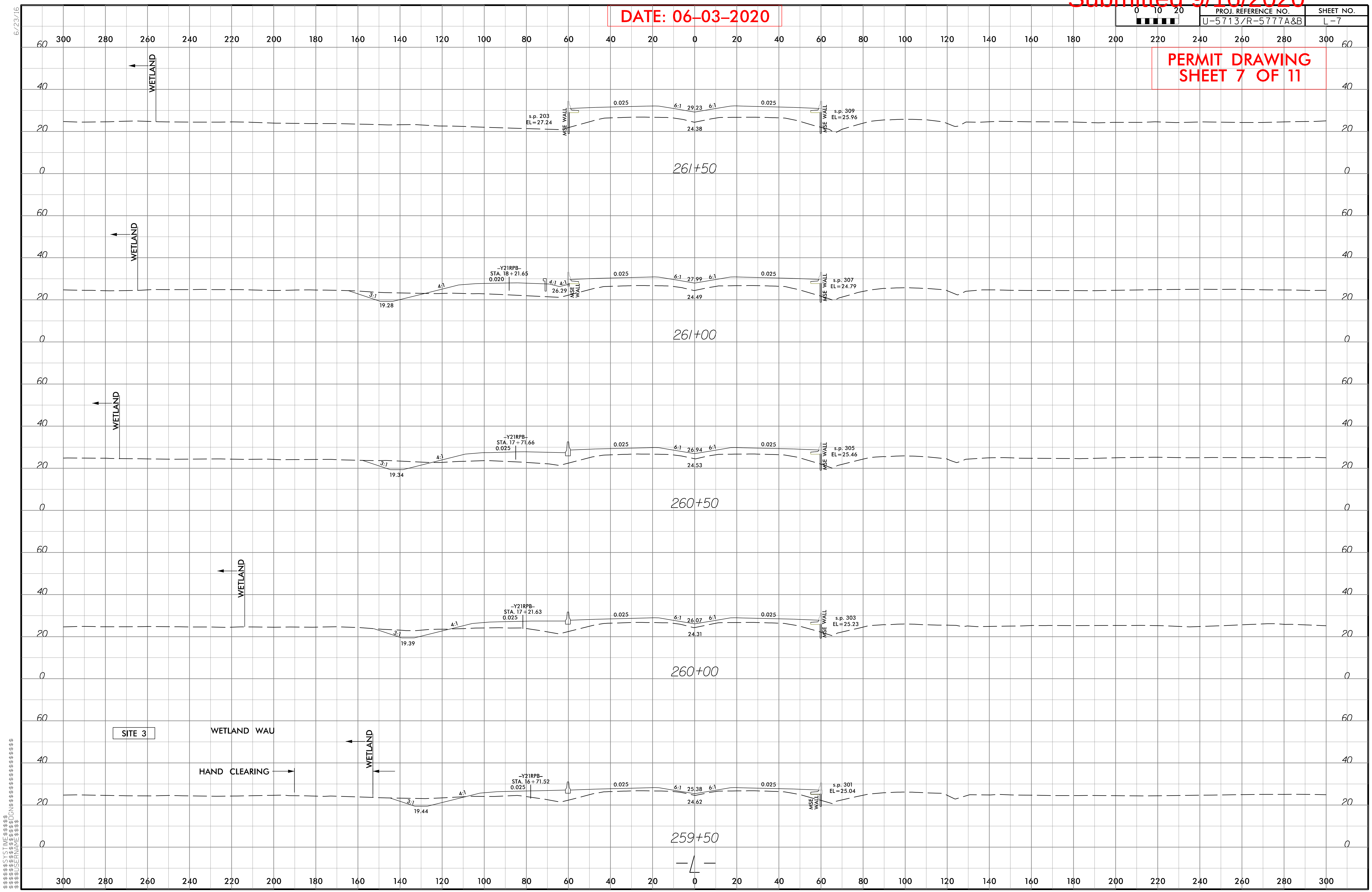
DATE: 06-03-2020

PERMIT DRAWING
SHEET 6 OF 11

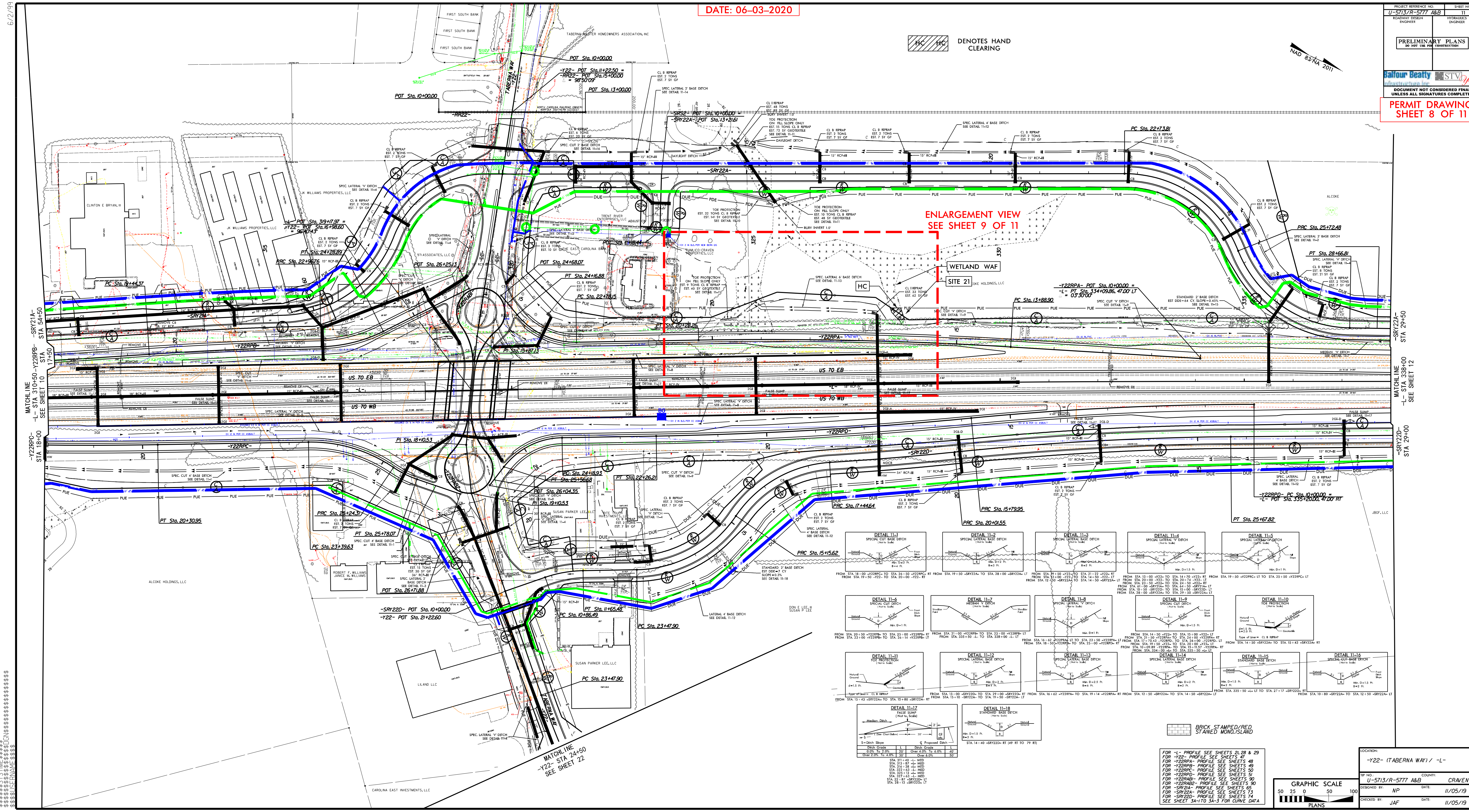
PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-6



Submitted 9/16/2020



Submitted 9/16/2020



Submitted 9/16/2020

8/17/99

DATE: 06–03–2020

HC HC DENOTES HAND CLEARING

20' 10' 0 20' 40'
SCALE: 1" = 40'
NAD 83

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	
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

PERMIT DRAWING
SHEET 9 OF 11

+62.17
125.07'

EX 2 IN B.O. PER NEW BERN GIS

RAMLICO-CRAVEN PROPERTIES, LLC

325

Q10 = 55.6 CFS
V10 = 2.0 FPS

WETLAND WAF

HAND CLEARING

CL I RIPRAP
EST. 33 TONS
EST. 62 SY GF

SPEC. LATERAL 6' BASE DITCH
SEE DETAIL 11–13

TOE PROTECTION
ON FILL SLOPE ONLY
EST. 9 TONS CL B RIPRAP
EST. 40 SY GEOTEXTILE
SEE DETAIL 11–11

PUE

SITE 21

ABANDON 16" UTILITY PIPE

16 IN, DI, City of New Bern

54" RCP–IV

ABANDON 10" UTILITY PIPE

10 IN, PVC, City of New Bern

3 IN, PVC, City of New Bern

8 IN, MD, Piedmont Natural Gas Company Inc.

OUTLET NOT FOUND (POSSIBLY BURRIED)

2GI

2GI–A

15" RCP–IV

24 STR, EOI

144 STR

96 STR

48 STR

24 STR

4' BST

US 70 EB 31' BST

US 70 EB

REMOVE 24" RCP

REMOVE DI

DI

CONC

5" RCP–IV

18" RCP–IV

3' BST

15" RCP–III

FALSE SUMP
SEE DETAIL 11–17

FALSE SUMP
SEE DETAIL 11–17

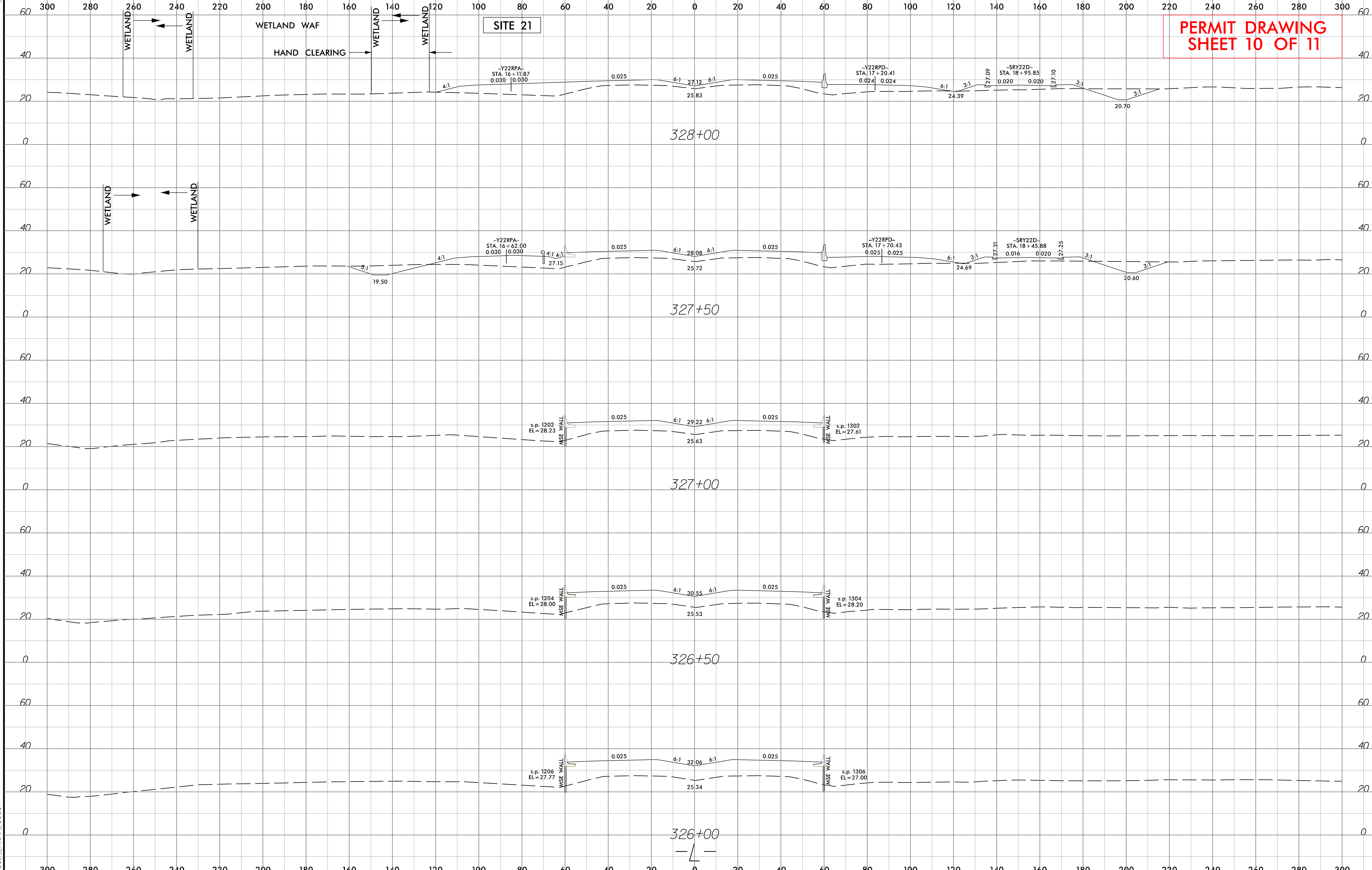
$$$$$SYSTIME$$$$$
$$$$$DGN$$$$$
$$$$$USERNAME$$$$$

Submitted 9/16/2020

DATE: 06-03-2020

PROJ. REFERENCE NO.	SHEET NO.
U-5713/R-5777A&B	L-35

PERMIT DRAWING
SHEET 10 OF 11



0 10 20

6/23/16

$$$$$$SYSTIME$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020

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)
3	15+01 to 16+74-Y21RPB-LT	UTILITY					0.14					
21	16+08 to 16+38-Y22RPA-RT	UTILITY					0.01					
25	35+43 to 38+30-SRY21C-RT	UTILITY **			0.08							
TOTALS*:					0.08		0.15			0	0	0

*Rounded totals are sum of actual impacts

NOTES:

** Site 25 - Excavation in Wetland impacts are temporary impacts.

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
07/01/2020
CRAVEN COUNTY
U-5713/R-5777A&B
50111.3.1
SHEET 11 OF 11

Revised 2018 Feb

TIP PROJECT: U-5713 /R-5777A&B

CONTRACT: C204225

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

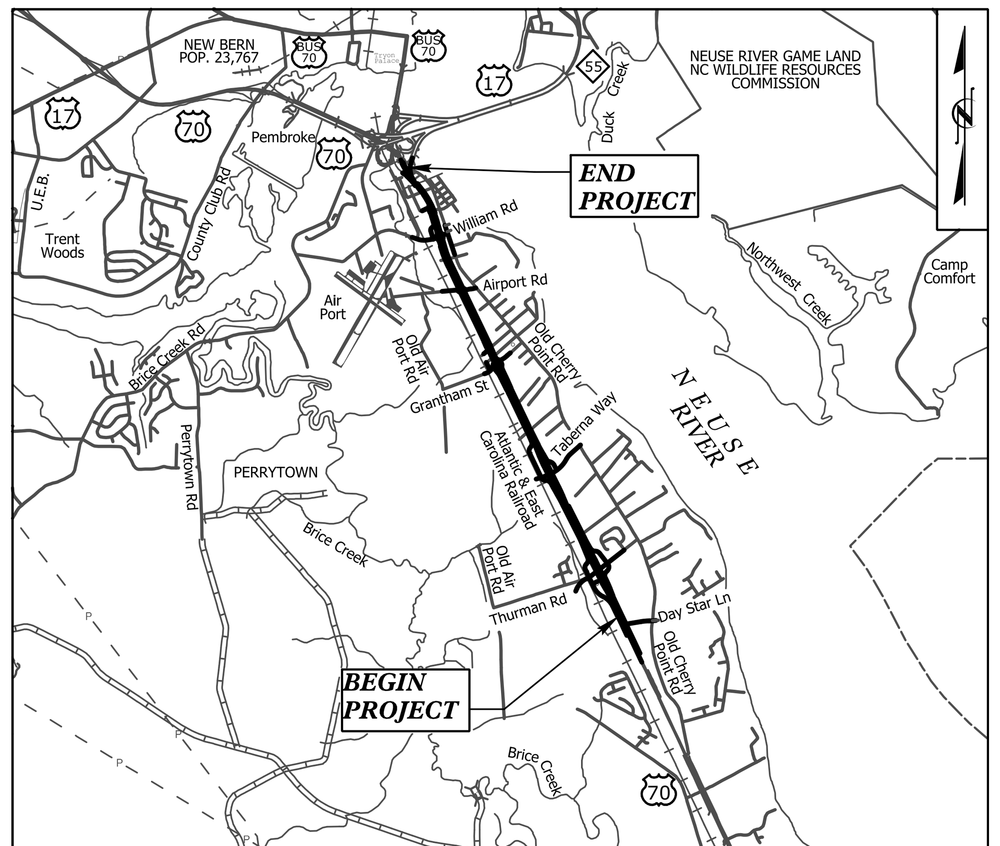
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5713/R-5777A&B	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50111.3.1	N/A	P.E. ROW.
		UTILITIES &
		CONSTRUCTION

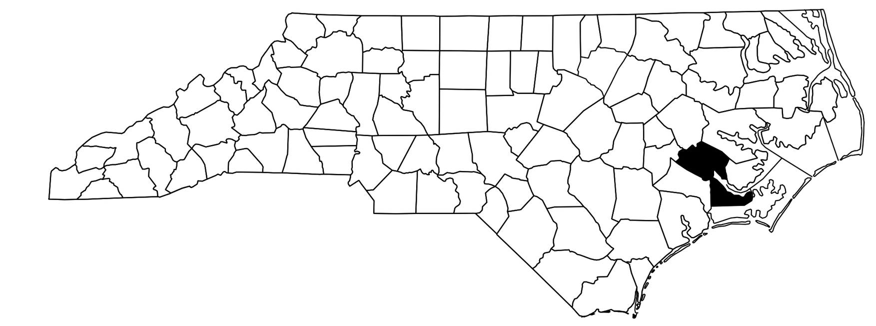
CRAVEN COUNTY

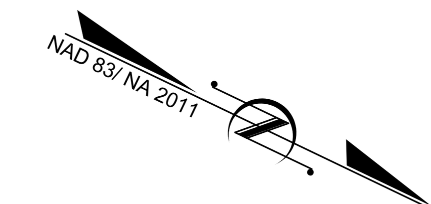
LOCATION: *U.S. 70 FROM EASTERN APPROACH OF THE NEUSE RIVER BRIDGE TO APPROXIMATELY ONE (1) MILE EAST OF S.R. 1116 (THURMAN ROAD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNING, ITS AND STRUCTURES*



VICINITY MAP N.T.S.

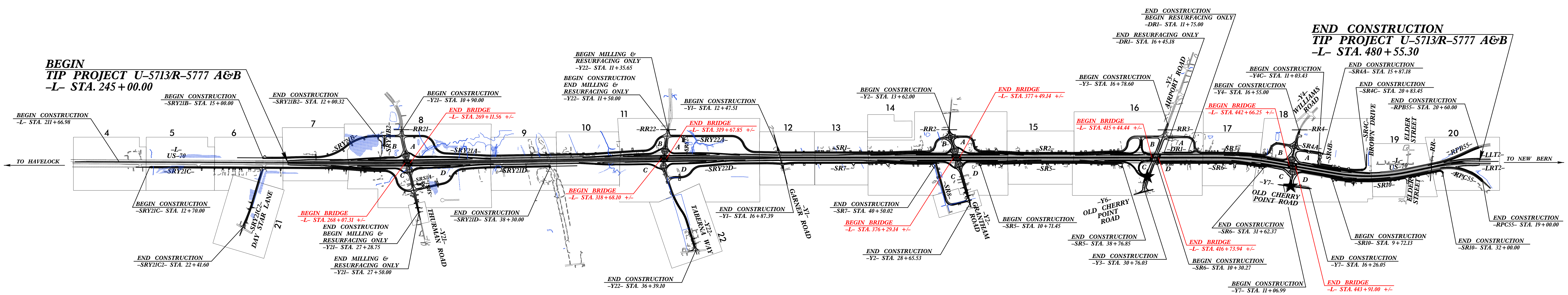




FINAL ROADWAY PLANS

SUBMITTED: 08-17-20

SUBMITTAL #J-046



★ *POTENTIAL TRAFFIC SIGNAL*

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 45,200
ADT 2040 = 62,000
K = 8%
D = 50%
T = 7%*
V = 60 MPH
* (TTST = 2% + DUAL 5%)
FUNC. CLASSIFICATION = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5713 /R-5777A&B = 4.350 MILES

LENGTH STRUCTURE TIP PROJECT U-5713 /R-5777A&B = 0.111 MILES

TOTAL LENGTH OF TIP PROJECT U-5713 /R-5777A&B = 4.461 MILES

NCDOT CONTACT: CADMUS CAPEHART, PE
DIVISION 2 - DIVISION CONSTRUCTION ENGINEER

PLANS PREPARED FOR THE NCDOT BY:

Balfour Beatty

STV 100 Years

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 17, 2019

LETTING DATE:
SEPTEMBER 17, 2019

J. ADAM FREEMAN, PE
PROJECT ENGINEER

NARONG PHAL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

8/14/2020
R:\Roadway\Proj\PSH\U-5713-R-5777_rdy_psh01_tsh.dgn
jfreeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

1.....TITLE SHEET

1A.....INDEX OF SHEETS

1B.....CONVENTIONAL SYMBOLS

2A–1 THRU 2A–12A.....TYPICAL SECTIONS

2A–13 THRU 2A–17.....STRUCTURE TYPICAL SECTIONS

2B–1 THRU 2B–6.....SHEAR POINT DIAGRAMS

2B–7 THRU 2B–11.....INTERSECTION /ROUNDABOUT DETAILS

2B–12 THRU 2B–23.....ROADWAY WALL ENVELOPES AND DETAILS

2B–24 THRU 2B–37.....TEMPORARY ALIGNMENTS & PROFILES *

2B–38 THRU 2B–X.....T–TYPE BARRIER SUMMARY SHEET *

2C–1 THRU 2C–7.....ROADWAY DETAILS

2D–1 THRU 2D–7.....DRAINAGE DETAILS

2G–1 THRU 2G–2.....MOMENT SLAB DETAILS

2G–3 THRU 2G–6.....TEMPORARY SHORING DETAILS

3A–1 THRU 3A–3.....ALIGNMENT CURVE DATA

3B–1.....MISC. ROADWAY SUMMARIES

3B–2 THRU 3B–3.....GUARDRAIL SUMMARY

3B–4 HRU 3B–5.....EARTHWORK SUMMARY

3D–1 THRU 3D–57.....DRAINAGE SUMMARIES

3P–1 THRU 3P–2.....PARCEL INDEX SHEETS

4 THRU 22.....PLAN SHEETS

23A THRU 90.....PROFILE SHEETS

RW02C–1 THRU RW02C–9.....SURVEY CONTROL SHEETS

RW02D–1 THRU RW02D–8.....PROPOSED ALIGNMENT CONTROL SHEETS

X–0 THRU SRS2–3.....CROSS–SECTIONS

*NOTE: TO BE PROVIDED WITH RFC PLAN SUBMISSION FOR REVIEW.

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS

EFFECTIVE: 01–16–2018
REVISED: 01–16–2018

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.

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03

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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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:

DUKE ENERGY – DISTRIBUTION
PIEDMONT NATURAL GAS
SPECTRUM FIBER
CENTURY LINK
EMBANQ
SUDDENLINK
MCNC
CRAVEN COUNTY
CITY OF NEW BERN

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT

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.

STANDARD DRAWINGS

EFF. 01–16–2018
REV. 01–16–2018

2018 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO. TITLE

DIVISION 2 – EARTHWORK

200.03 Method of Clearing – Method III
225.01 Guide for Grading Subgrade – Interstate and Freeway
225.02 Guide for Grading Subgrade – Secondary and Local
225.03 Deceleration and Acceleration Lanes
225.04 Method of Obtaining Superelevation – Two Lane Pavement
225.05 Method of Obtaining Superelevation – Divided Highways
225.06 Method of Grading Sight Distance at Intersections

DIVISION 3 – PIPE CULVERTS

300.01 Method of Pipe Installation
310.10 Driveway Pipe Construction

DIVISION 5 – SUBGRADE, BASES AND SHOULDERS

560.01 Method of Shoulder Construction – High Side of Superelevated Curve – Method I
560.02 Method of Shoulder Construction – High Side of Superelevated Curve – Method II

DIVISION 6 – ASPHALT BASES AND PAVEMENTS

654.01 Pavement Repairs
665.01 Asphalt Shoulders – Milled Rumble Strips

DIVISION 8 – INCIDENTALS

806.01 Concrete Right–of–Way Marker
806.03 Concrete Contol of Access Marker
815.02 Subsurface Drain
815.03 Pipe Underdrain and Blind Drain
838.01 Concrete Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
838.10 Brick Endwall for Single and Double Pipe Culverts – 15" thru 48" Pipe 90 Skew
840.01 Brick Catch Basin – 12" thru 54" Pipe
840.02 Concrete Catch Basin – 12" thru 54" Pipe
840.03 Frame, Grates and Hood – for Use on Standard Catch Basin
840.04 Concrete Open Throat Catch Basin – 12" thru 48" Pipe
840.05 Brick Open Throat Catch Basin – 12" thru 48" Pipe
840.14 Concrete Drop Inlet – 12" thru 30" Pipe
840.15 Brick Drop Inlet – 12" thru 30" Pipe
840.16 Drop Inlet Frame and Grates – for use with Std. Dwg 840.14 and 840.15
840.17 Concrete Grated Drop Inlet Type 'A' – 12" thru 72" Pipe
840.18 Concrete Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.19 Concrete Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.20 Frames and Wide Slot Flat Grates
840.22 Frames and Wide Slot Sag Grates
840.24 Frames and Narrow Slot Sag Grates
840.25 Anchorage for Frames – Brick or Concrete or Precast
840.26 Brick Grated Drop Inlet Type 'A' – 12" thru 72" Pipe
840.27 Brick Grated Drop Inlet Type 'B' – 12" thru 36" Pipe
840.28 Brick Grated Drop Inlet Type 'D' – 12" thru 36" Pipe
840.29 Frames and Narrow Slot Flat Grates
840.30 Driveway Drop Inlet
840.34 Traffic Bearing Junction Box – for Use with Pipes 42" and Under
840.35 Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.37 Steel Grate and Frame
840.45 Precast Drainage Structure
840.46 Traffic Bearing Precast Drainage Structure
840.52 Precast Manhole – 4', 5' and 6' Diameter
840.53 Precast Manhole with Masonry Base – 12" thru 42" Pipe
840.54 Manhole Frame and Cover
840.66 Drainage Structure Steps
840.71 Concrete and Brick Pipe Plug
840.72 Pipe Collar
846.01 Concrete Curb, Gutter and Curb & Gutter
846.02 Drop Inlet Installation in Expressway Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
848.01 Concrete Sidewalk
848.03 Driveway Turnout – Drop Curb Type
848.04 Street Turnout
848.05 Curb Ramp – Proposed Curb & Gutter
852.01 Concrete Islands
852.06 Method for Placement of Drop Inlets in Concrete Islands
854.02 Double Faced Concrete Barrier – Types 'T', 'T1' and 'T2'
854.05 Concrete Median Transition Barrier – Location of Overhead Assembly
857.01 Precast Reinforced Concrete Barrier – 41" Single Faced
862.01 Guardrail Placement
862.02 Guardrail Installation
862.03 Structure Anchor Units
862.04 Anchoring End of Guardrail – B–77 and B–83 Anchor Units
865.01 Cable Guiderail
866.01 Chain Link Fence – 4', 5' and 6' High Fence
866.02 Woven Wire Fence – with Wood Post
866.05 Glare Screen – Chain Link Fabric /Guardrail Mounted
876.01 Rip Rap in Channels
876.02 Guide for Rip Rap at Pipe Outlets
876.03 Drainage Ditches with Class 'A' Rip Rap
876.04 Drainage Ditches with Class 'B' Rip Rap

8/14/2020
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Submitted 9/16/2020

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

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.
- 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.

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STATE OF NORTH CAROLINA
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PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	5	Reuben Julius Logan & Sandra McClease Logan
2	5	Michael Huffman & Walter Huffman
3	5	Nick Arlnold
4	5	Taurino Perez Santos
5	5, 6	Cooper Street Partners, LLC
6	5, 6	Emma F. Ford Trustees
7	6, 21	Tommy Batten Rentals, LLC
8	6, 21	Rite Touch Investments, LLC
9	6, 21	John Henry Williams, Jr.
10	6, 21	Advantage Machinery Services, Inc
11	6, 7, 21	Brice's Creek Bible Church
12	6, 7	Theodore R Campbell and Vera Kay Campbell
13	7	Wilven, LLC
14	7	Barber Family Investments, LLC
15	7, 8	William H Barber, Trustee
16	7, 8	Barber Family Investments, LLC
17	7	William H Barber, Trustee
18	7	Gary M Cashwell and Leona M Cashwell
19	7	Willard N West, Jr and Jean E West
20	7	The Turf Club, LLC
21	7, 8	Randy Alan Wainwright and Sheree Wainright
22	8	Joseph S Nicholson and April D Nicholson
23	8	James Gaylor and Kathleen Gaylor
24	8	Harell B Hutchins
25	8	Genora Stevens Griffin
26	8	Thomas Stevens
27	8	Johnathan Owens
28	8	William H Barber, Trustee
29	8	Overlook Holdings, LLC
30	8	Branch Banking & Trust Company
31	8	Overlook Holdings, LLC
32	8	William H Barber, Trustee
33	8	Charles A Lapier and Kathryn A Lapier
34	8	Walton Thomas Keel, Jr and Gloria Keel
35	8	John C Gray and Ramona B Gray
36	8	Albert Nash Riggs, Trustee
37	8	Mclaughlin Properties, LLC
38	8	Mallard Oil Co
39	8, 9	Audry P Ward
40	8	EJP III Real Estate One, LLC
41	8	Blue Water Properties of New Bern, LLC
42	8	Anastosios Bogiatzis
43	8	Jessie Mars and Beatrice Mars
44	8	Steven E Anderson and Melinda C Charismar
45	8	Trent River Builders, Inc
46	8	Hunter Kaleb Martin
47	8	TRB Rentals, Inc
48	8	Ronald M Bradfield and Anna Bradfield
49	8	Triton Development, LLC
50	8	William d Gorges and Lynn L Gorges
51	8	Champion Modular, Inc
52	8, 9	JK Williams Properties, LLC
53	-	Eliminated Take/ Parcel #
54	-	Eliminated Take/ Parcel #
55	-	Eliminated Take/ Parcel #
56	9	Mattie A Midgette
57	9	Wilven, LLC
58	9	Mattie A Midgette
59	9	Wilven, LLC
60	9, 10	Craven County Junior Chamber of Commerce, Inc
61	9	Carlson & Williams Homes, LLC
62	9	Carlson & Williams Homes, LLC
63	9	Carlson & Williams Homes, LLC
64	9, 10	Carlson & Williams Homes, LLC
65	9, 10	Gary A Cahoon
66	10	Gary A Cahoon
67	-	Eliminated Take/ Parcel #
68	10	The Church at New Bern
69	-	Eliminated Take/ Parcel #
70	10	Clinton E Bryan, III
71	10, 11	Clinton E Bryan, III
72	11	JK Williams Properties, LLC
73	11	Robert F. Williams and Janice M. Williams
74	11	Liland LLC
75	11	Trent River Enterprises, LLC
76	11	The East Carolina Bank
77	11	Pamlico-Craven Properties, LLC
78	11	Pamlico-Craven Properties, LLC
79	11	Susan Parker Lee, LLC
80	11	Rite Touch Investments, LLC
81	11, 22	Susan Parker Lee, LLC
82	11	Alcoke Holdings, LLC
83	11	Don E Lee, III and Susan P Lee
84	11, 12	Alcoke Holdings, LLC
85	11, 12	JBGF, LLC
86	12	James D Finch and Nathaniel W Finch
87	12	Berean Community Church
88	12, 13	Grantham Crossing, LLC
89	13	Walter E Register & Ann C Register
90	13	T&H Properties of New Bern, LLC
91	13	Craven county Farm Bureau, Inc.
92	13, 14	J. Lawrence Tucker and Argent Spake
93	14	J. Lawrence Tucker
94	14	Magnolia Investors, LLC
95	14	Magnolia Investors, LLC
96	14	Fisher Properties East, LLC
97	14	Guy A. Whaley
98	14	Magnolia Investors, LLC
99	14	Thomas E. Green III
100	14	Glenda C. Willis
101	14	Carolona Conference Association of Seventh-Day Adventists, Inc.
102	14	Carolona Conference Association of Seventh-Day Adventists, Inc.
103	14	Cornerstone Assembly of God, Inc
104	14	Glenda C. Willis
105	14	Cornerstone Assembly of God, Inc
106	-	Eliminated Take/ Parcel #
107	-	Eliminated Take/ Parcel #
108	-	Eliminated Take/ Parcel #
109	14	Twin Forks Properties, LLC
110	14	Cornerstone Assembly of God, Inc
111	14	FDT, LLC
112	14	Hilda G Collins
113	14	George F Hedrick and Jessie M Hedrick
114	14	George F Hedrick and Jessie M Hedrick
115	14	Bobby G Hargett and Donna H Hargett
116	14	Albert Clifton Cannon Jr
117	14	Linda J Irwin
118	14	Chad L and Christine L Wright
119	14	Port Human Services
120	14	Raymond Eubanks and Stacey A Eubanks
121	14	Lumbee River Elec Membership Corp.
122	14	William R Lane and Linda D Lane
123	14	Michael D Hawkins and Robert Earl Jones
124	-	Eliminated Take/ Parcel #
125	14	Keith D Cowell and Gloria H Cowell
126	14	Elizabeth S. Brinson
127	14	Roger D Harker, Jr
128	14	Roger D Harker, Jr
129	14	Jose A Garcia
130	14	James A Tyndall and Joyce S Tyndall
131	14	Charles R Stewart
132	14	Bonnie L Adams and William B Stewart
133	14	Bonnie L Adams and William B Stewart
134	14	A Brian Zelinski and Donna M Zelinski
135	14	Larry T Britt and Cathy B Mills
136	14	Brooks Distrubuting, LLC
137	14	James L. Cayton, Jr, Oleene B Cayton, Kelly C Jones, and DSC Investments
138	14	Taurino P Santos
139	14, 15	Dale M Stroud and Linda A Stroud
140	14, 15	Joseph D Jones and Della M Jones
141	15	Genman Property Management, LLC
142	-	Eliminated Take/ Parcel #
143	15	GS Celinski Gerneral Contractors, Inc
144	15	GS Celinski Gerneral Contractors, Inc
145	15	George S Celinski and Joanne R Celinski
146	15	GS Celinski Gerneral Contractors, Inc
147	15	James L Cayton, JR
148	-	Eliminated Take/ Parcel #
149	15	James L Cayton, JR
150	15	Deichmann & Deichmann, LLC
151	15, 16	George L Deichmann, III
152	-	Eliminated Take/ Parcel #
153	16	Number 7, Township Fire Department of Craven County, North Carolina
154	16	Deichmann & Deichmann, LLC
155	16	Fisher Properties West, LLC
156	16	Deichmann & Deichmann, LLC
157	16	T&R Bland Properties, LLC
158	16	JRA Properties, LLC
159	16	Rose & Associates, PA
160	16	JRA Properties, LLC
161	16	DSC Invstments
162	16	Regina C Overly
162A	16	Regina C Overly
163	16	John R Riesback and Christine E Riesbeck
164	16	First Citizens Bank & Trust Company
165	16	Spear-Connor Rentals
166	16	Bos Development Group, LLC
167	16	Morris Family Ventures, LLC
168	16	Morris Family Ventures, LLC
169	16	Morris Family Ventures, LLC
170	16	Langemann Coastal Properties, LLC
171	16	Leased to Jerry Casey Auto Sales
172	16	Robert R Northington
173	16	Richard L Avellino and Sharon L Hunter
174	16, 17	Robert R Northington
175	16, 17	Mallard Oil Co

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PARCEL No.	SHEET No.	PROPERTY OWNER NAME
176	16, 17	Autozone Development, LLC
177	-	Eliminated Take/ Parcel #
178	17	Mallard Oil Co
179	17	Trent Development Group
180	17	Michelle D Foye, Beverly E Foye, Christel R Foye, and Greta S Foye
181	17	William A Forbes, Jr, Katherin F Teel, and Edna Mae F Lovick
182	17	Weldon Jerome King
183	17	Arnold L Banks, Jr and Darell Banks
184	17	R Allen Gaskins and Rebecca D Gaskins
185	17	Jonathan B Fulcher
186	17	William A Foskey
187	17	Jonathan B Fulcher
188	17	Lyle V Boyette
189	17, 18	Johnathan B Fulcher
190	17, 18	Triton Development, LLC
191	18	Mary C Coppage and Cassie M Coppage
192	18	Harvey L Wooten
193	18	Hezekiah Singleton and Carol A Singleton
194	18	Ulice W Richards
195	18	FSI Properties, LLC
196	18	Craven Animal Hospital Properties, LLC
197	18	Donald F Campbell
198	18	FSI Properties, LLC
199	18	Jennifer S Phang
200	18	National Retail Properties, LLP
201	18	Robert C Goldfinger, Patricia H Goldfinger, Wesley J Linkovich, and vickim Linkovich
202	18	Phuoc & Khen Group, LLC
203	18	Hagan Family Properties, LLC
204	18	Trent Develepment Group
205	18	Tribo Properties, LLC
206	18	JLA, LLC
207	18	Undenominational Penecostal Holiness Church of James City
208	19, 20	Ernest L Spears, Jr and Arthur J Smart, Jr
209	20	Whiteco Outdoor Advertising
210	21	Theodore Campbell & Vera Kay Campbell
211	21	Gary Garera
212	21	Gary Garera
213	21	Carey & Shelby R. Willis
214	21	Pamelia P Fesperman
215	21	Sylvia Heath
216	22	Tammy Eubanks Quidley
217	22	Royston D Blandford III & Angela F
218	11, 22	Royston D Blandford III & Angela F
219	12	Alcoke Holdings, LLC
220	12, 13	Alcoke Holdings, LLC
221	13	William T Burroughs, Jr and Yvonne M Burroughs
222	13	KHJH Properties, LLC
223	13, 14	Jacaha, LLC
224	14	Alvin D Easton
225	15	James L Cayton, Jr
226	15, 16	Crossroads Baptist Church of New Bern, North Carolina
227	-	Combined with 226
228	16	Magnolia Investors, LLC and VM&J, LLC
229	16, 17	Fun Properties, LLC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
230	17	Michael T Herriman
231	17	Mike and Bella, LLC
232	17	Mike and Bella, LLC
233	17	Car Management, LLC
234	18	Ejnar B Middendorf and A E Middendorf
235	18	Twin Rivers Baptist Church
236	18	R Allen Gaskins and Rebecca D Gaskins
237	18	R Allen Gaskins and Rebecca D Gaskins
238	18,19	Carolina Services
239	19	Carolina Services
240	19	MJM Properties of Eastern North Carolina
241	19, 20	Dixie Chemical Corporation
242	20	Carolyn Jones Dozier
243	20	Barbara A Joyner
244	20	James City Community Organization, Inc
245	18	Rich, Rich & Phillips
246	18	Cherrie D Sanders and Ivey H Harris
247	18	Trent Development Group
248	20	Gloria Robbins Eldridge
249	7, 8	Martha B. Quinn Heirs and Billy H. Barber Heirs
600	14	Joseph E Jones and Joyce B Jones
601	18	Getty NC Leasing, Inc
602	18, 19	Hilbert Crossing Plaza, LLC
603	18	WH Capital, LLC
604	18	FSI Properties, LLC
605	18	FSI Properties, LLC
606	16	N/A
607	16	N/A
608	16	Avera Investments, LLC
609	16	Craig M Goess and Craig F Goess
610	14	Monnie R Wood
611	14	Monnie R Wood
612	14	Wood & Wood Real Property, LLC
613	14	Wood & Wood Real Property, LLC
614	14	J&H Investments of New Bern, LLC
615	8	Brice's Creek Bible Church
616	8	Brice's Creek Bible Church
617	11	JK Williams Properties, LLC
618	11	971 Associates, LLC
619	10, 11	Alcoke Holdings, LLC
620	22	Earl Temple, III Mitzi Temple
621	14	N&B Co, LLC
699	19	Dixie Chemical Corporation

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

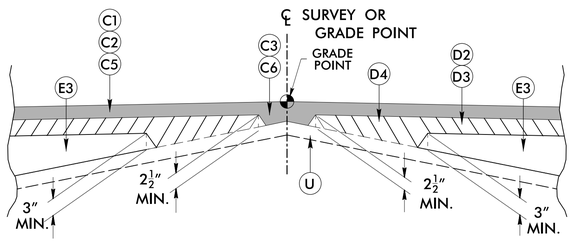
Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

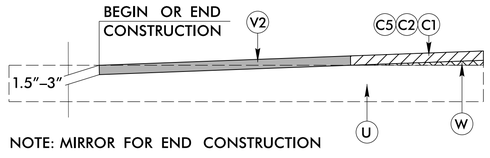
PAVEMENT SCHEDULE

A1	PROP. 6″ JOINTED CONCRETE REINFORCED WITH WOVEN WIRE MESH	J3	PROPOSED VARIABLE DEPTH AGGREGATE BASE COURSE
A2	PROP. 7″ JOINTED CONCRETE TRUCK APRON REINFORCED WITH WIRE MESH	P	PRIME COAT AT A RATE OF 0.35 GAL PER SQ. YD.
C1	PROP. APPROX. 2″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 220 LBS. PER SQ.YD.	R1	1′-6″ CURB & GUTTER
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	R2	2′-6″ CURB & GUTTER
C3	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 NOT LESS THAN 1″ OR GREATER THAN 1.5″ IN DEPTH.	R3	5″ MONOLITHIC CONCRETE ISLAND (KEYED-IN), RED COLORED AND STAMPED WITH A BRICK PATTERN
C4	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.	R4	EXPRESSWAY GUTTER
C5	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.	R5	REINFORCED SINGLE FACED CONCRETE BARRIER
C6	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5″ OR GREATER THAN 2″ IN DEPTH.	R6	REINFORCED SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
C7	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.	R7	REINFORCED TYPE T CONCRETE BARRIER (T, T1, T2)
C8	PROP. APPROX. 4.0″ ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 440 LBS. PER SQ.YD.	R8	SHOULDER BERM GUTTER
D1	PROP. APPROX. 2.5″ ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ.YD.	R9	PORTABLE CONCRETE BARRIER
D2	PROP. APPROX. 3″ ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ.YD.	S	4″ CONCRETE SIDEWALK
D3	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.	T	EARTH MATERIAL
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.	U	EXISTING PAVEMENT
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.	V1	MILLING (2.5″ IN DEPTH)
E2	PROP. APPROX. 4.5″ ASPHALT CONCRETE BASE COURSE TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ.YD.	V2	MILLING (VARIES 1.5″ TO 3.0″ IN DEPTH)
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.	V3	INCIDENTAL MILLING
J1	PROPOSED 6″ AGGREGATE BASE COURSE	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL SHEET 2A-2)
J2	PROPOSED 8″ AGGREGATE BASE COURSE	Y	PROPOSED RUMBLE STRIPS



METHOD OF WEDGING DETAIL NO. 1

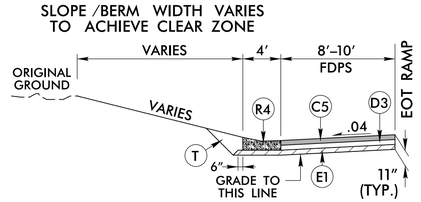
SEE PLANS FOR ALL WEDGING LOCATIONS



NOTE: MIRROR FOR END CONSTRUCTION

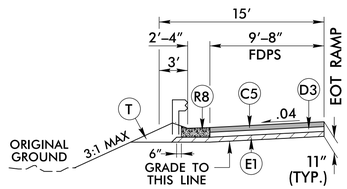
KEY–IN DETAIL NO. 2

TO BE USED AT ALL TIE–IN LOCATIONS



EXPRESSWAY GUTTER DETAIL NO. 3

SEE PLANS FOR LOCATION OF PROPOSED EXPRESSWAY GUTTER
USE WITH –Y21RPB– , –Y22RPC– & –Y4RPA– TYPICAL SECTION



SBG DETAIL NO. 3A

SEE PLANS FOR LOCATION OF PROPOSED SBG GUTTER
USE WITH –Y21RPA– TYPICAL SECTION

8/14/2020
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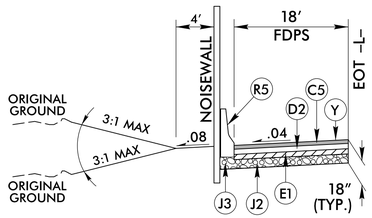
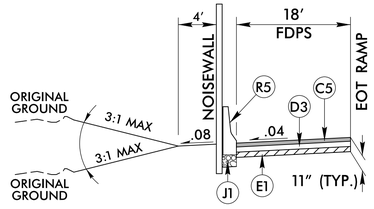
tgeorge

Submitted 9/16/2020



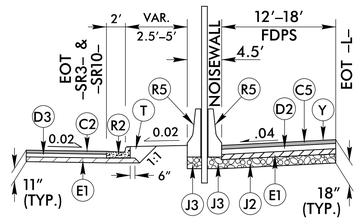
NOISEWALL WITH BARRIER DETAIL NO. 4

SEE PLANS FOR LOCATION OF PROPOSED NOISEWALL WITH BARRIER
USE WITH –L– TYPICAL SECTION



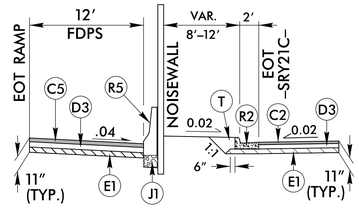
NOISEWALL WITH BARRIER DETAIL NO. 5

SEE PLANS FOR LOCATION OF PROPOSED NOISEWALL WITH BARRIER
USE WITH –RPB55– & –RPC55– TYPICAL SECTION



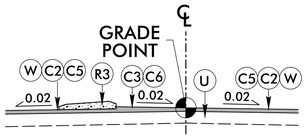
NOISEWALL WITH BARRIER DETAIL NO. 6

SEE PLANS FOR LOCATION OF PROPOSED NOISEWALL WITH BARRIER
USE WITH –L– TYPICAL SECTION



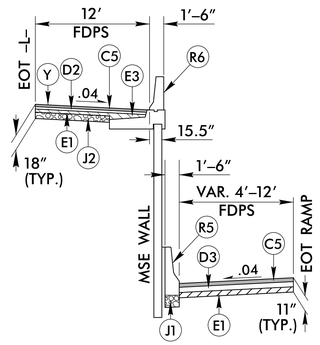
NOISEWALL WITH BARRIER DETAIL NO. 7

SEE PLANS FOR LOCATION OF PROPOSED NOISEWALL WITH BARRIER
USE WITH –Y21RPC– TYPICAL SECTION



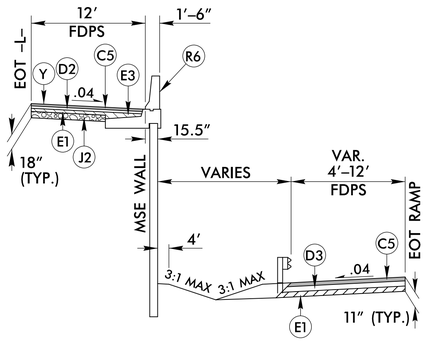
SLOPE AT TURN LANES DETAIL NO. 12

SEE PLANS FOR LOCATIONS
USE WITH SERVICE ROAD &
CROSS ROAD TYPICAL SECTIONS



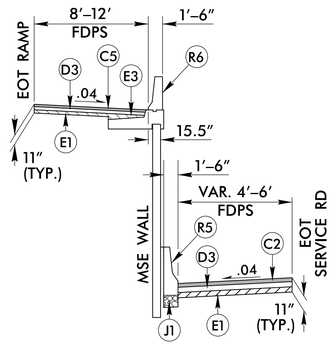
MSE WALL WITH MOMENT SLAB BARRIER DETAIL NO. 8

SEE PLANS FOR LOCATIONS OF PROPOSED MSE WALL
USE WITH –L– / RAMPS WITH BARRIER TYPICAL SECTION



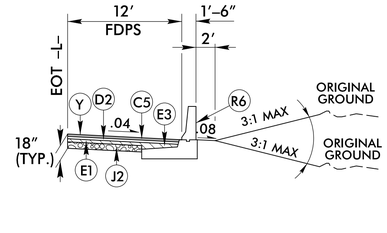
MSE WALL WITH MOMENT SLAB BARRIER DETAIL NO. 9

SEE PLANS FOR LOCATIONS OF PROPOSED MSE WALL
USE WITH –L– / RAMPS WITH GUARDRAIL TYPICAL SECTION



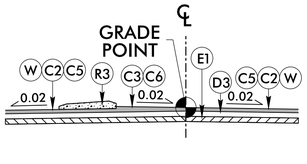
MSE WALL WITH MOMENT SLAB BARRIER DETAIL NO. 10

SEE PLANS FOR LOCATIONS OF PROPOSED MSE WALL
USE WITH RAMPS / SERVICE RD WITH BARRIER TYPICAL SECTION



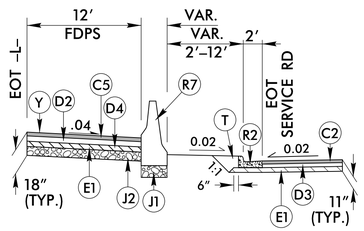
MOMENT SLAB BARRIER DETAIL NO. 11

SEE PLANS FOR LOCATIONS OF
MOMENT SLAB BARRIER WITHOUT WALL
USE WITH –L– TYPICAL SECTION



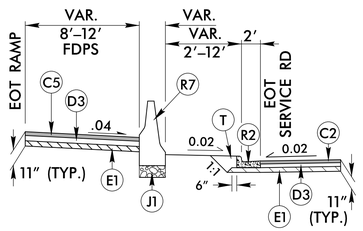
SLOPE AT TURN LANES DETAIL NO. 13

SEE PLANS FOR LOCATIONS
USE WITH SERVICE ROAD &
CROSS ROAD TYPICAL SECTIONS



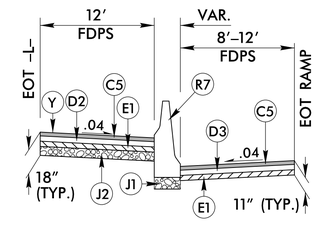
TYPE T–BARRIER DETAIL NO. 14

SEE PLANS FOR LOCATIONS OF TYPE T–BARRIER
USE WITH –L– / SERVICE RD TYPICAL SECTION



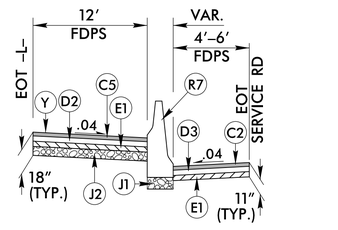
TYPE T–BARRIER DETAIL NO. 15

SEE PLANS FOR LOCATIONS OF TYPE T–BARRIER
USE WITH RAMP / SERVICE RD TYPICAL SECTION



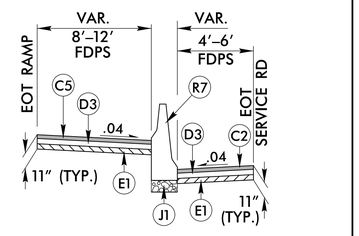
TYPE T–BARRIER DETAIL NO. 16

SEE PLANS FOR LOCATIONS OF TYPE T–BARRIER
USE WITH –L– / RAMPS TYPICAL SECTION



TYPE T–BARRIER DETAIL NO. 17

SEE PLANS FOR LOCATIONS OF TYPE T–BARRIER
USE WITH –L– / SERVICE RD TYPICAL SECTION



TYPE T–BARRIER DETAIL NO. 18

SEE PLANS FOR LOCATIONS OF TYPE T–BARRIER
USE WITH RAMPS / SERVICE RD TYPICAL SECTION

PAVEMENT SCHEDULE											
A1	6″JOINTED CONCRETE PAVEMENT	C5	3″ SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7″JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4″ BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5″ MILLING
C1	2″ SURFACE COURSE TYPE S9.5B	C7	1.5″ SURFACE COURSE TYPE S9.5B	E2	4.5″ BASE COURSE TYPE B25.0C	R1	1′-6″ CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3″ SURFACE COURSE TYPE S9.5B	D1	2.5″ INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2′-6″ CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3″ INTER. COURSE TYPE I19.0C	J1	6″ AGGREGATE BASE COURSE	R3	5″ MONO. ISLAND (RED COLORED)	S	4″ CONC. SIDEWALK	W	WEDGING
C4	1.5″ SURFACE COURSE TYPE S9.5C	D3	4″ INTER. COURSE TYPE I19.0C	J2	8″ AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/14/2020
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tlgreen

Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY,
SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.
SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

RUMBLE STRIPS TO BE LOCATED 6" FROM EOT WHERE APPROPRIATE.

TYPICAL NO. 1 & 2:

SEE DETAIL NO. 8 & 9, SHEET 2A–2 FOR MSE WALL WITH MOMENT SLAB BARRIER DETAIL
SEE DETAIL NO. 16, SHEET 2A–2 FOR TYPE T–BARRIER DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-3

ROADWAY DESIGN ENGINEER

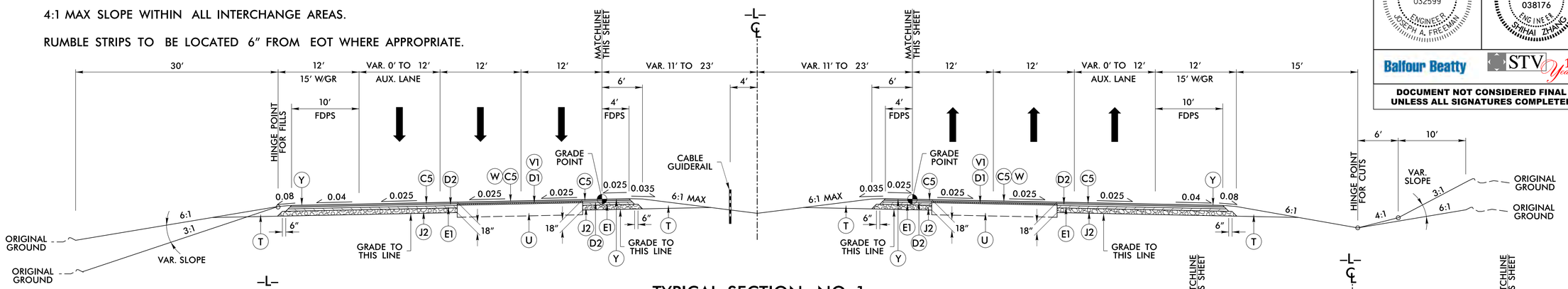
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHTAI ZHANG

Balfour Beatty | STV 100 Years

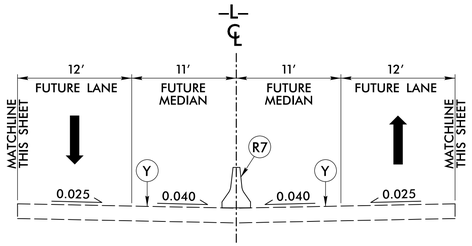
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 1

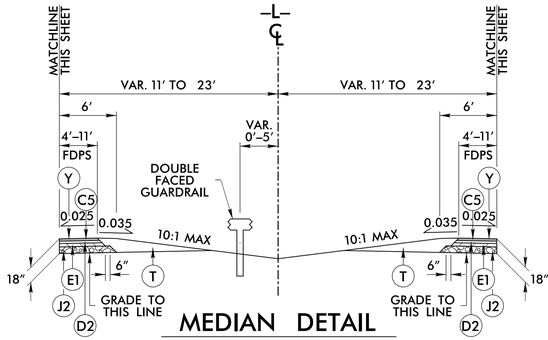
–L– STA. 245+00.00 TO 259+00.00
–L– STA. 278+50.00 TO 307+00.00
–L– STA. 329+00.00 TO 342+40.00

NOTE: SEE PLANS FOR LOCATING CABLE GUIDERAIL LEFT OR RIGHT OF CENTERLINE



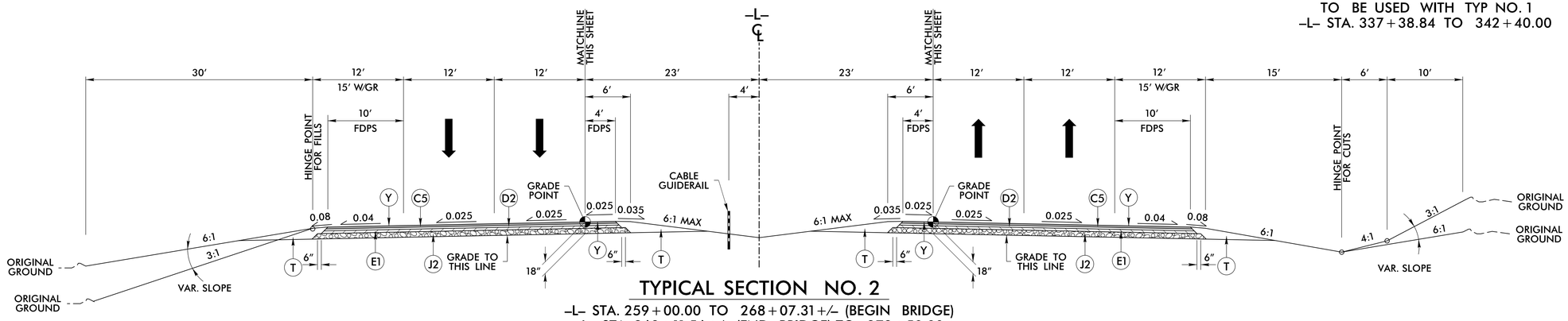
FUTURE WIDENING DETAIL

TO BE USED WITH TYP NO. 1 & 2



MEDIAN DETAIL

TO BE USED WITH TYP NO. 1
–L– STA. 337+38.84 TO 342+40.00



TYPICAL SECTION NO. 2

–L– STA. 259+00.00 TO 268+07.31 +/– (BEGIN BRIDGE)
–L– STA. 269+11.56 +/– (END BRIDGE) TO 278+50.00
–L– STA. 307+00.00 TO 318+68.10 +/– (BEGIN BRIDGE)
–L– STA. 319+67.85 +/– (END BRIDGE) TO 329+00.00

NOTE: SEE PLANS FOR LOCATING CABLE GUIDERAIL LEFT OR RIGHT OF CENTERLINE

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

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ftaylor

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS. SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

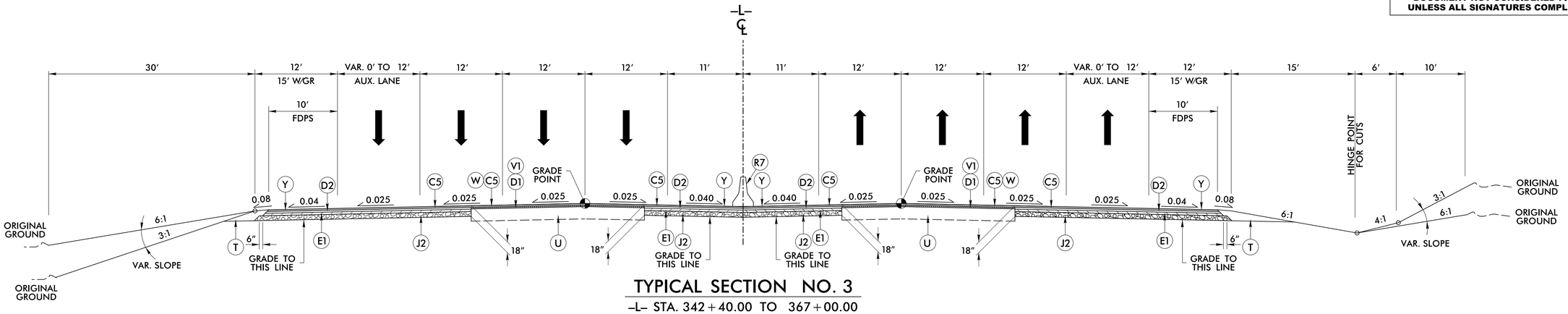
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

RUMBLE STRIPS TO BE LOCATED 6" FROM EOT WHERE APPROPRIATE.

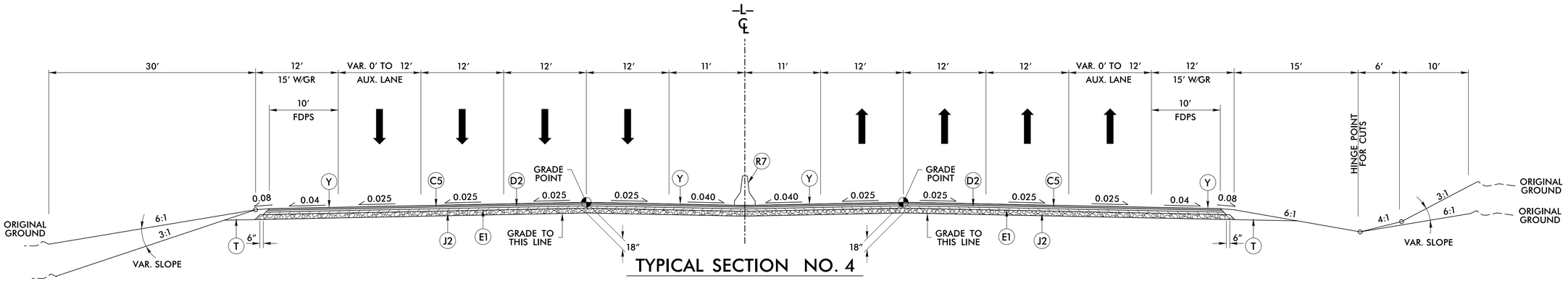
TYPICAL NO. 3 & 4:

SEE DETAIL NO. 4 & 6, SHEET 2A–2 FOR NOISEWALL WITH BARRIER DETAIL
SEE DETAIL NO. 8 & 9, SHEET 2A–2 FOR MSE WALL WITH MOMENT SLAB BARRIER DETAIL
SEE DETAIL NO. 11, SHEET 2A–2 FOR MOMENT SLAB BARRIER DETAIL
SEE DETAIL NO. 14, 16 & 17, SHEET 2A–2 FOR TYPE T–BARRIER DETAIL



TYPICAL SECTION NO. 3

–L– STA. 342+40.00 TO 367+00.00
–L– STA. 387+50.00 TO 405+50.00
–L– STA. 426+00.00 TO 432+50.00
–L– STA. 454+00.00 TO 470+52.59



TYPICAL SECTION NO. 4

–L– STA. 367+00.00 TO 376+29.14 +/– (BEGIN BRIDGE)
–L– STA. 377+49.14 +/– (END BRIDGE) TO 387+50.00
–L– STA. 405+50.00 TO 415+44.44 +/– (BEGIN BRIDGE)
–L– STA. 416+73.94 +/– (END BRIDGE) TO 426+00.00
–L– STA. 432+50.00 TO 442+66.25 +/– (BEGIN BRIDGE)
–L– STA. 443+91.00 +/– (END BRIDGE) TO 454+00.00

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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tgroce

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS. SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

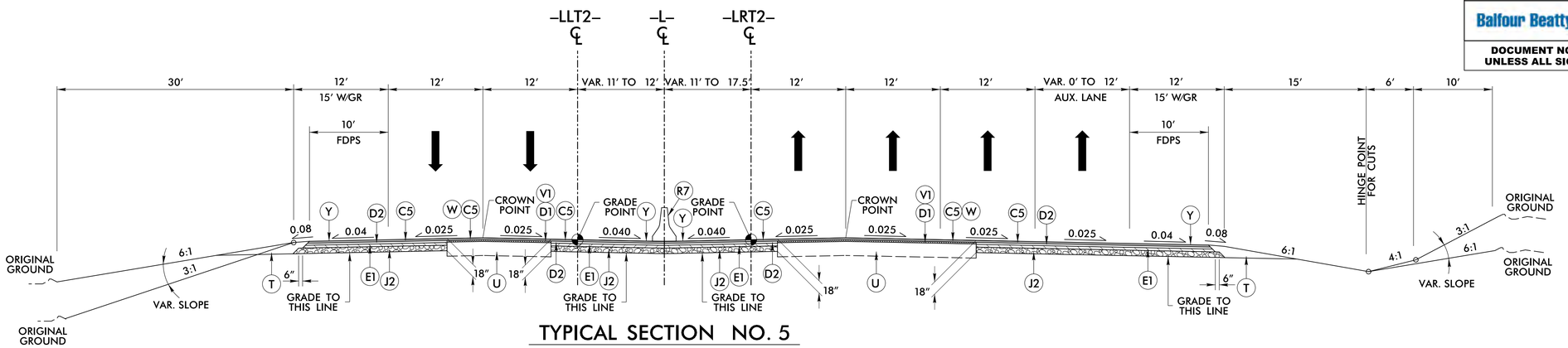
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

RUMBLE STRIPS TO BE LOCATED 6" FROM EOT WHERE APPROPRIATE.

TYPICAL NO. 5 & 6:

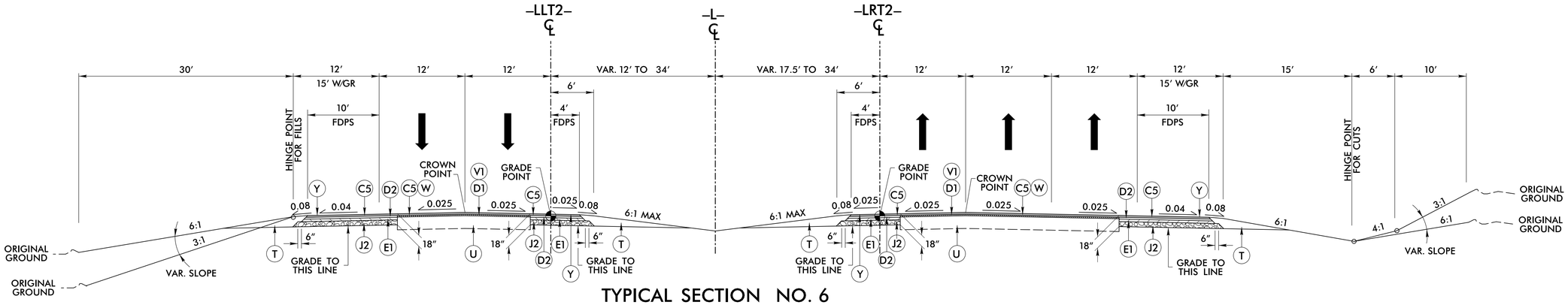
SEE DETAIL NO. 4 SHEET 2A-2 FOR NOISEWALL WITH BARRIER DETAIL



TYPICAL SECTION NO. 5

–LLT2– STA. 470+52.59 TO 473+82.10
–LRT2– STA. 470+52.59 TO 473+81.15

NOTE: SEE PLANS FOR NOISE WALL LOCATIONS



TYPICAL SECTION NO. 6

–LLT2– STA. 473+82.10 TO 480+60.00
–LRT2– STA. 473+81.15 TO 480+50.00
(SEE PLAN FOR LOCATIONS OF MEDIAN PROTECTION)

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY,
SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.
SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

RUMBLE STRIPS TO BE LOCATED 6" FROM EOT WHERE APPROPRIATE.

TYPICAL NO. 7 & 8:

SEE DETAIL NO. 5, SHEET 2A–2 FOR NOISEWALL WITH BARRIER DETAIL

TYPICAL NO. 9:

SEE DETAIL NO. 11, SHEET 2A–2 FOR MOMENT SLAB BARRIER DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A–6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

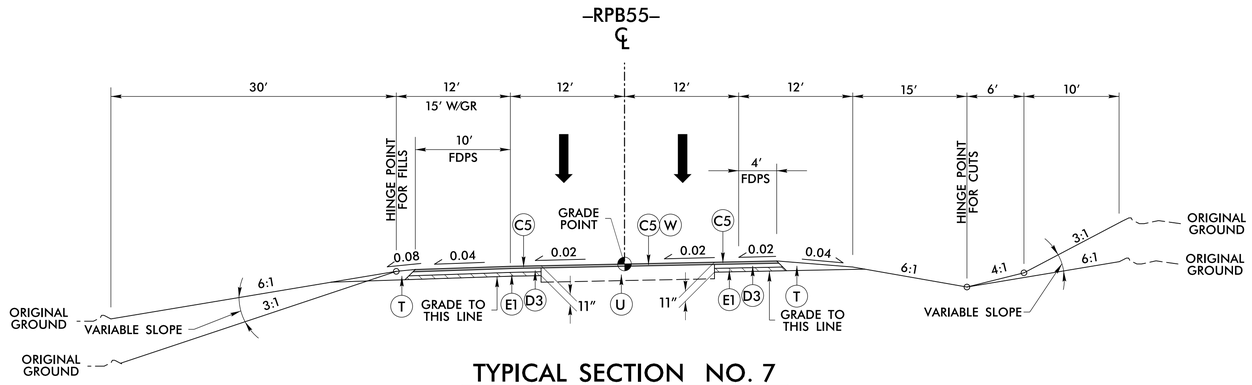
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty

STV 100 Years

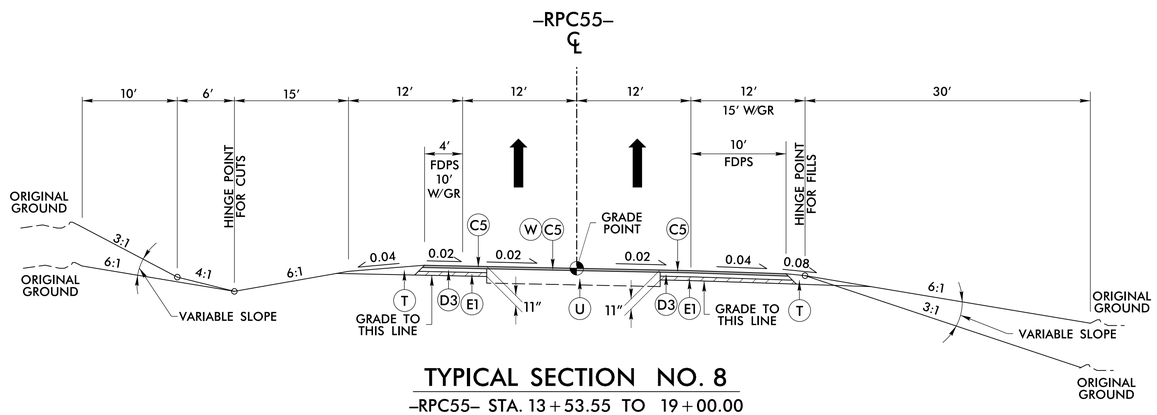
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 7

–RPB55– STA. 14+51.90 TO 20+60.00

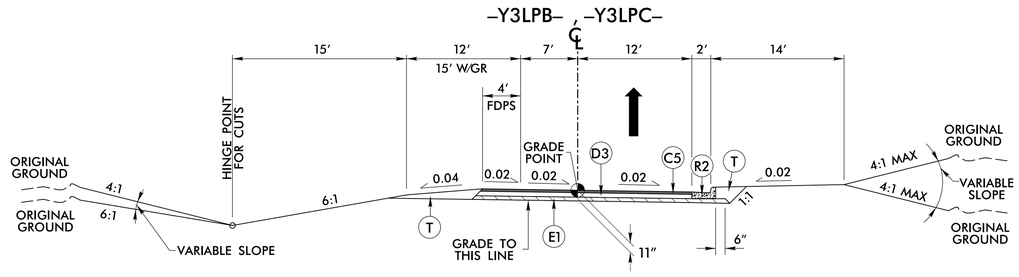
NOTE: SEE PLANS FOR NOISE WALL LOCATIONS



TYPICAL SECTION NO. 8

–RPC55– STA. 13+53.55 TO 19+00.00

NOTE: SEE PLANS FOR NOISE WALL LOCATIONS



TYPICAL SECTION NO. 9

–Y3LPB– STA. 11+77.71 TO 14+82.96
–Y3LPC– STA. 11+58.59 TO 15+34.87 *

NOTE:
* MIRROR AND REVERSE

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY,
SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.
SEE PLANS FOR LOCATIONS OF WALLS, TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

RUMBLE STRIPS TO BE LOCATED 6" FROM EOT WHERE APPROPRIATE.

NOTE: RAMP SHOULDERS (ADJACENT TO BARRIER). SEE PLANS FOR LOCATIONS.

MINIMUM 4' INSIDE SHOULDER WIDTH	=	Y4RPB
MINIMUM 5' INSIDE SHOULDER WIDTH	=	Y4RPD
MINIMUM 6' INSIDE SHOULDER WIDTH	=	Y21RPB , Y21RPD , Y22RPD , Y2RPB , Y2RPD & Y3RPB
MINIMUM 8' INSIDE SHOULDER WIDTH	=	Y2RPA , Y3RPC , Y4RPA & Y4RPC
MINIMUM 8.5' INSIDE SHOULDER WIDTH	=	Y2RPC
MINIMUM 8' OUTSIDE SHOULDER WIDTH	=	Y2RPA , Y4RPA & Y4RPC
MINIMUM 10' OUTSIDE SHOULDER WIDTH	=	Y2RPC & Y3RPC

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-7

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty | STV 100 Years

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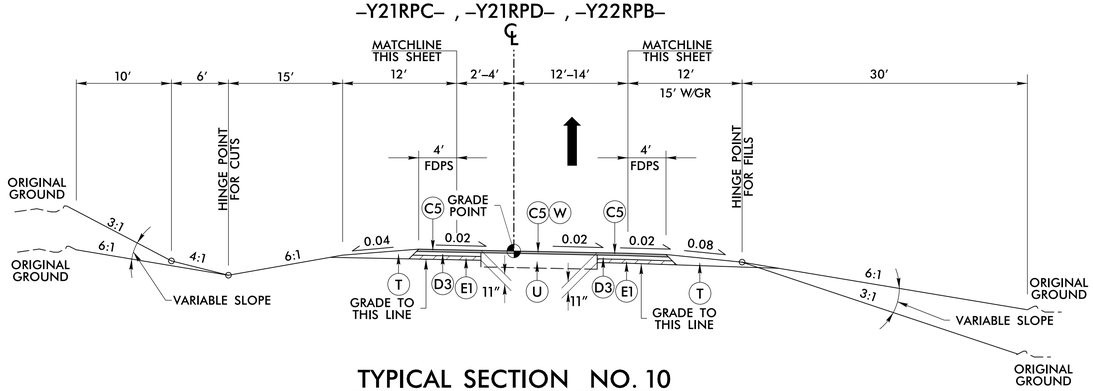
TYPICAL NO. 10 & 11:

SEE DETAIL NO. 3, SHEET 2A–2 FOR EXPRESSWAY GUTTER DETAIL
SEE DETAIL NO. 7, SHEET 2A–2 FOR NOISEWALL WITH BARRIER DETAIL
SEE DETAIL NO. 8, 9 & 10, SHEET 2A–2 FOR MSE WALL WITH MOMENT SLAB BARRIER DETAIL
SEE DETAIL NO. 15, 16 & 18, SHEET 2A–2 FOR TYPE T–BARRIER DETAIL

–Y21RPC– , –Y21RPD– , –Y22RPB–

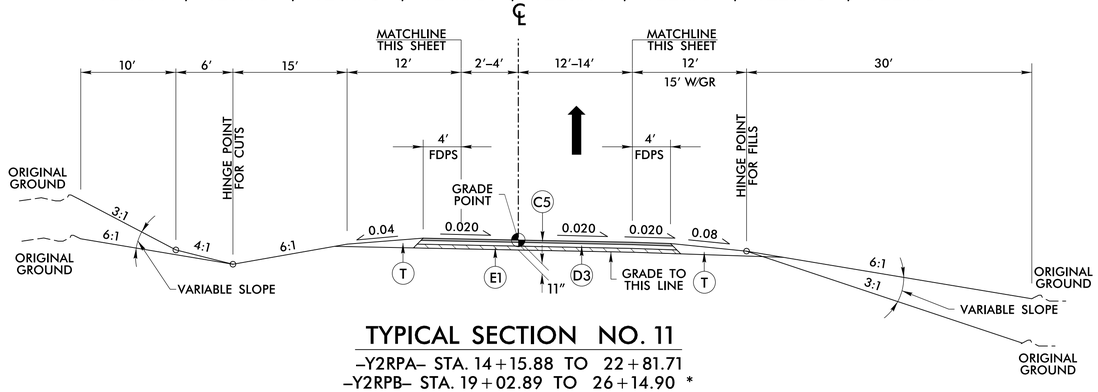


TYPICAL SECTION NO. 10

–Y21RPC– STA. 16+03.04 TO 23+35.64
–Y21RPD– STA. 20+95.45 TO 24+88.58 *
–Y22RPB– STA. 21+61.30 TO 23+98.54 *

NOTE:
* MIRROR AND REVERSE

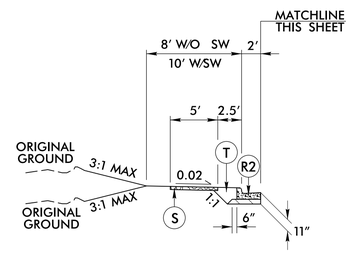
–Y2RPA– , –Y2RPB– , –Y2RPC–, –Y2RPD– , –Y3RPB– , –Y3RPC– , –Y4RPA–, –Y4RPB– , –Y4RPC– , –Y4RPD– ,
–Y21RPA– , –Y21RPB– , –Y21RPC– , –Y21RPD– , –Y22RPA– , –Y22RPB– , –Y22RPC– , –Y22RPD–



TYPICAL SECTION NO. 11

–Y2RPA– STA. 14+15.88 TO 22+81.71
–Y2RPB– STA. 19+02.89 TO 26+14.90 *
–Y2RPC– STA. 17+86.51 TO 25+89.22
–Y2RPD– STA. 18+66.02 TO 25+89.46 *
–Y3RPB– STA. 16+92.88 TO 24+98.51 *
–Y3RPC– STA. 14+90.72 TO 24+19.14
–Y4RPA– STA. 15+77.46 TO 25+24.48
–Y4RPB– STA. 18+51.56 TO 22+88.55 *
–Y4RPC– STA. 15+14.88 TO 21+11.86
–Y4RPD– STA. 19+40.19 TO 28+73.52 *
–Y21RPA– STA. 14+67.85 TO 26+42.74
–Y21RPB– STA. 17+52.23 TO 24+48.17 *
–Y21RPC– STA. 23+35.64 TO 25+13.75
–Y21RPD– STA. 18+50.38 TO 20+95.45 *
–Y21RPD– STA. 24+88.58 TO 26+09.17 *
–Y22RPA– STA. 16+60.91 TO 24+26.74
–Y22RPB– STA. 20+11.12 TO 21+61.30 *
–Y22RPB– STA. 23+98.54 TO 25+83.80 *
–Y22RPC– STA. 14+64.81 TO 26+30.56
–Y22RPD– STA. 17+72.31 TO 25+63.02 *

NOTE:
* MIRROR AND REVERSE



CURB & GUTTER DETAIL

SEE PLANS FOR LOCATIONS OF CURB & GUTTER
TO BE USED WITH TYP NO. 10 & 11

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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tfleming

Submitted 9/16/2020

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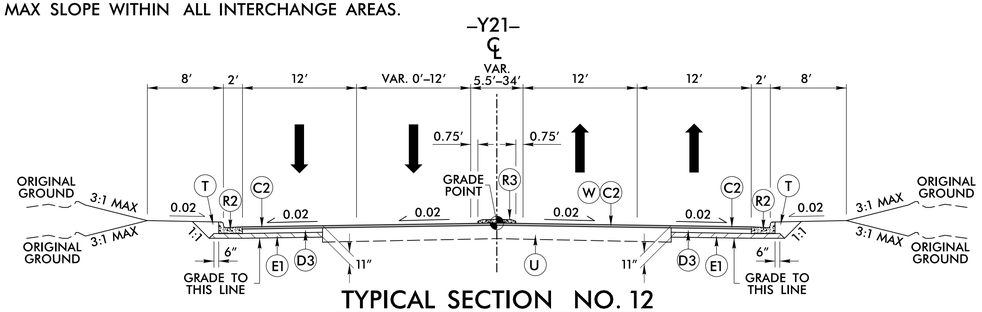
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

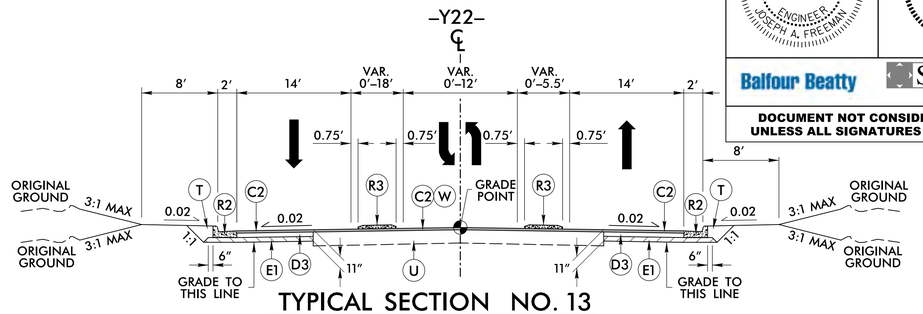
TYPICAL NO. 13 & 14:

SEE DETAIL NO. 12 & 13, SHEET 2A–2 FOR SLOPE AT TURN LANES DETAIL



TYPICAL SECTION NO. 12

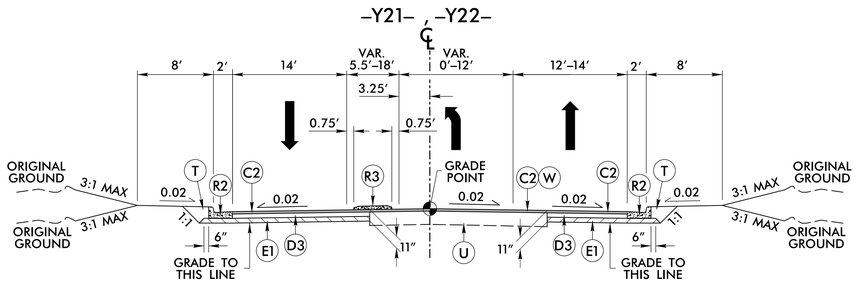
–Y21– STA. 10+90.00 TO 15+08.79



TYPICAL SECTION NO. 13

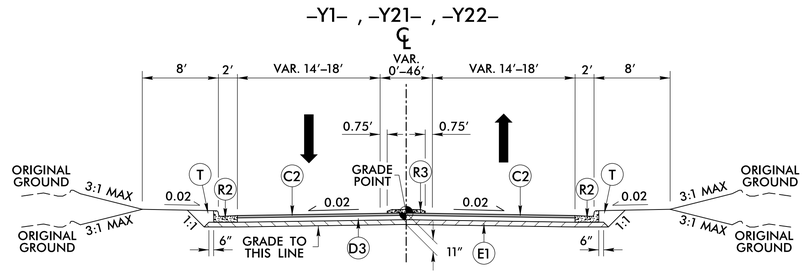
–Y22– STA. 11+50.00 TO 14+69.13

MILLING & RESURFACING ONLY
(1.5″ SURFACE COURSE C7)
–Y22– STA. 11+35.65 TO 11+50.00



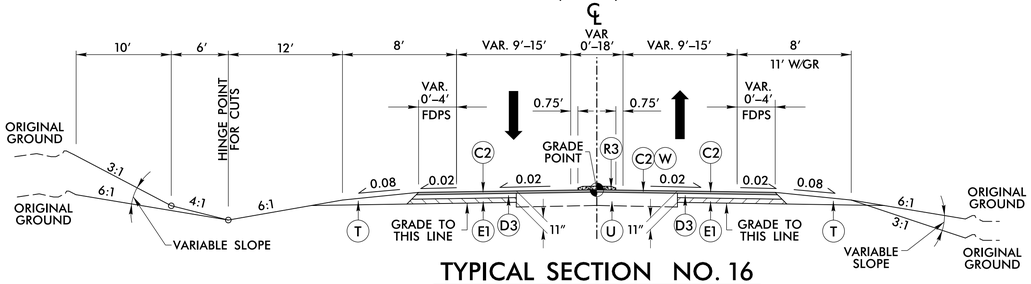
TYPICAL SECTION NO. 14

–Y21– STA. 19+56.46 TO 23+91.63
–Y22– STA. 19+28.88 TO 20+80.40



TYPICAL SECTION NO. 15

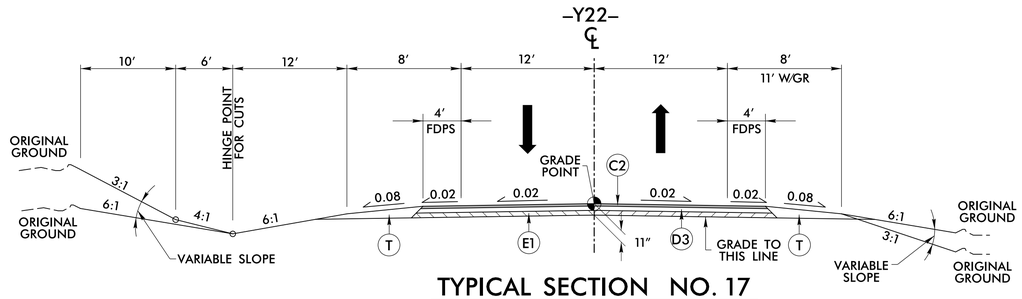
–Y1– STA. 13+00.36 TO 13+45.33
–Y1– STA. 16+05.20 TO 16+58.38
–Y21– STA. 16+46.16 TO 18+19.15
–Y22– STA. 16+05.15 TO 17+92.26
–Y22– STA. 20+80.40 TO 24+86.17



TYPICAL SECTION NO. 16

–Y1– STA. 12+47.51 TO 13+00.36
–Y1– STA. 16+58.38 TO 16+87.39
–Y2– STA. 13+62.00 TO 13+88.96
–Y2– STA. 27+35.32 TO 28+65.53
–Y21– STA. 23+91.63 TO 27+28.75

MILLING & RESURFACING ONLY
(1.5″ SURFACE COURSE C7)
–Y21– STA. 27+28.75 TO 27+50.00



TYPICAL SECTION NO. 17

–Y22– STA. 24+86.17 TO 36+39.10

PAVEMENT SCHEDULE											
A1	6″JOINTED CONCRETE PAVEMENT	C5	3″ SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7″JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4″ BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5″ MILLING
C1	2″ SURFACE COURSE TYPE S9.5B	C7	1.5″ SURFACE COURSE TYPE S9.5B	E2	4.5″ BASE COURSE TYPE B25.0C	R1	1′-6″ CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3″ SURFACE COURSE TYPE S9.5B	D1	2.5″ INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2′-6″ CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3″ INTER. COURSE TYPE I19.0C	J1	6″ AGGREGATE BASE COURSE	R3	5″ MONO. ISLAND (RED COLORED)	S	4″ CONC. SIDEWALK	W	WEDGING
C4	1.5″ SURFACE COURSE TYPE S9.5C	D3	4″ INTER. COURSE TYPE I19.0C	J2	8″ AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-8

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty STV 100 Years

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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

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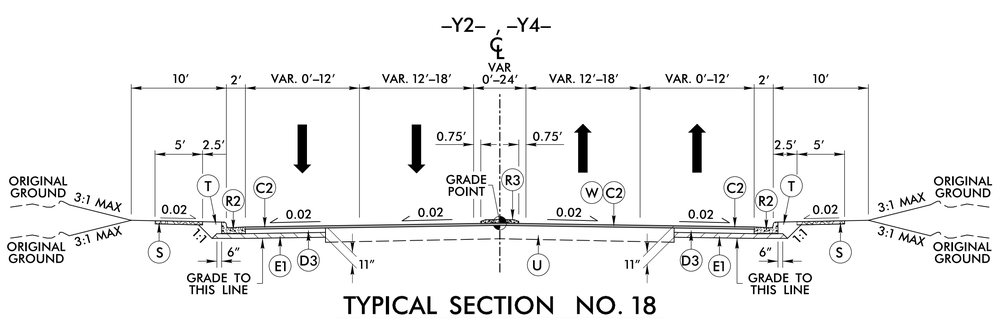
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

TYPICAL NO. 18 & 20:

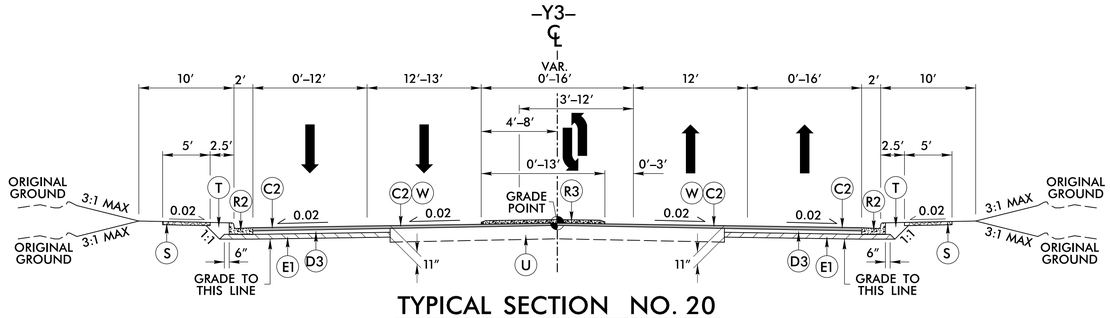
SEE DETAIL NO. 12 & 13, SHEET 2A-2 FOR SLOPE AT TURN LANES DETAIL



TYPICAL SECTION NO. 18

-Y2- STA. 13+88.96 TO 14+37.15
-Y2- STA. 15+73.25 TO 17+06.03
-Y2- STA. 21+46.21 TO 27+35.32
-Y4- STA. 16+55.00 TO 19+04.60
-Y4- STA. 20+40.47 TO 21+43.66

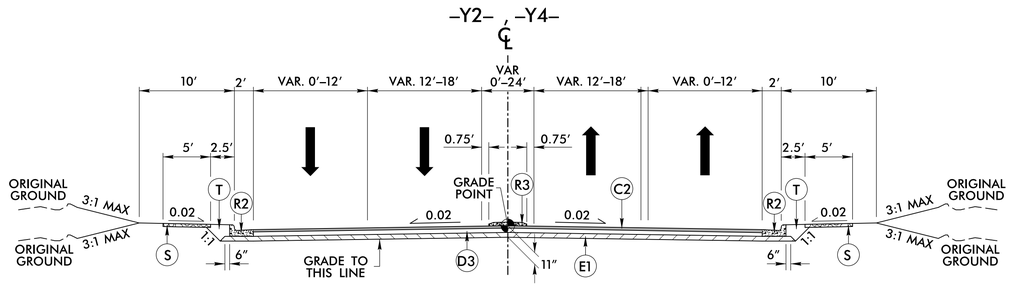
NO SIDEWALK FROM
-Y2- STA. 13+88.96 TO 14+37.15
-Y2- STA. 26+79.19 TO 27+35.32
-Y4- STA. 16+55.00 TO 20+40.00



TYPICAL SECTION NO. 20

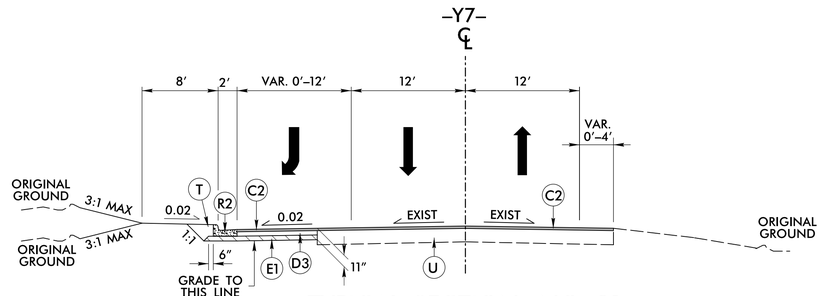
-Y3- STA. 18+13.02 TO 30+76.03

NO SIDEWALK FROM
-Y3- STA. 18+13.02 TO 19+44.72



TYPICAL SECTION NO. 19

-Y2- STA. 18+50.00 TO 19+95.00
-Y4- STA. 22+79.66 TO 24+29.06
-Y4- STA. 25+65.07 TO 27+33.70



TYPICAL SECTION NO. 21

-Y7- STA. 11+06.99 TO 16+26.05

PAVEMENT SCHEDULE											
A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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tgmoore

Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY,
SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.
SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

TYPICAL NO. 23 & 24:

SEE DETAIL NO. 6 & 7, SHEET 2A–2 FOR NOISEWALL WITH BARRIER DETAIL
SEE DETAIL NO. 10, SHEET 2A–2 FOR MSE WALL WITH MOMENT SLAB BARRIER DETAIL
SEE DETAIL NO. 12 & 13, SHEET 2A–2 FOR SLOPE AT TURN LANES DETAIL
SEE DETAIL NO. 14, 15, 17 & 18, SHEET 2A–2 FOR TYPE T–BARRIER DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A–10

ROADWAY DESIGN ENGINEER

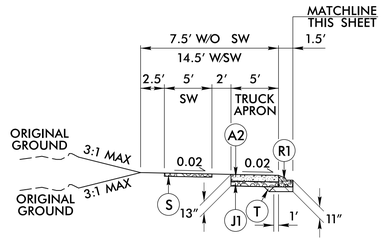
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty | STV 100 Years

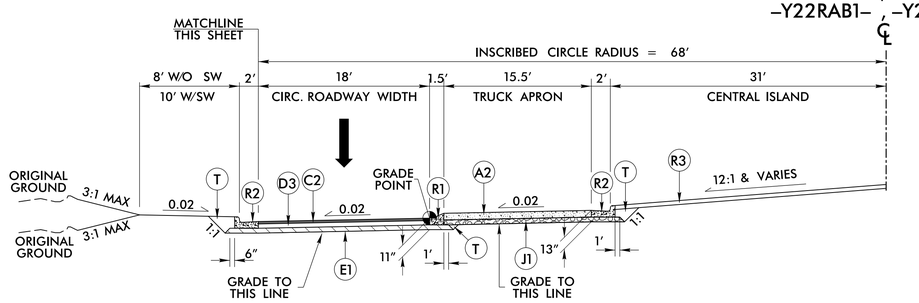
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TRUCK APRON DETAIL

SEE PLANS FOR LOCATIONS OF TRUCK APRON
TO BE USED WITH TYP NO. 22

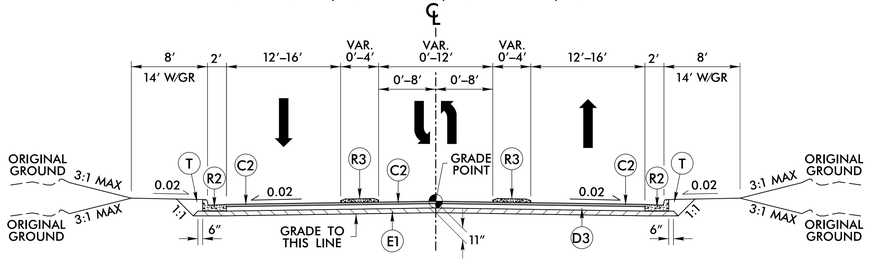
–Y2RAB1– , –Y2RAB2– , –Y2RAB3– ,
–Y4RAB1– , –Y4RAB2– , –Y4RAB3– ,
–Y21RAB1– , –Y21RAB2– ,
–Y22RAB1– , –Y22RAB2–



TYPICAL SECTION NO. 22

–Y2RAB1– STA. 10+00.00 TO 13+28.36
–Y2RAB2– STA. 10+00.00 TO 13+41.95
–Y2RAB3– STA. 10+00.00 TO 13+14.16
–Y4RAB1– STA. 10+00.00 TO 13+14.16
–Y4RAB2– STA. 10+00.00 TO 13+11.40
–Y4RAB3– STA. 10+00.00 TO 13+11.21
–Y21RAB1– STA. 10+00.00 TO 13+05.40
–Y21RAB2– STA. 10+00.00 TO 13+06.71
–Y22RAB1– STA. 10+00.00 TO 13+13.47
–Y22RAB2– STA. 10+00.00 TO 13+12.06

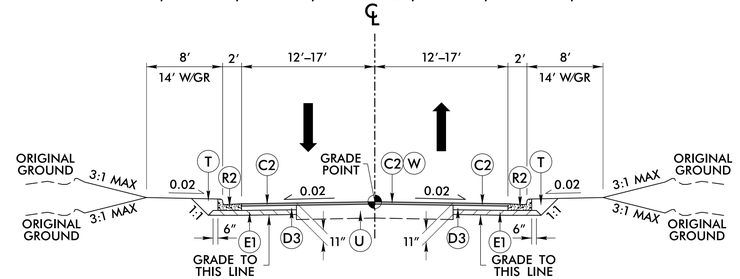
–SR1– , –SR2– , –SR3– ,
–SRY21A– , –SRY21B– , –SRY21B2– , –SRY21C–
–SRY21C2– , –SRY21D– , –SRY22A– , –SRY22D–



TYPICAL SECTION NO. 23

–SR1– STA. 39+77.00 TO 44+51.57
–SR2– STA. 10+65.78 TO 17+30.00
–SR2– STA. 45+40.00 TO 54+74.99
–SR3– STA. 10+34.19 TO 18+63.00
–SR3– STA. 31+68.70 TO 38+21.71
–SRY21A– STA. 10+26.93 TO 64+83.00
–SRY21B– STA. 15+00.00 TO 43+18.57
–SRY21B2– STA. 10+14.00 TO 12+00.32
–SRY21C– STA. 12+70.00 TO 21+71.21
–SRY21C– STA. 33+03.73 TO 37+66.30
–SRY21C– STA. 48+36.58 TO 66+54.08
–SRY21C2– STA. 10+14.59 TO 22+41.60
–SRY21D– STA. 10+22.75 TO 38+30.00
–SRY22A– STA. 10+23.03 TO 33+36.45
–SRY22D– STA. 10+16.75 TO 33+41.34

–SR1– , –SR2– , –SR3– , –SR4A– , –SR4B– , –SR4C– ,
–SR5– , –SR6– , –SR7– , –SRY21C–, –SRS1–, –SRS1A–, –SRS2–



TYPICAL SECTION NO. 24

–SR1– STA. 10+00.00 TO 39+77.00
–SR2– STA. 17+30.00 TO 45+40.00
–SR3– STA. 18+63.00 TO 31+68.70
–SR4A– STA. 10+64.92 TO 15+87.18
–SR4B– STA. 10+16.00 TO 12+10.41
–SR4C– STA. 11+03.43 TO 19+83.45
–SR5– STA. 10+71.45 TO 38+76.85
–SR6– STA. 10+30.27 TO 31+62.37
–SR7– STA. 10+00.00 TO 40+50.02
–SR10– STA. 9+72.13 TO 32+00.00
–SRY21C– STA. 21+71.21 TO 33+03.73
–SRY21C– STA. 37+66.30 TO 48+36.58
–SRS1– STA. 10+14.00 TO 10+34.94
–SRS2– STA. 10+14.01 TO 11+13.87

PAVEMENT SCHEDULE

A1	6"JOINTED CONCRETE PAVEMENT	C5	3" SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7"JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4" BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5" MILLING
C1	2" SURFACE COURSE TYPE S9.5B	C7	1.5" SURFACE COURSE TYPE S9.5B	E2	4.5" BASE COURSE TYPE B25.0C	R1	1'-6" CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3" SURFACE COURSE TYPE S9.5B	D1	2.5" INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2'-6" CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3" INTER. COURSE TYPE I19.0C	J1	6" AGGREGATE BASE COURSE	R3	5" MONO. ISLAND (RED COLORED)	S	4" CONC. SIDEWALK	W	WEDGING
C4	1.5" SURFACE COURSE TYPE S9.5C	D3	4" INTER. COURSE TYPE I19.0C	J2	8" AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

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Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS. SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

TYPICAL NO. 26:

SEE DETAIL NO. 14, 15, 17 & 18, SHEET 2A–2 FOR TYPE T–BARRIER DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A–11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

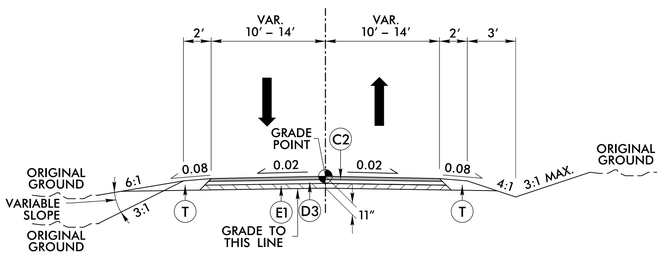
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

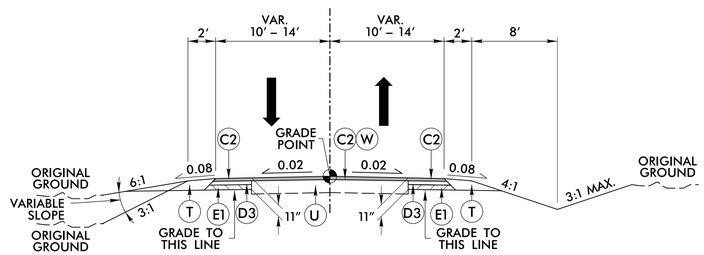
–SRS1–, –SRS1A–



TYPICAL SECTION NO. 25

–SRS1– STA. 10+34.94 TO 11+19.42
–SRS1A– STA. 10+18.32 TO 11+24.13

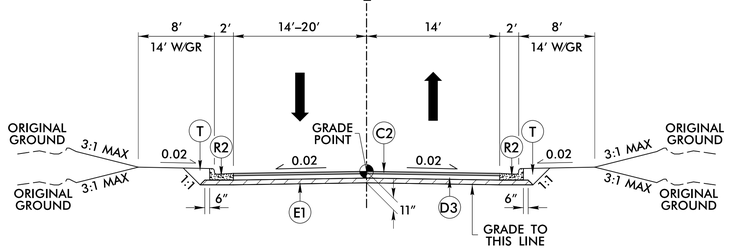
–SR4C–



TYPICAL SECTION NO. 26

–SR4C– STA. 19+83.45 TO 20+83.45

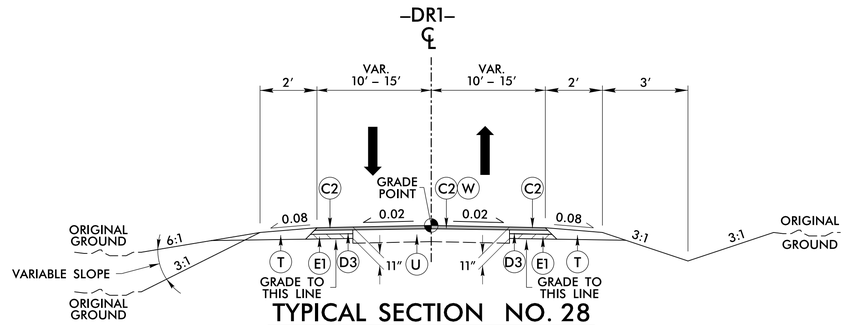
–SR8–



TYPICAL SECTION NO. 27

–SR8– STA. 10+14.55 TO 22+38.96

–DR1–



TYPICAL SECTION NO. 28

–DR1– STA. 10+14.00 TO 11+75.00

RESURFACING ONLY (1.5″ SURFACE COURSE (C7))
–DR1– STA. 11+75.00 TO 16+45.18

PAVEMENT SCHEDULE											
A1	6″JOINTED CONCRETE PAVEMENT	C5	3″ SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7″JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4″ BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5″ MILLING
C1	2″ SURFACE COURSE TYPE S9.5B	C7	1.5″ SURFACE COURSE TYPE S9.5B	E2	4.5″ BASE COURSE TYPE B25.0C	R1	1′-6″ CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3″ SURFACE COURSE TYPE S9.5B	D1	2.5″ INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2′-6″ CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3″ INTER. COURSE TYPE I19.0C	J1	6″ AGGREGATE BASE COURSE	R3	5″ MONO. ISLAND (RED COLORED)	S	4″ CONC. SIDEWALK	W	WEDGING
C4	1.5″ SURFACE COURSE TYPE S9.5C	D3	4″ INTER. COURSE TYPE I19.0C	J2	8″ AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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tregamo

Submitted 9/16/2020

NOTE: TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY,
SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS.
SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

4:1 MAX SLOPE WITHIN ALL INTERCHANGE AREAS.

WIDTH AT TURNOUT VARIES TO EXISTING

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-12

ROADWAY DESIGN ENGINEER

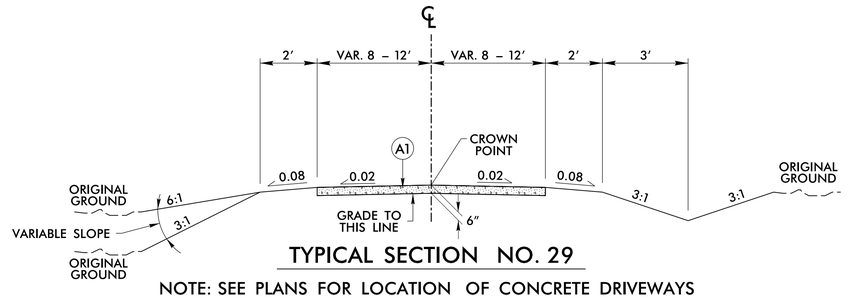
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG

Balfour Beatty | STV 100 Years

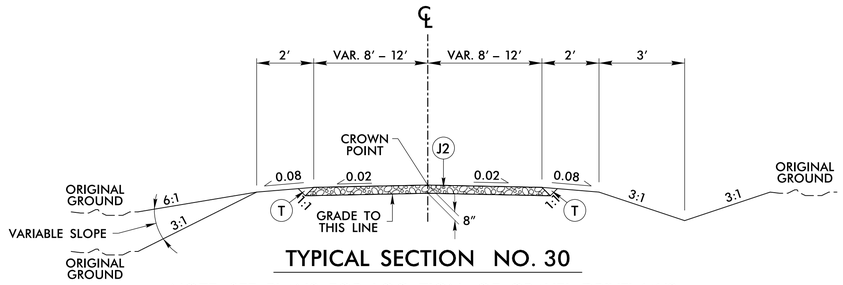
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TYPICAL SECTION NO. 29

NOTE: SEE PLANS FOR LOCATION OF CONCRETE DRIVEWAYS

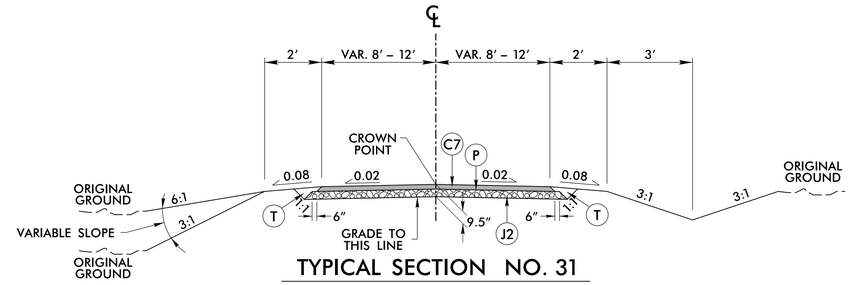
FOR DRIVEWAYS 10% GRADE OR LESS ONLY



TYPICAL SECTION NO. 30

NOTE: SEE PLANS FOR LOCATION OF GRAVEL DRIVEWAYS

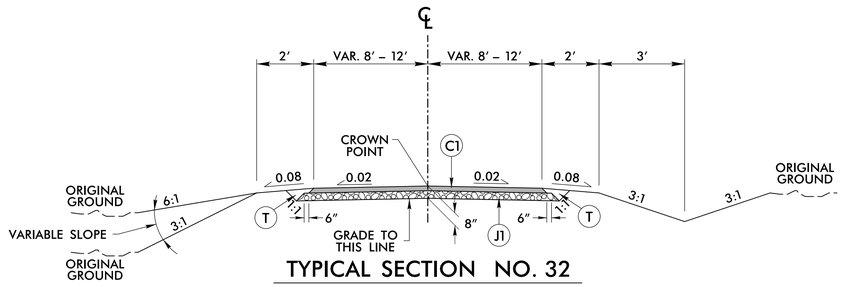
FOR DRIVEWAYS 10% GRADE OR LESS ONLY



TYPICAL SECTION NO. 31

NOTE: SEE PLANS FOR LOCATION OF ASPHALT DRIVEWAYS

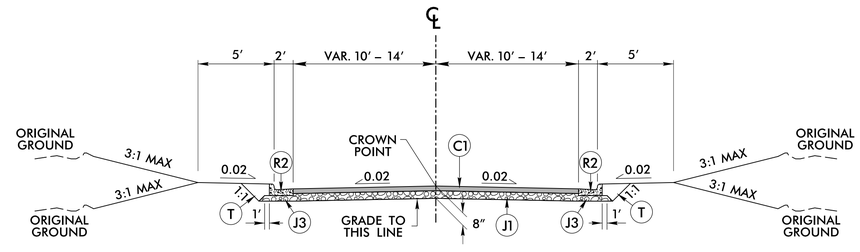
FOR DRIVEWAYS 10% GRADE ONLY



TYPICAL SECTION NO. 32

NOTE: SEE PLANS FOR LOCATION OF ASPHALT DRIVEWAYS

FOR DRIVEWAYS 10% GRADE OR LESS ONLY



TYPICAL SECTION NO. 33

NOTE: SEE PLANS FOR LOCATION OF ASPHALT DRIVEWAYS

FOR DRIVEWAYS 10% GRADE OR LESS ONLY

PAVEMENT SCHEDULE

A1	6″JOINTED CONCRETE PAVEMENT	C5	3″ SURFACE COURSE TYPE S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	U	EXISTING PAVEMENT
A2	7″JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	E1	4″ BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	V1	2.5″ MILLING
C1	2″ SURFACE COURSE TYPE S9.5B	C7	1.5″ SURFACE COURSE TYPE S9.5B	E2	4.5″ BASE COURSE TYPE B25.0C	R1	1′-6″ CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V2	VAR. MILLING
C2	3″ SURFACE COURSE TYPE S9.5B	D1	2.5″ INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2′-6″ CURB & GUTTER	R8	SHOULDER BERM GUTTER	V3	INCIDENTAL MILLING
C3	VAR. S9.5B	D2	3″ INTER. COURSE TYPE I19.0C	J1	6″ AGGREGATE BASE COURSE	R3	5″ MONO. ISLAND (RED COLORED)	S	4″ CONC. SIDEWALK	W	WEDGING
C4	1.5″ SURFACE COURSE TYPE S9.5C	D3	4″ INTER. COURSE TYPE I19.0C	J2	8″ AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	T	EARTH MATERIAL	Y	RUMBLE STRIPS

8/14/2020
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ft_ecpw

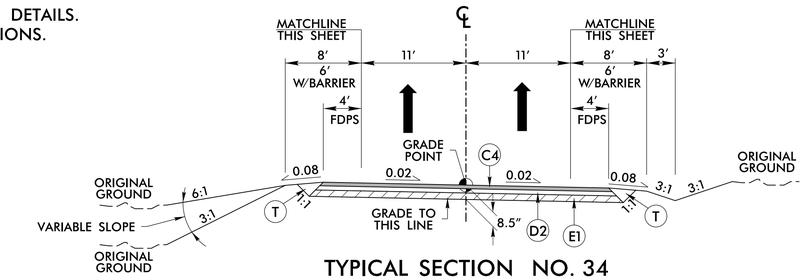
Submitted 9/16/2020

NOTE:

TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY, SEE PLANS AND STANDARD DRAWINGS FOR SUPERELEVATION DETAILS. SEE PLANS FOR LOCATIONS OF TURN LANES AND INTERSECTIONS.

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE.

–Y2BAT– , –Y2CDT– , –Y3BAT– ,–Y3CDT– , –Y4BAT–, –Y4CDT– , –Y21BAT– , –Y21CDT– , –Y22BAT– & –Y22CDT–



TYPICAL SECTION NO. 34

TEMPORARY ALIGNMENTS

MIRROR AND REVERSE

PENDING TEMPORARY ALIGNMENT DESIGN WILL BE PROVIDED IN FUTURE SUBMITTAL

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A–12A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

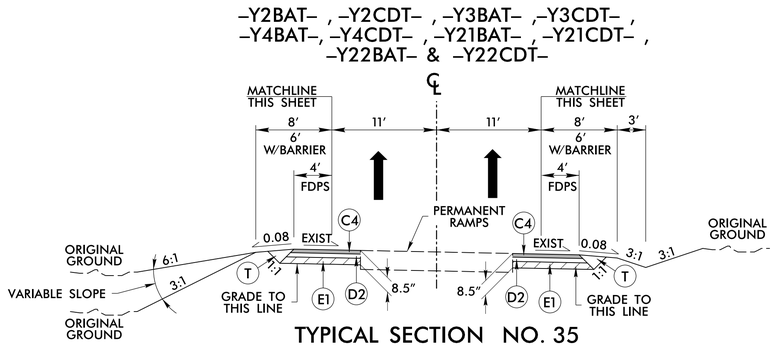
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 40555 ENGINEER SCOTT GUTOWSKI

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y2BAT– , –Y2CDT– , –Y3BAT– ,–Y3CDT– , –Y4BAT–, –Y4CDT– , –Y21BAT– , –Y21CDT– , –Y22BAT– & –Y22CDT–

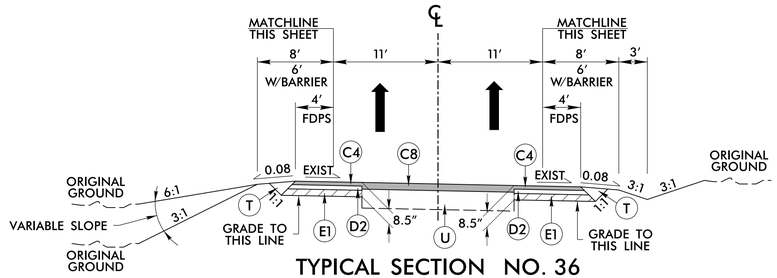


TYPICAL SECTION NO. 35

TEMPORARY ALIGNMENTS

MIRROR AND REVERSE

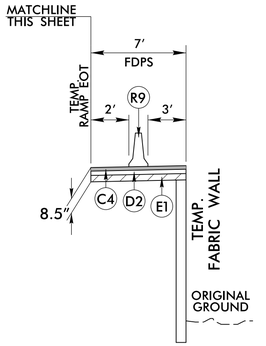
–Y3BAT– & –Y3CDT–



TYPICAL SECTION NO. 36

TEMPORARY ALIGNMENTS

MIRROR AND REVERSE

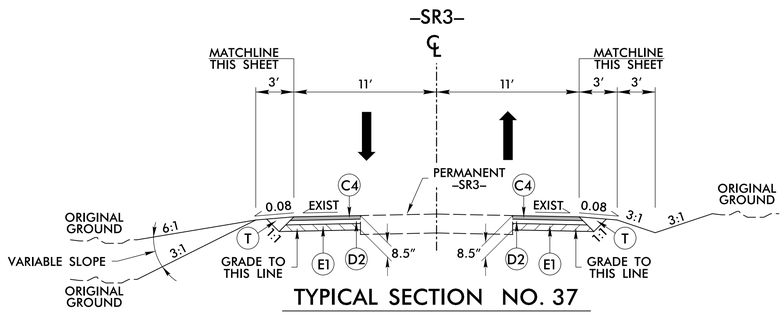


TEMPORARY FABRIC WALL DETAIL

SEE PLANS FOR LOCATIONS OF TEMPORARY FABRIC WALL

MIRROR AND REVERSE

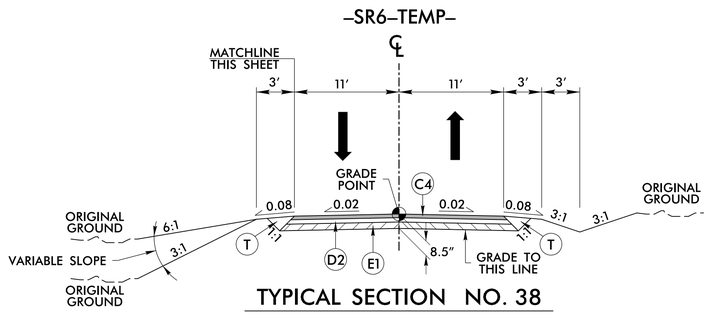
–SR3–



TYPICAL SECTION NO. 37

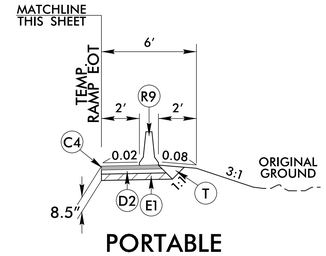
TEMPORARY ALIGNMENTS

–SR6–TEMP–



TYPICAL SECTION NO. 38

TEMPORARY ALIGNMENTS



PORTABLE CONCRETE BARRIER DETAIL

SEE PLANS FOR LOCATIONS OF PCB.

MIRROR AND REVERSE

PAVEMENT SCHEDULE

A1	6″JOINTED CONCRETE PAVEMENT	C5	3″ SURFACE COURSE TYPE S9.5C	D3	4″ INTER. COURSE TYPE I19.0C	J2	8″ AGGREGATE BASE COURSE	R4	EXPRESSWAY GUTTER	S	4″ CONC. SIDEWALK	W	WEDGING
A2	7″JOINTED CONCRETE TRUCK APRON	C6	VAR. S9.5C	D4	VAR. DEPTH I19.0C	J3	VAR. AGGREGATE BASE COURSE	R5	SINGLE FACED CONC. BARRIER	T	EARTH MATERIAL	Y	RUMBLE STRIPS
C1	2″ SURFACE COURSE TYPE S9.5B	C7	1.5″ SURFACE COURSE TYPE S9.5B	E1	4″ BASE COURSE TYPE B25.0C	P	PRIME COAT	R6	SINGLE FACED CONC. BARRIER WITH MOMENT SLAB	U	EXISTING PAVEMENT		
C2	3″ SURFACE COURSE TYPE S9.5B	C8	4″ SURFACE COURSE TYPE S9.5C	E2	4.5″ BASE COURSE TYPE B25.0C	R1	1′-6″ CURB & GUTTER	R7	TYPE T CONC. BARRIER (T,T1,T2)	V1	2.5″ MILLING		
C3	VAR. S9.5B	D1	2.5″ INTER. COURSE TYPE I19.0C	E3	VAR. B25.0C	R2	2′-6″ CURB & GUTTER	R8	SHOULDER BERM GUTTER	V2	VAR. MILLING		
C4	1.5″ SURFACE COURSE TYPE S9.5C	D2	3″ INTER. COURSE TYPE I19.0C	J1	6″ AGGREGATE BASE COURSE	R3	5″ MONO. ISLAND (RED COLORED)	R9	PORTABLE CONC. BARRIER	V3	INCIDENTAL MILLING		

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tfeezor

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-13

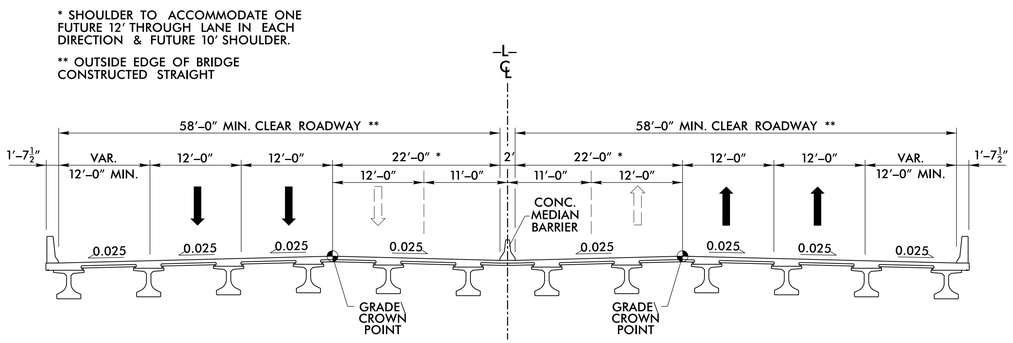
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

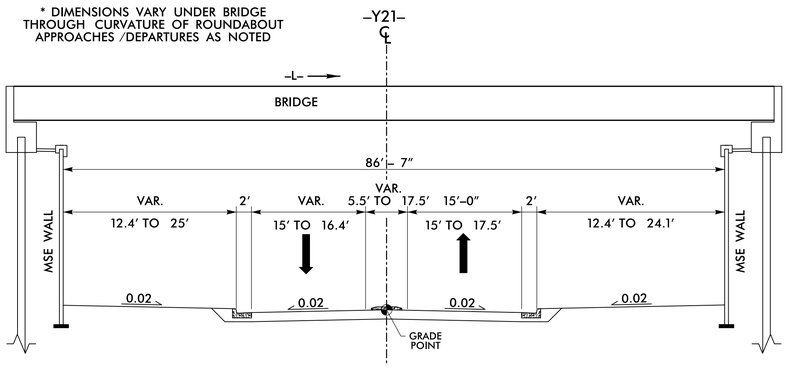
Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

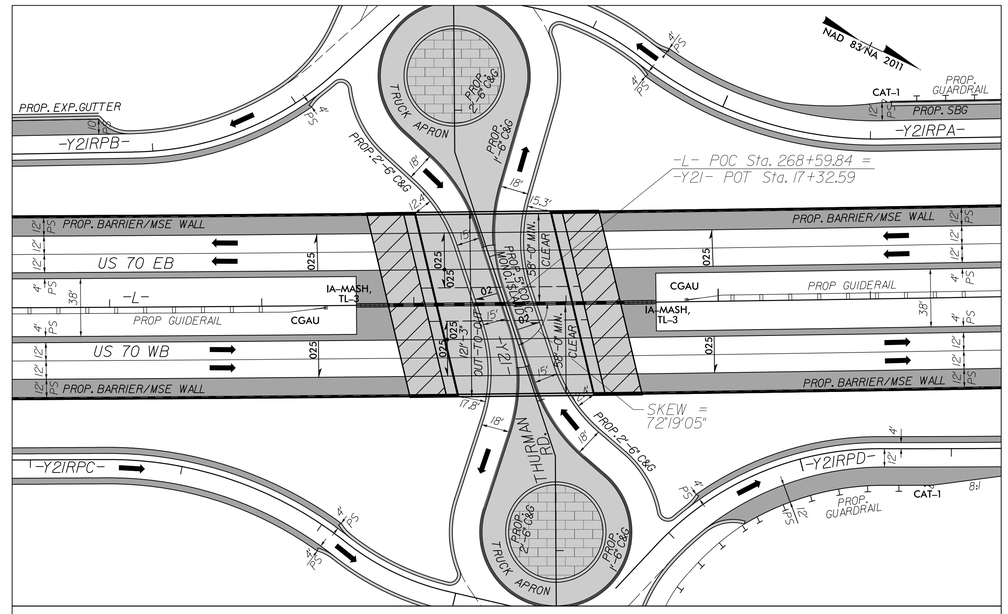
STRUCTURE #1
BRIDGE AT –L– STA. 268+59.84 OVER –Y21– STA. 17+32.59



STRUCTURE TYPICAL SECTION



TYPICAL SECTION UNDER STRUCTURE



SCALE: 1" = 50'

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP FOR –L– OVER –Y21– (THURMAN RD.)

8/14/2020
R:\Roadway\Proj\Structure Rec\U-5713-R-5777_rdy_struc rec_TYP.dgn
tfleming

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-14

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

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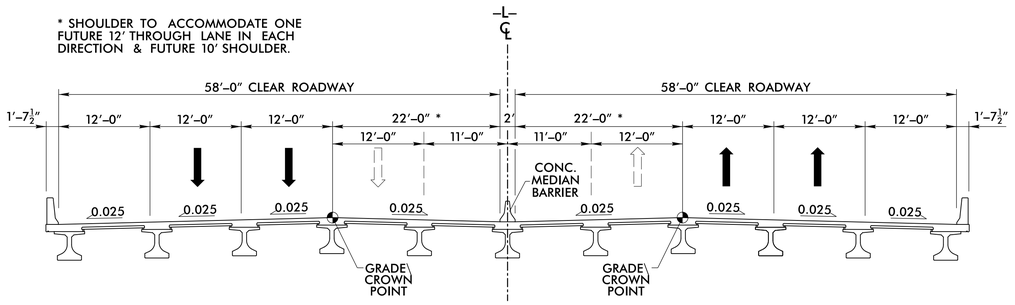
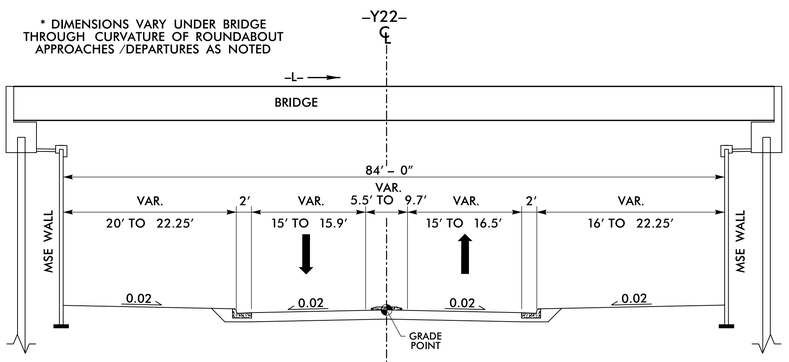
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STRUCTURE #2
BRIDGE AT –L– STA. 319+17.97 OVER –Y22– STA. 16+98.60



STRUCTURE TYPICAL SECTION



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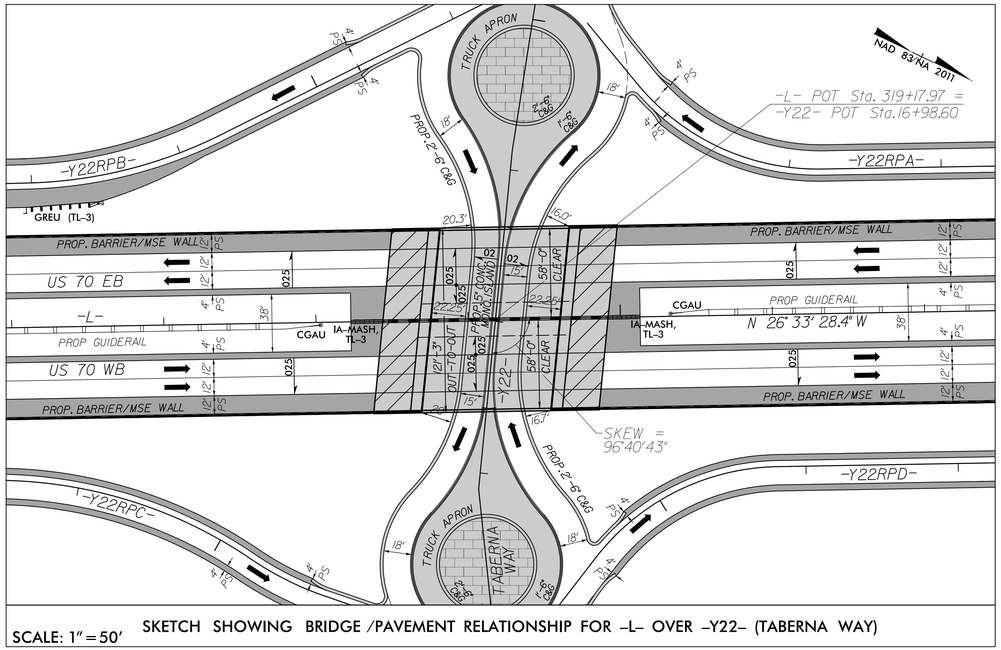

SCALE: 1" = 50'

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP FOR –L– OVER –Y22– (TABERNA WAY)

8/14/2020
R:\Roadway\Proj\Structure Rec\U-5713-R-5777_rdy_struc rec_TYP.dgn
rtgreno

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-15

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

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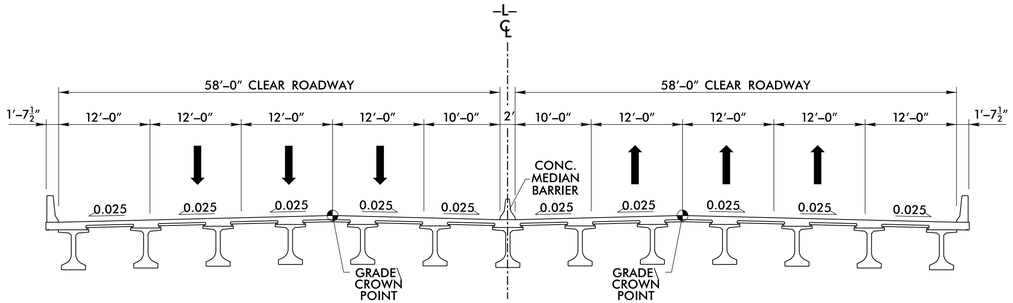
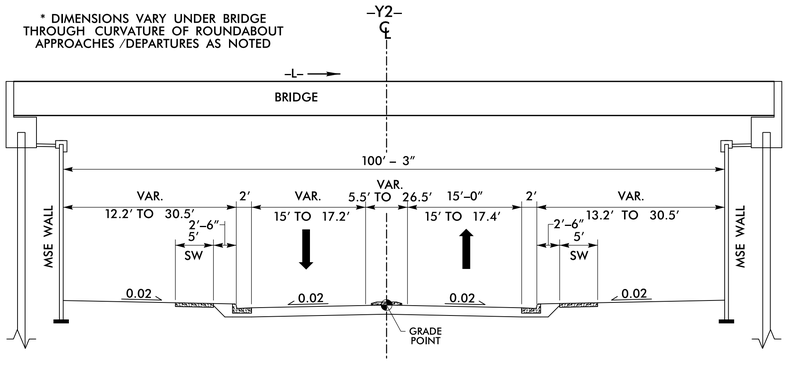
STRUCTURE #3
BRIDGE AT –L– STA. 376+88.97 OVER –Y2– STA. 19+20.94



STRUCTURE TYPICAL SECTION



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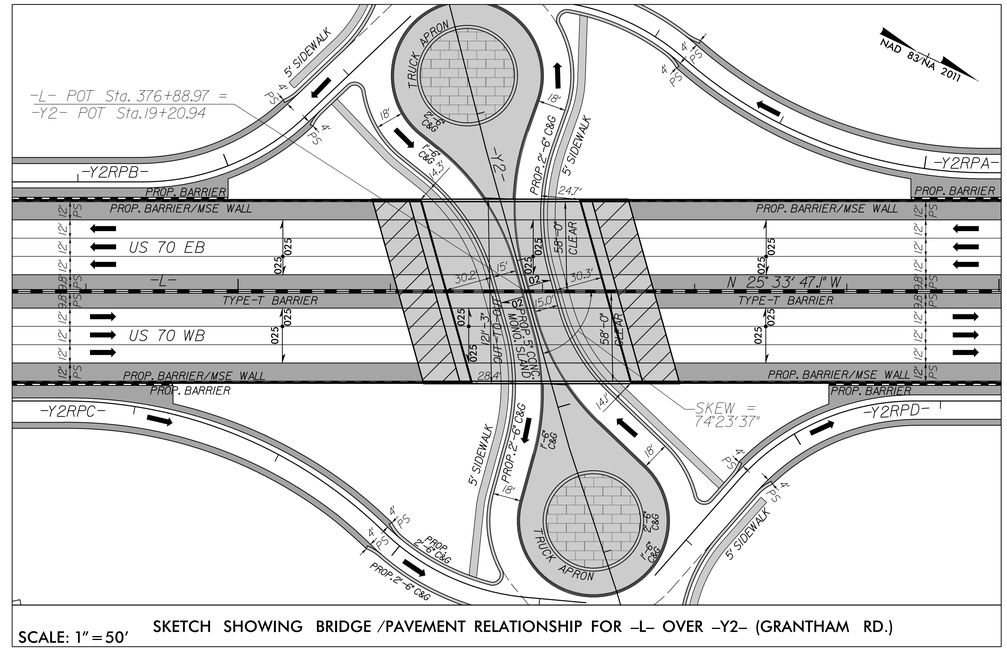

SCALE: 1″ = 50′

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP FOR –L– OVER –Y2– (GRANTHAM RD.)

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-16

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

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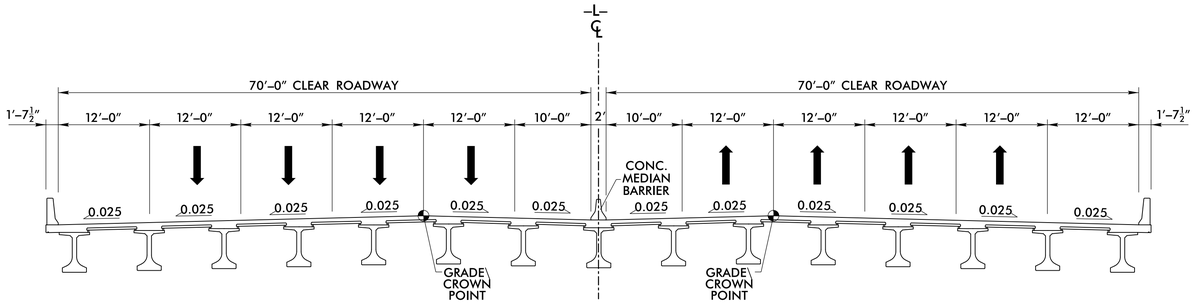
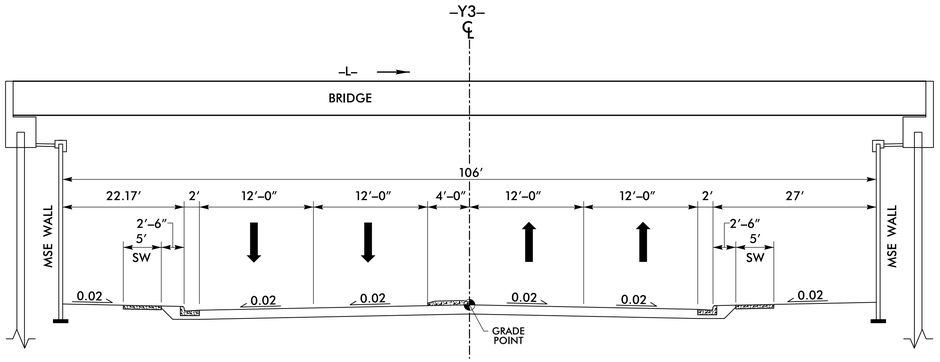
STRUCTURE #4
BRIDGE AT –L– STA. 416+09.20 OVER –Y3– STA. 23+78.65



STRUCTURE TYPICAL SECTION



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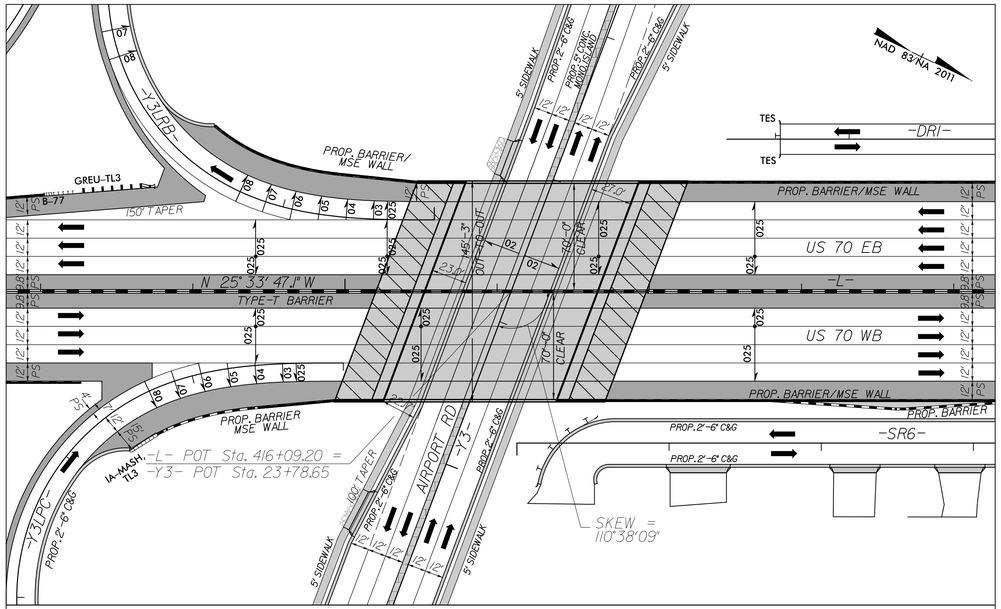

SCALE: 1" = 50'

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP FOR –L– OVER –Y3– (AIRPORT RD.)

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rfreeman

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2A-17

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

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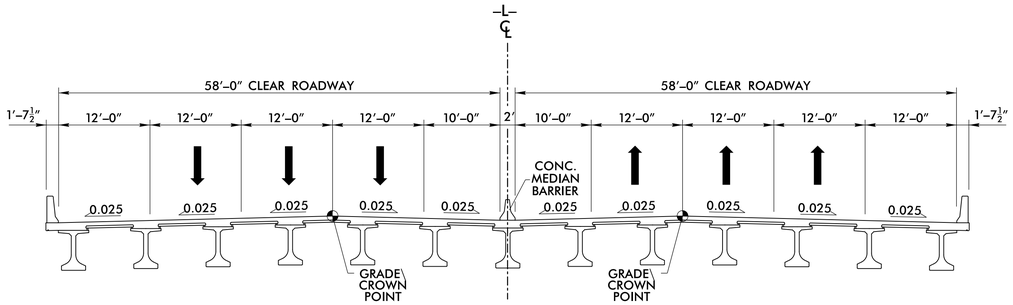
STRUCTURE #5
BRIDGE AT –L– STA. 443+28.96 OVER –Y4– STA. 23+57.01



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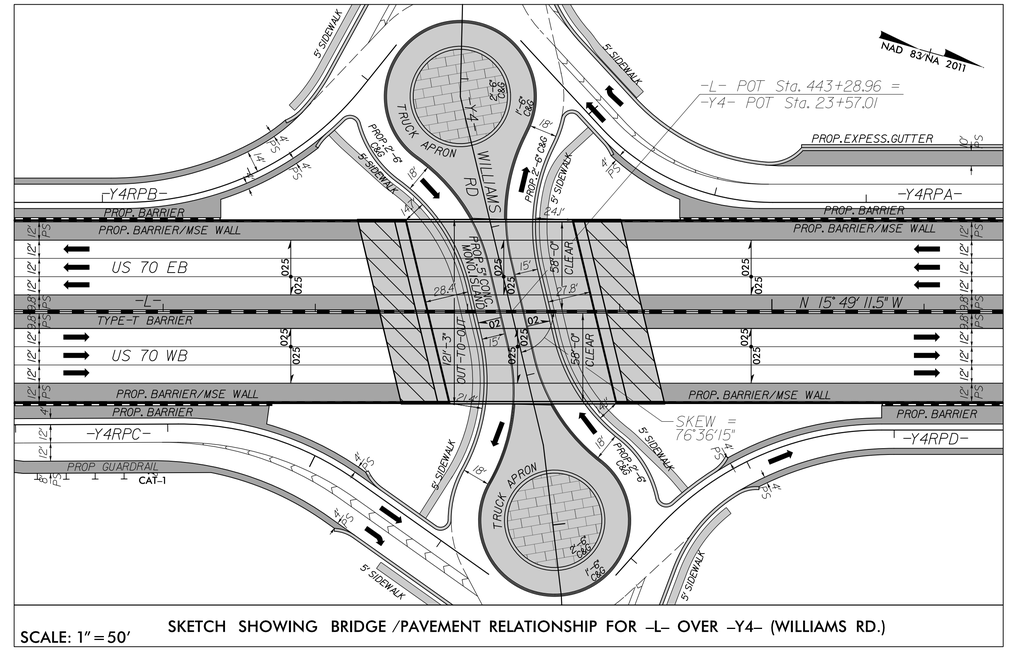
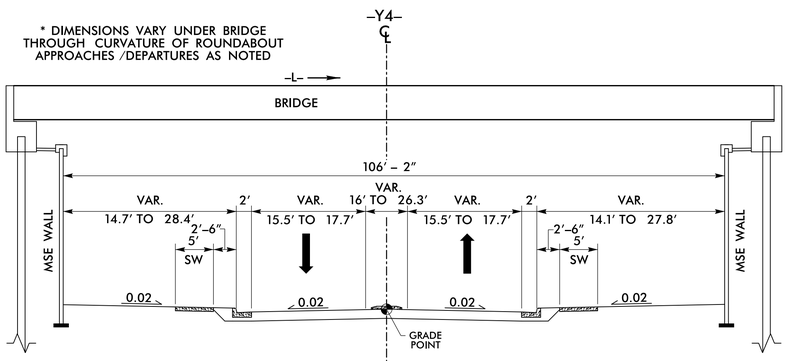


SCALE: 1″ = 50′

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP FOR –L– OVER –Y4– (WILLIAMS RD.)



TYPICAL SECTION UNDER STRUCTURE

8/14/2020
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rcgroup

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-1

ROADWAY DESIGN ENGINEER

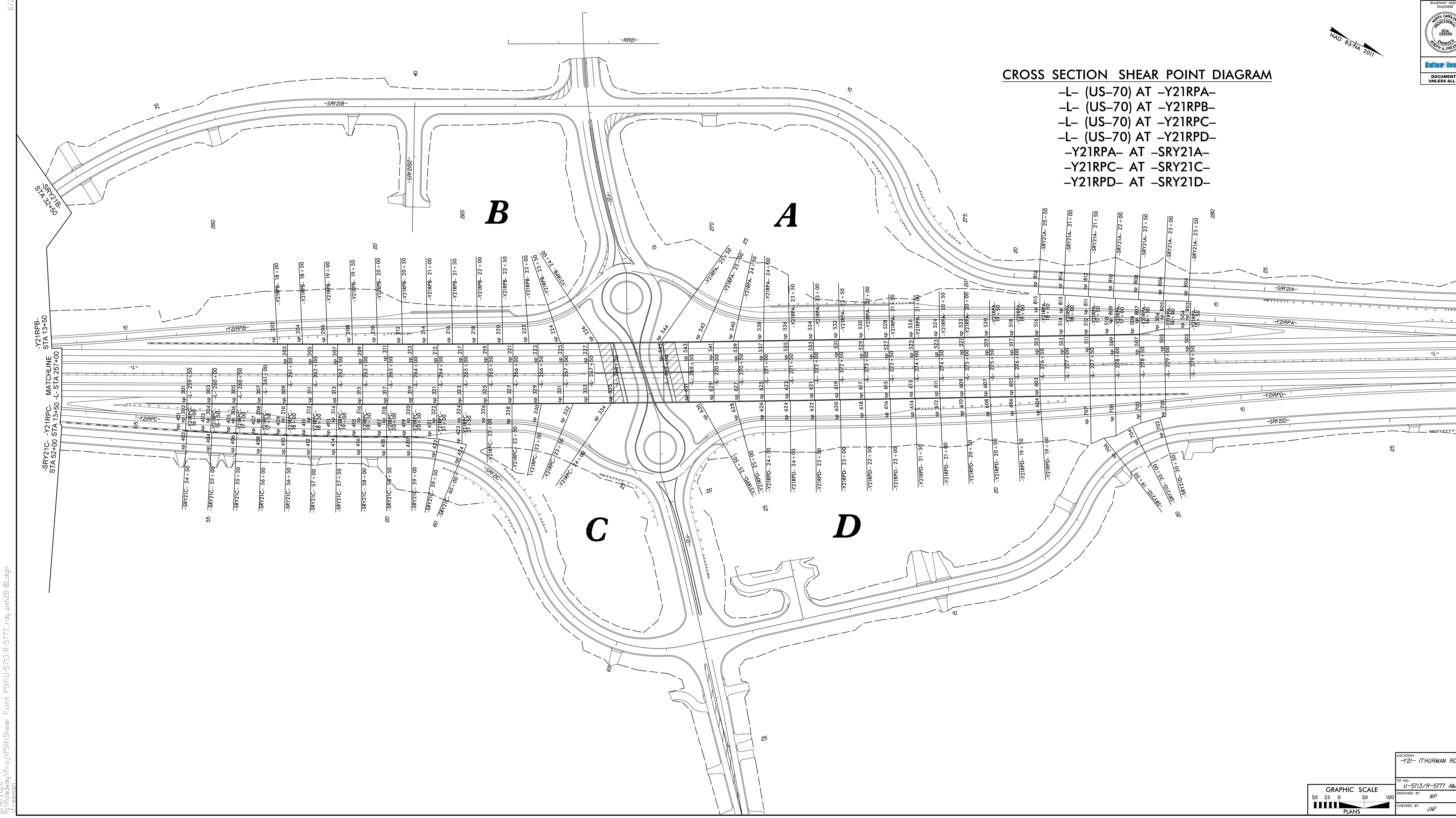
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CROSS SECTION SHEAR POINT DIAGRAM

–L– (US–70) AT –Y21RPA–
–L– (US–70) AT –Y21RPB–
–L– (US–70) AT –Y21RPC–
–L– (US–70) AT –Y21RPD–
–Y21RPA– AT –SRY21A–
–Y21RPC– AT –SRY21C–
–Y21RPD– AT –SRY21D–



GRAPHIC SCALE
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PLANS

LOCATION: -Y21- (THURMAN RD) / -L-

TIP NO.: U-5713/R-5777 A&B	COUNTY: CRAVEN
DESIGNED BY: NP	DATE: 08/10/20
CHECKED BY: JAF	DATE: 08/10/20

6/2/99

8/14/2020
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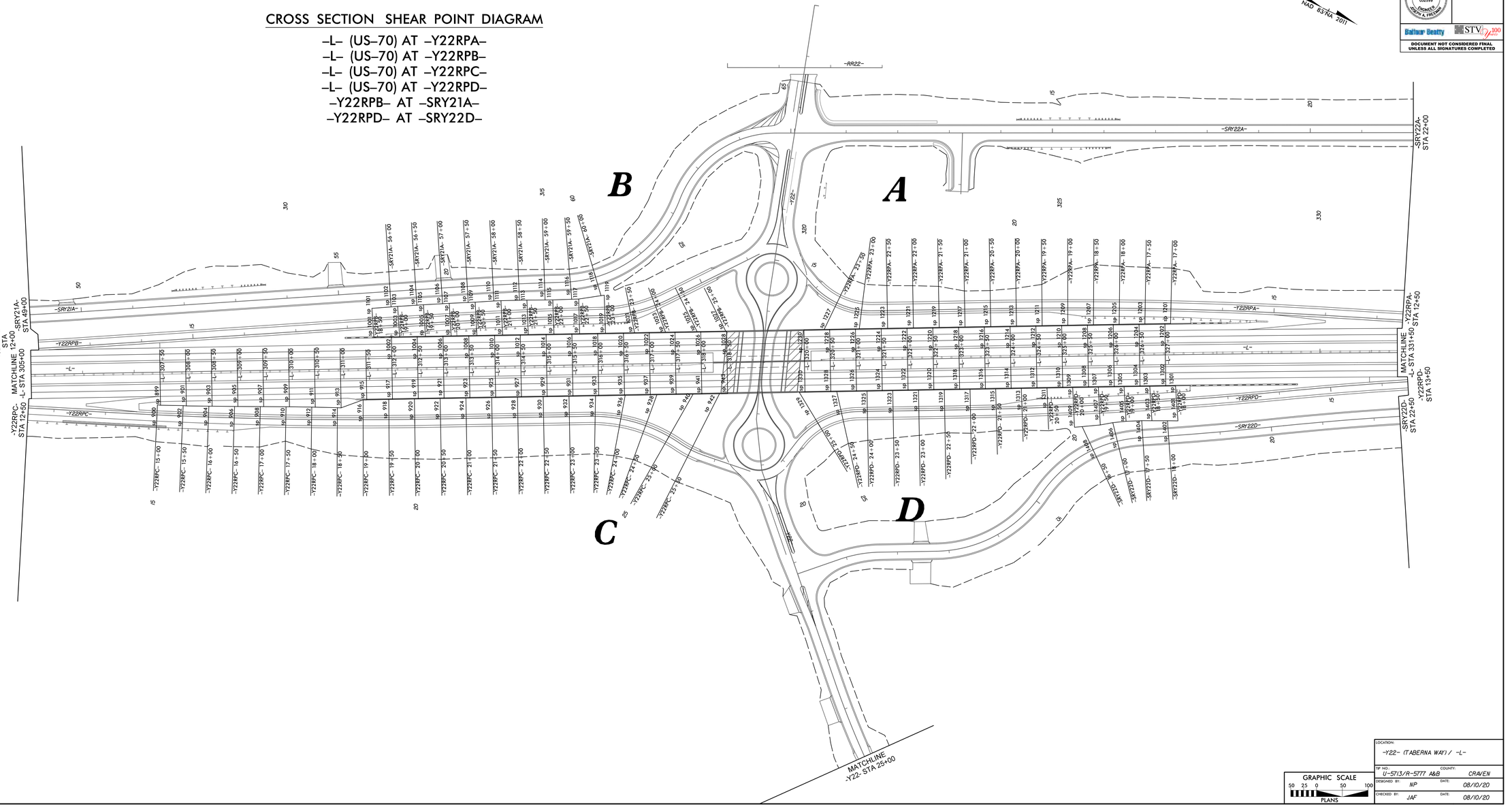
jfreeman

Submitted 9/16/2020

6/2/99

CROSS SECTION SHEAR POINT DIAGRAM

–L– (US–70) AT –Y22RPA–
–L– (US–70) AT –Y22RPB–
–L– (US–70) AT –Y22RPC–
–L– (US–70) AT –Y22RPD–
–Y22RPB– AT –SRY21A–
–Y22RPD– AT –SRY22D–



PROJECT REFERENCE NO. U-5713/R-5777AB
SHEET NO. 2B-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 033969 ENGINEER JOSEPH A. FREEMAN

Ballow Beatty | STV

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GRAPHIC SCALE
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PLANS

TIP NO.:	U-5713/R-5777 A&B	COUNTY:	CRAVEN
DESIGNED BY:	NP	DATE:	08/10/20
CHECKED BY:	JAF	DATE:	08/10/20

8/14/2020
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jfreeman

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033999 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV

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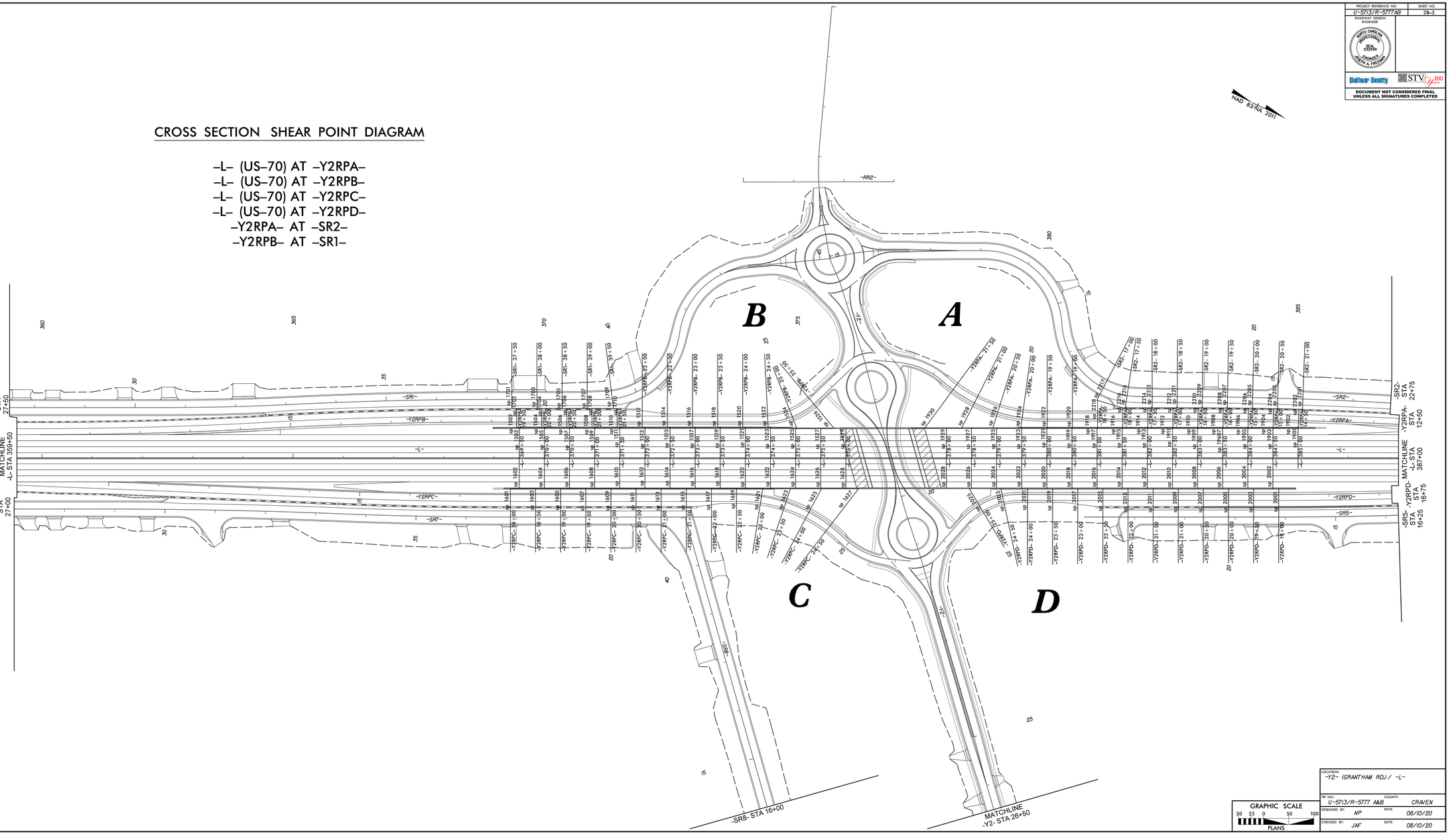
NAD 83/NA 2011

CROSS SECTION SHEAR POINT DIAGRAM

–L– (US–70) AT –Y2RPA–
–L– (US–70) AT –Y2RPB–
–L– (US–70) AT –Y2RPC–
–L– (US–70) AT –Y2RPD–
–Y2RPA– AT –SR2–
–Y2RPB– AT –SR1–



LOCATION:	–Y2– (GRANTHAM RDJ / –L–
TIP NO.:	U-5713/R-5777 A&B
COUNTY:	CRAVEN
DESIGNED BY:	NP
DATE:	08/10/20
CHECKED BY:	JAF
DATE:	08/10/20

GRAPHIC SCALE
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PLANS

8/4/2020
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freeman

Submitted 9/16/2020

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035999 ENGINEER JOSEPH A. FREEMAN

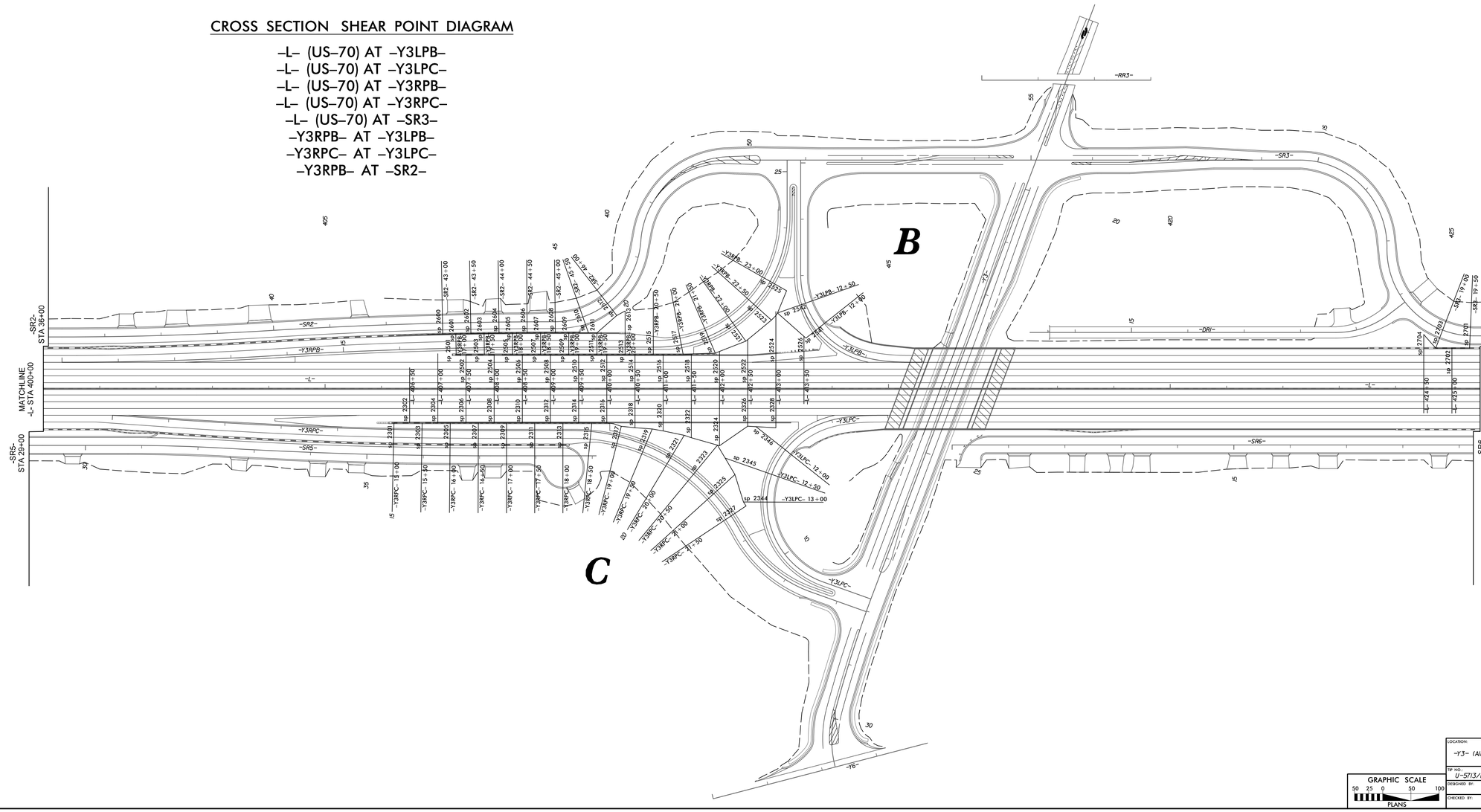
Balfour Beatty | STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

CROSS SECTION SHEAR POINT DIAGRAM

–L– (US–70) AT –Y3LPB–
–L– (US–70) AT –Y3LPC–
–L– (US–70) AT –Y3RPB–
–L– (US–70) AT –Y3RPC–
–L– (US–70) AT –SR3–
–Y3RPB– AT –Y3LPB–
–Y3RPC– AT –Y3LPC–
–Y3RPB– AT –SR2–



GRAPHIC SCALE	
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PLANS	

LOCATION:	–Y3– (AIRPORT RDJ / –L–
TIP NO.	U-5713/R-5777 A&B
COUNTY:	CRAVEN
DESIGNED BY:	NP
DATE:	08/10/20
CHECKED BY:	JAF
DATE:	08/10/20

8/14/2020
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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	28-S

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 033999 ENGINEER JOSEPH A. FREEMAN

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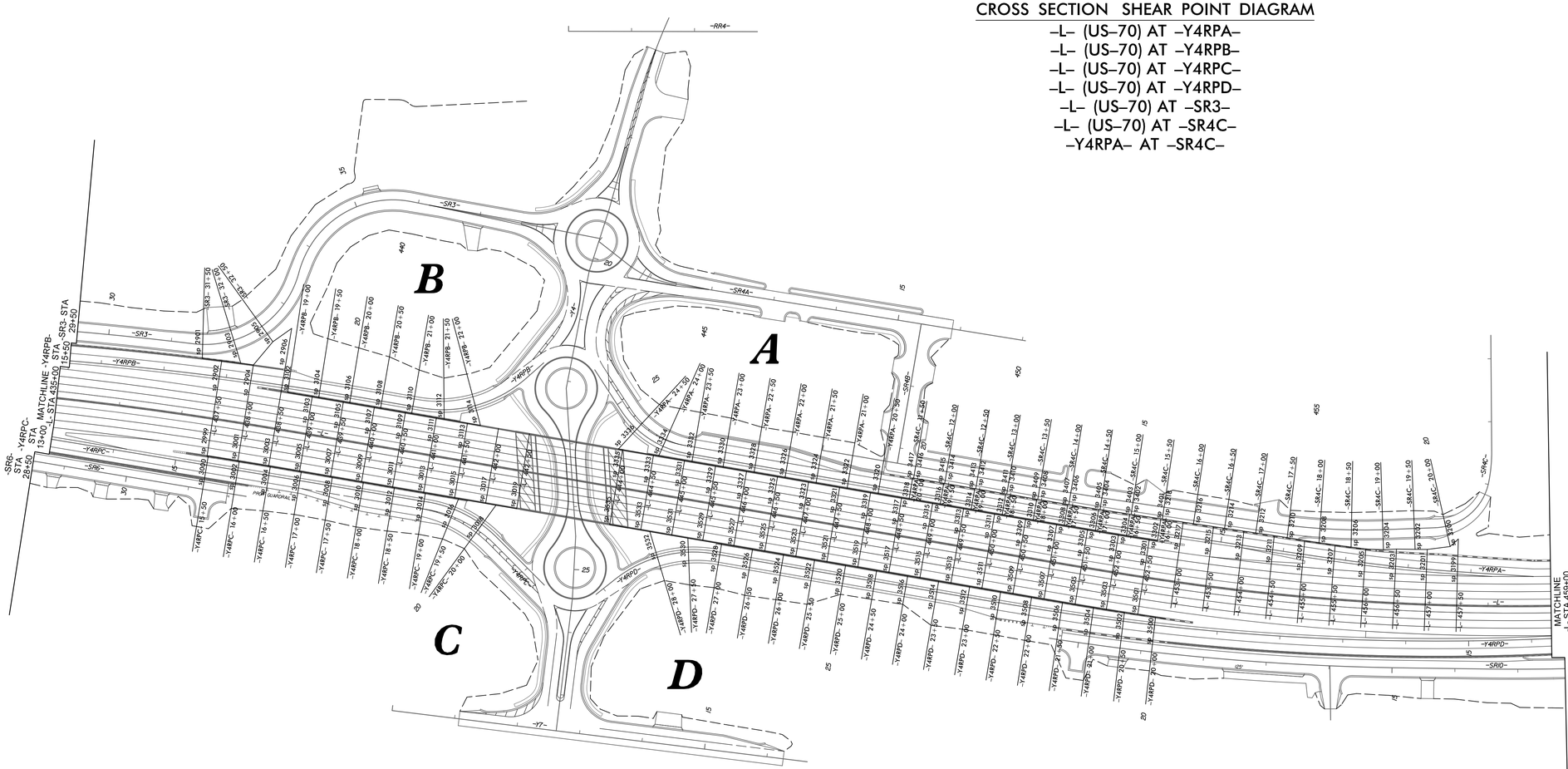
CROSS SECTION SHEAR POINT DIAGRAM

–L– (US–70) AT –Y4RPA–
–L– (US–70) AT –Y4RPB–
–L– (US–70) AT –Y4RPC–
–L– (US–70) AT –Y4RPD–
–L– (US–70) AT –SR3–
–L– (US–70) AT –SR4C–
–Y4RPA– AT –SR4C–



LOCATION:	–Y4– WILLIAMS RDJ / –L–
TIP NO.:	U-5713/R-5777 A&B
COUNTY:	CRAVEN
DESIGNED BY:	NP
DATE:	08/10/20
CHECKED BY:	JAF
DATE:	08/10/20

GRAPHIC SCALE
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PLANS

8/4/2020
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jfreeman

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

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CROSS SECTION SHEAR POINT DIAGRAM

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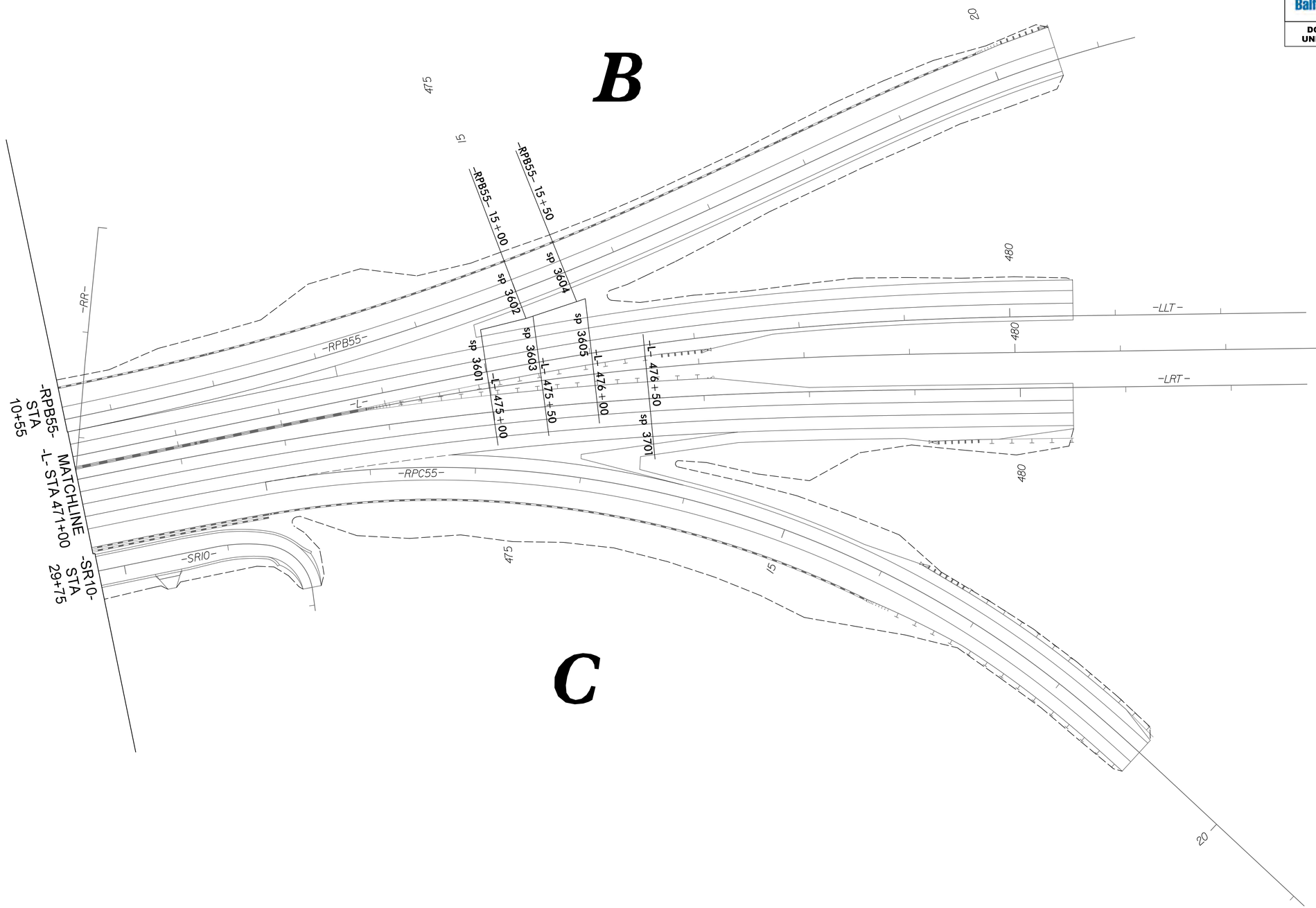
NAD 83/NA 2011



8/14/2020
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ffreeman

Submitted 9/16/2020

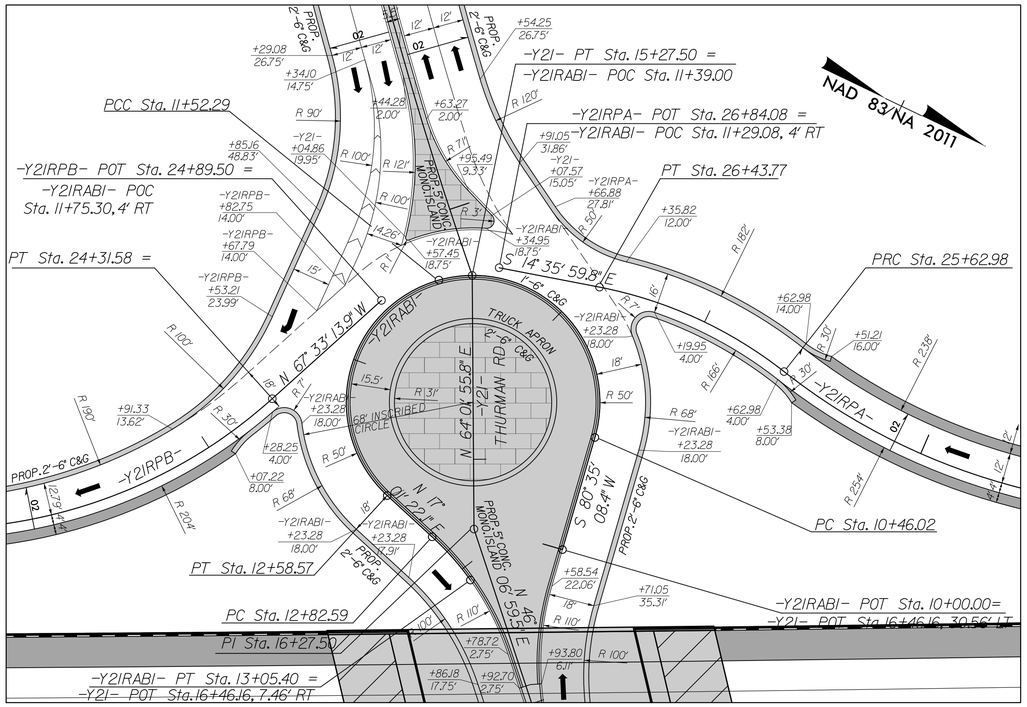
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-7

ROADWAY DESIGN ENGINEER

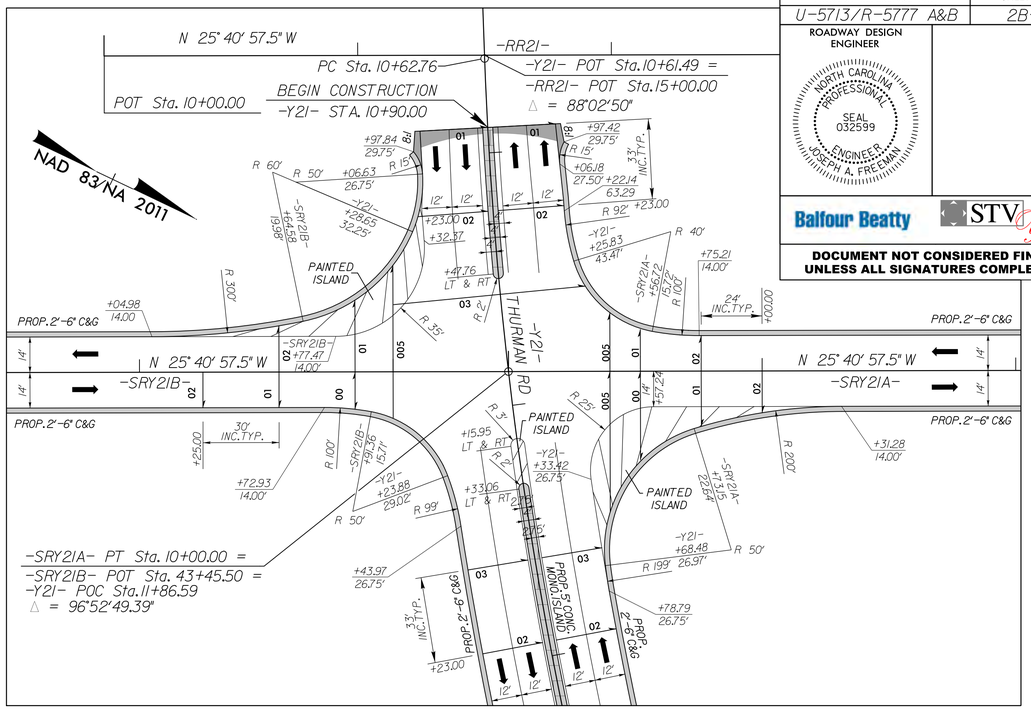
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

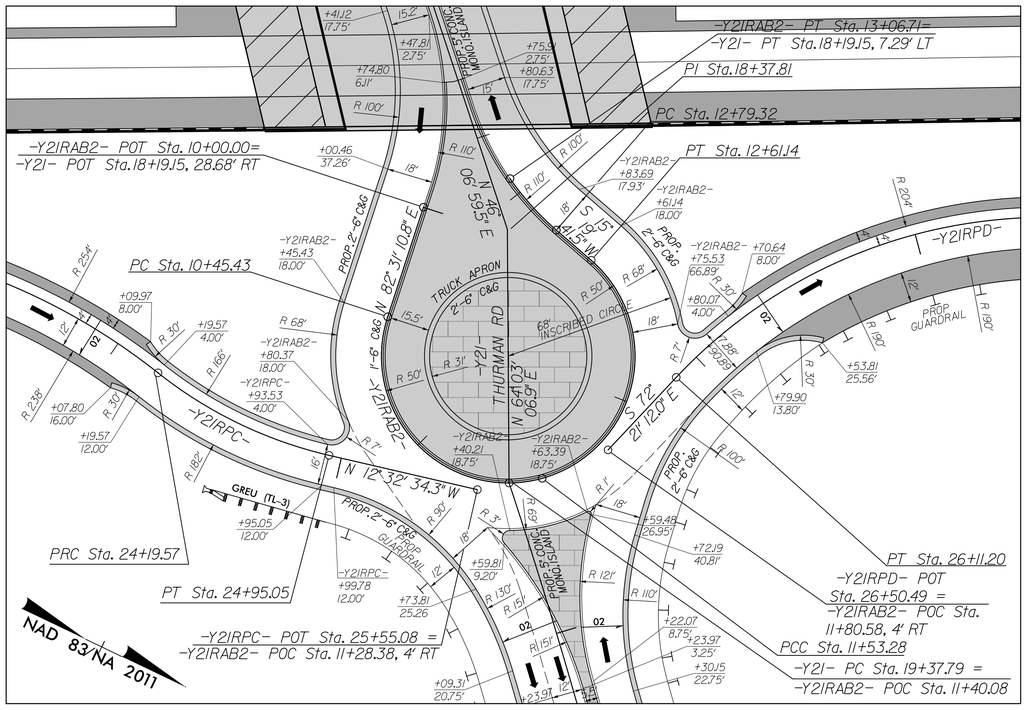
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



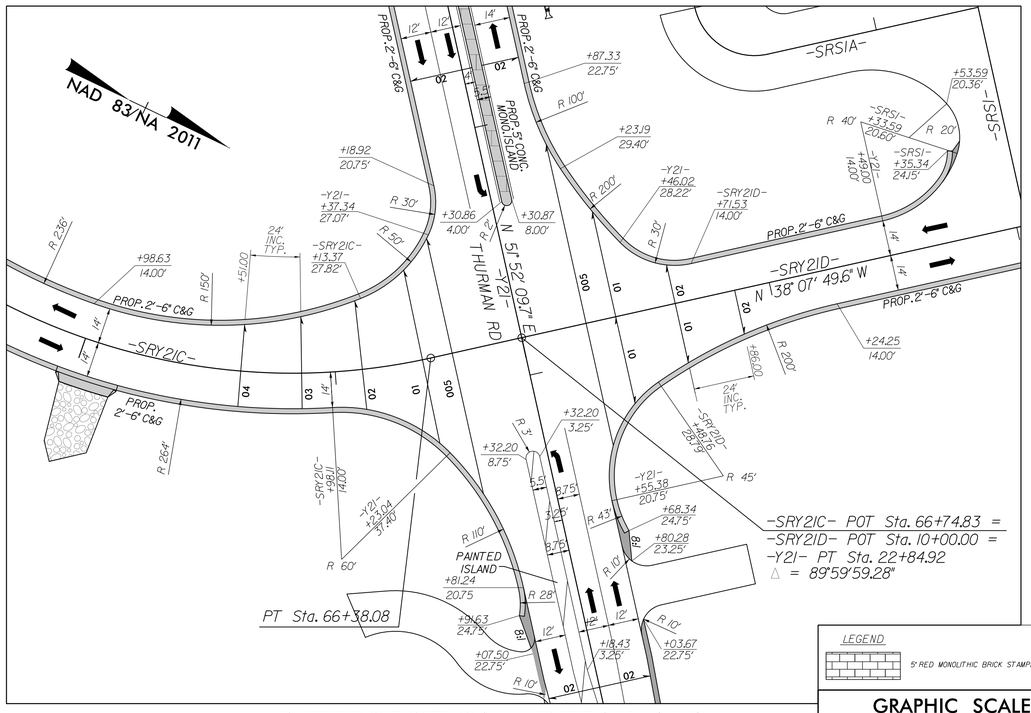
INTERSECTION DETAIL NO. 1
–Y21– @ –Y21RPA– & –Y21RPB–



INTERSECTION DETAIL NO. 3
–Y21– @ –SRY21A– & –SRY21B–



INTERSECTION DETAIL NO. 2
–Y21– @ –Y21RPC– & –Y21RPD–



INTERSECTION DETAIL NO. 4
–Y21– @ –SRY21C– & –SRY21D–

8/14/2020
H:\Roadway\Proj\Intersection Details\U-5713_R-5777A&B_RDY_INT_psh2B-07.dgn
kfreeman

Submitted 9/16/2020

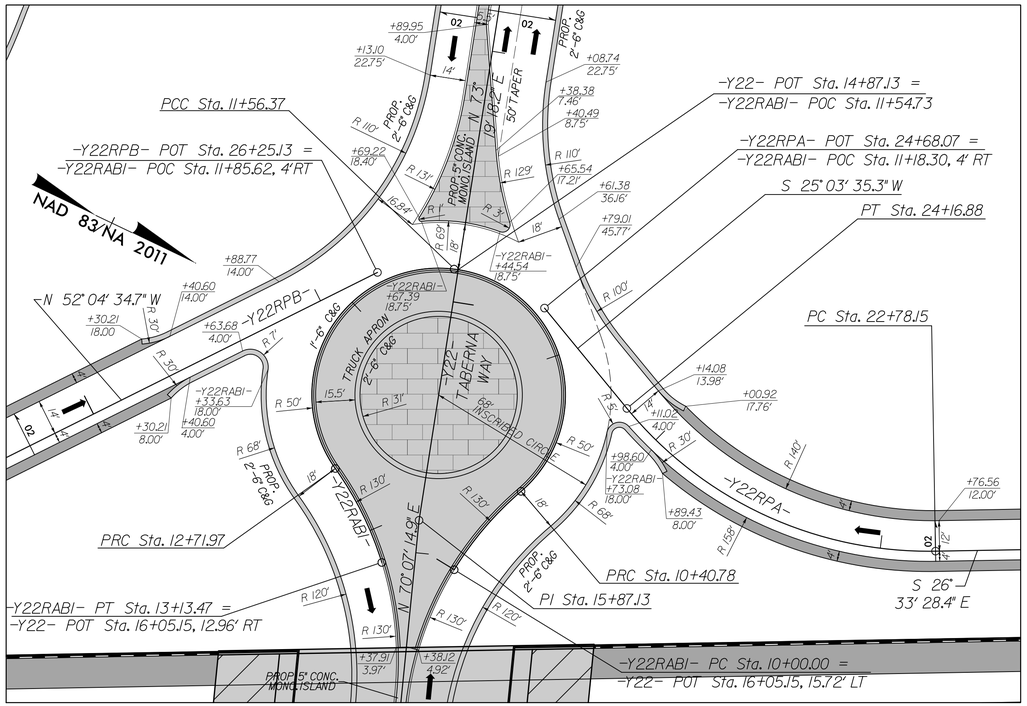
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-8

ROADWAY DESIGN ENGINEER

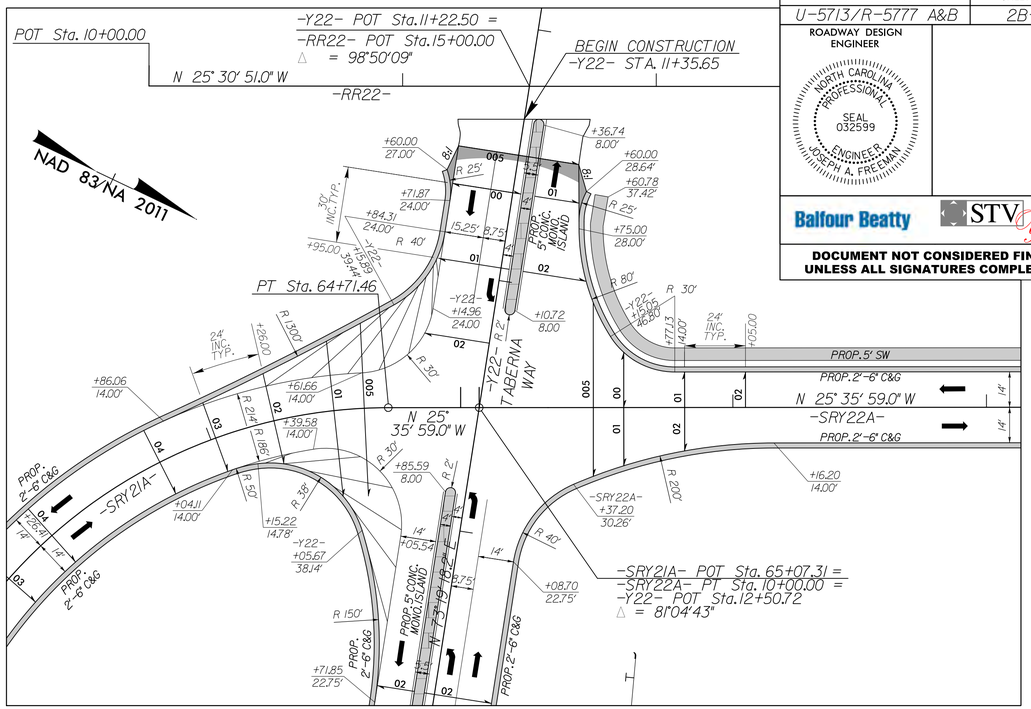
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

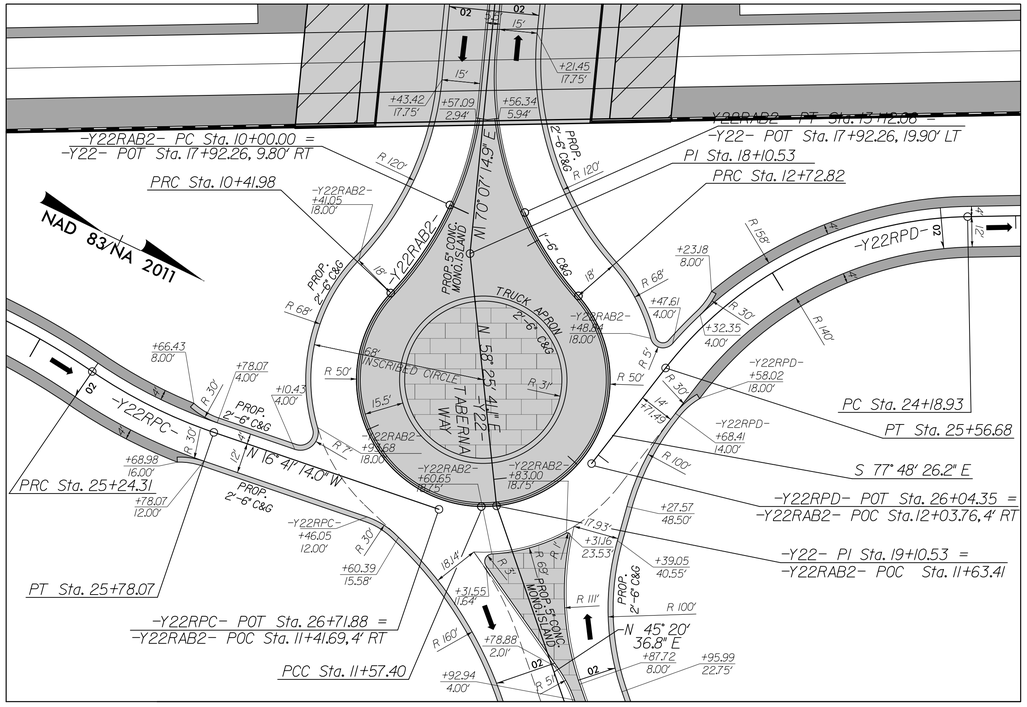
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



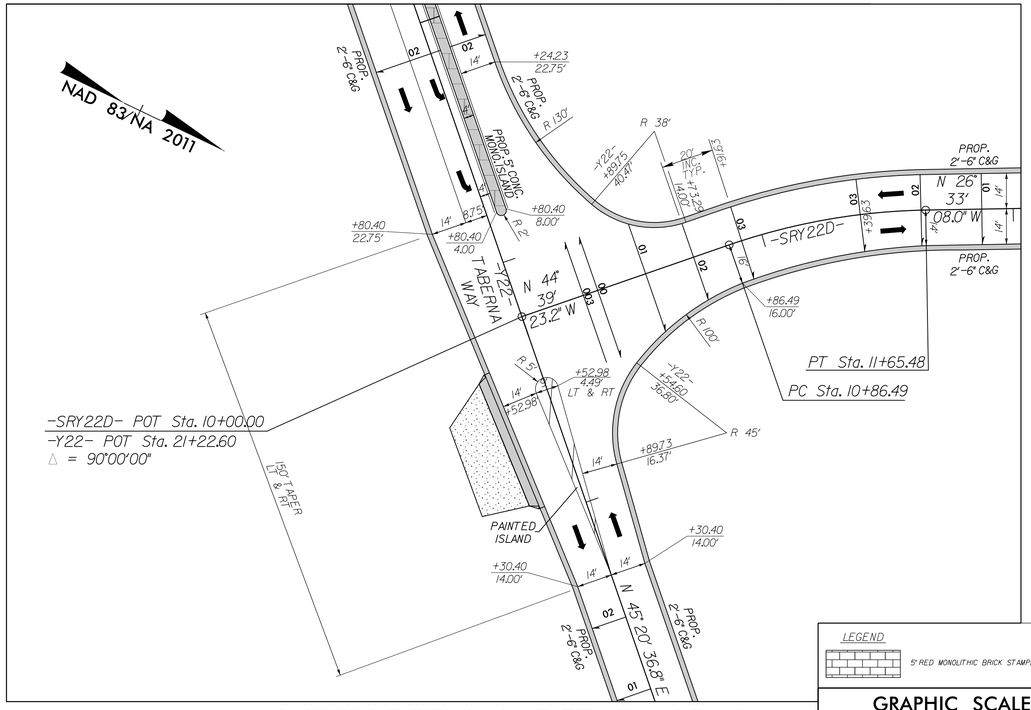
INTERSECTION DETAIL NO. 5
-Y22- @ -Y22RPA- & -Y22RPB-



INTERSECTION DETAIL NO. 7
-Y22- @ -SRY21A- & -SRY22A-



INTERSECTION DETAIL NO. 6
-Y22- @ -Y22RPC- & -Y22RPD-



INTERSECTION DETAIL NO. 8
-Y22- @ -SRY22D-

8/14/2020
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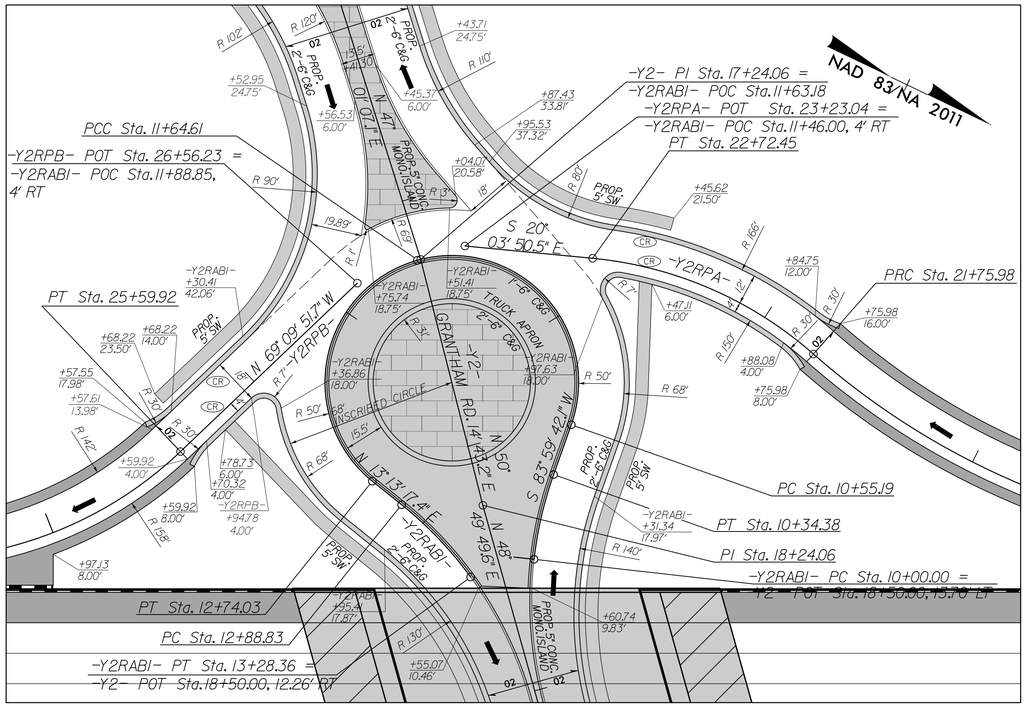
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-9

ROADWAY DESIGN ENGINEER

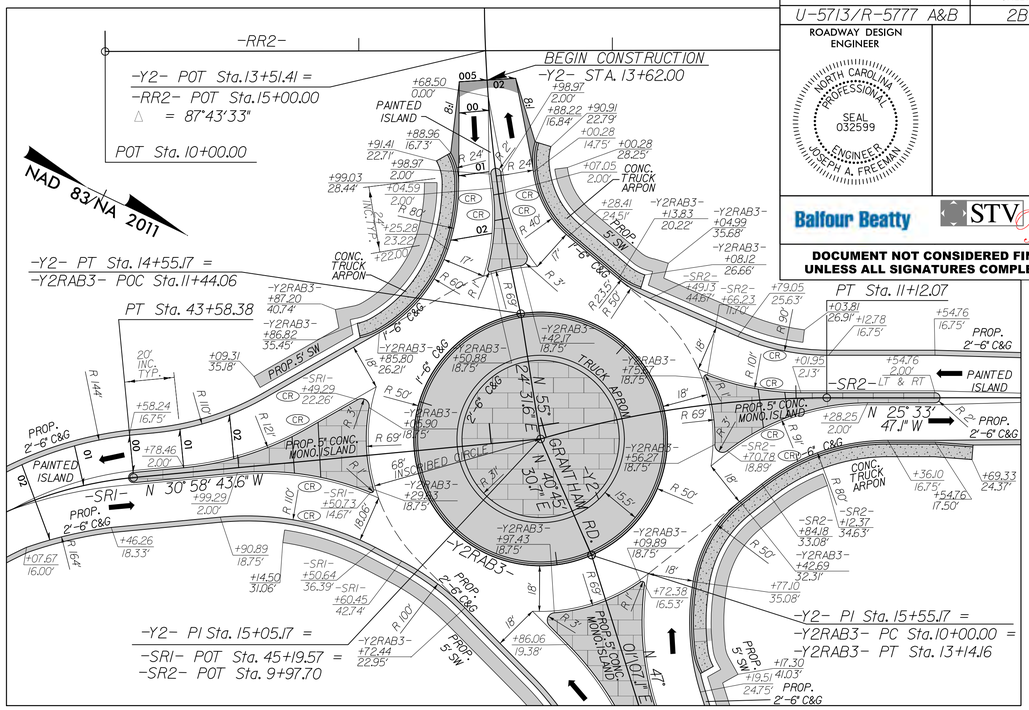
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

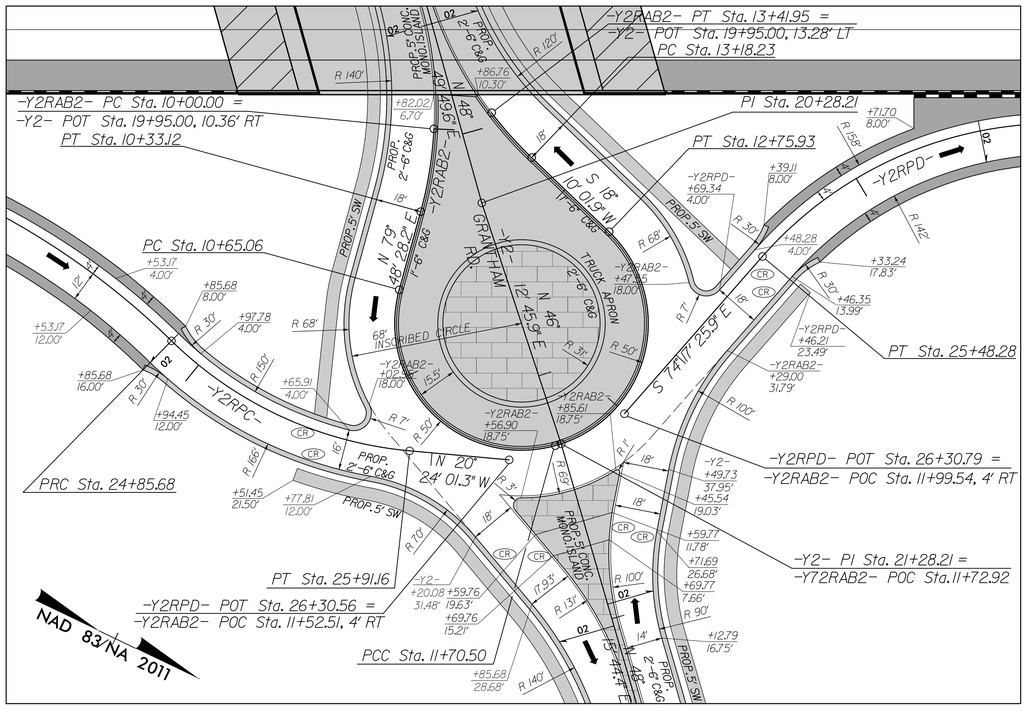
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



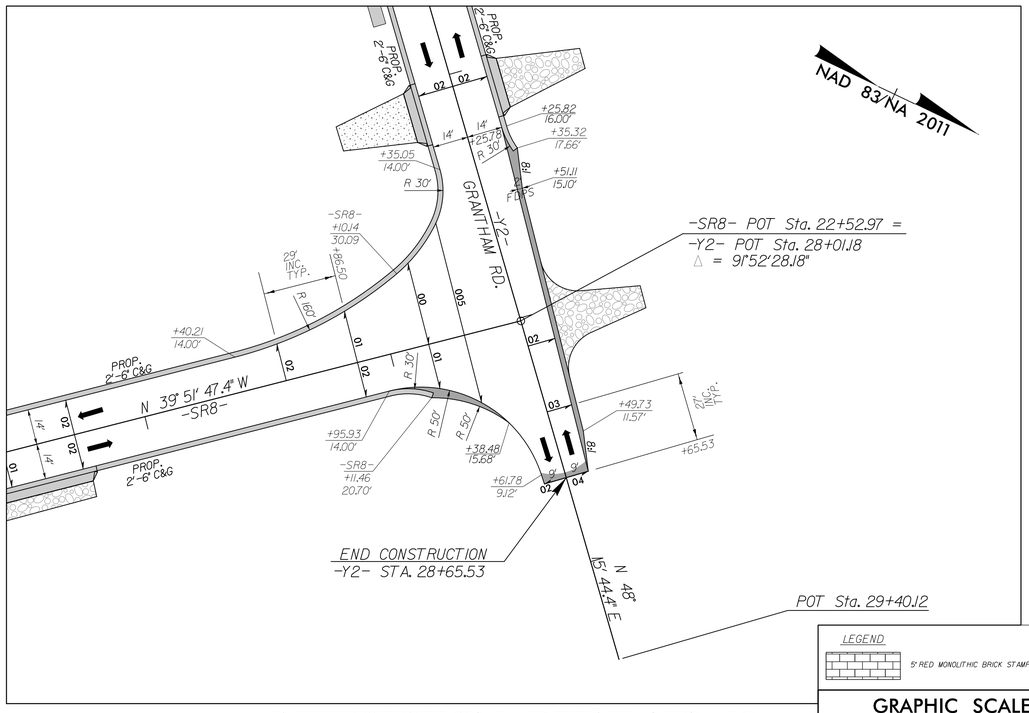
INTERSECTION DETAIL NO. 9
–Y2– @ –Y2RPA– & –Y2RPB–



INTERSECTION DETAIL NO. 11
–Y2– @ –SR1– & –SR2–



INTERSECTION DETAIL NO. 10
–Y2– @ –Y2RPC– & –Y2RPD–



INTERSECTION DETAIL NO. 12
–Y2– @ –SR8–

GRAPHIC SCALE
30 15 0 30 60

8/14/2020
H:\Roadway\Proj\Intersection Details\U-5713_R-5777A&B_RDY_INT_psh2B-09.dgn

Submitted 9/16/2020

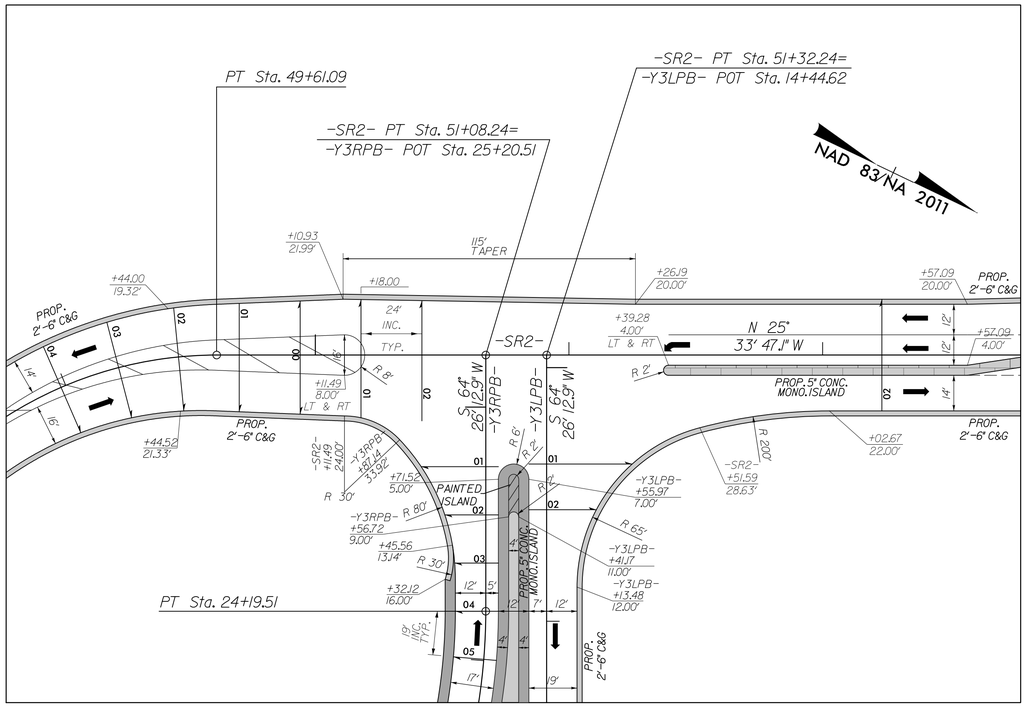
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-10

ROADWAY DESIGN ENGINEER

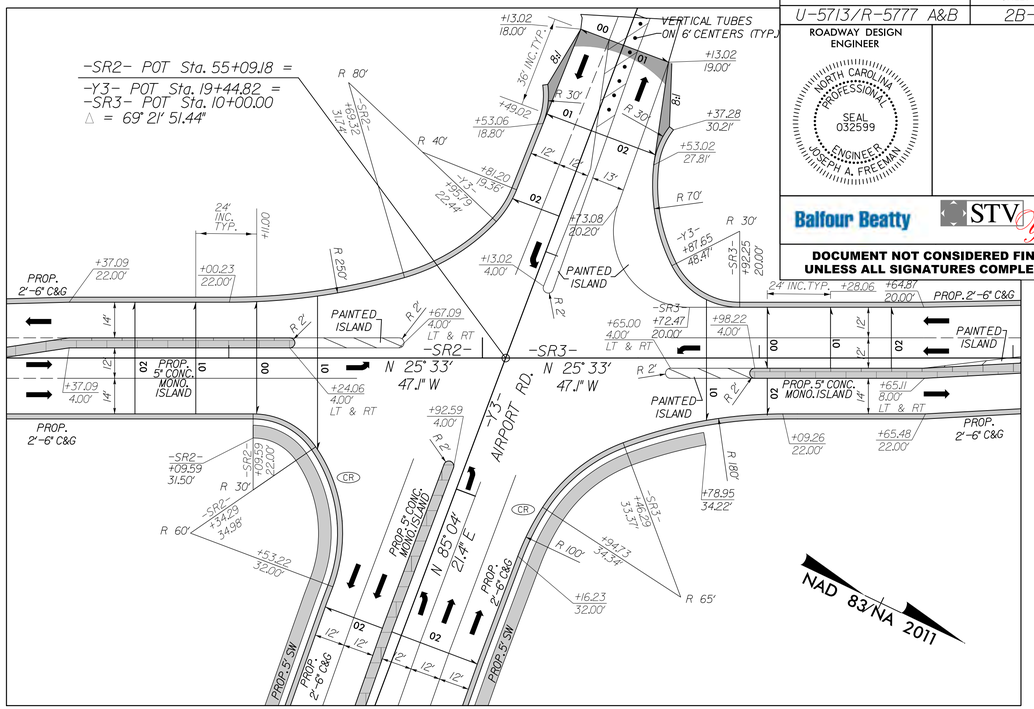
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

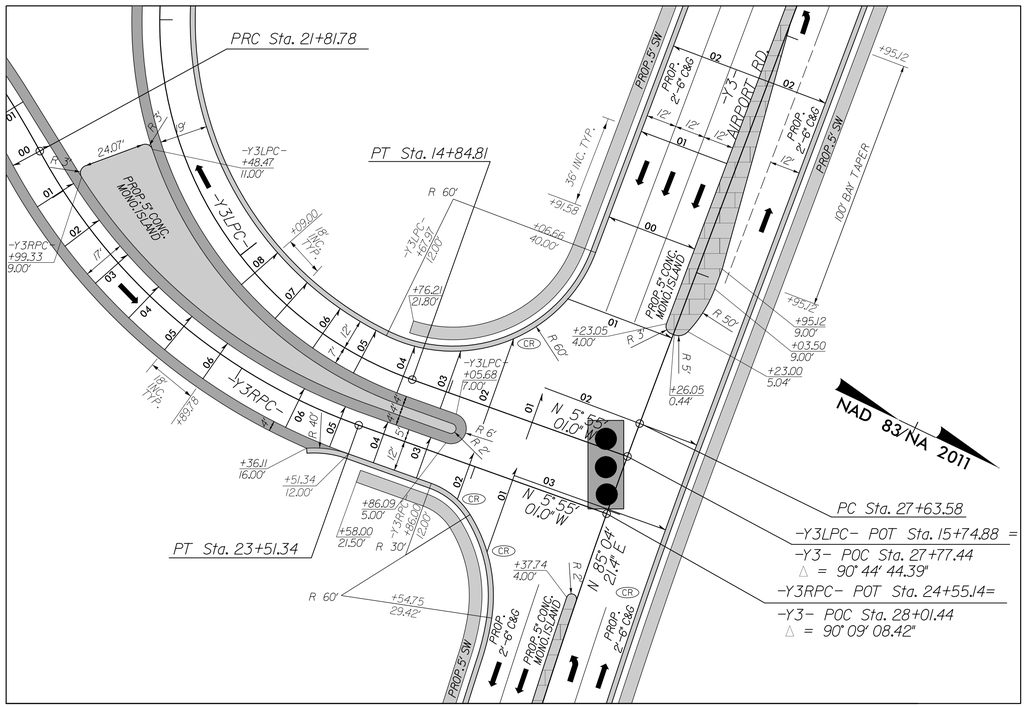
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



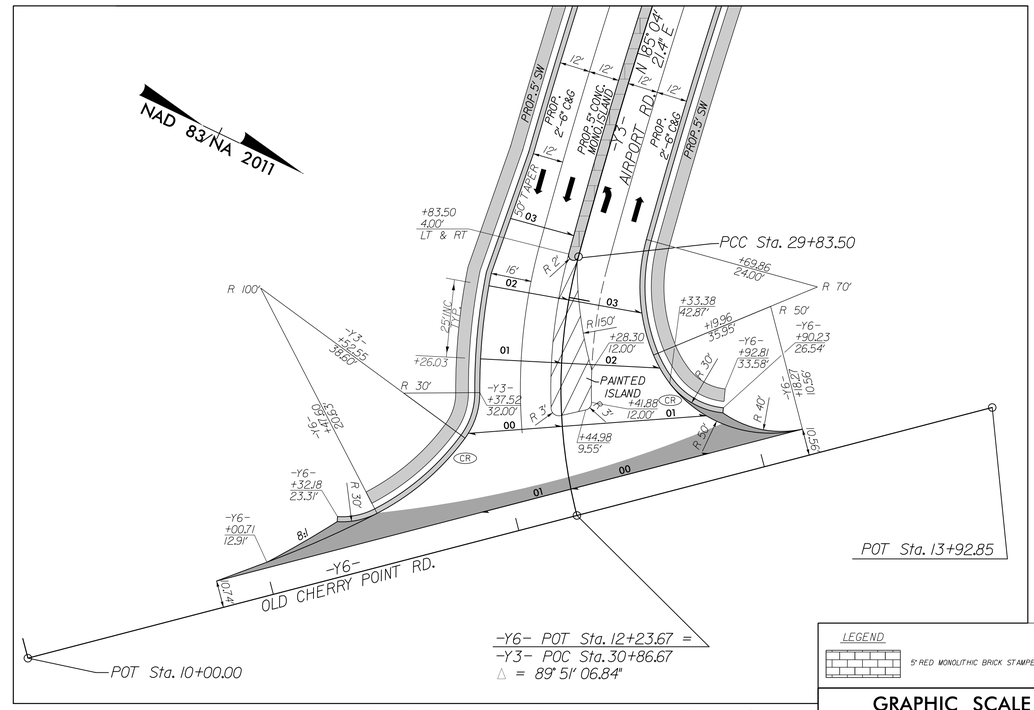
INTERSECTION DETAIL NO. 13
–Y3– @ –Y3LPB– & –Y3RPB–



INTERSECTION DETAIL NO. 15
–Y3– @ –SR2– & –SR3–



INTERSECTION DETAIL NO. 14
–Y3– @ –Y3LPC– & –Y3RPC–



INTERSECTION DETAIL NO. 16
–Y3– @ –Y7–

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kfreeman

Submitted 9/16/2020

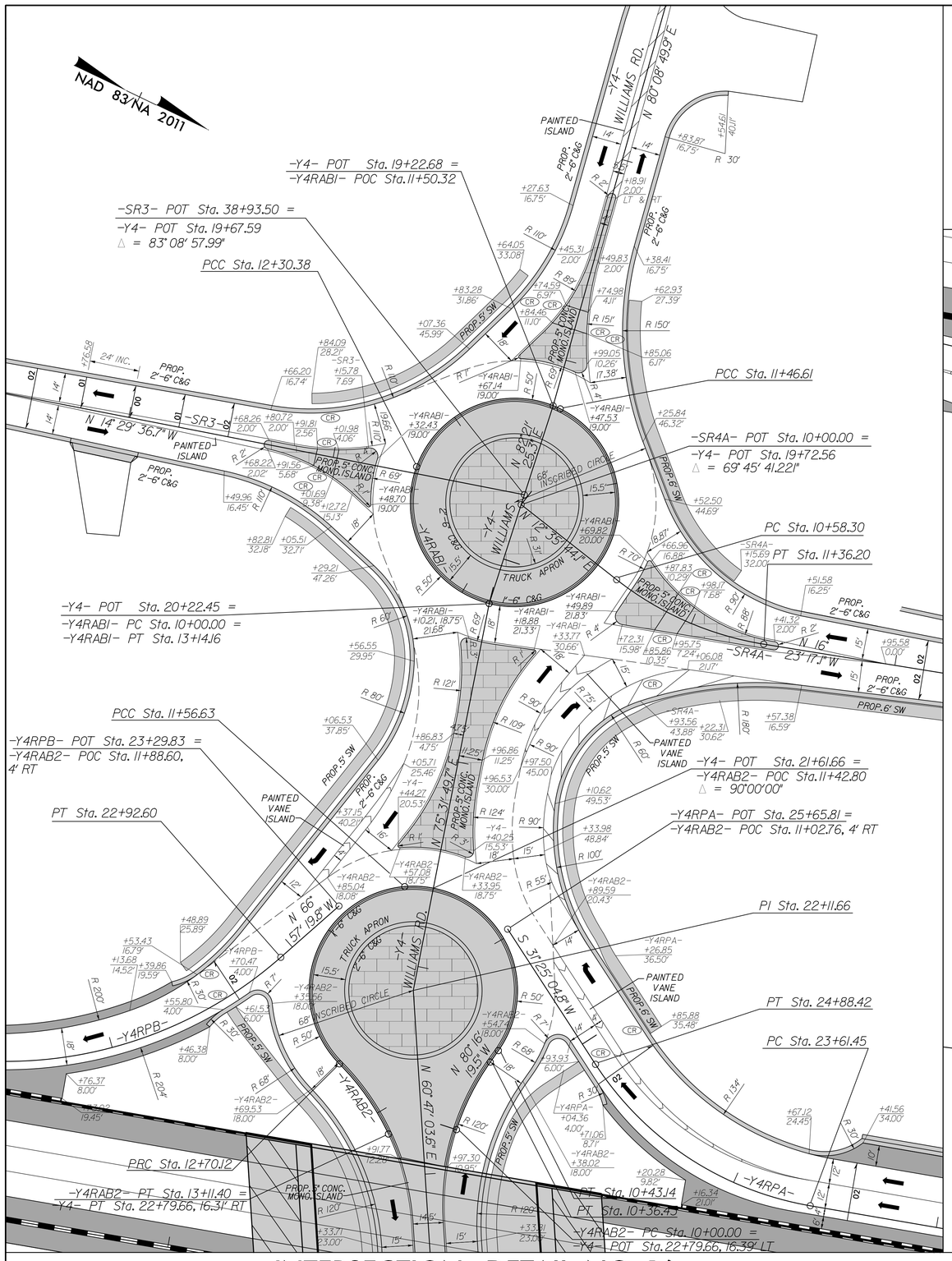
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-11

ROADWAY DESIGN ENGINEER

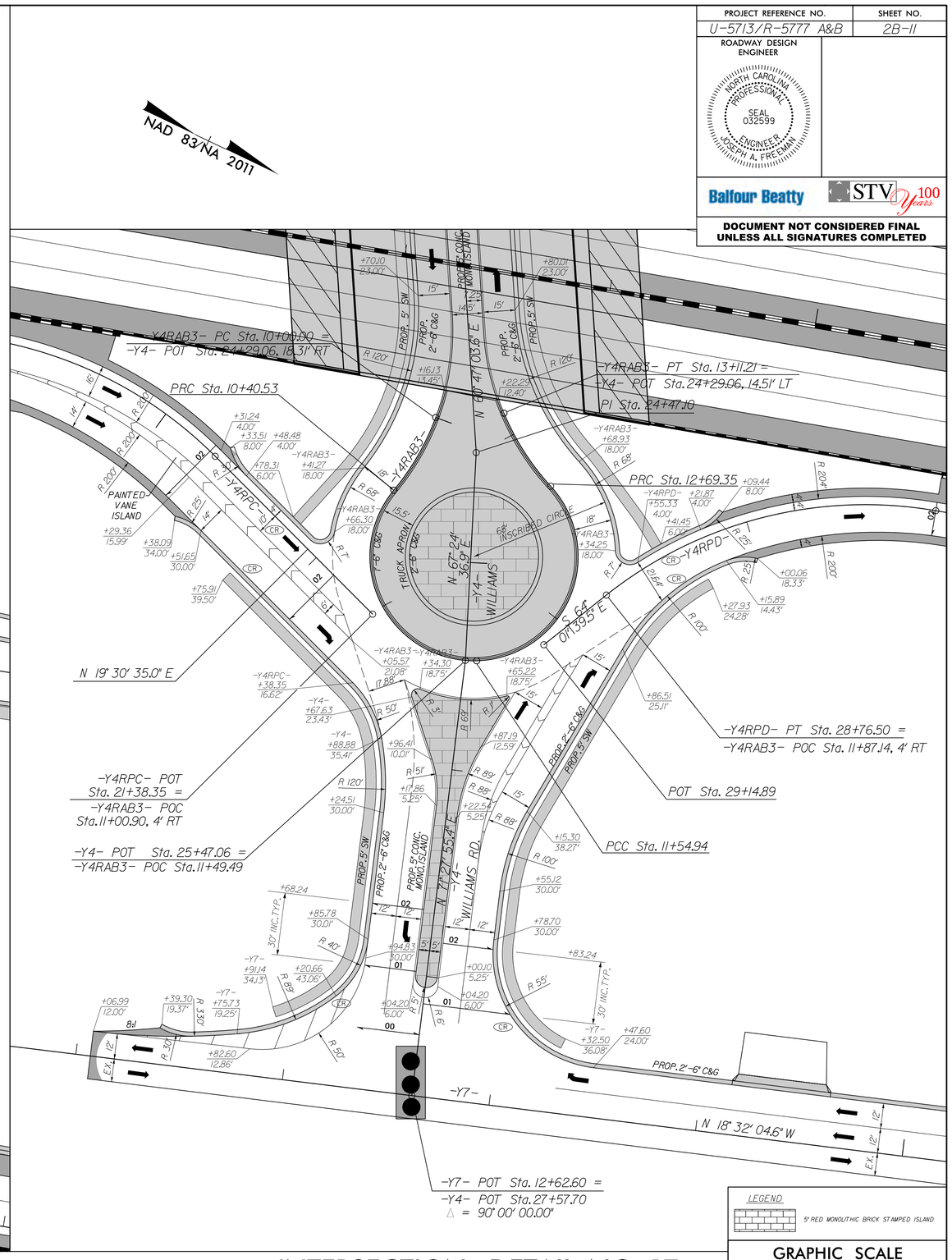
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



INTERSECTION DETAIL NO. 16
-Y4- @ -Y4RPA-, -Y4RPB-, -SR3- & -SR4A-



INTERSECTION DETAIL NO. 17
-Y4- @ -Y4RPC-, -Y4RPD- & -Y7-

LEGEND

5' RED MONOLITHIC BRICK STAMPED ISLAND

GRAPHIC SCALE

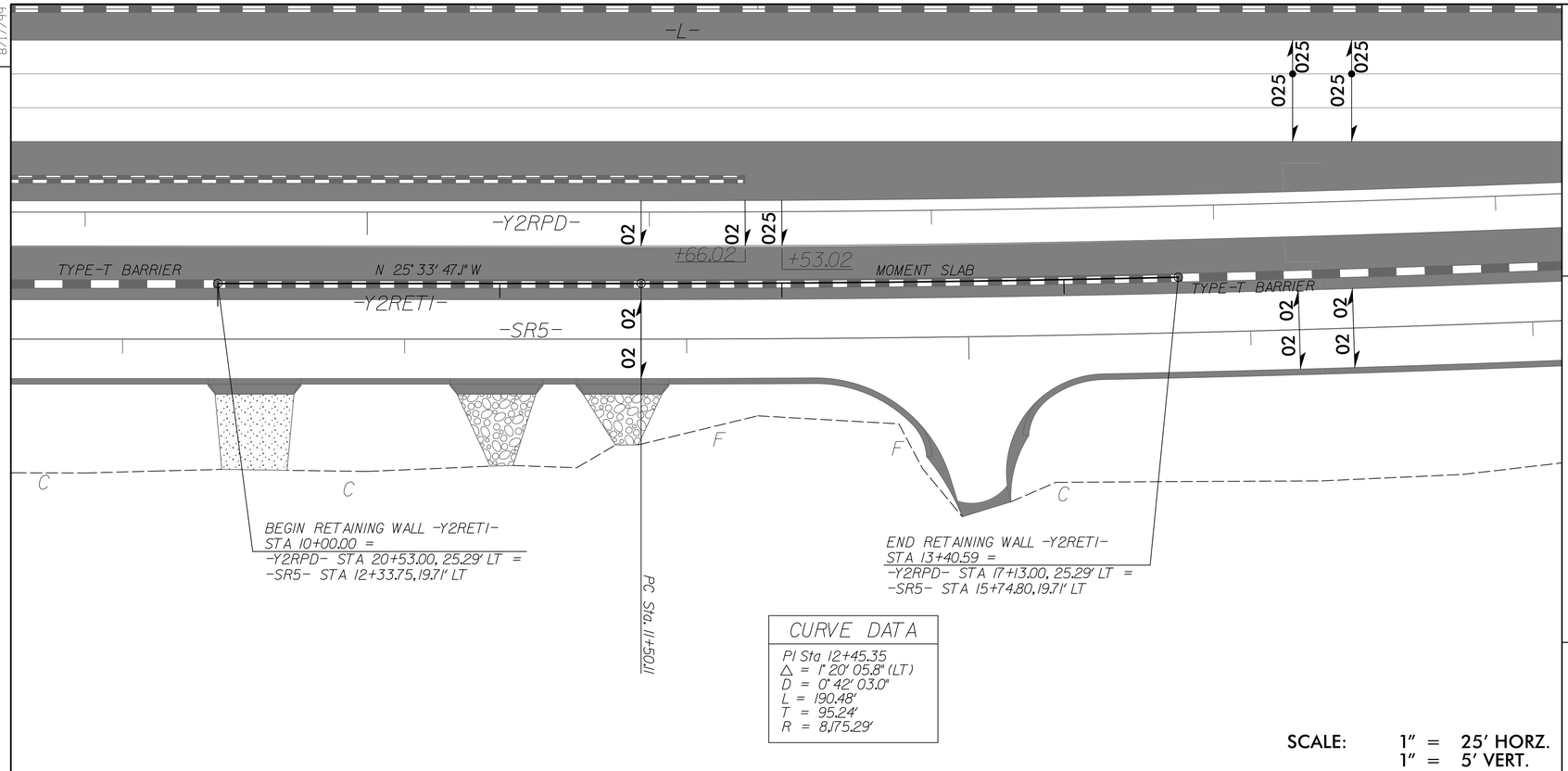
30 15 0 30 60

8/14/2020
H:\Roadway\Proj\Intersection Details\U-5713_R-5777A&B_RDY_INT_psh2B-11.dgn
ft_cgross

Submitted 9/16/2020

8/17/99

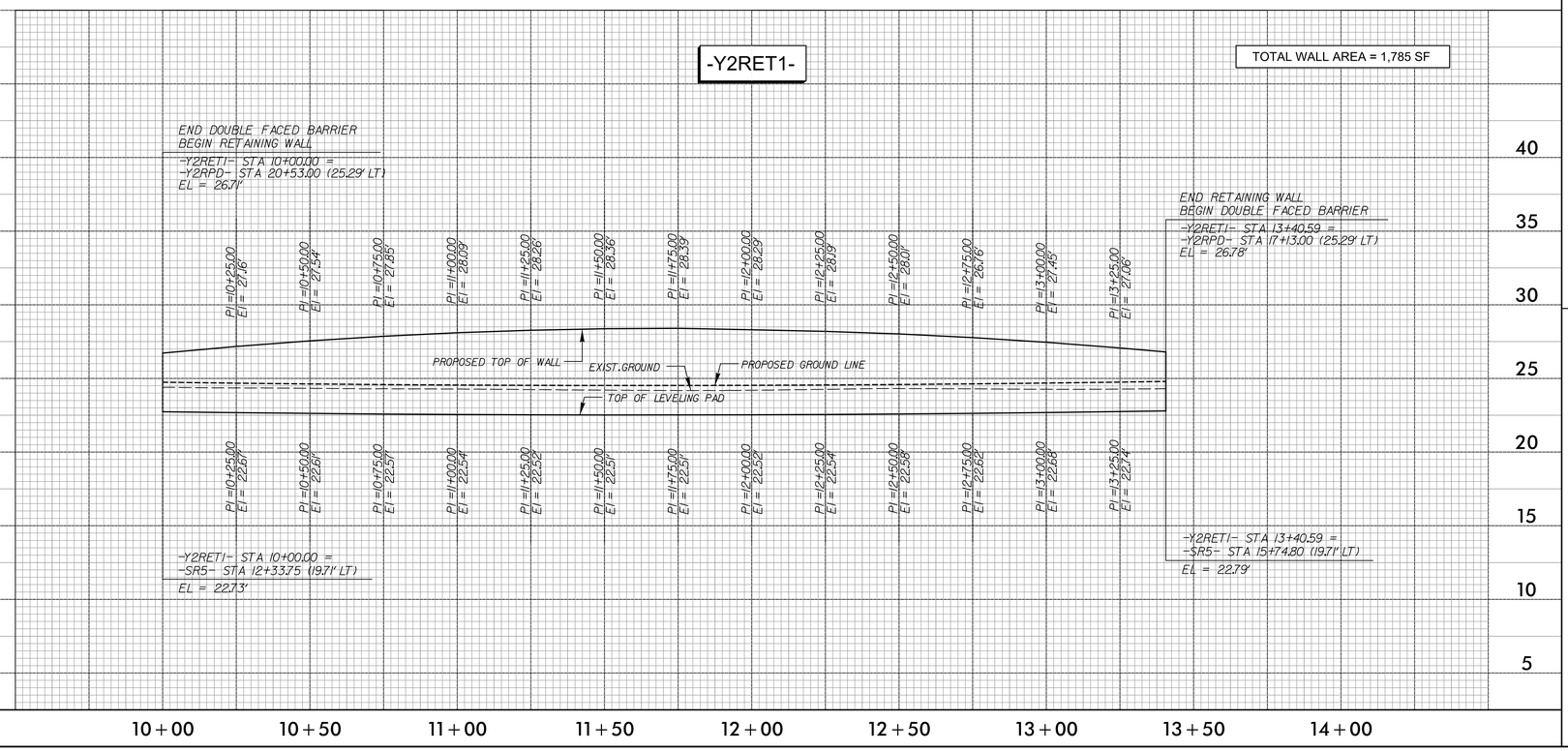
REVISIONS



CURVE DATA

PI Sta 12+45.35
△ = 1° 20' 05.8" (LT)
D = 0° 42' 03.0"
L = 190.48'
T = 95.24'
R = 8,175.29'

SCALE: 1" = 25' HORZ.
1" = 5' VERT.



8/14/2020
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kfreeman

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-12

ROADWAY DESIGN ENGINEER

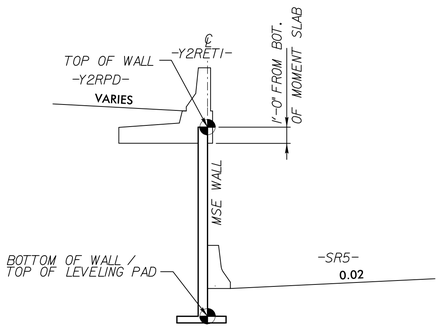
NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEET 14
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
-Y2RET1- STA. 10+00.00 TO STA. 13+40.59
NOT TO SCALE

Submitted 9/16/2020

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-13

ROADWAY DESIGN ENGINEER

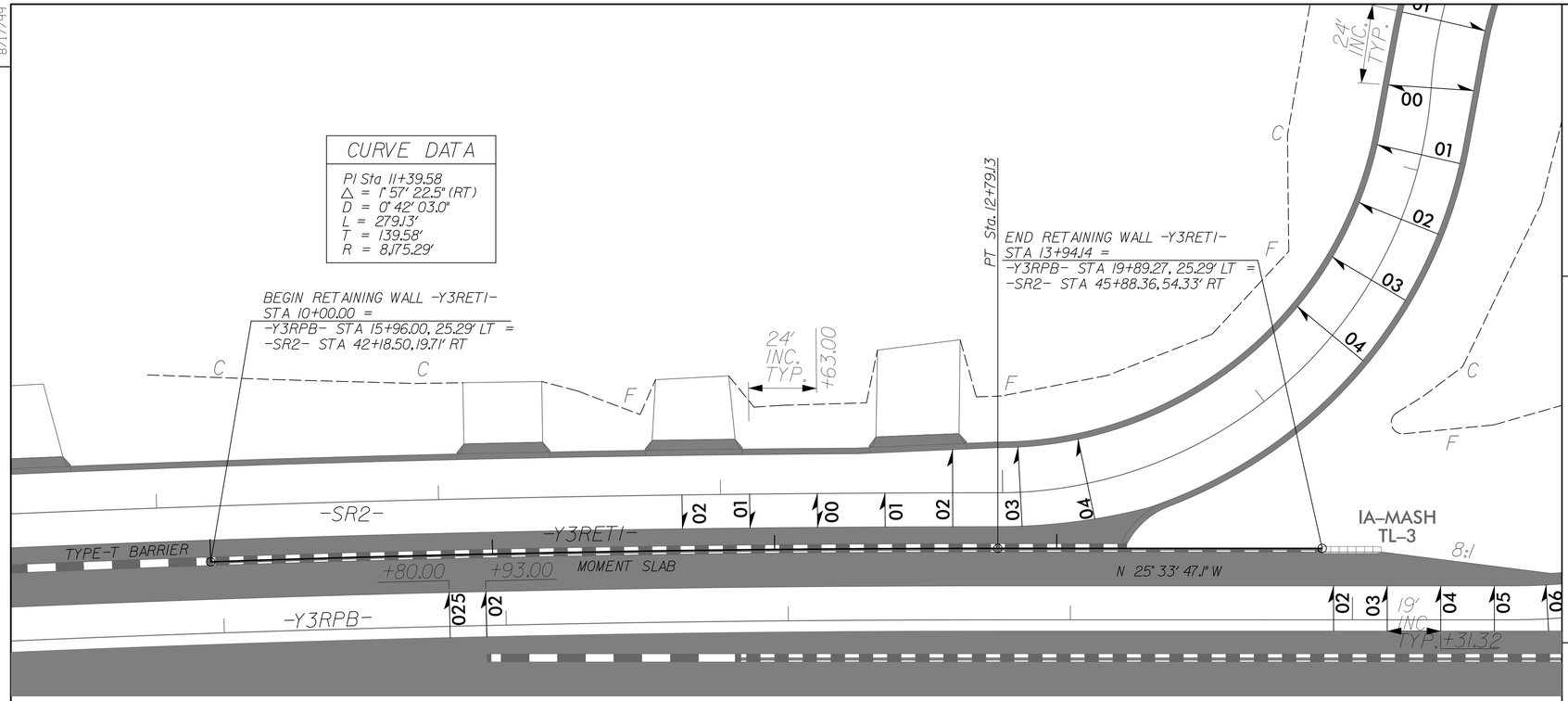
NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C ALVEY

Balfour Beatty | STV 100 Years

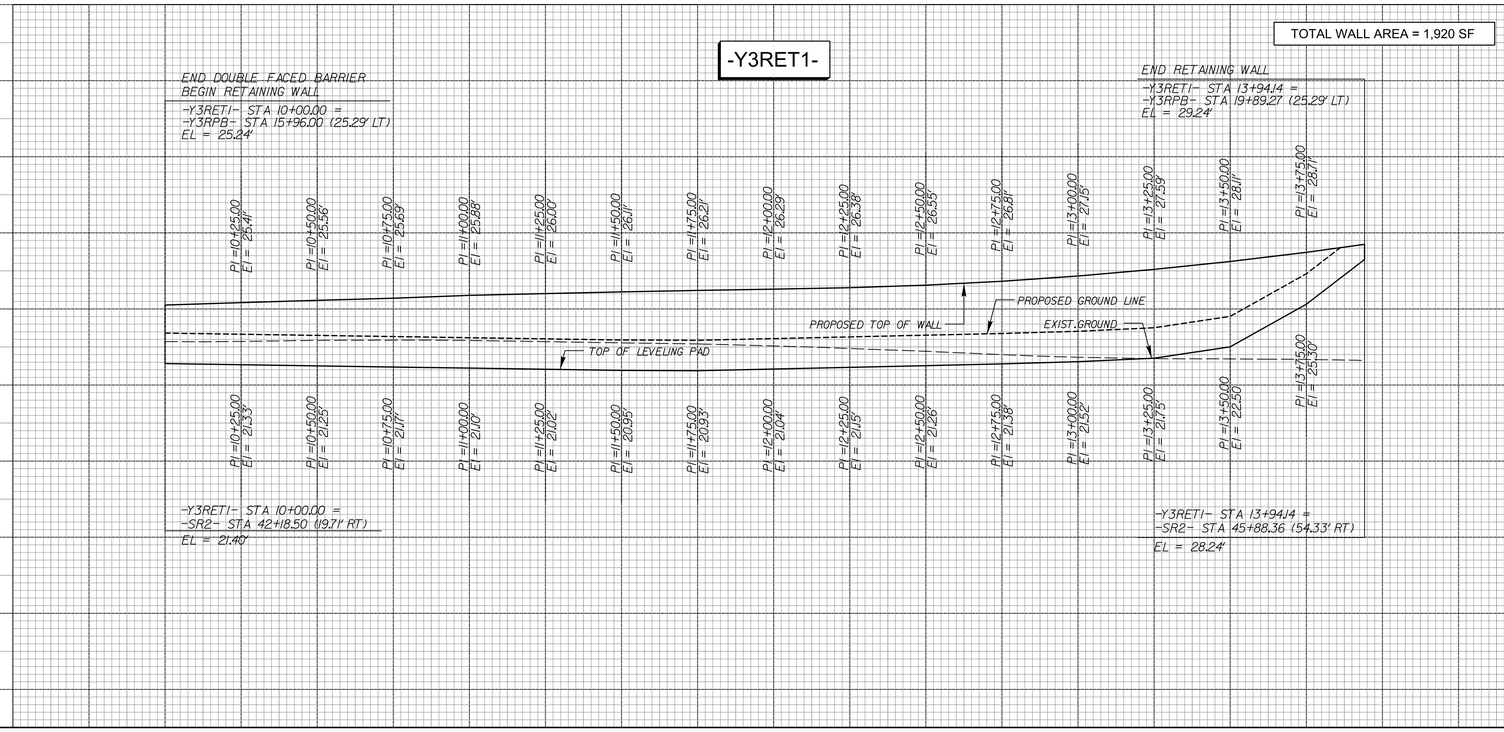
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

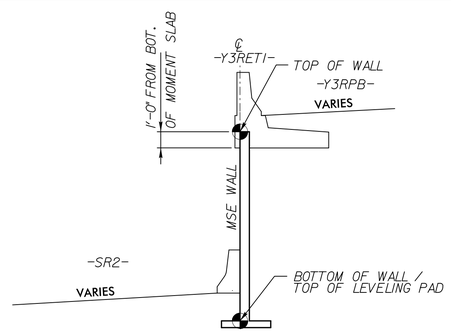
NAD 83/95

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEET 16
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23

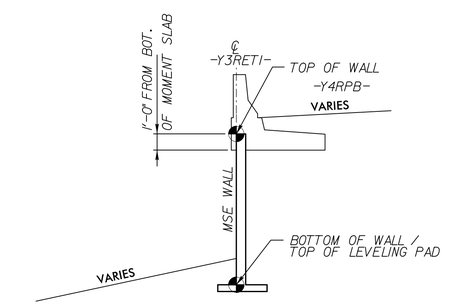


SCALE: 1" = 25' HORZ.
1" = 5' VERT.





RETAINING WALL DETAIL
-Y3RET2- STA. 10+00.00 TO STA. 13+24.96
NOT TO SCALE



RETAINING WALL DETAIL
-Y3RET2- STA. 13+24.96 TO STA. 13+94.14
NOT TO SCALE

8/14/2020
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ft_ecomo

Submitted 9/16/2020

8/17/99

REVISIONS

SCALE: 1" = 25' HORZ.
1" = 5' VERT.

B

NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-14

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C. ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEET 16
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23

24' INC. TYP. +63.00

END RETAINING WALL -Y3RET2-
STA 14+87.49 =
-L- STA 413+02.35, 63.91' LT =
-Y3RPB- STA 22+23.94, 90.87' RT

IA-MASH TL-3

8:1

-Y3RPB-

-Y3RET2-

19' INC. TYP. +31.32

PI Sta. 14+42.24

B-77

N 30° 09' 06.0" W

TYPE-T BARRIER

MOMENT SLAB

N 25° 33' 47.1" W

BEGIN RETAINING WALL -Y3RET2-
STA 10+00.00 =
-L- STA 408+15.00, 60.29' LT =
-Y3RPB- STA 17+82.40, 13.19' RT

-L-

-Y3RET2-

END DOUBLE FACED BARRIER
BEGIN RETAINING WALL
-Y3RET2- STA 10+00.00 =
-L- STA 408+15.00 (60.29' LT)
EL = 29.84'

END RETAINING WALL
-Y3RET2- STA 14+87.49 =
-L- STA 413+02.35 (63.91' LT)
EL = 43.98'

PROPOSED GROUND LINE

PROPOSED TOP OF WALL

TOP OF LEVELING PAD

EXIST.GROUND

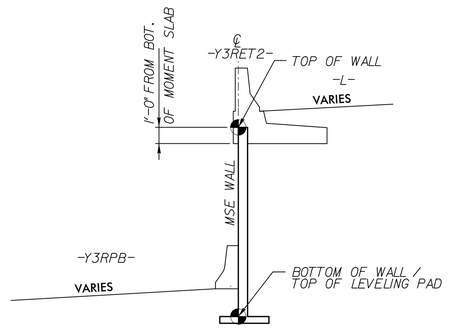
-Y3RET2- STA 10+00.00 =
-Y3RPB- STA 17+82.40 (13.19' RT)
EL = 25.98'

-Y3RET2- STA 14+87.49 =
-Y3RPB- STA 22+23.94 (90.87' RT)
EL = 42.81'

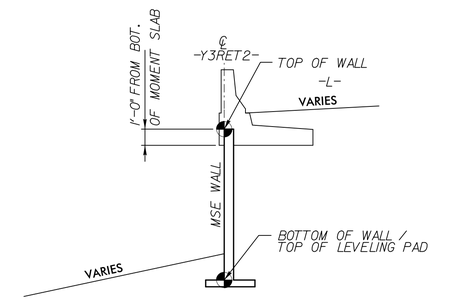
TOTAL WALL AREA = 3,160 SF

45 40 35 30 25 20 15 10

10+00 10+50 11+00 11+50 12+00 12+50 13+00 13+50 14+00 14+50 15+00



RETAINING WALL DETAIL
-Y3RET2- STA. 10+00.00 TO STA. 13+80.60
NOT TO SCALE



RETAINING WALL DETAIL
-Y3RET2- STA. 13+80.60 TO STA. 14+87.49
NOT TO SCALE

8/14/2020
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Default

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-15

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C ALVEY

Balfour Beatty | STV 100 Years

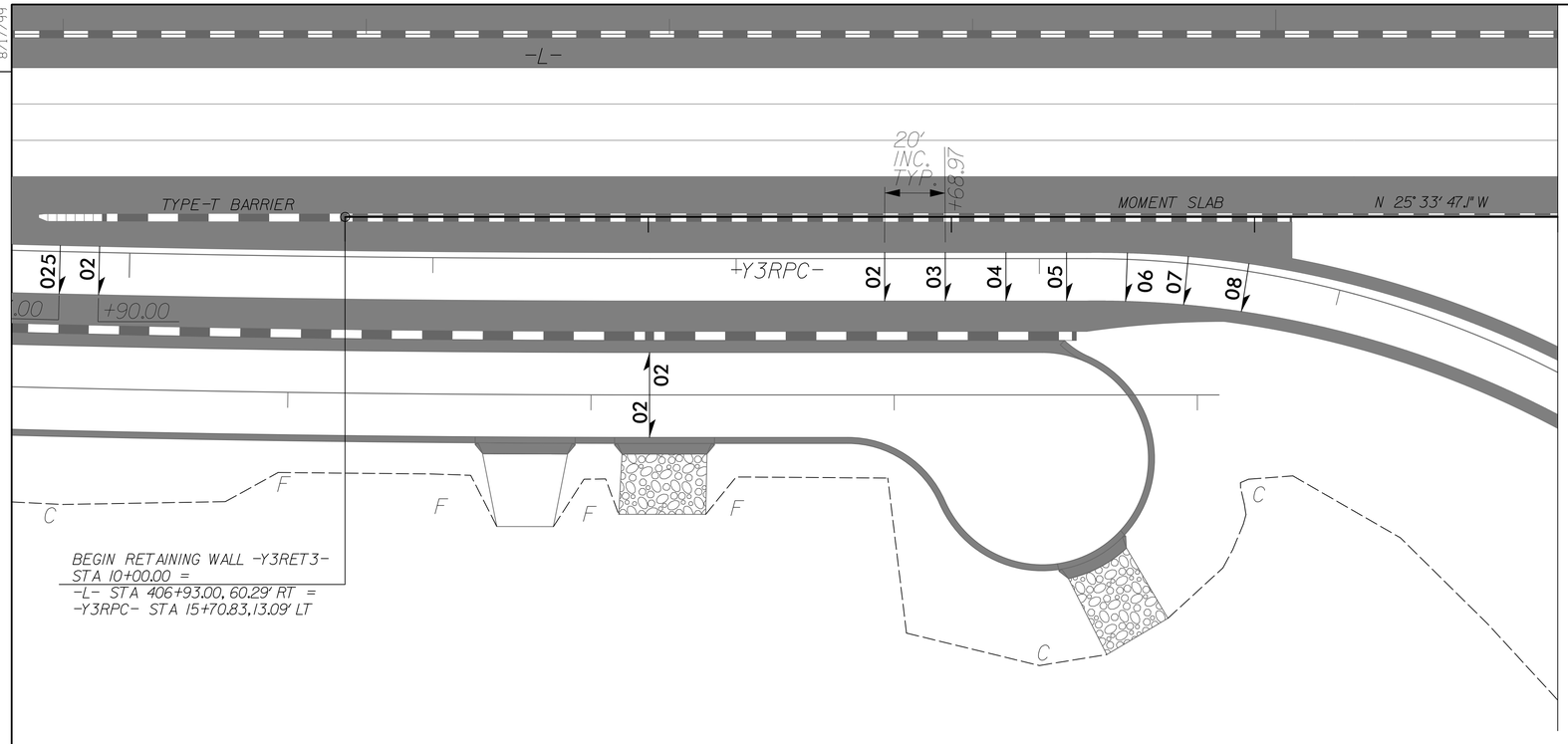
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

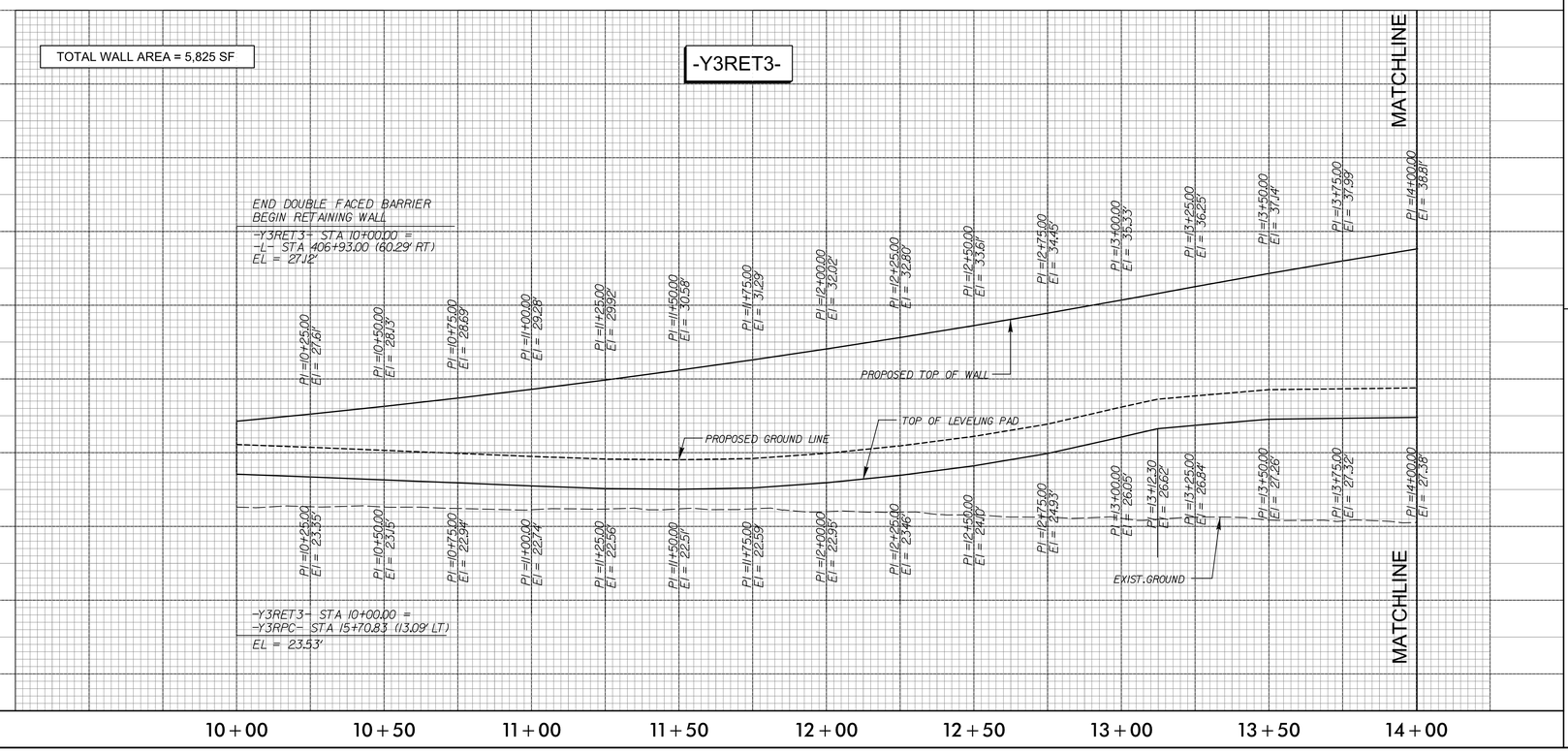
RETAINING WALL DETAIL SHEET
FOR PLAN SEE SHEET 16
FOR MOMENT SLAB DETAILS SEE SHEET XX
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET XX

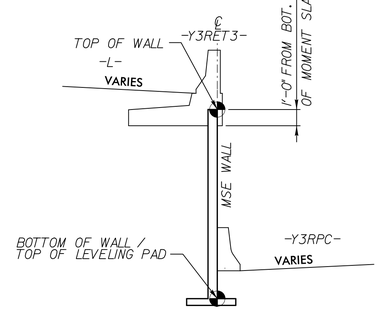
REVISIONS

8/17/99

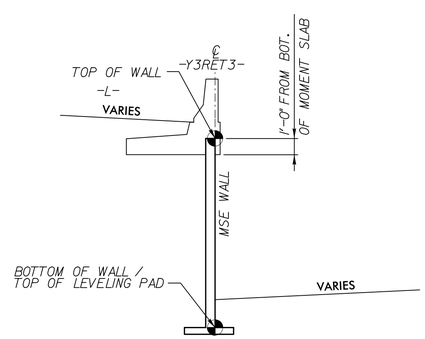


SCALE: 1" = 25' HORZ.
1" = 5' VERT.





RETAINING WALL DETAIL
-Y3RET3- STA. 10+00.00 TO STA. 13+12.30
NOT TO SCALE



RETAINING WALL DETAIL
-Y3RET3- STA. 13+12.30 TO STA. 14+00.00
NOT TO SCALE

8/14/2020
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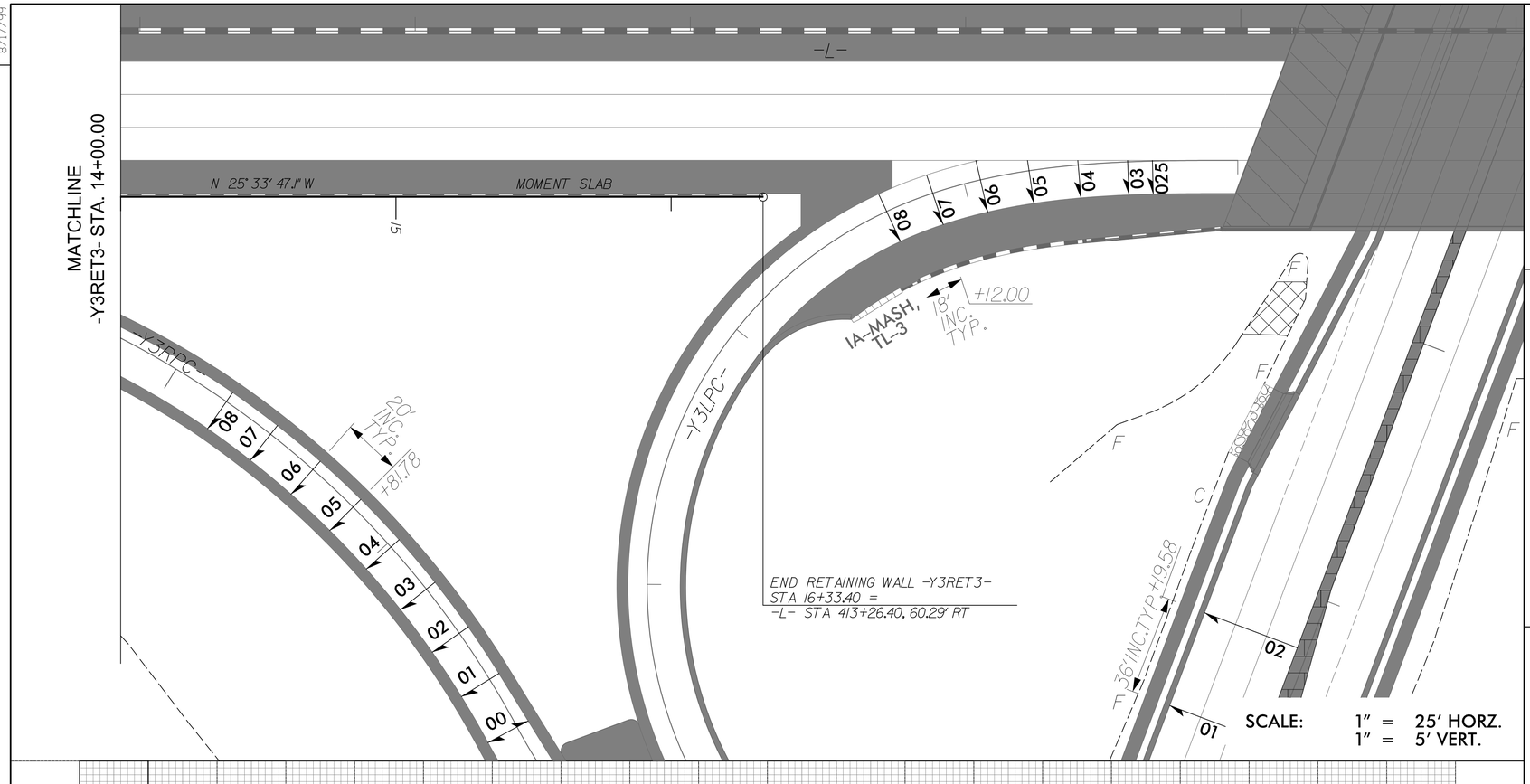
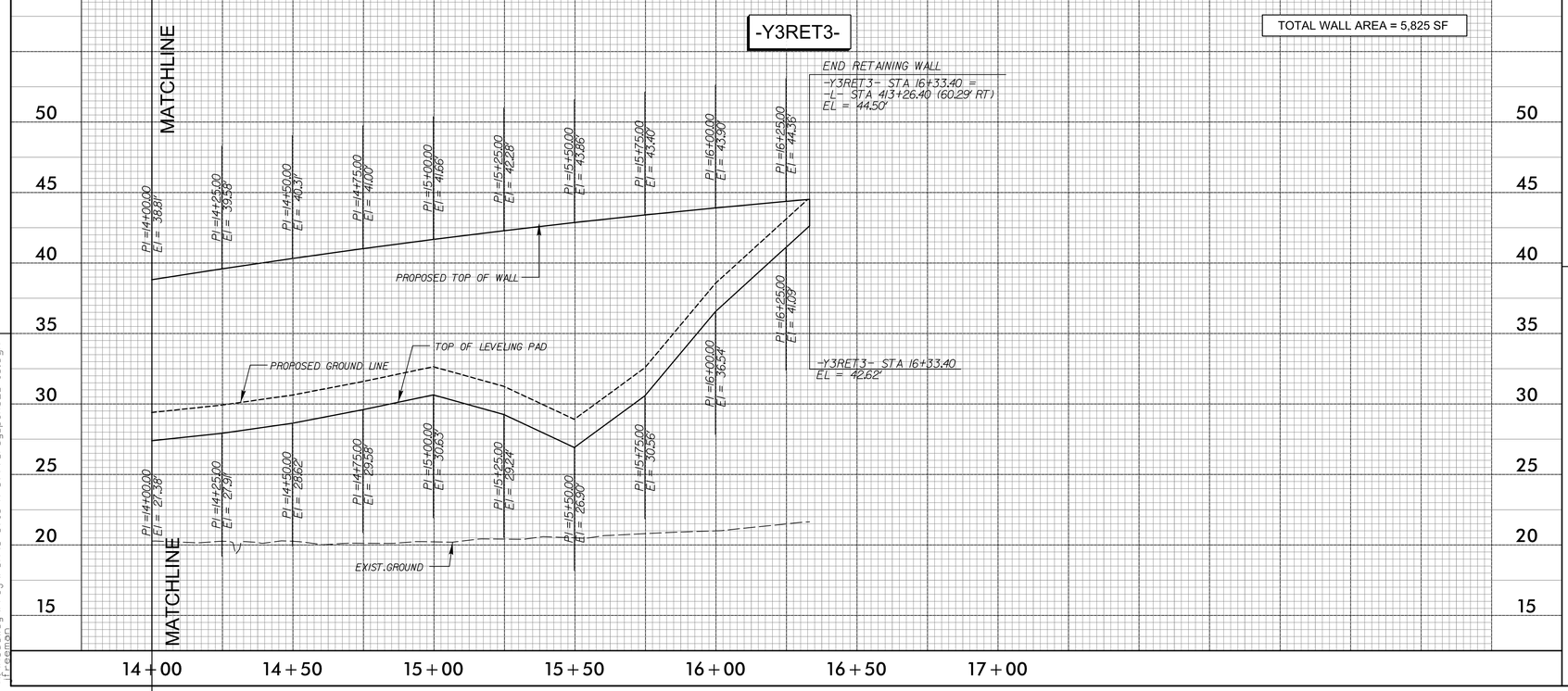
Layout1

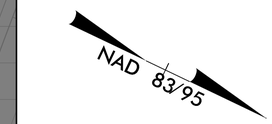
Submitted 9/16/2020

8/17/99

REVISIONS







PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-16

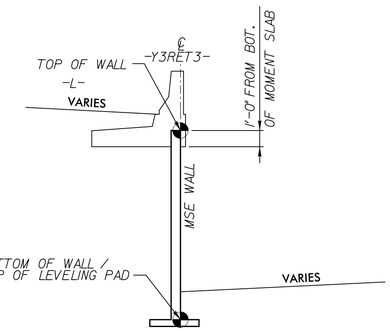
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C. ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEET 16
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
-Y3RET3- STA. 14+00.00 TO STA. 16+33.40
NOT TO SCALE

8/14/2020
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ft_ehoo

Submitted 9/16/2020

8/17/99

REVISIONS

SCALE: 1" = 25' HORZ.
1" = 5' VERT.

CURVE DATA
PI Sta 12+57.62
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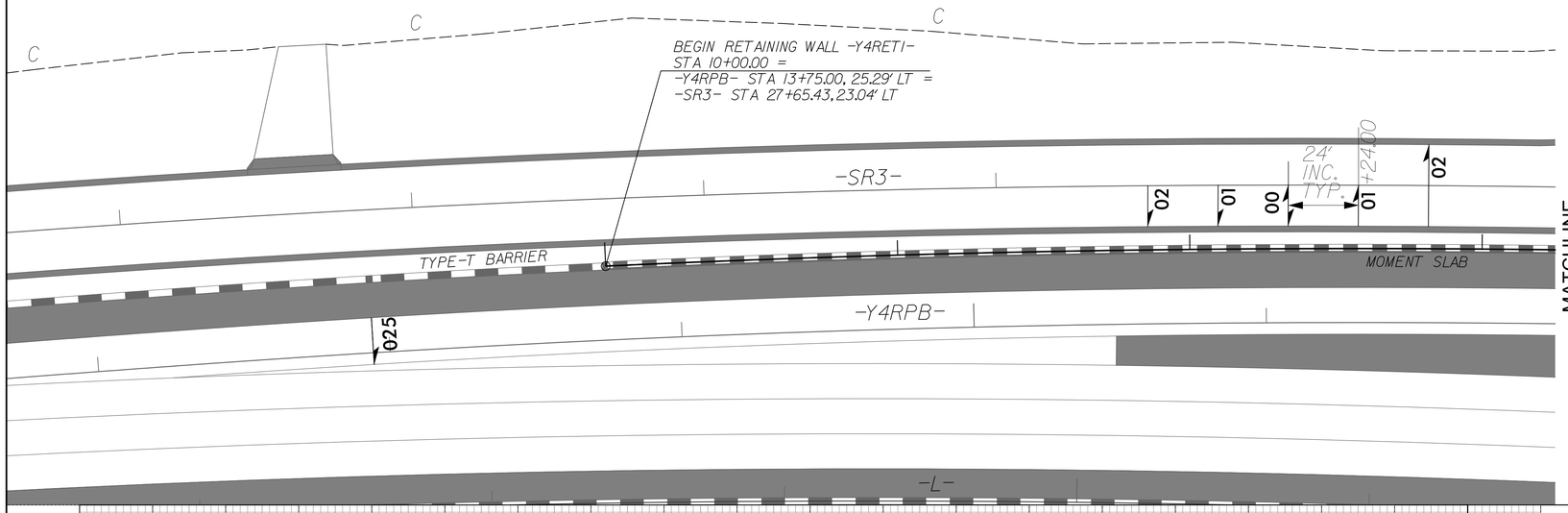
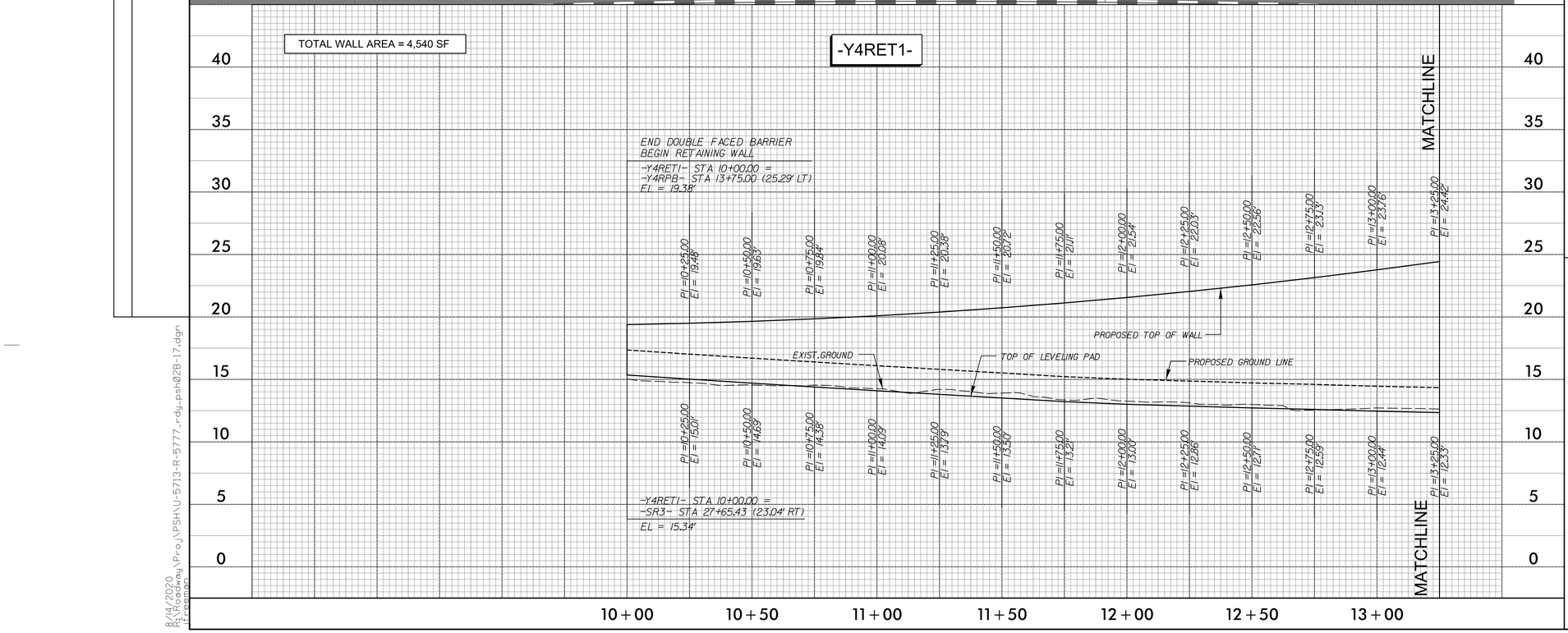
D = 1°02' 13.1"
L = 514.86'
T = 257.62'
R = 5,525.29'





PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-17

ROADWAY DESIGN ENGINEER

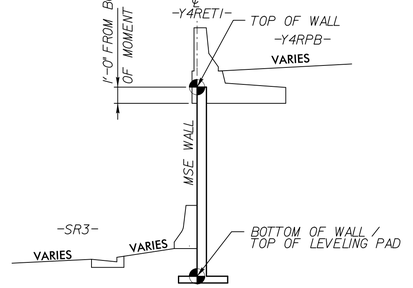
NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C. ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/95

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEETS 17 & 18
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
-Y4RET1- STA. 10+00.00 TO STA. 13+25.00
NOT TO SCALE

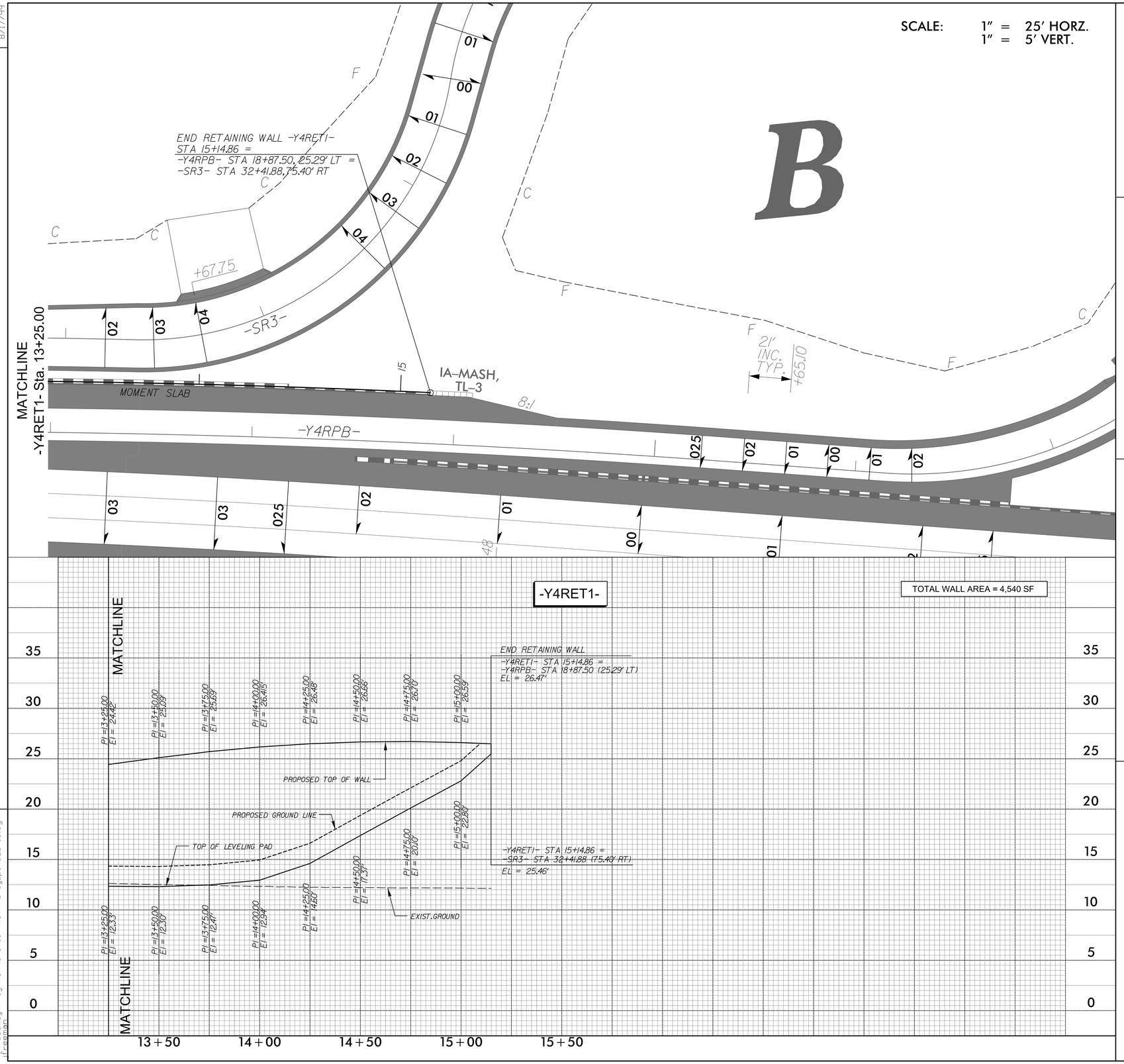
8/14/2020
R:\Roadway\Proj\PSHU-5713-R-5777-rdy_psh02B-17.dgn
ftaylor

Submitted 9/16/2020

8/17/99

REVISIONS

SCALE: 1" = 25' HORZ.
1" = 5' VERT.



NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-18

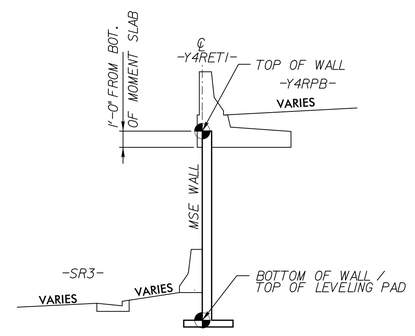
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C. ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEETS 17 & 18
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
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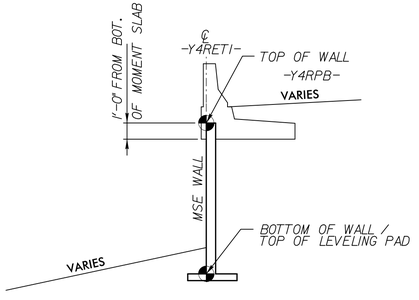
NOT TO SCALE



RETAINING WALL DETAIL
-Y4RET1- STA. 14+44.59 TO STA. 15+14.86
NOT TO SCALE

8/14/2020
R:\Roadway\Proj\PSH\U-5713-R-5777_rdy_psh02B-18.dgn

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-19

ROADWAY DESIGN ENGINEER

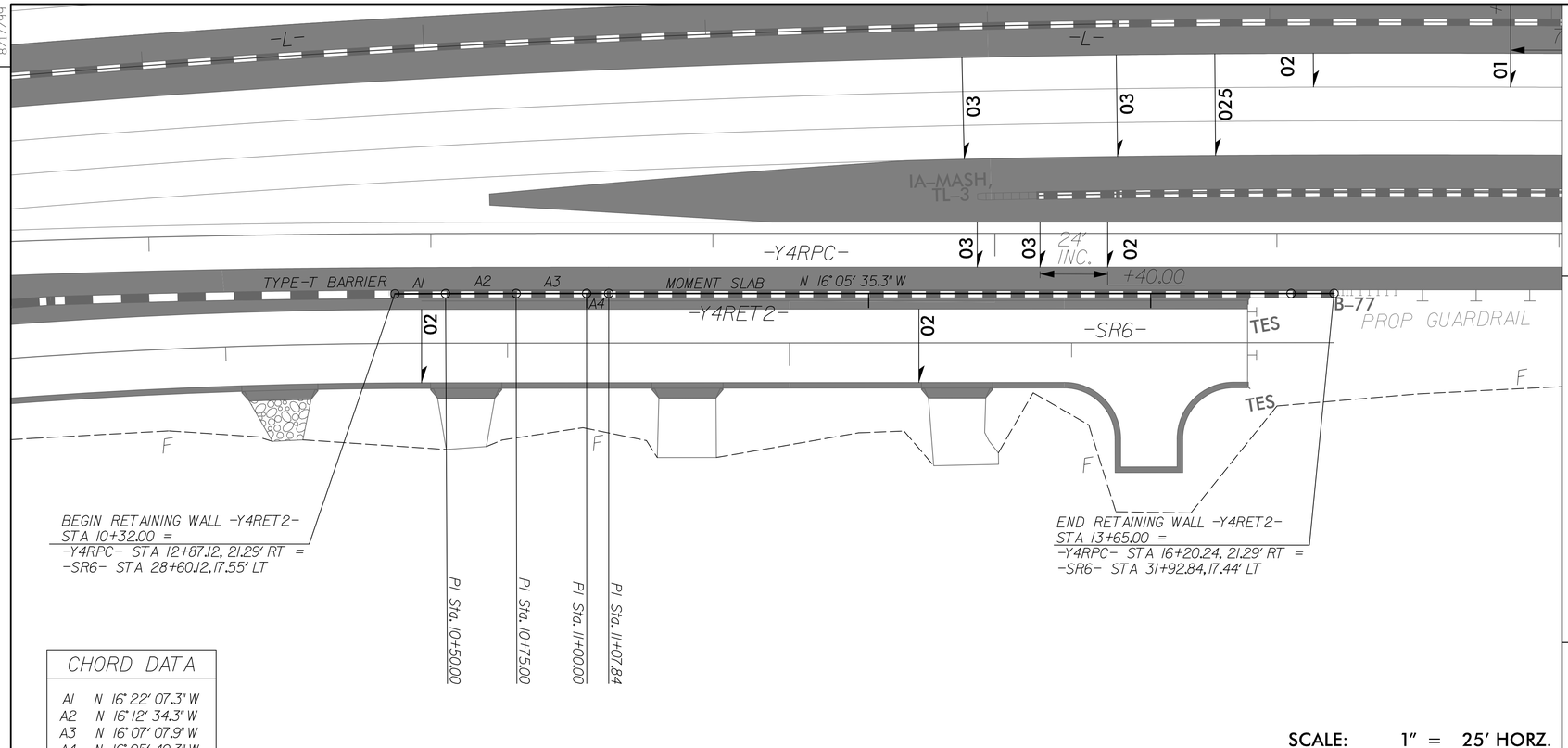
NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C ALVEY

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

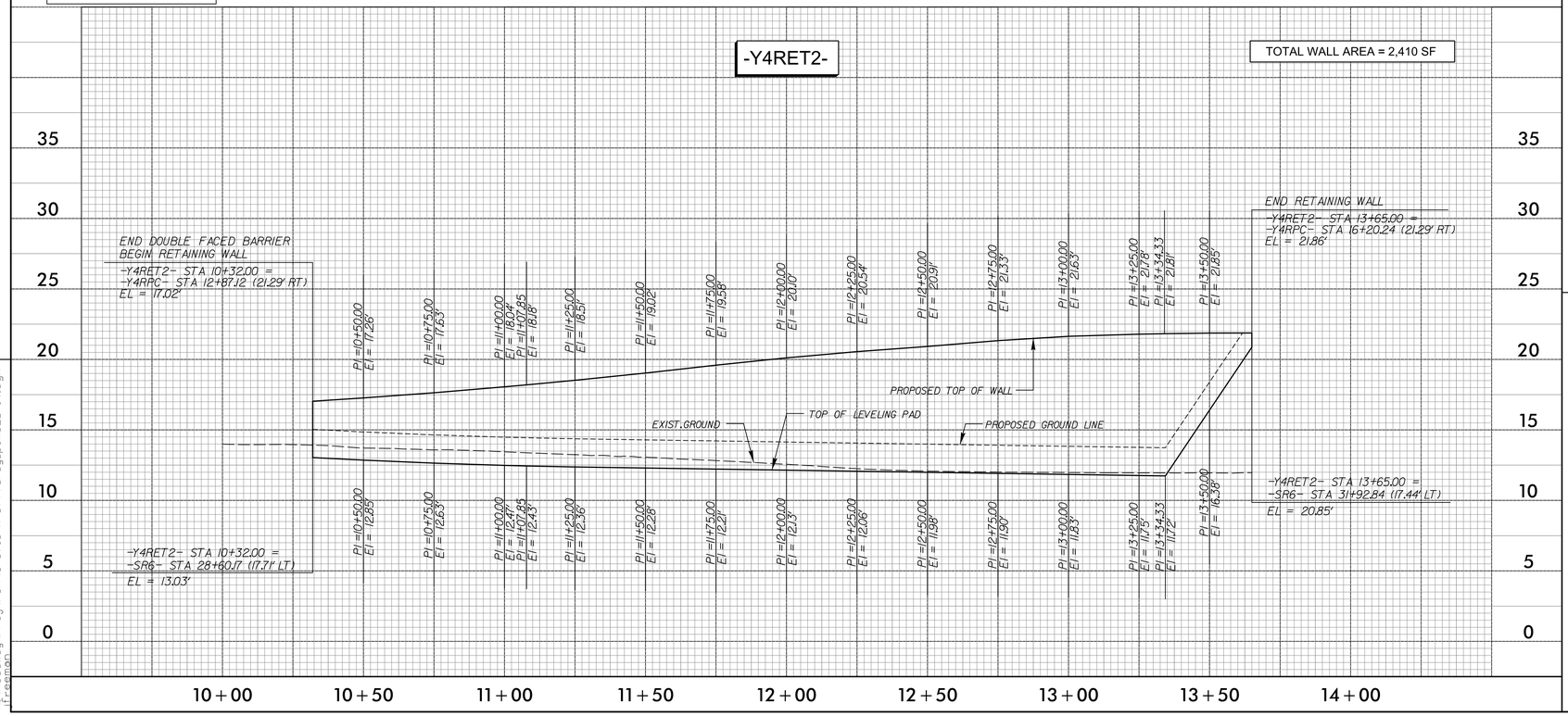
NAD 83/95

REVISIONS 8/17/99

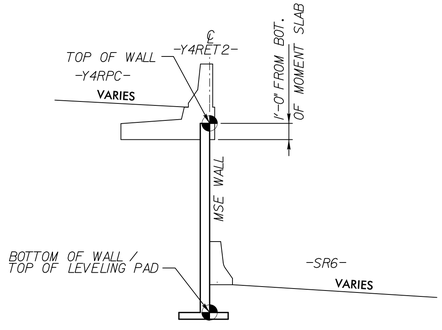


CHORD DATA	
A1	N 16° 22' 07.3" W
A2	N 16° 12' 34.3" W
A3	N 16° 07' 07.9" W
A4	N 16° 05' 40.3" W

SCALE: 1" = 25' HORZ.
1" = 5' VERT.



RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEETS 17 & 18
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23

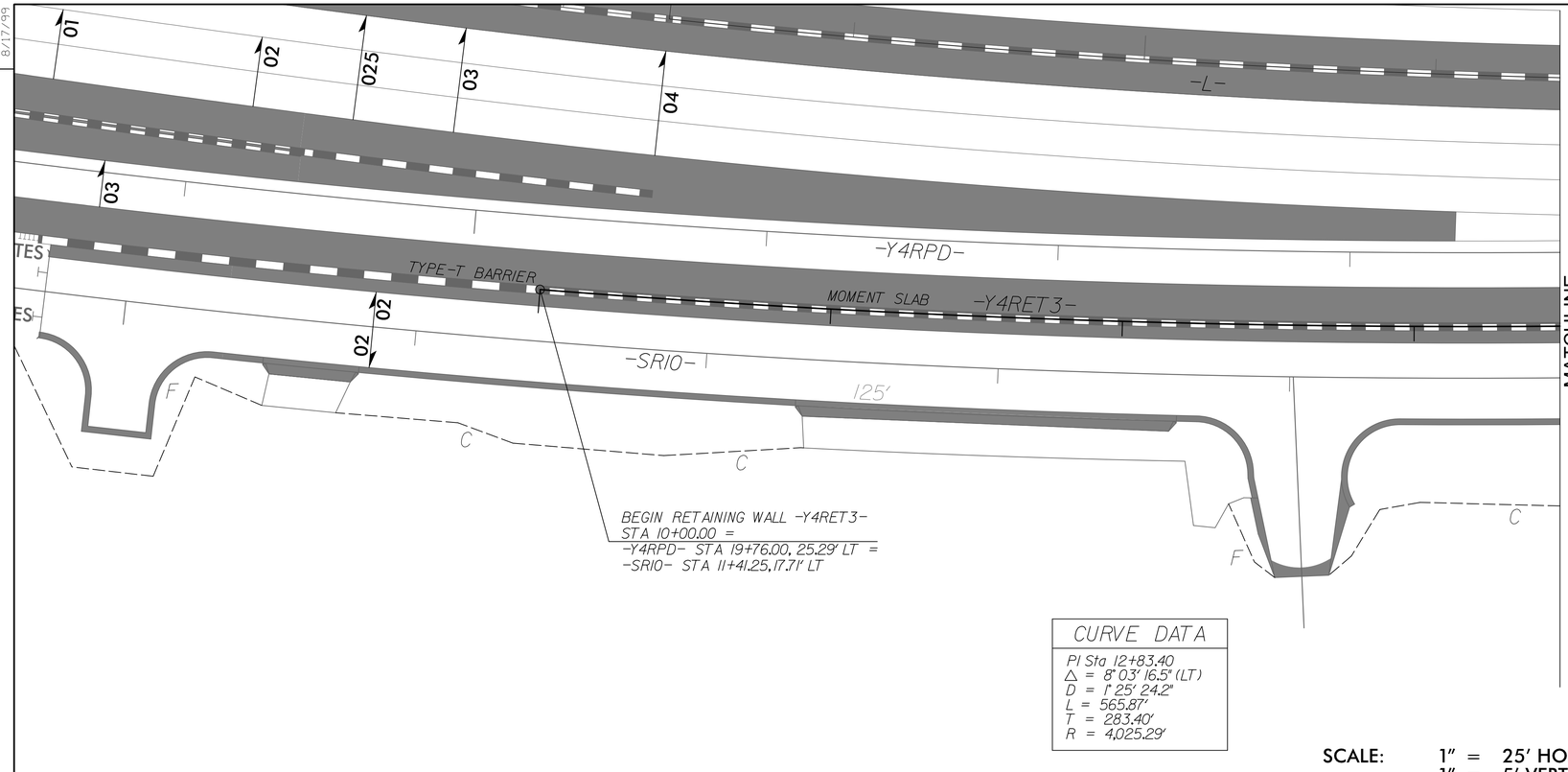


RETAINING WALL DETAIL
-Y4RET2- STA. 10+32.00 TO STA. 13+65.00
NOT TO SCALE

8/14/2020
R:\Roadway\Proj\PSHU-5713-R-5777_rdy_psh02B-19.dgn
ltessmon

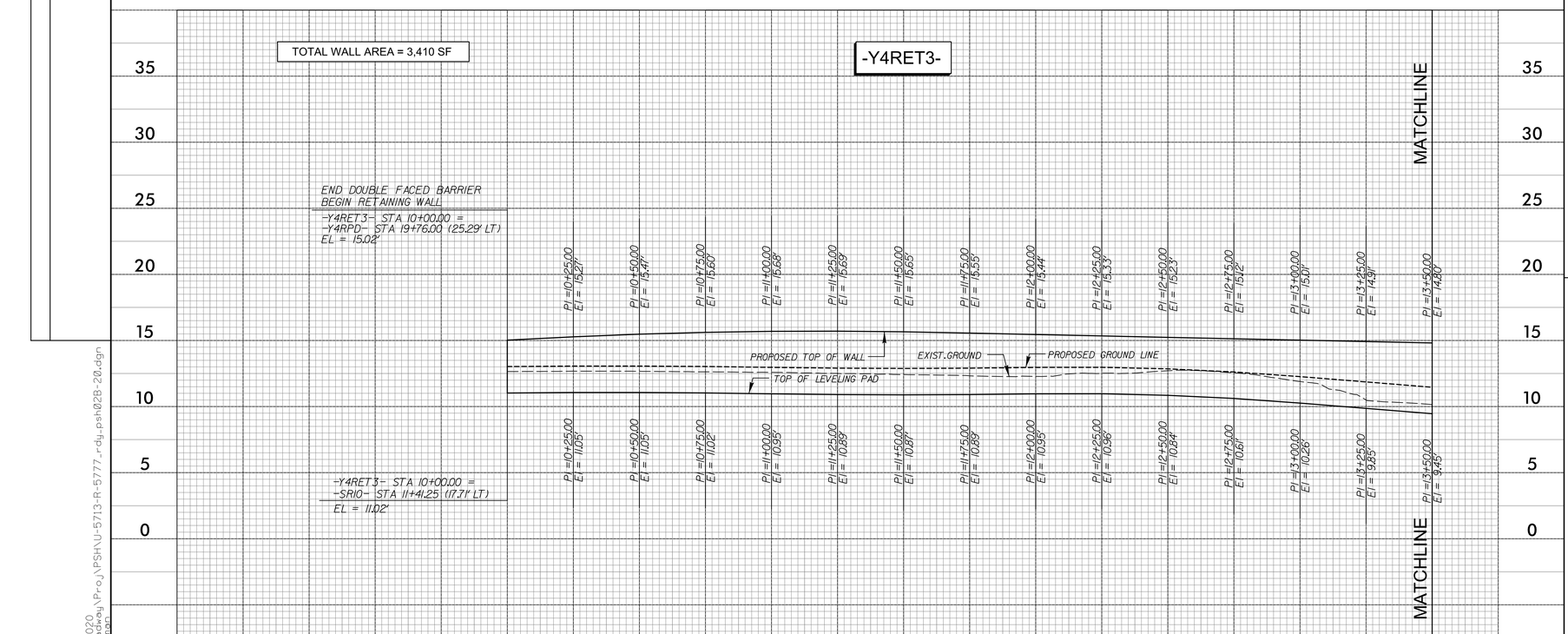
Submitted 9/16/2020

REVISIONS 8/17/99



CURVE DATA
PI Sta 12+83.40
△ = 8° 03' 16.5" (LT)
D = 1° 25' 24.2"
L = 565.87'
T = 283.40'
R = 4,025.29'

SCALE: 1" = 25' HORZ.
1" = 5' VERT.



NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-20

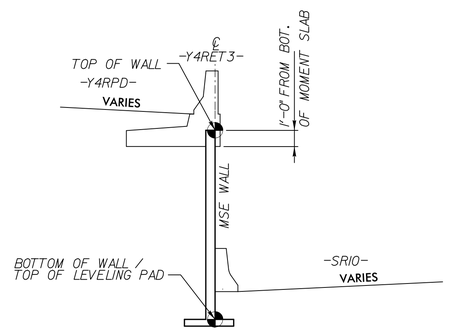
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C. ALVEY

Balfour Beatty STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEETS 18 & 19
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
–Y4RET3– STA. 10+00.00 TO STA. 13+50.00
NOT TO SCALE

8/14/2020
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IF (2.000)

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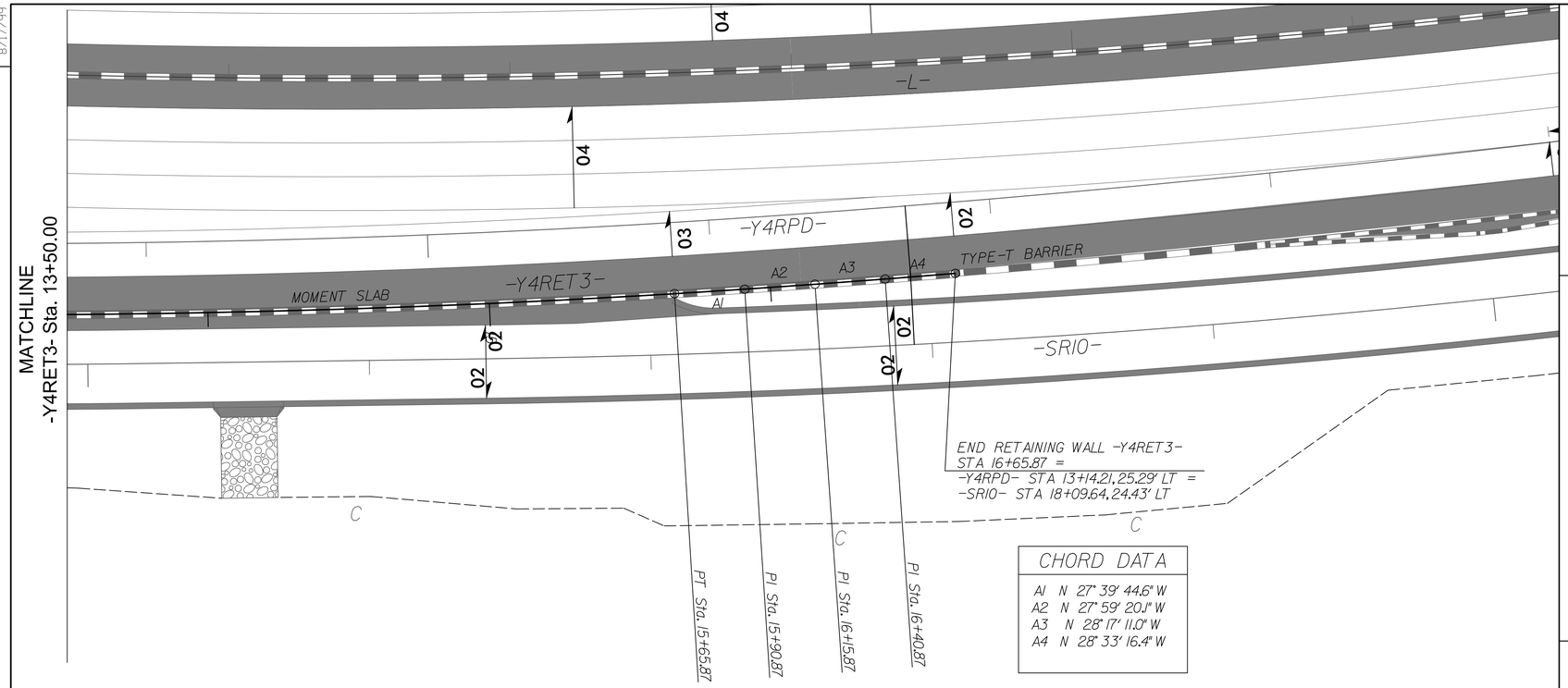
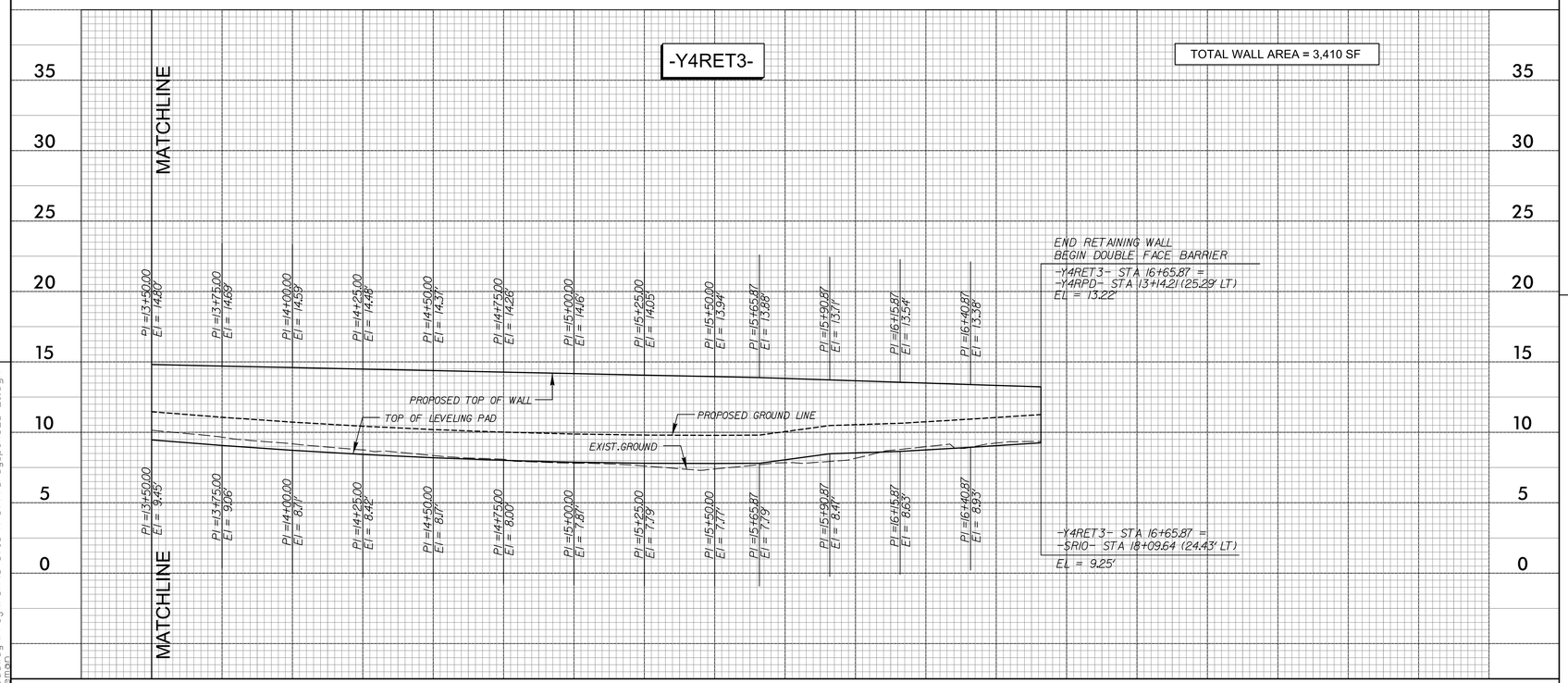
8/17/99

REVISIONS



CHORD DATA	
A1	N 27° 39' 44.6" W
A2	N 27° 59' 20.1" W
A3	N 28° 17' 11.0" W
A4	N 28° 33' 16.4" W

SCALE: 1" = 25' HORZ.
1" = 5' VERT.



NAD 83/95

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777 A&B	2B-21

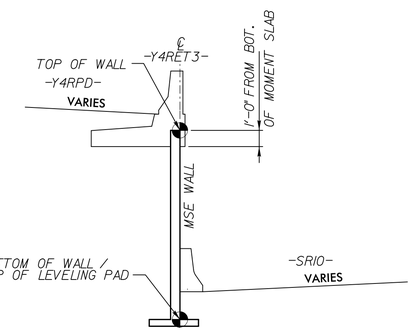
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044419 ENGINEER ADAM C ALVEY

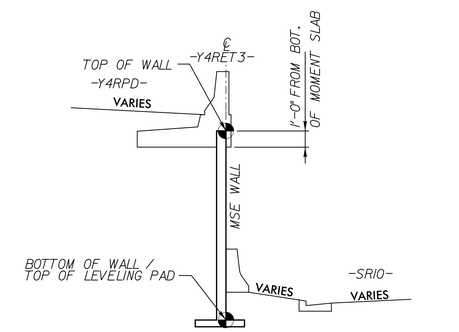
Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RETAINING WALL DETAIL SHEET
FOR ROADWAY PLAN SEE SHEETS 18 & 19
FOR MOMENT SLAB DETAILS SEE SHEET 2G-1
FOR DRAINAGE BOX IN MOMENT SLAB SEE SHEET 2G-2
FOR MSE WAL NOTES AND ADDITIONAL DETAILS
SEE SHEETS 2B-22 AND 2B-23



RETAINING WALL DETAIL
-Y4RET3- STA. 13+50.00 TO STA. 15+65.87
NOT TO SCALE



RETAINING WALL DETAIL
-Y4RET3- STA. 15+65.87 TO STA. 16+65.87
NOT TO SCALE

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-22

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 40555 ENGINEER SCOTT GUTOWSKI

Balfour Beatty | STV 100 Years

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NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

A CONCRETE BARRIER RAIL WITH MOMENT SLAB IS REQUIRED ABOVE RETAINING WALLS. SEE ROADWAY PLANS FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS.

AT THE CONTRACTOR'S OPTION, USE FINE AGGREGATE IN THE REINFORCED ZONE OF RETAINING WALL XX.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALLS XX.

A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALL XX.

A SEPARATION GEOTEXTILE IS REQUIRED AT THE BACK OF THE REINFORCED ZONE FOR RETAINING WALL XX.

A DRAIN IS REQUIRED FOR RETAINING WALL XX.

FINAL MSE WALL NOTES TO BE SUBMITTED FOR APPROVAL PRIOR TO RFC ROADWAY PLAN SUBMITTAL

DESIGN RETAINING WALL XX FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = SEE TABLE 3
4) MINIMUM REINFORCEMENT LENGTH (L) = SEE TABLE 4
5) MINIMUM EMBEDMENT ELEVATION = SEE TABLE 5
6) REINFORCED ZONE AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
COARSE	110	38	0
FINE	115	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION MATERIAL			
WALL ID	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) PSF

DESIGN RETAINING WALL xxx FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN RETAINING WALL xxx FOR THE STRIP SURCHARGE LOAD SHOWN.

DESIGN RETAINING WALL NO. 1 AND 2 TO ACCOMMODATE EXISTING DRAINAGE STRUCTURE UNDER WALL, SEE PLANS.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NXX UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

ADDITIONAL NOTES:

1)

2)

3)

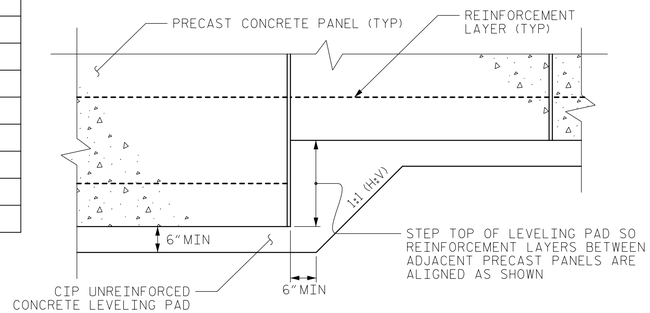
4)

TABLE 3

WALL ID	MAX. FACTORED BEARING PRESSURE PSF

TABLE 5

WALL ID	BEGINNING STATION	ENDING STATION	MINIMUM EMBEDMENT FT.



PRECAST PANELS LEVELING PAD STEP DETAIL

TABLE 4

WALL ID	ALIGNMENT	BEGINNING STATION	ENDING STATION	MINIMUM REINFORCMENT L/H	MINIMUM REINFORCMENT LENGTH FT.

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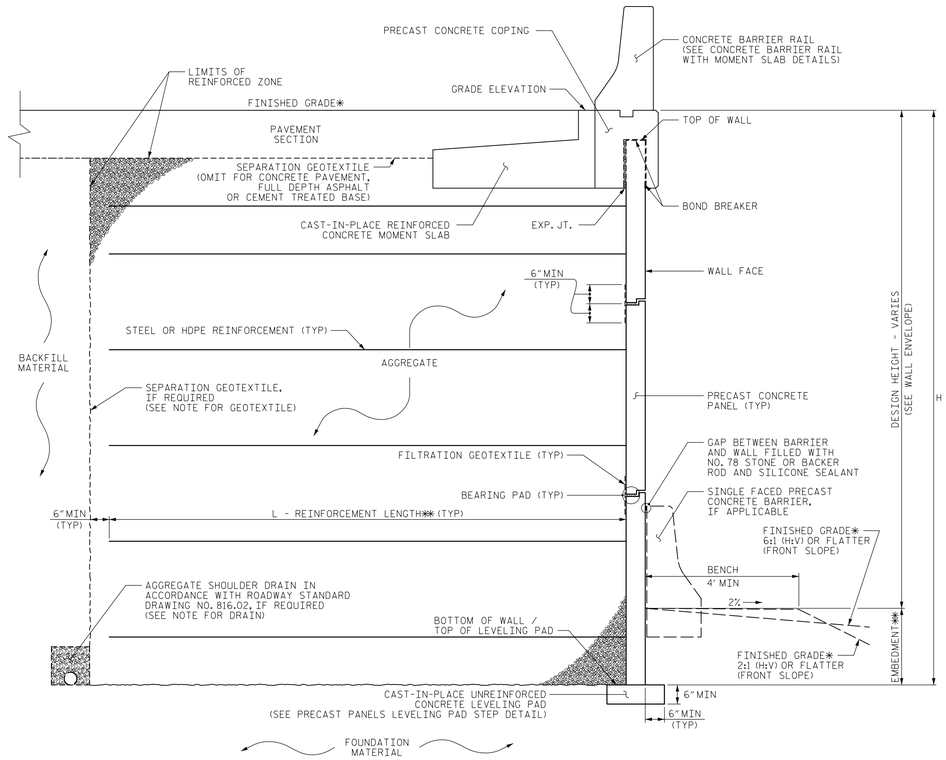
PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2B-23

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 40555 ENGINEER SCOTT GUTOWSKI

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

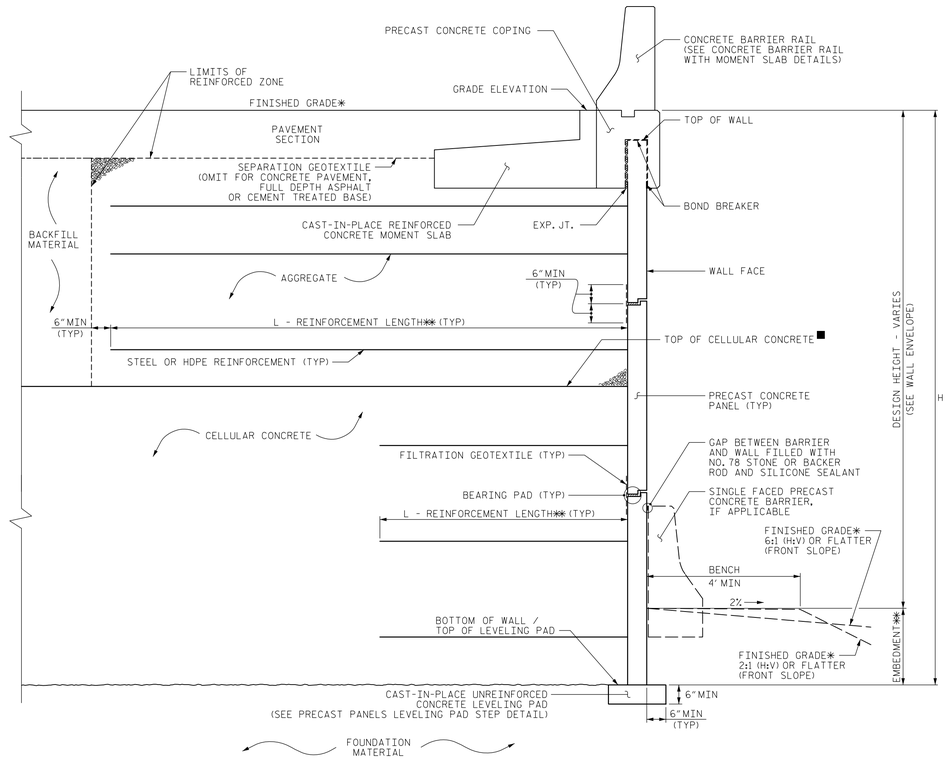


MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

APPLICABLE TO RETAINING WALLS WHERE NO PART OF RETAINED MATERIAL IS CELLULAR CONCRETE

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

APPLICABLE TO RETAINING WALLS WHERE ANY PART OF RETAINED MATERIAL IS CELLULAR CONCRETE

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

**SEE MSE RETAINING WALLS PROVISION AND IF APPLICABLE, MSE WALL NOTES FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.

■ TOP OF CELLULAR CONCRETE SHALL BE LOCATED A MINIMUM OF 6"FROM HORIZONTAL JOINT IN MSE WALL PANELS

TOP OF CELLULAR CONCRETE SHALL BE GRADED TO DRAIN TOWARD THE END OF THE MSE WALL

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tlgeorge

Submitted 9/16/2020

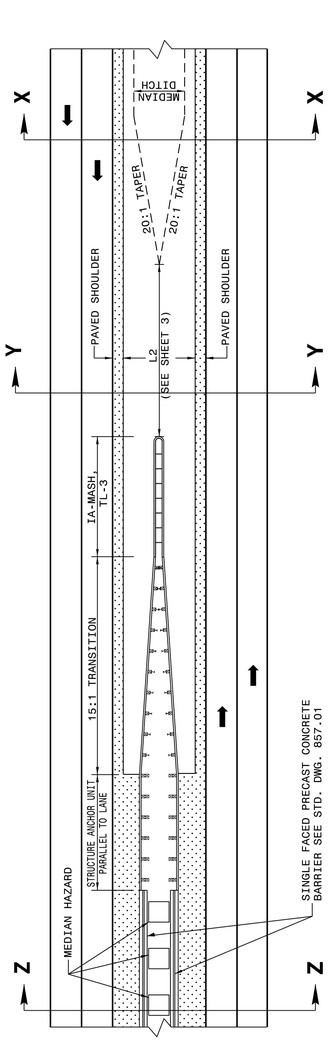
PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-1

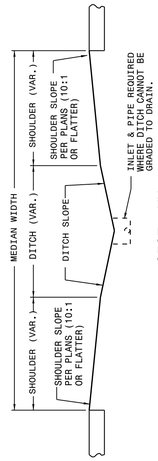
04-SEP-208 08:31
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\Division 8\862D01 Impact Attenuator Sheets 1 and 2.dgn
jhowerton AT CSD-292695

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

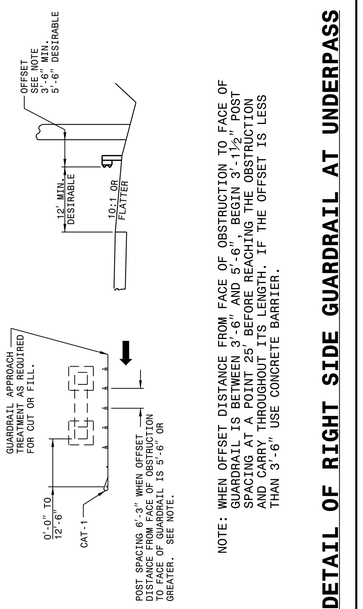
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 1 OF 11
862D01





DETAIL OF MEDIAN TREATMENT AT UNDERPASS



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

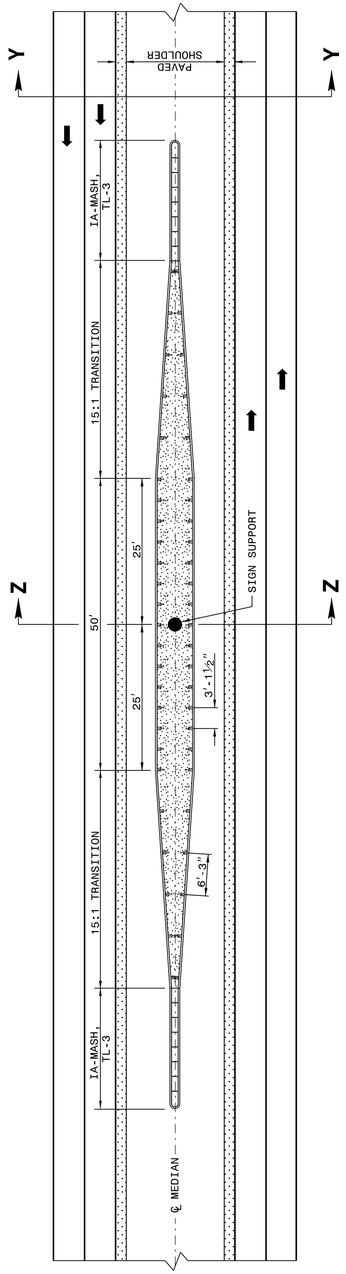
DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **GUARDRAIL PLACEMENT**	SHEET 1 OF 11 862D01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

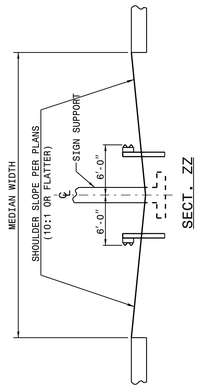
ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

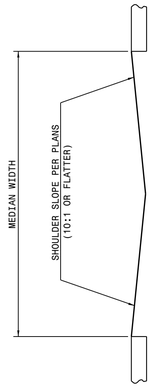
SHEET 2 OF 11
862D01



NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.
GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 12).





DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ROADWAY DETAIL DRAWING FOR **GUARDRAIL PLACEMENT**	SHEET 2 OF 11 862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 Joel S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J HOWERTON DATE: 08-23-18
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-2

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

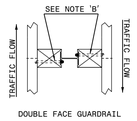
ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT DOUBLE FACED W-BEAM

SHEET OF

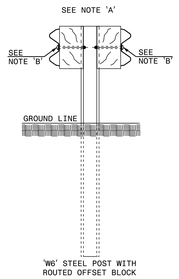
862D01

DRAWING NOT TO SCALE



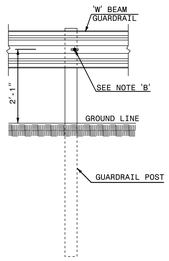
DOUBLE FACE GUARDRAIL

PLAN



'W6' STEEL POST WITH ROUTED OFFSET BLOCK

SIDE



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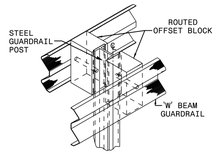
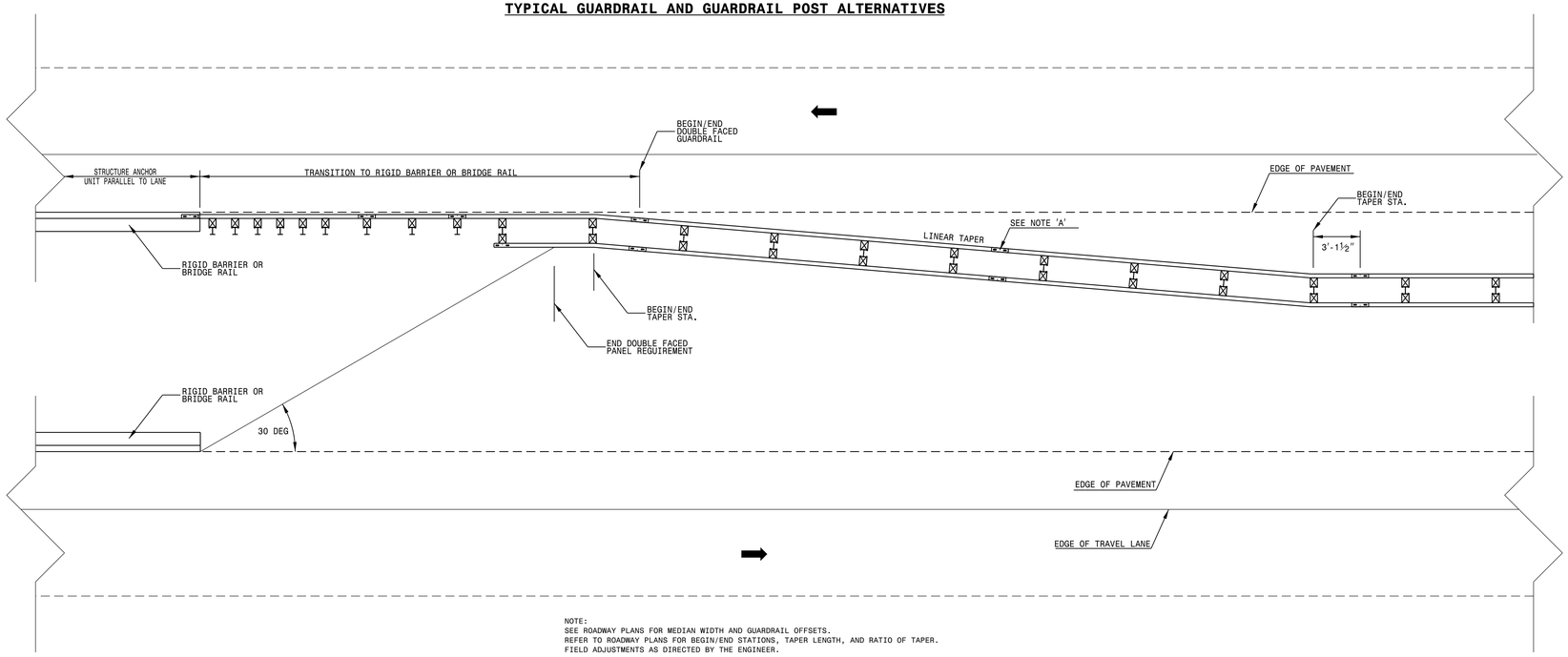


ISOMETRIC VIEW

NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES



NOTE:
SEE ROADWAY PLANS FOR MEDIAN WIDTH AND GUARDRAIL OFFSETS.
REFER TO ROADWAY PLANS FOR BEGIN/END STATIONS, TAPER LENGTH, AND RATIO OF TAPER.
FIELD ADJUSTMENTS AS DIRECTED BY THE ENGINEER.

APPROACH TO RIGID BARRIER OR BRIDGE RAIL

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR

GUARDRAIL PLACEMENT
DOUBLE FACED W-BEAM

SHEET OF

862D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

GUARDRAIL PLACEMENT
DOUBLE FACED W-BEAM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

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PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-3

STATE OF
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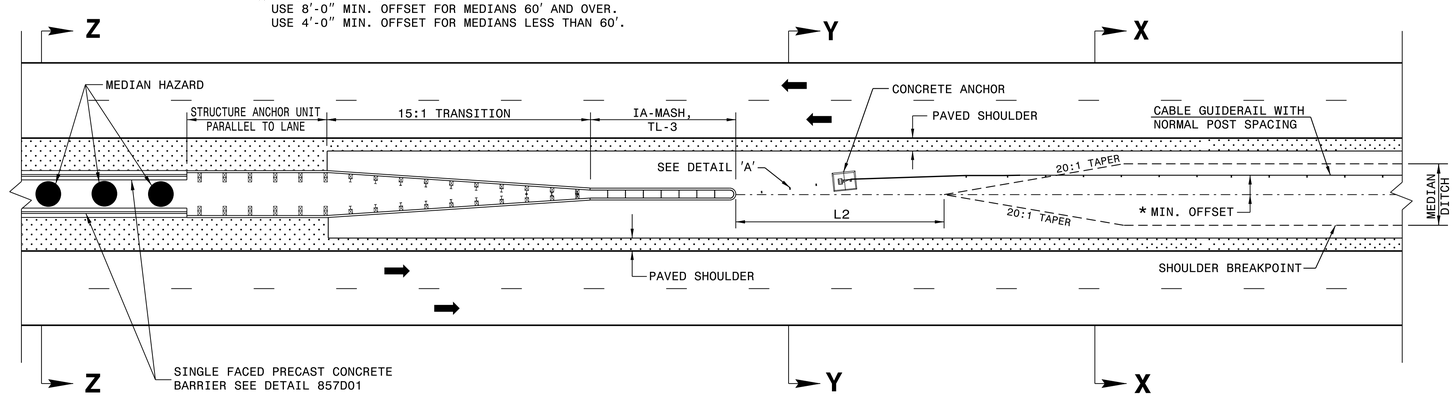
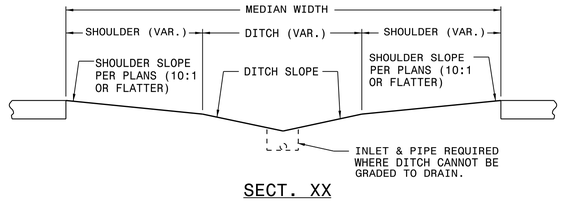
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
CABLE GUIDERAIL
MEDIAN HAZARD GUIDERAIL LAYOUT

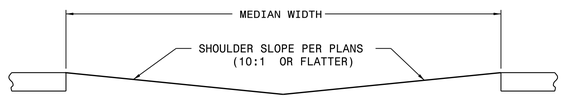
SHEET 1 OF 12
865D01

* OFFSET GUIDERAIL TO EITHER SIDE OF MEDIAN ℄.
USE 8'-0" MIN. OFFSET FOR MEDIANS 60' AND OVER.
USE 4'-0" MIN. OFFSET FOR MEDIANS LESS THAN 60'.

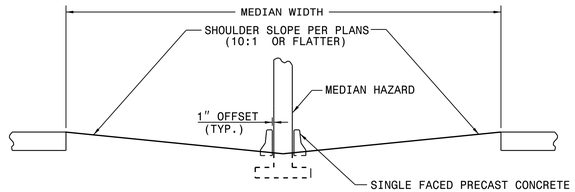




SECT. XX

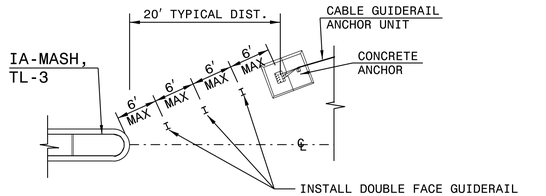


SECT. YY



SECT. ZZ

LIMITS OF -L2-	
MEDIAN WIDTH	-L2- DIMENSION
30'	80.0'
36'	60.0'
40' & ABOVE	40.0'



NOTE: POSTS WILL ONLY BE PLACED IN ONE OF THE TWO OPENINGS AT EACH MEDIAN HAZARD UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

DETAIL 'A'

DETAIL OF TREATMENT AT MEDIAN HAZARDS

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
CABLE GUIDERAIL
MEDIAN HAZARD GUIDERAIL LAYOUT

SHEET 1 OF12
865D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Jared S. Howerton

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SEE TITLE BLOCK

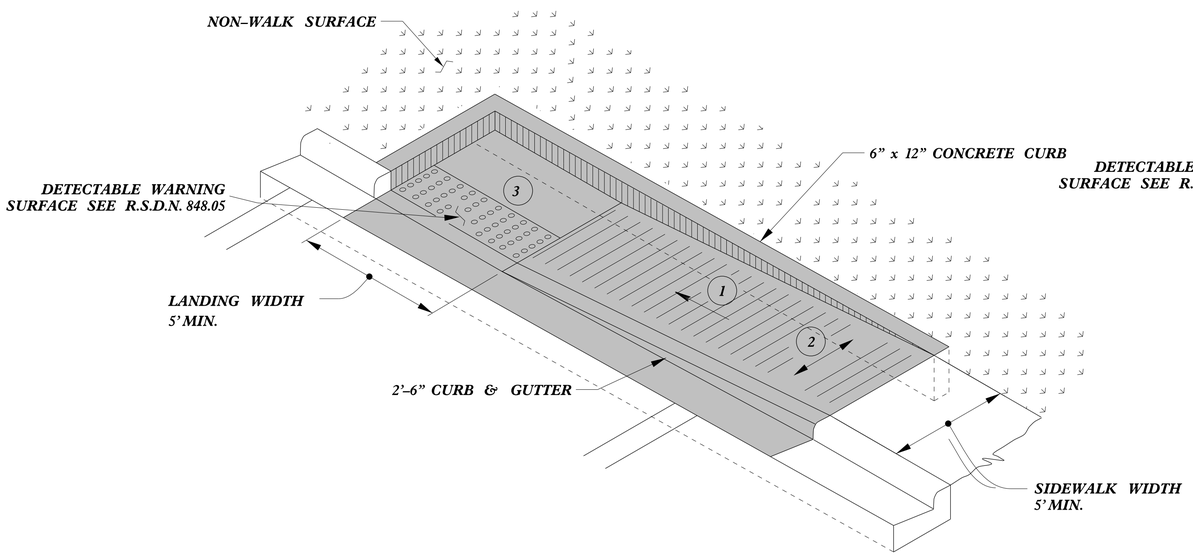
ORIGINAL BY: J HOWERTON DATE: 08-23-18
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

31-JAN-2019 10:43
S:\Contracts\Contracts\Special Details\jhowerton\Standard Drawings\2018 Standard Drawings\Details in Lieu of Standards\865D01 Impact Attenuator Sheet 1.dgn
jhowerton AT CSD-29595

Submitted 9/16/2020

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-4



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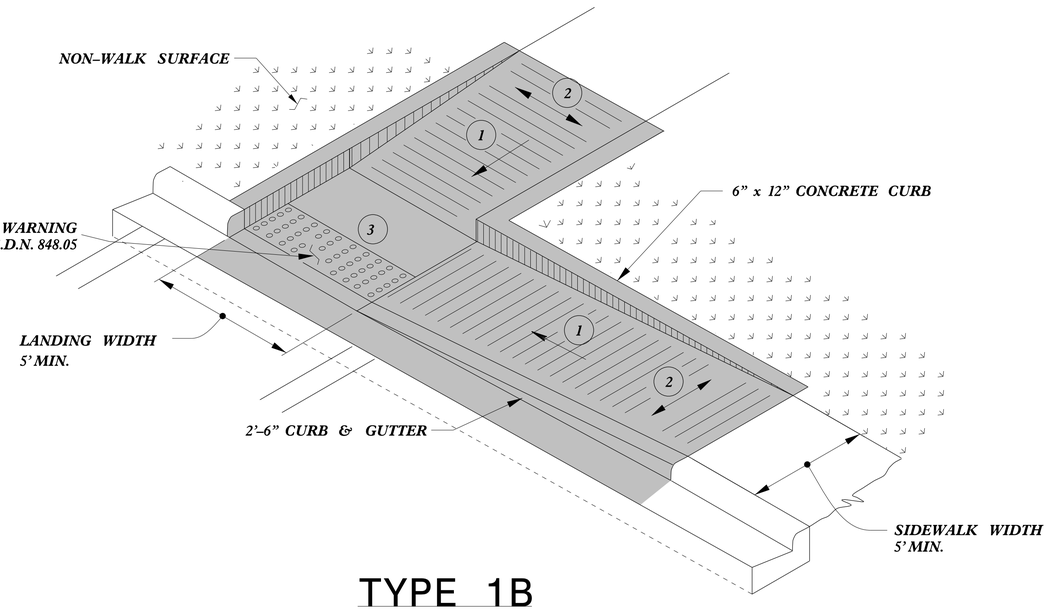
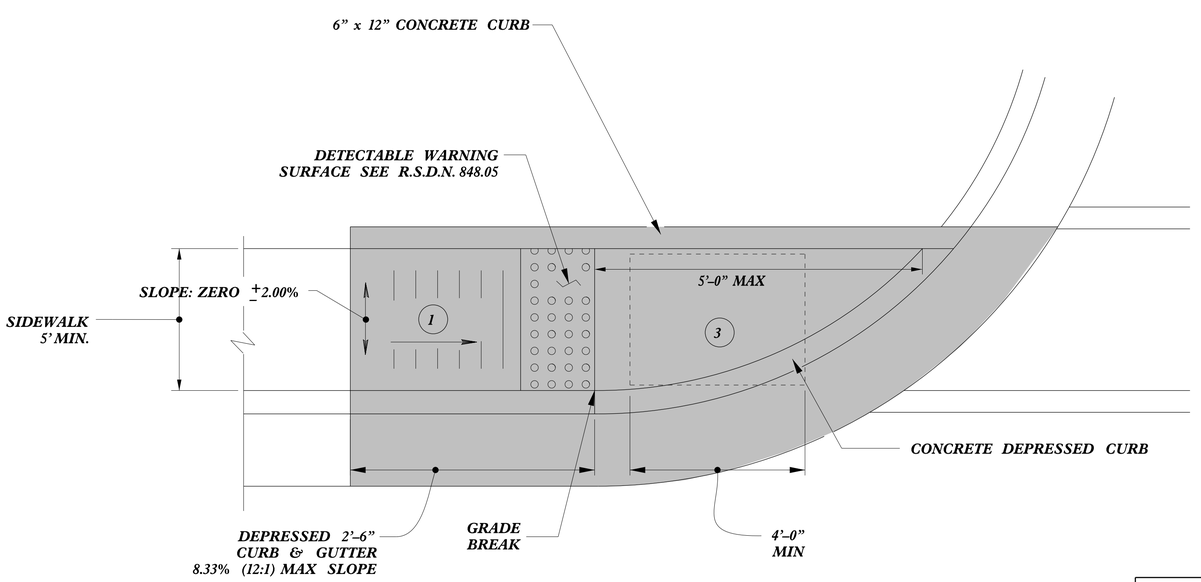


TYPE 1B



TYPE 1

PAY LIMITS FOR 1 CURB RAMP

(1) 8.33% (12:1) MAX RAMP SLOPE

(2) CROSS SLOPE: 2.00%

(3) CURB RAMPS REQUIRE A (4'–0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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CURB RAMPS

Directional Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$USERNAME$$$$

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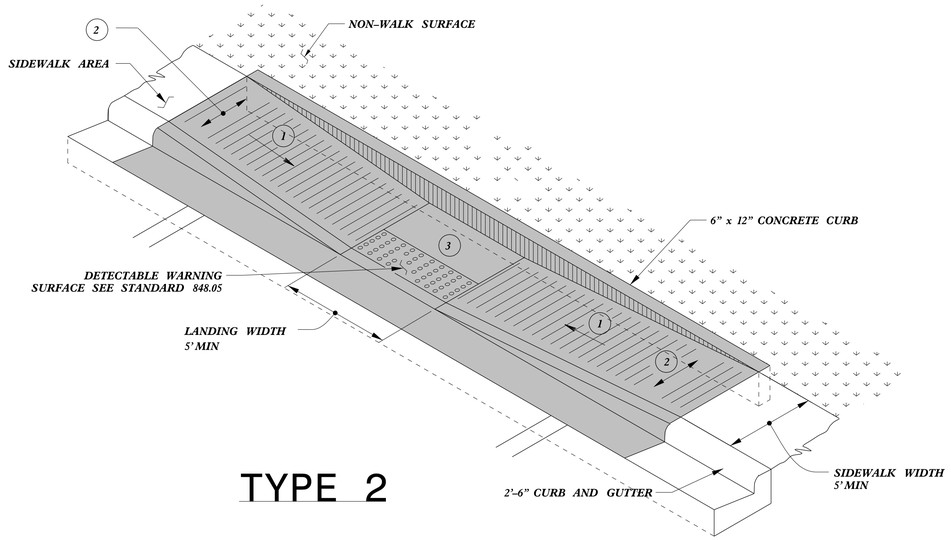
5/14/99

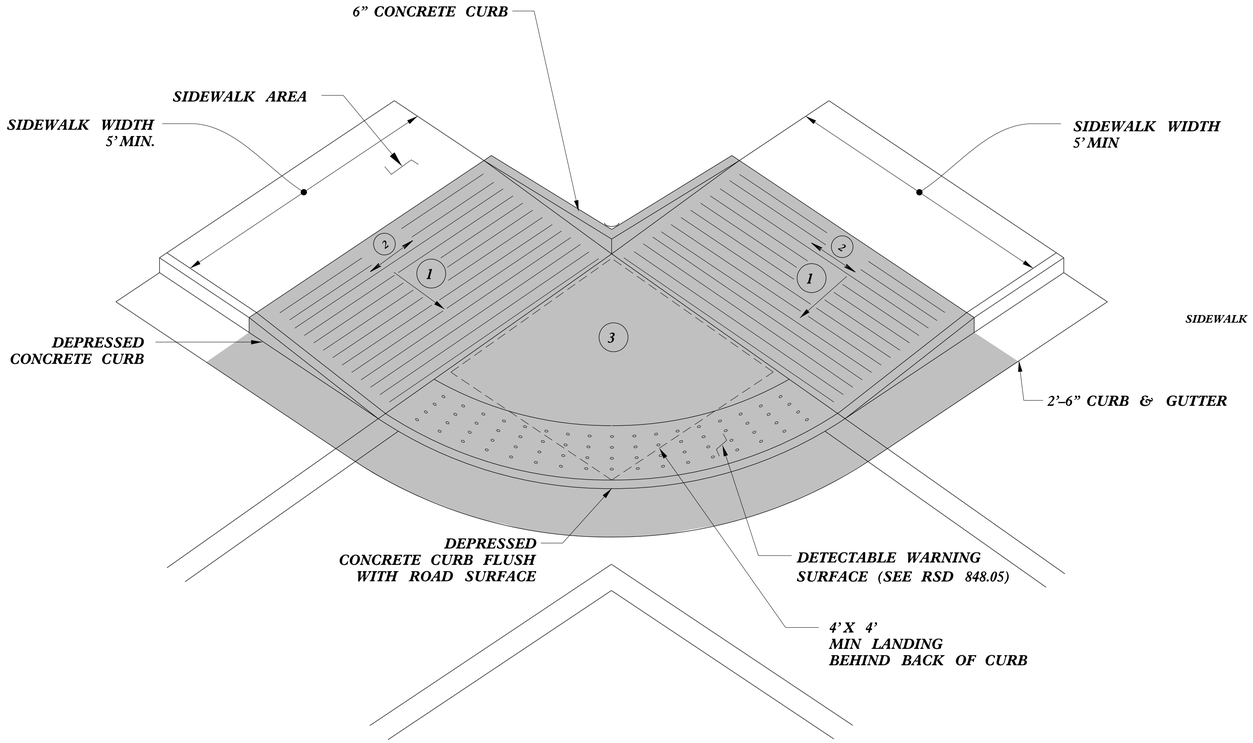
PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-5



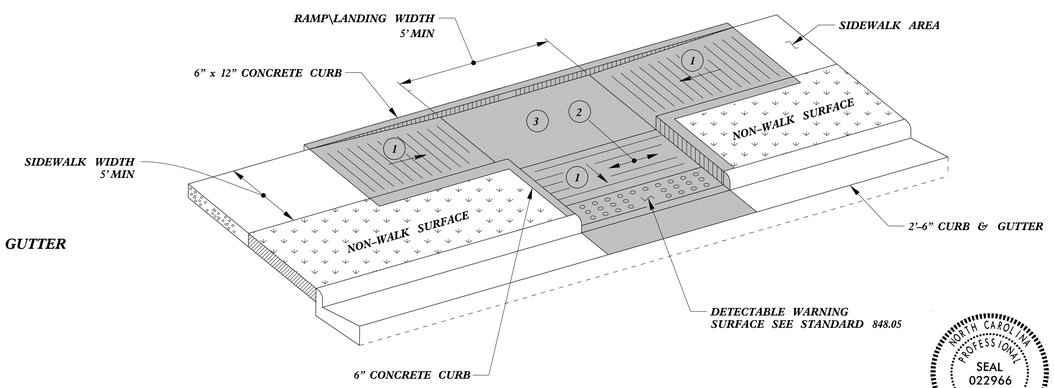
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

1. *8.33% (12:1) MAX RAMP SLOPE*
2. *CROSS SLOPE: 2.00%*
3. *CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.*



TYPE 2A



TYPE 3

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

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CURB RAMPS

Parallel Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

$$$$SYSTIME$$$$
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$$$$CONTIME$$$$
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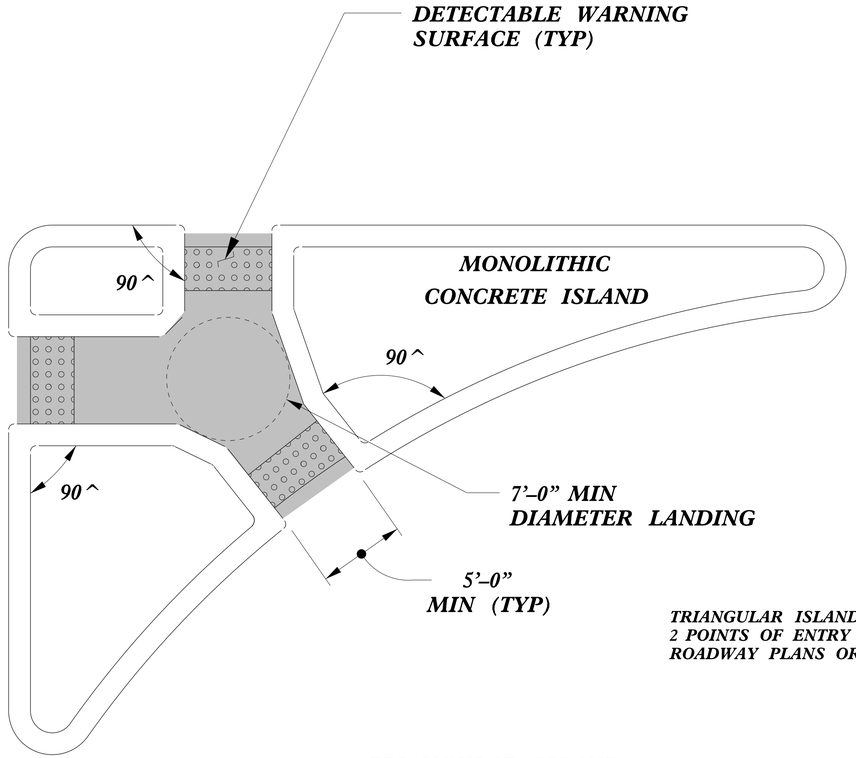
Submitted 9/16/2020

5/14/99

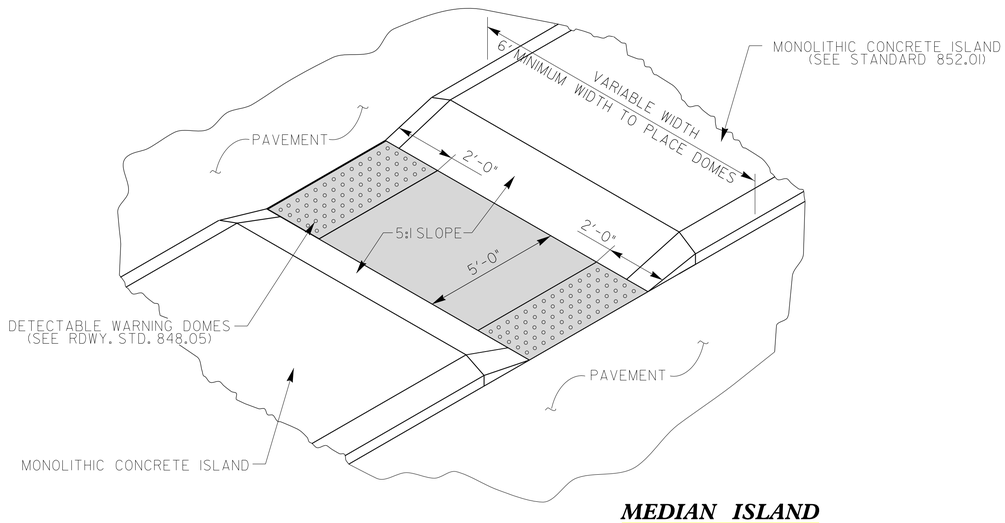
PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-6



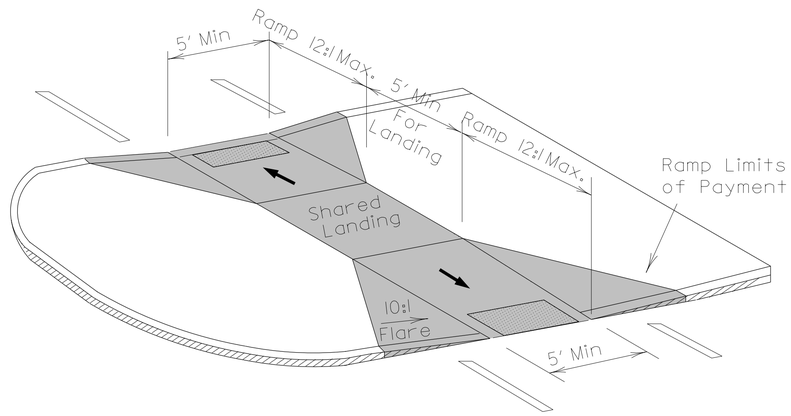
PAY LIMITS FOR 2 OR 3 CURB RAMPS (CALCULATE BASED ON NUMBER OF SETS OF TRUNCATED DOMES)

TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS

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CURB RAMPS

Median or Turn Lane Islands

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC. stds/2012CurbRamp/CurbRampDetails.dgn

$$$$USERNAME$$$$ $$$$USER$$$$ $$$$SYSTEM$$$$

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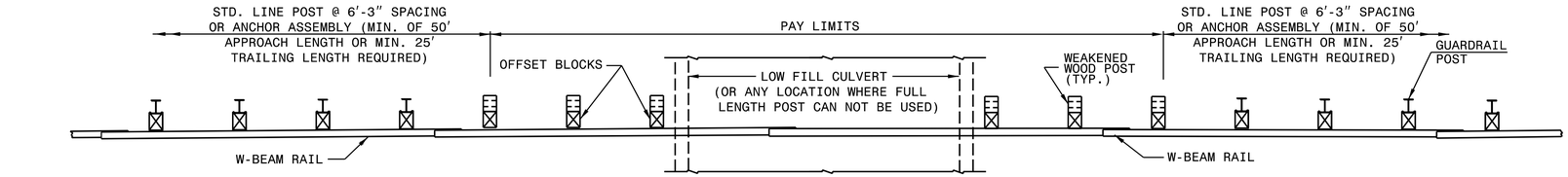
PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2C-7

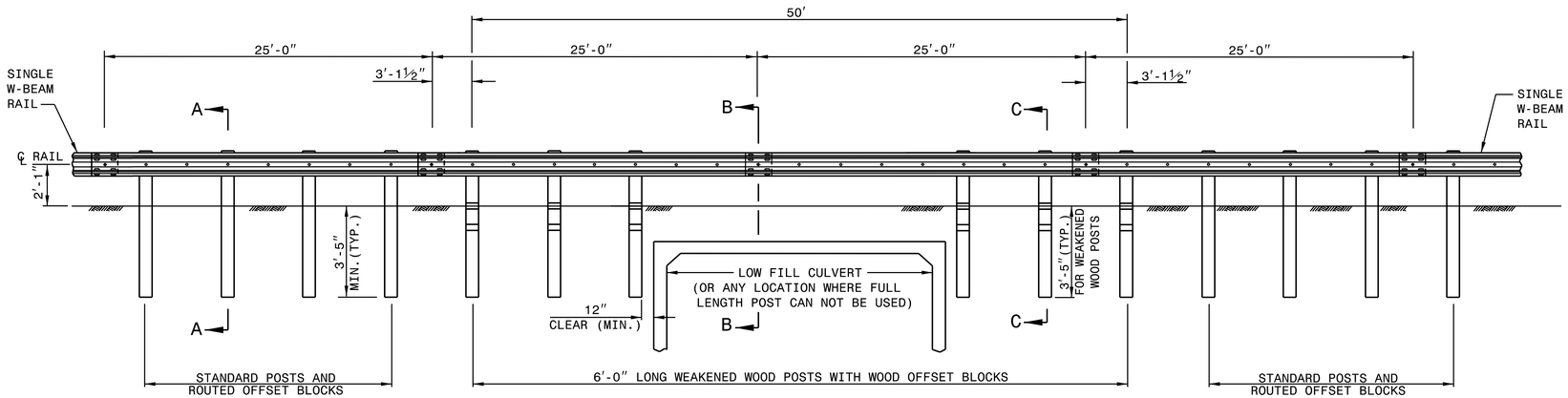
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SPECIAL DETAIL FOR
GUARDRAIL PLACEMENT
25'-0" CLEAR SPAN

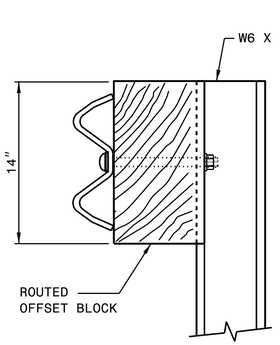
SHEET - OF -
862D01



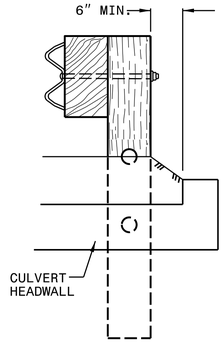
PLAN



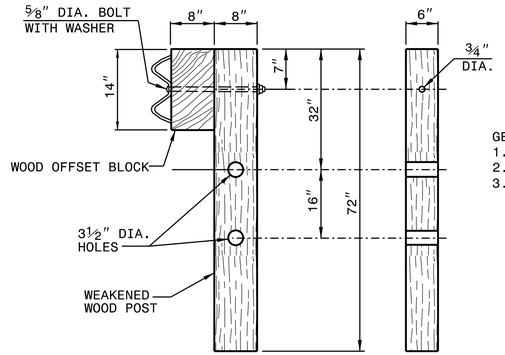
ELEVATION
25'-0" GUARDRAIL SPAN



SECTION A-A



SECTION B-B



SECTION C-C **FRONT**
WEAKENED WOOD POST

GENERAL NOTES:
1. LAP RAIL IN THE DIRECTION OF TRAFFIC FLOW.
2. SEE ROADWAY PLANS FOR LOCATIONS AND CONTINUATION OF RAIL OR END SECTIONS.
3. MINIMUM DISTANCE OF 5 FEET BEHIND THE GUARDRAIL SHOULD BE CLEAR OF ANY FIXED-OBJECT HAZARDS THAT COULD SNAG AN IMPACTING VEHICLE.

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

SPECIAL DETAIL FOR
GUARDRAIL PLACEMENT
25'-0" CLEAR SPAN

SHEET - OF -
862D01

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

25'-0" CLEAR SPAN GUARDRAIL PLACEMENT

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2D-1

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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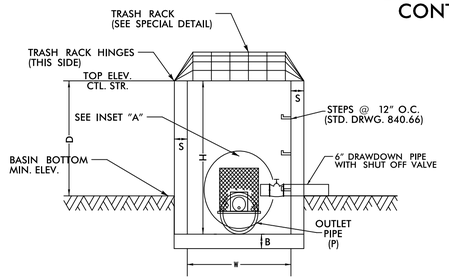
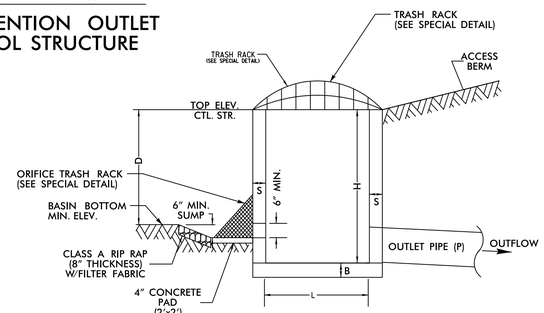
DETAIL #1

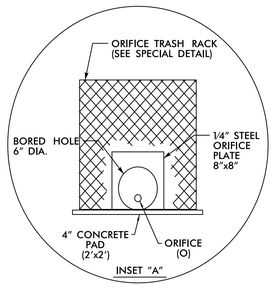
DRY DETENTION OUTLET CONTROL STRUCTURE



SIDE 1



SIDE 2



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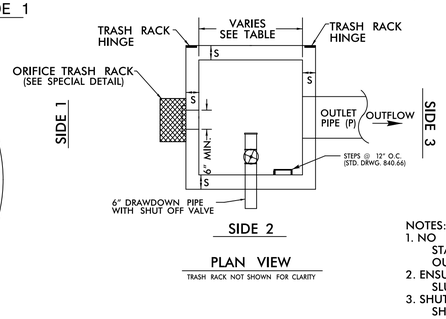

SIDE 2

PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES:
1. NO BEDDING MATERIAL TO BE USED. THERFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATE.
3. SHUT OFF VALVE MAY BE A GATE VALVE, BALL VALVE, SHEAR GATE, ETC. SHUT OFF VALVE IS TO REMAIN CLOSED DURING NORMAL OPERATION.

MINIMUM DIMENSIONS FOR DRY DETENTION BASIN DRAWDOWN STRUCTURE

BASIN /STATION	STRUCTURE NUMBER	S (INCHES)	B (INCHES)	TOP ELEVATION CONTROL STRUCTURE	CTL. STR. DIMENSIONS			ORIFICE DIAMETER (O) INCHES	ORIFICE INV. ELEV.	OUTLET PIPE INV.	OUTLET PIPE DIAMETER(P) INCHES	OUTLET PIPE MATERIAL
					W	L	H					
BASIN 1A /41+28 –SR1– RT	14268	6"	12"	23.0	4'	4'	3.0'	2.0"	20.7	20.0	18"	RCP
BASIN 1B /43+96 –SR1– RT	14270	6"	12"	23.0	4'	4'	3.0'	2.0"	20.7	20.0	18"	RCP
BASIN 2A /15+48 –SR2– RT	14274	6"	12"	23.0	4'	4'	3.0'	2.5"	20.6	20.0	18"	RCP
BASIN 2B /12+42 –SR2– RT	14272	6"	12"	23.0	4'	4'	3.0'	2.0"	20.7	20.0	18"	RCP
BASIN 3 /26+75 –Y3– RT	1657	6"	12"	24.0	4'	4'	4.0'	2.0"	21.7	20.0	24"	RCP
BASIN 4 /52+46 –SR2– RT	16163	6"	12"	22.0	4'	4'	4.0'	2.0"	19.7	18.0	24"	RCP
BASIN 5 /37+28 –SR3– LT	18149	6"	12"	9.2	4'	4'	4.2'	3.0"	5.6	5.0	30"	RCP

NOT TO SCALE

8/18/2020
R:\Drainage\U-5713_R5777_Hyd_PSH_02D01.dgn
tgomo

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2D-2

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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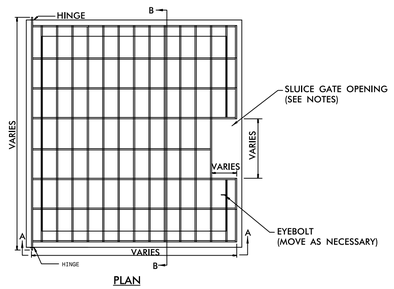
DETAIL #2

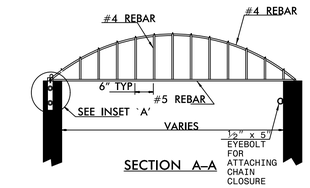
REBAR & ORIFICE TRASH RACKS

(N.T.S.)

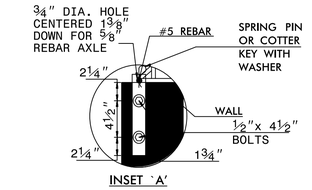
RISER TRASH RACK NOTES:
1. ALL JOINTS SHALL BE FULLY WELDED AROUND JOINT WITH A MINIMUM OF A 1/4" BEAD.
2. IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3. EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4. RACK 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, IF APPLICABLE, ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



PLAN



SECTION A–A



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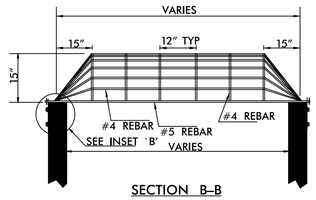
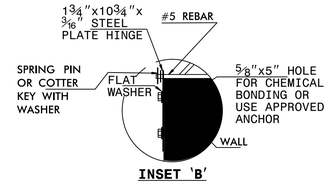
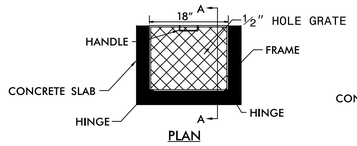


SECTION B–B

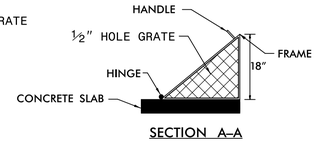


INSET 'B'

REBAR TRASH RACK
NOT TO SCALE



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.

ORIFICE TRASH RACK
NOT TO SCALE

8/14/2020
R:\Drainage\U-5713_R5777_Hyd_PSH_02D02.dgn
Levine

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2D-3

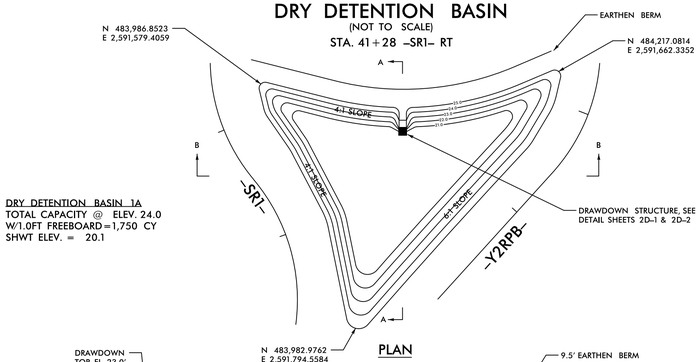
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

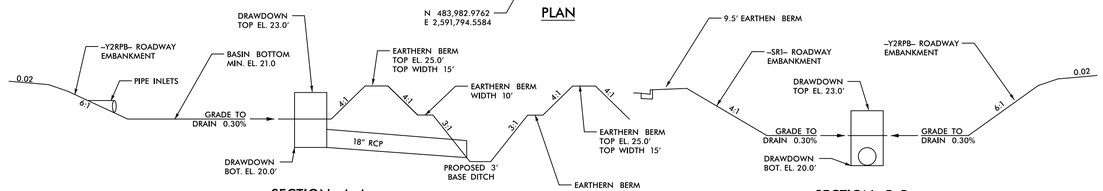
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1A
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 41+28 –SR1– RT



PLAN

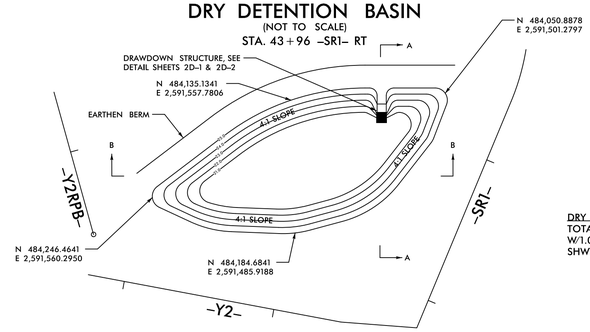
DRY DETENTION BASIN 1A
TOTAL CAPACITY @ ELEV. 24.0
W/1.0FT FREEBOARD=1,750 CY
SHWT ELEV. = 20.1



SECTION A–A

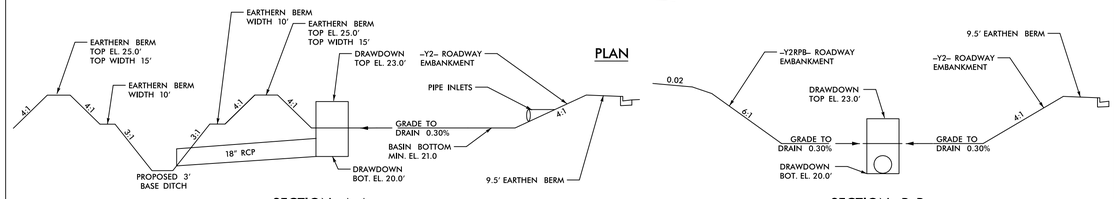
SECTION B–B

DETAIL 1B
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 43+96 –SR1– RT



PLAN

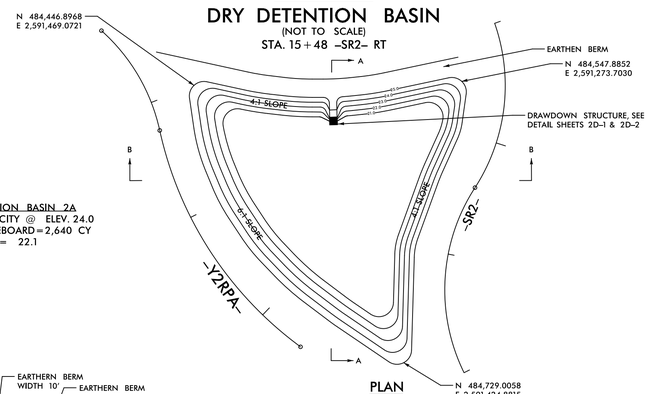
DRY DETENTION BASIN 1B
TOTAL CAPACITY @ ELEV. 24.0
W/1.0FT FREEBOARD=885 CY
SHWT ELEV. = 20.1



SECTION A–A

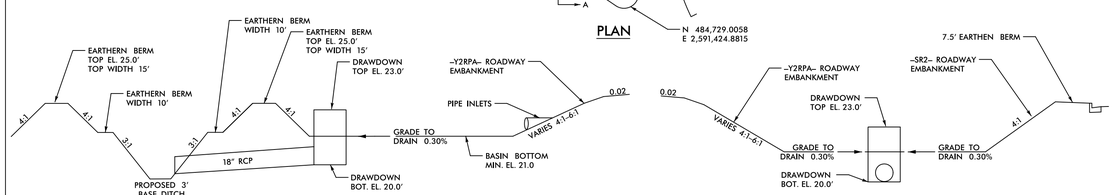
SECTION B–B

DETAIL 2A
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 15+48 –SR2– RT



PLAN

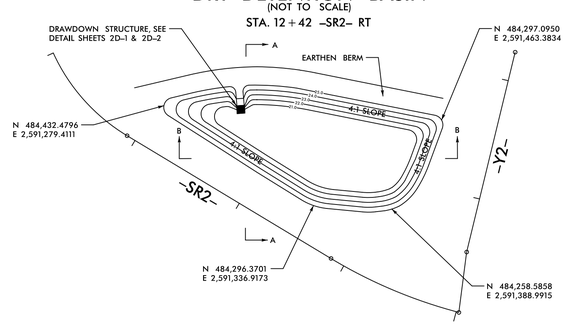
DRY DETENTION BASIN 2A
TOTAL CAPACITY @ ELEV. 24.0
W/1.0FT FREEBOARD=2,640 CY
SHWT ELEV. = 22.1



SECTION A–A

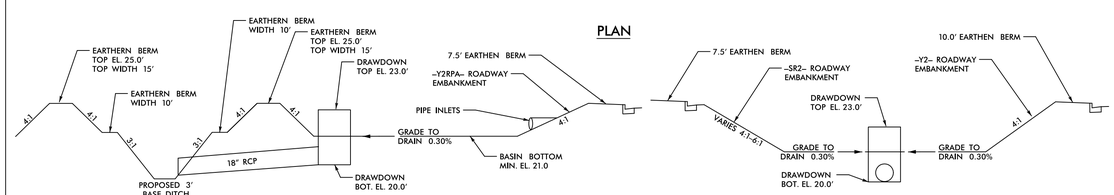
SECTION B–B

DETAIL 2B
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 12+42 –SR2– RT



PLAN

DRY DETENTION BASIN 2B
TOTAL CAPACITY @ ELEV. 24.0
W/1.0FT FREEBOARD=1,145 CY
SHWT ELEV. = 22.1



SECTION A–A

SECTION B–B

8/14/2020
R:\Drainage\U-5713_R5777_Hyd_PSH_02D03.dgn
tfrench

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2D-4

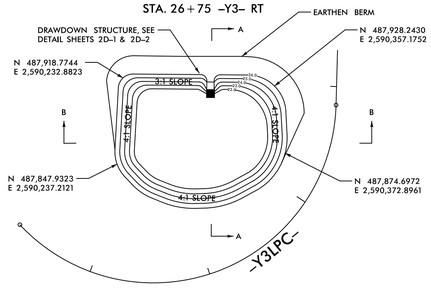
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

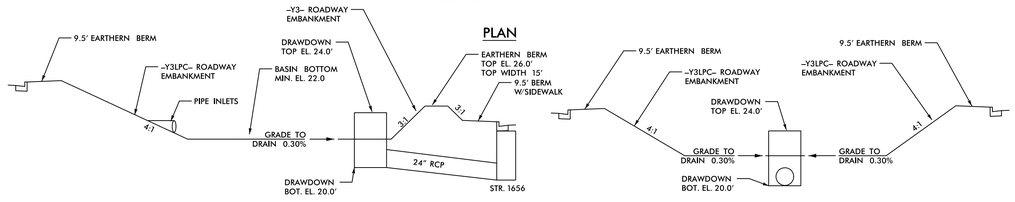
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 3
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 26+75 –Y3– RT



DRY DETENTION BASIN 3
TOTAL CAPACITY @ ELEV. 25.0
W/1.0FT FREEBOARD = 1,085 CY
SHWT ELEV. = 23.8

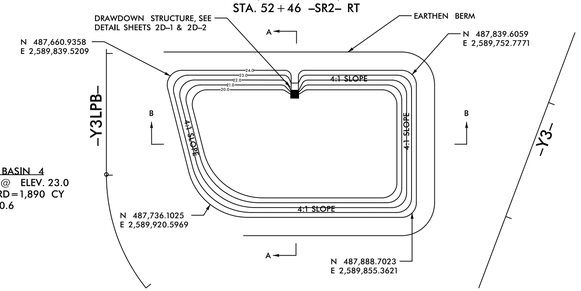
PLAN



SECTION A–A

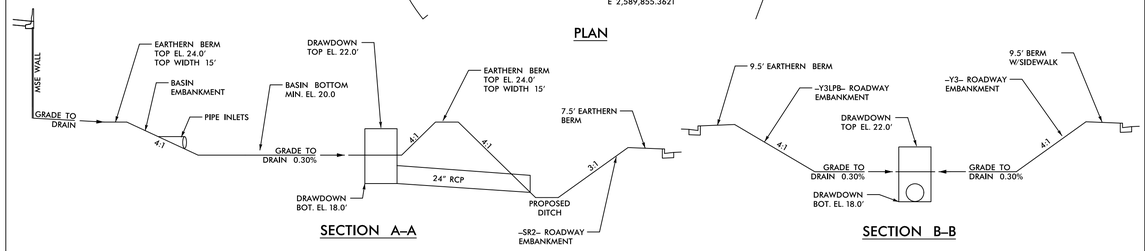
SECTION B–B

DETAIL 4
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 52+46 –SR2– RT



DRY DETENTION BASIN 4
TOTAL CAPACITY @ ELEV. 23.0
W/1.0FT FREEBOARD = 1,890 CY
SHWT ELEV. = 20.6

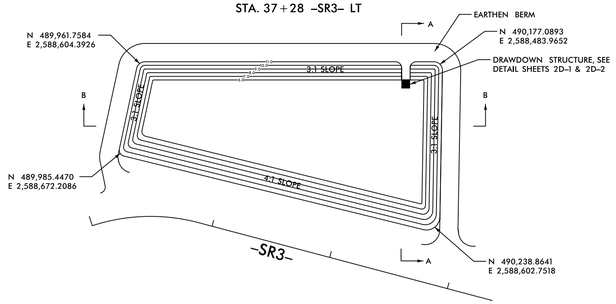
PLAN



SECTION A–A

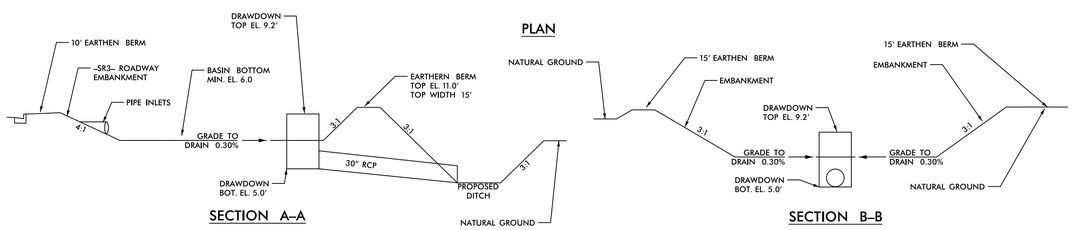
SECTION B–B

DETAIL 5
DRY DETENTION BASIN
(NOT TO SCALE)
STA. 37+28 –SR3– LT



DRY DETENTION BASIN 5
TOTAL CAPACITY @ ELEV. 10.0
W/1.0FT FREEBOARD = 3,136 CY
SHWT ELEV. = 7.1

PLAN



SECTION A–A

SECTION B–B

8/14/2020
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tlevine

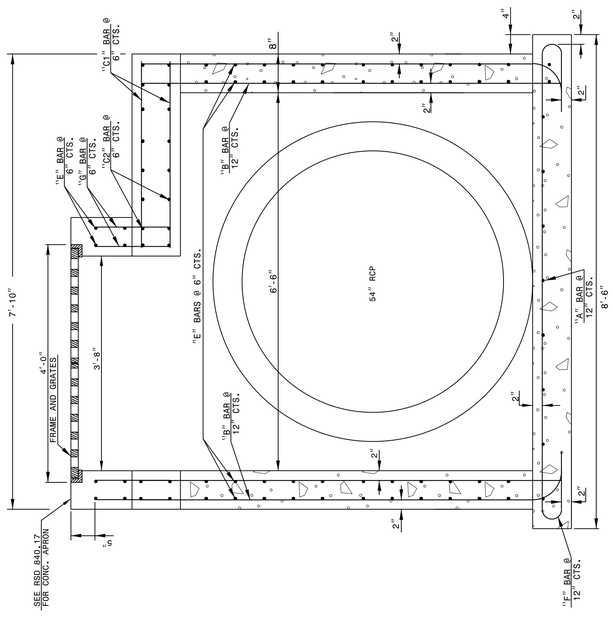
Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777A&B	2D-5

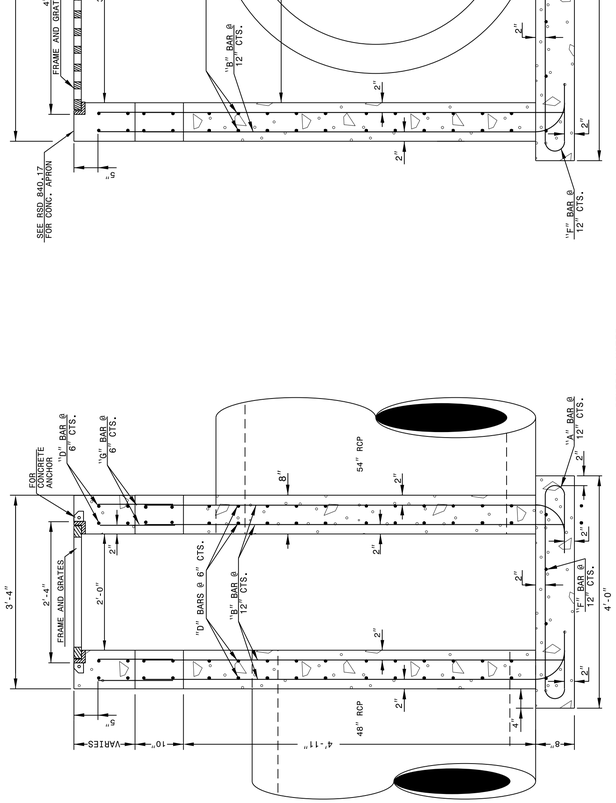
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING GRATED INLET
FOR PIPES UP TO 54"

SHEET 1 OF 2
840D35



SECTION X-X



SECTION Y-Y

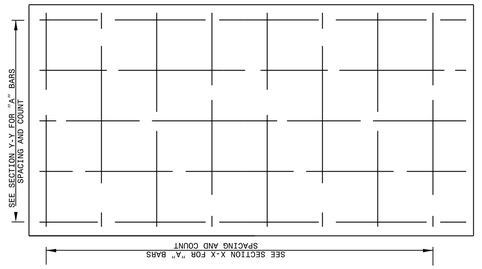
GENERAL NOTES:
-ALL CLASS 'AA' CONCRETE
-CHAMFER ALL EXPOSED CONCRETE CORNERS 3".
-USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
-IF PIPES ARE SET IN THE BASE, FOLLOW CONSTRUCTION
-PROCEDURES SHOWN BY STD. DWG. 840.00.
-PRECAST UNITS CONCRETE MAY BE
USED IN LIEU CAST IN PLACE CONCRETE.
-REFERENCE STD. DWG. 840.25 FOR FRAME ANCHORAGE
-PROVIDED DOOR ALTS. OVER 4'-6" DEEP WITH STEPS AS
DIRECTED BY STD. DWG. 840.66
-FRAME AND GRATES ARE SEPARATE CONTRACT ITEM.

NOTES:
-HORIZONTAL (UP TO 10' MAX. IN BOTH DIRECTIONS) AND VERTICAL (UP TO 20' MAX.)
DIMENSIONS MAY BE ADJUSTED AS THE FIELD CONDITIONS AND/OR ALTERNATE DESIGNS
ROUTE.
-ALL ADJUSTMENTS ARE TO BE MADE AS DIRECTED BY THE ENGINEER.

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
TRAFFIC BEARING GRATED INLET
FOR PIPES UP TO 54"

SHEET 2 OF 2
840D35



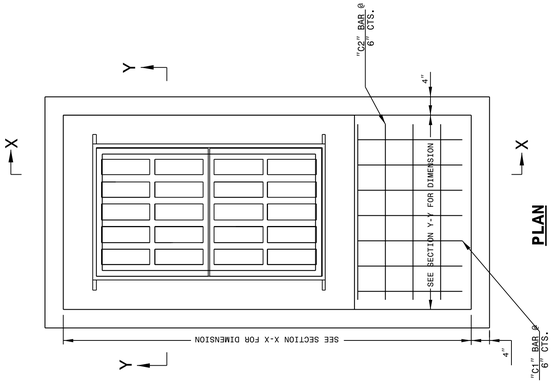
PLAN OF BASE

BILL OF MATERIALS

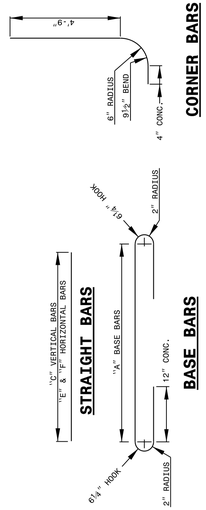
BAR	SIZE	LENGTH	QUANTITY	WEIGHT
A	#5	5'-0"	42	47
B	#5	7'-6"	104	780
C1	#5	3'-4"	9	32
C2	#5	3'-0"	6	19
D	#5	7'-6"	48	376
E	#5	3'-0"	48	151
F	#5	10'-0"	4	42
G	#5	1'-8"	104	181
REINF. STEEL (TOTAL WEIGHT LBS.)				1628
CONCRETE TOTAL (CU.YDS.) CLASS 'AA'				5.1

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES
FOR EVERY 1 FOOT OF RISER USE 0.41 CU.YDS CONCRETE AND 390 LBS STEEL.

DOWEL-H



PLAN



CORNER BARS

STRAIGHT BARS

BASE BARS

SEAL 022966 ENGINEER Jean S. Howerton
NORTH CAROLINA PROFESSIONAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: K. KEMPF DATE: 03-03-2015
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton/840d35 TBDI Up to 54in.dgn

13-AUG-2018 09:00
S:\Contracts\Contracts\Special Details\jhowerton\840d35 TBDI Up to 54in.dgn
jhowerton AT CSD-292695

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777A&B	2D-6

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL GRATED DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. 840.66.

CONSTRUCT WITH PIPE CROWNS MATCHING.

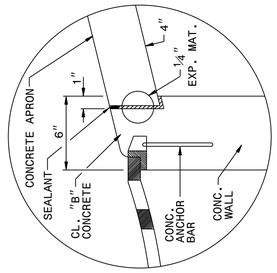
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20 (NOT SHOWN) OR 840.29 (NOT SHOWN).

SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES.

CHAMFER ALL EXPOSED CORNERS 1".

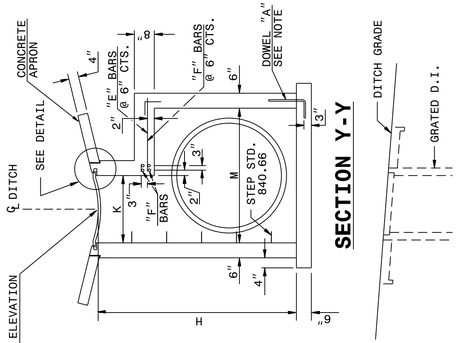
DRAWING NOT TO SCALE.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

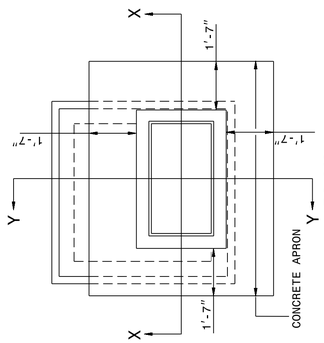


DETAIL
(APRON SUPPORT NOTCH)

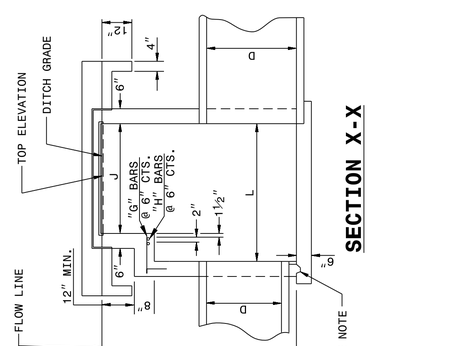
DOWEL-A



SECTION Y-Y

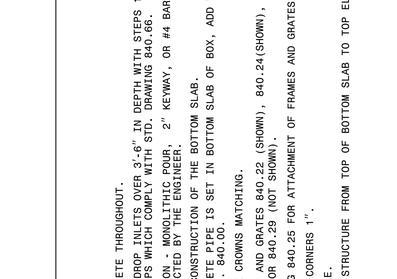


PLAN

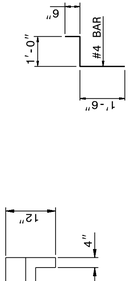


SECTION X-X

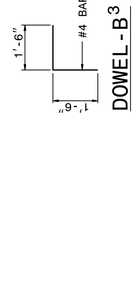
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH** 12" THRU 72" PIPE	SHEET 1 OF 2 **840d17**



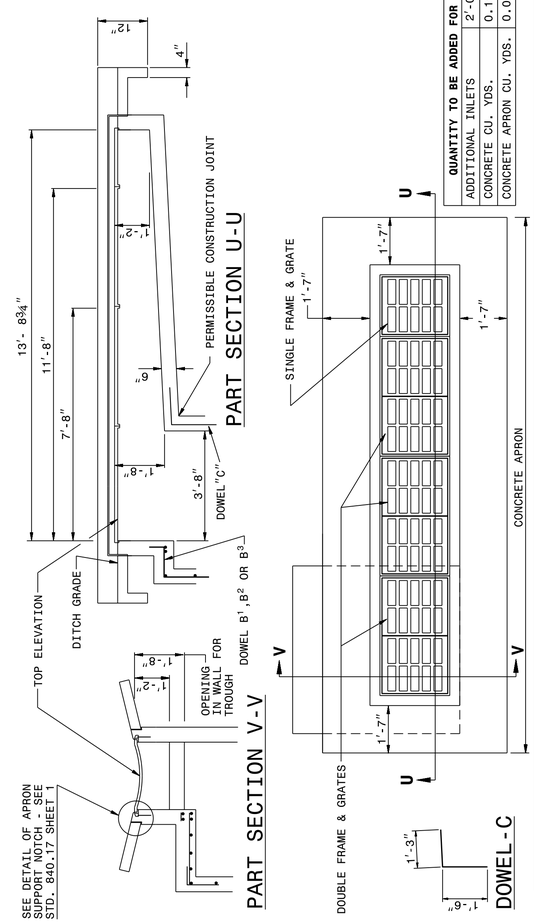
DOWEL-B¹
FOR 15" THRU 36" INLET



DOWEL-B²
FOR 42" INLET



DOWEL-B³



PART SECTION U-U

PART SECTION V-V

DOWEL-C

QUANTITY TO BE ADDED FOR EACH 2' INCREMENT INLET OPENING

	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"
ADDITIONAL INLETS						
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX AND PIPE					REINFORCING STEEL - NO. 4 BARS									CU YDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE
PIPE	SPAN	WIDTH	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON TOTAL	
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.				C.S.	R.C.
12"	3'-8"	2'-0"	3'-8"	2'-0"	2'-3"	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15"	3'-8"	2'-0"	3'-8"	2'-0"	2'-5"	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	0.395	1.745	0.023	0.036
18"				2'-0"	2'-8"	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247		1.807	0.033	0.049
24"				2'-10"	3'-3"	8	1'-5"	6	4'-9"	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30"			3'-8"	3'-5"	3'-10"	8	2'-0"	7	4'-9"	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36"			4'-0"	4'-0"	4'-4"	8	2'-5"	8	4'-11"	4	0'-9"	2	4'-11"	47	0.560	1.931	0.321		2.920	0.132	0.178
42"			4'-10"	4'-10"	5'-0"	10	3'-1"	9	5'-7"	4	1'-5"	3	5'-7"	67	0.704	2.500	0.370		3.677	0.180	0.243
48"			5'-4"	5'-4"	5'-6"	11	3'-7"	10	6'-1"	4	1'-11"	4	6'-1"	87	0.823	3.013	0.407		4.315	0.235	0.317
54"			6'-0"	6'-0"	6'-0"	12	4'-1"	11	6'-7"	5	2'-5"	5	6'-7"	107	0.951	3.589	0.444		5.072	0.297	0.401
60"			6'-6"	6'-6"	6'-7"	13	4'-9"	12	7'-3"	6	3'-1"	6	7'-3"	135	1.311	4.539	0.494		6.170	0.367	0.495
66"			7'-2"	7'-2"	7'-1"	14	5'-4"	14	7'-10"	7	3'-7"	8	8'-5"	168	1.136	5.061	0.537		6.901	0.444	0.599
72"	3'-8"	2'-0"	7'-8"	7'-8"	7'-8"	15	5'-11"	15	8'-5"	4	4'-3"	8	8'-5"	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH DETAIL DRAWING FOR **CONCRETE GRATED DROP INLET TYPE 'A' MINIMUM DEPTH** 12" THRU 72" PIPE	SHEET 2 OF 2 **840d17**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER S. Howerton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: J. Howerton DATE: 1/22/14
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: jhowerton\minimum depth type A.dgn

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jhowerton
MicroStation CSS 2.2.0.5

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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777A&B	2D-7

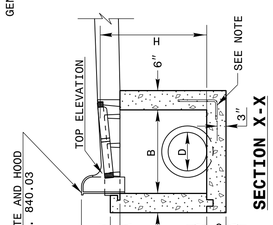
5/14/99

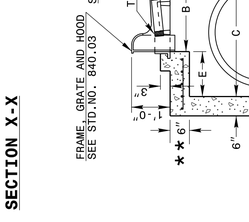
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

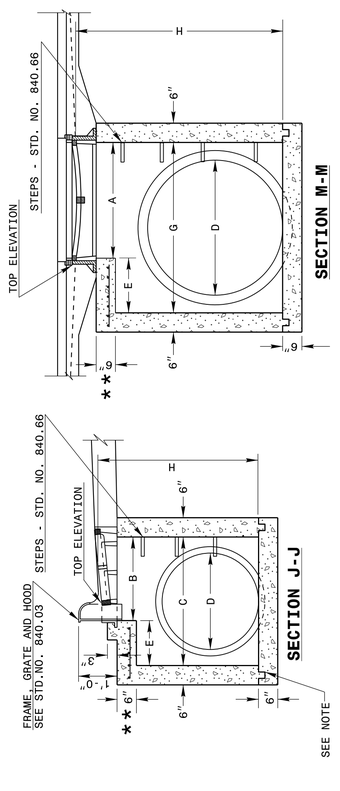
ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH
CONCRETE CATCH BASIN
12" THRU 84" PIPE

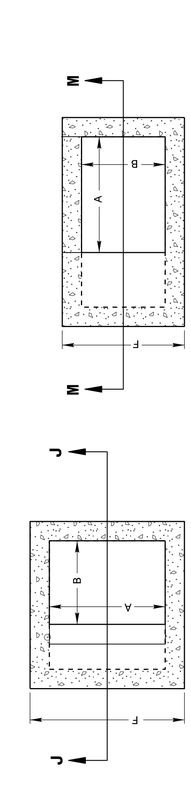
SHEET 1 OF 2 **840D02**

GENERAL NOTES:
USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.
FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.
CONSTRUCT WITH PIPE CROWNS MATCHING.
CHAMFER ALL EXPOSED CORNERS 1".
** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.









DETAIL SHOWING METHOD OF RISER CONSTRUCTION

STATE OF
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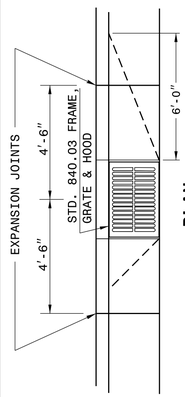
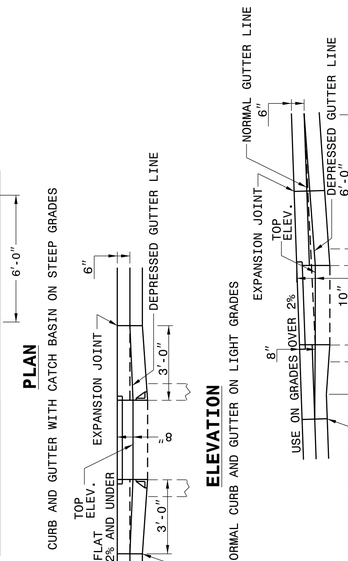
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH
CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**



ELEVATION
NORMAL CURB AND GUTTER ON LIGHT GRADES

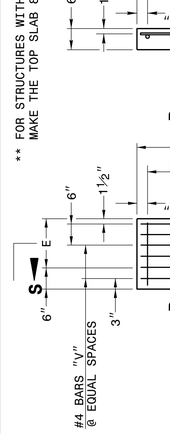


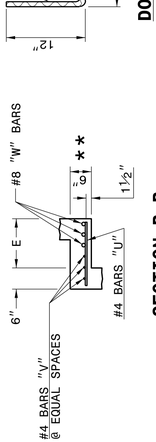
ELEVATION
NORMAL CURB AND GUTTER ON STEEP GRADES

* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

PIPE	DIMENSIONS OF BOX AND PIPE					COVER DIMENSION		BARS-U			CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
	SPAN	WIDTH	SPAN	MIN. HEIGHT				NO.	LENGTH	TOTAL LBS.	TOP SLAB	BOTTOM SLAB (TOT. CONC. FOR MINIMUM HEIGHT) H	C.M.	R.C.
D	A	B	C	G	H	E	F							
12"	3'-0"	2'-2"	--	--	2'-0"	--	--	--	--	--	--	0.235	0.015	0.026
15"	3'-0"	2'-2"			2'-3"							0.235	0.023	0.036
18"	3'-0"	2'-2"			2'-6"							0.235	0.033	0.049
24"	3'-0"	2'-2"			3'-1"							0.235	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"	1'-2"	4'-4"	4	1'-5"	2	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"	1'-8"	4'-10"	4	1'-11"	3	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"	2'-2"	5'-5"	5	2'-5"	4	0.200	0.543	1.738	0.180	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"	2'-10"	6'-0"	5	3'-1"	4	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"	3'-5"	6'-7"	6	3'-8"	5	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-3"	6'-3"	6'-3"	6'-6"	4'-1"	7'-3"	6	4'-4"	5	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"	4'-9"	7'-11"	7	5'-0"	6	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"	5'-3"	8'-6"	7	5'-6"	6	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"	5'-11"	9'-1"	8	6'-2"	7	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"	6'-7"	9'-9"	8	6'-10"	7	0.544	1.760	4.062	0.713	1.010





STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH
CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel Howerton
B73F3D17DCDC45F...
6/4/2015

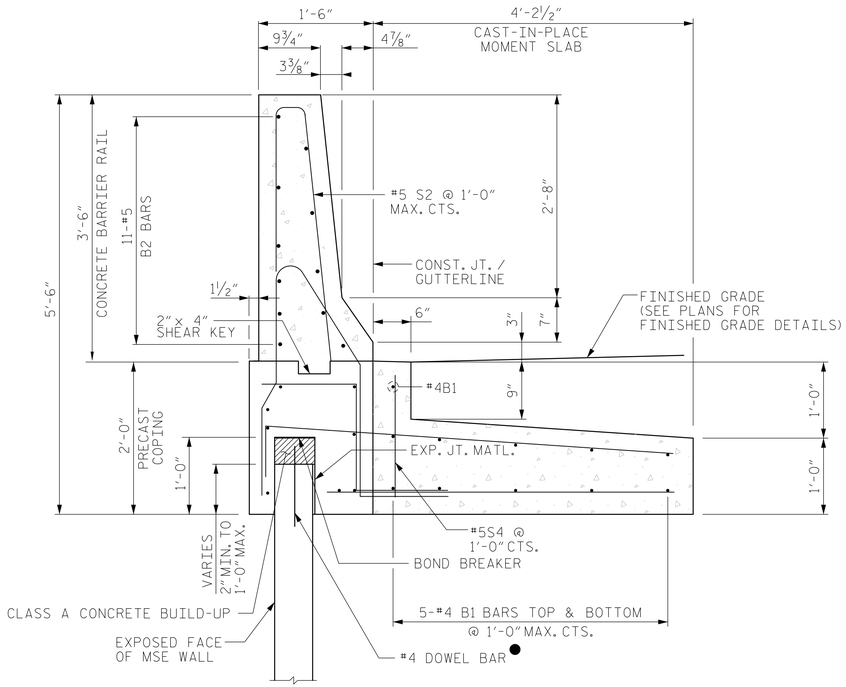
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: s:details/stand/840d01.dgn

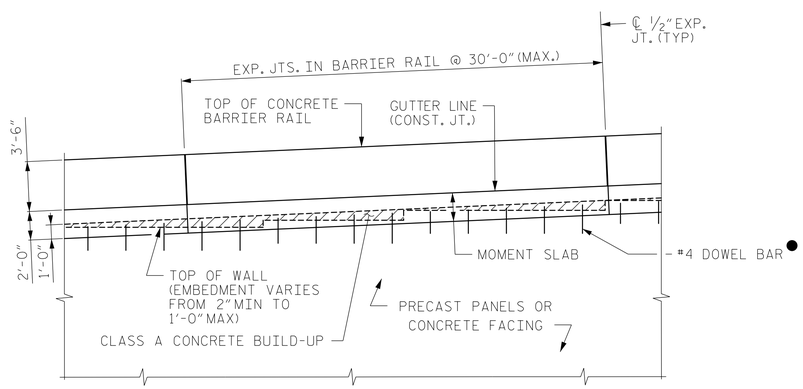
$$$$SYSTIME$$$$
$$$$PLOTSCALE$$$$
$$$$USERNAME$$$$

Submitted 9/16/2020



CONCRETE BARRIER RAIL WITH MOMENT SLAB

● #4 DOWEL BARS TO BE PLACED AT 1'-6" MAX SPA. AND EXTEND 10" FROM TOP OF MSE WALL PANELS. DOWELS ARE TO BE FIELD CUT TO PROVIDE 2" CLR TO PRECAST COPING.



CONCRETE BARRIER RAIL WITH MOMENT SLAB - PARTIAL ELEVATION

NOTES:

FOR CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE SECTION 460 OF THE STANDARD SPECIFICATIONS.

CONCRETE BARRIER RAIL WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH. WHEN BLOCKOUT FOR DRAINAGE BOX IS REQUIRED, MINIMUM LENGTH SHALL BE 20', CENTERED ABOUT CENTERLINE OF DRAINAGE BOX.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIER RAIL AND MOMENT SLAB AT A MAXIMUM SPACING OF 30'.

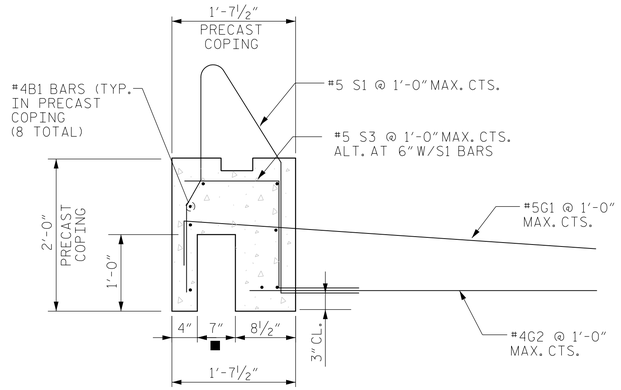
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

THE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

ALL REINFORCING STEEL IN THE BARRIER RAIL SHALL BE EPOXY COATED.

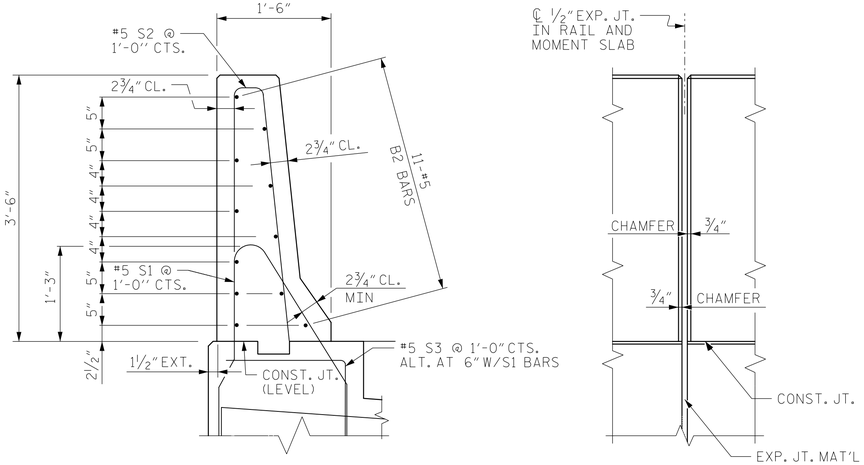
IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE BARRIER RAIL WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE BARRIER RAIL WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

WHERE DRAINAGE INLETS ARE TO BE PLACED IN MOMENT SLAB SECTION, SEE 'MOMENT SLAB BLOCKOUT @ DRAINAGE STRUCTURE' SHEET 2G-2



PRECAST COPING

■ OPENING IS BASED ON A 6" MSE WALL PANEL WIDTH. IF A DIFFERENT WIDTH PANEL IS USED, ADJUST OPENING SO THAT IT IS 1" WIDER THAN THE PANEL.



SECTION THRU RAIL

ELEV. @ EXP. JOINTS

BARRIER RAIL DETAILS

PREPARED BY: ACA	DATE: 8-20
REVIEWED BY: JTG	DATE: 8-20

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2G-1

STRUCTURAL ENGINEER

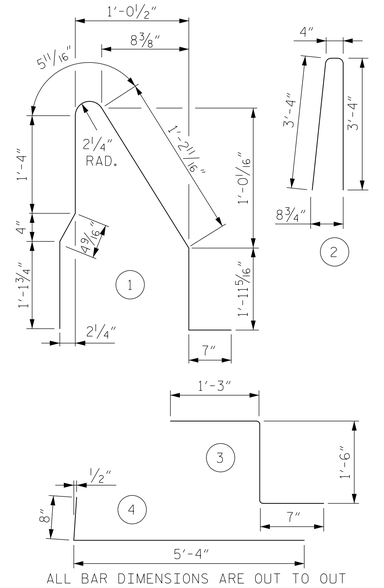
NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISOM

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE 30'-0" SECTION OF CONCRETE BARRIER RAIL WITH MOMENT SLAB

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	19	#4	STR	29'-7"	375
✳ B2	11	#5	STR	29'-7"	339
G1	31	#5	4	6'-0"	194
G2	31	#4	STR	4'-6"	93
✳ S1	31	#5	1	7'-1"	229
✳ S2	31	#5	2	7'-0"	226
S3	30	#5	3	3'-4"	104
S4	31	#5	STR	1'-7"	51

REINFORCING STEEL	817 LB
✳ EPOXY COATED REINFORCING STEEL	794 LB
CLASS AA CONCRETE BARRIER RAIL	3.78 CY
CLASS A CONCRETE MOMENT SLAB	5.76 CY
CLASS A CONCRETE PRECAST COPING	3.00 CY

SINGLE FACE BARRIER RAIL WITH MOMENT SLAB ON MSE WALL

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	-	-	3	-	-
2	-	-	4	-	-

8/14/2020
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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	2G-2

STRUCTURAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

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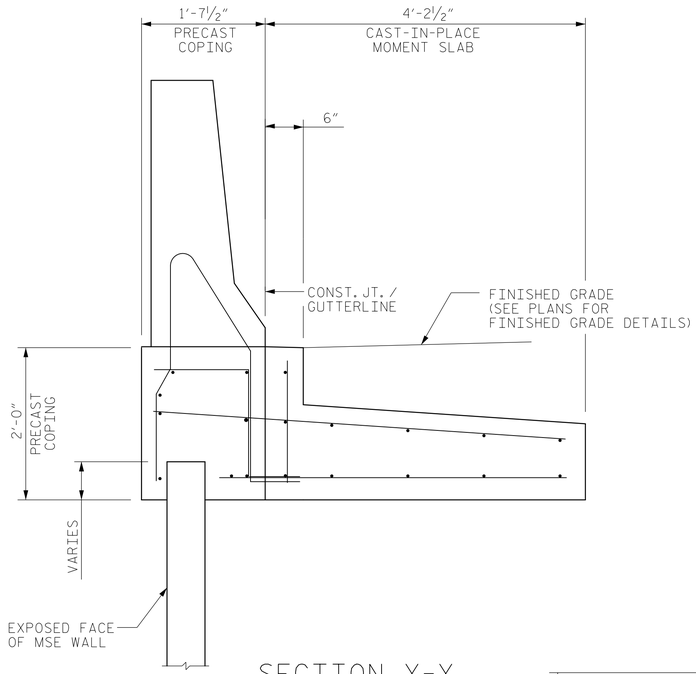
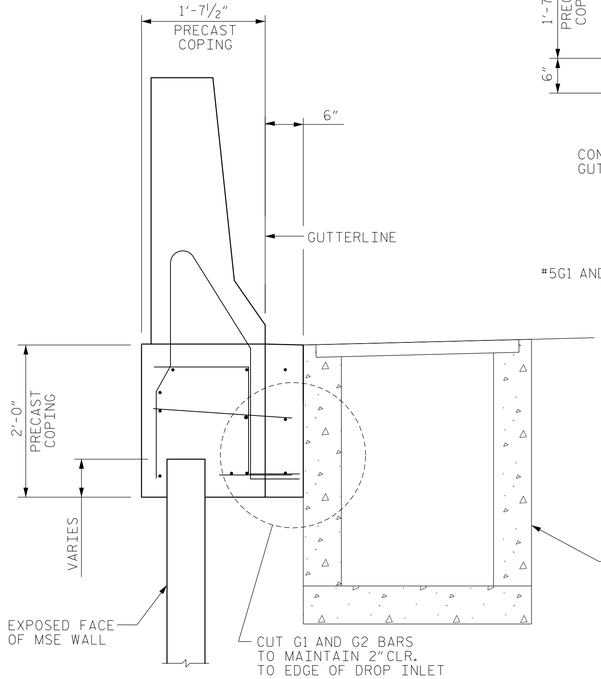


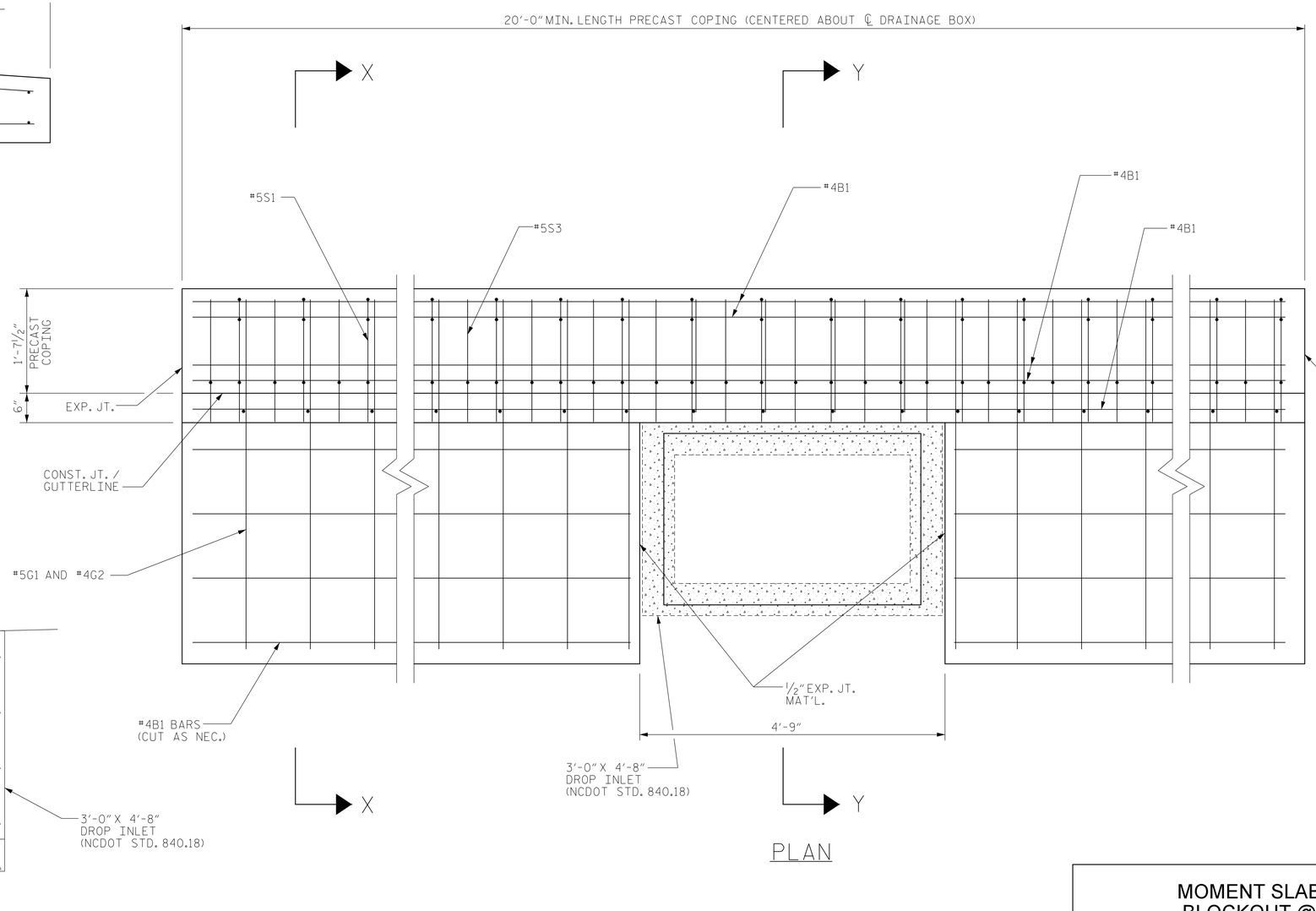
SECTION X-X

SEE SHEET 2G-1 FOR PRECAST COPING AND MOMENT SLAB DETAILS



SECTION Y-Y

SEE SHEET 2G-1 FOR PRECAST COPING DETAILS



PLAN

MOMENT SLAB BLOCKOUT @ DRAINAGE STRUCTURE

PREPARED BY: ACA	DATE: 8-20
REVIEWED BY: JTG	DATE: 8-20

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1	_	_	3	_	_
2	_	_	4	_	_

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PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2G-3

GEOTECHNICAL ENGINEER

SIGNATURE DATE SIGNATURE DATE

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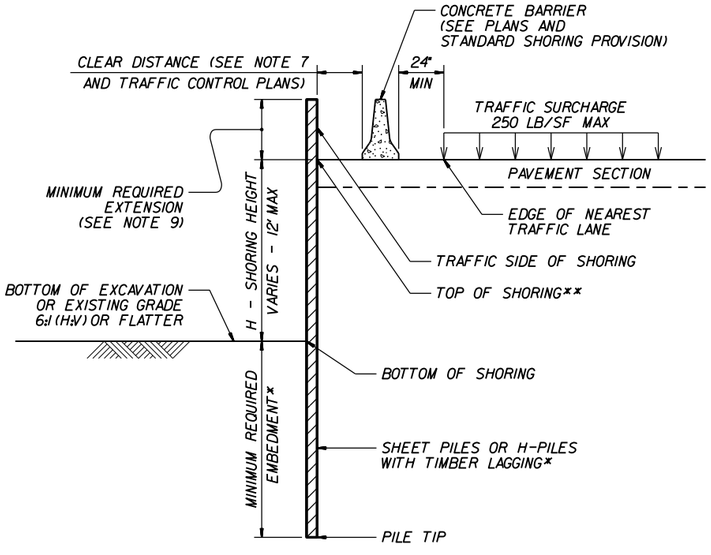
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

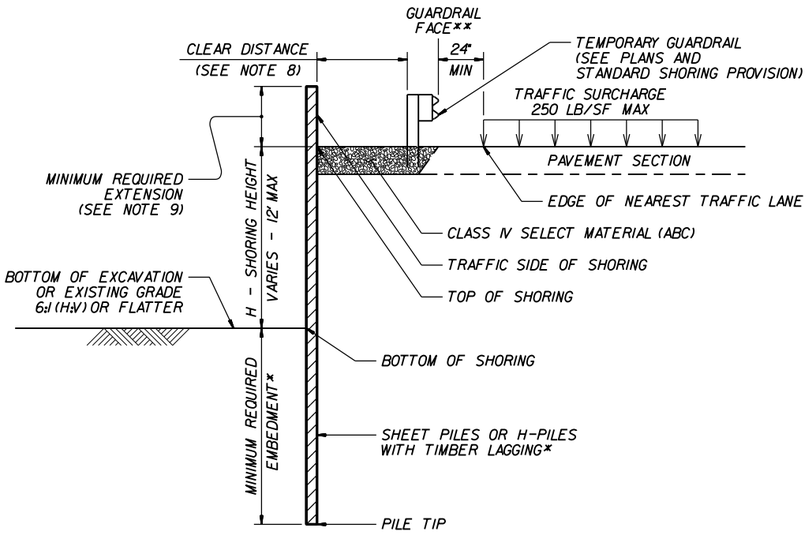
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



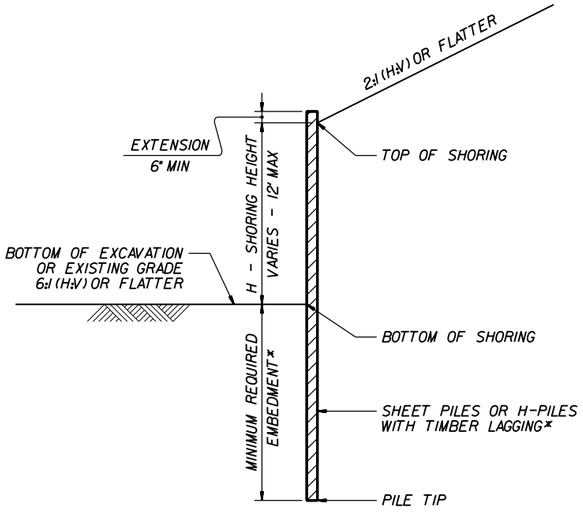
CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

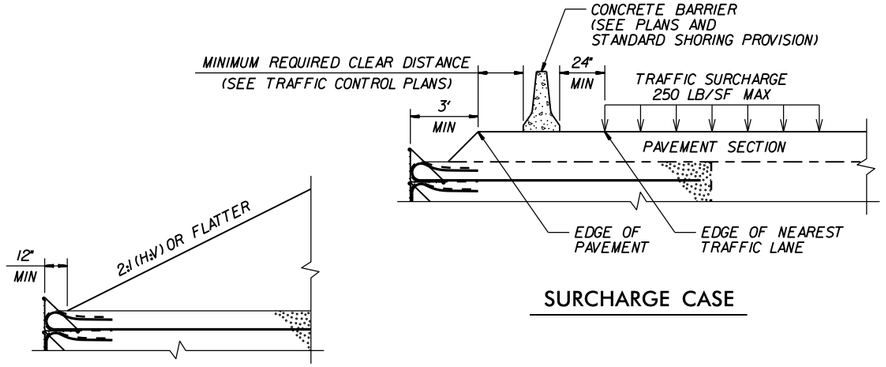
Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2G-4

GEOTECHNICAL ENGINEER

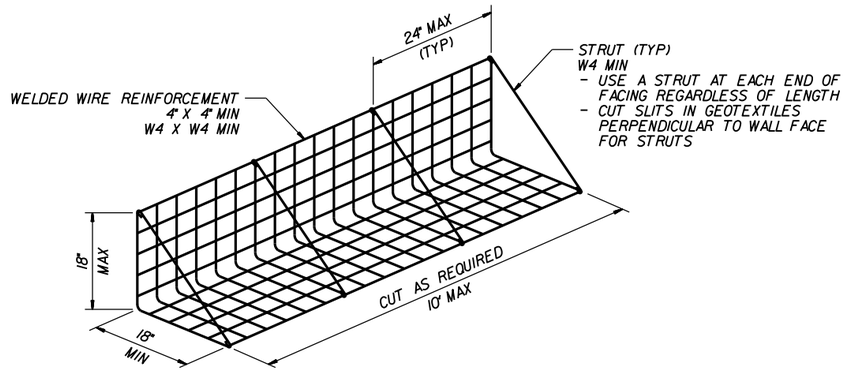
SIGNATURE DATE SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

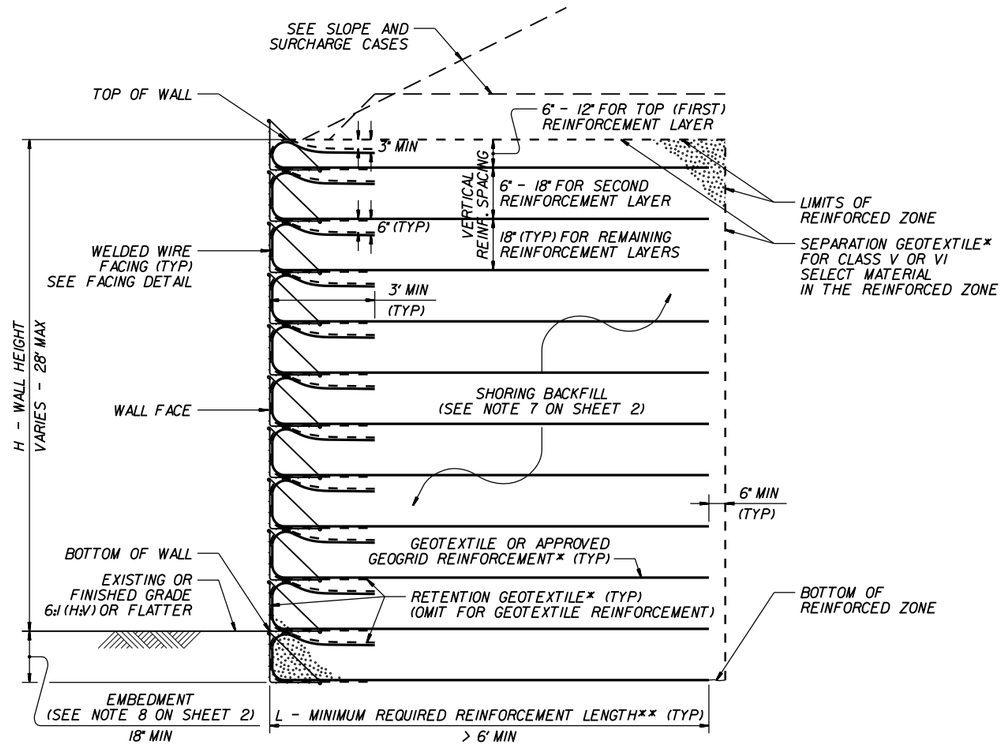


SURCHARGE CASE

SLOPE CASE

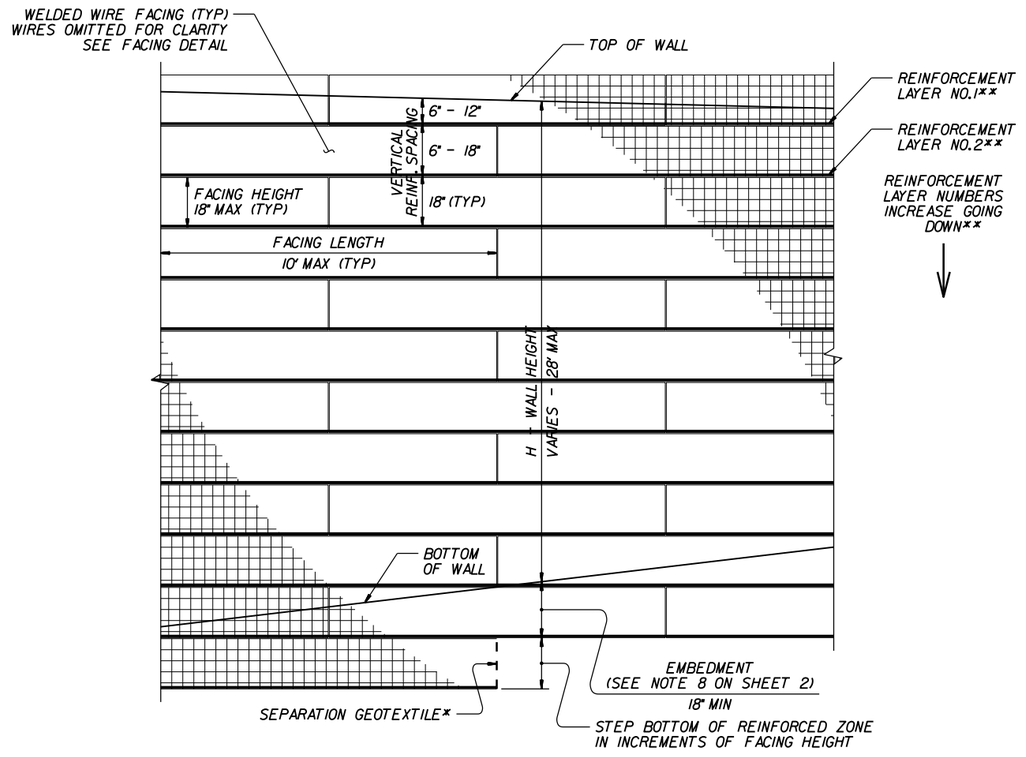


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

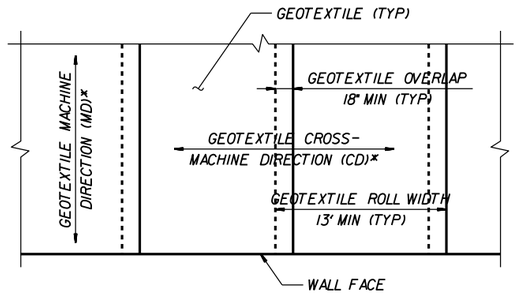
Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713 / R-5777AB	2G-5

GEOTECHNICAL ENGINEER

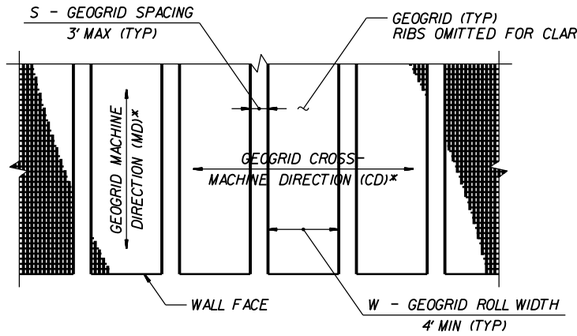
SIGNATURE DATE SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

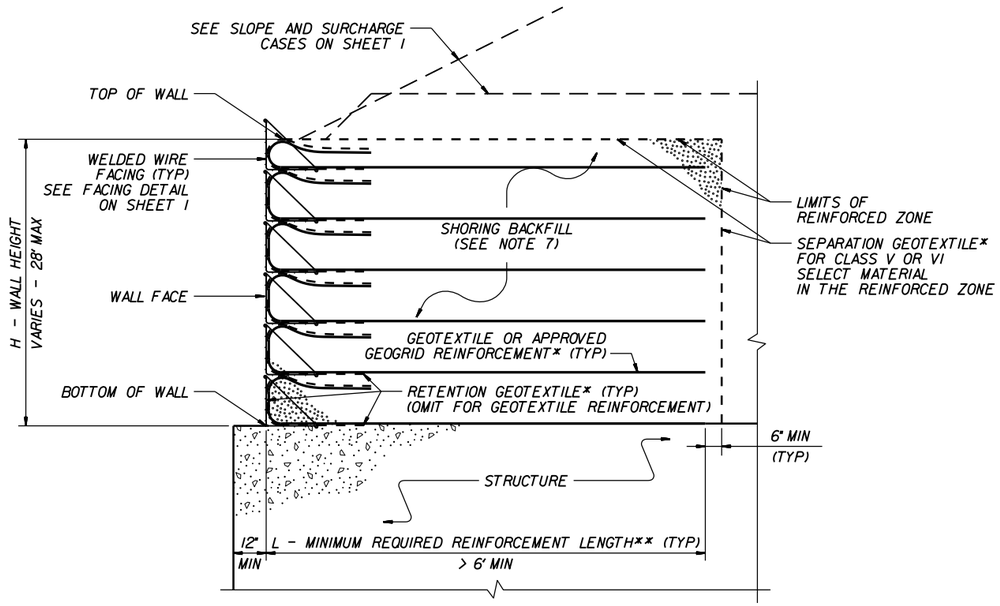


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 $\geq$ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

    IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) $\geq$ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD $\geq$ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD TEMPORARY WALL SHEET 2 OF 3

DATE: 11-19-13

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	4

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

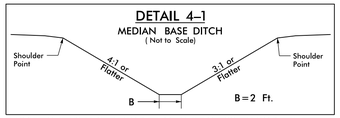
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 4-1
MEDIAN BASE DITCH
(Not to Scale)



FROM STA. 10+50 -SRY21C- TO STA. 12+00 -SRY21C- LT

NAD 83/NA 2011

205

210

215

POT Sta. 203+00.00

BEGIN CONSTRUCTION
-L- POT STA. 211+66.98

N 25°17'17.5" W

MB 10 PG 64
DB 891PG 238
EVA VIRTUE

MB 10 PG 64
DB 1313 PG 686
BURNEY L. &
PATSY S. HAWKIN

BM#18
BL STATION 6+23.00
59' LEFT
ELEV.=XX.XX'
BENCHTIE NAIL SET IN 14" OAK

BL-66

US 70 EB
-L-

US 70 WB

MEDIAN 2' BASE DITCH
SEE DETAIL 4-1

REMOVE

-SRY21C-

N 25°17'17.5" W

POT Sta. 10+00.00

MB 9 PG 88
DB 3346 PG 422
ROBERT P. &
HOLLY M. WOODCOCK

MB 9 PG 88
DB 1267 PG 085
JAMES L. ROBINSON, JR.

MB 9 PG 88
DB 3421PG 691
DONALD L.&
PAMELA P. HILL

MB 9 PG 88
DB 2275 PG 523
RANDALL ALLEN HILL &
BARBARA JONES HILL

REUBEN JULIUS LOGAN &
SANDRA MCCLEASE LOGAN
DB 953 PG 883
MB 9 PG 88

MATCHLINE
-L- STA 217+00
SEE SHEET 5

-SRY21C-
STA 12+00

PAVEMENT REMOVAL

FOR -SRY21C- PROFILE SEE SHEET 67

8/14/2020
H:\Roadway\Proj\PSH\U-5713-R-5777_rdy_psh04.dgn
tgmon

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	5

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

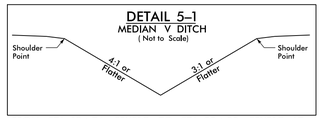
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

DETAIL 5–1
MEDIAN V DITCH
(Not to Scale)



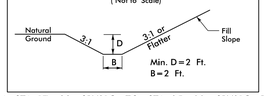
FROM STA. 12+74 –SRY21C– TO STA. 22+00 –SRY21C– LT
FROM STA. 23+00 –SRY21C– TO STA. 25+50 –SRY21C– LT

DETAIL 5–2
PIPE OUTLET BANK STABILIZATION
(Not to Scale)

Length = 22 Ft.
d = 4.0 Ft.
Est. = 42 Tons of Class II RIP RAP

STA. 13+47 –SRY21C– RT

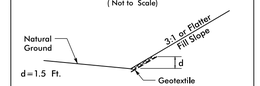
DETAIL 5–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2 Ft.
B = 2 Ft.

FROM STA. 17+66 –SRY21C– TO STA. 25+00 –SRY21C– RT

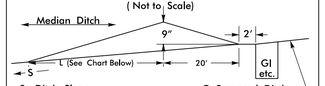
DETAIL 5–4
TOE PROTECTION
(Not to Scale)



Type of Liner = CL B RIPRAP

FROM STA. 14+39 –SRY21C– TO STA. 17+65 –SRY21C– RT

DETAIL 5–5
FALSE SUMP
(Not to Scale)

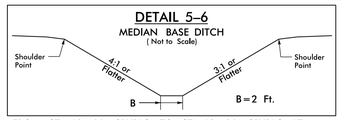


S = Ditch Slope
℄ Proposed Ditch

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'

STA. 12+50 –SRY21C– LT
STA. 17+06 –SRY21C– LT

DETAIL 5–6
MEDIAN BASE DITCH
(Not to Scale)



FROM STA. 12+00 –SRY21C– TO STA. 12+30 –SRY21C– LT

MATCHLINE -L- STA 217+00 SEE SHEET 4

MATCHLINE -L- STA 230+50 SEE SHEET 6

-SRY21C- STA 12+00

-SRY21C- STA 25+50

220 225 230

DB 2603 PG 396
EMMA F. FORD
TRUSTEES

US 70 EB

US 70 WB

-L- N 25°17'17.5" W

-SRY21C- N 25°17'17.5" W

BL-67

R5777-1

RETAIN 66" RCP

RETAIN 30" RCP

RETAIN DI

MEDIAN 2' BASE DITCH SEE DETAIL 5–6

BEGIN 47' WW FENCE & BEGIN CHL FENCE W/ 1/2" MESH GLARE SCREEN -L- +70.77' RT

MEDIAN 'V' DITCH SEE DETAIL 5–1

FALSE SUMP SEE DETAIL 5–5 2GI–A

COLLAR

REMOVE 20' LF 66" RCP

CHL FENCE WITH 1/2" MESH GLARE SCREEN

24" RCP–III

66" RCP–IV

PROP. 2'–6" C&G

15" RCP–IV

MDCB

REMOVE

PUE

DUE

50' TAPER

BEGIN CONSTRUCTION -SRY21C- ST. A. 12+70.00

+07.00 EX. R/W & 51.00'

+80.00 EX. R/W & 51.00'

+29.00 75.00' & 85.00'

+63.00 75.77' & 86.00'

PIPE OUTLET BANK STABILIZATION SEE DETAIL 5–2

TOE PROTECTION ON FILL SLOPE ONLY EST. 88 TONS CL B RIPRAP EST. 420 SY GEOTEXTILE SEE DETAIL 5–4

+99.00 65.00'

GL B RIPRAP EST. 8 TONS EST. 21 SY GF

DAYLIGHT DITCH

+92.00 77.48' & 103.00'

REMOVE 12 LF 30" RCP

30" RCP–III

30" RCP–IV

JB WITH

CB

+48.00 85.00'

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

SPEC. LATERAL 2' BASE DITCH SEE DETAIL 5–3

+42.00 85.62' & 105.00'

15" RCP–III

18" RCP–III

18" RCP–IV

24"

+00.00 88.00'

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

PROP. GRAVEL DRIVE (TYP.)

+04.00 80.00'

+35.00 67.00'

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

1 MB 9 PG 88 DB 953 PG 883 REUBEN JULIUS LOGAN & SANDRA MCCLEASE LOGAN

2 PC "H" PG 135–F DB 2775 PG 187 MICHAEL HUFFMAN & WALTER HUFFMAN

3 DB 1046 PG 703 NICK ARNOLD

4 PC "C" PG 380 DB 1215 PG 277 TAURINO PEREZ SANTOS

5 MB 6 PG 100 DB 2538 PG 830 COOPER STREET PARTNERS, LLC

PAVEMENT REMOVAL

FOR -SRY21C- PROFILE SEE SHEET 68

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

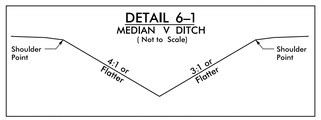
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

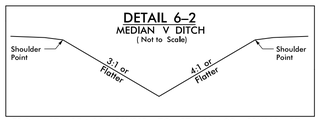
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 6–1
MEDIAN V DITCH
(Not to Scale)



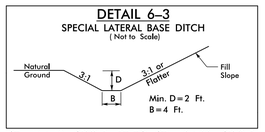
FROM STA. 25+50 –SRY21C– TO STA. 34+50 –SRY21C– LT
FROM STA. 36+00 –SRY21C– TO STA. 39+00 –SRY21C– LT

DETAIL 6–2
MEDIAN V DITCH
(Not to Scale)



FROM STA. 15+00 –SRY21B– TO STA. 19+00 –SRY21B– RT

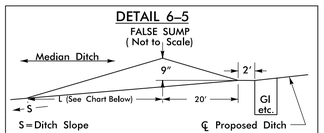
DETAIL 6–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2 Ft.
B = 4 Ft.

FROM STA. 14+50 –SRY21B– RT TO STA. 19+00 –SRY21B– LT

DETAIL 6–5
FALSE SUMP
(Not to Scale)

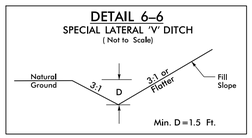


S = Ditch Slope
℄ Proposed Ditch

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'

STA. 26+27 –SRY21C– LT
STA. 240+47 –L– MED

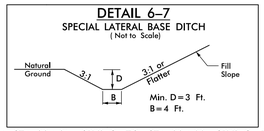
DETAIL 6–6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D = 1.5 Ft.

FROM STA. 36+00 –SRY21C– TO STA. 38+85 –SRY21C– RT

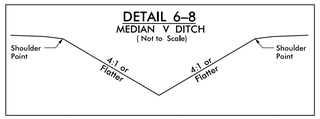
DETAIL 6–7
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 3 Ft.
B = 4 Ft.

FROM STA. 38+85 –SRY21C– TO STA. 39+00 –SRY21C– RT

DETAIL 6–8
MEDIAN V DITCH
(Not to Scale)



FROM STA. 237+00 –L– TO STA. 244+00 –L– MED

NAD 83/NA 2011

MATCHLINE -L- STA 230+50 SEE SHEET 5

-SRY21C- STA 25+50

-SRY21B- PT Sta. 10+00.00 = -L- POT Sta. 235+00.00 94.00' LT

BEGIN CONSTRUCTION -SRY21B- STA. 15+00.00

PC Sta. 16+86.07

SPEC. LATERAL 4' BASE DITCH SEE DETAIL 6–3

CL B RIPRAP EST. 7 TONS EST. 21 SY GF

+80.00, 14.00' LT
+50.00, 44.00' LT
+30.00, 44.00' LT
+00.00, 14.00' LT

BL STATION 239+45.00 ELEV. 1126.96' BENCHTIE NAIL SET IN 14" MAPLE

N 25° 17' 17.5" W

BEGIN 47" WW FENCE & BEGIN CHL FENCE W/ 1/2 MESH GLARE SCREEN -L- +00.00 RT

CHL FENCE WITH 1/2 MESH GLARE SCREEN

REMOVE

PROP. 2'-6" C&G

-SRY21B-

RETAIN DI

RETAIN 15" RCP

MEDIAN 'V' DITCH SEE DETAIL 6–1

MEDIAN 'V' DITCH SEE DETAIL 6–2

MEDIAN 'V' DITCH SEE DETAIL 6–8

REMOVE DI

FALSE SUMP SEE DETAIL 6–5

US 70 EB

US 70 WB

-L-

R5777-2

FULL DEPTH PVMT REPAIR @ PIPE CROSSING

MEDIAN 'V' DITCH SEE DETAIL 6–1

CHL FENCE WITH 1/2" MESH GLARE SCREEN

-SRY21C-

N 25° 17' 17.5" W

REMOVE 4 LF 18" RCP

SPEC. LATERAL 'V' DITCH SEE DETAIL 6–6

SPEC. LATERAL 4' BASE DITCH SEE DETAIL 6–7

CL I RIPRAP EST. 20 TONS EST. 39 SY GF

-SRY21C2- PT Sta. 10+00.00 = -SRY21C- POT Sta. 35+02.33 △ = 73°38'08"

-SRY21C2- STA 13+00 SEE SHEET 21

-SRY21B- STA 19+00

-SRY21C- STA 39+00

MATCHLINE -L- STA 244+00 SEE SHEET 7

5 MB 6 PG 100 DB 2538 PG 830 COOPER STREET PARTNERS, LLC

6 DB 2603 PG 396 EMMA F. FORD TRUSTEES

7 MB 6 PG 100 DB 1532 PG 302 TOMMY BATTEN RENTALS, LLC

8 MB 6 PG 100 DB 3517 PG 1913 RITE TOUCH INVESTMENTS, LLC

9 MB 6 PG 100 DB 3113 PG 730 JOHN HENRY WILLIAMS, JR.

10 MB 6 PG 100 DB 3381PG 840 ADVANTAGE MACHINERY SERVICES, INC

11 DB 2149 PG 469 BRICE'S CREEK BIBLE CHURCH

12 PC 'F' PG 161-C DB 2205 PG 1 THEODORE R CAMPBELL VERA KAY CAMPBELL

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEET 23A
FOR -SRY21B- PROFILE SEE SHEET 66
FOR -SRY21C- PROFILE SEE SHEET 68
FOR -SRY21C2- PROFILE SEE SHEET 70
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	7

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

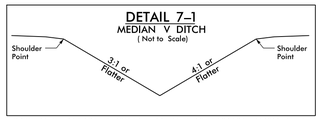
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

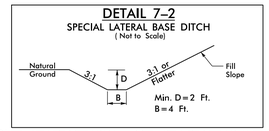
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 7–1
MEDIAN V DITCH
(Not to Scale)



FROM STA. 19+00 –SRY21B– TO STA. 25+00.32 –SRY21B– RT
FROM STA. 250+00 –L– TO STA. 253+00 –L– LT

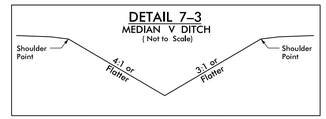
DETAIL 7–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=2 Ft.
B=4 Ft.

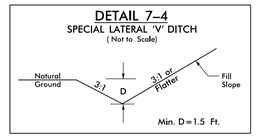
FROM STA. 19+00 –SRY21B– TO STA. 27+50 –SRY21B– LT

DETAIL 7–3
MEDIAN V DITCH
(Not to Scale)



FROM STA. 249+00 –L– TO STA. 252+00 –L– RT
FROM STA. 39+00 –SRY21C– TO STA. 43+00 –SRY21C– LT

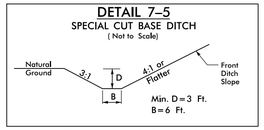
DETAIL 7–4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D=1.5 Ft.

FROM STA. 28+50 –SRY21B– TO STA. 31+50 –SRY21B– RT

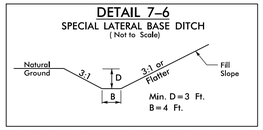
DETAIL 7–5
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D=3 Ft.
B=6 Ft.

FROM STA. 253+00 –L– TO STA. 257+00 –L– LT

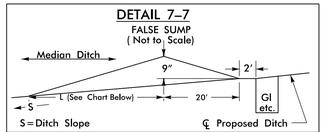
DETAIL 7–6
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=3 Ft.
B=4 Ft.

FROM STA. 39+00 –SRY21C– TO STA. 46+70 –SRY21C– RT

DETAIL 7–7
FALSE SUMP
(Not to Scale)

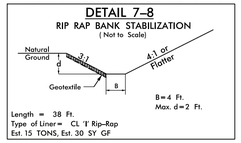


S = Ditch Slope ℄ Proposed Ditch

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'

STA. 253+37 –L– MED

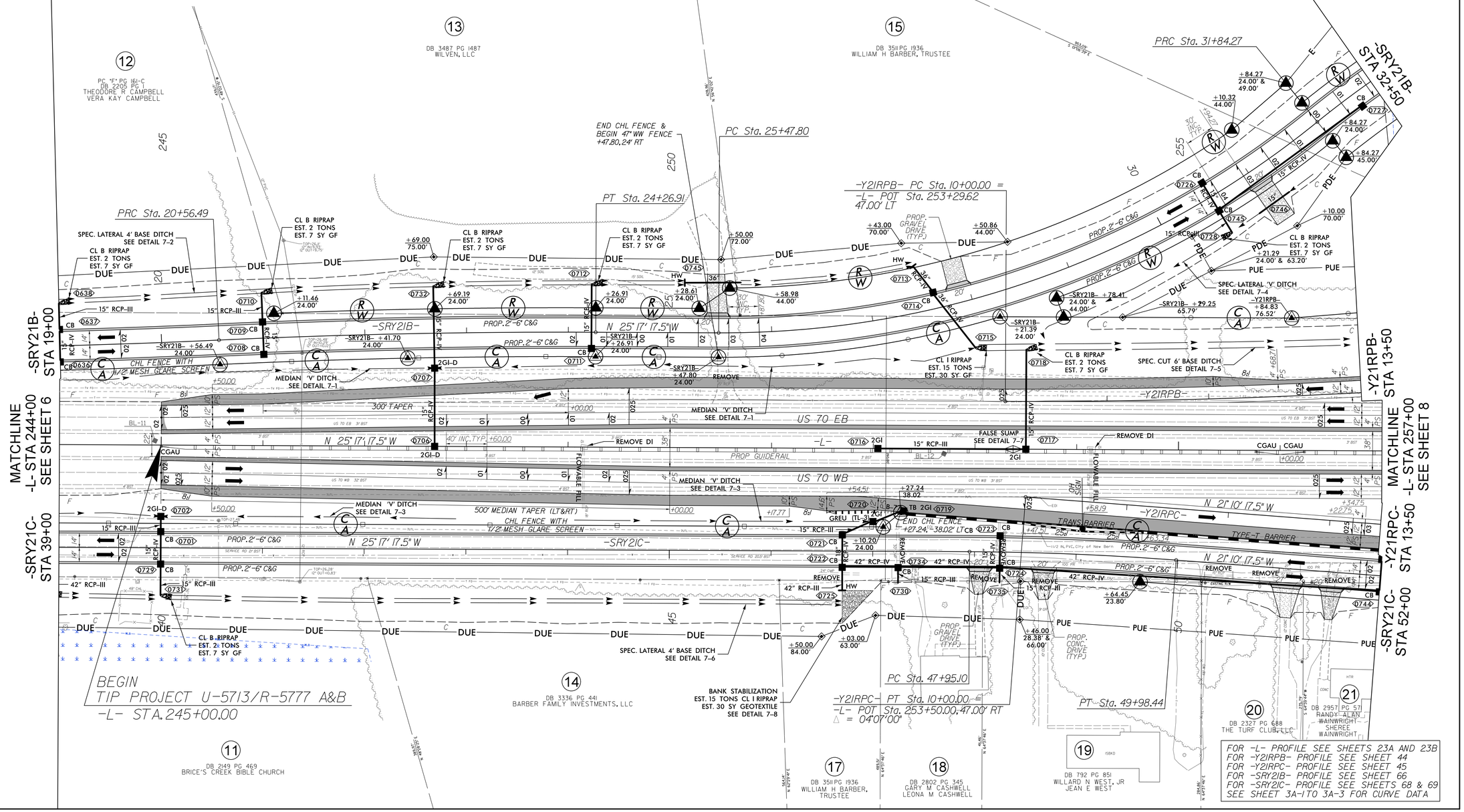
DETAIL 7–8
RIP RAP BANK STABILIZATION
(Not to Scale)



B=4 Ft.
Max. d=2 Ft.

Length = 38 Ft.
Type of Liner = CL 'I' Rip-Rap
Est. 15 TONS, Est. 30 SY GF

NAD 83/NA 2011



FOR -L- PROFILE SEE SHEETS 23A AND 23B
FOR -Y21RPB- PROFILE SEE SHEET 44
FOR -Y21RPC- PROFILE SEE SHEET 45
FOR -SRY21B- PROFILE SEE SHEET 66
FOR -SRY21C- PROFILE SEE SHEETS 68 & 69
SEE SHEET 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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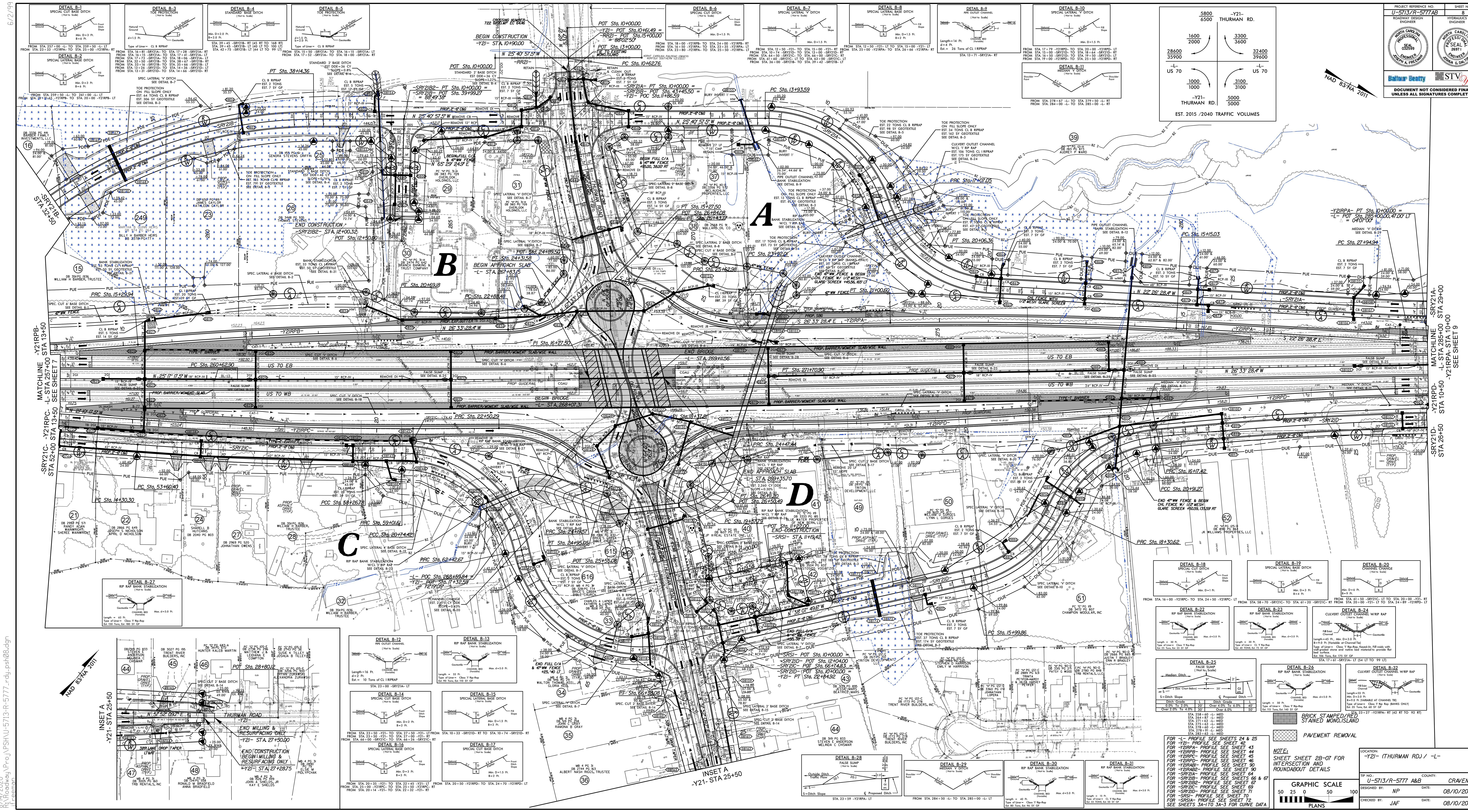
kfreeman

Submitted 9/16/2020



PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	8

ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty — STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BRICK STAMPED/RED STAINED MONO.ISLAND

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 24 & 25
FOR -Y21- PROFILE SEE SHEET 42
FOR -Y21RPA- PROFILE SEE SHEET 43
FOR -Y21RPB- PROFILE SEE SHEET 44
FOR -Y21RPC- PROFILE SEE SHEET 45
FOR -Y21RPD- PROFILE SEE SHEET 46
FOR -Y21RAB1- PROFILE SEE SHEET 90
FOR -Y21RAB2- PROFILE SEE SHEET 90
FOR -SRY21A- PROFILE SEE SHEET 64
FOR -SRY21B- PROFILE SEE SHEETS 66 & 67
FOR -SRY21B2- PROFILE SEE SHEET 67
FOR -SRY21C- PROFILE SEE SHEET 69
FOR -SRY21D- PROFILE SEE SHEET 71
FOR -SRS1- PROFILE SEE SHEET 70
FOR -SRS1A- PROFILE SEE SHEET 72
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

NOTE:
SHEET SHEET 2B-07 FOR INTERSECTION AND ROUNDABOUT DETAILS

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y21- (THURMAN RD) / -L-

TIP NO.: U-5713/R-5777 A&B	COUNTY: CRAVEN
DESIGNED BY: NP	DATE: 08/10/20
CHECKED BY: JAF	DATE: 08/10/20

6/2/99

8/14/2020
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jfreeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	9

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

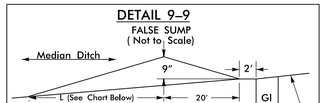
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

DETAIL 9–9
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

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'

DETAIL 9–10
TOE PROTECTION
(Not to Scale)

Type of Liner = CL B RIPRAP

FROM STA. 29+98 –SRY21A– TO STA. 30+61 –SRY21A– LT

STA. 286+87 –L– MED
STA. 286+37 –L– RT
STA. 286+87 –L– LT
STA. 289+34 –L– RT
STA. 291+37 –L– MED
STA. 291+37 –L– LT
STA. 294+37 –L– LT
STA. 294+63 –L– RT

PT Sta. 30+10.48

CULVERT OUTLET CHANNEL W/CL 'I' RIP RAP
EST. 130 TONS CL I RIPRAP
EST. 214 SY GEOTEXTILE
SEE DETAIL 9–8

FILL EXISTING CHANNEL TOE PROTECTION WITH SUITABLE MATERIAL ON FILL SLOPE ONLY
EST 120 CY

TOE PROTECTION
EST. 30 TONS CL B RIPRAP
EST. 135 SY GEOTEXTILE
SEE DETAIL 9–4

CL B RIPRAP
EST. 3 TONS
EST. 10 SY GF

CL B RIPRAP
EST. 3 TONS
EST. 95 SY GEOTEXTILE
SEE DETAIL 9–10

CL I RIPRAP
EST. 11 TONS
EST. 22 SY GF

CL I RIPRAP
EST. 20 TONS
EST. 39 SY GF

CL I RIPRAP
EST. 4 TONS
EST. 10 SY GF

CL I RIPRAP
EST. 20 TONS
EST. 39 SY GF

CL B RIPRAP
EST. 2 TONS
EST. 7 SY GF

RIP RAP BANK STABILIZATION W/CL 'I' RIP RAP
SEE DETAIL 9–7

LATERAL 6' BASE DITCH
SEE DETAIL 9–3

SPEC. LATERAL 'V' DITCH
SEE DETAIL 9–5

SPEC. CUT 4' BASE DITCH
SEE DETAIL 9–6

REMOVE 56 LF 42" RCP

REMOVE HEADWALL

REMOVE

FALSE SUMP
SEE DETAIL 9–9

REMOVE D1

MEDIAN 'V' DITCH
SEE DETAIL 9–1

MEDIAN 'V' DITCH
SEE DETAIL 9–2

CHL FENCE WITH 1/2 MESH GLARE SCREEN

END CHL FENCE & BEGIN 47" WW FENCE +30.24' LT

END CONSTRUCTION
–SRY21D– STA. 38+30.00

PROP GUARDRAIL

PROP GRAVEL DRIVE (TYP.)

FLOWABLE FILL

-SRY21A- STA 29+00

-SRY21A- STA 42+00

-SRY21D- STA 26+50 -Y21RPD- STA 10+50

-SRY21D- STA 39+50

MATCHLINE -L- STA 285+00 -Y21RPA- STA 10+00 SEE SHEET 8

MATCHLINE -L- STA 298+00 SEE SHEET 10

–Y21RPD– PC Sta. 10+00.00 = –L– POT Sta. 285+50.00, 47.00' RT = –SRY21D– PT Sta. 27+03.88

–SRY21A– +08.88

–SRY21D– +84.30

N 26° 33' 28.4" W

US 70 EB

US 70 WB

–L–

–SRY21D–

39
PC "F" PG 121-H
DB 1913 PG 873
AUDREY P WARD

57
PC "F" PG 121-H
DB 3487 PG 1487
WILVEN, LLC

59
PC "F" PG 121-H
DB 3487 PG 1487
WILVEN, LLC

61
DB 2778 PG 393
CARLSON & WILLIAMS HOMES, LLC

62
PC "H" PG 20-H
DB 2778 PG 393
CARLSON & WILLIAMS HOMES, LLC

63
PC "H" PG 20-H
DB 2807 PG 802
CARLSON & WILLIAM HOMES, LLC

64
PC "H" PG 20-H
DB 2807 PG 774
CARLSON & WILLIAMS HOMES, LLC

65
PC "H" PG 20-H
DB 2304 PG 98
GARY A CAHOON

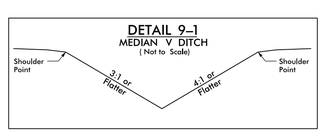
60
DB 1595 PG 487
CRAVEN COUNTY JUNIOR CHAMBER OF COMMERCE, INC

58
PC "G" PG 50-E
DB 1882 PG 126
MATTIE A MIDGETTE

56
MB 12 PG 50
DB 1882 PG 126
MATTIE A MIDGETTE

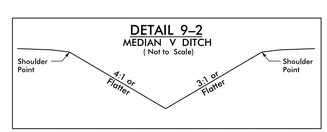
52
PC "H" PG 125-D
DB 1890 PG 864
JK WILLIAMS PROPERTIES, LLC

DETAIL 9–1
MEDIAN 'V' DITCH
(Not to Scale)



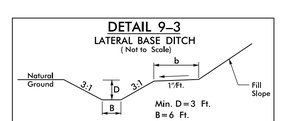
FROM STA. 285+00 –L– TO STA. 287+50 –L– LT
FROM STA. 291+50 –L– TO STA. 297+00 –L– LT
FROM STA. 297+00 –L– TO STA. 298+00 –L– LT

DETAIL 9–2
MEDIAN 'V' DITCH
(Not to Scale)



FROM STA. 285+00 –L– TO STA. 288+00 –L– RT
FROM STA. 293+50 –L– TO STA. 297+00 –L– RT

DETAIL 9–3
LATERAL BASE DITCH
(Not to Scale)



Min. D = 3 Ft.
B = 6 Ft.
b = 5 Ft.

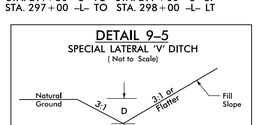
FROM STA. 26+99 –SRY21D– TO STA. 28+43.88 –SRY21D– RT

DETAIL 9–4
TOE PROTECTION
(Not to Scale)

Type of Liner = CL B RIPRAP

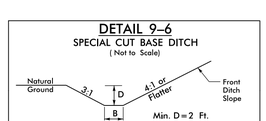
FROM STA. 30+61 –SRY21A– TO STA. 31+50 –SRY21A– LT

DETAIL 9–5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



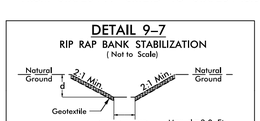
FROM STA. 34+00 –SRY21D– TO STA. 38+00 –SRY21D– RT
FROM STA. 40+60 –SRY21A– TO STA. 42+00 –SRY21A– LT

DETAIL 9–6
SPECIAL CUT BASE DITCH
(Not to Scale)



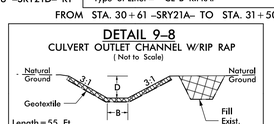
FROM STA. 297+00 –L– TO STA. 298+00 –L– RT

DETAIL 9–7
RIP RAP BANK STABILIZATION
(Not to Scale)



Length = 30 FT. (JS), 40 FT. Channel Relocation
Type of Liner = CL 'I' RIPRAP
Est. 55 TONS, Est. 100 SY GF

DETAIL 9–8
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)



Length = 55 Ft.
B = 6.0 Ft., Min. D = 3.0 Ft.
Type of Liner = Class 'I' Rip-Rap, Keyed-In. Fill voids with well graded stone and native bed material to provide flat bed surface.
Est. 130 Tons, Est. 214 SY GF

STA. 29+88 –SRY21A– LT (61 LT TO 118 LT)

FOR –L– PROFILE SEE SHEET 26
FOR –Y21RPD– PROFILE SEE SHEET 46
FOR –Y21RPD– PROFILE SEE SHEETS 64 & 65
FOR –SRY21D– PROFILE SEE SHEETS 71 & 72
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	10

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

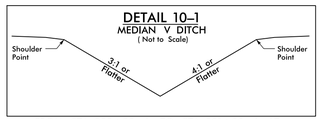
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty — STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

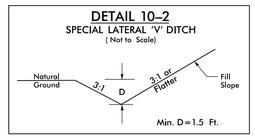
NAD 83/NA 2011

DETAIL 10–1
MEDIAN 'V' DITCH
(Not to Scale)



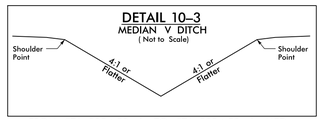
FROM STA. 298+00 –L– TO STA. 301+00 –L– LT
FROM STA. 306+50 –L– TO STA. 309+50 –L– LT

DETAIL 10–2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



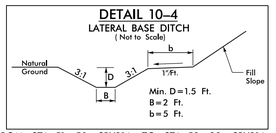
FROM STA. 42+00 –SRY21A– TO STA. 43+00 –SRY21A– LT

DETAIL 10–3
MEDIAN 'V' DITCH
(Not to Scale)



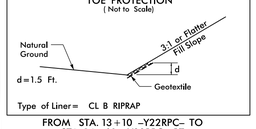
FROM STA. 305+50 –L– TO STA. 309+50 –L– MED

DETAIL 10–4
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 51+50 –SRY21A– TO STA. 52+22 –SRY21A– LT

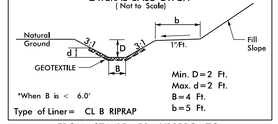
DETAIL 10–5
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP

FROM STA. 13+10 –Y22RPC– TO STA. 14+60 –Y22RPC– RT

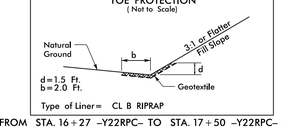
DETAIL 10–6
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Type of Liner= CL B RIPRAP

FROM STA. 15+50 –Y22RPC– TO STA. 16+15 –Y22RPC– RT

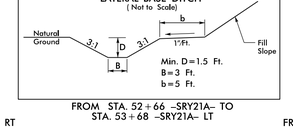
DETAIL 10–7
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP

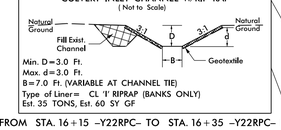
FROM STA. 16+27 –Y22RPC– TO STA. 17+50 –Y22RPC– RT

DETAIL 10–8
LATERAL BASE DITCH
(Not to Scale)



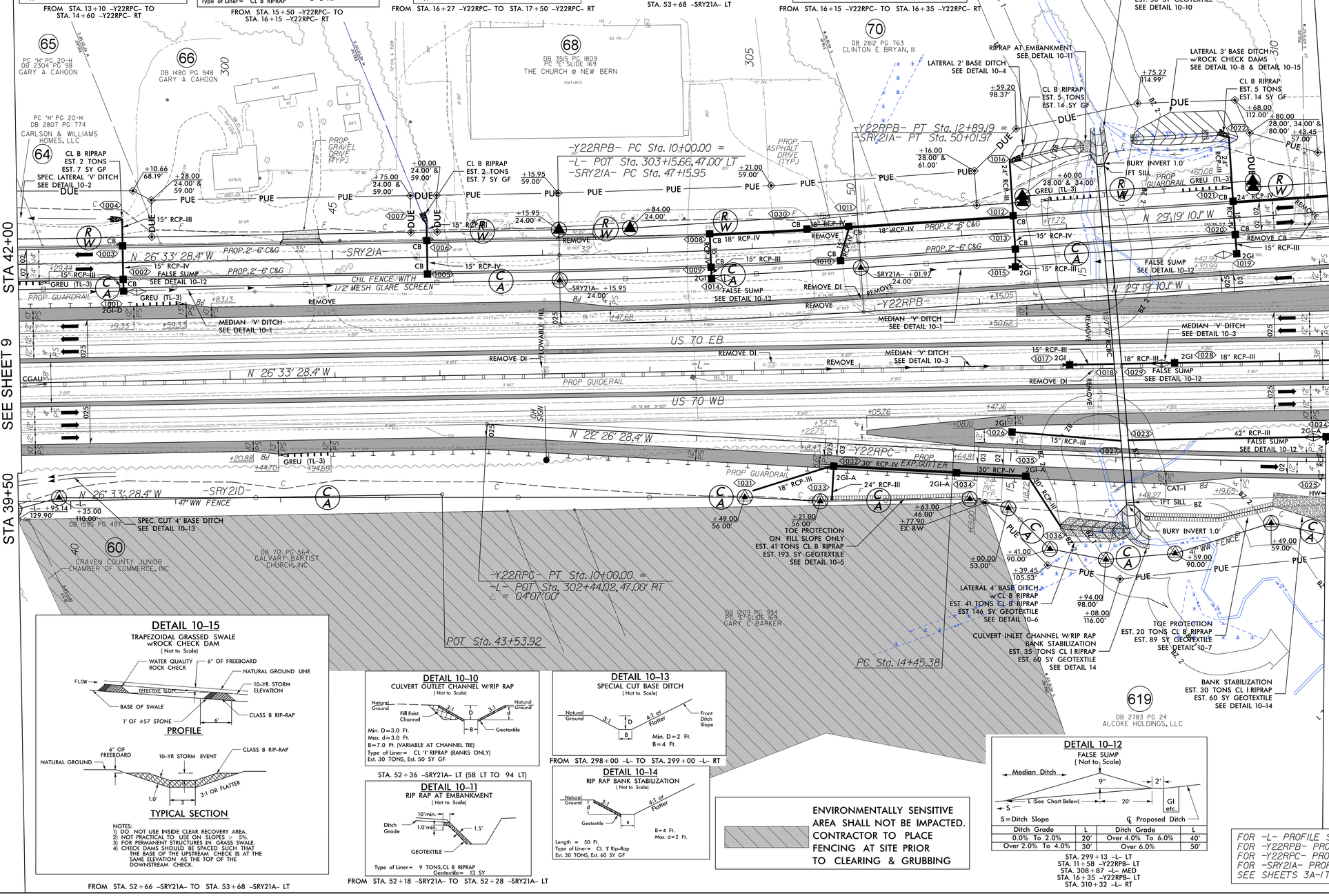
FROM STA. 52+66 –SRY21A– TO STA. 53+68 –SRY21A– LT

DETAIL 10–9
CULVERT INLET CHANNEL W/RIP RAP
(Not to Scale)



Type of Liner= CL 'I' RIPRAP (BANKS ONLY)
Est. 35 TONS, Est. 60 SY GF

FROM STA. 16+15 –Y22RPC– TO STA. 16+35 –Y22RPC– RT



DETAIL 10–15
TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM
(Not to Scale)

NOTES:
1) DO NOT USE INSIDE CLEAR RECOVERY AREA.
2) NOT PRACTICAL TO USE ON SLOPES < 5%.
3) FOR PERMANENT STRUCTURES IN GRASS SWALE.
4) CHECK DAMS SHOULD BE SPACED SUCH THAT THE BASE OF THE UPSTREAM CHECK IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM CHECK.

FROM STA. 52+66 –SRY21A– TO STA. 53+68 –SRY21A– LT

DETAIL 10–10
CULVERT OUTLET CHANNEL W/RIP RAP
(Not to Scale)

Type of Liner= CL 'I' RIPRAP (BANKS ONLY)
Est. 30 TONS, Est. 50 SY GF

STA. 52+36 –SRY21A– LT (58 LT TO 94 LT)

DETAIL 10–11
RIP RAP AT EMBANKMENT
(Not to Scale)

Type of Liner= 9 TONS,CL B RIPRAP
Geotextile= 13 SY

FROM STA. 52+18 –SRY21A– TO STA. 52+28 –SRY21A– LT

DETAIL 10–13
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM STA. 298+00 –L– TO STA. 299+00 –L– RT

DETAIL 10–14
RIP RAP BANK STABILIZATION
(Not to Scale)

Length = 50 Ft.
Type of Liner= CL 'I' Rip-Rap
Est. 30 TONS, Est. 60 SY GF

DETAIL 10–12
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'

STA. 299+13 –L– LT
STA. 11+58 –Y22RPB– LT
STA. 308+87 –L– MED
STA. 16+35 –Y22RPB– LT
STA. 310+32 –L– RT

FOR –L– PROFILE SEE SHEETS 26 & 27
FOR –Y22RPB– PROFILE SEE SHEET 49
FOR –Y22RPC– PROFILE SEE SHEET 50
FOR –SRY21A– PROFILE SEE SHEET 65
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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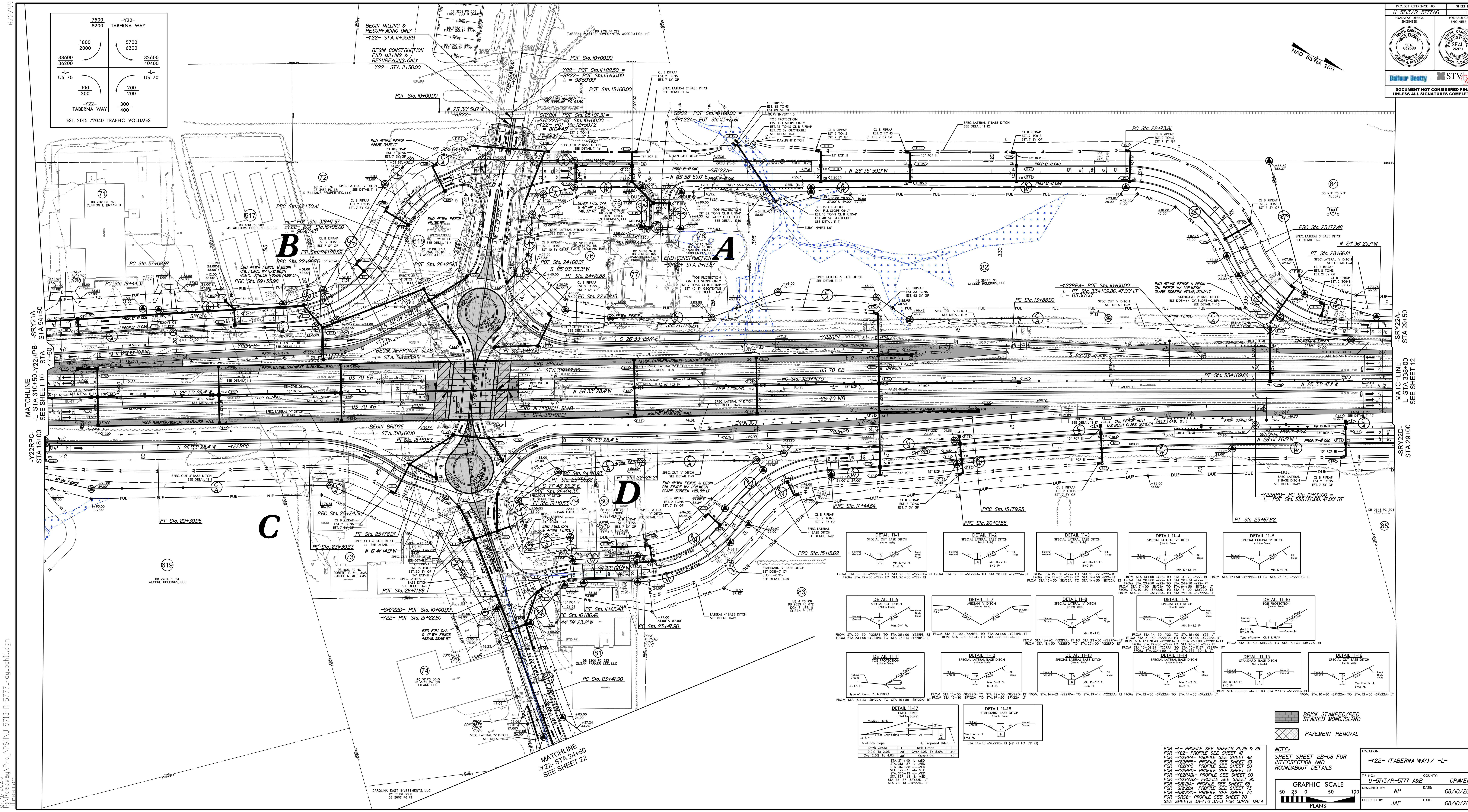

FOR -L- PROFILE SEE SHEETS 21, 28 & 29
FOR -Y22- PROFILE SEE SHEET 47
FOR -Y22RPA- PROFILE SEE SHEET 48
FOR -Y22RPB- PROFILE SEE SHEET 49
FOR -Y22RPC- PROFILE SEE SHEET 50
FOR -Y22RPD- PROFILE SEE SHEET 51
FOR -Y22RAB1- PROFILE SEE SHEET 90
FOR -Y22RAB2- PROFILE SEE SHEET 90
FOR -SRY21A- PROFILE SEE SHEET 65
FOR -SRY22A- PROFILE SEE SHEET 73
FOR -SRY22D- PROFILE SEE SHEET 74
FOR -SRS2- PROFILE SEE SHEET 70
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

NOTE:
SHEET SHEET 2B-08 FOR INTERSECTION AND ROUNDABOUT DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Balfour Beatty STV

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: -Y22- (TABERNA WAY) / -L-

TIP NO.: U-5713/R-5777 A&B	COUNTY: CRAVEN
DESIGNED BY: NP	DATE: 08/10/20
CHECKED BY: JAF	DATE: 08/10/20

6/2/99

8/14/2020
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jfreeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	12

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

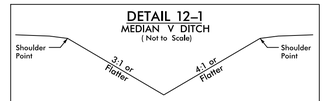
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

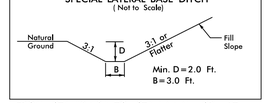
NAD 83/NA 2011

DETAIL 12–1
MEDIAN V DITCH
(Not to Scale)



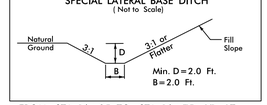
FROM STA. 345+64 TO STA. 347+50 –L– LT
FROM STA. 338+00 TO STA. 341+50 –L– LT

DETAIL 12–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



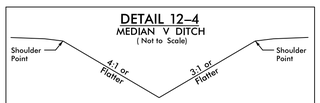
FROM STA. 10+84 TO STA. 14+45 –SR1– LT
FROM STA. 15+55 TO STA. 16+50 –SR7– RT

DETAIL 12–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 16+35 TO STA. 16+75 –Y1– LT
FROM STA. 12+65 TO STA. 13+95 –SR7– RT

DETAIL 12–4
MEDIAN V DITCH
(Not to Scale)



FROM STA. 341+00 TO STA. 342+70 –L– RT
FROM STA. 343+50 TO STA. 349+00 –L– RT

DETAIL 12–5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 10+10 TO STA. 10+84 –SR1– LT
FROM STA. 29+50 TO STA. 32+51 –SRY22A– LT

DETAIL 12–6
PIPE OUTLET CHANNEL
(Not to Scale)

Length = 25 Ft.
d = 3.0 Ft.
Est. = 40 Tons of Class I Rip–Rap

STA. 14+53 –SR1– LT

POT Sta. 10+00.00

N 49° 00' 03.6" E

–Y1– GARNER ROAD

84
DB N/F PG N/F
ALCOKE

86
FINCH
DB N/F PG N/F

340

345

BEGIN CONSTRUCTION
–Y1– STA. 12+47.51

–Y1– POT Sta. 14+65.65 =
–L– POT Sta. 342+13.52
Δ = 74°36'02.04"

–SRY22A– POT Sta. 33+36.45 =
–SR1– PC Sta. = 10+00.00 =
Y1– POT Sta. 13+59.92

–Y1– +75.47
EX. R/W

–Y1– +92.55
EX. R/W

CL B RIP RAP
EST. 2 TONS
EST. 7 SY GF
SPEC. LAT. 'V' DITCH
SEE DETAIL 12–5

CL B RIP RAP
EST. 11 TONS
EST. 28 SY GF

SPEC. LAT. 3'
BASE DITCH
SEE DETAIL 12–2

CL B RIP RAP
EST. 15 TONS
EST. 30 SY GF

BANK STABILIZATION
EST. 40 TONS
EST. 72 SY GF
SEE DETAIL 12–6

CL B RIP RAP
EST. 3 TONS
EST. 10 SY GF

88
DO NOT DISTURB
EXISTING BIORETENTION AREA
GRANTHAM CROSSING, LLC
DB 2420 PG 561
MB 15 PG 37

SPEC. LATERAL 'V' DITCH
SEE DETAIL 12–5

CL B RIPRAP
EST. 7 SY GF

CL B RIPRAP
EST. 2 TONS
EST. 7 SY GF

PROP. GRAVEL DRIVE (TYP.)

PROP. ASPHALT DRIVE (TYP.)

PROP. CONCRETE DRIVE (TYP.)

–SRY22A–
STA 29+50

–SR1–
STA 17+00

–SRY22D–
STA 29+00

–SR7–
STA 16+50

MATCHLINE
–L– STA 338+00
SEE SHEET 11

MATCHLINE
–L– STA 349+00
SEE SHEET 13

–SRY22A–
N 24° 36' 29.7" W

N 25° 33' 47.1" W

N 22° 49' 35.4" W

CHL FENCE WITH 1/2" MESH GLARE SCREEN

720' MEDIAN TAPER LT&RT

PROP. 2'–6" C&G

PROP. DOUBLE FACED GUARDRAIL

PROP. GUARDRAIL

MEDIAN 'V' DITCH
SEE DETAIL 12–1

MEDIAN 'V' DITCH
SEE DETAIL 12–4

REMOVE DI

REMOVE DI
& 5 LF 24" RCP

FLOWABLE FILL

US 70 EB

US 70 WB

TYPE–T BARRIER

CONTRACTOR NOT TO DISTURB THE PUMP STATION

PT Sta. 11+10.09

PC Sta. 14+62.47

PT Sta. 15+32.85

PC Sta. 30+11.25

PT Sta. 31+78.67

PRC Sta. 10+86.99

PT Sta. 13+45.74

–SRY22D– PT Sta. 33+41.34 =
–SR7– PC Sta. 10+00.00 =
–Y1– PT Sta. 15+90.53

END CONSTRUCTION
–Y1– STA. 16+87.39

POT Sta. 20+00.00

N 49° 48' 26.9" E

BEREAN COMMUNTIY CHURCH
DB 3280 PG 743

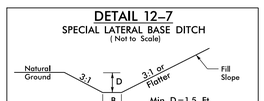
87

85
DB 2643 PG 904
JBGF, LLC

220
ALCOKE HOLDINGS, LLC
DB 1560 PG 0920

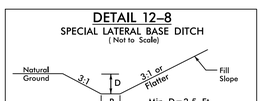
219
ALCOKE HOLDINGS, LLC
DB 2132 PG 333

DETAIL 12–7
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 29+00 –SRY22D– TO STA. 32+95.76 –SRY22D– RT
FROM STA. 16+00 –Y1– TO STA. 16+82 –Y1– RT

DETAIL 12–8
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 13+95 TO STA. 15+55 –SR7– RT

PAVEMENT REMOVAL

FOR –L– PROFILE SEE SHEETS 29 & 30
FOR –Y1– PROFILE SEE SHEET 52
FOR –SRY21A– PROFILE SEE SHEET 73
FOR –SRY21D– PROFILE SEE SHEET 74
FOR –SR1– PROFILE SEE SHEET 75
FOR –SR7– PROFILE SEE SHEET 85
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	13

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

DETAIL 13–1
MEDIAN 'V' DITCH
(Not to Scale)

FROM STA. 349+00 TO STA. 358+50 –L– RT

DETAIL 13–2
MEDIAN 'V' DITCH
(Not to Scale)

FROM STA. 349+00 TO STA. 353+50 –L– LT

DETAIL 13–3
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 20+10 TO STA. 21+25 –SR1– LT
FROM STA. 24+50 TO STA. 26+30 –SR1– LT
FROM STA. 19+25 TO STA. 20+70 –SR7– RT

DETAIL 13–4
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 16+50 TO STA. 17+15 –SR7– RT
FROM STA. 22+00 TO STA. 23+05 –SR7– RT

DETAIL 13–5
SPECIAL LATERAL BASE DITCH
(Not to Scale)

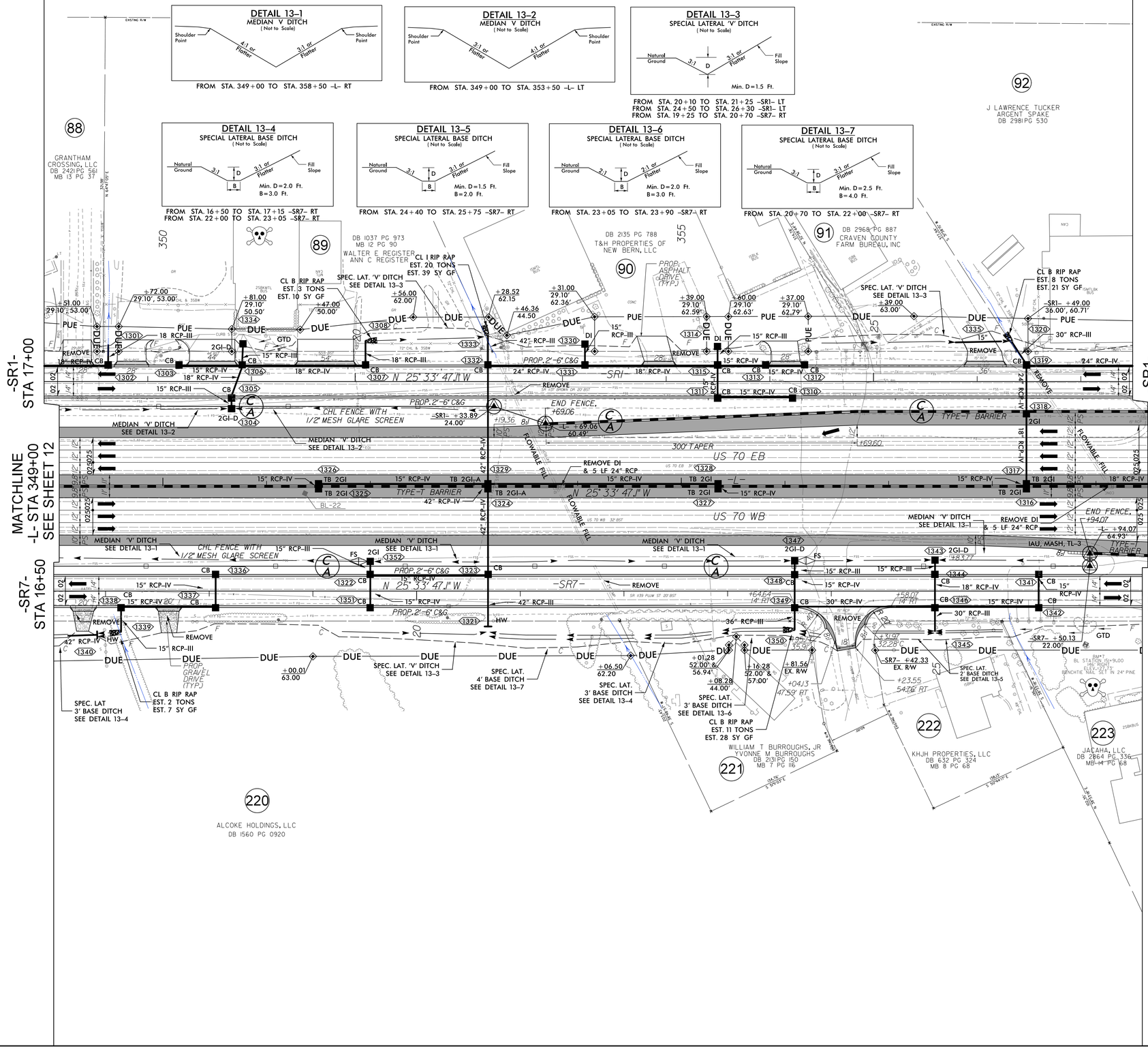
FROM STA. 24+40 TO STA. 25+75 –SR7– RT

DETAIL 13–6
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 23+05 TO STA. 23+90 –SR7– RT

DETAIL 13–7
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM STA. 20+70 TO STA. 22+00 –SR7– RT



PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 30 & 31
FOR -SR1- PROFILE SEE SHEET 75
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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tfgomo

Submitted 9/16/2020

6/2/99

MATCHLINE -SR8- STA 16+00

MATCHLINE -Y2- STA 26+50

INSET B

NAD 83/NA 2011

3400 / 4800 -Y2- GRANTHAM RD.
1600 / 2200
1800 / 2600
33200 / 41000 -L- US 70
35500 / 43700 -L- US 70
500 / 500
2600 / 2800
-Y2- GRANTHAM RD. 3100 / 3300
EST. 2015 /2040 TRAFFIC VOLUMES

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	14

ROADWAY DESIGN ENGINEER — PROFESSIONAL ENGINEER SEAL 035989 JOSEPH A. ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 39371 ENGINEER JOSHUA D. GRIFFIN

Ballow Beatty — STV/Ralph Whitehead Associates

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 14-1 SPECIAL LATERAL BASE DITCH — FROM STA 14+10 TO STA 16+00 -SR8- LT; FROM STA 13+80 TO STA 18+50 -SR8- RT

DETAIL 14-2 SPECIAL LATERAL "V" DITCH — FROM STA 10+25 TO STA 11+45 -SR8- LT; FROM STA 16+00 TO STA 18+00 -SR8- LT; FROM STA 21+50 TO STA 22+00 -SR8- LT; FROM STA 13+75 TO STA 14+25 -Y2RPA- LT; FROM STA 13+75 TO STA 14+50 -Y2RPA- LT; FROM STA 29+15 TO STA 29+50 -Y2- RT; FROM STA 31+15 TO STA 31+50 -Y2- RT; FROM STA 14+10 TO STA 20+50 -SR8- LT; FROM STA 21+00 TO STA 23+75 -SR8- LT

DETAIL 14-3 SPECIAL LATERAL BASE DITCH — FROM STA 33+00 TO STA 36+46 -SR7- RT

DETAIL 14-4 STANDARD BASE DITCH — STA 24+50 -Y2RPC- LT (60' LT TO 105' LT)

DETAIL 14-5 SPECIAL LATERAL BASE DITCH — FROM STA 37+90 TO STA 38+70 -Y2- LT; FROM STA 21+00 TO STA 24+50 -Y2RPC- RT; FROM STA 22+00 TO STA 24+50 -Y2RPC- RT

DETAIL 14-6 STANDARD "V" DITCH — STA 14+15 -SR2- LT (50' LT TO 155' LT)

DETAIL 14-7 SPECIAL LATERAL "V" DITCH — FROM STA 11+25 TO STA 13+55 -SR8- RT

DETAIL 14-8 STANDARD BASE DITCH — STA 13+75 -SR2- LT (60' LT TO 135' LT)

DETAIL 14-9 SPECIAL LATERAL "V" DITCH — FROM STA 18+50 TO STA 20+00 -SR8- RT

DETAIL 14-10 SPECIAL LATERAL BASE DITCH — FROM STA 36+46 TO STA 39+93 -SR7- RT; FROM STA 10+30 TO STA 11+90 -SR8- RT

DETAIL 14-11 SPECIAL LATERAL BASE DITCH — FROM STA 39+80 TO STA 43+10 -SR5- LT

DETAIL 14-12 MEDIAN "V" DITCH — FROM STA 359+50 TO STA 360+00 -L- RT

DETAIL 14-13 STANDARD BASE DITCH — STA 37+00 -Y2- LT (90' LT TO 145' LT); STA 25+90 -Y2RPB- LT (65 LT TO 225' LT)

A

B

C

D

BRICK STAMPED/RED STAINED MONO.ISLAND

PAVEMENT REMOVAL

NOTE:
SHEET SHEET 28-9 FOR INTERSECTION AND ROUNDABOUT DETAILS

FOR -L- PROFILE SEE SHEETS 31,32 & 33
FOR -Y2- PROFILE SEE SHEET 52
FOR -Y2RPA- PROFILE SEE SHEET 53
FOR -Y2RPB- PROFILE SEE SHEET 54
FOR -Y2RPC- PROFILE SEE SHEET 55
FOR -Y2RPD- PROFILE SEE SHEET 56
FOR -Y2RAB- PROFILE SEE SHEET 89
FOR -Y2RAD- PROFILE SEE SHEET 89
FOR -Y2RAB3- PROFILE SEE SHEET 89
FOR -SR8- PROFILE SEE SHEETS 75 & 76
FOR -SR2- PROFILE SEE SHEET 77
FOR -SR5- PROFILE SEE SHEET 82
FOR -SR7- PROFILE SEE SHEETS 85 & 86
FOR -SR8- PROFILE SEE SHEET 85
SEE SHEETS 3A-1TO 3A-3 FOR CURVE DATA

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: -Y2- (GRANTHAM RDJ / -L-

TIP NO.:	COUNTY:
U-5713/R-5777 A&B	CRAVEN
DESIGNED BY: NP	DATE: 08/10/20
CHECKED BY: JAF	DATE: 08/10/20

8/4/2020
R:\Roadway\Proj\PSHU\U-5713-R-5777_rdy_pshl14.dgn
T.Freeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	15

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

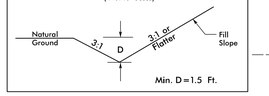
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

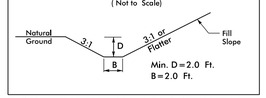
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 15-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 22+75 TO STA. 30+40 -SR2- LT

DETAIL 15-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 16+25 TO STA. 19+40 -SR5- RT

NAD 83/NA 2011

-Y2RPA- STA 12+50 MATCHLINE -SR2- STA 22+75
SEE SHEET 14

-L- STA 387+00 MATCHLINE -L- STA 400+00
SEE SHEET 16

-Y2RPD- STA 16+75 MATCHLINE -SR5- STA 16+25
SEE SHEET 15

-SR2- STA 36+00 MATCHLINE -SR5- STA 29+00

-Y2RPA- POT Sta. 9+37.12 = -L- POT Sta. 389+50.00, 47.00' LT
Δ = 04° 00' 00"
PT Sta. 27+17.06

PRC Sta. 23+74.25
PC Sta. 10+96.92

-Y2RPD- PC Sta. 10+00.00 = -L- POT Sta. 393+61.07, 47.00' RT

PRC Sta. 14+51.44
PRC Sta. 18+28.84
PT Sta. 19+91.74

N 25° 33' 47.1" W
S 21° 33' 47.1" E

US 70 EB
US 70 WB

TYPE-T BARRIER
TRANS. BARRIER

CL B RIP RAP EST. 2 TONS EST. 7 SY GF
CL I RIP RAP EST. 48 TONS EST. 89 SY GF
SPEC. LAT. 'V' DITCH SEE DETAIL 15-1
SPEC. LAT. 2' BASE DITCH SEE DETAIL 15-2
FILL TO BACK OF CURB
PROP. GRAVEL DRIVE (TYP.)
PROP. ASPHALT DRIVE (TYP.)
FLOWABLE FILL
GRADE TO DRAIN
RETAIN

138 TAURINO P SANTOS DB 3465 PG 726 MB 5 PG 3

139 DALE M STROUD LINDA A STROUD DB 2025 PG 1009 MB 5 PG 3

140 JOSEPH D JONES DELLA M JONES DB 533 PG 517 MB 5 PG 3

141 GENMAN PROPERTY MANAGEMENT, LLC DB 3575 PG 1879

143 GS CELINSKI GENERAL CONTRACTORS, INC DB 2677 PG 129

144 GS CELINSKI GENERAL CONTRACTORS, INC DB 1131 PG 491

145 GEORGE S CELINSKI JOANNE R CELINSKI DB 1131 PG 484

146 GS CELINSKI GENERAL CONTRACTORS, INC DB 2574 PG 273

147 JAMES L CAYTON, JR DB 2977 PG 836

149 JAMES L CAYTON, JR DB 2977 PG 836

150 DEICHMANN & DEICHMANN, LLC DB 3276 PG 697 PC "I" PG 47-F

151 GEORGE L DEICHMANN, III DB 1039 PG 426

225 JAMES L CAYTON, JR DB 3454 PG 837 MB 7 PG 34

226 CROSSROADS BAPTIST CHURCH OF NEW BERN, NORTH CAROLINA DB 1744 PG 1045 MB 7 PG 34

228 CROSSROADS BAPTIS CHURCH OF NEW BERN, NORTH CAROLINA DB 1812 PG 721 MB 7 PG 34

MAGNOLIA INVESTORS, LLC VM&J, LLC DB 2886 PG 332 MB 7 PG 34

229 FUN PROPERTIES, LLC DB 1898 PG 629 MB 7 PG 34

FOR -L- PROFILE SEE SHEETS 33 & 34
FOR -Y2RPA- PROFILE SEE SHEET 53
FOR -Y2RPD- PROFILE SEE SHEET 56
FOR -SR2- PROFILE SEE SHEETS 77 & 78
FOR -SR5- PROFILE SEE SHEET 82
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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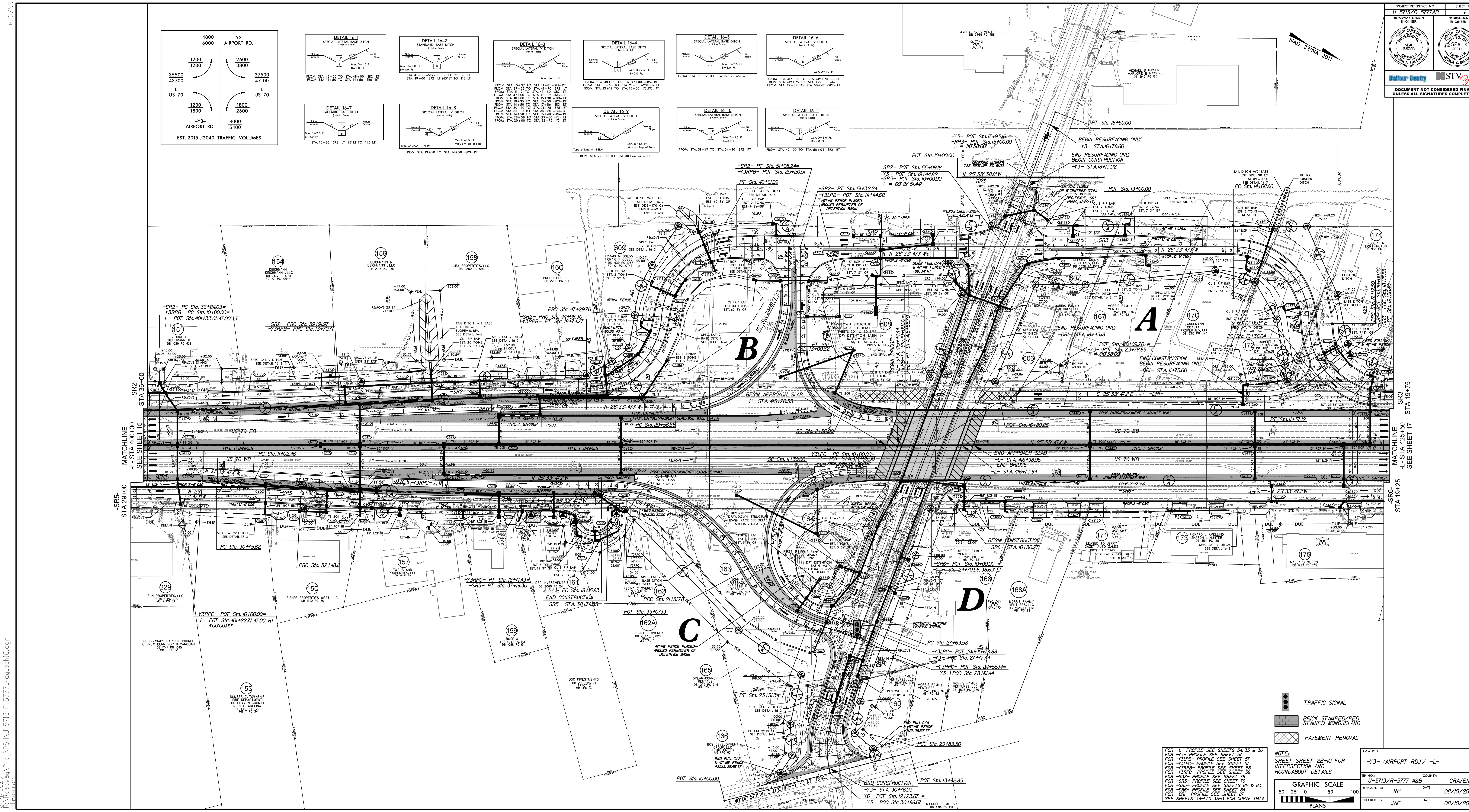
Submitted 9/16/2020



Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	17

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

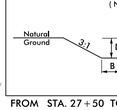
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

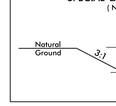
NAD 83/NA 2011

DETAIL 17–1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



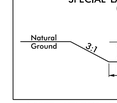
FROM STA. 27+50 TO STA. 31+00 –SR3– LT

DETAIL 17–2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



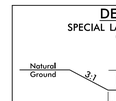
FROM STA. 20+60 TO STA. 24+70 –SR3– LT
FROM STA. 26+00 TO STA. 26+29 –SR6– RT

DETAIL 17–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)



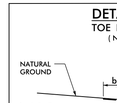
FROM STA. 24+70 TO STA. 27+50 –SR3– LT

DETAIL 17–4
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 19+75 TO STA. 20+10 –SR3– LT

DETAIL 17–5
TOE PROTECTION
(Not to Scale)



FROM STA. 26+50 TO STA. 28+05 –SR6– RT

-SR3- STA 19+75

MATCHLINE -L- STA 425+50 SEE SHEET 16

-SR3- STA 31+00

-Y4RPB- STA 17+40

MATCHLINE -L- STA 437+00 SEE SHEET 18

-SR6- STA 19+25

-Y4RPC- STA 15+00

-SR6- STA 30+00

-Y4RPB- POT Sta. 10+00.00
-L- POC Sta. 429+63.48, 47.00' LT

PC Sta. 24+17.77

PT Sta. 28+69.51

-Y4RPC- POT Sta. 9+23.90 =
-L- POC Sta. 431+13.34, 47.00' RT
△ = 03°42'23.66"

PC Sta. 22+42.59

PCC Sta. 26+96.96

TS Sta. 427+59.18

SC Sta. 429+69.18

TS Sta. 10+94.28

SC Sta. 12+94.28

TS Sta. 10+14.45

SC Sta. 11+44.45

CS Sta. 12+33.08

ST Sta. 13+63.08

176 AUTOZONE DEVELOPMENT, LLC DB 3433 PG 449 PC "D" PG 646

178 MALLARD OIL CO DB 986 PG 844

180 MICHELLE D FOYE, BEVERLY E FOYE, CHRISTEL R FOYE, GRETA S FOYE DB 1741PG 381

182 WELDON JEROME KING DB 739 PG 142

179 TRENT DEVELOPMENT GROUP DB 2556 PG 769

181 WILLIAM A FORBES, JR, KATHERIN F TEEL, DONA MAE F LOWICK DB 1551PG 29

183 ARNOLD L BANKS, JR, DARELL BANKS DB 3136 PG 703

184 R ALLEN GASKINS, REBECCA D GASKINS DB 1603 PG 861

185 JONATHAN B FULCHER DB 3318 PG 642

186 WILLIAM A FOSKEY DB N/F PG N/F

187 JONATHAN B FULCHER DB 3196 PG 843

189 JONATHAN B FULCHER DB 2145 PG 478 PC "B" PG 273 MB 1PG 95

175 MALLARD OIL CO DB 1493 PG 573

230 MICHAEL T HERRIMAN DB 2270 PG 321

231 MIKE AND BELLA, LLC DB 1513 PG 809 PC "H" PG 7-H

232 MIKE AND BELLA, LLC DB 1513 PG 809 PC "H" PG 7-H

233 CAR MANAGEMENT, LLC DB 2989 PG 366 PC "C" PG 99-C

188 LYLE V BOYETTE DB 1735 PG 1 / LYLE V BOYETTE DB 1127 PG 635

190 TRITON DEVELOPMENT, LLC DB 2153 PG 133 MB 1PG 99

COIR FIBER MATTING TOE PROTECTION SEE DETAIL 17–5

FOR -L- PROFILE SEE SHEET 36
FOR -Y4RPB- PROFILE SEE SHEET 62
FOR -Y4RPC- PROFILE SEE SHEET 62
FOR -SR3- PROFILE SEE SHEET 79
FOR -SR6- PROFILE SEE SHEET 84
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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17-60700

Submitted 9/16/2020

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	1B

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 033599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 39371 ENGINEER JOSHUA C. DARLING

Ballow Beatty | STV 100

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

15000 / 19000 –Y4– WILLIAMS RD.

6300 / 7400 | 7100 / 9600

37700 / 47400 –L– US 70 | 42300 / 57500 –L– US 70

1400 / 1400 | 5200 / 9300

–Y4– WILLIAMS RD. 8200 / 12700

EST. 2015 /2040 TRAFFIC VOLUMES

A

B

C

D

BEGIN CONSTRUCTION –Y4– STA.16+55.00

POT Sta. 10+00.00

PI Sta. 19+22.68

N 25° 27' 29.2" W –RR4–

PC Sta. 16+00.00

POT Sta. 13+00.00

–Y4– POT Sta.16+23.59 = –RR4– POT Sta.15+00.00 = 95°24'17"

PT Sta. 17+23.58

–SR3– POT Sta. 38+93.50 = –Y4– POT Sta.19+67.59 = 83°08'51.9"E

–SR4A– POT Sta. 10+00.00 = –Y4– POT Sta.19+72.56 = 69°45'41.22"

N 87°08'49.3" E

–SR4B– POT Sta.10+00.00 = –SR4A– POT Sta.15+37.27

N 12°35'44.2" E PC Sta. 10+58.50 PT Sta. 11+36.20

POT Sta. 17+05.06

END CONSTRUCTION –SR4A– STA. 15+87.18

N 23°17'17.9" W

–SR4B– POT Sta. 12+24.41 = –SR4C– POT Sta. 11+20.43

N 74°10'48.5" E

N 15°49'11.5" W

PC Sta. 13+56.53

PT Sta. 14+90.31

PC Sta. 17+21.32

PT Sta. 19+06.60

PT Sta. 21+53.88

PCC Sta. 21+04.30

END CONSTRUCTION –SR4C– STA. 20+83.45

PC Sta. 19+83.45

N 17°05'52.4" W

S 17°05'52.4" E

SC Sta. 14+03.36

CS Sta. 12+53.38

SC Sta. 11+88.43

S 22° 01' 25.3" E

PT Sta. 18+12.44

PC Sta. 823+68.68 = PC Sta. 45+16.59 US 70 EB

S 17°05'52.4" E

N 24°40'50.3" W

PT Sta. 15+18.48

PC Sta. 16+41.42

SC Sta. 14+13.68

POT Sta. 10+00.35 –Y4PA– POT Sta. 0+40.00 = 03°49'24.06" –L– POC Sta. 458+73.27, 41.00' LT

POT Sta. 23+37.27

BEGIN CONSTRUCTION –SR3– STA.9+72.13

END CONSTRUCTION –Y7– STA.16+26.05

POT Sta. 16+64.59

BEGIN CONSTRUCTION –Y7– STA.11+06.99

POT Sta. 10+00.00

–Y7– POT Sta. 12+62.60 = –Y4– POT Sta. 27+57.70

N 18°36'04.2" W

CHERRY POINT ROAD

PT Sta. 23+65.68

PC Sta. 21+41.10

PT Sta. 20+29.99

PC Sta. 20+13.43

PT Sta. 22+21.68

PC Sta. 23+16.85

POT Sta. 24+10.00

PT Sta. 24+88.48

PC Sta. 23+16.85 BEGIN CONSTRUCTION –Y4RRA– STA. 44+91.00

END APPROACH SLAB –L– STA. 44+51.00

S 31°25'04.2" W

END BRIDGE/ EXISTING R/W REF. –L– STA. 44+91.00

PT Sta. 24+18.43

PC Sta. 24+18.43

PT Sta. 24+88.43

S 16°49'11.5" E

S 16°49'11.5" E

PT Sta. 24+47.10

PT Sta. 28+17.50

S 64°01'39.5" E

PC Sta. 27+08.23

POT Sta. 23+44.87

N 10°30'35.2" E

PC Sta. 21+38.35

POT Sta. 23+57.70 = 76°36'15"

–L– POT Sta. 443+08.96 = –Y4– POT Sta. 23+57.70

PT Sta. 20+31.24

CS Sta. 437+45.68

BEGIN APPROACH SLAB –L– STA. 442+42.11

BEGIN BRIDGE –L– STA. 442+66.25

END CONSTRUCTION –SR6– STA. 31+62.37

PRC Sta. 33+56.50

PRC Sta. 31+85.23

–SR3– STA. 31+40.00 –L– STA. 437+00 SEE SHEET 17

–Y4RPB– STA. 17+40.00 –L– STA. 437+00 SEE SHEET 17

–SR6– STA. 30+00.00

–Y4RPC– STA. 15+00 –L– STA. 439+55.60

–Y4RPA– STA. 0+00.00 –L– STA. 439+55.60

–Y4RPD– STA. 0+00.00 –L– STA. 458+73.27

–Y4RPE– STA. 0+00.00 –L– STA. 458+73.27

–Y4RPF– STA. 0+00.00 –L– STA. 458+73.27

–SR5– STA. 13+70 SEE SHEET 19

–SR5– STA. 17+75

–Y4RPDL– STA. 0+00.00 –L– STA. 459+00

–SR5– STA. 14+13.68

DETAIL 18-1 SPECIAL LATERAL 'V' DITCH (Not to Scale)
FROM STA. 37+00 TO STA. 37+24 –Y4– RT
FROM STA. 30+50 TO STA. 31+38 –Y4RPC– RT
FROM STA. 31+56 TO STA. 32+00 –Y4– RT
FROM STA. 33+56 TO STA. 34+00 –Y4– RT
FROM STA. 20+41 TO STA. 21+44 –Y4– RT
FROM STA. 22+10 TO STA. 23+30 –Y4RPB– LT
FROM STA. 21+60 TO STA. 23+15 –Y4RPD– LT
FROM STA. 14+46 TO STA. 16+89 –SR10– RT

DETAIL 18-2 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 15+25 TO STA. 16+00 –Y4RPC– RT

DETAIL 18-3 LATERAL BASE DITCH (Not to Scale)
FROM STA. 16+00 TO STA. 19+20 –Y4RPC– RT

DETAIL 18-4 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 16+40 TO STA. 19+30 –Y4– LT

DETAIL 18-5 STANDARD DITCH (Not to Scale)
STA. 38+25 –SR3– LT (170 LT TO 310' LT)

DETAIL 18-6 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 23+00 TO STA. 26+60 –SR3– RT
FROM STA. 10+47 TO STA. 11+16 –Y4RPA– RT

DETAIL 18-7 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 23+50 TO STA. 26+60 –Y4RPD– LT

DETAIL 18-8 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 31+00 TO STA. 33+00 –SR3– LT

DETAIL 18-9 SPECIAL LATERAL 'V' DITCH (Not to Scale)
FROM STA. 26+60 TO STA. 27+50 –Y4RPD– LT

DETAIL 18-10 SPECIAL LATERAL BASE DITCH (Not to Scale)
FROM STA. 16+89 TO STA. 17+72 –SR10– RT

DETAIL 18-11 SPECIAL LATERAL 'V' DITCH (Not to Scale)
FROM STA. 27+00 TO STA. 27+34 –Y4– RT

TRAFFIC SIGNAL

BRICK STAMPED/RED STAINED MONO.ISLAND

PAVEMENT REMOVAL

NOTE:
SHEET SHEET 2B-II FOR INTERSECTION AND ROUNDABOUT DETAILS

FOR –L– PROFILE SEE SHEETS 36,37 & 38
FOR –Y4– PROFILE SEE SHEET 60
FOR –Y4RPA– PROFILE SEE SHEET 61
FOR –Y4RPB– PROFILE SEE SHEET 62
FOR –Y4RPC– PROFILE SEE SHEET 65
FOR –Y4RPD– PROFILE SEE SHEET 63
FOR –Y4RAB– PROFILE SEE SHEET 89
FOR –Y4RAB2– PROFILE SEE SHEET 89
FOR –Y4RAB3– PROFILE SEE SHEET 89
FOR –SR3– PROFILE SEE SHEETS 79 & 80
FOR –SR4A– PROFILE SEE SHEET 80
FOR –SR4B– PROFILE SEE SHEET 81
FOR –SR4C– PROFILE SEE SHEET 81
FOR –SR6– PROFILE SEE SHEET 84
FOR –SR9– PROFILE SEE SHEET 88
SEE SHEETS 3A-1TO 3A-3 FOR CURVE DATA

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION: –Y4– (WILLIAMS RDJ / –L–

TIP NO.	COUNTY:
U-5713/R-5777 A&B	CRAVEN
DESIGNED BY: NP	DATE: 08/10/20
CHECKED BY: JAF	DATE: 08/10/20

8/14/2020
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jfreeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	19

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

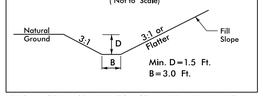
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

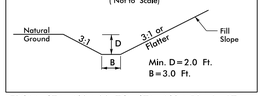
DETAIL 19–1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=1.5 Ft.
B=3.0 Ft.

FROM STA. 463+50 TO STA. 470+50 –L– LT

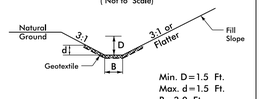
DETAIL 19–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
B=3.0 Ft.

FROM STA. 460+00 TO STA. 463+50 –L– LT

DETAIL 19–3
SPECIAL LATERAL BASE DITCH
(Not to Scale)

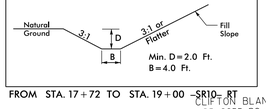


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=3.0 Ft.

Type of Liner= Class B Rip-Rap

FROM STA. 458+45 TO STA. 460+00 –L– LT

DETAIL 19–4
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
B=4.0 Ft.

FROM STA. 17+72 TO STA. 19+00 –SR10– RT

DETAIL 19–5
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D=1.0 Ft.

FROM STA. 27+23 TO STA. 29+23 –SR10– RT

-Y4RPD- MATCHLINE STA -L- STA 459+00 SEE SHEET 18
-SR10- STA 17+75 13+70

-RPB55- MATCHLINE STA -L- STA 471+00 SEE SHEET 20
-SR10- STA 29+75 10+55

-LLT2- POT Sta. 470+52.59 = -L- POT Sta. 470+52.59, 11.00' LT

-RPB55- ST Sta. 10+00.00 = -L- POT Sta. 470+44.57, 47.00' LT

-Y4RPD- POT Sta. 10+00.00 = -L- POC Sta. 462+63.55, 47.00' RT
△ = 00°00'00.00"

-LRT2- ST Sta. 470+52.59 = -L- POT Sta. 470+52.59, 11.00' RT

-RPB55- POT Sta. 10+52.05, 58.71'

CS Sta. 464+73.43

CS Sta. 13+13.68

SC Sta. 11+00.00

CT Sta. 22+85.92

PT Sta. 24+85.11

ST Sta. 467+48.43

POT Sta. 15+00.00

CONTRACTOR TO REMOVE EXISTING PEDESTRIAN BRIDGE

CONTRACTOR TO REMOVE EXISTING TRACK WITHIN RIGHT OF WAY

PAVEMENT REMOVAL

FOR -L- PROFILE SEE SHEETS 38 & 39
FOR -LLT2- PROFILE SEE SHEET 40
FOR -LRT2- PROFILE SEE SHEET 40
FOR -RPB55- PROFILE SEE SHEET 41
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

JOSEPH A BIZZELL
LILLIE B BIZZELL
PATRICIA D BIZZELL
DB 2037 PG 297

JAMES VAIL
DB N/F PG N/F

HENRY L HENDERSON
EMMA HENDERSON
DB 657 PG 60

WAYNE ARTIS
DB 2765 PG 539
MB 153 PG 175

PILGRAM CHAPEL MISSIONARY BAPTIST CHURCH
DB 618 PG 27
MB 153 PG 175

CLYDE B LEE, JR
DB 732 PG 641
MB 153 PG 175

ROBERT SPIVEY
DB 359 PG 82
MB 153 PG 175

CLIFTON BLANCO, III
DB 2655 PG 728
MB 153 PG 175

MARY BRYANT
GEORGE BRYANT
DB 712 PG 390
MB 153 PG 175

HARRY J THOMPSON
DB 1022 PG 439
MB 153 PG 175

WILLA G BOND
DB 1330 PG 702
MB 153 PG 175

JONES CHAPEL AME ZION CHURCH
DB 1363 PG 223

ADDIE GODETTE
DB 968 PG 864
MB 153 PG 175

WILLIAM H MOORE
GATSIE MOORE
DB 209 PG 72
MB 153 PG 175

ROSA W BELL
DB 109 PG 312
MB 153 PG 175

GEORGE S GODETTE, JR
ADDIE J GODETTE
DB 541 PG 260
MB 153 PG 175

AGNES V BIZZELL-COLDEN
DB 1821 PG 279
MB 153 PG 175

HAGER-JONES
HARRIETT JONES
HARRIETT ODEN
ELIZABETH JONES ET AL
SUSAN GIBBS
HENRY ODEN
RONELLA ODEN
OWEN A ODEN
DB 1494 PG 192
MB 153 PG 175

RORI GEORGE
DB 3438 PG 14
MB 153 PG 175

ALEATHA B FORBES
THOMAS J SMART
MELVIN SMART
DB 1038 PG 231
MB 153 PG 175

ALEATHA B FORBES
DB 1083 PG 890
MB 153 PG 175

CLEO FOY
DB 541 PG 89
MB 153 PG 175

RODNEY C ALLEN
DB 3491 PG 1819
MB 153 PG 175

ERNEST L SPEARS, JR
ARTHUR L SMART, JR
DB 1847 PG 327
MB 152 PG 172

HILBERT CROSSING PLAZA, LLC
DB 2892 PG 920

MJM PROPERTIES OF EASTERN NORTH CAROLINA
DB 2523 PG 666
PC "H" PG 147-D

DIXIE CHEMICAL CORPORATION
DB 338 PG 346
MB 1 PG 47

GARY CABRERA
DB N/PG 398
MB 1 PG 47

CAROLINA SERVICES
DB 714 PG 626

CAROLINA SERVICES
DB 645 PG 558
MB 2 PG 10

MJM PROPERTIES OF EASTERN NORTH CAROLINA
DB 2523 PG 666
PC "H" PG 147-D

DIXIE CHEMICAL CORPORATION
DB 1099 PG 556
MB 9 PG 36

8/14/2020
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kfreeman

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	20

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

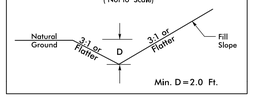
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

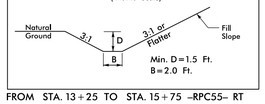
NAD 83/NA 2011

DETAIL 20–1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



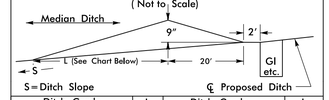
FROM STA. 12+55 TO STA. 14+05 –RPB55– LT
FROM STA. 10+75 TO STA. 13+25 –RPC55– RT

DETAIL 20–2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



FROM STA. 13+25 TO STA. 15+75 –RPC55– RT

DETAIL 20–3
FALSE SUMP
(Not to Scale)



S = Ditch Slope ℄ Proposed Ditch

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'

STA. 479+80 –L– MED

PI Sta. 11+26.39

CONTRACTOR TO REMOVE EXISTING TRACK (WITHIN USTO ROW)

POT Sta. 10+00.00

N 70° 04' 22.0" E

47" WW FENCE

SPEC. LAT. 'V' DITCH SEE DETAIL 20–1

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

SC Sta. 12+00.00

50' INC. TYP.

24" RCP–IV

CL B RIP RAP EST. 2 TONS EST. 7 SY GF

15" W/ 2 ELBOWS

CS Sta. 15+87.47

END FENCE, +99.85, 163.45 LT

EARL W MOORE MAMIE H MOORE DB 850 PG 777 MB 142 PG 395

LINDA C MIDGETT DB 1156 PG 667 MB 142 PG 395

B JOYNER DB 409 PG 421 MB 142 PG 395

HAROLD SPELLMAN DB N/F PG N/F

NCDOT DB 820 PG 201

SHIRLEY S SMART DB 2542 PG 594 MB 142 PG 395

BM#3 BL STATION 269+59.00 59' LEFT ELEV.=76.89 BENCHTIE NAIL SET IN 6" SILK

ST Sta. 17+87.47

TS Sta. 18+04.96

SC Sta. 20+04.96

CL B RIP RAP EST. 2 TONS EST. 7 SY GF

PT Sta. 21+35.37

RETAIN

END CONSTRUCTION –RPB55– STA. 20+60.00

END CONSTRUCTION TIP PROJECT U-5713/R-5777 A&B
–L– STA. 480+55.30 =
–LLT2– STA. 480+60.00 =
–LRT2– STA. 480+50.00

–LLT2– POT Sta. 482+80.84 =
–L– POT Sta. 482+76.44, 34.00' LT

N 50° 41' 01.2" W

CS Sta. 478+91.39

ST Sta. 480+91.39

40' INC. TYP.

US 70 EB

N 26° 22' 33.3" W

POT Sta. 484+31.47

–LLT2– PC Sta. 10+00.00 =
–L– POC Sta. 472+74.08, 49.35' RT

–L– POT Sta. 471+01.08 =
–RR– POT Sta. 12+28.88
△ = 106°21'31"

–RPB55– MATCHLINE STA 10+55 –L– STA 471+00 SEE SHEET 19

–RPC55– MATCHLINE STA 29+75 –SR10– SEE SHEET 19

–SR10– PC Sta. 30+86.82

SC Sta. 472+72.59

PROP GRAVEL DRIVE (TYP.)

PCC Sta. 31+36.58

PT Sta. 32+02.88

POT Sta. 32+22.24

SPEC. LAT. 'V' DITCH SEE DETAIL 20–1

JAMES CITY COMMUNITY ORGANIZATION, INC DB 7515 PG 420 MB 1PG 47

ANNIE E FOY DB 1078 PG 257 MB 1PG 47

KENNETH WALSTON LOUISE WALSTON DB 803 PG 155 MB 1PG 47

SHILOH MISSIONARY BAPTIST CHURCH DB 1444 PG 527 MB 1PG 47

NCDOT DB 1476 PG 362

INDIA H BLANGO FOY DB 810 PG 128 MB 1PG 47

WHITECO OUTDOOR ADVERTISING DB 1663 PG 511

SPEC. LAT. 2' BASE DITCH SEE DETAIL 20–2

+85.51 EX. R/W

+30.05 EX. ROW

+81.63 EX. R/W

+24.21 EX. R/W

+90.34 EX. R/W

END RESURFACING ONLY –SR10– PT STA. 32+00.00

TIDEWATER MARINE COMPANY, INC DB 2031 PG 989 PC "G" SLIDE 164-E

ST Sta. 473+84.16

TS Sta. 473+84.16

SC Sta. 474+91.68

CS Sta. 477+37.15

ST Sta. 480+12.15

CS Sta. 477+09.33

ST Sta. 479+29.33

–LRT2– POT Sta. 482+71.85 =
–L– POT Sta. 482+76.44, 34.00' RT

TRENCHLESS INSTALLATION 36" WELDED STEEL

FLOWABLE FILL

TIE TO EXISTING GUARDRAIL

END CONSTRUCTION –RPC55– STA. 19+00.00

CS Sta. 18+02.84

END FENCE, +00.00, 59.49' RT

ST Sta. 19+52.84

N 17° 24' 57.8" E

POT Sta. 21+13.51

FOR –LLT2– PROFILE SEE SHEET 40
FOR –LRT2– PROFILE SEE SHEET 40
FOR –RPB55– PROFILE SEE SHEET 41
FOR –RPC55– PROFILE SEE SHEET 41
SEE SHEETS 3A-1 TO 3A-3 FOR CURVE DATA

8/14/2020
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rtaylor

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	21

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

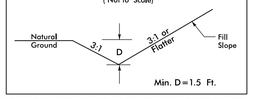
Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

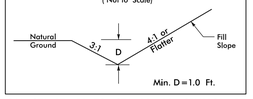
NAD 83/NA 2011

DETAIL 21-1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



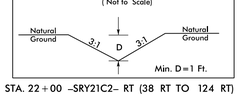
FROM STA. 15+50 TO STA. 21+00 -SRY21C2- LT

DETAIL 21-2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



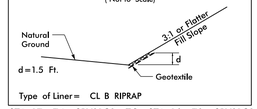
FROM STA. 17+50 TO STA. 22+00 -SRY21C2- RT

DETAIL 21-3
STANDARD 'V' DITCH
(Not to Scale)



STA. 22+00 -SRY21C2- RT (38 RT TO 124 RT)

DETAIL 21-4
TOE PROTECTION
(Not to Scale)



Type of Liner= CL B RIPRAP

FROM STA. 17+74 -SRY21C2- TO STA. 16+73 -SRY21C2- RT

MATCHLINE -SRY21C2- STA 13+00 SEE SHEET 6

PC Sta. 17+32.77

PRC Sta. 21+09.59

POT Sta. 24+18.13

PT Sta. 23+01.79

END CONSTRUCTION -SRY21C2- STA. 22+41.60

N 81° 04' 34.7" E

N. 84° 48' 50.8" E

DAY STAR LANE -SRY21C2-

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-1

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-2

SPEC. LATERAL 'V' DITCH SEE DETAIL 21-1

TOE PROTECTION ON FILL SLOPE ONLY EST. 54 TONS CL B RIPRAP EST. 256 SY GEOTEXTILE SEE DETAIL 21-4

STANDARD CUT 'V' DITCH EST. DDE=10 CY SLOPE=0.11% SEE DETAIL 21-3

CL B RIPRAP EST. 2 TONS EST. 7 SY GF

PROP. 2'-6" C&G 24" RCP-IV 2102 CB 24" RCP-IV 2103 CB

PROP. 2'-6" C&G

PROP. GRAVEL DRIVE (TYP.)

PROP. CONCRETE DRIVE (TYP.)

18" RCP-III

15" RCP-IV

15" RCP-III

24" RCP-III

+30.00 29.87' & 65.00'

+30.00 45.00'

+51.00 62.00'

+70.00 30.00' & 47.00'

+73.00 29.41' & 50.00'

+42.00 29.38' & 50.00'

+52.36 23.72'

+04.74 EX. RW

+50.72 51.56' LT

+05.45 14.00' LT RETAIN

+98.37 14.00' RT

+97.94 EX. RW

+92.96 EX. RW

+32.28 54.69' RT

BY7-69

BY7-70

MDCB

REMOVE

11 DB 2149 PG 469 BRICE'S CREEK BIBLE CHURCH

10 MB 6 PG 100 DB 3381PG 840 ADVANTAGE MACHINERY SERVICES, INC

211 MB 6 PG 100 DB 2149 PG 469 GARY GARERA

212 MB 6 PG 100 DB 1944 PG 422 GARY GARERA

213 MB 6 PG 100 DB 1745 PG 580 CAREY L. & SHELBY R. WILLIS

214 MB 6 PG 100 DB 1838 PG 209 DONNIE G. & PAMELIA P FESPERMAN

215 MB 6 PG 100 DB 817 PG 732 SYLVIA HEATH

DB 2205 PG 1 THEODORE R. CAMPBELL & VERA KAY CAMPBELL

DB 1740 PG 590 RONALD ALAN YOUNG

DB 2700 PG 330 RIVERDALE METHODIST CHURCH

DB 0613 PG 226 ROBERT G. & PHYILLIS H. WILLIAMS

MB 6 PG 100 DB 313 PG 730 JOHN HENRY WILLIAMS, JR.

MB 6 PG 100 DB 313 PG 730 JOHN HENR WILLIAMS, JR.

BM#18 BL STATION 28+87.00 ELEV. 305.28 BENCHTIE NAIL SET IN 14" MAPLE

FOR -SRY21C2- PROFILE SEE SHEET 7O SEE SHEETS 3A-1TO 3A-3 FOR CURVE DATA

8/14/2020
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Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	22

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

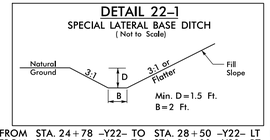
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

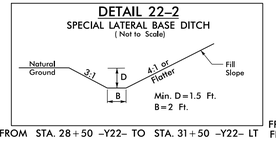
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 22-1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



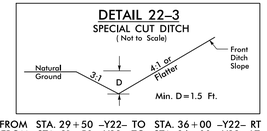
FROM STA. 24+78 -Y22- TO STA. 28+50 -Y22- LT
FROM STA. 24+78 -Y22- TO STA. 26+00 -Y22- RT

DETAIL 22-2
SPECIAL LATERAL BASE DITCH
(Not to Scale)



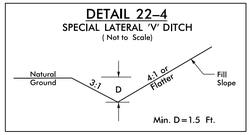
FROM STA. 28+50 -Y22- TO STA. 31+50 -Y22- LT

DETAIL 22-3
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 29+50 -Y22- TO STA. 36+00 -Y22- RT
FROM STA. 31+50 -Y22- TO STA. 36+00 -Y22- LT

DETAIL 22-4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 24+50 -Y22- TO STA. 24+78 -Y22- RT
FROM STA. 26+00 -Y22- TO STA. 29+50 -Y22- RT

NAD 83/NA 2011

MB 4 PG 108
DB 2629 PG 672
DON E LEE, III
SUSAN P LEE

83

MATCHLINE -Y22- STA 24+50 SEE SHEET 11

81

SUSAN PARKER LEE, LLC
DB 2200 PG 323

PRC Sta. 28+15.57

PT Sta. 30+26.28

216

TAMMY EUBANKS QUIDLEY
DB 1597 PG 946

TAMMY EUBANKS QUIDLEY
DB 1700 PG 590

PCC Sta. 37+15.95

SPEC. LATERAL 2' BASE DITCH SEE DETAIL 22-1

SPEC. LATERAL 2' BASE DITCH SEE DETAIL 22-2

SPEC. CUT 'V' DITCH SEE DETAIL 22-3

SPEC. LATERAL 'V' DITCH SEE DETAIL 22-4

SPEC. CUT 2' BASE DITCH SEE DETAIL 22-1

+33.73 EX. R/W

+61.00 70.00' LT

+43.34 EX. R/W

+65.00 59.00'

24" RCP-III

24" RCP-IV

30" RCP-III

36" RCP-IV

+52.00 61.00'

+75.00 71.00'

+07.42 52.43'

+89.37 EX. R/W

+08.79 EX. R/W

+51.65 66.15' LT

+11.20 147.02' RT

-Y22- N 47° 18' 33.9" E

TABERNA WAY

PROP. GRAVEL DRIVE (TYP.)

30' INC. TYP.

75' TAPER LT&RT

40' TAPER LT&RT

REMOVE

RETAIN

END CONSTRUCTION -Y22- STA. 36+39.10

R 300

HY2-48

BY2-49

BY2-50

217

ROYSTON D BLANDFORD III & ANGELA F
PC 'C' PG 119-F
DB 2602 PG 119

620

EARL TEMPLE, III
MITZI TEMPLE
DB 1999 PG 624

74

PC 'C' PG 30-G
DB 2739 PG 265
LILAND LLC

218

ROYSTON D BLANDFORD III & ANGELA F
PC 'C' PG 30-G
DB 2602 PG 119

ROYSTON D BLANDFORD III & ANGELA F
DB 2602 PG 119

ROBERT P POWELL
PHYLLIS A POWELL
DB 868 PG 374

RM#8
BL STATION 36+52.00
36.15' RT
ELEV. 929.87
BENCHTIE NAIL SET IN 22" PINE

FOR -Y22- PROFILE SEE SHEET 47
SEE SHEETS 3A-1TO 3A-3 FOR CURVE DATA

8/14/2020
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Submitted 9/16/2020

–L– LEFT

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	23A

ROADWAY DESIGN ENGINEER

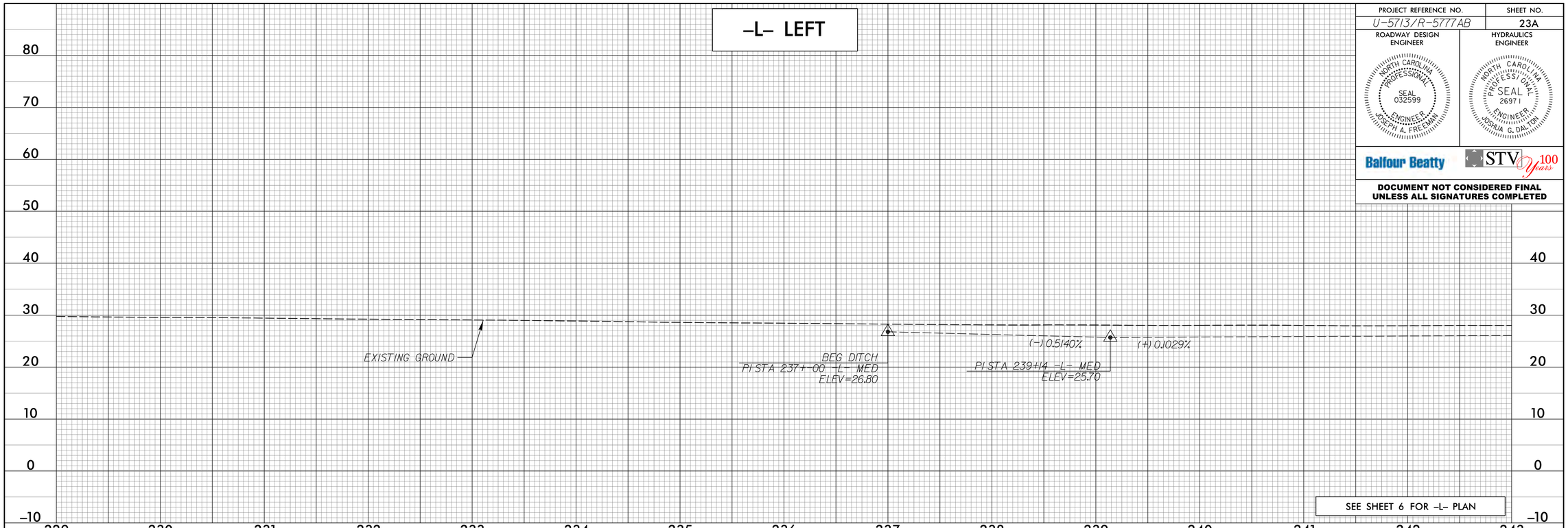
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

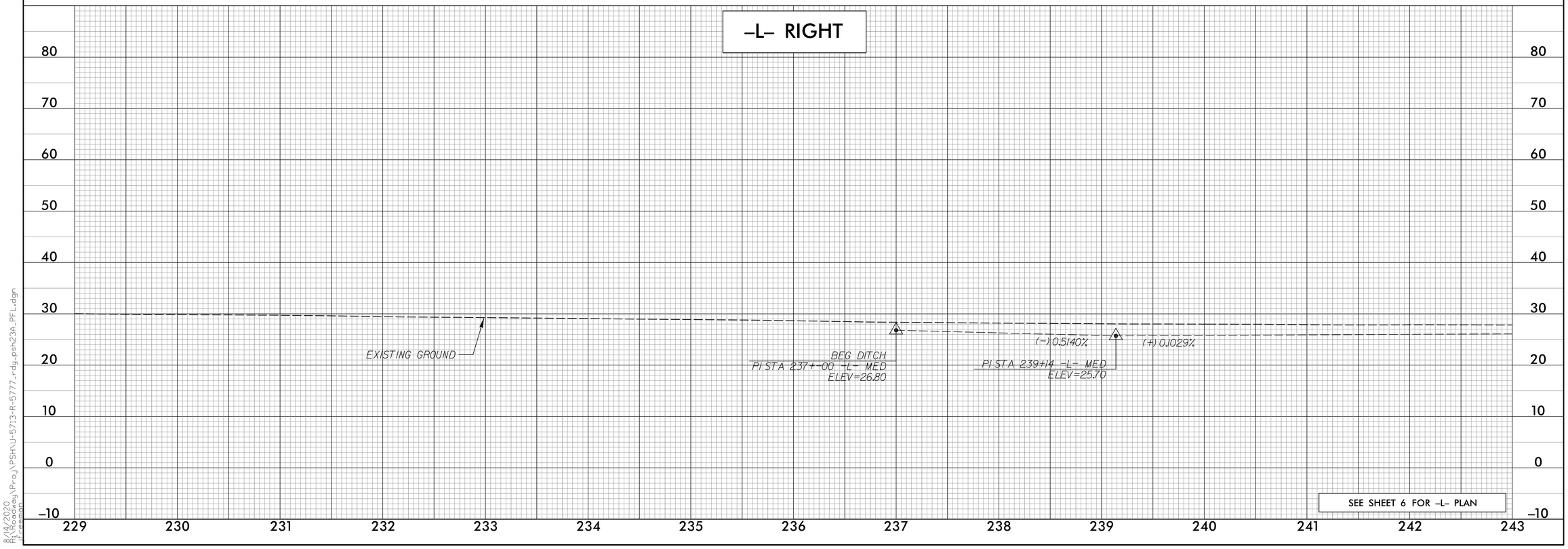
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



–L– RIGHT



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ltrenfro

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	23B

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

BEGIN GRADE
–L– (LEFT) STA. 245+00.00
ELEV = 27.71'

PI = 245+90.00
EL = 28.12'
VC = 180'
K = 239
DS = 71 MPH

PI = 247+70.00
EL = 27.58'
VC = 180'
K = 286
DS > 80 MPH

PI = 249+80.00
EL = 28.27'
VC = 240'
K = 368
DS = 79 MPH

PI = 252+00.00
EL = 27.56'
VC = 200'
K = 321
DS > 80 MPH

PI = 254+30.00
EL = 28.25'
VC = 260'
K = 427
DS > 80 MPH

PROPOSED GRADE

(+) 0.1029%
(+)0.4530%
(–)0.3000%
(–)0.3000%
(+)0.3286%
(+)0.3286%
(–)0.3227%
(–) 0.5000%
(–)0.3227%
(–) 1.0000%
(+)0.3000%
(–) 5.6000%
(+)0.3000%
(–)0.3094%
(–) 0.1025%

END DITCH
PI STA 244+00 –L– MED
ELEV=26.20

EXISTING GROUND

BEG DITCH
PI STA 250+00 –L– LT
ELEV=24.90

PI STA 251+00 –L– LT
ELEV=24.40

PI STA 252+50 –L– LT
ELEV=22.90

PI STA 253+00 –L– LT
ELEV=20.10

SEE SHEETS 6 & 7 FOR –L– PLAN

–L– RIGHT

BEGIN GRADE
–L– (RIGHT) STA. 245+00.00
ELEV = 27.65'

PI = 245+90.00
EL = 28.06'
VC = 180'
K = 237
DS = 69 MPH

PI = 247+70.00
EL = 27.51'
VC = 180'
K = 297
DS > 80 MPH

PI = 249+80.00
EL = 28.14'
VC = 240'
K = 380
DS > 80 MPH

PI = 252+00.00
EL = 27.41'
VC = 200'
K = 317
DS > 80 MPH

PI = 254+70.00
EL = 28.22'
VC = 340'
K = 543
DS > 80 MPH

PROPOSED GRADE

(+) 0.1029%
(+)0.4544%
(–)0.3056%
(–)0.3056%
(+)0.3000%
(+)0.3000%
(–)0.3318%
(–) 0.1000%
(–)0.3318%
(+)0.3000%
(+)0.3000%
(–)0.3266%

END DITCH
PI STA 244+00 –L– MED
ELEV=26.20

BEG DITCH
PI STA 249+00 –L– RT
ELEV=24.40

EXISTING GROUND

END DITCH
PI STA 252+00 –L– RT
ELEV=24.10

SEE SHEETS 6 & 7 FOR –L– PLAN

8/14/2020
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tlowder

Submitted 9/16/2020

–L– LEFT

PI = 260+15.00
EL = 26.44'
VC = 540'
K = 136
DS = 60 MPH

PI = 268+50.00
EL = 56.90'
VC = 1,130'
K = 152
DS = 60 MPH

(−)0.1025%
(−)0.3094%
(+)3.6479%
(+)3.6479%
(−)3.8081%
PROPOSED GRADE
EXISTING GROUND
–L– STA.268+59.84 =
–Y2I– STA.17+32.59
BRIDGE
–Y2I–
THURMAN RD.
END DITCH
PI STA 261+00 –L– LT
ELEV=19.28

SEE SHEET 8 FOR –L– PLAN

–L– RIGHT

PI = 260+15.00
EL = 26.44'
VC = 540'
K = 136
DS = 60 MPH

PI = 268+50.00
EL = 56.90'
VC = 1,130'
K = 152
DS = 60 MPH

(−)0.3266%
(+)3.6479%
(+)3.6479%
(−)3.8081%
PROPOSED GRADE
EXISTING GROUND
–L– STA.268+59.84 =
–Y2I– STA.17+32.59
BRIDGE
–Y2I–
THURMAN RD.

SEE SHEET 8 FOR –L– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	24

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/14/2020
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mlewis

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	25

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 320	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 19.0	FT
BASE DISCHARGE	= 320	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 19.0	FT
OVERTOPPING DISCHARGE	= 390	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 20.6	FT

PIPE HYDRAULIC DATA

48" Sta. 278+78 –L–

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 75	YRS
DESIGN DISCHARGE	= 221	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 85	CFS
100 YEAR HW ELEVATION	= 22.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 116	CFS
OVERTOPPING ELEVATION	= 24.0	FT

PI = 276+55.00
EL = 26.24'
VC = 480'
K = 137
DS = 60 MPH

(–)13.8081%

(–)13.8081%

(–)0.3000%

PROPOSED GRADE

EXISTING GROUND

48"

(–)0.3000%

(–)0.3000%

BEG DITCH
PI STA 284+50 –L– LT
ELEV=20.20

1@10'x6' RCBC W/1FT SILLS

SEE SHEET 8 FOR –L– PLAN

–L– RIGHT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 320	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 19.0	FT
BASE DISCHARGE	= 320	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 19.0	FT
OVERTOPPING DISCHARGE	= 390	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 20.6	FT

PIPE HYDRAULIC DATA

48" Sta. 278+78 –L–

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 75	YRS
DESIGN DISCHARGE	= 221	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 85	CFS
100 YEAR HW ELEVATION	= 22.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 116	CFS
OVERTOPPING ELEVATION	= 24.0	FT

PI = 276+55.00
EL = 26.25'
VC = 480'
K = 138
DS = 60 MPH

(–)3.8081%

PROPOSED GRADE

(–)3.8081%

(–)0.3229%

(+)1.6867%

48"

(–)0.3229%

(–)0.2000%

EXISTING GROUND

BEG DITCH
PI STA 278+67 –L– RT
ELEV=20.40

END DITCH
PI STA 279+50 –L– RT
ELEV=21.80

BEG DITCH
PI STA 284+00 –L– RT
ELEV=20.70

PI STA 285+00 –L– RT
ELEV=20.50

1@10'x6' RCBC W/1FT SILLS

SEE SHEET 8 FOR –L– PLAN

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	26

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 210	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 16.5	FT
BASE DISCHARGE	= 210	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 16.5	FT
OVERTOPPING DISCHARGE	= > 250	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 23.6	FT

PIPE HYDRAULIC DATA

30" Sta. 294+50 –L–

DRAINAGE AREA	= 3.1	AC
DESIGN FREQUENCY	= 18	YRS
DESIGN DISCHARGE	= 23.1	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 23.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 43	CFS
OVERTOPPING ELEVATION	= 25.1	FT

PIPE HYDRAULIC DATA

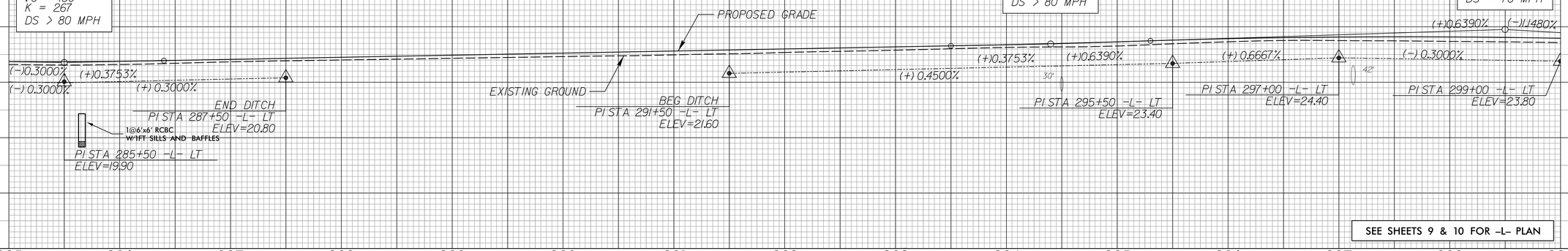
42" Sta. 297+13 –L–

DRAINAGE AREA	= 20	AC
DESIGN FREQUENCY	= 47	YRS
DESIGN DISCHARGE	= 22.8	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 50	CFS
100 YEAR HW ELEVATION	= 23.1	FT
OVERTOPPING FREQUENCY	= 200+/–	YRS
OVERTOPPING DISCHARGE	= 61	CFS
OVERTOPPING ELEVATION	= 23.5	FT

PI = 285+50.00
EL = 23.56'
VC = 180'
K = 267
DS > 80 MPH

PI = 294+40.00
EL = 26.90'
VC = 180'
K = 682
DS > 80 MPH

PI = 298+50.00
EL = 29.52'
VC = 640'
K = 358
DS = 78 MPH



SEE SHEETS 9 & 10 FOR –L– PLAN

–L– RIGHT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 210	CFS
DESIGN FREQUENCY	= 100	YRS
DESIGN HW ELEVATION	= 16.5	FT
BASE DISCHARGE	= 210	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 16.5	FT
OVERTOPPING DISCHARGE	= > 250	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 23.6	FT

PIPE HYDRAULIC DATA

30" Sta. 294+50 –L–

DRAINAGE AREA	= 3.1	AC
DESIGN FREQUENCY	= 18	YRS
DESIGN DISCHARGE	= 23.1	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 20	CFS
100 YEAR HW ELEVATION	= 23.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 43	CFS
OVERTOPPING ELEVATION	= 25.1	FT

PIPE HYDRAULIC DATA

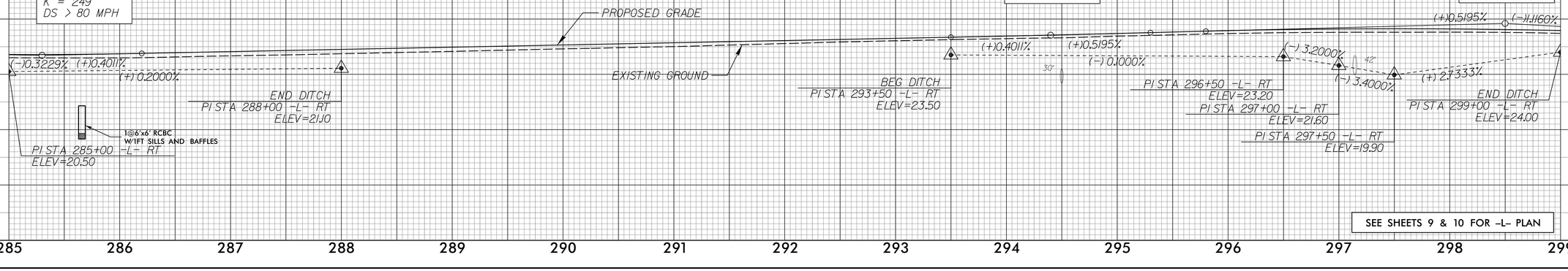
42" Sta. 297+13 –L–

DRAINAGE AREA	= 20	AC
DESIGN FREQUENCY	= 47	YRS
DESIGN DISCHARGE	= 22.8	CFS
DESIGN HW ELEVATION	= 100	FT
100 YEAR DISCHARGE	= 50	CFS
100 YEAR HW ELEVATION	= 23.1	FT
OVERTOPPING FREQUENCY	= 200+/–	YRS
OVERTOPPING DISCHARGE	= 61	CFS
OVERTOPPING ELEVATION	= 23.5	FT

PI = 285+30.00
EL = 23.42'
VC = 180'
K = 249
DS > 80 MPH

PI = 294+40.00
EL = 27.07'
VC = 180'
K = 1520
DS > 80 MPH

PI = 298+50.00
EL = 29.20'
VC = 540'
K = 330
DS = 76 MPH



SEE SHEETS 9 & 10 FOR –L– PLAN

8/14/2020
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tlewis

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	27

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

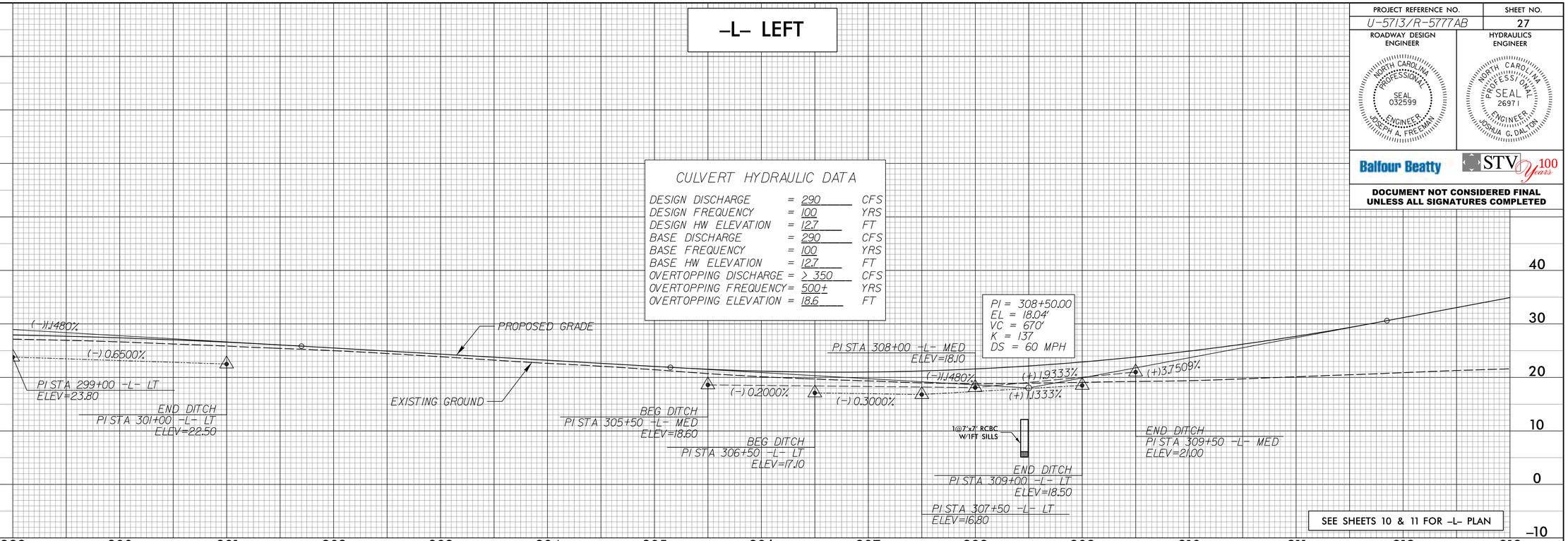
STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

CULVERT HYDRAULIC DATA

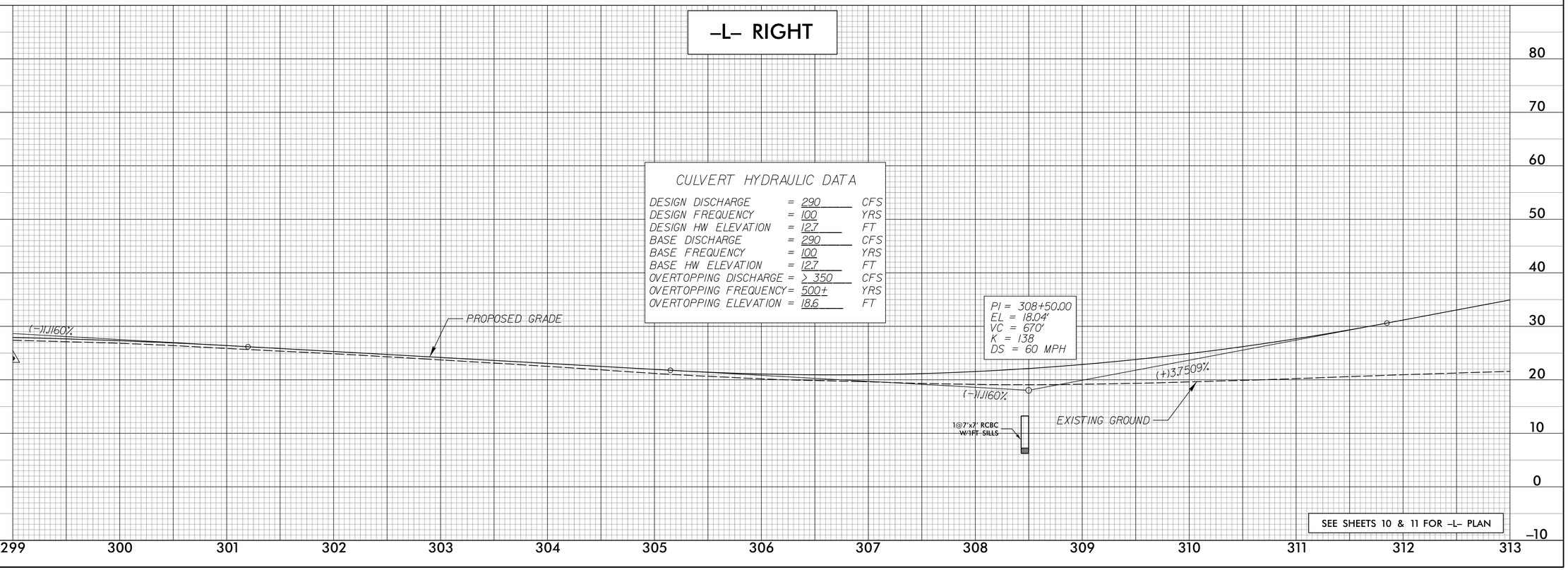
DESIGN DISCHARGE	=	290	CFS
DESIGN FREQUENCY	=	100	YRS
DESIGN HW ELEVATION	=	12.7	FT
BASE DISCHARGE	=	290	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	12.7	FT
OVERTOPPING DISCHARGE	=	> 350	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	18.6	FT



–L– RIGHT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	=	290	CFS
DESIGN FREQUENCY	=	100	YRS
DESIGN HW ELEVATION	=	12.7	FT
BASE DISCHARGE	=	290	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	12.7	FT
OVERTOPPING DISCHARGE	=	> 350	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	18.6	FT



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tlowder

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	28

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA S. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

PI = 319+50.00
EL = 59.30'
VC = 1,140'
K = 151
DS = 60 MPH

(+)3.7509%

(–)3.7952%

–L– STA. 319+17.97 =
–Y22– STA. 16+98.60

BRIDGE

PROPOSED GRADE

–Y22–
TABERNA WAY

EXISTING GROUND

SEE SHEET 11 FOR –L– PLAN

–L– RIGHT

PI = 319+50.00
EL = 59.30'
VC = 1,140'
K = 151
DS = 60 MPH

(+)3.7509%

(–)3.7952%

–L– STA. 319+17.97 =
–Y22– STA. 16+98.60

BRIDGE

PROPOSED GRADE

–Y22–
TABERNA WAY

EXISTING GROUND

SEE SHEET 11 FOR –L– PLAN

8/14/2020
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tcrowell

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	29

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

PIPE HYDRAULIC DATA

54" Sta. 327+50 –L–

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 24.1	FT
100 YEAR DISCHARGE	= 75	CFS
100 YEAR HW ELEVATION	= 24.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 1740	CFS
OVERTOPPING ELEVATION	= 27.6	FT

PI = 328+00.00
EL = 27.04'
VC = 560'
K = 136
DS = 60 MPH

PI = 334+00.00
EL = 28.97'
VC = 400'
K = 639
DS > 80 MPH

PI = 338+10.00
EL = 27.72'
VC = 420'
K = 619
DS > 80 MPH

PROPOSED GRADE

EXISTING GROUND

(+)0.3215%

(–)3.7952%

(–)0.3049%

(–) 0.3333%

(+) 1.3500%

(+)0.3735%

(+) 0.2000%

54"

BEG DITCH
PI STA 334+00 –L– LT
ELEV=21.20

PI STA 335+50 –L– LT
ELEV=20.70

PI STA 337+50 –L– LT
ELEV=23.40

SEE SHEETS 11 & 12 FOR –L– PLAN

–L– RIGHT

PIPE HYDRAULIC DATA

54" Sta. 327+50 –L–

DRAINAGE AREA	= 27	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 24.1	FT
100 YEAR DISCHARGE	= 75	CFS
100 YEAR HW ELEVATION	= 24.1	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 1740	CFS
OVERTOPPING ELEVATION	= 27.6	FT

PI = 328+00.00
EL = 27.04'
VC = 560'
K = 136
DS = 60 MPH

PI = 334+84.00
EL = 29.25'
VC = 572'
K = 912
DS > 80 MPH

PI = 338+60.00
EL = 28.10'
VC = 180'
K = 270
DS > 80 MPH

PI = 340+75.00
EL = 28.88'
VC = 250'
K = 372
DS = 79 MPH

PROPOSED GRADE

EXISTING GROUND

(–)3.7952%

(+)0.3224%

(+)0.3224%

(–)0.3048%

(–)0.3048%

(+)0.3628%

(+)0.3628%

(–)0.3100%

54"

SEE SHEETS 11 & 12 FOR –L– PLAN

8/14/2020
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tlewis

Submitted 9/16/2020

–L– LEFT

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	30

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA S. DALTON

Balfour Beatty — STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PIPE HYDRAULIC DATA
36" Sta. 342+70 –L–

DRAINAGE AREA	= 5.2	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 32	CFS
DESIGN HW ELEVATION	= 24.3	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 24.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= >40	CFS
OVERTOPPING ELEVATION	= 24.8	FT

PIPE HYDRAULIC DATA
48" Sta. 13+95 –SR7–

DRAINAGE AREA	= 38.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 85	CFS
DESIGN HW ELEVATION	= 24.4	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 25.1	FT
OVERTOPPING FREQUENCY	= +/–25	YRS
OVERTOPPING DISCHARGE	= +/–85	CFS
OVERTOPPING ELEVATION	= 24.2	FT

GRADE PT SHIFT
FROM EOP @ 11' LT TO 23' LT
–L– STA. 342+40.00
EL = 28.98'
EL = 28.68'

PI = 341+50.00
EL = 28.99'
VC = 180'
K = 251
DS = 70 MPH

PI = 347+50.00
EL = 27.22'
VC = 250'
K = 322
DS > 80 MPH

PI = 354+25.00
EL = 30.14'
VC = 300'
K = 296
DS = 74 MPH

(+)0.3735% (–)0.3444% (–)0.3444% (+) 0.2000% (–)0.3444% (+)0.4320% (–) 0.3030% (+) 0.6000% (–) 0.5714% (+)0.4320% (–)0.5811%

PROPOSED GRADE

EXISTING GROUND

36" 48"

END DITCH
PI STA 341+50 –L– LT
ELEV=24.20

PI STA 346+40 –L– LT
ELEV=24.70

(+) 0.6579% (–) 0.3000%

BEG DITCH
PI STA 345+64 –L– LT
ELEV=24.20

END DITCH
PI STA 347+50 –L– LT
ELEV=24.37

BEG DITCH
PI STA 349+00 –L– LT
ELEV=25.30

PI STA 350+65 –L– LT
ELEV=24.80

END DITCH
PI STA 353+50 –L– LT
ELEV=26.50

PI STA 353+15 –L– LT
ELEV=26.30

SEE SHEETS 12 & 13 FOR –L– PLAN

–L– RIGHT

PIPE HYDRAULIC DATA
36" Sta. 342+70 –L–

DRAINAGE AREA	= 5.2	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 32	CFS
DESIGN HW ELEVATION	= 24.3	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 24.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= >40	CFS
OVERTOPPING ELEVATION	= 24.8	FT

PIPE HYDRAULIC DATA
48" Sta. 13+95 –SR7–

DRAINAGE AREA	= 38.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 85	CFS
DESIGN HW ELEVATION	= 24.4	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 25.1	FT
OVERTOPPING FREQUENCY	= +/–25	YRS
OVERTOPPING DISCHARGE	= +/–85	CFS
OVERTOPPING ELEVATION	= 24.2	FT

GRADE PT SHIFT
FROM EOP @ 11' RT TO 23' RT
–L– STA. 342+40.00
EL = 28.67'
EL = 28.37'

PI = 347+00.00
EL = 27.24'
VC = 400'
K = 568
DS > 80 MPH

PI = 354+30.00
EL = 30.13'
VC = 200'
K = 211
DS = 67 MPH

( )0.3100% ( )0.3100% (–)0.3100% (+)0.3948% (+)0.3948% (–)0.5528%

PROPOSED GRADE

(–) 1.3235% (–) 0.2308% (+) 0.20347% (–) 0.3000% (–) 0.1798%

36" 48"

BEG DITCH
PI STA 341+00 –L– RT
ELEV=23.95

END DITCH
PI STA 342+70 –L– RT
ELEV=21.70

BEG DITCH
PI STA 343+50 –L– RT
ELEV=25.30

PI STA 346+10 –L– RT
ELEV=24.70

EXISTING GROUND

PI STA 352+00 –L– RT
ELEV=25.90

PI STA 353+00 –L– RT
ELEV=26.20

SEE SHEETS 12 & 13 FOR –L– PLAN

8/14/2020
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tlowe

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	31

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

PI = 359+05.00
EL = 27.35'
VC = 510'
K = 577
DS > 80 MPH

PI = 363+50.00
EL = 28.70'
VC = 380'
K = 571
DS > 80 MPH

PI = 368+45.00
EL = 26.91'
VC = 610'
K = 148
DS = 63 MPH

PROPOSED GRADE

(–)0.5811%

(+)0.3034%

EXISTING GROUND

(+)0.3034%

(–)0.3616%

(–)0.3616%

(+)3.7532%

SEE SHEETS 13 & 14 FOR –L– PLAN

–L– RIGHT

PI = 359+05.00
EL = 27.50'
VC = 510'
K = 598
DS > 80 MPH

PI = 363+15.00
EL = 28.73'
VC = 310'
K = 482
DS > 80 MPH

PI = 368+45.00
EL = 26.91'
VC = 610'
K = 149
DS = 63 MPH

PROPOSED GRADE

(–) 0.1798%

(+) 0.2857%

(–)0.5528%

(+)0.3000%

END DITCH
PI STA 358+50 –L– RT
ELEV=25.70

PI STA 357+45 –L– RT
ELEV=25.40

EXISTING GROUND

(+)0.3000%

(–)0.3434%

(–)0.3434%

(+)3.7532%

SEE SHEETS 13 & 14 FOR –L– PLAN

8/14/2020
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tlewis

Submitted 9/16/2020

–L– LEFT

PI = 377+00.00
EL = 59.00'
VC = 1,100'
K = 151
DS = 60 MPH

(+)3.7532%
(−)13.5299%
–L– STA 376+88.97 =
–Y2– STA 19+20.94
BRIDGE
PROPOSED GRADE
–Y2–
GRANTHAM RD.
EXISTING GROUND

SEE SHEET 14 FOR –L– PLAN

–L– RIGHT

PI = 377+00.00
EL = 59.00'
VC = 1,100'
K = 151
DS = 60 MPH

(+)3.7532%
(−)13.5299%
–L– STA 376+88.97 =
–Y2– STA 19+20.94
BRIDGE
PROPOSED GRADE
–Y2–
GRANTHAM RD.
EXISTING GROUND

SEE SHEET 14 FOR –L– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	32

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty
STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/14/2020
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tlewis

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	33

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

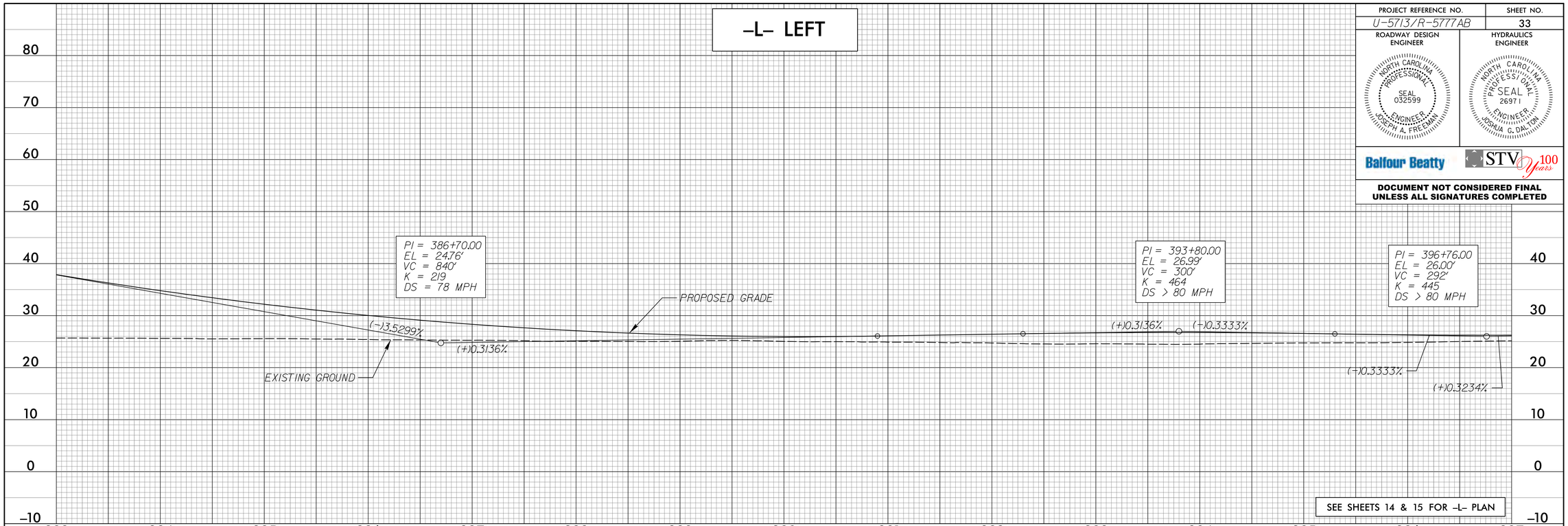
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

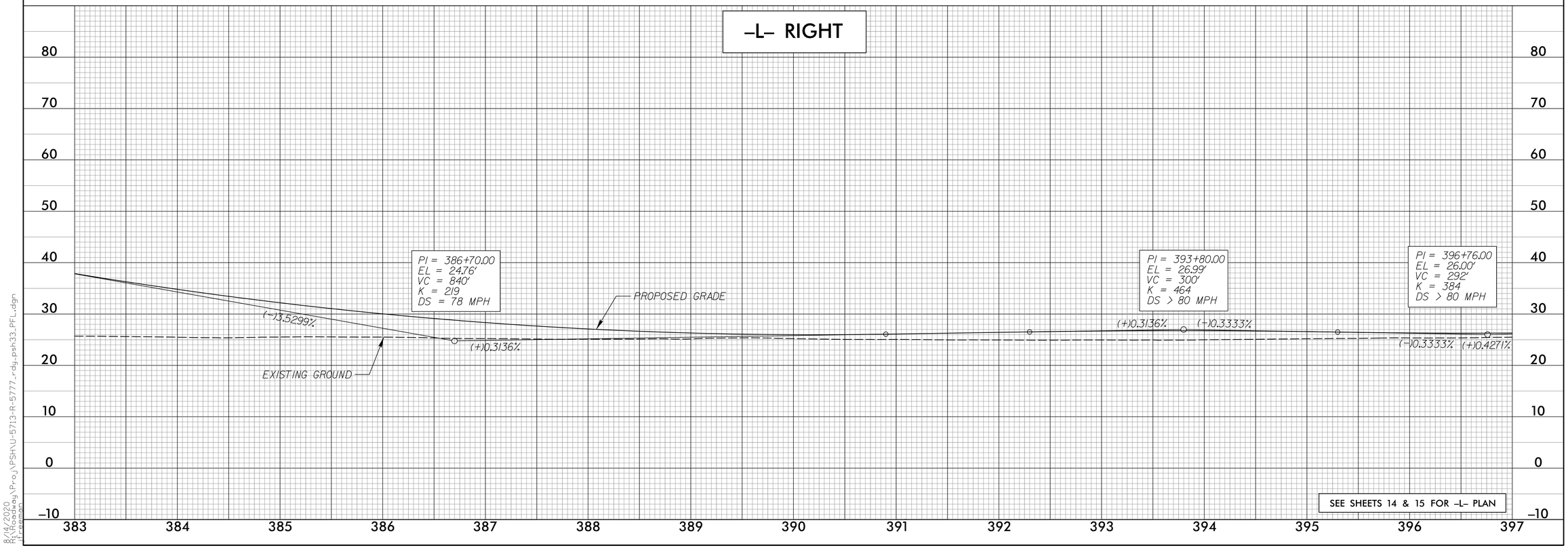
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT



SEE SHEETS 14 & 15 FOR –L– PLAN

–L– RIGHT



SEE SHEETS 14 & 15 FOR –L– PLAN

8/14/2020
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tlowder

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	34

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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–L– LEFT

PI = 400+10.00
EL = 27.08'
VC = 376'
K = 600
DS > 80 MPH

PI = 406+60.00
EL = 25.11'
VC = 700'
K = 175
DS = 69 MPH

(+)0.3234%
(–)0.3031%
(+)0.3234%
EXISTING GROUND
(–)0.3031%
PROPOSED GRADE
(+)3.6921%
(+)3.6921%

SEE SHEETS 15 & 16 FOR –L– PLAN

–L– RIGHT

PI = 399+64.00
EL = 27.23'
VC = 284'
K = 388
DS > 80 MPH

PI = 406+60.00
EL = 25.11'
VC = 700'
K = 175
DS = 69 MPH

(+)0.4271%
(–)0.3046%
(+)0.4271%
(–)0.3046%
PROPOSED GRADE
(+)3.6921%
(+)3.6921%
EXISTING GROUND

SEE SHEETS 15 & 16 FOR –L– PLAN

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tlewis

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	35

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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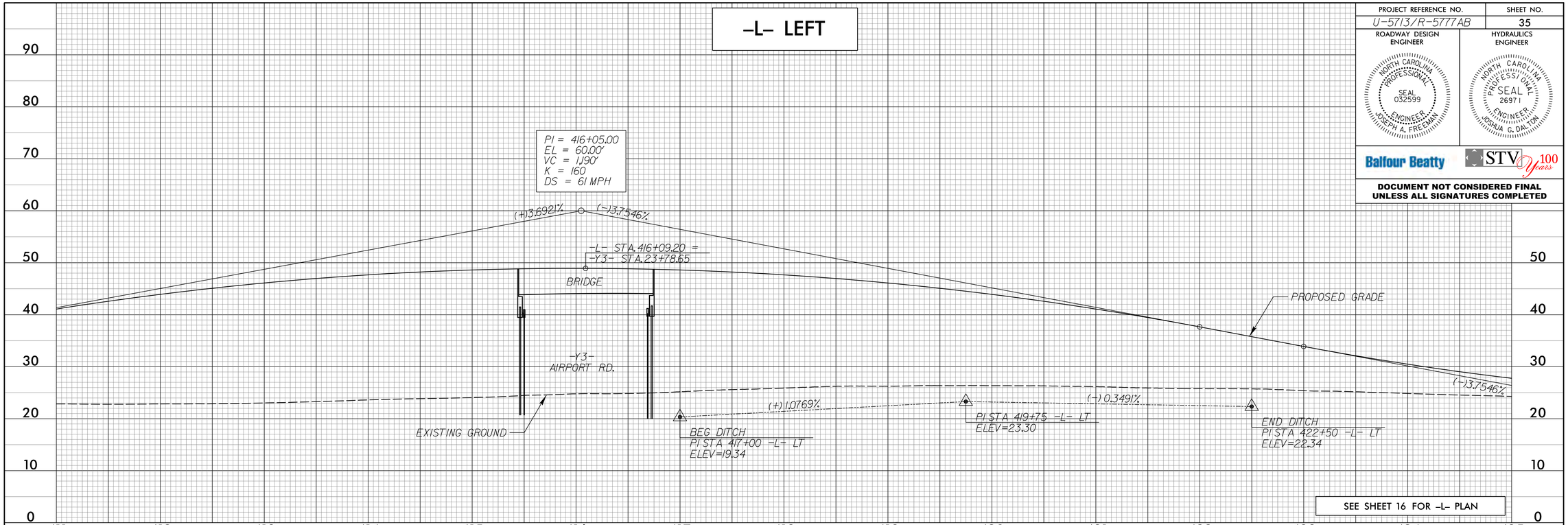
–L– LEFT



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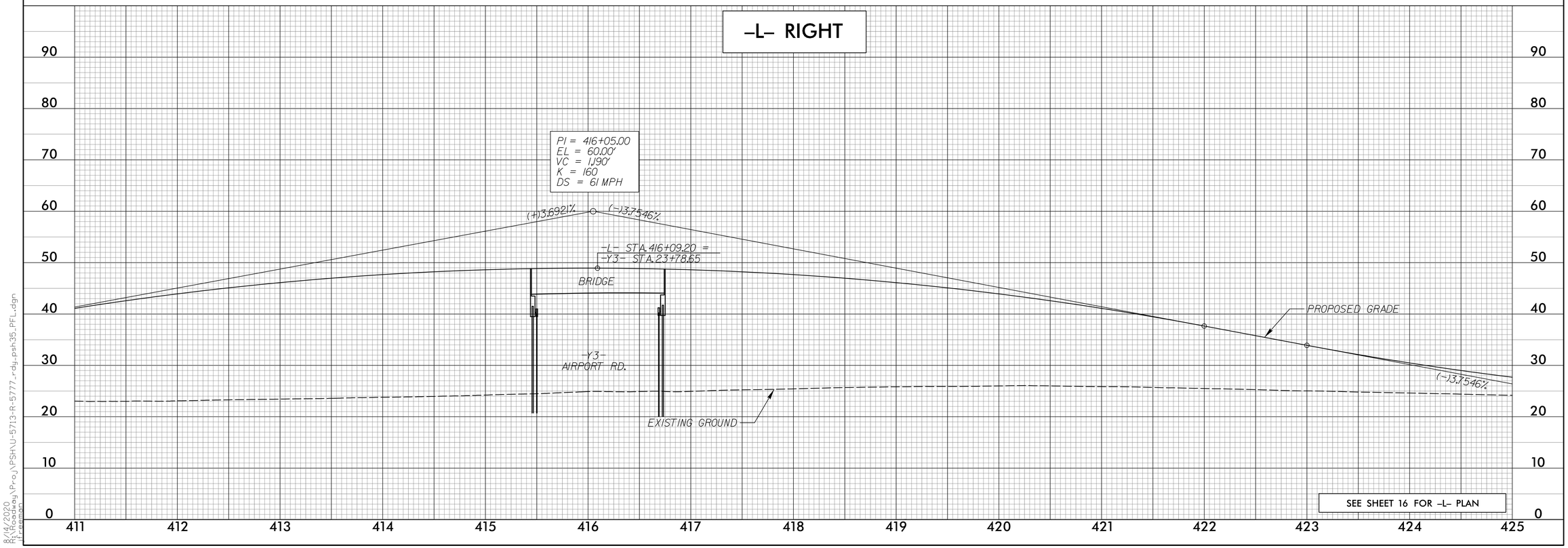

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tcarroll

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	36

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

PI = 425+30.00
EL = 25.27'
VC = 460'
K = 145
DS = 64 MPH

(–)3.7546%

(–)10.5837%

PI = 429+60.00
EL = 22.76'
VC = 200'
K = 323
DS > 80 MPH

(–)10.5837%

(–)1.2038%

PI = 434+70.00
EL = 16.62'
VC = 640'
K = 138
DS = 60 MPH

PROPOSED GRADE

(+)3.4310%

(–)1.2038%

EXISTING GROUND

SEE SHEETS 16 TO 18 FOR –L– PLAN

–L– RIGHT

PI = 425+30.00
EL = 25.27'
VC = 460'
K = 153
DS = 64 MPH

(–)3.7546%

(–)10.7512%

PI = 429+60.00
EL = 22.04'
VC = 180'
K = 304
DS = 74 MPH

(–)10.7512%

(–)1.3435%

PI = 434+40.00
EL = 15.59'
VC = 650'
K = 136
DS = 60 MPH

PROPOSED GRADE

(+)3.4310%

(–)1.3435%

(+)3.4310%

EXISTING GROUND

SEE SHEETS 16 TO 18 FOR –L– PLAN

80 70 60 50 40 30 20 10 0 –10

425 426 427 428 429 430 431 432 433 434 435 436 437 438 439

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tmorgan

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	37

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT

PI = 443+40.00
EL = 46.47'
VC = 1,100'
K = 151
DS = 60 MPH

(+)3.4310%

(–)3.8506%

–L– STA. 443+28.96 =
–Y4– STA. 23+57.01

BRIDGE

–Y4–
WILLIAMS RD.

PROPOSED GRADE

PI = 451+50.00
EL = 15.28'
VC = 520'
K = 146
DS = 62 MPH

(–)3.8506%

(–)0.3000%

EXISTING GROUND

SEE SHEET 18 FOR –L– PLAN

70 60 50 40 30 20 10 0 –10 –20

439 440 441 442 443 444 445 446 447 448 449 450 451 452 453

–L– RIGHT

PI = 443+40.00
EL = 46.47'
VC = 1,100'
K = 151
DS = 60 MPH

(+)3.4310%

(–)3.8506%

–L– STA. 443+28.96 =
–Y4– STA. 23+57.01

BRIDGE

–Y4–
WILLIAMS RD.

PROPOSED GRADE

PI = 451+32.00
EL = 15.97'
VC = 484'
K = 136
DS = 60 MPH

(–)3.8506%

(–)0.3006%

EXISTING GROUND

SEE SHEET 18 FOR –L– PLAN

70 60 50 40 30 20 10 0 –10 –20

439 440 441 442 443 444 445 446 447 448 449 450 451 452 453

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lfreeland

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	38

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 years

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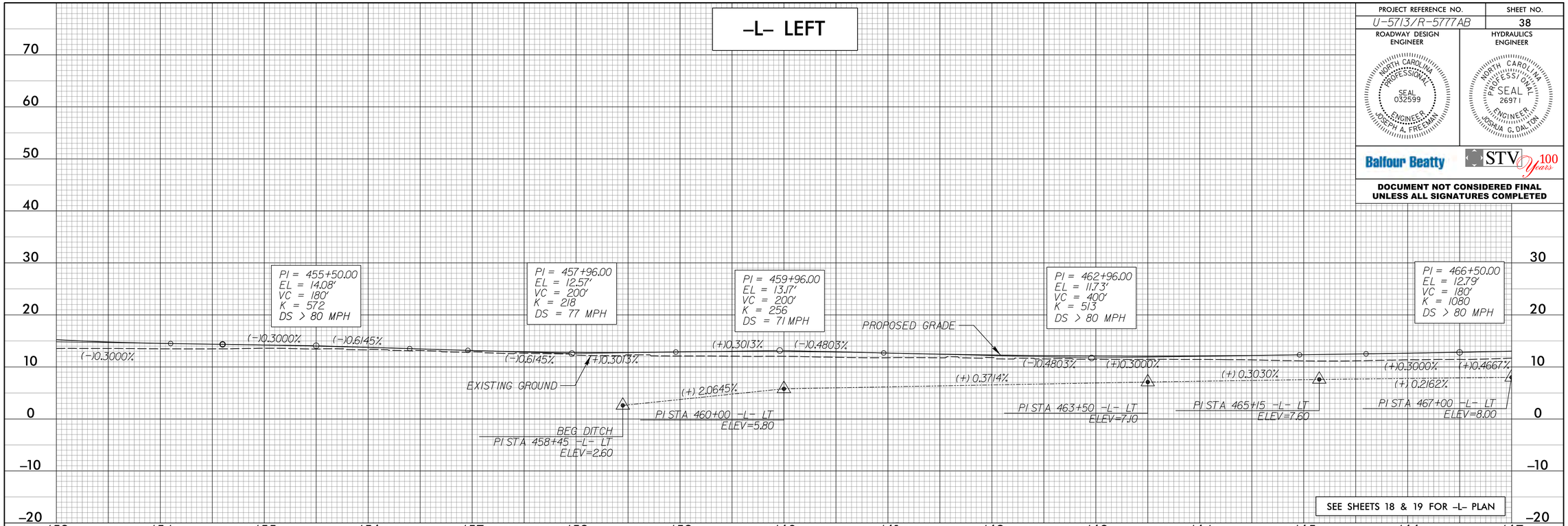
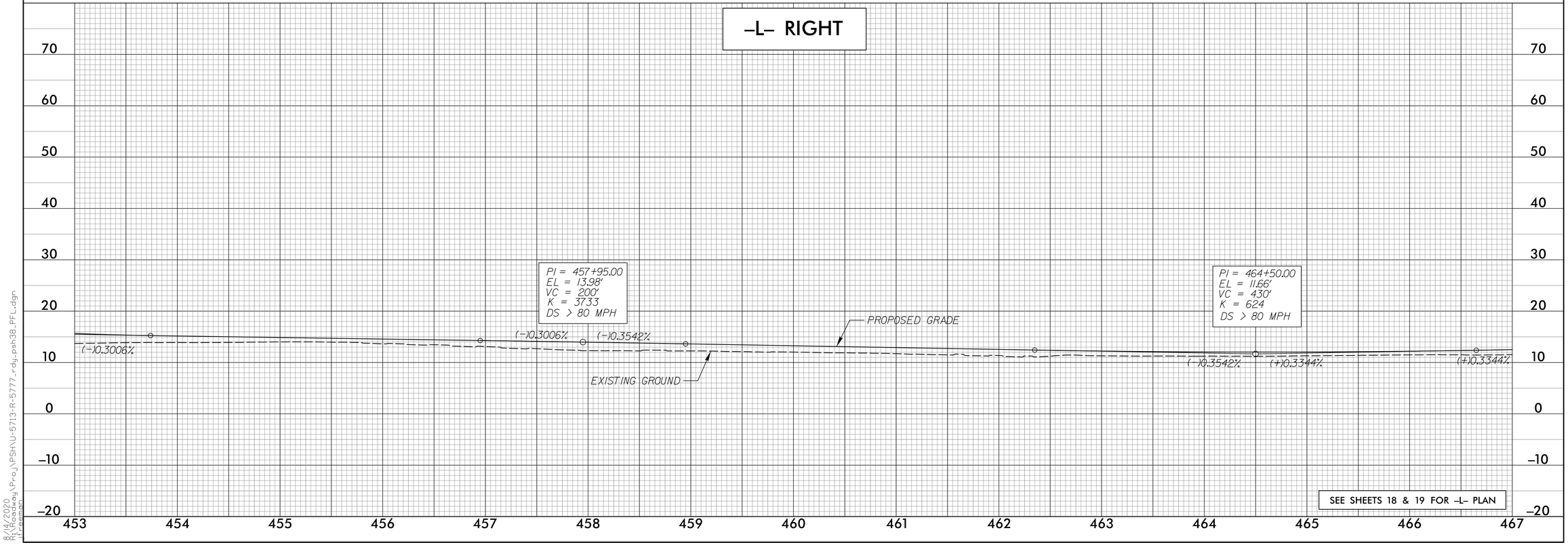
–L– LEFT



SEE SHEETS 18 & 19 FOR –L– PLAN

–L– RIGHT



SEE SHEETS 18 & 19 FOR –L– PLAN

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ltownsend

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	39

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

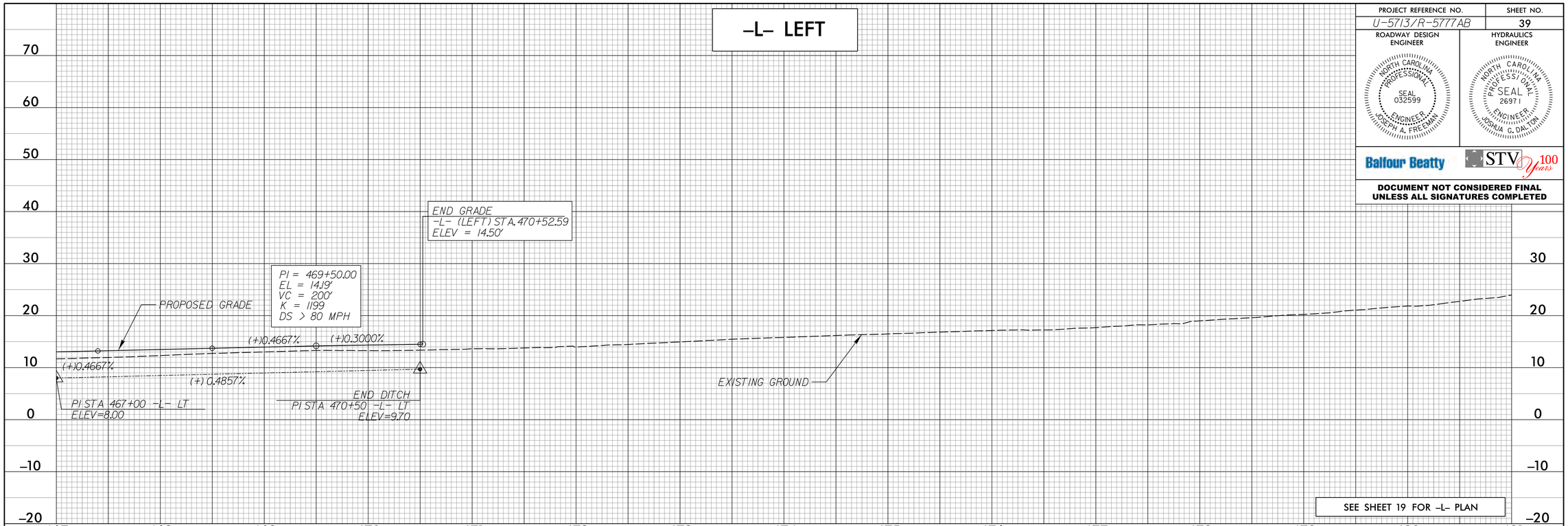
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

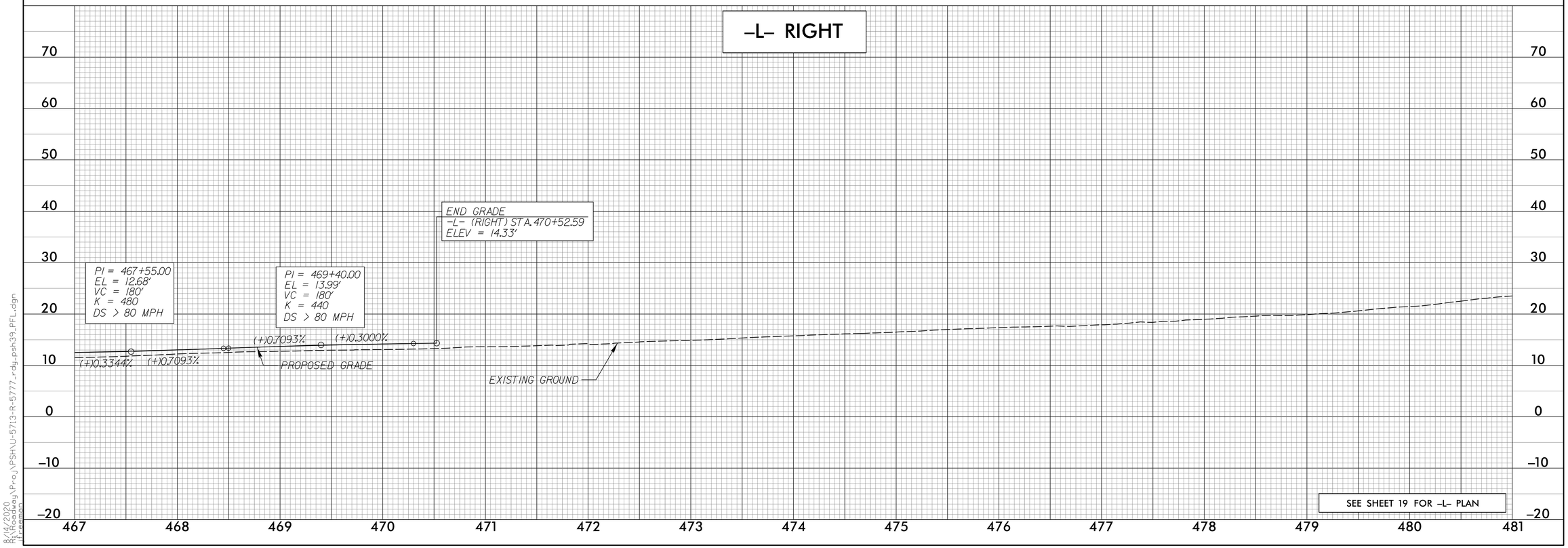
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– LEFT



SEE SHEET 19 FOR –L– PLAN

–L– RIGHT



SEE SHEET 19 FOR –L– PLAN

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ftreadgold

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	40

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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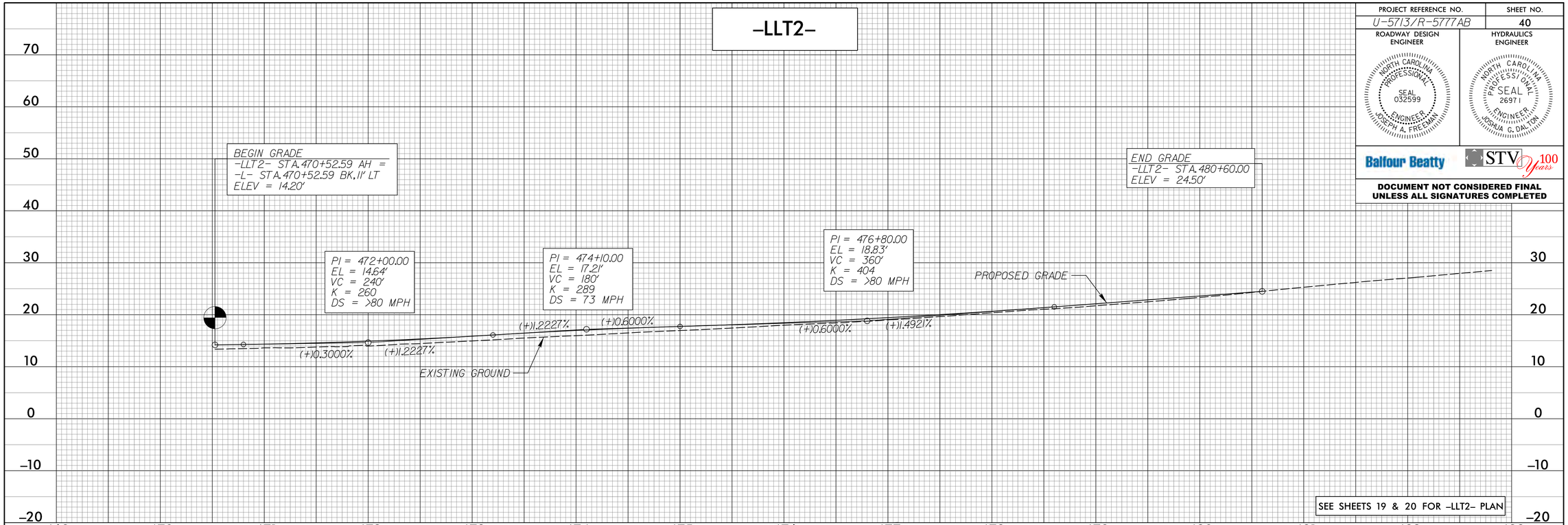
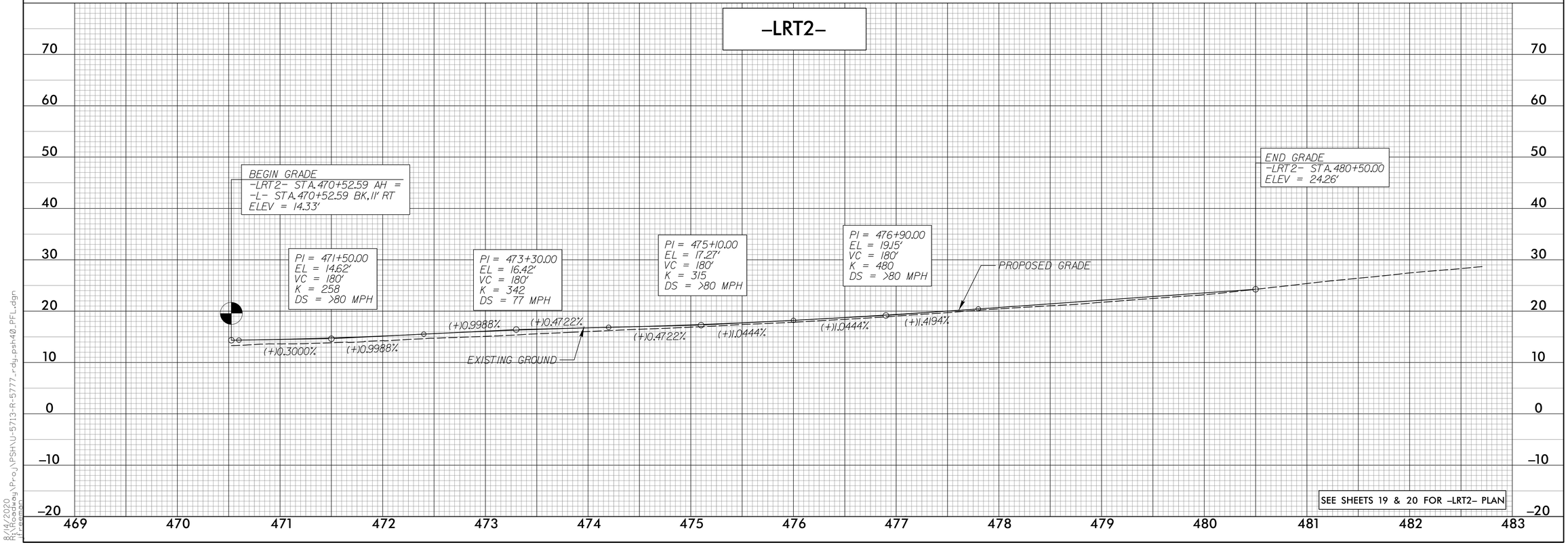
–LLT2–



SEE SHEETS 19 & 20 FOR –LLT2– PLAN

–LRT2–



SEE SHEETS 19 & 20 FOR –LRT2– PLAN

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tlowder

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	41

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–RPB55–

BEGIN GRADE
–RPB55– STA. 10+00.00
ELEV = 13.88'

PI = 11+25.00
EL = 14.25'
VC = 190'
K = 404
DS = >80 MPH

PI = 13+20.00
EL = 15.75'
VC = 200'
K = 293
DS = >80 MPH

PI = 15+29.30
EL = 18.79'
VC = 150'
K = 86
DS = 50 MPH

PI = 19+30.00
EL = 17.59'
VC = 180'
K = 250
DS = 70 MPH

END GRADE
–RPB55– STA. 20+60.00
ELEV = 16.26'

PROPOSED GRADE

EXISTING GROUND

(+)0.2992%
(+)0.7700%
(+)0.7700%
(+)1.4515%
(+)1.4515%
(+)0.3000%
(–)0.3000%
(–)1.0212%
(–)0.3000%

BEG DITCH
PI STA 12+55 –RPB55– LT
ELEV=8.65

END DITCH
PI STA 14+05 –RPB55– LT
ELEV=8.20

SEE SHEETS 19 & 20 FOR –RPB55– PLAN

–RPC55–

BEGIN GRADE
–RPC55– STA. 10+00.00
ELEV = 14.41'

PI = 10+75.00
EL = 15.09'
VC = 150'
K = 133
DS = 58 MPH

PI = 12+60.00
EL = 14.68'
VC = 220'
K = 284
DS = >80 MPH

PI = 17+30.00
EL = 17.26'
VC = 200'
K = 161
DS = 66 MPH

END GRADE
–RPC55– STA. 19+00.00
ELEV = 20.30'

PROPOSED GRADE

EXISTING GROUND

(+)0.9027%
(–)0.2249%
(–)0.2249%
(+)0.5500%
(+)0.5500%
(+)1.7900%
(–) 0.7857%
(–) 0.3636%
(–) 0.6800%

BEG DITCH
PI STA 10+75 –RPC55– RT
ELEV=8.70

PI STA 12+15 –RPC55– RT
ELEV=7.60

PI STA 13+25 –RPC55– RT
ELEV=7.20

END DITCH
PI STA 15+75 –RPC55– RT
ELEV=5.50

PIPE HYDRAULIC DATA

36" Sta. 16+11 –RPC55–

DRAINAGE AREA	= 7.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 34	CFS
DESIGN HW ELEVATION	= 8.2	FT
100 YEAR DISCHARGE	= 40	CFS
100 YEAR HW ELEVATION	= 8.6	FT
OVERTOPPING FREQUENCY	= <10	YRS
OVERTOPPING DISCHARGE	= 23	CFS
OVERTOPPING ELEVATION	= 7.6	FT

SEE SHEET 20 FOR –RPC55– PLAN

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PIPE HYDRAULIC DATA

18" Sta. 14+26 -Y21-

DRAINAGE AREA	= 0.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 2.5	CFS
DESIGN HW ELEVATION	= 21.6	FT
100 YEAR DISCHARGE	= 3	CFS
100 YEAR HW ELEVATION	= 21.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 17	CFS
OVERTOPPING ELEVATION	= 24.9	FT

-Y21-

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 240	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 18.8	FT
BASE DISCHARGE	= 310	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 20.4	FT
OVERTOPPING DISCHARGE	= > 390	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 23.7	FT

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	42

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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BEGIN GRADE
-Y21- STA.10+90.00
ELEV = 24.51'

PI = 12+68.00
EL = 25.46'
VC = 240'
K = 275
DS = 73 MPH

PI STA 14+26 -Y21- RT
ELEV=20.80

END GRADE
-Y21- STA.15+08.79
ELEV = 25.30'

PI = 14+48.00
EL = 24.85'
VC = 120'
K = 111
DS = 54 MPH

BEGIN GRADE
-Y21- STA.16+46.16
ELEV = 24.50'

END GRADE
-Y21- STA.18+19.15
ELEV = 23.98'

BEGIN GRADE
-Y21- STA.19+56.46
ELEV = 23.98'

PI = 20+20.00
EL = 23.28'
VC = 120'
K = 78
DS = 44 MPH

BEG DITCH
PI STA 12+50 -Y21- RT
ELEV=23.20

PROPOSED GRADE

(+)0.5333%

(-)0.3396%

(-)0.3396%

(+)0.7403%

(-) 0.3175%

(-) 4.0000%

(-)12.0000%

(+) 2.7027%

(-)12.8000%

(-)0.3000%

EXISTING GROUND

Y2IRAB1

Y2IRAB2

END DITCH
PI STA 16+00 -Y21- RT
ELEV=22.80

BEG DITCH
PI STA 12+50 -Y21- LT
ELEV=22.70

PI STA 13+00 -Y21- RT
ELEV=21.20

END DITCH
PI STA 16+00 -Y21- LT
ELEV=16.90

PI STA 14+00 -Y21- LT
ELEV=19.70

(-)1.0985%

(+)0.4474%

(+)0.4760%

(+)0.3200%

1@9'x6' RCBC W/1FT SILLS

BEG DITCH
PI STA 20+14 -Y21- RT
ELEV=18.40

BEG DITCH
PI STA 20+35 -Y21- LT
ELEV=18.40

END DITCH
PI STA 22+45 -Y21- LT
ELEV=19.40

END DITCH
PI STA 22+32 -Y21- RT
ELEV=19.10

SEE SHEET 8 FOR -Y21- PLAN

-Y21-

END GRADE
BEGIN MILLING & RESURFACING ONLY
-Y21- STA.27+28.75
ELEV = 25.17'

PI = 25+60.00
EL = 25.70'
VC = 200'
K = 26.3
DS = 71 MPH

END MILLING & RESURFACING ONLY
-Y21- STA.27+50.00
ELEV = 25.16'

BEG DITCH
PI STA 23+50 -Y21- RT
ELEV=21.00

END DITCH
PI STA 27+00 -Y21- RT
ELEV=22.20

PROPOSED GRADE

(+)0.4474%

(-)0.3141%

(+) 0.3429%

(+) 0.3000%

EXISTING GROUND

BEG DITCH
PI STA 23+50 -Y21- LT
ELEV=20.70

END DITCH
PI STA 27+50 -Y21- LT
ELEV=21.90

SEE SHEET 8 FOR -Y21- PLAN

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ltrenou

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–Y21RPA–

BEGIN GRADE
–Y2IRPA– STA.10+00.00
ELEV = 23.14'

PI = 10+50.00
EL = 23.15'
VC = 100'
K = 769
DS > 80 MPH

PI = 11+50.00
EL = 23.30'
VC = 100'
K = 219
DS = 67 MPH

PROPOSED GRADE

(+)0.1500%

(–)0.3075%

(+)0.0200%

EXISTING GROUND

PI = 15+50.00
EL = 22.07'
VC = 200'
K = 185
DS = 71 MPH

(–)0.3075%

BEG DITCH
PI STA 16+50 –Y2IRPA– LT
ELEV=21.10

(+)0.7761%

(–)0.3000%

(+)0.7761%

(–)0.7303%

PI = 19+43.00
EL = 25.12'
VC = 300'
K = 199
DS = 66 MPH

SEE SHEETS 8 & 9 FOR –Y21RPA– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	43

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y21RPA–

END GRADE
–Y2IRPA– STA.26+42.74
ELEV = 24.85'

BEG DITCH
PI STA 23+80 –Y2IRPA– LT
ELEV=19.00

END DITCH
PI STA 23+35 –Y2IRPA– LT
ELEV=19.00

PI STA 25+50 –Y2IRPA– LT
END DITCH
ELEV=20.80

PI = 24+25.00
EL = 21.60'
VC = 300'
K = 135
DS = 60 MPH

PROPOSED GRADE

(–)0.7303%

(+)1.4940%

(–)0.3000%

(–)0.3500%

(+)1.0588%

EXISTING GROUND

PI STA 22+50 –Y2IRPA– LT
ELEV=19.30

BEG DITCH
PI STA 23+33 –Y2IRPA– RT
ELEV=11.40

(+)0.0198%

PI STA 25+00 –Y2IRPA– RT
ELEV=11.60

(+) 3.2000%

(+) 3.1818%

END DITCH
PI STA 26+66 –Y2IRPA– RT
ELEV=16.90

PI STA 26+00 –Y2IRPA– RT
ELEV=14.80

SEE SHEET 8 FOR –Y21RPA– PLAN

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kfreeland

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	44

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y21RPB–

BEGIN GRADE
–Y21RPB– STA.10+00.00
ELEV = 27.34'

PI = 11+40.00
EL = 27.65'
VC = 280'
K = 37.4
DS > 80 MPH

(+)0.2229%

(–)0.5255%

PROPOSED GRADE

EXISTING GROUND

PI = 15+40.00
EL = 25.55'
VC = 200'
K = 105
DS = 52 MPH

(=)0.5255%

(+)1.3800%

PI = 17+90.00
EL = 29.00'
VC = 300'
K = 120
DS = 56 MPH

(+)1.3800%

(–)1.1097%

BEG DITCH
PI STA 18+00 –Y21RPB– RT
ELEV=26.00

(–)1.1097%

(–) 0.8000%

(–) 0.1009%

BEG DITCH
PI STA 18+21.65 –Y21RPB– LT
ELEV=19.28

END DITCH
PI STA 20+00 –Y21RPB– LT
ELEV=19.10

PI = 21+00.00
EL = 25.56'
VC = 200'
K = 285
DS > 80 MPH

SEE SHEETS 7 & 8 FOR –Y21RPB– PLAN

–Y21RPB–

PI = 21+00.00
EL = 25.56'
VC = 200'
K = 285
DS > 80 MPH

(–)0.4071%

(–) 0.8000%

PROPOSED GRADE

PI STA 22+00 –Y21RPB– RT
ELEV=22.80

PI = 23+80.00
EL = 24.42'
VC = 136'
K = 121
DS = 57 MPH

(–)0.4071%

(–)0.4000%

(+)0.7188%

END GRADE
–Y21RPB– STA.24+48.17
ELEV = 24.91

EXISTING GROUND

END DITCH
PI STA 24+00 –Y21RPB– RT
ELEV=22.00

SEE SHEET 8 FOR –Y21RPB– PLAN

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tlewis

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–Y21RPC–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	45

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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BEGIN GRADE
–Y21RPC– STA. 10+00.00
ELEV = 27.24'

PI = 11+00.00
EL = 27.23'
VC = 150'
K = 278
DS = 72 MPH

PI = 14+35.00
EL = 25.39'
VC = 170'
K = 145
DS = 62 MPH

PI = 16+40.00
EL = 26.66'
VC = 240'
K = 258
DS = 71 MPH

PROPOSED GRADE

(–)0.0100%

(–)0.5493%

(–)0.5493%

(+)0.6195%

(+)0.6195%

(–)0.3092%

(–) 0.4000%

(–) 0.6000%

EXISTING GROUND

BEG DITCH
PI STA 16+00 –Y21RPC– LT
ELEV=24.20

PI STA 17+50 –Y21RPC– LT
ELEV=23.60

SEE SHEETS 7 & 8 FOR –Y21RPC– PLAN

–Y21RPC–

END GRADE
–Y2IRPC– STA. 25+13.75
ELEV = 23.71'

END DITCH
PI STA 24+50 –Y2IRPC– LT
ELEV=19.00

PI = 24+00.00
EL = 24.31'
VC = 150'
K = 689
DS > 80 MPH

PI STA 22+50 –Y2IRPC– LT
ELEV=20.60

PROPOSED GRADE

(–)0.3092%

(–)0.5270%

(–) 0.6000%

(–) 0.8000%

EXISTING GROUND

SEE SHEET 8 FOR –Y21RPC– PLAN

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–Y21RPD–

BEGIN GRADE
–Y21RPD– STA. 10+00.00
ELEV = 23.00'

PI = 10+50.00
EL = 22.95'
VC = 100'
K = 284
DS > 80 MPH

PI = 12+80.00
EL = 23.53'
VC = 150'
K = 1903
DS > 80 MPH

PI = 14+30.00
EL = 23.79'
VC = 150'
K = 317
DS = 75 MPH

PI = 15+80.00
EL = 23.34'
VC = 150'
K = 206
DS = 75 MPH

(+)0.2522%
(–)0.1000%
(+)0.2522%
(+)0.1733%
(+)0.1733%
(–)0.3000%
(–)0.3000%
(+)0.4269%
EXISTING GROUND

BEG DITCH
PI STA 19+00 –Y21RPD– RT
ELEV=22.60

PROPOSED GRADE

(+)0.4269%
(–) 0.3077%
(+) 0.3306%
(+) 1.4000%
(–)0.3000%

BEG DITCH
PI STA 17+79 –Y21RPD– LT
ELEV=18.60

PI STA 19+00 –Y21RPD– LT
ELEV=19.00

END DITCH
PI STA 20+00 –Y21RPD– LT
ELEV=20.40

BEG DITCH
PI STA 20+50 –Y21RPD– LT
ELEV=20.60

SEE SHEETS 8 & 9 FOR –Y21RPB– PLAN

–Y21RPD–

END DITCH
PI STA 25+50 –Y21RPD– RT
ELEV=20.60

END GRADE
–Y21RPD– STA. 26+09.17
ELEV = 23.61'

PI = 25+00.00
EL = 24.25'
VC = 150'
K = 616
DS > 80 MPH

PROPOSED GRADE

(–)0.3410%
(–)0.3410%
(–)0.5845%
(–) 0.3077%
(–)0.3000%
(–)0.5000%

PI = 21+07.00
EL = 25.59'
VC = 220'
K = 286
DS = 73 MPH

EXISTING GROUND

END DITCH
PI STA 24+70 –Y21RPD– LT
ELEV=19.30

PI STA 24+50 –Y21RPD– LT
ELEV=19.40

SEE SHEET 8 FOR –Y21RPD– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	46

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty
STV 100 Years

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	47

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y22–

BEGIN GRADE
END MILLING & RESURFACING ONLY
–Y22– STA.11+50.00
ELEV = 26.19'

BEGIN MILLING & RESURFACING ONLY
–Y22– STA.11+35.65
ELEV = 26.01'

BEG DITCH
PI STA 13+00 –Y22– RT
ELEV=24.00

PI = 12+30.00
EL = 27.09'
VC = 90'
K = 63
DS = 45 MPH

PROPOSED GRADE

(+)11.1250%

(–)0.3000%

(–) 0.5882%

(+) 0.4000%

BEG DITCH
PI STA 13+00 –Y22– LT
ELEV=20.80

END GRADE
–Y22– STA.14+69.13
ELEV = 26.37'

END DITCH
PI STA 15+00 –Y22– LT
ELEV=21.60

BEGIN GRADE
–Y22– STA.16+05.15
ELEV = 26.64'

BEG DITCH
PI STA 14+70 –Y22– RT
ELEV=23.00

–Y22RAB1–

EXISTING GROUND

(–)0.3000%

–Y22RAB2–

END GRADE
–Y22– STA.17+92.26
ELEV = 26.08'

BEG DITCH
PI STA 19+50 –Y22– RT
ELEV=19.40

BEGIN GRADE
–Y22– STA.19+28.88
ELEV = 25.49'

BEG DITCH
PI STA 19+50 –Y22– LT
ELEV=20.00

(+)0.3000%

(+) 2.6163%

(–) 0.4000%

(+) 0.2703%

PROPOSED GRADE

END DITCH
PI STA 21+22 –Y22– RT
ELEV=23.90

END DITCH
PI STA 20+74 –Y22– LT
ELEV=20.00

PI STA 20+00 –Y22– LT
ELEV=19.80

BEG DITCH
PI STA 23+50 –Y22– RT
ELEV=24.30

(–)11.2000%

PIPE HYDRAULIC DATA
18" Sta. 11+98 –Y22–

DRAINAGE AREA	= 1.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 5	CFS
DESIGN HW ELEVATION	= 21.3	FT
100 YEAR DISCHARGE	= 6	CFS
100 YEAR HW ELEVATION	= 21.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 18	CFS
OVERTOPPING ELEVATION	= 24.4	FT

PIPE HYDRAULIC DATA
30" Sta. 20+00 –Y22–

DRAINAGE AREA	= 3.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 21.7	FT
100 YEAR DISCHARGE	= 18	CFS
100 YEAR HW ELEVATION	= 21.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 36	CFS
OVERTOPPING ELEVATION	= 23.3	FT

SEE SHEET 11 FOR –Y22– PLAN

–Y22–

PI = 29+68.00
EL = 28.61'
VC = 200'
K = 317
DS = 75 MPH

BEG DITCH
PI STA 24+78 –Y22– LT
ELEV=21.80

(+)0.3000%

(–)0.3312%

(–) 2.5641%

(+) 0.2139%

(+) 0.2050%

PI STA 24+78 –Y22– RT
ELEV=21.70

PI STA 24+00 –Y22– RT
ELEV=23.70

EXISTING GROUND

PROPOSED GRADE

PI = 35+71.00
EL = 26.61'
VC = 100'
K = 156
DS = 65 MPH

END GRADE
–Y22– STA.36+39.10
ELEV = 26.82'

END DITCH
PI STA 36+34 –Y22– LT
ELEV=24.60

PI STA 36+00 –Y22– LT
ELEV=24.20

(–)0.3312%

(+)0.3080%

(+)11.1800%

END DITCH
PI STA 36+00 –Y22– RT
ELEV=24.00

SEE SHEETS 11 & 22 FOR –Y22– PLAN

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y22RPA–

BEGIN GRADE
–Y22RPA– STA.10+00.00
ELEV = 28.06'

PI = 10+75.00
EL = 27.91'
VC = 150'
K = 512
DS > 80 MPH

PI = 14+20.00
EL = 26.23'
VC = 164'
K = 114
DS = 55 MPH

PI = 17+00.00
EL = 28.88'
VC = 200'
K = 309
DS > 80 MPH

PI = 19+40.00
EL = 29.60'
VC = 280'
K = 282
DS > 80 MPH

PROPOSED GRADE

(–)0.1960%
(–)0.4892%
(–)0.4892%
(+)0.9481%
(+)0.2990%
(+)0.9481%
(+)0.3000%
(+)0.3000%
(–)0.6924%
(–)1.0407%
(–)1.0984%

BEG DITCH
PI STA 10+09.89 –Y22RPA– RT
ELEV=21.20

END DITCH
PI STA 15+11.57 –Y22RPA– RT
ELEV=22.70

BEG DITCH
PI STA 16+62 –Y22RPA– LT
ELEV=27.10

EXISTING GROUND

BEG DITCH
PI STA 16+62 –Y22RPA– RT
ELEV=19.50

END DITCH
PI STA 19+14 –Y22RPA– RT
ELEV=19.00

SEE SHEET 11 FOR –Y22RPA– PLAN

–Y22RPA–

END GRADE
–Y22RPA– STA.24+26.74
ELEV = 26.23'

PROPOSED GRADE
(–)0.6924%

END DITCH
PI STA 23+50 –Y22RPA– LT
ELEV=24.30

(–) 0.4070%
(–) 0.8000%
(–) 0.4000%

EXISTING GROUND

BEG DITCH
PI STA 21+50 –Y22RPA– RT
ELEV=23.40

END DITCH
PI STA 24+00 –Y22RPA– RT
ELEV=21.60

PI STA 23+50 –Y22RPA– RT
ELEV=21.80

SEE SHEET 11 FOR –Y22RPA– PLAN

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–Y22RPB–

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U-5713/R-5777AB	49

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–Y22RPB– STA. 10+00.00
ELEV = 23.57'

PI = 10+95.00
EL = 22.47'
VC = 150'
K = 1616
DS > 80 MPH

PI = 12+60.00
EL = 20.42'
VC = 150'
K = 174
DS = 69 MPH

PI = 15+00.00
EL = 19.50'
VC = 280'
K = 108
DS = 53 MPH

PI = 19+00.00
EL = 28.37'
VC = 315'
K = 84
DS = 50 MPH

PROPOSED GRADE

(–)11.526%
(–)11.2455%
(–)11.2455%
(–)10.3833%
(–)10.3833%
(+)2.2169%
(+)2.2169%
(–)11.513%
(–)0.8000%

EXISTING GROUND

BEG. DITCH
PI STA 20+50 –Y22RPB– RT
ELEV=23.90

SEE SHEETS 10 & 11 FOR –Y22RPB– PLAN

–Y22RPB–

PI = 22+20.00
EL = 23.53'
VC = 215'
K = 94
DS = 54 MPH

END GRADE
–Y22RPB– STA. 25+83.80
ELEV = 26.30'

PROPOSED GRADE

END DITCH
PI STA 25+00 –Y22RPB– RT
ELEV=24.00

PI STA 23+00 –Y22RPB– RT
ELEV=21.90

(–)11.513%
(–)0.8000%
(+)0.7636%
(+)1.0500%
(–)0.7000%
(+)0.6500%
(+)0.7895%

EXISTING GROUND

BEG. DITCH
PI STA 21+00 –Y22RPB– LT
ELEV=22.20

PI STA 23+00 –Y22RPB– LT
ELEV=20.80

PI STA 25+00 –Y22RPB– LT
ELEV=22.10

END DITCH
PI STA 26+14 –Y22RPB– LT
ELEV=23.00

SEE SHEET 11 FOR –Y22RPB– PLAN

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–Y22RPC–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	50

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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PIPE HYDRAULIC DATA

42" Sta. 18+00 –Y22RPC–

DRAINAGE AREA	= 25.7	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 55	CFS
DESIGN HW ELEVATION	= 21.1	FT
100 YEAR DISCHARGE	= 65	CFS
100 YEAR HW ELEVATION	= 21.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 88	CFS
OVERTOPPING ELEVATION	= 22.7	FT

BEGIN GRADE
–Y22RPC– STA.10+00.00
ELEV = 24.20'

PROPOSED GRADE

PI = 14+94.00
EL = 17.63'
VC = 440'
K = 132
DS = 55 MPH

(–)1.3306%

(+)2.0103%

BEG DITCH
PI STA 13+06.78 –Y22RPC– RT
ELEV=13.40

(–) 3.1053%

PI STA 15+00 –Y22RPC– RT
ELEV=7.40

(–) 0.5217%

END DITCH
PI STA 16+15 –Y22RPC– RT
ELEV=6.80

EXISTING GROUND

BEG DITCH
PI STA 18+00 –Y22RPC– RT
ELEV=17.70

42"

PI = 19+76.00
EL = 27.32'
VC = 512'
K = 208
DS = 66 MPH

BEG DITCH
PI STA 19+50 –Y22RPC– LT
ELEV=24.00

(+)2.0103%

(–)0.4552%

(–) 0.1000%

(+) 0.2000%

SEE SHEETS 10 & 11 FOR –Y22RPC– PLAN

–Y22RPC–

END GRADE
–Y22RPC– STA.26+30.56
ELEV = 25.40'

END DITCH
PI STA 25+50 –Y22RPC– LT
ELEV=23.40

PI = 25+20.00
EL = 24.84'
VC = 150'
K = 157
DS = 65 MPH

PROPOSED GRADE

(–)0.4552%

(+)0.5000%

(–) 0.1000%

(+) 0.2000%

EXISTING GROUND

END DITCH
PI STA 26+50 –Y22RPC– RT
ELEV=19.40

SEE SHEET 11 FOR –Y22RPC– PLAN

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–Y22RPD–

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ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–Y22RPD– STA.10+00.00
ELEV = 28.19'

PI = 11+40.00
EL = 28.24'
VC = 280'
K = 610
DS > 80 MPH

(+)0.0343%

(–)0.4248%

PROPOSED GRADE

EXISTING GROUND

PI = 15+94.00
EL = 26.31'
VC = 249'
K = 166
DS = 67 MPH

(–)0.4248%

(+)1.0749%

BEG DITCH
PI STA 17+70.43 –Y22RPD– LT
ELEV=26.00

BEG DITCH
PI STA 18+50 –Y22RPD– RT
ELEV=26.00

PI = 18+30.00
EL = 28.85'
VC = 223'
K = 84
DS = 50 MPH

(+)1.0749%

(–) 1.3892%

PI STA 19+00 –Y22RPD– LT
ELEV=24.20

(–)1.5891%

(–) 1.1000%

PI STA 20+00 –Y22RPD– LT
ELEV=22.40

(–) 1.8000%

PI STA 20+50 –Y22RPD– RT
ELEV=23.80

(–)1.5891%

(–) 0.4667%

(–) 0.4000%

PI = 21+40.00
EL = 23.92'
VC = 280'
K = 146
DS = 62 MPH

SEE SHEET 11 FOR –Y22RPD– PLAN

–Y22RPD–

END GRADE
–Y22RPD– STA.25+63.02
ELEV = 25.29'

PI STA 22+00 –Y22RPD– RT
ELEV=23.10

PI = 21+40.00
EL = 23.92'
VC = 280'
K = 146
DS = 62 MPH

BEG DITCH
PI STA 25+00 –Y22RPD– RT
ELEV=22.50

PROPOSED GRADE

(–)1.5891%

(+) 0.4667%

(+)0.3239%

(–)0.2000%

(–) 0.4000%

END DITCH
PI STA 26+00 –Y22RPD– LT
ELEV=20.00

EXISTING GROUND

SEE SHEET 11 FOR –Y22RPD– PLAN

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	52

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y2–

BEGIN GRADE
–Y2– STA.13+62.00
ELEV = 24.18'

PI = 13+99.50
EL = 24.44'
VC = 75'
K = 27
DS = 25 MPH

END GRADE
–Y2– STA.14+37.15
ELEV = 25.75'

BEGIN GRADE
–Y2– STA.15+73.25
ELEV = 26.34'

END GRADE
–Y2– STA.17+06.03
ELEV = 26.74'

BEGIN GRADE
–Y2– STA.18+50.00
ELEV = 25.58'

END GRADE
–Y2– STA.19+95.00
ELEV = 25.15'

BEGIN GRADE
–Y2– STA.21+46.21
ELEV = 26.46'

PI = 22+10.00
EL = 25.64'
VC = 120'
K = 76
DS = 44 MPH

PI = 23+45.00
EL = 26.04'
VC = 150'
K = 246
DS = 70 MPH

–RR–
–Y2RAB3–
–Y2RAB1–
–Y2RAB2–
PROPOSED GRADE
EXISTING GROUND

(+)0.7000% (+)3.4729% (+)0.8888% (+)0.3000% (–)0.3000% (–)1.2868% (+)0.3000% (+)0.4943% (+)0.3000% (–)0.3109% (+)0.3182%

BEG DITCH
PI STA 13+75 –Y2– LT
ELEV=19.50

END DITCH
PI STA 14+20 –Y2– LT
ELEV=19.90

BEG DITCH
PI STA 21+26 –Y2– RT
ELEV=20.89

PI STA 22+50 –Y2– RT
ELEV=21.50

SEE SHEET 14 FOR –Y2– PLAN

–Y2–

PIPE HYDRAULIC DATA
24" Sta. 28+55 –Y2–

DRAINAGE AREA	= 3.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 12	CFS
DESIGN HW ELEVATION	= 23.6	FT
100 YEAR DISCHARGE	= 15	CFS
100 YEAR HW ELEVATION	= 23.9	FT
OVERTOPPING FREQUENCY	= ≥500	YRS
OVERTOPPING DISCHARGE	= ≥18	CFS
OVERTOPPING ELEVATION	= 25.5	FT

PI = 25+10.00
EL = 25.53'
VC = 180'
K = 295
DS > 80 MPH

PI = 26+90.00
EL = 26.07'
VC = 180'
K = 291
DS = 73 MPH

BEG DITCH
PI STA 26+15 –Y2– LT
ELEV=21.90

END GRADE
–Y2– STA.28+65.53
ELEV = 25.51'

PROPOSED GRADE
EXISTING GROUND

(–)0.3109% (–)0.3109% (+)0.3000% (+)0.3000% (–)0.3190% (+)0.4500% (+)0.2500% (–)0.2857% (+)0.3182%

END DITCH
PI STA 26+90 –Y2– RT
ELEV=22.90

BEG DITCH
PI STA 27+30 –Y2– RT
ELEV=21.90

END DITCH
PI STA 27+50 –Y2– RT
ELEV=21.99

PI STA 27+90 –Y2– LT
ELEV=21.40

END DITCH
PI STA 28+70 –Y2– LT
ELEV=21.60

SEE SHEET 14 FOR –Y2– PLAN

–Y1–

BEGIN GRADE
–Y1– STA.12+47.51
ELEV = 23.73'

PI = 12+75.00
EL = 23.97'
VC = 50'
K = 29
DS = 26 MPH

END GRADE
–Y1– STA.13+45.33
ELEV = 25.52'

BEGIN GRADE
–Y1– STA.16+05.18
ELEV = 26.95'

PI = 16+26.00
EL = 27.01'
VC = 40'
K = 22
DS = 32 MPH

PI = 16+66.00
EL = 26.41'
VC = 40'
K = 33
DS = 28 MPH

PROPOSED GRADE
EXISTING GROUND

(+)0.8618% (+)2.6070% (+)1.5000% (–)1.4957% (+)0.3000% (+)0.1220% (+)0.5000% (–)0.3000%

PI = 13+20.00
EL = 25.14'
VC = 40'
K = 36
DS = 37 MPH

BEG DITCH
PI STA 16+00 –Y1– RT
ELEV=23.50

BEG DITCH
PI STA 16+35 –Y1– LT
ELEV=22.30

END DITCH
PI STA 16+75 –Y1– LT
ELEV=22.50

END DITCH
PI STA 16+82 –Y1– RT
ELEV=23.60

END GRADE
–Y1– STA.16+87.39
ELEV = 26.35'

SEE SHEET 12 FOR –Y1– PLAN

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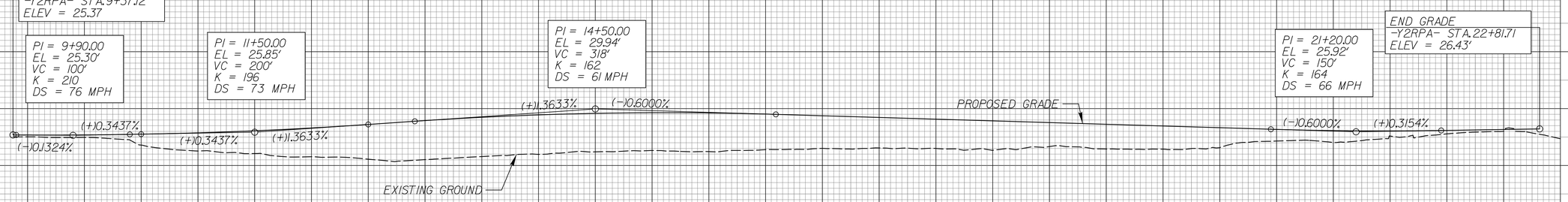
–Y2RPA–



PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	53

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEETS 14 & 15 FOR –Y2RPA– PLAN

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8/14/2020
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lrogers

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	54

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y2RPB–

BEGIN GRADE
–Y2RPB– STA.10+00.00
ELEV = 27.26'

PI = 10+80.00
EL = 27.29'
VC = 120'
K = 645
DS > 80 MPH

PI = 12+65.00
EL = 27.71'
VC = 138'
K = 262
DS = 72 MPH

PI = 16+60.00
EL = 26.53'
VC = 230'
K = 139
DS = 61 MPH

PI = 19+05.00
EL = 29.83'
VC = 240'
K = 84
DS = 50 MPH

PROPOSED GRADE

(+)0.0400%
(+)0.2259%
(+)0.2259%
(–)0.3000%
(–)0.3000%
(+)1.3503%
(+)1.3503%
(–)1.5205%

EXISTING GROUND

SEE SHEET 14 FOR –Y2RPB– PLAN

–Y2RPB–

PI = 21+40.00
EL = 26.26'
VC = 190'
K = 99
DS = 51 MPH

PI = 23+40.00
EL = 27.07'
VC = 210'
K = 295
DS = 73 MPH

END GRADE
–Y2RPB– STA.26+14.90
ELEV = 26.23'

PROPOSED GRADE

(–)1.5205%
(–)1.5205%
(+)0.4059%
(+)0.4059%
(–)0.3062%

EXISTING GROUND

SEE SHEET 14 FOR –Y2RPB– PLAN

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tfreeman

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	55

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y2RPC–

BEGIN GRADE
–Y2RPC– STA. 10+00.00
ELEV = 27.59'

PI = 11+20.00
EL = 27.80'
VC = 160'
K = 292
DS = 74 MPH

PROPOSED GRADE

(+)0.1752%

(–)0.3732%

PI = 15+38.00
EL = 26.24'
VC = 176'
K = 97
DS = 50 MPH

(–)0.3732%

(+)1.4412%

PI = 18+22.00
EL = 30.35'
VC = 290'
K = 85
DS = 50 MPH

(+)1.4412%

(–)1.9847%

EXISTING GROUND

SEE SHEET 14 FOR –Y2RPC– PLAN

–Y2RPC–

PI = 20+84.00
EL = 25.15'
VC = 234'
K = 98
DS = 51 MPH

PROPOSED GRADE

(–)1.9847%

(+)0.4120%

PI = 23+00.00
EL = 26.04'
VC = 180'
K = 251
DS = 70 MPH

(+)0.4120%

(–)0.3056%

PI = 24+80.00
EL = 25.49'
VC = 180'
K = 204
DS = 75 MPH

(–)0.3056%

(+)0.5769%

END GRADE
–Y2RPC– STA. 25+89.22
ELEV = 26.12'

EXISTING GROUND

BEG DITCH
PI STA 22+00 –Y2RPC– RT
ELEV=20.70

(–) 0.2000%

PI STA 24+50 –Y2RPC– RT
ELEV=20.20

30"

(+) 0.4943%

END DITCH
PI STA 25+89–Y2RPC– RT
ELEV=20.89

PIPE HYDRAULIC DATA

30" Sta. 24+52 –Y2RPC–

DRAINAGE AREA	= 4.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 22	CFS
DESIGN HW ELEVATION	= 22.6	FT
100 YEAR DISCHARGE	= 23	CFS
100 YEAR HW ELEVATION	= 22.7	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >29	CFS
OVERTOPPING ELEVATION	= 24.7	FT

SEE SHEET 14 FOR –Y2RPC– PLAN

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	56

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y2RPD–

BEGIN GRADE
–Y2RPD– STA. 10+00.00
ELEV = 26.14'

PI = 11+00.00
EL = 26.06'
VC = 150'
K = 428
DS > 80 MPH

PI = 12+50.00
EL = 25.42'
VC = 150'
K = 1248
DS > 80 MPH

PI = 15+00.00
EL = 24.65'
VC = 210'
K = 98
DS = 51 MPH

PI = 19+00.00
EL = 32.00'
VC = 370'
K = 90
DS = 51 MPH

PROPOSED GRADE

(–)0.0778%
(–)0.4281%
(–)0.4281%
(–)0.3080%
(–)0.3080%
(+)1.8375%
(+)1.8375%
(–)2.2939%
(–)2.2939%

EXISTING GROUND

SEE SHEETS 14 & 15 FOR –Y2RPD– PLAN

–Y2RPD–

END GRADE
–Y2RPC– STA. 25+89.46
ELEV = 25.90'

PI = 22+30.00
EL = 24.43'
VC = 290'
K = 107
DS = 53 MPH

PROPOSED GRADE

(–)2.2939%
(+)0.4089%
(–) 0.2462%

EXISTING GROUND

BEG DITCH
PI STA 22+50 –Y2RPD– LT
ELEV=21.60

END DITCH
PI STA 25+75 –Y2RPD– LT
ELEV=20.80

SEE SHEET 14 FOR –Y2RPD– PLAN

8/14/2020
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tfreeland

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–Y3–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	57

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–Y3– STA.18+13.02
ELEV = 23.47'

PI = 19+90.00
EL = 24.12'
VC = 240'
K = 313
DS = 75 MPH

PI = 22+20.00
EL = 23.20'
VC = 220'
K = 296
DS > 80 MPH

EXISTING GROUND

PROPOSED GRADE

PI = 28+90.00
EL = 25.50'
VC = 150'
K = 132
DS = 59 MPH

END GRADE
–Y3– STA.30+76.03
ELEV = 27.26'

END DITCH
PI STA 30+66 –Y3– RT
ELEV=23.90

(+)0.3673%
(–)0.4000%
(–)0.4000%
(+)0.3433%
(+)0.3433%
(+)1.4831%
(–)0.3000%
(+)1.4831%
(+)0.3030%
(–) 0.3273%
(+) 0.3030%
(+) 1.0769%
(+) 3.3457%

BEG DITCH
PI STA 20+00 –Y3– LT
ELEV=19.50

PI STA 20+60 –Y3– LT
ELEV=19.30

PI STA 22+25 –Y3– LT
ELEV=19.80

END DITCH
PI STA 22+75 –Y3– LT
ELEV=20.34

BEG DITCH
PI STA 28+58 –Y3– RT
ELEV=18.95

PI STA 30+00 –Y3– RT
ELEV=23.70

PI = 30+20.00
EL = 27.43'
VC = 110'
K = 62
DS = 45 MPH

SEE SHEET 16 FOR –Y3– PLAN

–Y3LPB–

BEGIN GRADE
–Y3LPB– STA.10+00.00
ELEV = 48.27'

PI = 10+80.00
EL = 47.97'
VC = 80'
K = 23
DS = 32 MPH

PI = 11+60.00
EL = 44.91'
VC = 80'
K = 26
DS = 33 MPH

PI = 14+20.00
EL = 27.00'
VC = 100'
K = 26
DS = 25 MPH

END GRADE
–Y3LPB– STA.14+82.96
ELEV = 25.05'

PROPOSED GRADE

EXISTING GROUND

(–)0.3704%
(–)3.8296%
(–)16.8885%
(–)16.8885%
(–)3.0912%

54"

PIPE HYDRAULIC DATA

54" Sta. 14+36 –Y3LPB–

DRAINAGE AREA	= 29	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 95	CFS
DESIGN HW ELEVATION	= 20.9	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 21.3	FT
OVERTOPPING FREQUENCY	= 100 +/–	YRS
OVERTOPPING DISCHARGE	= 100 +/–	CFS
OVERTOPPING ELEVATION	= 21.3	FT

SEE SHEET 16 FOR –Y3LPB– PLAN

–Y3LPC–

BEGIN GRADE
–Y3LPC– STA.10+00.00
ELEV = 48.00'

PI = 10+80.00
EL = 47.36'
VC = 80'
K = 26
DS = 33 MPH

PI = 11+60.00
EL = 44.30'
VC = 80'
K = 26
DS = 33 MPH

END GRADE
–Y3LPC– STA.15+34.87
ELEV = 26.07'

PROPOSED GRADE

PI = 14+10.00
EL = 27.08'
VC = 160'
K = 26
DS = 25 MPH

(–)0.8038%
(–)3.8262%
(–)16.8876%
(–)16.8876%
(–)0.8096%
(–)0.1011%

EXISTING GROUND

BEG DITCH
PI STA 13+12 –Y3LPC– RT
ELEV=19.14

END DITCH
PI STA 15+00 –Y3LPC– RT
ELEV=18.95

SEE SHEET 16 FOR –Y3LPC– PLAN

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tfreeman

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–Y3RPB–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	58

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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BEGIN GRADE
–Y3RPB– STA. 10+00.00
ELEV = 26.18'

PI = 11+03.00
EL = 26.13'
VC = 180'
K = 481
DS > 80 MPH

PI = 13+23.00
EL = 25.20'
VC = 200'
K = 183
DS = 70 MPH

PI = 17+00.00
EL = 27.72'
VC = 210'
K = 582
DS > 80 MPH

PI = 19+41.00
EL = 28.46'
VC = 270'
K = 72
DS = 43 MPH

PROPOSED GRADE

(–)0.0485%
(–)0.4227%
(–)0.4227%
(+)0.6680%
(+)0.6680%
(+)0.3075%
(+)0.3075%
(+)4.0799%

EXISTING GROUND

SEE SHEET 16 FOR –Y3RPB– PLAN

–Y3RPB–

PI = 22+42.00
EL = 40.74'
VC = 215'
K = 19
DS = 30 MPH

PI = 24+36.00
EL = 27.20'
VC = 105'
K = 30
DS = 26 MPH

END GRADE
–Y3RPB– STA. 24+98.51
ELEV = 25.06'

(+)4.0799%
(+)4.0799%
(–)6.9795%
(–)6.9795%
(–)3.4235%

PROPOSED GRADE

EXISTING GROUND

54"

PIPE HYDRAULIC DATA

54" Sta. 24+51 –Y3RPB–

DRAINAGE AREA	=	29	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	95	CFS
DESIGN HW ELEVATION	=	20.9	FT
100 YEAR DISCHARGE	=	100	CFS
100 YEAR HW ELEVATION	=	21.3	FT
OVERTOPPING FREQUENCY	=	100 +/–	YRS
OVERTOPPING DISCHARGE	=	100 +/–	CFS
OVERTOPPING ELEVATION	=	21.3	FT

SEE SHEET 16 FOR –Y3RPB– PLAN

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tlowder

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–Y3RPC–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	59

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BEGIN GRADE
–Y3RPC– STA 10+00.00
ELEV = 26.15'

PI = 12+89.00
EL = 24.70'
VC = 180'
K = 185
DS = 71 MPH

PI = 15+16.00
EL = 25.77'
VC = 150'
K = 116
DS = 55 MPH

PI = 18+30.00
EL = 23.19'
VC = 300'
K = 46
DS = 34 MPH

PROPOSED GRADE

(–)0.50061%
(+)0.4714%
(+)0.4714%
(–)0.8218%
(–)0.8218%
(+)5.7080%
(–) 0.1000%

EXISTING GROUND

BEG DITCH
PI STA 18+60 –Y3RPC– RT
ELEV=19.43

SEE SHEET 16 FOR –Y3RPC– PLAN

–Y3RPC–

PI = 20+85.00
EL = 37.74'
VC = 210'
K = 20
DS = 30 MPH

END GRADE
–Y3RPC– STA 24+19.14
ELEV = 26.28'

(+)5.7080%
(–)4.8892%
PROPOSED GRADE
(–)4.8892%
(–)0.8000%
(–) 0.1000%

PI = 23+00.00
EL = 27.23'
VC = 220'
K = 54
DS = 37 MPH

EXISTING GROUND

END DITCH
PI STA 21+50 –Y3RPC– RT
ELEV=19.14

SEE SHEET 16 FOR –Y3RPC– PLAN

8/14/2020
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tlowder

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–Y4–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	60

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

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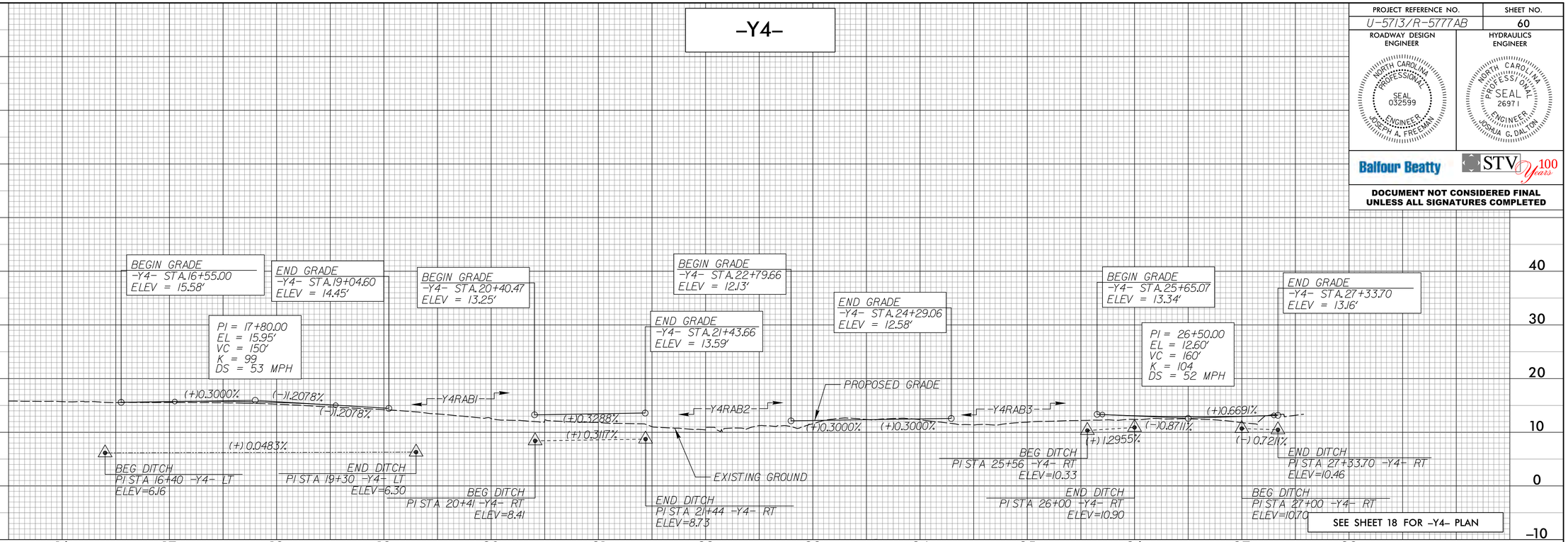

SEE SHEET 18 FOR –Y4– PLAN

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lrodgers

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	61

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y4RPA–

BEGIN GRADE
–Y4RPA– STA.10+00.35
ELEV = 11.85'

PI = 10+99.00
EL = 11.43'
VC = 193'
K = 233
DS > 80 MPH

PI = 12+78.00
EL = 12.15'
VC = 165'
K = 2358
DS > 80 MPH

PI = 15+85.00
EL = 13.17'
VC = 150'
K = 167
DS = 62 MPH

PI = 18+50.00
EL = 11.67'
VC = 150'
K = 171
DS = 68 MPH

(–)0.4268% (+)0.4022% (+)0.4022% (+)0.3322% (+)0.3322% (–)0.5660% (–)0.5660% (+)0.3136%

PROPOSED GRADE

EXISTING GROUND

(+) 2.0000%

END DITCH
PI STA 11+16 –Y4RPC– RT
ELEV=5.00

BEG DITCH
PI STA 10+41 –Y4RPC– RT
ELEV=3.50

SEE SHEET 18 FOR –Y4RPA– PLAN

–Y4RPA–

END GRADE
–Y4RPA– STA.25+24.48
ELEV = 12.31'

PI = 22+90.00
EL = 13.05'
VC = 460'
K = 731
DS > 80 MPH

PROPOSED GRADE

(+)0.3136% (–)0.3156%

EXISTING GROUND

SEE SHEET 18 FOR –Y4RPA– PLAN

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lfreeland

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	62

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y4RPB–

BEGIN GRADE
–Y4RPB– STA. 10+00.00
ELEV = 23.24'

PI = 10+75.00
EL = 22.53'
VC = 150'
K = 642
DS > 80 MPH

(–)0.9467%

(–)1.1803%

PI = 14+30.00
EL = 18.34'
VC = 508'
K = 132
DS = 59 MPH

PROPOSED GRADE

(–)1.1803%

(+)2.6821%

EXISTING GROUND

PI = 18+96.00
EL = 30.84'
VC = 343'
K = 44
DS = 40 MPH

(+)2.6821%

(–)5.1294%

END GRADE
–Y4RPB– STA. 22+88.55
ELEV = 12.69'

PI = 22+35.00
EL = 13.45'
VC = 100'
K = 27
DS = 25 MPH

(–)5.1294%

(–)1.4192%

(–) 0.3121%

BEG DITCH
PI STA 21+10 –Y4RPB– LT
ELEV=9.10

END DITCH
PI STA 23+30 –Y4RPB– LT
ELEV=8.73

SEE SHEETS 17 & 18 FOR –Y4RPB– PLAN

–Y4RPC–

BEGIN GRADE
–Y4RPC– STA. 9+23.90
ELEV = 19.18'

PI = 11+90.00
EL = 15.67'
VC = 468'
K = 130
DS = 59 MPH

(–)1.3185%

(+)2.2940%

EXISTING GROUND

PI = 16+90.00
EL = 27.14'
VC = 532'
K = 85
DS = 50 MPH

(+)2.2940%

(–)3.9971%

PROPOSED GRADE

(–) 0.3125%

BEG DITCH
PI STA 16+00 –Y4RPC– RT
ELEV=7.80

END DITCH
PI STA 19+20 –Y4RPC– RT
ELEV=6.80

PI = 20+31.00
EL = 13.51'
VC = 150'
K = 49
DS = 35 MPH

(–)3.9971%

(–)0.9665%

(–) 0.6452%

END GRADE
–Y4RPC– STA. 21+11.86
ELEV = 12.73'

END DITCH
PI STA 21+12 –Y4RPC– RT
ELEV=10.20

BEG DITCH
PI STA 20+50 –Y4RPC– RT
ELEV=10.60

SEE SHEETS 17 & 18 FOR –Y4RPC– PLAN

8/14/2020
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tmcdonald

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	63

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y4RPD–

BEGIN GRADE
–Y4RPD– STA.10+00.00
ELEV = 13.29'

PI = 12+15.00
EL = 14.02'
VC = 380'
K = 4245
DS > 80 MPH

PROPOSED GRADE

(+)0.3410%

(+)0.4305%

PI = 18+90.00
EL = 16.93'
VC = 150'
K = 101
DS = 53 MPH

(+)0.4305%

(–)1.0594%

EXISTING GROUND

SEE SHEETS 18 & 19 FOR –Y4RPD– PLAN

–Y4RPD–

PI = 23+33.25
EL = 12.23'
VC = 420'
K = 283
DS > 80 MPH

(–)1.0594%

(+)0.4239%

PROPOSED GRADE

PI = 26+83.25
EL = 13.71'
VC = 150'
K = 159
DS = 61 MPH

(+)0.4239%

(–)0.5222%

END GRADE
–Y4RPD– STA.28+73.52
ELEV = 12.72'

(–) 0.2000%

(–) 0.0909%

(+) 0.4444%

BEG DITCH
PI STA 21+75 –Y4RPD– LT
ELEV=7.80

EXISTING GROUND

END DITCH
PI STA 23+75 –Y4RPD– LT
ELEV=7.40

BEG DITCH
PI STA 25+50 –Y4RPD– LT
ELEV=7.10

END DITCH
PI STA 26+60 –Y4RPD– LT
ELEV=7.00

END DITCH
PI STA 27+50 –Y4RPD– LT
ELEV=7.40

SEE SHEETS 18 & 19 FOR –Y4RPD– PLAN

8/14/2020
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kfreeman01

Submitted 9/16/2020

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	64

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty | STV 100 Years

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–SRY21A–

PIPE HYDRAULIC DATA

42" Sta. 13+54 –SRY21A–

DRAINAGE AREA	= 14	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 32	CFS
DESIGN HW ELEVATION	= 22.5	FT
100 YEAR DISCHARGE	= 40	CFS
100 YEAR HW ELEVATION	= 23.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 58	CFS
OVERTOPPING ELEVATION	= 24.3	FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 340	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 16.3	FT
BASE DISCHARGE	= 410	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 17.0	FT
OVERTOPPING DISCHARGE	= > 490	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 21.5	FT

BEGIN GRADE
–SRY21A– STA.10+26.93
ELEV = 24.21'

PI = 11+49.00
EL = 23.83'
VC = 102'
K = 51
DS = 51 MPH

PI = 13+50.00
EL = 27.25'
VC = 200'
K = 88
DS = 51 MPH

PI = 24+00.00
EL = 21.20'
VC = 400'
K = 440
DS > 80 MPH

(–)0.3088%
(+)1.7000%
(+)1.7000%
(–)0.5762%
(–)0.5762%
42"
PROPOSED GRADE
EXISTING GROUND
1@10'x7' RCBC W/1FT SILLS

SEE SHEET 8 FOR –SRY21A– PLAN

–SRY21A–

PI = 24+00.00
EL = 21.20'
VC = 400'
K = 440
DS > 80 MPH

(+)0.3333%
(+)0.3333%
PROPOSED GRADE
EXISTING GROUND

SEE SHEETS 8 & 9 FOR –SRY21A– PLAN

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tcrowell

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	65

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–SRY21A–

PI = 42+00.00
EL = 27.20'
VC = 400'
K = 295
DS = 74 MPH

(+)0.3333%
(–)1.0235%
(+) 0.4167%

BEG DITCH
PI STA 40+60 –SRY21A– LT
ELEV=19.50

END DITCH
PI STA 43+00 –SRY21A– LT
ELEV=20.50

PROPOSED GRADE

PI = 50+50.00
EL = 18.50'
VC = 500'
K = 179
DS = 70 MPH

EXISTING GROUND

(–)1.0235%
(+)1.7708%
(–) 0.4167%

BEG DITCH
PI STA 51+50 –SRY21A– LT
ELEV=7.90

SEE SHEETS 9 & 10 FOR –SRY21A– PLAN

–SRY21A–

PI = 55+30.00
EL = 27.00'
VC = 460'
K = 206
DS = 66 MPH

(+)1.7708%
(–)0.4634%

EXISTING GROUND

PROPOSED GRADE

PI = 59+70.00
EL = 24.96'
VC = 100'
K = 131
DS = 59 MPH

(–)0.4634%
(+)0.3000%

END GRADE
–SRY21A– STA 64+83.00
ELEV = 26.50'

(–) 0.3143%

(–) 0.4167%
(+) 1.4563%

END DITCH
PI STA 53+68 –SRY21A– LT
ELEV=9.10

BEG DITCH
PI STA 52+66 –SRY21A– LT
ELEV=7.60

END DITCH
PI STA 52+22 –SRY21A– LT
ELEV=7.60

BEG DITCH
PI STA 61+00 –SRY21A– LT
ELEV=21.10

END DITCH
PI STA 64+50 –SRY21A– LT
ELEV=20.00

SEE SHEETS 10 & 11 FOR –SRY21A– PLAN

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–SRY21B–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	66

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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BEGIN GRADE
–SRY21B– STA. 15+00.00
ELEV = 26.50'

BEG DITCH
PI STA 15+00 –SRY21B– RT
ELEV=25.20

PROPOSED GRADE

PI STA 14+50 –SRY21B– RT
BEG DITCH
ELEV=23.20

(–) 0.3000%

PI STA 16+50 –SRY21B– LT
ELEV=22.60

(–) 0.2000%

EXISTING GROUND

(–) 0.1302%

PI = 23+50.00
EL = 29.05'
VC = 200'
K = 309
DS > 80 MPH

PI STA 22+68 –SRY21B– RT
ELEV=24.20

(+)0.3000%

(–)0.3410%

SEE SHEETS 6 & 7 FOR –SRY21B– PLAN

–SRY21B–

PIPE HYDRAULIC DATA
36" Sta. 27+71 –SRY21B–

DRAINAGE AREA	= 29	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 41	CFS
DESIGN HW ELEVATION	= 23.6	FT
100 YEAR DISCHARGE	= 50	CFS
100 YEAR HW ELEVATION	= 24.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 81	CFS
OVERTOPPING ELEVATION	= 26.5	FT

END DITCH
PI STA 25+00.32 –SRY21B– RT
ELEV=24.90

(–) 0.2000%

36"

END DITCH
PI STA 27+50 –SRY21B– LT
ELEV=20.40

(+) 0.9000%

EXISTING GROUND

BEG DITCH
PI STA 28+50 –SRY21B– RT
ELEV=20.50

(–)0.3470%

(+)1.2008%

PI = 31+00.00
EL = 26.45'
VC = 160'
K = 103
DS = 51 MPH

END DITCH
PI STA 31+50 –SRY21B– RT
ELEV=23.20

(+)1.2008%

(–)1.4111%

PI = 34+00.00
EL = 30.05'
VC = 240'
K = 92
DS = 51 MPH

(–)1.4111%

(+)0.5058%

PI = 36+20.00
EL = 26.95'
VC = 200'
K = 104
DS = 52 MPH

BEG DITCH
PI STA 36+00 –SRY21B– LT
ELEV=22.80

PROPOSED GRADE

(–) 0.5263%

SEE SHEETS 7 & 8 FOR –SRY21B– PLAN

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tlewis

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–SRY21B–

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U-5713/R-5777AB	67

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 Years

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PI = 40+40.00
EL = 29.07'
VC = 230'
K = 137
DS = 58 MPH

(+)0.5058%

(–)11.7726%

PROPOSED GRADE

18"

(–) 0.5263%

END DITCH
PI STA 39+42 –SRY21B– LT
ELEV=21.00

EXISTING GROUND

END GRADE
–SRY21B– STA. 43+18.57
ELEV = 25.79'

PIPE HYDRAULIC DATA

18" Sta. 39+49 –SRY21B–

DRAINAGE AREA	=	1.7	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	6	CFS
DESIGN HW ELEVATION	=	23.4	FT
100 YEAR DISCHARGE	=	7	CFS
100 YEAR HW ELEVATION	=	23.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	16	CFS
OVERTOPPING ELEVATION	=	25.6	FT

SEE SHEET 8 FOR –SRY21B– PLAN

–SRY21B2–

BEGIN GRADE
–SRY21B2– STA.10+14.00
ELEV = 28.38'

PI = 11+10.00
EL = 26.00'
VC = 154'
K = 96
DS = 50 MPH

(–)12.4792%

(–)0.8750%

PROPOSED GRADE

EXISTING GROUND

END GRADE
–SRY21B2– STA.12+00.32
ELEV = 25.21'

SEE SHEET 8 FOR –SRY21B2– PLAN

–SRY21C–

(–) 1.0556%

BEG. DITCH
PI STA 10+50 –SRY21C– LT
ELEV=23.40

SEE SHEET 4 FOR –SRY21C– PLAN

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–SRY21C–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	68

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

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BEGIN GRADE
–SRY21C– STA.12+70.00
ELEV = 26.51'

PROPOSED GRADE

PI = 16+00.00
EL = 25.52'
VC = 400'
K = 412
DS > 80 MPH

(–) 1.0556%

(+) 5.7692%

(–)0.3000%

(+)0.6700%

(+)0.3000%

EXISTING GROUND

PI STA 13+00 –SRY21C– LT
ELEV=22.50

BEG DITCH
PI STA 12+74 –SRY21C– LT
ELEV=21.00

END DITCH
PI STA 12+30 –SRY21C– LT
ELEV=21.50

PI STA 18+00 –SRY21C– LT
ELEV=24.00

PI STA 21+00 –SRY21C– LT
ELEV=26.40

PI = 20+00.00
EL = 28.20'
VC = 200'
K = 661
DS > 80 MPH

(+)0.8000%

(+)0.6700%

(+)0.3675%

BEG DITCH
PI STA 17+66 –SRY21C– RT
ELEV=20.80

(+) 0.6000%

(+)0.3270%

END DITCH
PI STA 22+00 –SRY21C– LT
ELEV=27.00

BEG DITCH
PI STA 23+00 –SRY21C– LT
ELEV=27.00

PI = 24+00.00
EL = 29.67'
VC = 200'
K = 300
DS = 74 MPH

(+)0.3675%

(–)0.3000%

(–) 0.1346%

END DITCH
PI STA 25+00 –SRY21C– RT
ELEV=23.20

SEE SHEETS 5 & 6 FOR –SRY21C– PLAN

–SRY21C–

PI = 27+00.00
EL = 28.77'
VC = 400'
K = 667
DS > 80 MPH

(–)0.3000%

(+)0.3000%

PI = 29+60.00
EL = 29.55'
VC = 120'
K = 103
DS = 53 MPH

(+)0.3000%

(–)0.8638%

EXISTING GROUND

(–) 0.1346%

(–)0.8638%

PI = 31+95.00
EL = 27.52'
VC = 350'
K = 176
DS = 69 MPH

(+)1.1279%

PI = 35+00.00
EL = 30.96'
VC = 260'
K = 115
DS = 55 MPH

(+)1.1279%

(–)1.1314%

(+) 0.5556%

PI STA 34+14 –SRY21C– LT
ELEV=25.50

END DITCH
PI STA 34+50 –SRY21C– LT
ELEV=25.70

BEG DITCH
PI STA 36+00 –SRY21C– LT
ELEV=25.20

PROPOSED GRADE

(–) 0.4000%

BEG DITCH
PI STA 36+00 –SRY21C– RT
ELEV=23.60

PI STA 38+00 –SRY21C– RT
ELEV=22.80

PI STA 38+85 –SRY21C– RT
ELEV=20.40

PI STA 40+00 –SRY21C– LT
ELEV=24.00

PI = 38+50.00
EL = 27.00'
VC = 120'
K = 84
DS = 46 MPH

(–)1.1314%

(+)0.3031%

(–) 0.3000%

(–) 2.8235%

(–) 0.1792%

SEE SHEETS 6 & 7 FOR –SRY21C– PLAN

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kfreeman

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–SRY21C–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	69

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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PI STA 40+00 –SRY21C– LT
ELEV=24.00

PI = 41+75.00
EL = 27.99'
VC = 160'
K = 265
DS = 72 MPH

END DITCH
PI STA 43+00 –SRY21C– LT
ELEV=24.50

PROPOSED GRADE

(+)0.3031%

(–)0.3000%

(+) 0.1667%

(–) 0.1792%

PI = 46+70.00
EL = 26.50'
VC = 640'
K = 1067
DS > 80 MPH

(–)0.3000%

(+)0.3000%

EXISTING GROUND

PI = 51+00.00
EL = 27.79'
VC = 220'
K = 338
DS = 77 MPH

(+)0.3000%

(–)0.3500%

END DITCH
PI STA 46+70 –SRY21C– RT
ELEV=19.00

SEE SHEETS 7 & 8 FOR –SRY21C– PLAN

–SRY21C–

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 340	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 19.7	FT
BASE DISCHARGE	= 300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 21.6	FT
OVERTOPPING DISCHARGE	= > 370	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 24.8	FT

PIPE HYDRAULIC DATA

24" Sta. 66+00 –SRY21C–

DRAINAGE AREA	= 3.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 22.7	FT
100 YEAR DISCHARGE	= 18	CFS
100 YEAR HW ELEVATION	= 23.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 26	CFS
OVERTOPPING ELEVATION	= 24.0	FT

(–)0.3500%

EXISTING GROUND

PI STA 58+70 –SRY21C– RT
ELEV=15.20

BEG DITCH

(–) 0.1200%

PI STA 61+20 –SRY21C– RT
ELEV=14.90

END DITCH

1@9'x6' RCBC W/1FT SILLS

PI STA 61+60 –SRY21C– LT
ELEV=19.00

BEG DITCH

PI = 61+00.00
EL = 24.29'
VC = 200'
K = 306
DS > 80 MPH

(–)0.3500%

(+)0.3046%

(+)0.3046%

(+) 1.0714%

PI STA 63+00 –SRY21C– LT
ELEV=20.50

END DITCH

PI = 63+40.00
EL = 25.02'
VC = 280'
K = 459
DS > 80 MPH

(–)0.3060%

PI STA 64+50 –SRY21C– RT
ELEV=21.20

BEG DITCH

PROPOSED GRADE

24"

(–) 0.4000%

(+) 1.5385%

END GRADE
–SRY21C– STA.66+54.08
ELEV = 24.06'

END DITCH
PI STA 66+26 –SRY21C– RT
ELEV=21.00

PI STA 66+00 –SRY21C– RT
ELEV=20.60

SEE SHEET 8 FOR –SRY21C– PLAN

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–SRY21C2–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	70

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–SRY21C2– STA.10+14.59
ELEV = 29.95'

PI = 11+60.00
EL = 30.39'
VC = 280'
K = 429
DS > 80 MPH

(+)0.3026%

(–)0.3500%

EXISTING GROUND

PI = 15+00.00
EL = 29.20'
VC = 400'
K = 585
DS > 80 MPH

(–)0.3500%

(+)0.3333%

BEG DITCH
PI STA 15+50 –SRY21C2– LT
ELEV=25.00

BEG DITCH
PI STA 17+50 –SRY21C2– RT
ELEV=26.70

(+)0.3333%

(+) 0.2000%

PI = 18+00.00
EL = 30.20'
VC = 200'
K = 284
DS = 73 MPH

(–)0.3718%

(–) 0.2444%

PROPOSED GRADE

END DITCH
PI STA 21+00 –SRY21C2– LT
ELEV=25.90

(+) 0.1000%

PI STA 19+00 SRY21C2 LT
ELEV=25.70

END GRADE
–SRY21C2– STA.22+41.60
ELEV = 28.93'

PI = 21+90.00
EL = 28.75'
VC = 100'
K = 139
DS = 61 MPH

(–)0.3718% (+)0.3489%

END DITCH
PI STA 22+00 –SRY21C2– RT
ELEV=25.60

SEE SHEETS 6 & 21 FOR –SRY21C2– PLAN

–SRS1–

BEGIN GRADE
–SRS1– STA.10+14.00
ELEV = 25.17'

(–)1.0573%

END GRADE
–SRS1– STA.11+19.42
ELEV = 24.05'

SEE SHEET 8 FOR –SRS1– PLAN

–SRS2–

BEGIN GRADE
–SRS2– STA.10+14.01
ELEV = 25.04'

(–)1.2390%

END GRADE
–SRS2– STA.11+13.87
ELEV = 23.80'

SEE SHEET 11 FOR –SRS2– PLAN

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–SRY21D–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	71

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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PIPE HYDRAULIC DATA
24" Sta. 10+74 –SRY21D–

DRAINAGE AREA	= 5.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 22.7	FT
100 YEAR DISCHARGE	= 18	CFS
100 YEAR HW ELEVATION	= 23.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 27	CFS
OVERTOPPING ELEVATION	= 24.3	FT

PIPE HYDRAULIC DATA
18" Sta. 18+66 –SRY21D–

DRAINAGE AREA	= 1.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 4	CFS
DESIGN HW ELEVATION	= 22.5	FT
100 YEAR DISCHARGE	= 4.8	CFS
100 YEAR HW ELEVATION	= 22.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 12	CFS
OVERTOPPING ELEVATION	= 23.8	FT

BEGIN GRADE
–SRY21D– STA.10+22.75
ELEV = 24.01'

PI = 11+50.00
EL = 24.46'
VC = 120'
K = 82
DS = 46 MPH

PI = 14+00.00
EL = 29.00'
VC = 100'
K = 36
DS = 37 MPH

PI = 16+70.00
EL = 26.34'
VC = 100'
K = 75
DS = 43 MPH

PI = 20+00.00
EL = 27.50'
VC = 400'
K = 470
DS > 80 MPH

(–) 0.2439% (+)0.3571% (+)1.8142% (+) 0.9292% (+)1.8142% (–)0.9845% (–)0.9845% (+)0.3510% (–) 0.4206% (–) 0.5000% (–) 2.4000% (+)0.3510% (–)0.5000%

PROPOSED GRADE

EXISTING GROUND

BEG DITCH
PI STA 10+33 –SRY21D– RT
ELEV=20.70

PI STA 10+74 –SRY21D– RT
ELEV=20.60

END DITCH
PI STA 13+00 –SRY21D– RT
ELEV=22.70

BEG DITCH
PI STA 15+00 –SRY21D– RT
ELEV=24.00

PI STA 16+50 –SRY21D– RT
ELEV=22.30

BEG DITCH
PI STA 16+50 –SRY21D– LT
ELEV=22.00

END DITCH
PI STA 18+64 –SRY21D– RT
ELEV=21.40

PI STA 18+50 –SRY21D– LT
ELEV=21.00

END DITCH
PI STA 19+50 –SRY21D– LT
ELEV=18.60

SEE SHEET 8 FOR –SRY21D– PLAN

–SRY21D–

PI = 28+00.00
EL = 23.50'
VC = 400'
K = 406
DS > 80 MPH

PI = 35+00.00
EL = 26.90'
VC = 600'
K = 632
DS > 80 MPH

PROPOSED GRADE

EXISTING GROUND

(–)0.5000% (+)0.4857% (+)0.3451% (+)0.4857% (–)0.4636% (–) 0.4000%

BEG DITCH
PI STA 26+99 –SRY21D– RT
ELEV=11.30

END DITCH
PI STA 28+43.88 –SRY21D– RT
ELEV=11.80

BEG DITCH
PI STA 34+03.88 –SRY21D– RT
ELEV=21.80

SEE SHEETS 8 & 9 FOR –SRY21D– PLAN

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–SRY21D–

END GRADE
–SRY21D– STA. 38+30.00
ELEV = 25.37'

PROPOSED GRADE
(–)0.4636%
(+) 0.5000%
PI STA 36+03.88 –SRY21D– RT
ELEV=21.00
END DITCH
PI STA 38+03.88 –SRY21D– RT
ELEV=22.00
EXISTING GROUND

SEE SHEET 9 FOR –SRY21D– PLAN

–SRS1A–

BEGIN GRADE
–SRS1A– STA. 10+18.32
ELEV = 24.36'

END GRADE
–SRS1A– STA. 11+24.13
ELEV = 24.04'

(–)0.3000%

SEE SHEET 8 FOR –SRS1A– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	72

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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lfreeman

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	73

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–SRY22A–

PIPE HYDRAULIC DATA
18" Sta. 10+67 –SRY22A–

DRAINAGE AREA	= 1.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 8	CFS
DESIGN HW ELEVATION	= 22.5	FT
100 YEAR DISCHARGE	= 9	CFS
100 YEAR HW ELEVATION	= 22.7	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 19	CFS
OVERTOPPING ELEVATION	= 26.0	FT

PIPE HYDRAULIC DATA
72" Sta. 15+19 –SRY22A–

DRAINAGE AREA	= 52	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 110	CFS
DESIGN HW ELEVATION	= 20.8	FT
100 YEAR DISCHARGE	= 140	CFS
100 YEAR HW ELEVATION	= 21.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= >160	CFS
OVERTOPPING ELEVATION	= 25.1	FT

BEGIN GRADE
–SRY22A– STA.10+23.03
ELEV = 26.52'

PI = 12+20.00
EL = 25.00'
VC = 200'
K = 187
DS = 71 MPH

PI = 14+50.00
EL = 25.69'
VC = 260'
K = 418
DS > 80 MPH

PI = 18+50.00
EL = 24.40'
VC = 540'
K = 784
DS > 80 MPH

PROPOSED GRADE
EXISTING GROUND
(–)0.7717%
(+)0.3000%
(–)0.3243%
(+)0.3000%
(–)0.3225%
(+)0.1818%
(–)0.3225%
(+)0.3663%
(+)0.1768%
18"
72"

BEG DITCH
PI STA 10+80 –SRY22A– LT
ELEV=19.40

END DITCH
PI STA 14+50 –SRY22A– LT
ELEV=18.20

BEG DITCH
PI STA 15+10 –SRY22A– LT
ELEV=18.10

PI STA 19+50 –SRY22A– LT
ELEV=18.90

SEE SHEET 11 FOR –SRY22A– PLAN

–SRY22A–

PIPE HYDRAULIC DATA
30" Sta. 27+16 –SRY22A–

DRAINAGE AREA	= 3.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 18	CFS
DESIGN HW ELEVATION	= 22.7	FT
100 YEAR DISCHARGE	= 22	CFS
100 YEAR HW ELEVATION	= 23.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 39	CFS
OVERTOPPING ELEVATION	= 25.4	FT

PI = 24+98.00
EL = 26.77'
VC = 100'
K = 148
DS = 60 MPH

PI = 32+18.00
EL = 24.55'
VC = 200'
K = 156
DS = 65 MPH

END GRADE
–SRY22A– STA.33+36.45
TIE TO BEGIN GRADE
–SRI– STA.10+00.00
ELEV = 25.70'

PROPOSED GRADE
EXISTING GROUND
(+)0.3663%
(–)0.3088%
(+)0.1768%
(–)0.3088%
(+)0.9704%
30"

END DITCH
PI STA 32+51.03 –SRY22A– LT
ELEV=21.20

SEE SHEETS 11 & 12 FOR –SRY22A– PLAN

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–SRY22D–

BEGIN GRADE
–SRY22D– STA.10+22.75
ELEV = 25.62'

BEG DITCH
PI STA 10+50 –SRY22D– LT
ELEV=20.00

(+) 0.4667%

BEG DITCH
PI STA 13+00 –SRY22D– RT
ELEV=22.40

PI = 14+30.00
EL = 30.50'
VC = 240'
K = 121
DS = 56 MPH

(+)1.1983%

(–)0.7872%

END DITCH
PI STA 15+00 –SRY22D– LT
ELEV=22.10

PROPOSED GRADE

EXISTING GROUND

(–) 0.3297%

PI = 19+00.00
EL = 26.80'
VC = 500'
K = 460
DS > 80 MPH

(–)0.7872%

(+)0.3000%

PI STA 18+45.88 –SRY22D– RT
ELEV=20.60

(+) 0.2000%

SEE SHEET 11 FOR –SRY22D– PLAN

–SRY22D–

PI = 26+00.00
EL = 28.90'
VC = 900'
K = 1492
DS > 80 MPH

(+)0.3000%

(–)0.3032%

(+) 0.2000%

EXISTING GROUND

PROPOSED GRADE

END GRADE
–SRY22D– STA.33+41.34
TIE TO BEGIN GRADE
–SR7– STA.10+00.00
ELEV = 26.65'

END DITCH
PI STA 32+95.76 –SRY22D– RT
ELEV=23.50

SEE SHEETS 11 & 12 FOR –SRY22D– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	74

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 Years

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–SR1–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	75

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–SRI– STA.10+00.00
TIE TO END GRADE
–SRY22A– STA.33+36.45
ELEV = 25.70'

PI = 11+30.00
EL = 26.93'
VC = 220'
K = 172
DS = 63 MPH

PI = 14+00.00
EL = 26.05'
VC = 320'
K = 424
DS > 80 MPH

PI = 16+70.00
EL = 27.20'
VC = 220'
K = 302
DS = 74 MPH

PI = 19+05.00
EL = 26.50'
VC = 250'
K = 336
DS > 80 MPH

PI = 21+30.00
EL = 27.50'
VC = 100'
K = 130
DS = 57 MPH

PROPOSED GRADE

EXISTING GROUND

(+)0.9500% (–)0.3278% (–)0.3278% (+)0.4278% (+)0.4278% (–)0.3000% (–)0.3000% (+)0.4444% (+)0.4444% (–)0.3263% (–)0.3263%

(–) 0.4054% (–) 0.3047% (–) 0.6087%

36" 48"

BEG DITCH
PI STA 10+10 –SRI– LT
ELEV=21.20

PI STA 10+84 –SRI– LT
ELEV=20.90

END DITCH
PI STA 14+45 –SRI– LT
ELEV=19.80

BEG DITCH
PI STA 20+10 –SRI– LT
ELEV=22.20

END DITCH
PI STA 21+25 –SRI– LT
ELEV=21.50

PIPE HYDRAULIC DATA

36" Sta. 10+84 –SRI–

DRAINAGE AREA	= 5.2	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 32	CFS
DESIGN HW ELEVATION	= 24.3	FT
100 YEAR DISCHARGE	= 32	CFS
100 YEAR HW ELEVATION	= 24.3	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= >40	CFS
OVERTOPPING ELEVATION	= 24.8	FT

PIPE HYDRAULIC DATA

48" Sta. 13+95 –SR7–

DRAINAGE AREA	= 38.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 85	CFS
DESIGN HW ELEVATION	= 24.4	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 25.1	FT
OVERTOPPING FREQUENCY	= +/–25	YRS
OVERTOPPING DISCHARGE	= +/–85	CFS
OVERTOPPING ELEVATION	= 24.2	FT

SEE SHEETS 12 & 13 FOR –SR1– PLAN

–SR1–

PI = 24+15.00
EL = 26.57'
VC = 360'
K = 573
DS > 80 MPH

PI = 26+40.00
EL = 27.25'
VC = 90'
K = 127
DS = 57 MPH

PI = 29+00.00
EL = 26.20'
VC = 300'
K = 426
DS > 80 MPH

PI = 31+80.00
EL = 27.04'
VC = 200'
K = 243
DS = 70 MPH

PI = 35+00.00
EL = 25.36'
VC = 300'
K = 364
DS > 80 MPH

PROPOSED GRADE

EXISTING GROUND

(+)0.3022% (–)0.4038% (–)0.4038% (+)0.3000% (+)0.3000% (–)0.5236% (–)0.5236% (+)0.3012%

(–) 0.3333%

BEG DITCH
PI STA 24+50 –SRI– LT
ELEV=22.80

END DITCH
PI ST2 26+30 –SRI– LT
ELEV=22.20

SEE SHEETS 13 & 14 FOR –SR1– PLAN

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–SR1–

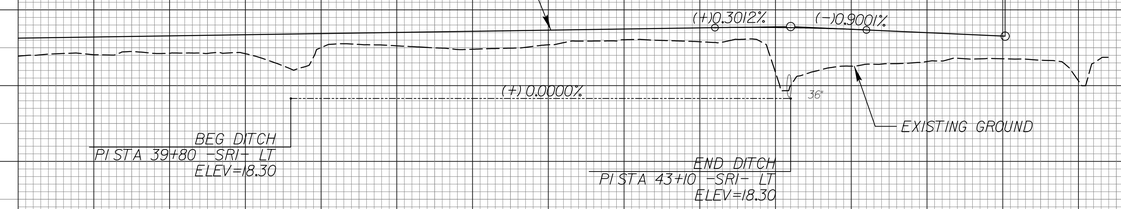
PIPE HYDRAULIC DATA

36" Sta. 43+09 –SR1–

DRAINAGE AREA	= 8.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 35	CFS
DESIGN HW ELEVATION	= 21.5	FT
100 YEAR DISCHARGE	= 42	CFS
100 YEAR HW ELEVATION	= 21.9	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 250	CFS
OVERTOPPING ELEVATION	= 26.3	FT

PI = 43+10.00
EL = 27.80'
VC = 100'
K = 83
DS = 49 MPH

END GRADE
–SR1– STA. 44+51.57
ELEV = 26.53'



70 60 50 40 30 20 10 0 –10 –20

38 39 40 41 42 43 44 45 46

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	76

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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SEE SHEET 14 FOR –SR1– PLAN

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–SR2–

PIPE HYDRAULIC DATA

36" Sta. 13+72 –SR2–

DRAINAGE AREA	= 8.0	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 39	CFS
DESIGN HW ELEVATION	= 22.4	FT
100 YEAR DISCHARGE	= 46	CFS
100 YEAR HW ELEVATION	= 22.8	FT
OVERTOPPING FREQUENCY	= 500±	YRS
OVERTOPPING DISCHARGE	= >55	CFS
OVERTOPPING ELEVATION	= 25.3	FT

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	77

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–SR2– STA.10+65.78
ELEV = 25.50'

PI = 11+50.00
EL = 25.10'
VC = 100'
K = 76
DS = 44 MPH

PI = 13+75.00
EL = 27.00'
VC = 200'
K = 117
DS = 55 MPH

PI = 16+70.00
EL = 24.46'
VC = 325'
K = 278
DS > 80 MPH

PI = 20+00.00
EL = 25.47'
VC = 100'
K = 153
DS = 60 MPH

PROPOSED GRADE

(+)0.8444%
(–)0.8610%
(–)0.4749%
(+)0.8444%
(–)0.8610%
(+)0.3061%
(+) 0.3577%
(+)0.3061%
(–)0.3457%

EXISTING GROUND

36"

BEG DITCH
PI STA 14+15 –SR2– LT
ELEV=19.40

END DITCH
PI STA 20+30 –SR2– LT
ELEV=21.60

SEE SHEET 14 FOR –SR2– PLAN

–SR2–

PI = 23+50.00
EL = 24.26'
VC = 100'
K = 155
DS = 65 MPH

PI = 24+50.00
EL = 24.56'
VC = 100'
K = 137
DS = 58 MPH

PI = 29+83.00
EL = 22.26'
VC = 800'
K = 869
DS > 80 MPH

PROPOSED GRADE

(+)0.3000%
(–)0.4315%
(–)0.3457%
(+)0.3000%
(–) 0.3000%
(–)0.4315%
(+)0.4894%
(–) 0.5741%
(+) 0.9524%

BEG DITCH
PI STA 21+00 –SR2– LT
ELEV=21.30

PI STA 25+00 –SR2– LT
ELEV=20.10

EXISTING GROUND

PI STA 30+40 –SR2– LT
ELEV=17.00

END DITCH
PI STA 34+60 –SR2– LT
ELEV=21.00

SEE SHEETS 14 & 15 FOR –SR2– PLAN

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–SR2–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	78

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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PI = 36+45.00
EL = 25.50'
VC = 200'
K = 252
DS = 70 MPH

(+)0.4894%
(–)0.3030%
(–) 0.6498%
(+) 1.0692%
(–) 0.4359%
(–) 1.3440%
(+)1.1621%
(–)0.3030%

BEG DITCH
PI STA 37+56 –SR2– LT
ELEV=21.69

END DITCH
PI STA 41+70 –SR2– LT
ELEV=19.00

BEG DITCH
PI STA 41+91 –SR2– LT
ELEV=19.00

END DITCH
PI STA 43+50 SR2 LT
ELEV=20.70

BEG DITCH
PI STA 46+50 –SR2– RT
ELEV=19.00

BEG DITCH
PI STA 47+00 –SR2– LT
ELEV=18.15

END DITCH
PI STA 48+95 –SR2– LT
ELEV=17.30

PI STA 49+00 –SR2– RT
ELEV=15.64

PROPOSED GRADE

EXISTING GROUND

PI = 48+10.00
EL = 21.97'
VC = 100'
K = 68
DS = 42 MPH

SEE SHEETS 15 & 16 FOR –SR2– PLAN

–SR2–

PIPE HYDRAULIC DATA

54" Sta. 49+00 –SR2–

DRAINAGE AREA	= 33	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 90	CFS
DESIGN HW ELEVATION	= 19.7	FT
100 YEAR DISCHARGE	= 110	CFS
100 YEAR HW ELEVATION	= 20.2	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= >150	CFS
OVERTOPPING ELEVATION	= 22.1	FT

END GRADE
–SR2– STA.54+74.99
ELEV = 23.24'

PI = 50+50.00
EL = 24.76'
VC = 100'
K = 66
DS = 44 MPH

(+)1.1621%
(–)0.3573%
(+) 1.3481%
(+) 0.0962%
(+) 0.0989%

PROPOSED GRADE

EXISTING GROUND

54"

BEG DITCH
PI STA 49+07 –SR2– LT
ELEV=17.80

END DITCH
PI STA 50+42 –SR2– LT
ELEV=19.62

END DITCH
PI STA 50+04 –SR2– RT
ELEV=15.74

PI STA 49+00 –SR2– RT
ELEV=15.64

BEG DITCH
PI STA 51+47 –SR2– RT
ELEV=16.18

END DITCH
PI STA 54+10 –SR5– RT
ELEV=16.44

SEE SHEET 16 FOR –SR2– PLAN

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	79

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–SR3–

PIPE HYDRAULIC DATA

24" Sta. 15+34 –SR3–

DRAINAGE AREA	=	3.1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	14	CFS
DESIGN HW ELEVATION	=	20.5	FT
100 YEAR DISCHARGE	=	17	CFS
100 YEAR HW ELEVATION	=	20.8	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	>20	CFS
OVERTOPPING ELEVATION	=	23.4	FT

BEGIN GRADE
–SR3– STA.10+34.19
ELEV = 23.21'

PI = 16+30.00
EL = 25.13'
VC = 120'
K = 192
DS = 64 MPH

PROPOSED GRADE

PI STA 12+50 –SR3– RT
ELEV=20.20

PI STA 14+50 –SR3– RT
ELEV=19.30

PI STA 15+40 –SR3– RT
ELEV=18.40

END DITCH
PI STA 17+86 –SR3– RT
ELEV=19.33

(+)0.3273%

(–) 0.4500%

(–) 0.3111%

(–) 1.00000%

(+)0.3220%

(–)0.3034%

(+) 0.3780%

BEG DITCH
PI STA 10+80 –SR3– LT
ELEV=19.50

BEG DITCH
PI STA 10+35 –SR3– RT
ELEV=19.50

EXISTING GROUND

END DITCH
PI STA 15+30 –SR3– LT
ELEV=18.10

BEG DITCH
PI STA 16+52 –SR3– LT
ELEV=18.10

SEE SHEET 16 FOR –SR3– PLAN

–SR3–

PI = 20+80.00
EL = 23.76'
VC = 149'
K = 588
DS > 80 MPH

PI = 24+30.00
EL = 21.81'
VC = 500'
K = 576
DS > 80 MPH

PI = 27+95.00
EL = 16.61'
VC = 130'
K = 499
DS > 80 MPH

PI = 31+00.00
EL = 13.06'
VC = 160'
K = 81
DS = 46 MPH

PROPOSED GRADE

(–)0.3034%

(–)0.5571%

(–) 1.0000%

(–)0.5571%

(–)1.4247%

(–) 1.5714%

(–)1.4241%

(–)1.1639%

(–) 0.7436%

(–)1.1639%

(+)0.8000%

(–) 0.2500%

(+) 0.2235%

END DITCH
PI STA 20+10 –SR3– LT
ELEV=18.90

BEG DITCH
PI STA 20+60 –SR3– LT
ELEV=20.50

EXISTING GROUND

PI STA 24+70 –SR3– LT
ELEV=16.40

PI STA 27+50 –SR3– LT
ELEV=12.00

PI STA 31+40 –SR3– LT
ELEV=9.10

SEE SHEETS 16, 17 & 18 FOR –SR3– PLAN

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kfreeland

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	80

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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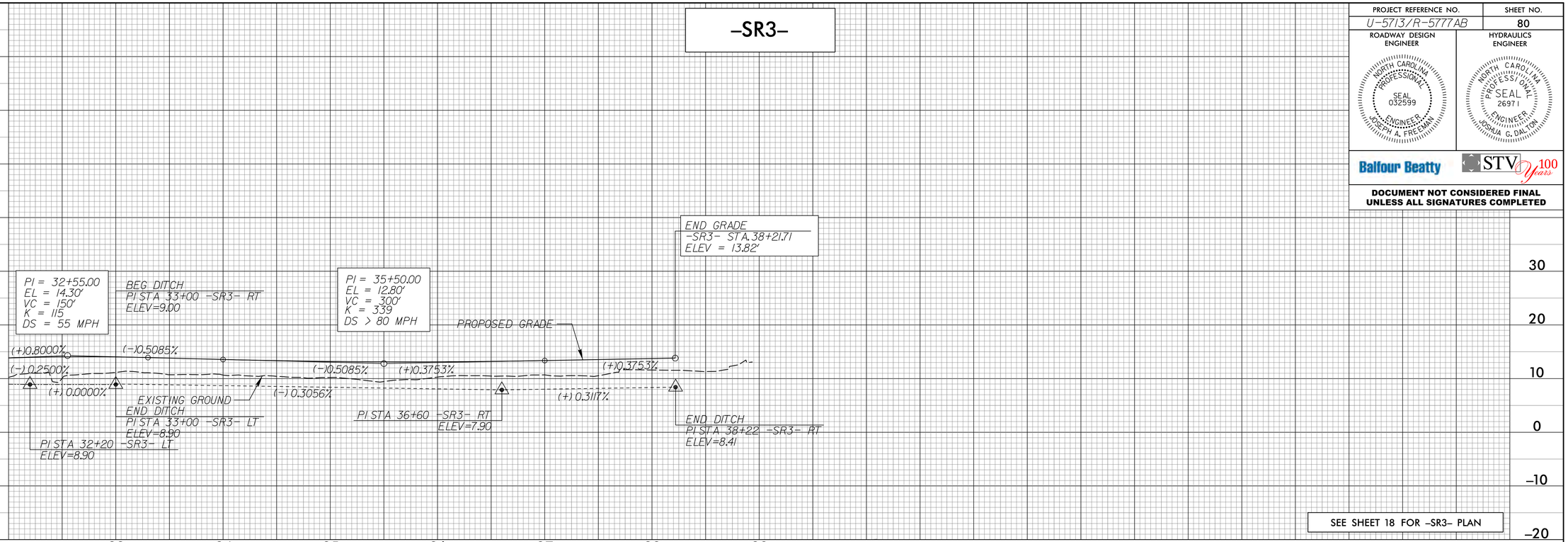
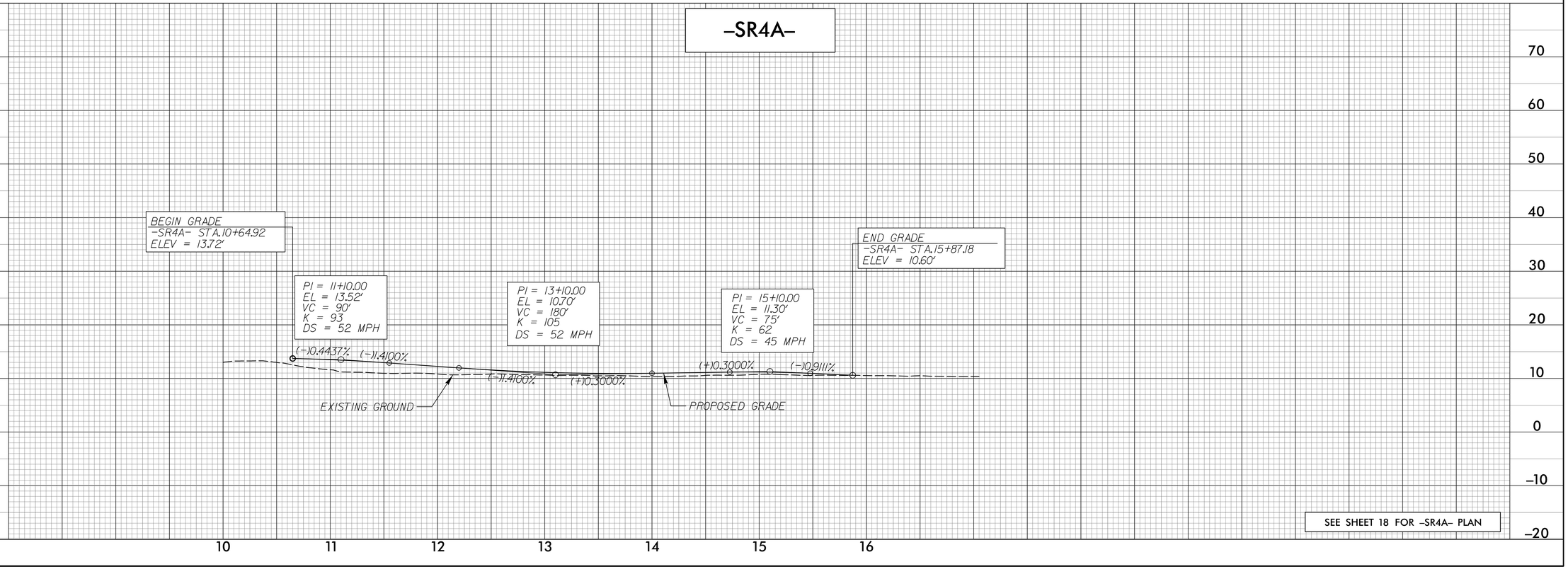
–SR3–



SEE SHEET 18 FOR –SR3– PLAN

–SR4A–



SEE SHEET 18 FOR –SR4A– PLAN

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U-5713/R-5777AB	81

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA S. DALTON

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–SR4B–

BEGIN GRADE
–SR4B– STA. 10+16.00
ELEV = 10.42'

END GRADE
–SR4B– STA. 12+10.41
ELEV = 11.27'

PI = 11+24.00
EL = 11.54'
VC = 75'
K = 55
DS = 43 MPH

(+)1.0385%
(–)0.3142%
EXISTING GROUND
PROPOSED GRADE

SEE SHEET 18 FOR –SR4B– PLAN

–SR4C–

BEGIN GRADE
–SR4C– STA. 11+03.43
ELEV = 11.40'

PI = 11+50.00
EL = 11.80'
VC = 75'
K = 197
DS = 66 MPH

PI = 14+00.00
EL = 12.97'
VC = 200'
K = 259
DS = 72 MPH

PI = 17+50.00
EL = 11.90'
VC = 75'
K = 52
DS = 37 MPH

PI = 18+73.00
EL = 13.30'
VC = 170'
K = 54
DS = 43 MPH

END GRADE
–SR4C– STA. 20+83.45
ELEV = 9.11'

(+)0.8491%
(+)0.4678%
(+)0.4678%
(–)0.3043%
(–)0.3043%
(+)1.1346%
(+)1.1346%
(–)1.9922%
PROPOSED GRADE
EXISTING GROUND

SEE SHEET 18 FOR –SR4C– PLAN

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ltrenda01

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	82

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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–SR5–

BEGIN GRADE
–SR5– STA.10+71.45
ELEV = 25.04'

PI = 11+10.00
EL = 25.46'
VC = 76'
K = 55
DS = 43 MPH

(+)1.0895% (–)0.3000%

(–) 0.1304%

BEG DITCH
PI STA 11+25 –SR5– RT
ELEV=21.20

PI = 14+00.00
EL = 24.59'
VC = 360'
K = 582
DS > 80 MPH

(–)0.3000% (+)0.3182%

END DITCH
PI STA 13+55 –SR5– RT
ELEV=20.90

PI = 16+20.00
EL = 25.29'
VC = 80'
K = 91
DS = 51 MPH

(+)0.3182% (–)0.5636%

(–) 0.2073%

EXISTING GROUND

BEG DITCH
PI STA 15+30 –SR5– RT
ELEV=20.25

PROPOSED GRADE

SEE SHEETS 14 & 15 FOR –SR5– PLAN

–SR5–

PI = 18+40.00
EL = 24.21'
VC = 80'
K = 89
DS = 47 MPH

(–)0.5636% (+)0.3375%

(–) 0.2073%

END DITCH
PI STA 19+40 –SR5– RT
ELEV=19.40

PI = 19+20.00
EL = 24.48'
VC = 80'
K = 64
DS = 45 MPH

(+)0.3375% (–)0.9125%

PI = 20+00.00
EL = 23.75'
VC = 80'
K = 134
DS = 59 MPH

(–)0.9125% (–)0.3176%

PI = 21+10.00
EL = 23.24'
VC = 80'
K = 89
DS = 47 MPH

(–)0.3176% (+)0.5782%

PI = 22+50.00
EL = 24.05'
VC = 80'
K = 61
DS = 45 MPH

(+)0.5782% (–)0.7400%

PI = 23+50.00
EL = 23.31'
VC = 120'
K = 103
DS = 51 MPH

(–)0.7400% (+)0.4216%

EXISTING GROUND

PROPOSED GRADE

PI = 27+20.00
EL = 24.87'
VC = 260'
K = 2231
DS > 80 MPH

(+)0.4216% (+)0.3036%

PI = 30+00.00
EL = 25.72'
VC = 300'
K = 477
DS > 80 MPH

(+)0.3036% (–)0.3250%

(–) 0.9677%

BEG DITCH
PI STA 30+20 –SR5– RT
ELEV=21.50

END DITCH
PI STA 31+75 –SR5– RT
ELEV=20.00

SEE SHEETS 15 & 16 FOR –SR5– PLAN

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kfreeland

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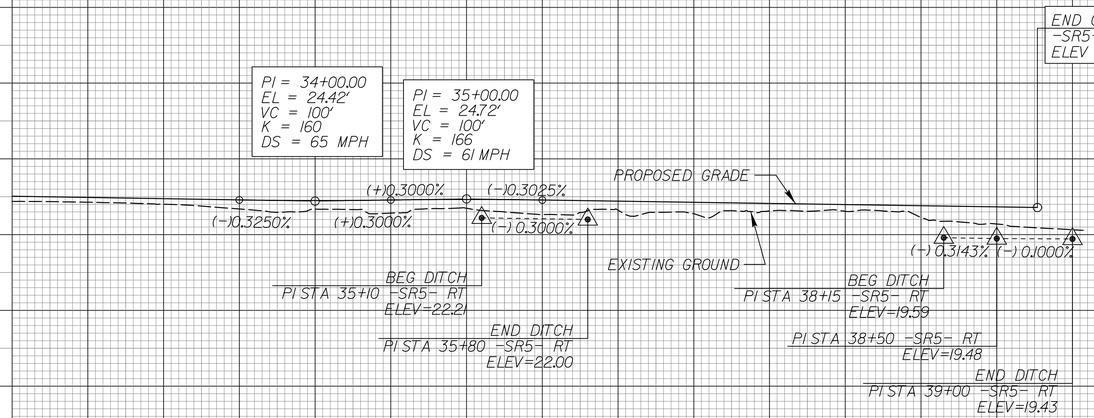
–SR5–



PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	83

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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SEE SHEET 16 FOR –SR5– PLAN

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lrodgers

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–SR6–

BEGIN GRADE
–SR6– STA 10+30.27
ELEV = 24.64'

PI = 12+85.00
EL = 26.50'
VC = 500'
K = 47.9
DS > 80 MPH

(+)0.7302%

(–)0.3131%

(+)0.2653%

BEG DITCH
PI STA 11+50 –SR6– RT
ELEV=21.40

PROPOSED GRADE

END DITCH
PI STA 16+40 –SR6– RT
ELEV=22.70

PI = 17+80.00
EL = 24.95'
VC = 260'
K = 69.4
DS > 80 MPH

(–)0.3131%

(–)0.6880%

EXISTING GROUND

PI = 21+60.00
EL = 22.34'
VC = 100'
K = 24.9
DS = 70 MPH

(–)0.6880%

(–)1.0898%

SEE SHEET 16 & 17 FOR –SR6– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	84

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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–SR6–

END GRADE
–SR6– STA 31+62.37
ELEV = 13.40'

PI = 29+09.00
EL = 14.17'
VC = 100'
K = 12.7
DS = 57 MPH

PROPOSED GRADE

(–)0.3042%

(–)1.0898%

(–)0.3448%

EXISTING GROUND

BEG DITCH
PI STA 26+00 –SR6– RT
ELEV=14.70

END DITCH
PI STA 26+29 –SR6– RT
ELEV=14.60

SEE SHEET 17 & 18 FOR –SR6– PLAN

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tlewis

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–SR7–

PIPE HYDRAULIC DATA
30" Sta. 10+35 –SR7–

DRAINAGE AREA	= 3.7	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 18	CFS
DESIGN HW ELEVATION	= 24.5	FT
100 YEAR DISCHARGE	= 21	CFS
100 YEAR HW ELEVATION	= 24.8	FT
OVERTOPPING FREQUENCY	= 500+/–	YRS
OVERTOPPING DISCHARGE	= 26+/–	CFS
OVERTOPPING ELEVATION	= 25.5	FT

PIPE HYDRAULIC DATA
48" Sta. 13+95 –SR7–

DRAINAGE AREA	= 38.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 85	CFS
DESIGN HW ELEVATION	= 24.4	FT
100 YEAR DISCHARGE	= 100	CFS
100 YEAR HW ELEVATION	= 25.1	FT
OVERTOPPING FREQUENCY	= +/–25	YRS
OVERTOPPING DISCHARGE	= +/–85	CFS
OVERTOPPING ELEVATION	= 24.2	FT

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	85

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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BEGIN GRADE
–SR7– STA.10+0.00
TIE TO END GRADE
–SRY22D– STA.33+41.34
ELEV = 26.65'

PI = 10+40.00
EL = 26.53'
VC = 80'
K = 97
DS = 50 MPH

PI = 12+00.00
EL = 27.36'
VC = 100'
K = 122
DS = 56 MPH

PI = 13+80.00
EL = 26.82'
VC = 100'
K = 120
DS = 56 MPH

PI = 15+30.00
EL = 27.62'
VC = 200'
K = 238
DS = 69 MPH

PI = 18+20.00
EL = 26.73'
VC = 200'
K = 281
DS > 80 MPH

(+)0.5195% (+)0.5195% (–)0.3000% (–)0.3000% (+)0.5333% (–)0.3069% (–)0.3069% (+)0.4053%
(–)0.5032%
30
48
EXISTING GROUND
PROPOSED GRADE
(–) 1.3077% (+) 0.2500% (+) 1.0000% (–) 0.3448%

BEG DITCH
PI STA 12+65 –SR7– RT
ELEV=21.90

PI STA 13+95 –SR7– RT
ELEV=20.20

PI STA 15+55 –SR7– RT
ELEV=20.60

END DITCH
PI STA 17+15 –SR7– RT
ELEV=22.20

BEG DITCH
PI STA 19+25 –SR7– RT
ELEV=22.40

SEE SHEETS 12 & 13 FOR –SR7– PLAN

–SR7–

PI = 22+00.00
EL = 28.27'
VC = 300'
K = 425
DS > 80 MPH

PI = 25+00.00
EL = 27.37'
VC = 200'
K = 333
DS > 80 MPH

PI = 28+60.00
EL = 28.45'
VC = 300'
K = 491
DS > 80 MPH

PI = 33+90.00
EL = 26.80'
VC = 200'
K = 327
DS > 80 MPH

(+)0.4053% (–)0.3000% (–)0.3000% (+)0.3000% (+)0.3000% (–)0.3113% (+)0.3000%
(–) 0.3448% (+) 0.1250% (–) 0.0833% (+) 0.9333% (–) 0.3113% (–) 0.2023%
EXISTING GROUND
PROPOSED GRADE

PI STA 20+70 –SR7– RT
ELEV=21.90

END DITCH
PI STA 23+90 –SR7– RT
ELEV=22.30

BEG DITCH
PI STA 24+40 –SR7– RT
ELEV=22.95

PI STA 25+00 –SR7– RT
ELEV=22.90

END DITCH
PI STA 25+75 –SR7– RT
ELEV=23.60

BEG DITCH
PI STA 33+00 –SR7– RT
ELEV=20.90

SEE SHEETS 13 & 14 FOR –SR7– PLAN

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ltrenda01

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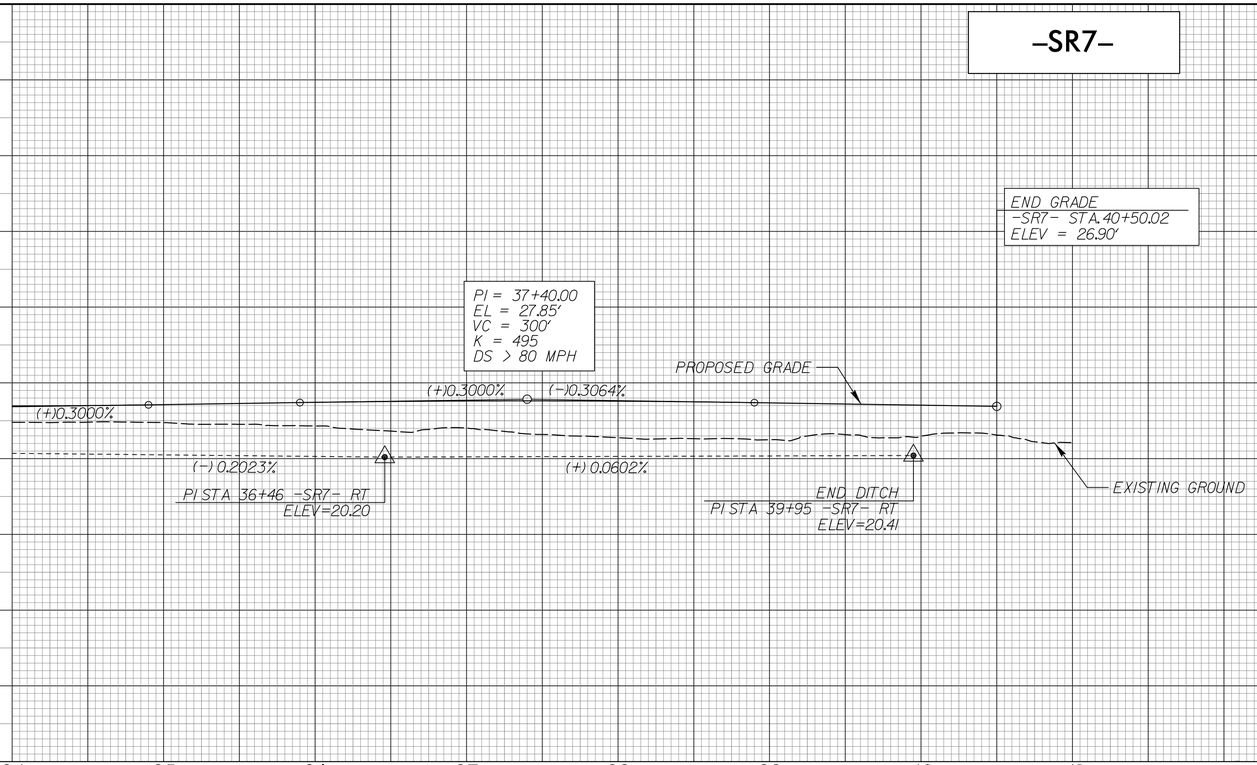
–SR7–



PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	86

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty

STV 100 Years

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SEE SHEET 14 FOR –SR7– PLAN

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lrodgers

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PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	87

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–SR8–

PIPE HYDRAULIC DATA

24" Sta. 13+97 –SR8–

DRAINAGE AREA	= 2.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 22.4	FT
100 YEAR DISCHARGE	= 15	CFS
100 YEAR HW ELEVATION	= 22.6	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >19	CFS
OVERTOPPING ELEVATION	= 24.9	FT

BEGIN GRADE
–SR8– STA. 10+14.55
ELEV = 26.65'

PI = 11+00.00
EL = 25.97'
VC = 100'
K = 202
DS = 74 MPH

END DITCH
PI STA 11+45 –SR8– LT
ELEV=21.70

(–)0.7958% (–)0.3000%

(+) 0.8333%

(+) 0.0667%

EXISTING GROUND

END DITCH
PI STA 10+90 –SR8– RT
ELEV=20.45

BEG DITCH
PI STA 10+30 –SR8– RT
ELEV=20.41

BEG DITCH
PI STA 10+25 –SR8– LT
ELEV=20.70

BEG DITCH
PI STA 14+10 –SR8– LT
ELEV=20.50

24"

(+) 0.2949%

(+) 0.3636%

BEG DITCH
PI STA 13+80 –SR8– RT
ELEV=20.20

(+)0.3000%

PI = 16+00.00
EL = 24.47'
VC = 360'
K = 582
DS > 80 MPH

(+)0.3188%

PI STA 16+00 –SR8– RT
ELEV=21.00

(+) 0.6240%

END DITCH
PI STA 18+00 –SR8– LT
ELEV=21.65

PROPOSED GRADE

(+) 0.9600%

END DITCH
PI STA 20+00 –SR8– RT
ELEV=24.00

PI STA 18+50 –SR8– RT
ELEV=22.56

PI = 20+87.00
EL = 26.02'
VC = 200'
K = 285
DS = 72 MPH

(+)0.3188%

(–)0.3832%

(–) 0.4200%

BEG DITCH
PI STA 21+50 –SR8– LT
ELEV=22.20

END GRADE
–SR8– STA. 22+38.96
ELEV = 25.44'

END DITCH
PI STA 22+00 –SR8– LT
ELEV=21.99

SEE SHEET 14 FOR –SR8– PLAN

–DR1–

BEGIN GRADE
–DR1– STA. 10+14.00
ELEV = 25.21'

PI = 11+30.00
EL = 24.35'
VC = 90'
K = 86
DS = 47 MPH

END CONSTRUCTION
BEGIN RESURFACING ONLY
–DR1– STA. 11+75.00
EL = 24.49'

END RESURFACING ONLY
–DR1– STA. 16+45.18
ELEV = 24.87'

PROPOSED GRADE

(–)0.7414%

(+)0.3111%

(+) 0.6736%

EXISTING GROUND

END DITCH
PI STA 11+81 –DR1– RT
ELEV=20.30

BEG DITCH
PI STA 10+37 –DR1– RT
ELEV=19.33

SEE SHEET 16 FOR –DR1– PLAN

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tmoore01

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–SR10–

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	88

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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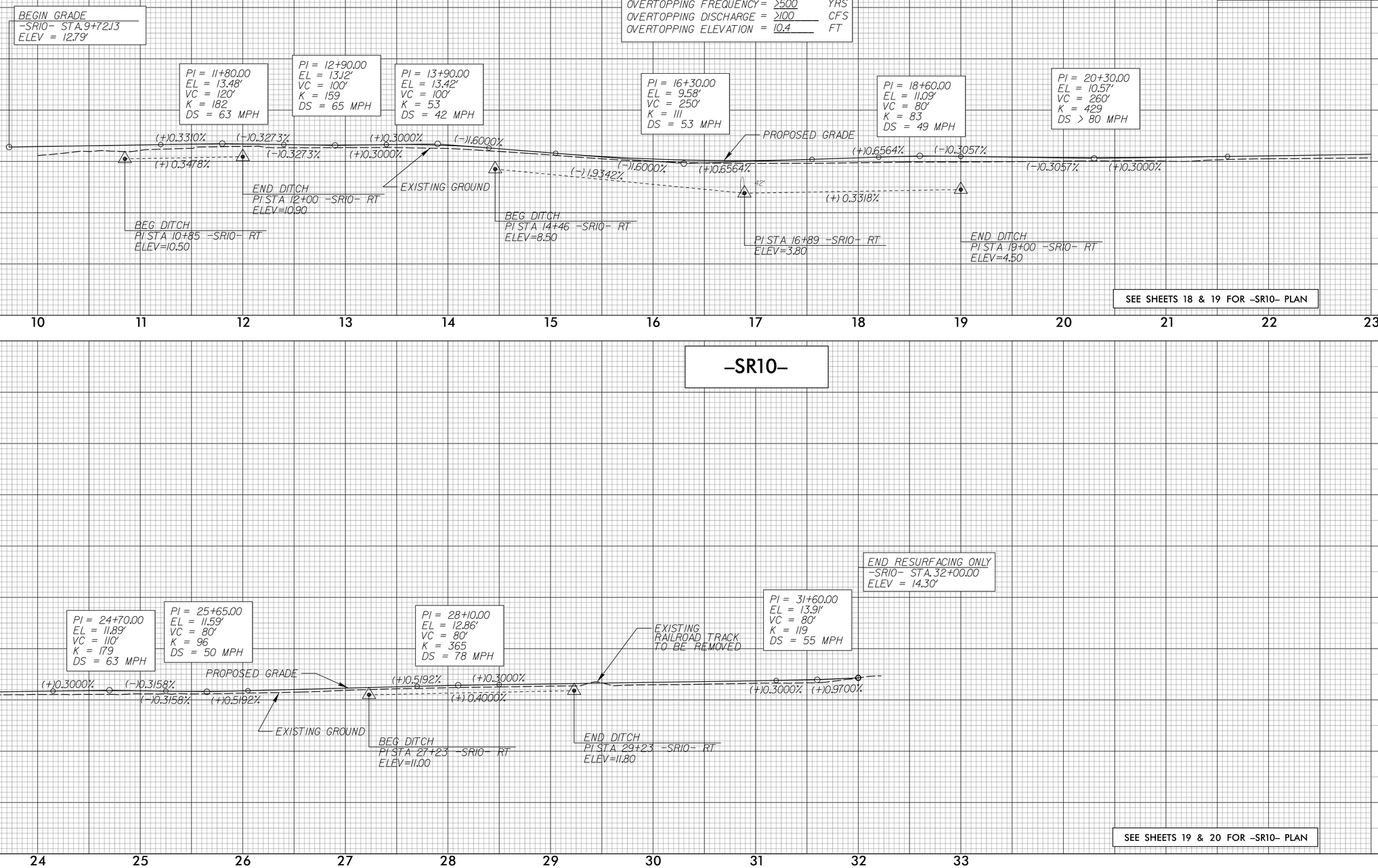
PIPE HYDRAULIC DATA

42" Sta. 16+87 –SR10–

DRAINAGE AREA	= 14.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 7.9	FT
100 YEAR DISCHARGE	= 85	CFS
100 YEAR HW ELEVATION	= 8.7	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >100	CFS
OVERTOPPING ELEVATION	= 10.4	FT



–SR10–

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kfreeman

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–Y2RAB1–

BEGIN GRADE
–Y2RAB1– STA.10+00.00
ELEV = 25.31'

END GRADE
–Y2RAB1– STA.13+28.36
ELEV = 25.33'

PI = 10+40.00
EL = 25.43'
VC = 80'
K = 48
DS = 34 MPH

PI = 11+60.00
EL = 27.78'
VC = 140'
K = 36
DS = 37 MPH

PI = 12+80.00
EL = 25.48'
VC = 90'
K = 56
DS = 38 MPH

(+)0.3000% (+)1.9583% (+)1.9583% (–)1.9208% (–)1.9208% (–)0.3000%

EXISTING GROUND

PROPOSED GRADE

SEE SHEET 14 FOR –Y2RAB1– PLAN

–Y2RAB2–

BEGIN GRADE
–Y2RAB2– STA.10+00.00
ELEV = 24.94'

END GRADE
–Y2RAB2– STA.13+41.95
ELEV = 24.88'

PI = 10+40.00
EL = 24.82'
VC = 80'
K = 32
DS = 27 MPH

PI = 11+70.00
EL = 27.73'
VC = 160'
K = 35
DS = 37 MPH

PI = 13+00.00
EL = 24.75'
VC = 80'
K = 31
DS = 27 MPH

(–)0.3000% (+)2.2362% (+)2.2362% (–)2.2868% (–)2.2868% (+)0.3000%

EXISTING GROUND

PROPOSED GRADE

SEE SHEET 14 FOR –Y2RAB2– PLAN

–Y2RAB3–

BEGIN GRADE
–Y2RAB3– STA.10+00.00
ELEV = 26.70'

END GRADE
–Y2RAB3– STA.13+14.16
ELEV = 26.70'

PI = 10+90.00
EL = 25.53'
VC = 80'
K = 34
DS = 29 MPH

PI = 12+64.00
EL = 27.35'
VC = 88'
K = 37
DS = 38 MPH

(–)1.3000% (+)1.0472% (+)1.0472% (–)1.3000%

EXISTING GROUND

PROPOSED GRADE

SEE SHEET 14 FOR –Y2RAB3– PLAN

–Y4RAB1–

BEGIN GRADE
–Y4RAB1– STA.10+00.00
ELEV = 13.61'

END GRADE
–Y4RAB1– STA.13+14.16
ELEV = 13.61'

PI = 11+90.00
EL = 15.13'
VC = 80'
K = 27
DS = 34 MPH

PI = 12+76.00
EL = 13.30'
VC = 76'
K = 26
DS = 25 MPH

PROPOSED GRADE (+)0.8000% (–)2.1224% (–)2.1224% (+)0.8000%

EXISTING GROUND

SEE SHEET 18 FOR –Y4RAB1– PLAN

–Y4RAB2–

BEGIN GRADE
–Y4RAB2– STA.10+00.00
ELEV = 11.80'

END GRADE
–Y4RAB2– STA.13+11.40
ELEV = 11.80'

PI = 10+37.50
EL = 11.69'
VC = 75'
K = 23
DS = 23 MPH

PI = 11+50.00
EL = 15.06'
VC = 150'
K = 26
DS = 34 MPH

PI = 12+70.00
EL = 11.68'
VC = 80'
K = 26
DS = 25 MPH

(–)0.3000% (+)3.0000% (+)3.0000% (–)12.8222% (–)12.8222% (+)0.3000%

EXISTING GROUND

PROPOSED GRADE

SEE SHEET 18 FOR –Y4RAB2– PLAN

–Y4RAB3–

BEGIN GRADE
–Y4RAB3– STA.10+00.00
ELEV = 12.21'

END GRADE
–Y4RAB3– STA.13+11.21
ELEV = 12.29'

PI = 10+40.00
EL = 12.33'
VC = 80'
K = 53
DS = 36 MPH

PI = 11+45.00
EL = 14.24'
VC = 130'
K = 38
DS = 37 MPH

PI = 12+60.00
EL = 12.44'
VC = 100'
K = 79
DS = 45 MPH

(+)0.3000% (+)1.8227% (+)1.8227% (–)1.5654% (–)1.5654% (–)0.3000%

EXISTING GROUND

PROPOSED GRADE

SEE SHEET 18 FOR –Y4RAB3– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	89

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

Balfour Beatty STV 100 Years

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tlowder

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–Y21RAB1–

BEGIN GRADE
–Y21RAB1– STA.10+00.00
ELEV = 23.89'

PI = 10+40.00
EL = 24.01'
VC = 80'
K = 42
DS = 32 MPH

PI = 11+40.00
EL = 26.21'
VC = 120'
K = 33
DS = 36 MPH

PI = 12+65.00
EL = 24.47'
VC = 80'
K = 73
DS = 43 MPH

END GRADE
–Y21RAB1– STA.13+05.40
ELEV = 24.35'

(+)0.3000%
(+)2.2040%
(+)2.2040%
(–)1.3942%
(–)1.3942%
(–)0.3000%
PROPOSED GRADE
EXISTING GROUND

SEE SHEET 8 FOR –Y21RAB1– PLAN

–Y21RAB2–

BEGIN GRADE
–Y21RAB2– STA.10+00.00
ELEV = 23.41'

PI = 10+40.00
EL = 23.29'
VC = 80'
K = 46
DS = 34 MPH

PI = 11+40.00
EL = 24.74'
VC = 120'
K = 48
DS = 41 MPH

PI = 12+50.00
EL = 23.57'
VC = 100'
K = 73
DS = 43 MPH

END GRADE
–Y21RAB2– STA.13+06.71
ELEV = 23.74'

(–)0.3000%
(+)1.4470%
(+)1.4470%
(–)1.0610%
(–)1.0610%
(+)0.3000%
PROPOSED GRADE
EXISTING GROUND

SEE SHEET 8 FOR –Y21RAB2– PLAN

PROJECT REFERENCE NO.	SHEET NO.
U-5713/R-5777AB	90

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032599 ENGINEER JOSEPH A. FREEMAN

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

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–Y22RAB1–

BEGIN GRADE
–Y22RAB1– STA.10+00.00
ELEV = 26.33'

PI = 11+65.07
EL = 26.83'
VC = 124'
K = 207
DS = 66 MPH

END GRADE
–Y22RAB1– STA.13+13.47
ELEV = 26.38'

(+)0.3000%
(–)0.3000%
PROPOSED GRADE
EXISTING GROUND

SEE SHEET 11 FOR –Y22RAB1– PLAN

–Y22RAB2–

BEGIN GRADE
–Y22RAB2– STA.10+00.00
ELEV = 25.88'

PI = 10+77.00
EL = 25.65'
VC = 102'
K = 170
DS = 68 MPH

PI = 11+69.00
EL = 25.93'
VC = 82'
K = 111
DS = 55 MPH

PI = 12+60.00
EL = 25.52'
VC = 100'
K = 135
DS = 60 MPH

END GRADE
–Y22RAB2– STA.13+12.06
ELEV = 25.68'

(–)0.3000%
(+)0.3000%
(–)0.4409%
(+)0.3000%
PROPOSED GRADE
EXISTING GROUND

SEE SHEET 11 FOR –Y22RAB2– PLAN

8/14/2020
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