



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

May 9, 2022

U.S. Army Corps of Engineers
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

ATTN: Mr. Andy Williams, NCDOT Regulatory Coordinator

Subject: Request for Modification of the Phased Section 404 Individual Permit and Section 401 Individual Water Quality Certification, Neuse River Riparian Buffer Authorization, Non-404 Jurisdictional Wetlands and Waters Permit for the Construction of the Triangle Expressway Southeast Extension from NC-55 Bypass in Apex to I-40, Wake and Johnston Counties. TIP Nos. R-2721, R-2828, and R-2829. Debit \$570 from WBS 37673.1.TA1.

References: USACE Section 404 Authorization SAW-2009-02240, issued October 24, 2019, modified February 4, 2020, (with a correction revision issued February 7, 2020), modified April 29, 2020, January 7, 2021, March 19, 2021, April 20, 2021, and March 3, 2022.

NCDWR Water Quality Certification Number 4179 and Neuse River Riparian Buffer Authorization, issued February 15, 2019, modified January 21, 2020, (with a correction revision issued January 30, 2020), April 20, 2020 (with a correction revision issued April 23, 2020), June 1, 2020, December 29, 2020, March 9, 2021, April 8, 2021, and November 1, 2021.

Dear Sir:

The North Carolina Department of Transportation (NCDOT) applied for a phased Section 404 Individual Permit, Section 401 Individual Water Quality Certification (WQC), Neuse River Riparian Buffer Authorization, Non-404 Jurisdictional Wetlands and Waters Permit for the subject project in September 2018. The project, also known as Complete 540, encompasses three NCDOT Transportation Improvement Plan (TIP) projects: R-2721 (NC55 Bypass to US-401), R-2828 (east of US-401 to I-40 Interchange) and R-2829 (east of I-40 to US 64/264). Revised permit applications were submitted in February 2019 and the North Carolina Division of Water Resources (NCDWR) 401 Certification/Buffer Authorization and the United States Army Corp of Engineers (USACE) 404 Authorization #SAW-2009-02240 were issued in February and October of 2019. Additionally, NCDOT received a modified 401 WQC for the Complete 540 Project on January 21, 2020, (with a correction revision issued January 30, 2020), April 20, 2020 (with a correction revision on April 23, 2020), June 1, 2020, December 29, 2020, March 9, 2021, April 8, 2021, and November 1, 2021 from the NCDWR and a modified USACE authorization #SAW-2009-02240 was received on February 4, 2020 (with a correction revision issued February 7, 2020), and modifications on April 29, 2020, January 7, 2021, March 19, 2021, and April 20, 2021.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
CENTURY CENTER BUILDING
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

Telephone: (919) 707-6000
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

This modification will result in changes to the previously permitted stream impacts as well as impacts to wetlands and riparian buffers. Wetland impact changes at Site 9 were a result of construction methodology and stream impact changes were due to a request for stabilization at the culvert inlet and ditch tie to the stream. Total stream impacts at Site 9 have not changed; however, the type of impact changed. Wetland impact type has changed at Permit Site 9 from mechanized clearing to excavation in wetlands, but the footprint of impact is unchanged. Wetland impact type has changed at Permit Site 20 from mechanized clearing to excavation in wetlands, but the footprint of impact is unchanged. Wetland Site 27 is new and increases wetland impact by 0.01 acre (ac.) for a total of 12.46 ac. of permanent wetland impact. Riparian buffer impacts have changed at Sites 18 and 23. Buffer Site 23 impact changes are due to the construction of a Multi-Use Path (MUP) at the Town of Cary. Buffer Site 18 impacts changed due to a small sliver of Buffer Zone 1 and Buffer Zone 2 being missed in the original permit application that has now been incorporated near Y13RPD – Station 18+62.53. Riparian buffers will increase 27 square feet (sq. ft.) in Buffer Zone 1 and will increase 2,088 sq. ft. in Buffer Zone 2. Please see the enclosed revised permit drawings and updated impact summary sheets which reflect the changes in impacts. We are requesting a modification to the Section 404 USACE Authorization #SAW-2009-02240 and the 401 Water Quality Certification, Number 4179.

Stream Impacts

As recommended by NCDOT, Site 9 now includes bank stabilization along both banks at the inlet of the 66" RCP on Y10A due to the ditch tie to the stream and for future stability of the channel banks. As a result, culvert stabilization increased 20 ft. from 115 ft. to 135 ft. due to the addition of bank stabilization.

Wetland Impacts

The Design-Build contractor has determined the topographic grade for the culvert diversion located at Permit Site 9 on the R-2721B Section, is such that an at grade pipe installation cannot be constructed without excavating in a portion of the mechanized clearing impact area. The areas which need to be changed from mechanized clearing to excavation for construction of the culvert diversion are located on the inlet and outlet side of the 6'x8' RCBC. The contractor realized they would need to excavate in this mechanized clearing area to have enough room to construct the bench required for the special lateral 2' base ditch (Detail 13-10). There will be an additional 0.054 acre of temporary excavation for the culvert diversion. The total temporary excavation at Site 9 is 0.06 acre. These impacts were previously mitigated as mechanized clearing. No additional mitigation is proposed.

At Permit Site 9 in order to create a haul road to Y10A, fabric was placed in a mechanized clearing area of the wetland and temporary fill was placed on top of the fabric in order to maintain existing ground conditions after the temporary fill is removed. This area is the only access point from the mainline due to conflicts with shallow waterlines in this area and is needed to grade Y10A. The temporary haul road impacts are 0.07 ac.; however, temporary impacts are not mitigable, so the impacts are still shown as mechanized clearing in the permit impact summary table since this is the permanent impact to the wetland but illustrated as temporary fill on Permit Drawing Sheet 27A.

Due to these changes at Permit Site 9, excavation increased from <0.01 ac. to 0.07 ac. The footprint of impacts are unchanged, and impacts were previously mitigated as mechanized clearing.

During construction of the permanent ditch at Permit Site 20 a portion of the mechanized clearing was changed to excavation (Station Number 486+132 -RT) in order to have room to construct the ditch. Due to these changes at Permit Site 20, excavation increased from 2.25 ac. to 2.29 ac. The footprint of impacts are unchanged, and impacts were previously mitigated as mechanized clearing.

Also, the Design-Build contractor is now extending a Multi-Use Path for the Town of Cary. The MUP extension is located near the Bells Lake Road (Y8) interchange. This site has been labeled Permit Site 27 and is located on Permit Drawing Sheet 20C. The MUP design is governed by the American Association of State Highway and Transportation Officials (AASHTO). The MUP has already been shifted as far away from the wetland area as possible while still meeting the deflection angle requirements of this code. To tie to the existing MUP at the appropriate angle a portion of the wetland will be impacted resulting in an increase of permanent fill by <0.01 ac. and an increase of 0.01 ac. for mechanized clearing.

Buffer Impacts

Buffer Site 23 on Buffer Permit Drawing Sheet 8A of 19 is a new impact site created by the need to tie the new section of the MUP into the existing MUP at the appropriate angle as well as a small buffer area near Oxford Green Road (Buffer Permit Drawing 8 of 19) both requiring a portion of Buffer Zone 2 to be impacted. This will increase buffer zone 2 impacts at Buffer Site 23 by 1,444 sq. ft.

Buffer Site 18 has changes to buffer impacts in both Buffer Zone 1 and Buffer Zone 2. The change in impacts at this site is due to a small sliver (Y13RPD – Station 18+62.53) of Buffer Zone 1 and Buffer Zone 2 being missed in the original permit application and has now been incorporated. Buffer Site 18 had an increase of 27 sq. ft. for Buffer Zone 1 and an increase of 644 sq. ft. for Buffer Zone 2.

Revised Impacts Summary R-2721B

Jurisdictional stream impacts, jurisdictional wetland impacts, and riparian buffer impacts have changed, as presented in this modification request. The new proposed impacts to jurisdictional wetlands total 12.46 ac. of permanent riparian wetland impacts. Total stream impacts remain the same, however bank stabilization increased by 20 feet. The new proposed Buffer Zone 1 impacts increase 27 sq. ft., and the total Buffer Zone 2 impacts increase 2,088 sq. ft. This modification request results in changes to Tables 3, 12, 14, 15, and 24 of the previous permit application/modifications. No changes to the other tables were required so they are not included in this modification request.

Revised Table 3. R-2721B Jurisdictional Resources Impacts

Impact Type	Riparian Wetland Temp./ Perm. (ac.)	Non-Riparian Wetland Temp./ Perm. (ac.)	Isolated Wetlands (ac.)	Ponds (ac.)	Isolated Ponds (ac.)	Stream (lf)			Riparian Buffer (sq. ft.) Zone 1/2
						Perm.	Temp.	Bank Stab. / Culvert Stab.	
Neuse River Basin (HUC 03020201)	1.34/ 12.46	0.0	2.42	14.04	1.52	8,898	555	282/ 859	777,751/ 468,711

Bolded impact amounts represent a change from the 404 (SAE-2009-02240) issued on February 7, 2020 (modified April 29, 2020, and January 7, 2021) and 401 WQC (4179) issued January 30, 2020 (modified April 23, 2020, June 1, 2020, and December 29, 2020) for R-2721B

Revised Table 12. R-2721B Wetland Impacts

Permit Drawing Site Number	NRTR Label	Impact Type	Wetland Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)
1	WAR	Fill	Riparian	0.05	
1	WAR	Mechanized Clearing	Riparian	0.01	
1	WAS	Fill	Riparian	1.37	
1	WAS	Excavation	Riparian	<0.01	
1	WAS	Mechanized Clearing	Riparian	0.11	
2	WAW(1)	Fill	Riparian	0.86	

Revised Table 12. R-2721B Wetland Impacts (cont.)

Permit Drawing Site Number	NRTR Label	Impact Type	Wetland Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)
2	WAW (1)	Mechanized Clearing	Riparian	0.15	
2	WAW (1)	Excavation	Riparian		0.007**
4	WAX	Fill	Riparian	0.14	
4	WAX	Excavation	Riparian	0.01	
4	WAX	Mechanized Clearing	Riparian	0.02	
4	WAY	Fill	Riparian	0.05	
4	WAY	Mechanized Clearing	Riparian	0.02	
5	WBC	Fill	Riparian	1.04	
5	WBC	Mechanized Clearing	Riparian	0.26	
5	WBC	Excavation	Riparian		0.03**
6	WBE	Fill	Riparian	0.49	
6	WBE	Excavation	Riparian	0.07	0.003**
6	WBE	Mechanized Clearing	Riparian	0.03	
7	WBF	Fill	Riparian	0.12	
7	WBF	Mechanized Clearing	Riparian	0.02	
7	WBF	Temporary Causeway	Riparian		0.74
7	WBF	Hand Clearing	Riparian		0.46
8	WBG	Fill	Riparian	0.23	
8	WBG	Excavation	Riparian	<0.01	
8	WBG	Mechanized Clearing	Riparian	0.03	
8	WBG	Temporary Diversion	Riparian		<0.01
9	WBH	Fill	Riparian	0.06	
9	WBH	Excavation	Riparian	0.07**	0.006**
9	WBH	Mechanized Clearing	Riparian	0.26	
12	WBI	Fill	Riparian	0.86	
12	WBI	Excavation	Riparian	0.04	
12	WBI	Mechanized Clearing	Riparian	0.17	
14	WBN (1)	Fill	Riparian	0.31	
14	WBN (1)	Excavation	Riparian	0.06	0.007**
14	WBN (1)	Mechanized Clearing	Riparian	0.09	
14	WBN (1)	Temporary Diversion	Riparian		0
16	WBN (2)	Fill	Riparian	0.74	
16	WBN (2)	Excavation	Riparian	0.03	
16	WBN (2)	Mechanized Clearing	Riparian	0.37	
17	WBP	Fill	Riparian	0.42	
17	WBP	Mechanized Clearing	Riparian	0.09	
17	WBP	Temporary Diversion	Riparian		0
17	WBQ	Fill	Riparian	0.02	
17	WBQ	Mechanized Clearing	Riparian	0.01	
17	WBS	Fill	Riparian	0.04	
18	WBR	Fill	Riparian	0.18	
20	WBY	Fill	Riparian	0.62	
20	WBY	Excavation	Riparian	2.29**	
20	WBY	Mechanized Clearing	Riparian	0.05	
21	WBZ	Fill	Riparian	0.40	
21	WBZ	Mechanized Clearing	Riparian	0.09	
22	WCB	Fill	Riparian	0.14	
22	WCB	Excavation	Riparian	<0.01	
25	WBW	Fill	Riparian	0.03	
26		Mechanized Clearing	Non Riparian	0	

Revised Table 12. R-2721B Wetland Impacts (cont.)

Permit Drawing Site Number	NRTR Label	Impact Type	Wetland Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)
27	MUPBL	Fill	Riparian	<0.01	
27	MUPBL	Mechanized Clearing	Riparian	0.01	
1*	WAS	Temporary Fill	Riparian		0.04
1*	WAS	Mechanized Clearing	Riparian	0.01	
2*	WAW	Temporary Fill	Riparian		0.05
Total Riparian Impacts:				12.46	1.343

*Impacts associated with the Town of Cary sewer relocation. **Impacts were previously permitted as mechanized clearing impacts. Bolded impact amounts represent a change from the 404 (SAE-2009-02240) issued on February 7, 2020 (modified April 29, 2020, and January 7, 2021) and 401 WQC (4179) issued January 30, 2020 (modified April 23, 2020, June 1, 2020, and December 29, 2020) for R-2721B.

Revised Table 14. R-2721B Surface Waters Impacts

Permit Drawing Site Number	NRTR Label	Impact Type	Permanent Surface Water Impacts (Ponds) (ac.)	Permanent Surface Water Impacts (Stream) (lf.)	Temporary Surface Water Impacts (Stream) (lf.)	Stream Flow
1	SAJ	RCBC		302		Perennial
1	SAJ	Culvert Stabilization		51	26	Perennial
1	SAJ	Bank Stabilization		50		Perennial
1	SAK	Culvert Stabilization		18	10	Perennial
2	SAL	Fill		398	11	Perennial
2	PD	Fill	0.95			N/A
3	SAM	RCBC		285		Perennial
3	SAM	Fill			46	Perennial
3	SAM	Culvert Stabilization		96		Perennial
4	SAR	Fill		107	14	Intermittent
5	SAQ	RCBC		458		Perennial
5	SAQ	Culvert Stabilization		57	52	Perennial
6	SAS	RCBC		244		Intermittent
6	SAS	RCBC		284		Intermittent
6	SAS	Fill		311	10	Intermittent
6	SAS	Culvert Stabilization		113		Intermittent
8	SAT	Fill		105		Intermittent
9	SAU	RCBC		237		Intermittent
9	SAU	RCP		105		Intermittent
9	SAU	Fill		204	37	Intermittent
9	SAU	Culvert Stabilization		135		Intermittent
11	SAW	RCP		404	60	Perennial
11	SAW	Fill		20	0	Perennial
11	PF	Fill	4.43			N/A
12	SAX	Fill		157	46	Intermittent

Revised Table 14. R-2721B Surface Waters Impacts (cont.)

Permit Drawing Site Number	NRTR Label	Impact Type	Permanent Surface Water Impacts (Ponds) (ac.)	Permanent Surface Water Impacts (Stream) (lf.)	Temporary Surface Water Impacts (Stream) (lf.)	Stream Flow
14	SAZ	Fill		413	28	Perennial
15	SBA	RCBC		142		Intermittent
15	PI	Fill	2.30			N/A
16	SBB	RCP		315		Intermittent
16	SBB	Fill		64	13	Intermittent
16	SBB	Stabilization		0		Intermittent
17	SBF	RCBC		0		Perennial
17	SBF	Fill		170	46	Perennial
17	SBF	Bank Stabilization		216		Perennial
17	SBF	Culvert Stabilization		163		Perennial
18	SBH	RCBC		116		Perennial
18	SBH	Culvert Stabilization		75		Perennial
18	PK	Fill	6.36			N/A
20	SBI	Fill		615 215	60	Intermittent / Perennial
21	SBJ	RCBC		977		Perennial
21	SBJ	Fill		233	34	Perennial
21	SBJ	Culvert Stabilization		151		Perennial
22	SBK	RCP		490		Intermittent
22	SBK	Fill		257	13	Intermittent
22	SBK	Stabilization		0		Intermittent
23	SBN	Fill		9	11	Intermittent
24	SSI	RCP		1		Intermittent
24	SSI	Fill		13	17	Intermittent
25	SBO	RCP		115		Intermittent
25	SBO	Fill		11	6	Intermittent
25	SBO	Bank Stabilization		16		Intermittent
1*	SAJ	Open Cut			15	Perennial
Total Impacts:			14.04	8,918	555	
Intermittent Impacts:				4,050	227	
Intermittent Bank Stabilization:				16		
Intermittent Culvert Stabilization:				248		
Perennial Impacts:				4,868	328	
Perennial Bank Stabilization:				266		
Perennial Culvert Stabilization:				611		
Total Requiring Mitigation:				3,991		

*Impacts associated with the Town of Cary sewer relocation. Bolded impact amounts represent a change in the last permit application submittal.

Revised Table 15. R-2721B Riparian Buffer Impacts

Mitigation requirements (sq. ft.)	Allowable with mitigation*	Allowable with mitigation**	Allowable	Total Impacts	Wetlands in Buffers^	Impacts Requiring Mitigation
Zone 1 Impact	75,711	696,141	5,899	777,751	214,553	557,299
Zone 2 Impact	51,408	408,220	9,083	468,711	84,202	375,426

* Impacts other than Road Crossing, ** Road Crossing, ^ Allowable, non-mitigable buffer impacts have been deducted from wetlands in buffers. Bolded impact amounts represent a change from the original issued 404 (SAW-2009-02240)/401 WQC (4179).

Revised Table 24. R-2721B Proposed Compensatory Mitigation

Mitigation Type	Riparian Wetland (ac.)	Non-Riparian Wetland (ac.)	Isolated Wetlands (ac.)	Stream (lf)	Riparian Buffer Calculation (sq. ft.)		Riparian Buffer Total (sq. ft.)
					Zone 1	Zone 2	
Neuse River Basin (HUC 03020201)	24.92	0.0	1.95	7,982	557,299 x 3.0 = 1,671,897	375,426 x 1.5 = 563,139	2,235,036

Bolded mitigation amounts represent a change from the original issued 404 (SAW-2009-02240)/401 WQC (4179) and subsequent modifications/revisions.

Currently NCDOT has acquired mitigation for R-2721B from NCDMS to compensate for 14.64 ac. of wetland impacts. The mitigation amount required for the modification of wetland impacts, after the changes addressed above, is 12.46 ac. which is below the wetland mitigation acquired by 2.18 ac. The new excavation impacts reported in Revised Table 12 are not counted towards mitigation due to the excavation areas occurring within areas previously permitted and mitigated as mechanized clearing. Therefore, no other changes to the required mitigation for wetland impacts are necessary due to this wetland modification request. The original Neuse Zone 1 riparian buffer impacts request was for 582,622 sq. ft. This amount exceeds the 557,299 sq. ft. needed by 25,323 sq. ft. The original Neuse Zone 2 riparian buffer impacts request was for 387,313 sq. ft. This amount exceeds the 375,426 sq. ft. needed for Neuse Zone 2 impacts by 11,887 sq. ft. No additional buffer mitigation is being proposed for this modification. The buffer impact amounts for R-2721B were multiplied by the appropriate mitigation ratios to calculate the proposed mitigation amounts in Table 24 (2:1 for streams and wetlands, 3:1 for Zone 1 riparian buffer impacts, and 1.5:1 for Zone 2 riparian buffer impacts).

REGULATORY APPROVALS

Section 404: We are requesting a modification to the USACE Permit Number SAW-2009-02240 Section 404 Individual Permit for the above-described activities.

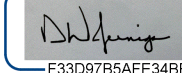
Section 401: We are requesting a modification to the WQC Permit Number 4179 Section 401 Individual Water Quality Certification, Neuse Riparian Buffer Authorization, and Non-404 Jurisdictional Wetlands and Waters Permit (IWGP10000) from NCDWR. We are providing this application to NCDEQ, for their approval. Authorization to debit the \$570.00 Permit Modification Fee from TIP No. R-2721/WBS 37673.1.TA1 is hereby given.

The individual permit modification package for the Complete 540 project (STIP Projects R-2721, R-2828 and R-2829) is available at <https://xfer.services.ncdot.gov/pdea/PermApps/>

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Deanna Riffey at driffey@ncdot.gov or 919-707-6151.

Sincerely,

DocuSigned by:

A handwritten signature in black ink, appearing to read "D. Jernigan", is placed over a grey rectangular background.

F33D97B5AFE34BE...

Dennis Jernigan, P.E.

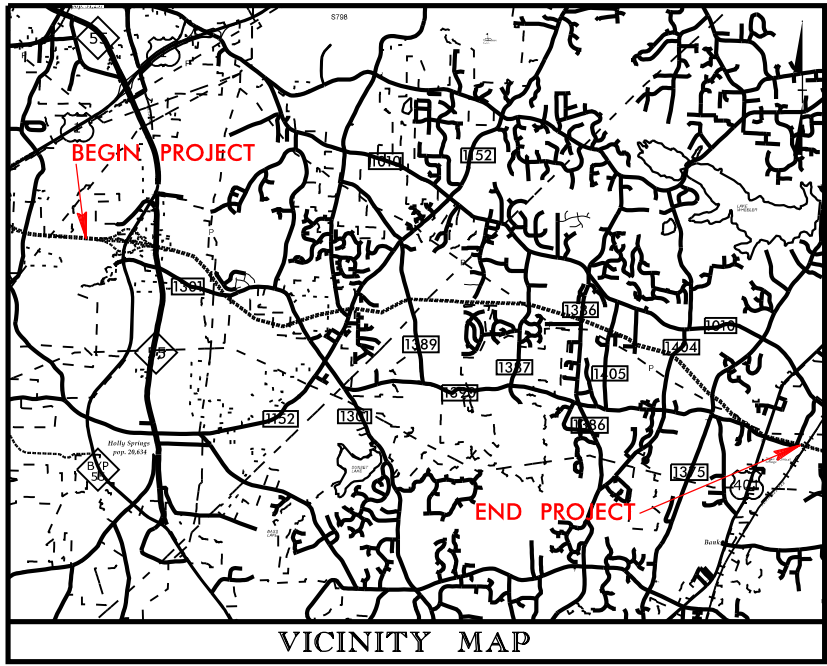
North Carolina Turnpike Authority

Deputy Chief Engineer

cc: NCDOT Permit Application Standard Distribution List

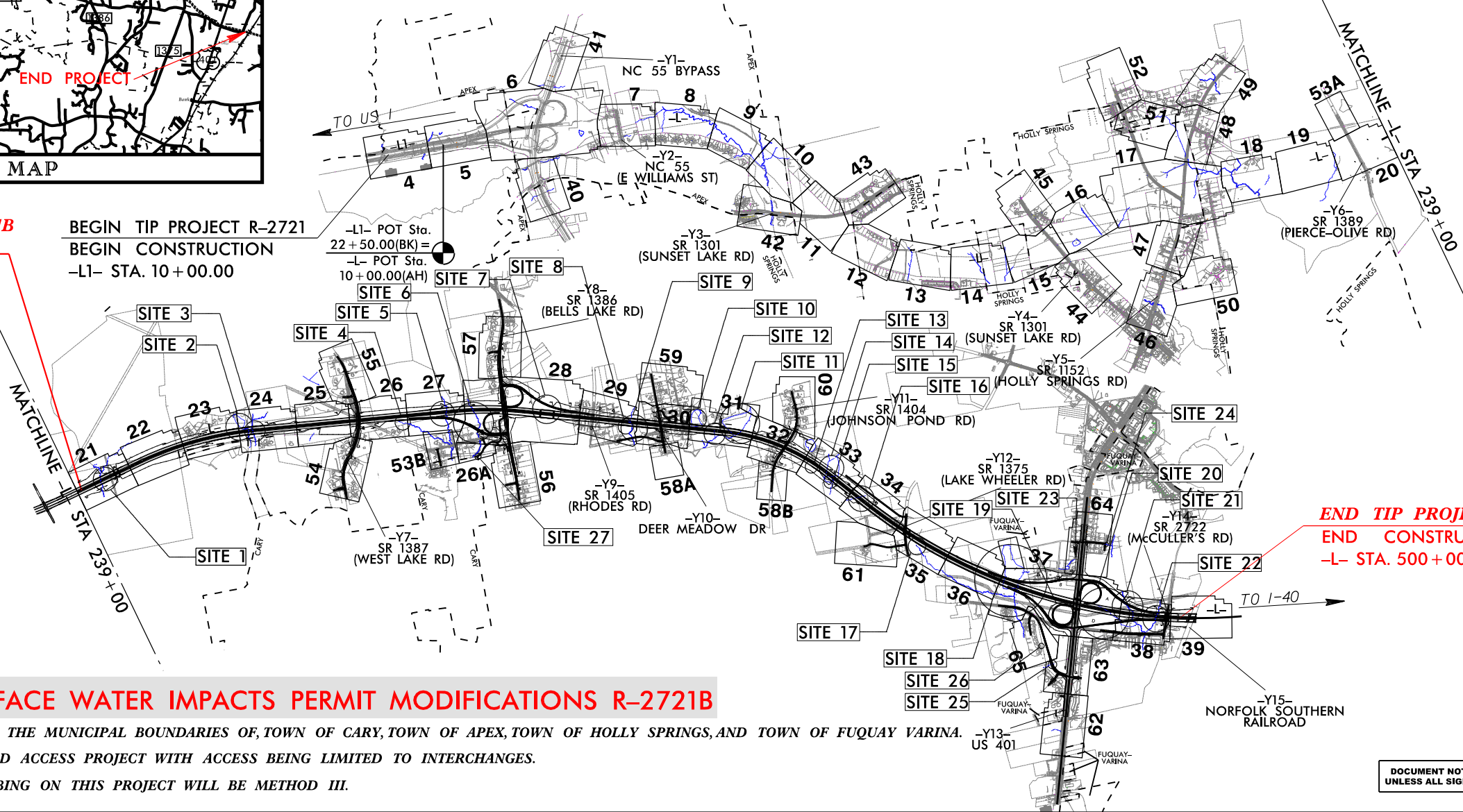
TIP PROJECT: R-2721

CONTRACT:



BEGIN TIP PROJECT R-2721B
BEGIN CONSTRUCTION
-L- STA. 240+00.00

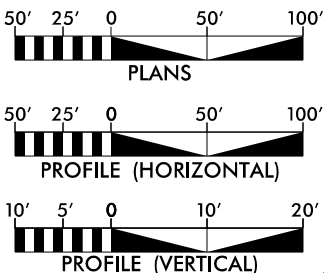
BEGIN TIP PROJECT R-2721
BEGIN CONSTRUCTION
-L1- STA. 10+00.00



WETLAND AND SURFACE WATER IMPACTS PERMIT MODIFICATIONS R-2721B

THIS PROJECT WITHIN THE MUNICIPAL BOUNDARIES OF, TOWN OF CARY, TOWN OF APEX, TOWN OF HOLLY SPRINGS, AND TOWN OF FUQUAY VARINA.
THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.
CLEARING AND GRUBBING ON THIS PROJECT WILL BE METHOD III.

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 28,200
ADT 2040 = 66,400
K = 12 %
D = 65 %
T = 11 % *
V = 75 MPH
* TTST = 7% DUAL 4%
FUNC CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2721 = 9.529 Miles
LENGTH STRUCTURES = 0.178 Miles
TOTAL LENGTH TIP PROJECT R-2721 = 9.351 Miles

PERMIT DRAWING
SHEET 1 OF 69

PERMIT DRAWING PACKAGE
LAST REVISED ON 05/05/22

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2721	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
6.401078	STP-540(19)	PE	



END TIP PROJECT R-2721B
END CONSTRUCTION
-L- STA. 500+00.33

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.

Prepared in the Office of:



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, NC, 27601
N.C. B.E.L.S. License Number: F-01116

2018 STANDARD SPECIFICATIONS

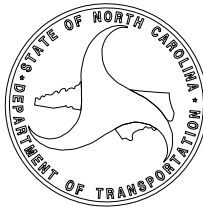
RIGHT OF WAY DATE:
February 18, 2020

LETTING DATE:
February 18, 2020

Brian K. Eason, PE
PROJECT ENGINEER

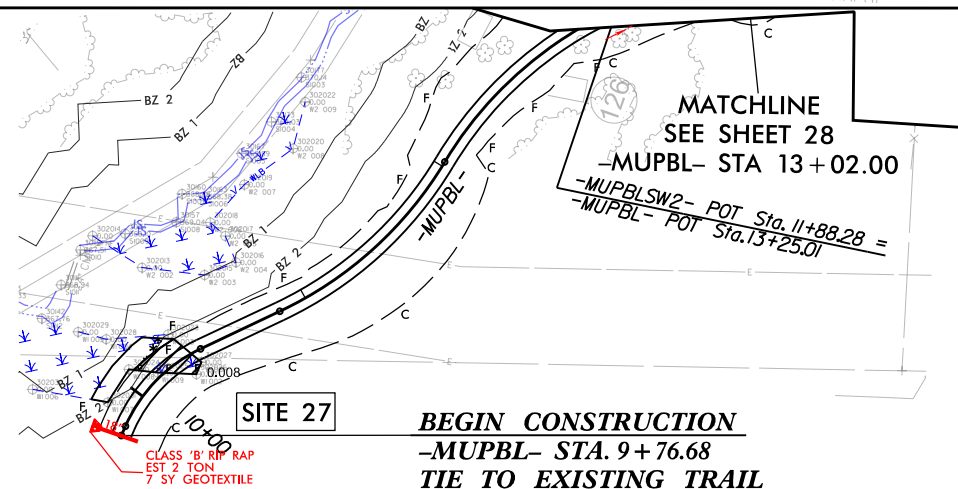
Christina L. Yokeley, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT



CONST. REV.01 – APRIL 13, 2020 – REVISED –Y8D– PROFILE OVER COLONIAL PIPELINE , TNB.
CONST. REV.02 – MARCH 26, 2021 – ADDED MULTI-USE-PATH TYING TO EXISTING GREENWAY, TNB.

INSET 26A



LEGEND



BEGIN CONSTRUCTION
-MUPBL- STA. 9+76.68
TIE TO EXISTING TRAIL

MATCHLINE, SEE SHEET 27

SAR

MATCHLINE
SEE SHEET 28



GRADIENT
L & M / WAPOR / COMFORT / SOLA

Gradient, PLLC
127 W. Chatham St Cary, NC 27511
N.C.B.E.L.S. License Number: P-1875



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.		SHEET NO.	
R-2721B		53B	
R-2721B ROADWAY SHEET NO. 26			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



MATCHLINE, SEE SHEET 28

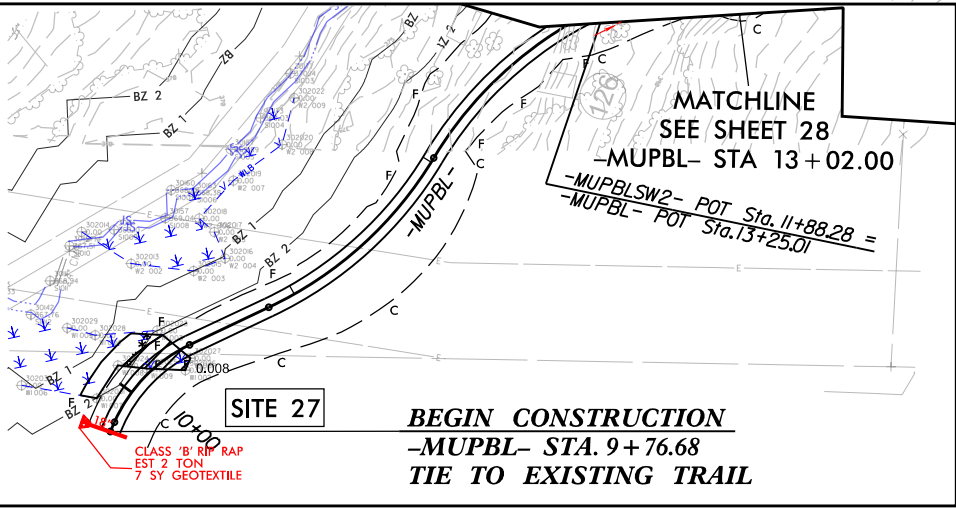
PERMIT DRAWING
SHEET 20B OF 69

PLOT DRIVER: NCDOT_color_eng-100.plt
USER: CMYERS
FILE: Flatiron-Construction-Corp.\Flatiron-R-2721B-Hydraulics\PERMITS-EnvironmentalDrawings\R2721B.RDY_PSH26.HDR_new_site27.dgn
PENTABLE: NCDOT_permits.CON_R2721B.tbl
DATE: 1/19/2022
TIME: 12:26:20 PM

REVISIONS

CONST. REV.01 - APRIL 13, 2020 - REVISED -Y8D- PROFILE OVER COLONIAL PIPELINE .TNB.
CONST. REV.02 - MARCH 26, 2021 - ADDED MULTI-USE-PATH TYING TO EXISTING GREENWAY .TNB.

INSET 26A



LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

PERMIT DRAWING PACKAGE
LAST REVISED ON 01/19/22

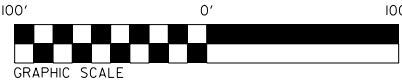


Gradient, PLLC
127 W. Chatham St. Cary, NC 27511
N.C.B.E.L.S. License Number: P-1875

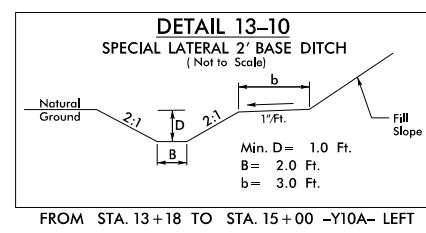


HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
R-2721B	53B
R-2721B ROADWAY SHEET NO. 26	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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

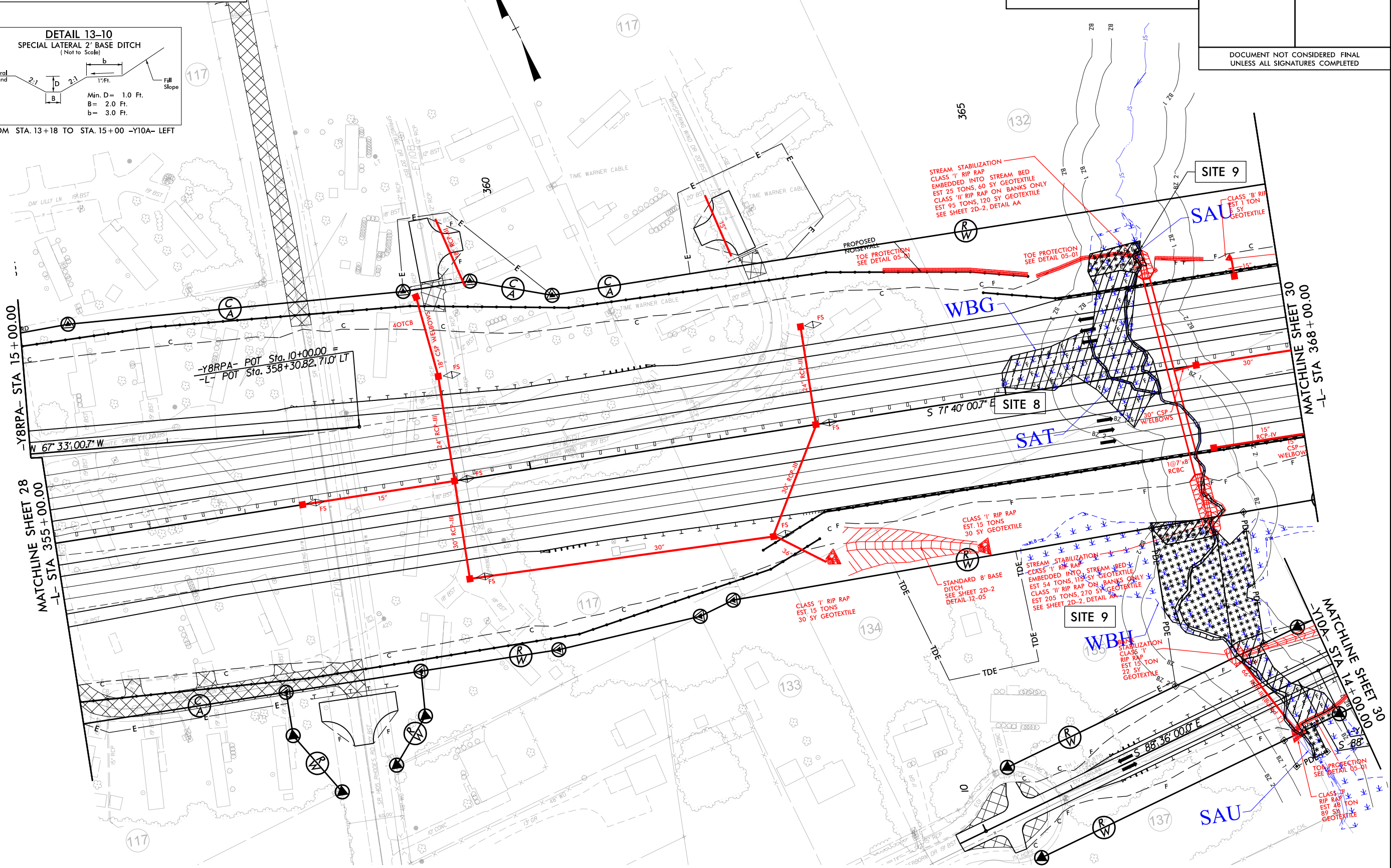


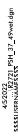
FROM STA. 13+18 TO STA. 15+00 -Y10A- LEFT

PERMIT DRAWING
SHEET 27 OF 69

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.		SHEET NO.	
R-2721		29	
R-2721B ROADWAY SHEET NO. 12 & 13			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			





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 (Pond) (ac)	Permanent SW impacts (Stream) (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	244+00-L-/248+00-L-	3@8'x10' RCBC							0.08		302		
	244+00-L-/248+00-L-	FILL	1.42		< 0.01	0.12							
	244+00-L-/248+00-L-	BANK STABILIZATION							< 0.01	0.01	50	36	
	244+00-L-/248+00-L-	CULVERT STABILIZATION							0.02		69		
2	279+00-L-/280+22-L-	FILL	0.86			0.15		0.95	0.03	< 0.01	398	11	
3	281+00 -L-/283+00-L-	2@7'X7' RCBC							0.04		285		
	281+00 -L-/283+00-L-	FILL								0.01		46	
	281+00 -L-/283+00-L-	CULVERT STABILIZATION							0.01		96		
4	313+00-L-/317+00-L-	FILL	0.19		0.01	0.04			0.01	< 0.01	107	14	
5	322+00-L-/325+00-L-	1@6'X8' RCBC							0.05	< 0.01	458	52	
	322+00-L-/325+00-L-	FILL	1.04			0.26							
	322+00-L-/325+00-L-	CULVERT STABILIZATION							0.01		57		
6	330+00-L-/332+00-L-	1@6'X8' RCBC (1)	0.41		0.03	0.03			0.02	< 0.01	284	10	
	330+00-L-/332+00-L-	1@6'X8' RCBC (2)							0.02		244		
	330+00-L-/332+00-L-	FILL	0.08		0.04				0.02		311		
	330+00-L-/332+00-L-	CULVERT STABILIZATION							0.01		113		
7	346+00-L-/349+00-L-, 21+00-Y8RPA-/25+00-Y8RPA-	BRIDGES	0.12	0.74		0.02	0.46						
8	365+00-L-/366+50-L-	FILL	0.23	< 0.01	< 0.01	0.03			< 0.01		105		
9	366+50-L-/13+50 -Y10A-	1@6'X8' RCBC	0.01			0.25			0.01	< 0.01	237	37	
	366+50-L-/13+50 -Y10A-	66" RCP	0.05						< 0.01		105		
	366+50-L-/13+50 -Y10A-	FILL			0.07				0.01		204		
	366+50-L-/13+50 -Y10A-	CULVERT STABILIZATION							0.01		135		
10++	380+00 -L-/383+00-L-	42" RCP						1.52					
TOTALS* THIS SHEET:			4.42	0.74	0.16	0.90	0.46	2.47	0.35	0.03	3560	205	

TOTALS*	ENTIRE R-2721B:		8.38	0.74	4.81	1.77	0.46	15.56	0.84	0.06	8918	540	
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*Rounded totals are sum of actual impacts.

NOTES:
++Site includes only isolated resources.
Sites containing temporary excavation listed below are included in the mechanized clearing impacts:
Site 2 = .007ac ; Site 5 = .03ac ; Site 6 = .003ac
Site 9 = .06ac ; Site 14 = .007ac, Site 20 = .04 Grand Total = .11ac Temp Excavation
Site 9 = 0.07ac of Temp Fill for Haul Road

PERMIT DRAWING PACKAGE LAST REVISED ON 05/05/22

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2022
WAKE COUNTY
TIP R-2721B
STATE PROJ. # 6.401078
SHEET 68 OF 69

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 (Pond) (ac)	Permanent SW impacts (Stream) (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
11	386+00-L-/391+00-L-	48" RCP						4.43	0.04	< 0.01	404	60	
	386+00-L-/391+00-L-	FILL							< 0.01	< 0.01	20		
12	384+50-L-/387+00-L-	FILL	0.86		0.04	0.17			0.01	< 0.01	157	46	
13++	408+00-L-/411+00-L-	FILL	0.21		0.06								
14	412+00-L-/416+00-L-	FILL	0.31		0.06	0.09			0.03	< 0.01	413	28	
15	414+50-L-/415+50-L-	1@7'X8' RCBC						2.30	< 0.01		142		
16	420+00-L-/425+00-L-	42" RCP	0.74		0.03	0.37			0.04	< 0.01	315	13	
	420+00-L-/425+00-L-	FILL							< 0.01		64		
	420+00-L-/425+00-L-												
17	437+00-L-/30+00-Y13A-	2@7'X7'RCBC	0.48			0.10			< 0.01	< 0.01		46	
	437+00-L-/30+00-Y13A-	FILL							< 0.01		170		
	437+00-L-/30+00-Y13A-	BANK STABILIZATION							0.02		216		
	437+00-L-/30+00-Y13A-	CULVERT STABILIZATION							0.05		163		
18	459+50-L-/463+50-L-	2@7'X8'RCBC	0.18					6.36	0.02		116		
	459+50-L-/463+50-L-	CULVERT STABILIZATION							< 0.01		75		
19++	15+00-Y13LPC-	EXCAVATION			2.15								
20	478+00-L-/488+00-L-	FILL	0.62		2.29	0.05			0.07	0.01	830	60	
21	490+00-L-	2@6'X8'RCBC	0.40			0.09			0.08	< 0.01	977	34	
	490+00-L-	FILL							0.02		233		
	490+00-L-	CULVERT STABILIZATION							0.02		151		
	490+00-L-												
22	495+00-L-	1 @ 6'X8' RCBC	0.14		< 0.01				0.03	< 0.01	490	13	
	495+00-L-	FILL							0.01		257		
	495+00-L-												
23	65+30-Y13-	FILL							< 0.01	< 0.01	9	11	
24	10+00-Y13B-	15" RCP							< 0.01	< 0.01	1	17	
	10+00-Y13B-	FILL							< 0.01		13		
TOTALS* THIS SHEET:			3.93	0	4.65	0.87	0	13.09	0.47	0.03	5216	328	

TOTALS*	ENTIRE R-2721B:		8.38	0.74	4.81	1.77	0.46	15.56	0.84	0.06	8918	540	
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*Rounded totals are sum of actual impacts.

NOTES:

++Site includes only isolated resources.

PERMIT DRAWING PACKAGE LAST REVISED ON 05/05/22

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
JANUARY 2022
WAKE COUNTY
TIP R-2721B
STATE PROJ. # 6.401078

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 (Pond) (ac)	Permanent SW impacts (Stream) (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
25	15+00-Y13A-	36" RCP	0.03						0.01	< 0.01	115	6	
	15+00-Y13A-	FILL							< 0.01		11		
	15+00-Y13A-	BANK STABILIZATION							< 0.01		16		
26++	10+00-Y13A-	FILL											
27	10+00 -MUPBL-	FILL	< 0.01			0.01							
TOTALS* THIS SHEET:			0.03	0	0	0.01	0	0	0.02	0.00	142	6	
TOTALS* ENTIRE R-2721B:			8.38	0.74	4.81	1.77	0.46	15.56	0.84	0.06	8918	540	

*Rounded totals are sum of actual impacts.

NOTES:

++Site not impacted in final design

PERMIT DRAWING PACKAGE LAST REVISED ON 05/05/22

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
January 2022
WAKE COUNTY
TIP R-2721B
STATE PROJ. # 6.401078

CONTRACT:



BEGIN TIP PROJECT R-2721
 BEGIN CONSTRUCTION
 -L1- STA. 10+00.00

WAKE COUNTY

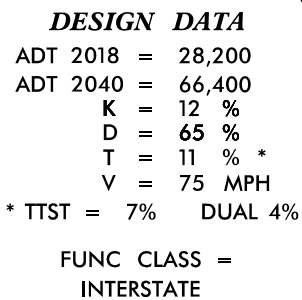
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

PERMIT DRAWING PACKAGE
LAST REVISED ON 02/22/22

NAD 83



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

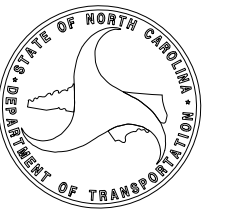


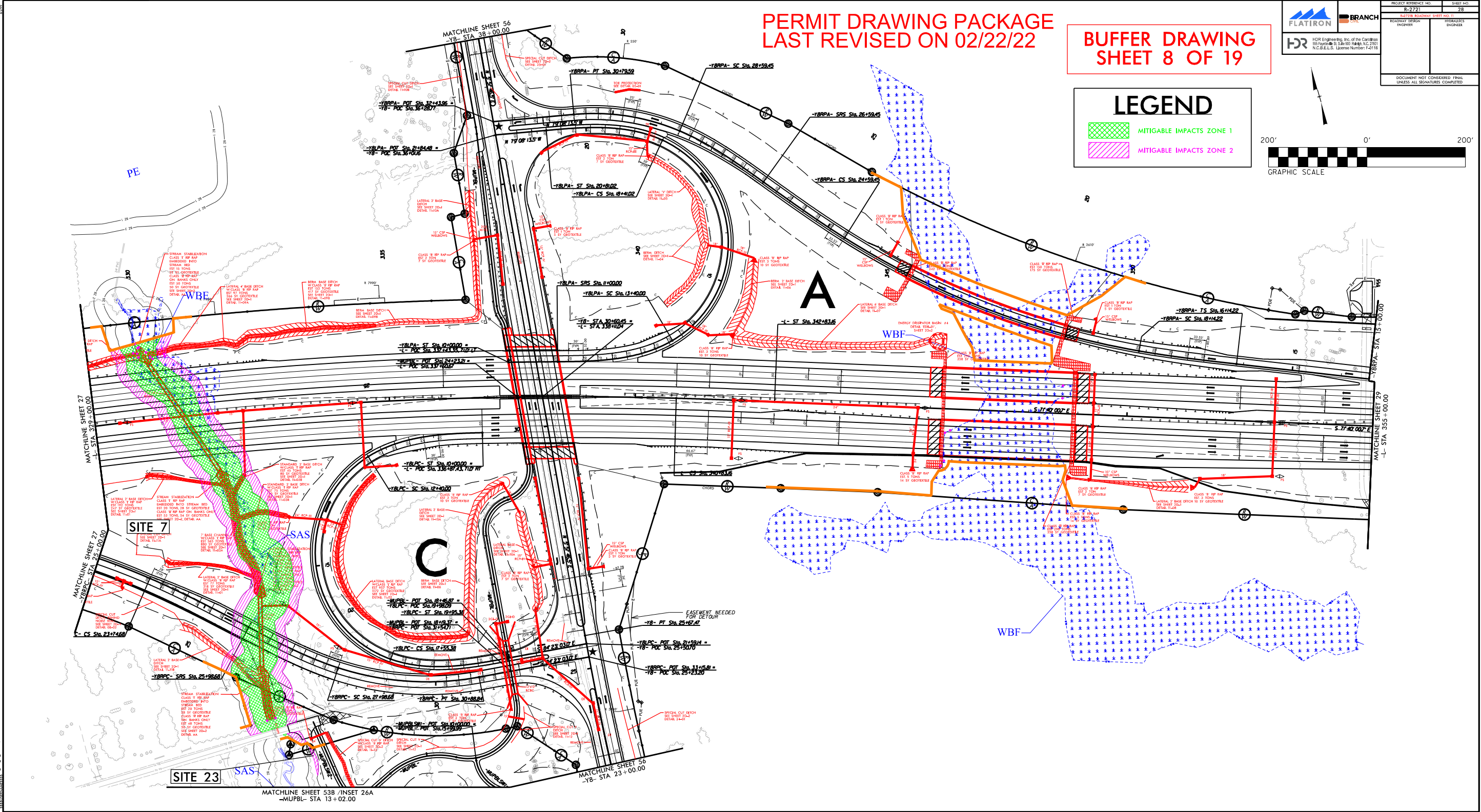
LENGTH ROADWAY TIP PROJECT R-2721	=9.529 Miles
LENGTH STRUCTURES	=0.178 Miles
TOTAL LENGTH TIP PROJECT R-2721	=9.351 Miles

LETTING DATE:
February 18, 2020

NCDOT CONTACT

P.E.
SIGNATURE: _____



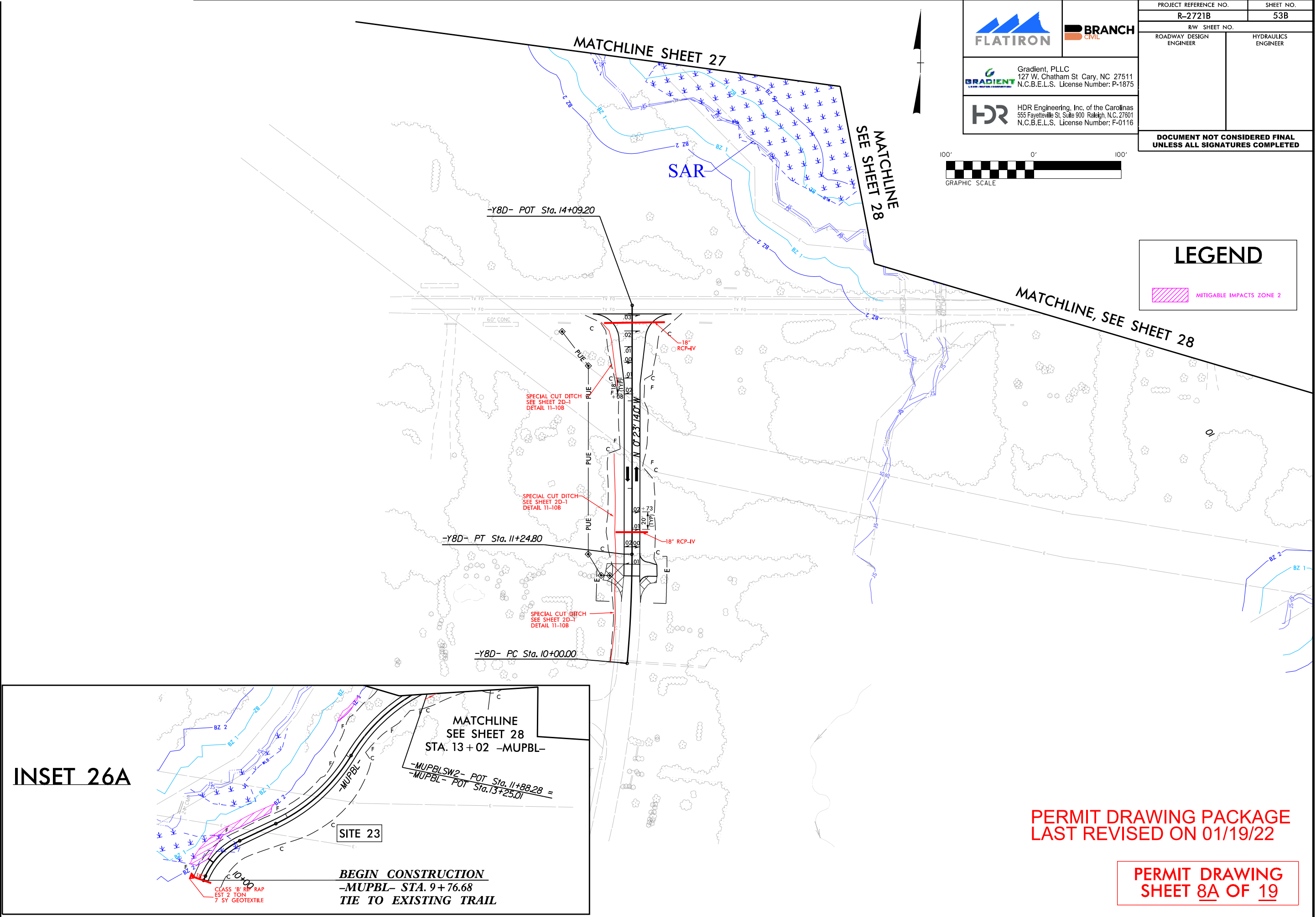


PROJECT REFERENCE NO.	SHEET NO.
8-2721	28
8-2721B R/W/SHEET NO. 11	28
ROADWAY DESIGN	REVISIONS
INVOICES	BOOKING
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PLOT DRIVER: NCDOT_color_eng-100.plt
USER: CMYERS
FILE: Flatiron-Construction-Corp.\Flatiron-R-2721B-Hydraulics\PERMITS-Environmental\Drawings\Buffers\R2721B_RDY_PSH26_HDB_new_site_23.dgn
PENTABLE: NCDOT_permits.NCON.tbl
DATE: 1/19/2022
TIME: 10:26:07 AM

REVISIONS

CONST. REV.01 - APRIL 13, 2020 - REVISED -Y8D- PROFILE OVER COLONIAL PIPELINE .TNB.
CONST. REV.02 - MARCH 26, 2021 - ADDED MULTI-USE-PATH TYING TO EXISTING GREENWAY .TNB.



**BUFFER DRAWING
SHEET 16 OF 19**

LEGEND

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

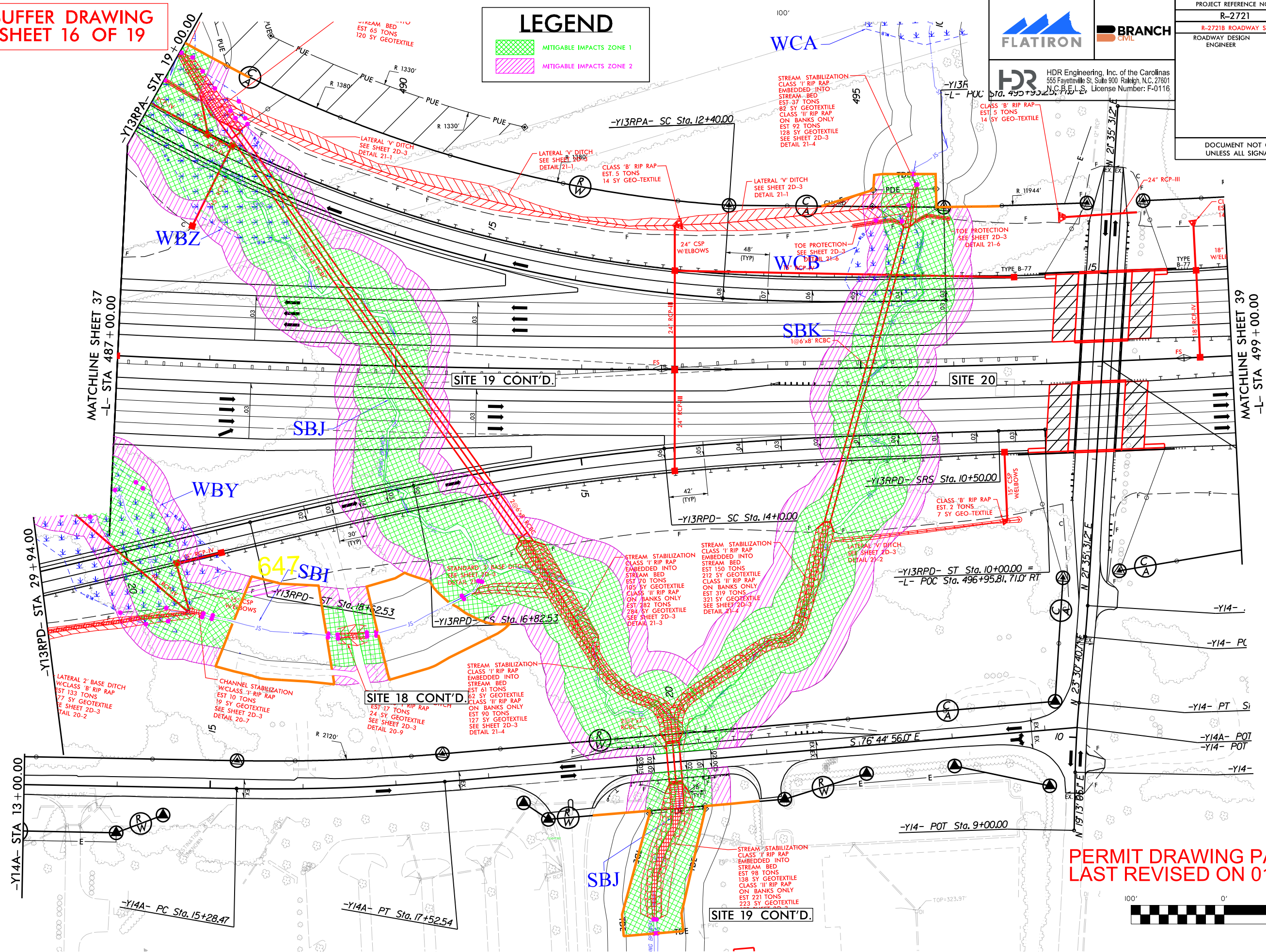




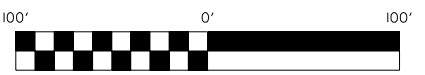
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
R-2721	38
R-2721B ROADWAY SHEET NO. 20 & 21	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



**PERMIT DRAWING PACKAGE
LAST REVISED ON 01/19/22**



2/14/2022 R2721_PSH_38_16b.dgn
SSSSISENAMES\$

RIPARIAN BUFFER IMPACTS SUMMARY													
			IMPACT									BUFFER REPLACEMENT	
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)	ZONE 1 (ft²)	ZONE 2 (ft²)	TOTAL (ft²)	ZONE 1 (ft²)	ZONE 2 (ft²)
1	3@8'X10' RCBC	244+00 - 248+00 -L-	X					0	25550	16098	41648		
2**	ROADWAY FILL	277+00 - 280+50 -L-	X					0	53612	31141	84753		
3	2@7'X8' RCBC	280+50-L-/282+00-L-	X					0	25733	13164	38897		
4	ROADWAY CUT	294+00 - 295+00 -L-	X			118	1520	1638			0		
5	30" RCP	313+00 - 318+00 -L-			X			0	11175	9950	21125		
6	1@6'X8' RCBC	324+00 - 326+00 -L-	X					0	30655	18451	49106		
7	1@6'X8' RCBC (TWO)	329+00 - 333+00 -L-, 28+00 - 30+00 -Y8RPC-	X					0	57937	36187	94124		
8	ROADWAY FILL	365+50-L-/366+00-L-	X			788	862	1650			0		
9	1@6'X8' RCBC, 66" RCP	366+00-L-/367+50-L-	X					0	43026	19363	62389		
10**	48" RCP	384+50 - 393+00 -L-	X					0	92463	58771	151234		
11	ROADWAY FILL	384+50-L-/386+50-L-	X					0	12732	9284	22016		
12	48' RCP	382+00-L-/383+00-L-	X			0	0	0			0		
13**	1@7'X8' RCBC	411+00 - 416+00 -L-	X					0	58868	34339	93207		
14	ROADWAY FILL	412+00 - 415+00 -L-			X			0	7343	2935	10278		
15	42" RCP	420+00-L-/422+00-L-	X					0	25536	20063	45599		
16	30" RCP, 2@7'X7' RCBC	438+00-L-/30+00-Y13A-	X					0	44523	22076	66599		
17	2@7'X8' RCBC	459+00-L-/464+00-L-	X					0	89202	58288	147490		
18	48" RCP/ ROADWAY FILL	481+00-L-/491+00-L-			X			0	55977	38523	94500		
19	2@6'X8' RCBC, 2@7'X7' RCBC	486+00-L-/493+00-L-	X					0	90341	43690	134031		
20	1@ RCBC	493+00-L-/496+00-L-	X					0	45963	25860	71823		
21	24" RCP	65+00 - 66+00 -Y13-	X			2273	2776	5049			0		
22	15" RCP	10+90 - 11+60 -Y13B-	X			2720	2485	5205			0		
23	18" RCP	10+00 -13+25 -MUPBL-	X							1444	1444		
TOTAL:						5899	7643	13542	770636	459628	1230264	0	0

**Site includes calculated impacts to entire pond buffers outside ROW

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: TIP R-2721B

LAST REVISED 02/22/2022
SHEET 18 OF 19

WETLANDS IN BUFFER IMPACTS SUMMARY

			WETLANDS IN BUFFERS	
SITE NO.	STATION (FROM/TO)		ZONE 1 (ft ²)	ZONE 2 (ft ²)
1	244+00 - 248+00 -L-		0	2148
2	277+00 - 280+50 -L-		12154	3987
3	280+50-L-/282+00-L-		15887	5267
4	294+00 - 295+00 -L-		0	0
5	313+00 - 318+00 -L-		4183	3782
6	324+00 - 326+00 -L-		12811	8240
7	329+00 - 333+00 -L-, 28+00 - 30+00 -Y8RPC-		18916	3794
8	365+50-L-/366+00-L-		0	0
9	366+00-L-/367+50-L-		18112	3993
10	384+50 - 393+00 -L-		8611	2996
11	384+50-L-/386+50-L-		12073	6870
12	382+00-L-/383+00-L-		0	0
13	411+00 - 416+00 -L-		11330	2080
14	412+00 - 415+00 -L-		3001	1760
15	420+00-L-/422+00-L-		17309	10179
16	438+00-L-/30+00-Y13A-		14093	5154
17	459+00-L-/464+00-L-		2771	1708
18	481+00-L-/491+00-L-		42113	16265
19	486+00-L-/493+00-L-		17540	3825
20	493+00-L-/496+00-L-		3649	1742
21	65+00 - 66+00 -Y13-		0	0
22	10+90 - 11+60 -Y13B-		0	0
23	10+00-13+25 -MUPBL-		0	412
TOTAL:			214553	84202

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

WAKE COUNTY
PROJECT: TIP R-2721B

LAST REVISED DATE 02/22/2022
SHEET 19 OF 19