STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT L. MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

April 1, 2015

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

ATTN: Mr. Eric Alsmeyer
NCDOT Coordinator

SUBJECT: **Request for Modification of the Section 404 Individual Permit, Section 401 Water Quality Certification, and Neuse River Riparian Buffer Authorization** for the proposed East End Connector from NC 147 (Durham Freeway/Buck Dean Expressway) to north of NC 98 (Holloway Street) in Durham, Durham County, North Carolina, Division 5. Federal Aid Project No. NHF–76–1(2), TIP No. U-0071.

Debit $570.00 from WBS Element No. 34745.1.1

REFERENCE: USACE Individual Permit, Action ID No. SAW-2011-00796, dated March 24, 2014.

NCDWR Section 401 Water Quality Certification, Neuse River Buffer Authorization, and Isolated Wetlands Permit, NCDWR Project No. 20131282, Certification No. 3980, January 28, 2014.

Dear Sir:

The purpose of this letter is to request a modification to the United States Army Corps of Engineers (USACE) Section 401 Individual Permit and North Carolina Division of Water Resources (NCDWR) Section 401 Water Quality Certification and Neuse River Riparian Buffer Authorization for the above-referenced project.

In addition to this cover letter, please find enclosed the revised Division of Mitigation Services (DMS) (formerly EEP) Acceptance Letter, revised Wetland Permit Drawing Sheet Nos. 20, 21, 36, 37, 60, 61, 74, 75, 90, and 91 of 91 and Buffer Permit Drawing Sheet Nos. 5 through 7 and 18 of 18.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT SECTION
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-707-6100

FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

PHYSICAL ADDRESS:
Century Center - Building B
1020 Birch Ridge Dr
Raleigh, NC 27610-4328

IMPACTS TO WATERS OF THE UNITED STATES

Surface Waters

All revisions occur within the Neuse River Basin (HUC 03020101). No revisions to wetland impacts were made. Stream impact revisions occur at Sites 7, 17, and 23. Descriptions for the changes at each site are below. Please also see Table 1, which has been revised to reflect these modifications. Revised Sites, sub-totals, and totals are in italics.

- Site 7: A review of the culvert construction sequence indicates that the tie-in point of the temporary diversion channel at the culvert inlet is located outside of the permitted stream impact footprint. Additional stream impacts are necessary at this site to install the temporary diversion channel at the culvert inlet. There will be a reduction in temporary stream impacts of 6 linear ft. and an increase in bank stabilization of 55 linear ft.
- Sites 17 and 23: A review of the culvert construction sequence indicates that the tie-in points of the temporary diversion channel at the culvert inlet and culvert outlet are located outside of the permitted bank stabilization impact footprint. A review of the stream banks at this location indicates a presence of Triassic rock. Backfilling of the tie-in points of the temporary diversion channel with native soil material will not allow for establishment of suitable streambank vegetation. Accordingly, the revision extends rip rap on the stream banks to fully cover the limits of the tie-in points of the temporary diversion channel. At Site 17, there is a reduction in temporary stream impacts of 11 linear ft. and an increase in bank stabilization of 24 linear ft. At Site 23, there is a reduction in temporary stream impacts of 48 linear ft. and an increase in bank stabilization of 48 linear ft.

Table 1. Revised Surface Water Impacts within the Neuse River Basin (HUC 03020201)

Permit Site No.	Stream Name	Stream ID[1]	Intermittent /Perennial	Impact Type	Impacts (lin. ft.)	Impacts Requiring USACE mitigation (lin. ft.)	USACE Mitigation Ratio	Impacts Requiring 1:1 DWR mitigation (lin. ft.)
1	UT of Goose Creek	S-B	Intermittent	Perm. Fill	412	0[2]		0[3]
2	UT of Goose Creek	S-A	Intermittent	Temp. Fill	14	0		0
				Perm. Fill	673	0[2]		0[3]
				Bank Stabil.	20	0[5]		0[3]
3	UT of Goose Creek	S-35	Intermittent	Perm. Fill	410	0[2]		0[3]
4	UT of Little Lick Creek	S-26	Intermittent **(Isolated)**	Temp. Fill	15	0		0
				Perm. Fill	349	0[4]		0[3]
				Bank Stabil.	70	0[4]		0[3]

Table 1. Revised Surface Water Impacts within the Neuse River Basin (HUC 03020201) (Continued)

Permit Site No.	Stream Name	Stream ID[1]	Intermittent /Perennial	Impact Type	Impacts (lin. ft.)	Impacts Requiring USACE mitigation (lin. ft.)	USACE Mitigation Ratio	Impacts Requiring 1:1 DWR mitigation (lin. ft.)
6	UT of Little Lick Creek	S-25	Intermittent	Temp. Fill	15	0		0
7	*UT of Little Lick Creek*	*S-18*	*Perennial*	*Temp. Fill*	*104*	*0*		*0*
				Perm. Fill	*665*	*665*	*2:1*	*665*
				Bank Stabil.	*305*	*0*[5]		*305*
8	UT of Little Lick Creek	S-19	Intermittent	Perm. Fill	443	0[2]		0[3]
9	UT of Little Lick Creek	S-24	Intermittent	Perm. Fill	29	0[2]		0[3]
				Bank Stabil.	43	0[5]		0[3]
12	UT of Little Lick Creek	S-16	Intermittent	Temp. Fill	132	0		0
				Perm. Fill	705	0[2]		0[3]
				Bank Stabil.	42	0[5]		0[3]
17	*UT of Little Lick Creek*	*S-6*	*Perennial*	*Temp. Fill*	*28*	*0*		*0*
				Perm. Fill	*479*	*479*	*2:1*	*479*
				Bank Stabil.	*85*	*0*[5]		*85*
17A	UT of Little Lick Creek	S-12	Intermittent	Temp. Fill	56	0		0
17B	UT of Little Lick Creek	S-14	Intermittent	Temp. Fill	7	0		0
23	*UT of Little Lick Creek*	*S-6*	*Perennial*	*Temp. Fill*	*76*	*0*		*0*
				Perm. Fill	*280*	*280*	*2:1*	*280*
				Bank Stabil.	*127*	*0*[5]		*127*
24	UT of Little Lick Creek	S-7	Intermittent	Temp. Fill	23	0		0
				Perm. Fill	104	0[2]		0[3]

Table 1. Revised Surface Water Impacts within the Neuse River Basin (HUC 03020201) (Continued)

Permit Site No.	Stream Name	Stream ID[1]	Intermittent /Perennial	Impact Type	Impacts (lin. ft.)	Impacts Requiring USACE mitigation (lin. ft.)	USACE Mitigation Ratio	Impacts Requiring 1:1 DWR mitigation (lin. ft.)
25	UT of Little Lick Creek	S-2	Intermittent	Temp. Fill	10	0		0
				Perm. Fill	168	0[2]		0[3]
				Bank Stabil.	35	0[5]		0[3]
26	UT of Little Lick Creek	S-2	Intermittent	Temp. Fill	23	0		0
				Perm. Fill	50	0[2]		0[3]
				Bank Stabil.	50	0[5]		0[3]
27	UT of Little Lick Creek	S-6	Perennial	Bank Stabil.	10	0[5]		10[6]
U-1	UT of Little Lick Creek	S-25	Intermittent	Utility/ Bank Stabil.	20	0[5]		0[3]
Temporary Fill Impacts (Non-isolated)					*488*	0		0
Temporary Fill Impacts (Isolated)					15	0		0
Permanent Fill Impacts (Non-isolated)					4,418	1,424		1,424
Permanent Fill Impacts (Isolated)					349	0[4]		0
Bank Stabilization Impacts (Non-isolated)					*737*	0		*527*
Bank Stabilization Impacts (Isolated)					70	0[4]		0
TOTAL TEMPORARY IMPACTS					***503***	**0**		**0**
TOTAL PERMANENT IMPACTS					***5,574***	**1,424**		***1,951***

[1] Stream IDs are from the JD re-verification packet, dated April 7, 2011.

[2] Per USACE, no compensatory mitigation is required for permanent impacts (including bank stabilization) to USACE-regulated intermittent streams associated with this project.

[3] Per the NCDWQ Public Memorandum dated August 14, 2009, any NCDOT project within the Merger 01 process that has reached CP 4A prior to the effective date of October 16, 2009 is not subject to the NCDWR Intermittent Stream Mitigation Policy. This project reached CP 4A on December 13, 2007 and is not subject to this policy. Therefore, no compensatory mitigation for permanent impacts along intermittent streams is required by NCDWR for this project.

[4] Isolated streams are not regulated by USACE.

[5] Per USACE, bank stabilization impacts do not require compensatory mitigation.

[6] Although this Site does not individually exceed the 150 linear foot threshold set by NCDWR for requiring compensatory mitigation, when combined with other Sites along the same stream, the cumulative impact to the stream exceeds that threshold.

Buffers

All revisions occur within the Neuse River basin (HUC 03020101). Buffer revisions occur at Buffer Sites 4 and 6. Descriptions for the changes at each site are below. Please also see Table 2, which has been revised to reflect these modifications. Revised sub-totals and totals are in italics. Please refer to the Wetland Impact Summary Sheet and Wetlands in Buffer Sheet for site-by-site impacts.

- Site 4: A review of the permit drawings indicates that additional riparian buffer impacts are necessary to allow for construction to install the fill slope and install erosion control devices. There is an increase of 2,560 square ft. of Zone 1 impacts and 135 square ft. of Zone 2 impacts.
- Site 6: This is the same stream as Wetland and Stream Site 7. A review of the culvert construction sequence indicates that the tie-in point of the temporary diversion channel at the culvert inlet is located outside of the permitted riparian buffer footprint. Additional riparian buffer impacts are necessary to install the temporary diversion channel at the culvert inlet. There is an increase of 1,524 square ft. of Zone 1 impacts and 1,228 square ft. of Zone 2 impacts.

Table 2. Revised Riparian Buffer Impacts within the Neuse River Basin (HUC 03020101)

Impact Type[1]	Zone 1 Impacts (sq. ft.)	Zone 2 Impacts (sq. ft.)	Buffer Impact Total (sq. ft.)
Allowable Stormwater Management Impacts	5,584	3,789	9,373
Allowable Utility Impacts	2,599	1,960	4,559
Allowable Road Crossing Impacts	20,076	12,601	32,677
Mitigable Utility Impacts	329	0	329
Mitigable Parallel Impacts	5,317	7,867	13,184
Mitigable Road Crossing Impacts	*350,635*	*235,769*	*586,404*
Total Allowable Impacts	28,259	18,350	46,609
Total Mitigable Impacts	*356,281*	*243,636*	*599,917*
Wetlands in Buffer Within Mitigable Impacts	6,999	2,335	9,334
Total Mitigable Impacts, Minus Wetlands In Buffer	*349,282*	*241,301*	*590,583*
TOTAL IMPACTS	***384,540***	***261,986***	***646,526***
TOTAL WETLANDS IN BUFFER	**6,999**	**2,335**	**9,334**
TOTAL IMPACTS, MINUS WETLANDS IN BUFFER	***377,541***	***259,651***	***637,192***

[1] See Buffer Impact Summary Sheet in the attached buffer drawings for site-by-site impacts.

Compensatory Mitigation

Compensatory mitigation requirements for permanent stream, wetland, and buffer impacts associated with U-0071 within the Neuse River Basin (HUC 03020101) are summarized below in Table 3. Stream and wetland mitigation requirements have not changed since the original application and subsequent permits. Revised sub-totals and totals are in italics.

Stream and Wetland Impacts

A total of 5,574 linear feet of permanent warm water stream impacts will occur within the Neuse Basin. This is an increase of 127 linear feet compared to the 5,447 linear feet that was reported in the original application. The entire 127 linear-foot increase is due to the addition of bank stabilization on perennial streams, which does not require compensatory mitigation per USACE. Therefore, the 1,424 linear feet of permanent warm water stream impacts that will require compensatory mitigation per the USACE at a 2:1 ratio remains unchanged from the original permit application and subsequent permit.

The 127 linear feet of added bank stabilization did, however, increase the amount of mitigation required by NCDWR since all additions occurred on perennial streams that had already exceeded 150 linear feet of permanent impact. NCDWR will now require compensatory mitigation for 1,951 linear feet of permanent warm water stream impacts at a 1:1 ratio, rather than the 1,824 linear feet that was reported in the original application and subsequent certification.

After revisions, the total USACE mitigation requirement still exceeds the NCDWR mitigation requirement. Therefore, NCDOT does not need to request any additional compensatory mitigation from the NCEEP for mitigable stream impacts.

Buffers

A total of 349,282 square feet of Zone 1 impacts and 241,301 square feet of Zone 2 impacts are Mitigable. This is an increase of 4,084 square feet of Zone 1 Mitigable impacts and 1,363 square feet of Zone 2 Mitigable impacts when compared to the original permit application and subsequent buffer authorization. NCEEP will provide compensatory mitigation for the revised Mitigable Zone 1 buffer impacts at a 3:1 ratio and the revised Mitigable Zone 2 buffer impacts at a 1.5:1 ratio. A copy of the revised NCEEP Mitigation Acceptance Letter is attached.

Table 3. Revised Neuse River Basin Compensatory Mitigation Summary

	Stream Impacts (lin. ft.)	Riparian Wetland Impacts (ac.)	Mitigable Zone 1 Buffer Impacts (sq. ft.)	Mitigable Zone 2 Buffer Impacts (sq. ft.)
Impacts Requiring Mitigation	1,424	0.19	*349,282*	*241,301*
Mitigation Ratio	2:1	2:1	3:1	1.5:1
Total NCEEP Mitigation Required	2,848	0.38	*1,047,846*	*361,952*

A copy of this permit modification application and its distribution list will be posted on the NCDOT website at https://connect.ncdot.gov/resources/Environmental/Pages/default.aspx, under *Quick Links > Permit Applications*. Thank you for your time and assistance with this project. Please contact James Mason at either jsmason@ncdot.gov or (919) 707-6136 if you have any questions or need additional information.

Sincerely,

for Richard W. Hancock, P.E., Manager
Project Development and Environmental Analysis Unit

Cc: NCDOT Permit Application Standard Distribution List

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Division of Mitigation Services

Donald R. van der Vaart
Secretary

March 31, 2015

Mr. Richard W. Hancock, P.E.
Manager, Project Development & Environmental Analysis Unit
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Hancock:

Subject: Mitigation Acceptance Letter:

U-0071, East End Connector from NC 147 (Buck Dean Fwy) to North of NC 98, Durham County

References: USACE 404 Individual Permit issued March 24, 2014 (USACE Action ID 2011-00796)

NCDWR 401 Water Quality Certification issued January 28, 2014 (NCDWR Project ID 2013-1282)

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the additional buffer mitigation for the subject project. Based on the information supplied by you on March 30, 2015, the additional buffer impacts are located in CU 03020201 of the Neuse River Basin in the Central Piedmont (CP) Eco-Region, and are as follows:

Table 1 – Additional Impacts (feet / acres)

Neuse 03020201 CP	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1 (3:1)	Zone 2 (1.5:1)
Impacts (feet/acres)	0	0	0	0	0	0	4,084.0	1,363.0

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 funds from the NCDOT 2984 Fund into the Riparian Restoration Buffer Fund. Upon completion of transfer payment, NCDOT will have completed its addition riparian buffer mitigation responsibility for TIP Number U-0071. These additional impacts and associated mitigation needs were not projected by the NCDOT in the 2015 impact data. DMS is currently providing stream and riparian wetland mitigation for the impacts associated with this project located in cataloging unit 03030002 of the Cape Fear River basin and cataloging unit 03020201 of the Neuse River basin as required by the 404 and 401 permits that were issued in 2014, as shown in the below table (in mitigation credits):

Table 2 – Current Permitted Impacts and Mitigation Requirements (based on 2014 permits) and Revised Anticipated Impacts (based on mitigation request)

Neuse 03020201

Impact Type	Total Permitted Impacts (feet / acre)	Mitigation Provided by DMS per Issued Permits (Credits)	Additional Impact (for approval)	Revised Total Impacts*
Stream	1,424.0	2,848.0	0	1,424.0
Riparian Wetland	0.19	0.38	0	0.19
Buffer – Zone 1	345,198.0 sq ft	1,035,594.0 sq ft	4,054.0 sq ft	349,282.0 sq ft
Buffer – Zone 2	239,938.0 sq ft	359,907.0 sq ft	1,363.0 sq ft	241,301.0 sq ft

Cape Fear 03030002

Impact Type	Total Permitted Impacts (feet / acre)	Mitigation Provided by DMS per Issued Permits (Credits)	Additional Impact (for approval)	Revised Total Impacts*
Stream	440.0	880.0	0	440.0

*Some of the stream and wetland impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details. DMS will provide the amount of mitigation as determined by the regulatory agencies.

DMS has previously made debits for the stream and riparian wetland mitigation requirements to mitigation sites available in the cataloging units based on the amounts required in the 404 and 401 permits issued in 2014. The riparian buffer mitigation was paid on February 11, 2014 and the buffer mitigation requirement is not yet due. Upon issuance of the permit modifications for the project, DMS will make appropriate adjustments to the existing mitigation debits.

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

Sincerely,

James B. Stanfill

James B. Stanfill
DMS Asset Management Supervisor

Cc: Mr. Eric Alsmeyer, USACE – Raleigh Regulatory Field Office
Mr. Rob Ridings, NC Division of Water Resources
File: U-0071 Additional

Revised March 16, 2015

Permit Drawing
Sheet 20 of 91

PROJECT REFERENCE NO.	SHEET NO.
U-5017	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

M A Engineering Consultants, Inc.
700 East Chatham Street Suite 137 Cary NC, 27511
Phone: 919.297.0220 Fax: 919.297.0221

MATCH LINE SEE SHEET NO.25

SITE 4 | SITE 5 | SITE 6 | SITE 7 | SITE 8 | SITE 9 | SITE 10 | SITE 11

SURFACE WATER IMPACTS

TEMP. SURFACE WATER IMPACTS

NOTE: CONTRACTOR SHALL NOT PLACE FILL IN WETLANDS

FILL IN WETLANDS

TEMP. FILL IN WETLANDS

MECHANIZED CLEARING

NAD 83/95

DENOTES MECHANIZED CLEARING

DENOTES FILL IN WETLAND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES TEMPORARY FILL IN WETLAND

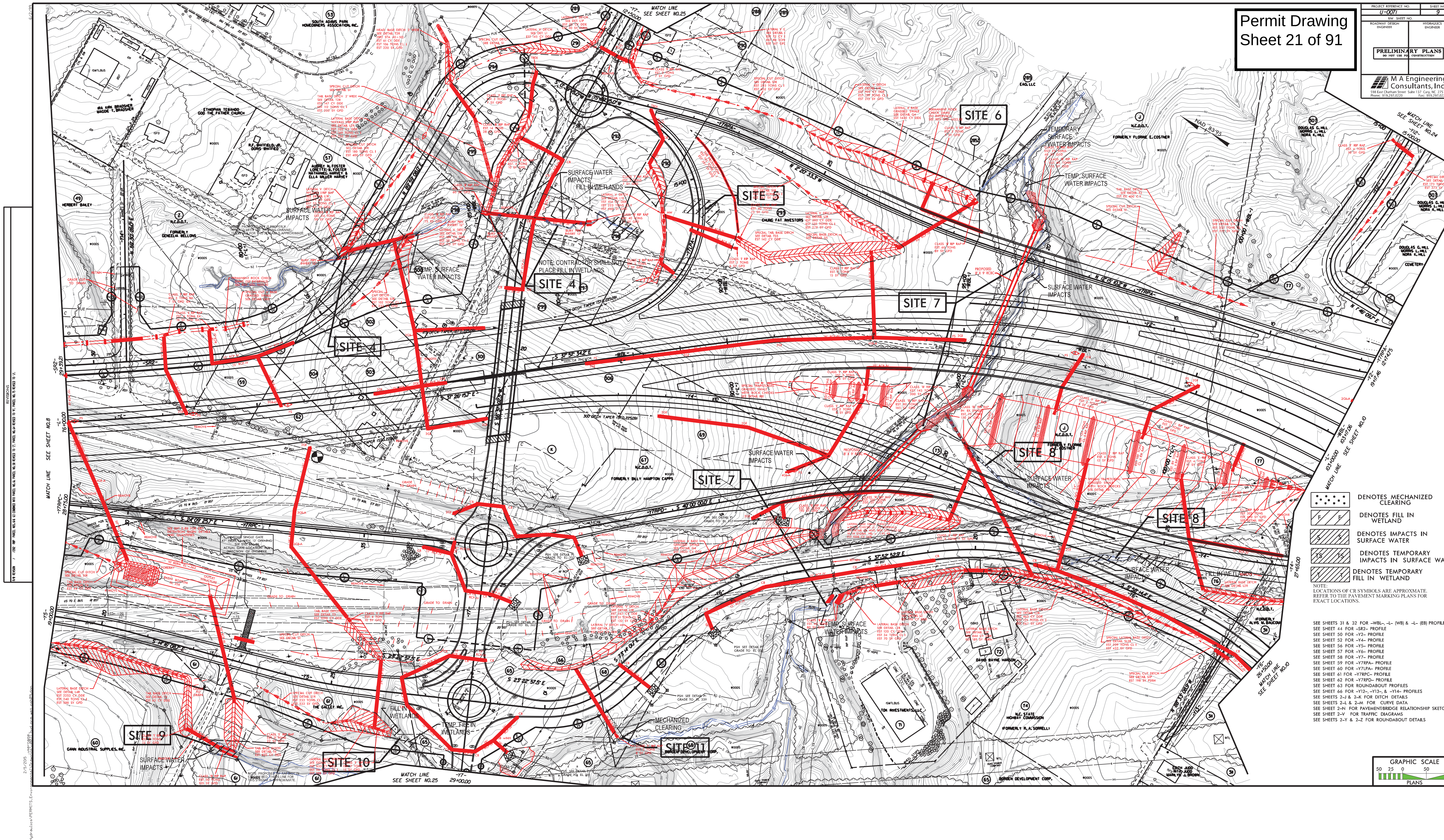
NOTE:
LOCATIONS OF CR SYMBOLS ARE APPROXIMATE. REFER TO THE PAVEMENT MARKING PLANS FOR EXACT LOCATIONS.

SEE SHEETS 31 & 32 FOR -WBL-, -L- (WB) & -L- (EB) PROFILES
SEE SHEET 44 FOR -SR2- PROFILE
SEE SHEET 50 FOR -Y2- PROFILE
SEE SHEET 52 FOR -Y4- PROFILE
SEE SHEET 56 FOR -Y5- PROFILE
SEE SHEET 57 FOR -Y6- PROFILE
SEE SHEET 58 FOR -Y7- PROFILE
SEE SHEET 59 FOR -Y78PA- PROFILE
SEE SHEET 60 FOR -Y7UPA- PROFILE
SEE SHEET 61 FOR -Y78PC- PROFILE
SEE SHEET 62 FOR -Y78PD- PROFILE
SEE SHEET 63 FOR ROUNDABOUT PROFILES
SEE SHEET 66 FOR -Y12-, -Y13-, & -Y14- PROFILES
SEE SHEETS 2-J & 2-K FOR DITCH DETAILS
SEE SHEETS 2-L & 2-M FOR CURVE DATA
SEE SHEET 2-N FOR PAVEMENT/BRIDGE RELATIONSHIP SKETCH
SEE SHEET 2-Y FOR TRAFFIC DIAGRAMS
SEE SHEETS 2-Y & 2-Z FOR ROUNDABOUT DETAILS

GRAPHIC SCALE
50 25 0 50 100
PLANS

2/5/2015
R:\Hydr-Roles\PERMITS\...

Revised March 16, 2015



PROJECT REFERENCE NO.	SHEET NO.
U-0071	9-C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

M A Engineering Consultants, Inc.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

Permit Drawing
Sheet 36 of 91

Revised March 16, 2015

REVISIONS

8/17/99

2/5/2015
username
K:\Projects\PERMITS_Environmental\Drawings\0071_hyd_crm_wet_ash09f.dgn

SITE 4

SITE 5

SITE 6

SITE 7

SITE 8

SITE 8

Complete site shown on Sheet 9-B

Complete site shown on Sheet 9-B

TEMP. SURFACE WATER IMPACTS

TEMPORARY SURFACE WATER IMPACTS

SURFACE WATER IMPACTS

SURFACE WATER IMPACTS

SURFACE WATER IMPACTS

TEMP. SURFACE WATER IMPACTS

FILL IN WETLANDS

F F DENOTES FILL IN WETLAND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

CHUNG FAT INVESTORS

FORMERLY FLORINE E. COSTNER

FORMERLY BILLY HAMPTON CAPPS

DAVID WAYNE HANSON

N.C.D.O.T.

N.C.D.O.T. (FORMERLY ALVIS M. BAUCOM)

SEAL & ABANDON WELL -L- STA. 90+00 (140' RT)

PROPOSED 8' X 9' RCBC

PROPOSED 8' X 9' RCBC

PSH SEE DETAIL P1 GRADE TO EL. 337

PSH SEE DETAIL P1 GRADE TO EL. 335

-Y2- SC Sta. 12+65.63

-Y2- CS Sta.

-WBL- POC Sta. 95+08.63 (61.00' LT)

-WBL- SC Sta. 94+57.58

-L- SC Sta. 93+87.96

-Y4- CS Sta. 17+99.33

-Y4- SRS Sta. 19+99.33

-Y4- SC Sta. 21+99.33

-Y7RPD- TS Sta. 6+37.62

-Y7RPD- SC Sta. 7+97.62

-Y7RPD- CS Sta. 9+14.66

-Y7RPD- SRS Sta. 11+54.66

-Y7RPD- SC Sta. 13+54.66 = -Y4- POC Sta. 23+97.52 (12' RT)

-Y6- PC Sta. 24+66.24

-Y7LPA- SC Sta. 12+00.00

-Y7RPA- STA. 23+75

END SBG -Y7RPA- STA. 19+35

BEGIN SBG -L- STA. 91+50

BEGIN SBG -Y7RPD- STA. 6+00

BEGIN SBG STA. 28+55

N 12° 15' 10.2" W -Y7RPA-

S 37° 52' 52.9" E

S 5° 58' 14.4" E -Y6-

S 40° 00' 00.0" E -Y7RPD-

-WBL- (95+00)

-L- (90+00)

-Y2-

-Y4-

-Y6-

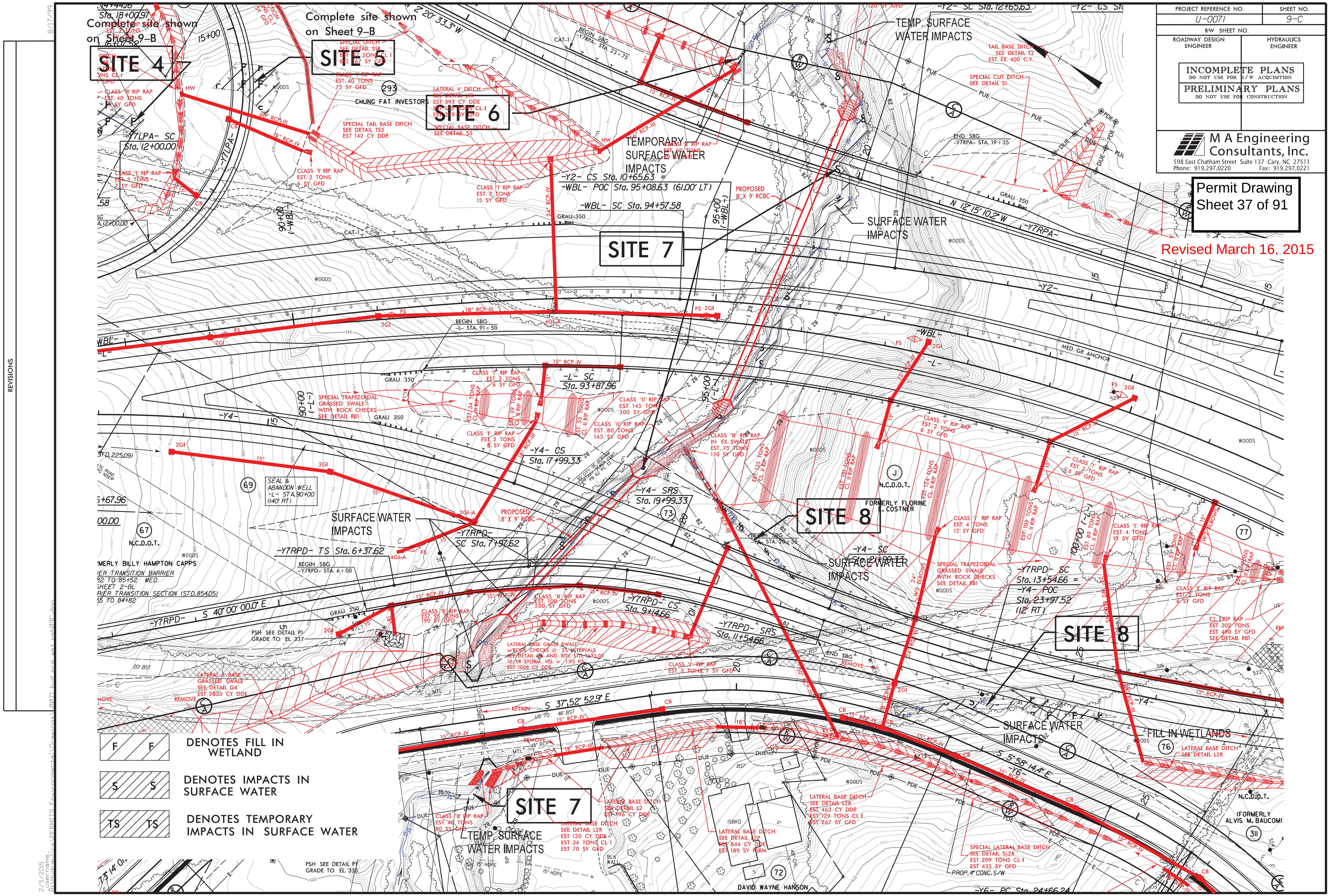
-Y7RPA-

-Y7RPD-

-Y7LPA-

-WBL-

-L-


PROJECT REFERENCE NO.
U-0071
SHEET NO.
9-C
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
M A Engineering Consultants, Inc.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221
Permit Drawing
Sheet 37 of 91
Revised March 16, 2015
Complete site shown on Sheet 9-B
Complete site shown on Sheet 9-B
SITE 4
SITE 5
SITE 6
SITE 7
SITE 7
SITE 8
SITE 8
TEMP. SURFACE WATER IMPACTS
TEMPORARY SURFACE WATER IMPACTS
SURFACE WATER IMPACTS
SURFACE WATER IMPACTS
SURFACE WATER IMPACTS
SURFACE WATER IMPACTS
TEMP. SURFACE WATER IMPACTS
FILL IN WETLANDS
CHUNG FAT INVESTORS
N.C.D.O.T.
FORMERLY FLORINE E. COSTNER
FORMERLY BILLY HAMPTON CAPPS
(FORMERLY ALVIS M. BAUCOM)
DAVID WAYNE HANSON
-Y2- CS Sta. 10+65.63
-WBL- POC Sta. 95+08.63 (61.00' LT)
-WBL- SC Sta. 94+57.58
-L- SC Sta. 93+87.96
-Y4- CS Sta. 17+99.33
-Y4- SRS Sta. 19+99.33
-Y7RPD- TS Sta. 6+37.62
-Y7RPD- SC Sta. 7+97.62
-Y7RPD- CS Sta. 9+14.66
-Y7RPD- SRS Sta. 11+54.66
-Y7RPD- SC Sta. 13+54.66 = -Y4- POC Sta. 23+97.52 (12' RT)
N 12°15'10.2" W
S 40°00'00.0" E
S 37°52'52.9" E
S 5°58'14.4" E
F F DENOTES FILL IN WETLAND
S S DENOTES IMPACTS IN SURFACE WATER
TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
REVISIONS

M A Engineering Consultants, Inc.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

PROJECT REFERENCE NO.	SHEET NO.
U-0071	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 60 of 91

Revised March 16, 2015

REVISIONS
8/17/99
R/W REVISION / /20/2 RMP PARCEL NOS. 52 & 80 COMBINED INTO PARCEL NO. 92, AND PARCEL NAME CHANGED TO "DURHAM COCA COLA BOTTLING COMPANY"; PARCEL NOS. 378 & 380 COMBINED INTO PARCEL NO. 378, PARCEL NO. 85 REVISED TO "S"; PARCEL NO. 87 REVISED TO "L"; PARCEL NO. 90 REVISED TO "H"; PARCEL NO. 384 REVISED TO "R".

INSTALL SINGLE GATE 47" HIGH, 12' WIDE, 12' OPENING SEE STD. 866.02 ACTUAL GATE LOCATION PER DIRECTION OF ENGINEER

SITE 27
SITE 17A
SITE 17
SITE 18
SITE 15
SITE 16
SITE 17B

TEMP. IMPACTS IN SURFACE WATERS
SURFACE WATER IMPACTS
TEMP. IMPACTS IN SURFACE WATERS

PROPOSED 6' X 7' RCBC
CLASS 'II' RIP RAP EST. 17 TONS 35 SY GFD
CLASS 'II' RIP RAP EST. 20 TONS 40 SY GFD
CLASS 'II' RIP RAP EST. 22 TONS 45 SY GFD
CLASS 'II' RIP RAP EST. 20 TONS 40 SY GFD
LATERAL 'V' DITCH SEE DETAIL L1R EST 1366 CY DDE EST 226 TONS CL I EST 487 SY GFD
LATERAL BASE DITCH SEE DETAIL L3 EST 511 CY DDE
10-YR VELOCITY @ BUFFER = 1.95 FT/SEC

SEE SHT 2-BF FOR DETENTION BASIN OUTLET DITCH DETAILS AND QUANTITIES

10' BERM EL = 364
FOREBAY
OUTLET STRUCTURE
BASIN BOTTOM EL = 357

DRAIN POND
POND WE 358
POND WE 372
POND WE 360

ALICE SHAMBLEY YATES
FORMERLY ALBERT L. HIGHT
(FORMERLY DORIS M. LINDSEY)
(FORMERLY WILLIAM K. GRAHAM)
(FORMERLY R.G. FAULKNER)
(FORMERLY ANNIE D. KNIGHT)
FORMERLY OTIS L. WALLER
WILLIAM A. ROCHELLE
BELINDA H. ROCHELLE
IRIS K. DOUGLAS
DURHAM PROPERTIES, INC.
CITY OF DURHAM
DURHAM COCA COLA BOTTLING COMPANY

N.C.D.O.T.

68' DUKE POWER COMPANY ESMT.
25' CITY OF DURHAM SANITARY SEWER ESMT. PB 65 PG 53
25' CITY OF DURHAM SANITARY SEWER ESMT. PB 99 PG 70

TTA Tk B
TTA Tk A
FUTURE BY OTHERS
NORFOLK SOUTHERN RR
SR 1926 ANGIER AVE
CHECKERBERRY LN 16' GR

DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER (POND)
DENOTES IMPACTS IN SURFACE WATER
DENOTES FILL IN WETLAND

370 JOHN E. HINTZ, BRENDA J. HINTZ	382 JOSHUA H. MILAN, DEBORAH S. MILAN
378 LESTER E. DUDLEY, RANDY THOMAS DUDLEY	381 FRANKIE D. WILSON, JOHN L. DILLARD, JR.
383 JAMIE WILLIAM WRENN, CASEY NICHOLAS WRENN	

MATCH LINE SEE SHEET NO.10
MATCH LINE SEE SHEET NO.12

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M A Engineering Consultants, Inc.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

PROJECT REFERENCE NO.	SHEET NO.
U-0071	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Permit Drawing
Sheet 61 of 91

Revised March 16, 2015

REVISIONS
8/17/99
R/W REVISION / 7/02 RWP PARCEL NOS. 52 & 80 COMBINED INTO PARCEL NO. 52; AND PARCEL NAME CHANGED TO "DURHAM COCA COLA BOTTLING COMPANY"; PARCEL NOS. 379 & 380 COMBINED INTO PARCEL NO. 379, PARCEL NO. 85 REVISED TO "S"; PARCEL NO. 87 REVISED TO "L"; PARCEL NO. 90 REVISED TO "H"; PARCEL NO. 384 REVISED TO "R".

INSTALL SINGLE GATE 47" HIGH, 12' WIDE, 12' OPENING SEE STD. 866.02 ACTUAL GATE LOCATION PER DIRECTION OF ENGINEER

SITE 27
SITE 17A
SITE 17
SITE 18
SITE 15
SITE 16
SITE 17B

TEMP. IMPACTS IN SURFACE WATERS
SURFACE WATER IMPACTS
TEMP. IMPACTS IN SURFACE WATERS

CLASS 'II' RIP RAP EST. 17 TONS 35 SY GFD
CLASS 'II' RIP RAP EST. 20 TONS 40 SY GFD
PROPOSED 6'X 7' RCBC
CLASS 'II' RIP RAP EST. 22 TONS 43 SY GFD
CLASS 'II' RIP RAP EST. 20 TONS 40 SY GFD
LATERAL 'V' DITCH SEE DETAIL L1R EST 1366 CY DDE EST 226 TONS CL I EST 452 SY GFD
LATERAL BASE DITCH SEE DETAIL L3 EST 511 CY DDE
10-YR VELOCITY @ BUFFER=1.95 FT/SEC

10' BERM EL=364 FOREBAY OUTLET STRUCTURE BASIN BOTTOM EL=357
SEE SHT 2-BR FOR DETAIL OF DETENTION BASIN OUTLET DITCH, DETAILS AND QUANTITIES

DRAIN POND
POND WE 358
POND WE 373
POND WE 360

BEGIN FENCE (60' CL)
BEGIN FENCE (60' CL)

FUTURE BY OTHERS -Y18- PC Sta. 20+06.91
FUTURE BY OTHERS -Y18-

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER
S S DENOTES IMPACTS IN SURFACE WATER
P P DENOTES IMPACTS IN SURFACE WATER (POND)
F F DENOTES FILL IN WETLAND

370 JOHN E. HINTZ, BRENDA J. HINTZ	382 JOSHUA H. MILAN, DEBORAH S. MILAN
378 LESTER E. DUDLEY, RANDY THOMAS DUDLEY	381 FRANKIE D. WILSON, JOHN L. DILLARD, JR.
383 JAMIE WILLIAM WRENN, CASEY NICHOLAS WRENN	

DURHAM PROPERTIES, INC.
IRIS K. DOUGLAS
WILLIAM A. ROCHELLE, BELINDA H. ROCHELLE
CITY OF DURHAM
DURHAM COCA COLA BOTTLING COMPANY
ALICE SHAMBLEY YATES
FORMERLY ALBERT L. HIGHT
FORMERLY OTIS L. WALLER
(FORMERLY DORIS M. LINDSEY)
(FORMERLY WILLIAM K. GRAHAM)
(FORMERLY R.G. FAULKNER)
(FORMERLY ANNIE D. KNIGHT)

MATCH LINE SEE SHEET NO.10
MATCH LINE SEE SHEET NO.12

2/20/2015
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PROJECT REFERENCE NO.	SHEET NO.
U-0071	20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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Permit Drawing
Sheet 74 of 91

Revised March 16, 2015

REVISIONS
R/W REVISION / /202 RWP ALL ADJACENT PARCELS OWNED BY WILLIAM B. BARKER COMBINED INTO PARCEL NO. 309. PARCEL NO. 185 REVISED TO 928.

8/17/99

2/20/2015
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MATCH LINE SEE SHEET NO.10

Site continued on Sheet 10-A and 10B

SITE 12

SITE 23

SITE 24

WILLIAM B. BARKER (309)

LYNN-OXFORD ASSOCIATES

N.C. STATE HIGHWAY COMMISSION
FORMERLY ALLEN D. ALDRIDGE (184)

LIVING CHRISTIAN (186)

PHILLIP C. RANSDELL II
PAGE GUNTER RANSDELL
PAUL ANDREW RANSDELL (928)

NAD 83/95

TEMPORARY SHORING – SEE WORK ZONE TRAFFIC CONTROL PLANS

TEMP. IMPACTS IN SURFACE WATERS

IMPACTS IN SURFACE WATERS

SURFACE WATER IMPACTS

BURY PIPE INVERT 12"

CLASS 'II' RIP RAP EST. 41 TONS 82 SY GFD

-US70FLY- STA. 43+30 LT 115' 60 LF LEVEL SPREADER BASE INV. 320' SEE DETAIL LS1

PAVED TAIL DITCH SEE DETAIL PTI EST 23 CY DDE EST 21 SY CONC.

15" RCP-IV 2 ELBOWS

HW=4' RCP-IV

BURY PIPE INVERT 12" 2GI WANGLE VANE GRATE

TAIL DITCH SEE DETAIL T1

LATERAL V DITCH SEE DETAIL L1R EST 236 CY DDE EST 124 TONS CL I EST 256 SY GFD

LATERAL V DITCH SEE DETAIL L1R EST 150 CY DDE EST 119 TONS CL I EST 245 GFD

CLASS 'I' RIP RAP EST. 4 TONS 10 SY GFD

SPECIAL GRASS SWALE SEE DETAIL G1S

TOE PROTECTION SEE DETAIL R1 EST 115 TONS CL I EST 233 SY GFD

REMOVE 18" RCP

REMOVE EXISTING RCBC

PROPOSED 8' X 10' RCBC

PSH SEE DETAIL P1 GRADE TO EL. 325

PSH SEE DETAIL P1 GRADE TO EL. 326

2GI WANGLE VANE GRATE

ROUND MH w/COVER

SPECIAL CUT DITCH SEE DETAIL S1R EST 170 TONS CL I EST 363 SY GFD

PLACE PERMANENT ROCK CHECK DAMS @ 25' INTERVALS SEE RDY STD 1633.02

SPECIAL CUT GRASSED SWALE w/5' BASE SEE DETAIL G5S

LATERAL BASE GRASSED SWALE SEE DETAIL G5 EST 861 CY DDE

CLASS 'I' RIP RAP EST. 3 TONS 7 SY GFD

GRASSED SWALE W/4' BASE SEE DETAIL G4

RETAIN

CLASS 'II' RIP RAP EST. 16 TONS EST. 32 SY GFD NOTE: RIPRAP PAD TO BE COUNTERSUNK

S 4° 50' 14.6" E

S 33° 15' 07.0" E

S 37° 45' 34.7" E

N 20°02'38" W 255.31'

N 20°02'35" W 259.94'

-US70FLY- 40+70.00

-Y2- 30+00.00

-Y3-

-Y4- 40+52.64

-EEC70E- 26+10.00

MATCH LINE SEE SHEET NO.10

MATCH LINE SEE SHEET NO.21

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
U-0071	20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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Phone: 919.297.0220 Fax: 919.297.0221

Permit Drawing
Sheet 75 of 91

Revised March 16, 2015

REVISIONS
R/W REVISION / /202 RMP ALL ADJACENT PARCELS OWNED BY WILLIAM B. BARKER COMBINED INTO PARCEL NO. 309. PARCEL NO. 185 REVISED TO 928.

8/17/99

MATCH LINE SEE SHEET NO.10

-US70FLY- 40+70.00

-Y2- 30+00.00

-Y4- 40+52.64

-EEC70E- 26+90.00

MATCH LINE SEE SHEET NO.10

MATCH LINE SEE SHEET NO.21

-Y3- 43+00.00

Site continued on Sheet 10-A and 10B

TEMP. IMPACTS IN SURFACE WATERS

SITE 12

IMPACTS IN SURFACE WATERS

-US70FLY- STA. 43+30 LT 115' 60' ER. LEVEL SPREADER BASE INV. 320' SEE DETAIL LS1

BURY PIPE INVERT 12"

CLASS 'II' RIP RAP EST. 41 TONS 82 SY GFD

PAVED TAIL DITCH SEE DETAIL PTI EST. 23 CY DDE EST. 21 SY CONC.

2-45° BENDS

15" RCP-IV

2GI

BURY PIPE INVERT 12" 2GI WANGLE VANE GRATE

TAIL DITCH SEE DETAIL TDI

TEMP. IMPACTS IN SURFACE WATERS

S 4°50'46.6" E

LATERAL V-DITCH SEE DETAIL L1R EST. 236 CY DDE EST. 124 TONS CL I EST. 256 SY GFD

LATERAL V DITCH SEE DETAIL L1R EST. 150 CY DDE EST. 119 TONS CL I EST. 245 GFD

CLASS 'I' RIP RAP EST. 4 TONS 10 SY GFD

SPECIAL GRASS SWALE SEE DETAIL G1S

TOE PROTECTION SEE DETAIL R1 EST. 115 TONS CL I EST. 233 SY GFD

18" RCP-IV

TEMP. SHORING - SEE WORK ZONE TRAFFIC CONTROL PLANS

WILLIAM B. BARKER

LYNN-OXFORD ASSOCIATES

N 20°02'38" W 255.5'

NAD 83/95

N 20°02'35" W 259.94'

N.C. STATE HIGHWAY COMMISSION FORMERLY ALLEN D. ALDRIDGE

PSH SEE DETAIL P1 GRADE TO EL. 325

TEMP. IMPACTS IN SURFACE WATERS

SITE 23

REMOVE EXISTING R.C.P.

S 33°15'07.0" E

S 37°45'34.7" E

US 70 47' BST

6' BST

REMOVE 18" RCP

PROPOSED 8' X 10' RCBC

IMPACTS IN SURFACE WATERS

4GI-A

3GI-A

2GI-D

ROUND MH w/COVER

PSH SEE DETAIL P1 GRADE TO EL. 326

TEMP. IMPACTS IN SURFACE WATERS

SURFACE WATER IMPACTS

CLASS 'II' RIP RAP EST. 16 TONS EST. 22 SY GFD NOTE: RIPRAP PAD TO BE COUNTERSUNK

SITE 24

SPECIAL CUT DITCH SEE DETAIL S1R EST. 170 TONS CL I EST. 363 SY GFD

PLACE PERMANENT ROCK CHECK DAMS @ 25' INTERVALS SEE RDY STD. 1633.02

SPECIAL CUT GRASSED SWALE w/5' BASE SEE DETAIL G5S

LATERAL BASE GRASSED SWALE SEE DETAIL G5 EST. 861 CY DDE

CLASS 'I' RIP RAP EST. 9 TONS 7 SY GFD

GRASSED SWALE W/4' BASE SEE DETAIL G4

RETAIN

TBDI

15" RCP-IV

LIVING CHRISTIAN

ISMTL LIVING WATERS CHRISTIAN COMMUNITY CHURCH

ISBK LIVING WATERS CHRISTIAN COMMUNITY CHURCH

PHILLIP C. RANSDELL II PAGE GUNTER RANSDELL PAUL ANDREW RANSDELL

928

184

186

309

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

2/20/2015
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WETLAND PERMIT IMPACT 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)
1	L 32+58 to 36+64	FILL						0.04		412		
2	L 37+75 - SR1 34+84 Y17 11+14	66" RCP-IV, 48"RCP-III, 24"RCP-III	0.08					0.07	<0.01	673	14	
		BANK STABILIZATION								20		
3	L 44+53	30" RCP-III	0.06					0.06		410		
* 4	SR2 36+89 Y7 17+24	48" RCP-III, 60" RCP-III	0.05					0.03	<0.01	349	15	
		BANK STABILIZATION								70		
* 5(T)	Y7LPA 13+98	60" RCP-III	0.06									
6	Y7RPA 21+78	66" RCP-III							<0.01		15	
7	Y7RPA 20+75 to Y6 15+90	8'x9' RCBC						0.17	0.01	665	104	
		BANK STABILIZATION								305		
8	Y4 19+63 to 22+30 and Y4 23+04 to 25+59	30" RCP-III, FILL	0.04					0.07		443		
9	Y5 23+20 RT.	30" RCP-III						0.03	<0.01	29	0	
		BANK STABILIZATION								43		
10	Y5 26+62 RT.	FILL	0.01	0.01								
11	Y6 11+15 off 104 RT.	18" RCP-III				<0.01						
12	Y2 26+53 to 27+90 LT.	48" RCP-III & RECHANNELIZATION						0.11	0.03	705	132	
		BANK STABILIZATION								42		
13(T)	Y4 35+48	36" RCP-IV						0.78				
* 14(T)	L 122+93	30" RCP-V	0.08									
* 15(T)	L 132+13	FILL	0.03									
* 16(T)	L 132+33 RT.	FILL	0.05									
17	L 133+41	6'x7' RCBC						0.06	<0.01	479	28	
		BANK STABILIZATION								85		
17A	L 133+26 264' LT	FILL							<0.01		56	
TOTALS:			0.46	0.01		<0.01		1.42	0.04	4730	364	

*Rounded totals are sum of actual impacts

NOTES:
* indicates isolated wetland

(T) Indicates Total Take

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

DURHAM COUNTY
WBS - 34745.1.1 (U-0071)

3/5/2015

Revised March 16, 2015

WETLAND PERMIT IMPACT 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)
17B	L 133+69 263' RT	FILL							<0.01		7	
18(T)	L 134+53 LT.	FILL						0.19				
19	not jurisdictional	0										
20	DFLW 27+34 to 38+06	42" RCP-III						0.02	<0.01	218	17	
21	DFLW 39+19	FILL						0.01		28		
22	DFLW 41+62	FILL						0.01		23		
23	Y3 34+45	8'x10' CULVERT						0.08	0.02	280	76	
		BANK STABILIZATION								127		
24	Y3 40+16.69 RT	30" RCP-III						0.04	0.01	104	23	
25	Y9 28+10 LT to 26+85 RT	66" RCP-III						0.01	<0.01	168	10	
		BANK STABILIZATION								35		
26	Y3 57+75 LT to RT	60" RCP-III						0.01	<0.01	50	23	
		BANK STABILIZATION								50		
27	L 129+77 414LT.	BANK STABILIZATION								10		
28	DFLW 52+08 LT & RT	36" RCP						0.02	0.01	121	20	
29	DFLW 72+35 LT	FILL						< 0.01		40		
30	DFLW 73+72 LT	FILL						< 0.01		10		
31	DFLW 78+76 LT& 81+14 RT	BANK STABILIZATION								61		
		Construction Activity							<0.01		22	
32	DFLW 78+79 LT	Construction Activity							<0.01		9	
TOTALS (page 2 of 2):			0.00	0.00		0.00		0.39	0.04	1325	207	
TOTALS (page 1 of 2):			0.46	0.01		<0.01		1.42	0.04	4730	364	
TOTALS:			0.46	0.01		<.0.01		1.81	0.09	6055	571	

*Rounded totals are sum of actual impacts

NOTES:
* indicates isolated wetland

(T) Indicates Total Take

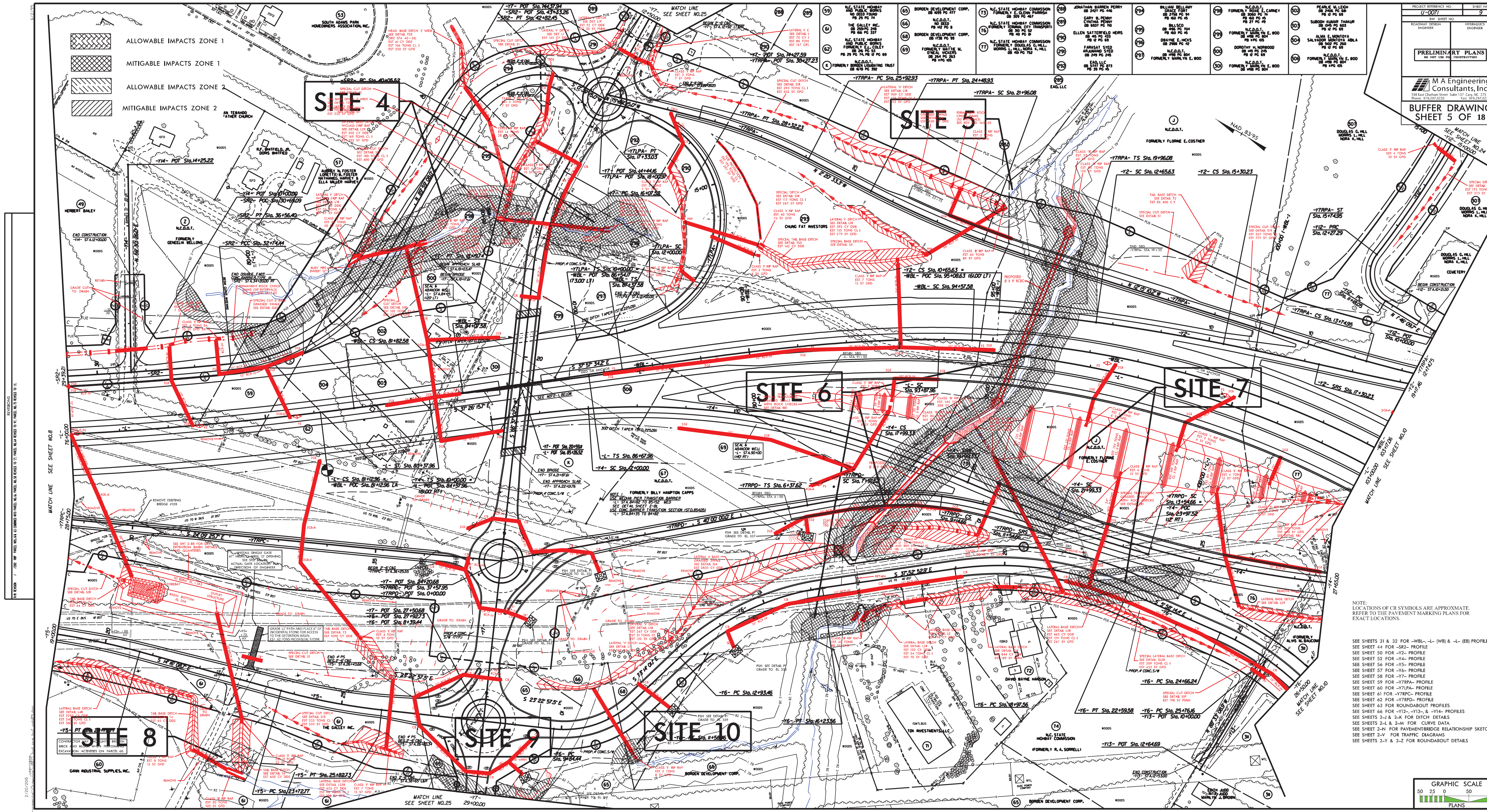
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

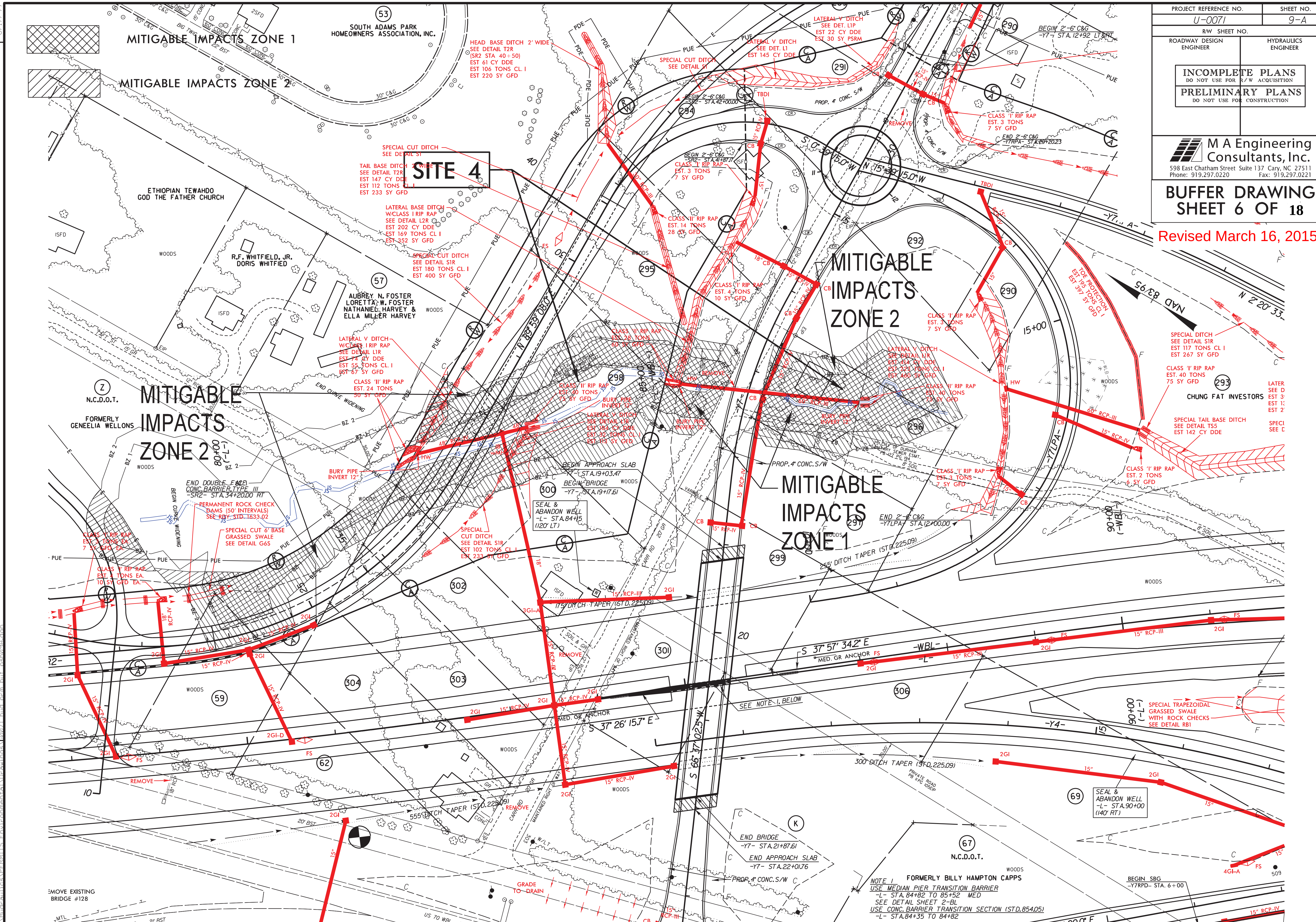
DURHAM COUNTY
WBS - 34745.1.1 (U-0071)

3/5/2015

Revised March 16, 2015

Revised March 16, 2015





PROJECT REFERENCE NO. U-0071 | SHEET NO. 9-A

RW SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

M A Engineering Consultants, Inc.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

BUFFER DRAWING SHEET 6 OF 18

Revised March 16, 2015

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-0071	9-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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BUFFER DRAWING SHEET 7 OF 18

Revised March 16, 2015

ALLOWABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

MITIGABLE IMPACTS ZONE 2

SITE 5

SITE 6

SITE 7

CHUNG FAT INVESTORS

N.C.D.O.T. FORMERLY FLORINE E. COSTNER

DAVIS WAYNE HANSON

N.C.D.O.T. (FORMERLY ALVIS M. BAUCOM)

-Y2- CS Sta. 10+65.63 = -WBL- POC Sta. 95+08.63 (61.00' LT)

-WBL- SC Sta. 94+57.58

-WBL- SC Sta. 93+87.96

-Y4- CS Sta. 17+99.33

-Y4- SC Sta. 19+99.33

-Y4- SC Sta. 21+99.33

-Y7RPD- TS Sta. 6+37.62

-Y7RPD- SC Sta. 7+97.62

-Y7RPD- CS Sta. 9+14.66

-Y7RPD- SRS Sta. 11+54.66

-Y7RPD- SC Sta. 13+54.66 = -Y4- POC Sta. 23+97.52 (12' RT)

-Y7RPA- CS Sta. 13+74.95

-Y2- SRS Sta. 17+30.23

-Y6- PC Sta. 24+66.24

-Y7RPA- TS Sta. 19+35

N 12° 15' 10.2" W

S 37° 52' 52.9" E

S 5° 58' 14.4" E

REVISIONS

8/17/99

2/5/2015
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BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									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)
1	66" RCP-V	L 36+86RT to 38+71LT	X						41408	26834	68242		
2	30" RCP & 15"RCP	L 44+95 to 49+16 LT	X						22801	15534	38335		
3	30" RCP-III	Y17 12+93 to 13+97	X			2222	997	3219					
4	18", 48" & 60" RCP	SR2 32+99 to Y7 16+51	X						44620	35088	79708		
5	66" RCP-III	Y7RPA 21+27 to 22+32	X			2342	3142	5484					
6	TWO 8'x9' RCBC	Y7RPA 20+32 to Y7RPD 7+62	X						63171	38576	101747		
7	30" RCP-III	Y4 21+14	X						24286	16780	41066		
8	DITCH	Y5 23+24	STORMWATER MANAGEMENT			3438	1805	5243					
9	15" RCP-III	Y7 29+00			X				4340	6087	10427		
10	18" RCP-III	Y6 11+09			X				977	1780	2757		
11	PREFORMED SCOUR HOLE	Y12 10+00	STORMWATER MANAGEMENT				87	87					
12	15", 24", & 36" RCP	L 109+80 to Y2 29+08	X						77205	50757	127962		
13	8'x10' RCBC	Y3 34+44	X						27871	20229	48100		
14	30" RCP	Y3 40+73	X			7822	3210	11032					
15	60" RCP	Y9 27+33	X						13171	8861	22032		
16	60" RCP	Y3 57+71	X			7690	5252	12942					
17	6'x7' RCBC	L 133+41	X						36102	23110	59212		
18	DITCH	L 129+60	STORMWATER MANAGEMENT			2146	1897	4043					
TOTAL:						25660	16390	42050	355952	243636	599588		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

DURHAM COUNTY
PROJECT: 34745.2.8 (U-0071)

2/20/2015
SHEET **18** OF **18**

Revised March 16, 2015