STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

December 16, 2011

U. S. Army Corps of Engineers
Regulatory Field Office
Post Office Box 1000
Washington, NC 27889-1000

ATTN: Mr. William J. Biddlecome
NCDOT Coordinator

N.C. Dept. of Environment and Natural Resources
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

ATTN: Mr. Stephen Lane
NCDOT Coordinator

Subject: **Permit Modification Request for the Individual Section 404 Permit, Individual Water Quality Certification, and CAMA Permit** for the widening of US 158/NC 34 from East of Pasquotank River to the US 158/ NC 34 split in Camden County. Federal Aid Project No. STP-158(2), Division 1, TIP Nos. R-2414 A&B. Debit $670 from WBS 34430.1.1.

Reference: Original Permit Application requested October 15, 2008
Section 404 Individual Permit issued January 14, 2009;
USACE Permit No. SAW- 1994-02124
Section 401 Water Quality Certification issued December 18, 2008;
NCDWQ Project No. 003774
Division of Coastal Management Permit issued January 13, 2009;
DCM Permit No. 03-09

Dear Gentlemen:

Please see the enclosed revised permit drawings (Sheets 1, 14, 15, 16, 17, 29, 30, 31, 32 of 38), roadway drawings, and revised EEP Acceptance Letter for the above referenced project. Due to the continual rejections of bids by contractors due to the stabilization methods, the NCDOT has redesigned the soil stabilization method which has resulted in impact changes at the three culvert locations on the above referenced project. Due to these changes, a permit modification is requested by the Department.

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

TELEPHONE: 919-707-6100
FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610-4328

Substrate Stabilization Method Change

Due to the need to prevent subsidence around the three culverts along the project, different stabilization methods have been proposed. The department considered using aluminum culverts, and then a "mass soil mixing" to stabilize the area. It has now been determined that the most predictable and cost-predictable method is to use a buoyant cement method (also referred to as foamed concrete) at the approaches, and to place the culverts on piles at the crossings. This will ensure stability, as well remove the concerns of the uncertainty of subsurface material.

Despite of the Department's minimization efforts, the project footprint will expand at the culvert sites. This is necessary to safely detour traffic around this larger stabilization operation. Right of way limits will not change as a result of these activities.

This activity will occur at the approaches at two of the three culverts sites, previously identified as Permit Sites 3 and 6.

The concrete will be contained inside the protective form, providing a barrier between the concrete and the jurisdictional resources abutting this activity.

Site 3

The fill slopes will be expanded into a wetland area previously permitted as hand clearing. However, the hand clearing limit will not be expanded at this location. As a result, the permanent fill in wetlands will increase from 0.65 to 0.67 acre, and the hand clearing impact will be reduced from 0.26 to 0.24 acre.

The culvert type has also been reverted back to a single barrel 8' by 6' reinforced concrete box culvert (RCBC), as this stabilization method obviates the need for the lightweight aluminum.

Site 6

The fill slopes will be expanded into an area previously permitted as hand clearing, and the area of hand clearing will also expand out in the amount previously identified in earlier permits (0.37 acre). As a result, the permanent fill in wetlands will increase from 0.85 to 0.87 acre. The hand clearing amount will remain the same (0.37 acre), as it will be moved out from the expanded fill line.

The culvert type has also been reverted back to a double barrel 6' by 5' RCBC, as this stabilization method obviates the need for the lightweight aluminum.

Mitigation
Compensatory mitigation for the additional 0.04 acre of wetland impact will be provided by EEP. A copy of the acceptance letter is included with this request.

Section 404 Permit: NCDOT requests that the USACE review this application and issue a modification for the Individual 404 Permit issued October 6, 2010, as required for the above-described activities.

Section 401 Permit: NCDOT requests that the NCDWQ review this application and issue a modification for the Individual 401 Certification issued October 20, 2010, as required for the above-described activities. In accordance with 15A NCAC 2H .0501(a) we are providing five copies of this modification request to the DWQ for their approval and $570 to act as payment for processing the permit modification (see subject line).

CAMA Permit: NCDOT requests that the Division of Coastal Management review this application and issue a modification for the permit issued December 9, 2010, as required for the above-described activities. Debit $100 modification fee from the aforementioned (see subject line) WBS element.

A copy of this permit modification request and its distribution list will be posted on the NCDOT website at http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Michael Turchy at maturchy@ncdot.gov or (919) 707-6157.

Sincerely,

E. L. Fuck

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

Cc:
NCDOT Permit Application Standard Distribution List.

Ecosystem Enhancement PROGRAM

December 14, 2011

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

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

R-2414A, US 158/NC 34 Widening from East of the Pasquotank River to SR 1257 (Havenwood Drive), Camden County

References: USACE 404 Individual Permit issued February 5, 2009 and Individual Modification issued July 1, 2010 (USACE Action ID 1994-02124-115)

NCDWQ 401 Water Quality Certification issued December 18, 2008 and Modifications issued June 28 and October 20, 2010 (NCDWQ Project ID 2008-1602)

NCDCM Major CAMA Permit issued January 12, 2009 and modifications issued July 1 and October 22, 2010 (NCDEM Permit Number 03-09)

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide the additional riparian wetland mitigation for the subject project. Based on the information supplied by you on December 12 and 14, 2011, the additional impacts are located in CU 03010205 of the Pasquotank River Basin in the Northern Outer Coastal Plain (NOCP) Eco-Region, and are as follows:

Table 1 – Additional Impacts

Pasquotank 03010205 NOCP	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	0.04	0	0	0	0

This mitigation acceptance letter replaces the mitigation acceptance letters issued on September 20 and October 1, 2010. EEP is currently providing stream and riparian wetland mitigation for the impacts associated with this project located in Pasquotank 03010205 as required by the 404, 401, and CAMA Major permits that were issued February 5, 2009, December 18, 2008, and January 12, 2009, respectively, and the permit modifications issued in June/July 2010 and October 2010, as shown in the below table (in mitigation credits):

Table 2 – Total Revised Impacts and Mitigation Credits Provided from EEP

Impact Type	Permitted Impacts	Mitigation Provided by EEP per Issued Permits (Credits)	Additional Impact (for approval)	Revised Total Impacts
Stream	246.0	492.0	0	246.0
Riparian Wetland	4.70	9.40	0.04	4.74

EEP commits to implementing sufficient riparian wetland mitigation credits to offset the additional impacts associated with this project as determined by the regulatory agencies in accordance with the N.C. Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from EEP.

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

Sincerely,

James B. Stanfill for

Michael Ellison
EEP Deputy Director

Cc: Ms. Bill Biddlecome, USACE – Washington Regulatory Field Office
Mr. Brian Wrenn, NC Division of Water Quality
File: R-2414A Additional 2

WETLAND PERMIT IMPACT 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	-L- 47+83 LT / 47+94 RT	1 @ 30" RCP					0.01					
2	-L- 51+60 LT / 51+95 RT	1 @ 30" RCP	0.09				0.05					
3	-L- 55+12 LT / 56+49 RT	1 @8ft x 6ft RCBC	0.67				0.24	0.04	0.01	121	29	
	-L- 57+44 RT / 58+25 RT		0.10		0.05							
4	-L- 62+65 LT / 62+94 RT	1 @ 24" RCP	0.06				0.04					
5	-L- 67+19 LT / 67+70 RT	1 @ 30" RCP	0.08				0.06					
6	-L- 72+48 LT / 74+48 RT	2@6ft x 5ft RCBC	0.87		0.01		0.37	0.05	0.01	92	21	
Old Site 7	-L- 82+43 / 82+83 RT	SITE DELETED										
7	-L- 88+48L / 89+68L	1 @ 16ft x 6ft Al Box	0.38				0.16	0.02	0.01	83	19	
TOTALS:			2.25		0.06		0.93	0.11	0.03	296	69	

0.21ac of Temporary Fill in Wetlands in the Hand Clearing areas for erosion control measures.

Permit Drawing

Sheet 1 of 38

Revised: December 2011

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

CAMDEN COUNTY
PROJECT 8.T020401 (R-2414B)
US 158 - NC 34 WIDENING

SHEET REV 12/11

JMD Revised 2/03/05

REVISIONS
11/07/06 - REVISED ROW AND TCE ON PARCEL 22.(ABP)
R/W REVISION - REVISED PROPERTY OWNER NAMES ON PARCEL NO.13,17,18,19,20,21 & 23. ADDED PARCEL NO.16A & 17A. BAM
R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.22. BAM

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

WETHERILL ENGINEERING
829 James Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 9077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

METRIC 5 0 10

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

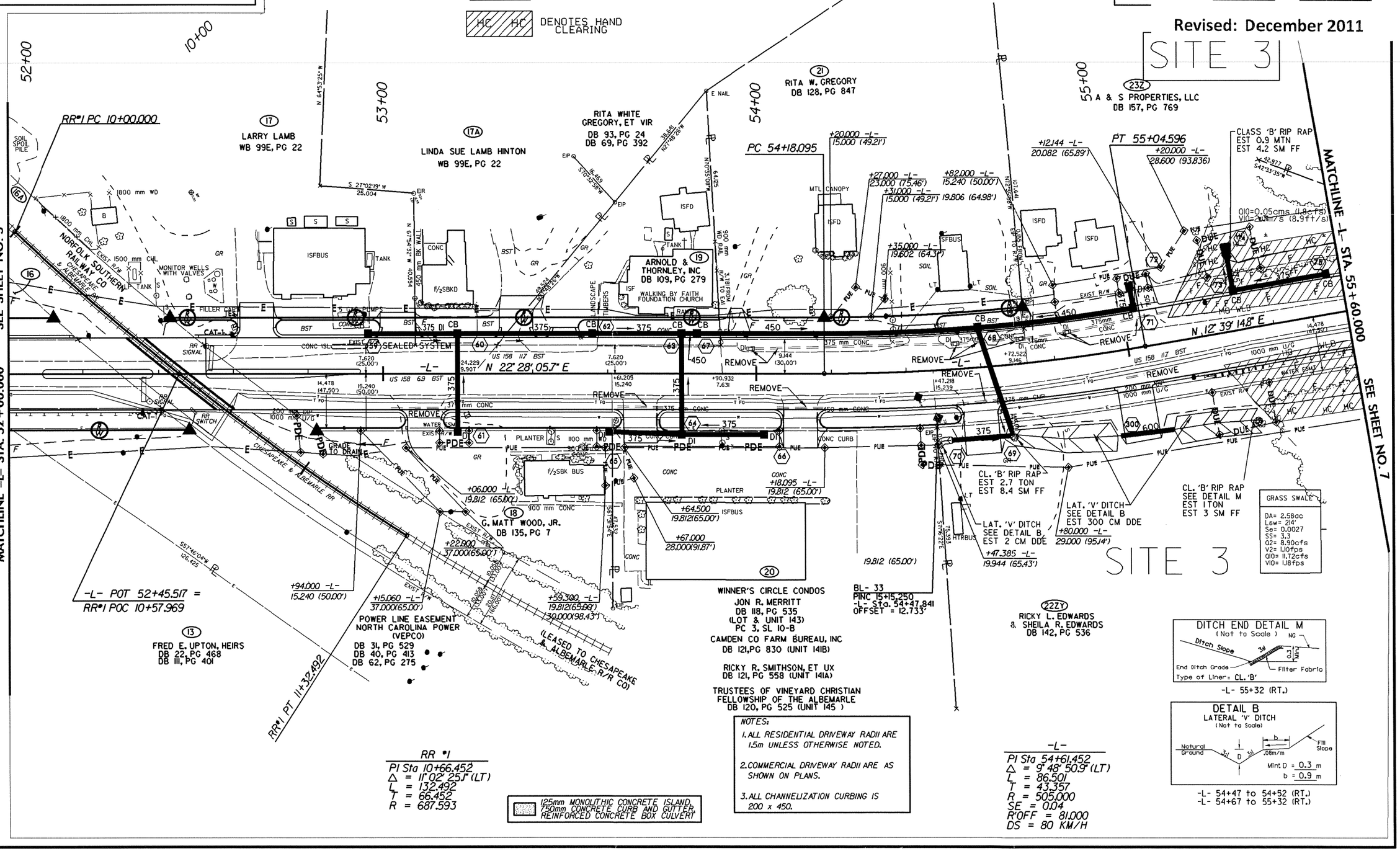
CONST.RE
R/W REV

Permit Drawing

Sheet 14 of 38

Revised: December 2011

SITE 3



REVISIONS

11/07/06 - REVISED ROW AND TCE ON PARCEL 22.(ABP)
R/W REVISION - REVISED PROPERTY OWNER NAMES ON PARCEL NO.13,17,18,19,20,21 & 23. ADDED PARCEL NO.16A & 17A. BAM
R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.22. BAM

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

WETHERILL ENGINEERING
329 James Franklin Rd, Suite 164
Raleigh, N.C. 27606
Bus: 919 881 0077
Fax: 919 881 0107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

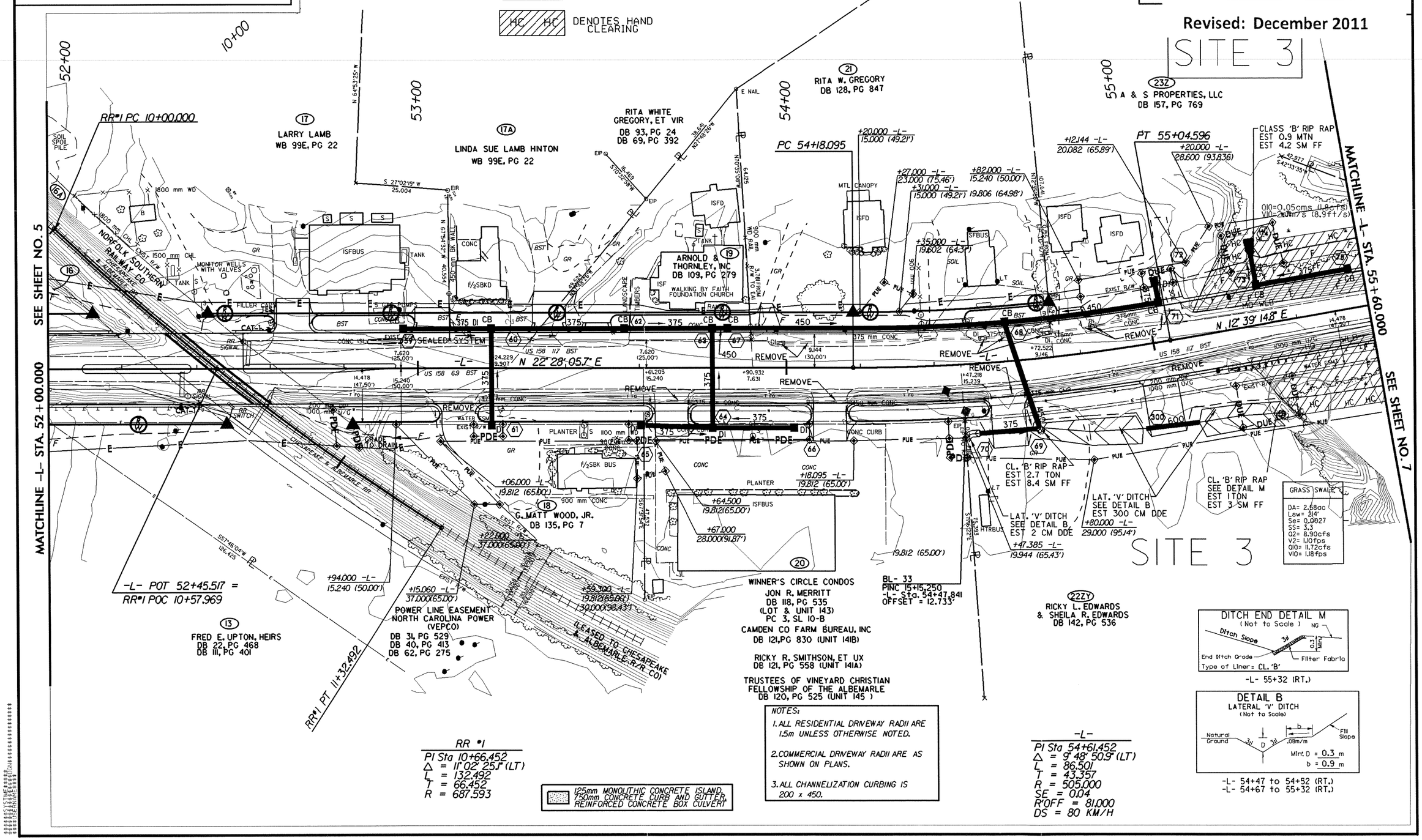
CONS
R/W

Permit Drawing

Sheet 15 of 38

Revised: December 2011

SITE 3



NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

125mm MONOLITHIC CONCRETE ISLAND, 150mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

RR •1
PI Sta 10+66.452
Δ = 11° 02' 25" (LT)
L = 132.492
T = 66.452
R = 687.593

-L-
PI Sta 54+61.452
Δ = 9° 48' 50.9" (LT)
L = 86.501
T = 43.357
R = 505.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

DITCH END DETAIL M
(Not to Scale)
Ditch Slope
3:1
0.3 Min.
NG
End Ditch Grade
Filter Fabric
Type of Liner= CL. 'B'
-L- 55+32 (RT.)

DETAIL B
LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
3:1
D
3:1
b
.08m/m
Fill Slope
Min. D = 0.3 m
b = 0.9 m
-L- 54+47 to 54+52 (RT.)
-L- 54+67 to 55+32 (RT.)

REVISIONS

11/07/06 - REVISED ROW,TCE & PDE ON PARCEL 25.(ABP)
R/W REVISION - REVISED PROPERTY OWNER NAMES ON PARCEL NO.23 & 24. ADDED PARCEL NO.24A & 25A. CORRECTED PROPERTY OWNER NAMES CHARLES H.HODGES & HOWARD S.STEVENS,HEIRS. BAM
R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.22. BAM

F F — DENOTES FILL IN WETLAND
HC HC — DENOTES HAND CLEARING
S S — DENOTES IMPACTS IN SURFACE WATER
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
E E — DENOTES EXCAVATION IN WETLAND

NAD 83 NC GRID

NORTH CAROLINA PROFESSIONAL SEAL 22587 ENGINEER RANDALL A. BOYD

WETHERILL ENGINEERING
309 James Franklin Rd. Suite 144
Raleigh, N.C. 27603
Registration # C-0178
Phone: 919 661 9003
Fax: 919 661 9107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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Raleigh, N.C. 27609
License No. C-1628

METRIC

R-2414B	7

Permit Drawing

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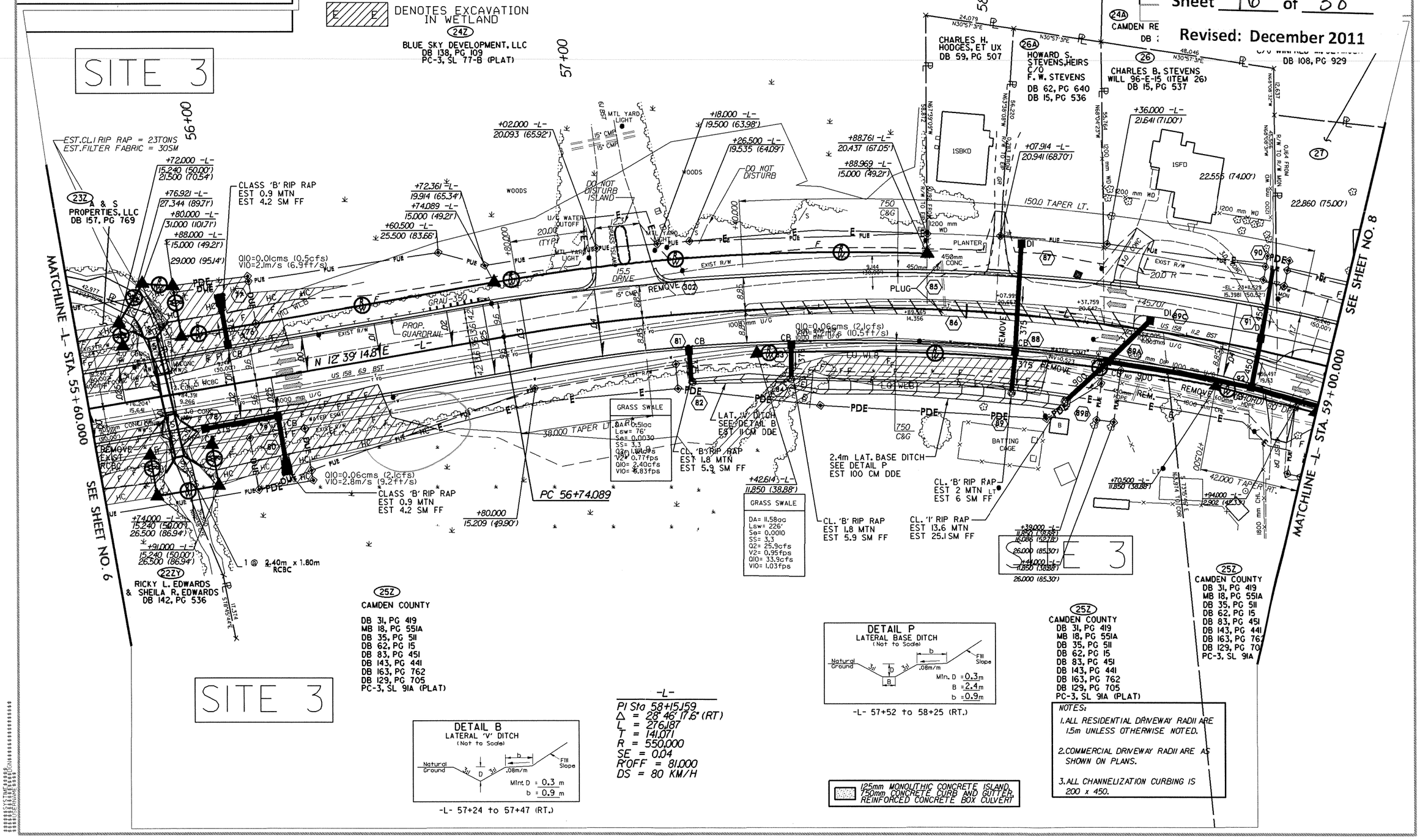
Revised: December 2011



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

-L- 57+24 to 57+47 (RT.)

-L-
PI Sta 58+15.59
Δ = 28° 46' 17.6" (RT)
L = 276.187
T = 141.071
R = 550.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

DETAIL P
LATERAL BASE DITCH
(Not to Scale)

-L- 57+52 to 58+25 (RT.)

125mm MONOLITHIC CONCRETE ISLAND, 150mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTES:
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R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.22. BAM

F F — DENOTES FILL IN WETLAND
HC HC — DENOTES HAND CLEARING
S S — DENOTES IMPACTS IN SURFACE WATER
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
E E — DENOTES EXCAVATION IN WETLAND

NAD 83 NC GRID

NORTH CAROLINA PROFESSIONAL SEAL 22587 ENGINEER RANDALL A. BOYD

WETHERILL ENGINEERING
509 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Raleigh: 919-851-9077
Durham: 919-361-5672
Fax: 919-851-8127
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
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Raleigh, N.C. 27609
License No. C-1628

METRIC

R-2414B	7

Permit Drawing

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Revised: December 2011

SITE 3

EST.CL.I RIP RAP = 23TONS
EST.FILTER FABRIC = 30SM

(23Z) A & S PROPERTIES, LLC DB 157, PG 769

CLASS 'B' RIP RAP
EST 0.9 MTN
EST 4.2 SM FF

Q10=0.01cms (0.5cfs)
V10=2.1m/s (6.9ft/s)

MATCHLINE -L- STA. 55+60.000

SEE SHEET NO. 6

N 12° 39' 14.8" E

US 158 69 BST

PROP. GUARDRAIL -L-

GRAU-350

REMOVE (302)

15.5 DRIVE

DO NOT DISTURB ISLAND

U/G WATER CUTOFF 20.00 (TYP)

MTL YARD LIGHT

WOODS

+02.000 -L- 20.093 (65.92')

+18.000 -L- 19.500 (63.98')

+26.500 -L- 19.535 (64.09')

+72.000 -L- 15.240 (50.00') 21.500 (70.54')

+76.921 -L- 27.344 (89.71')

+80.000 -L- 31.000 (101.71')

+88.000 -L- 15.000 (49.21')

29.000 (95.14')

+72.361 -L- 19.914 (65.34')

+74.089 -L- 15.000 (49.21')

+60.500 -L- 25.500 (83.66')

+88.761 -L- 20.437 (67.05')

+88.969 -L- 15.000 (49.21')

+07.914 -L- 20.941 (68.70')

+36.000 -L- 21.641 (71.00')

150.0 TAPER LT.

38.000 TAPER LT.

42.000 TAPER RT.

Q10=0.06cms (2.1cfs)
V10=2.8m/s (9.2ft/s)

CLASS 'B' RIP RAP
EST 0.9 MTN
EST 4.2 SM FF

PC 56+74.089

+80.000 15.209 (49.90')

GRASS SWALE
DA= 0.51ac
Lsw= 76'
Se= 0.0030
SS= 3.3
Q2= 1.04cfs
V2= 0.77fps
Q10= 2.40cfs
V10= 0.83fps

LAT. W DITCH SEE DETAIL B EST 11 CM DDE

CL. 'B' RIP RAP
EST 1.8 MTN
EST 5.9 SM FF

+42.614 -L- 11.850 (38.88')

GRASS SWALE
DA= 11.58ac
Lsw= 226'
Se= 0.0010
SS= 3.3
Q2= 25.9cfs
V2= 0.95fps
Q10= 33.9cfs
V10= 1.03fps

2.4m LAT. BASE DITCH
SEE DETAIL P
EST 100 CM DDE

CL. 'B' RIP RAP
EST 1.8 MTN
EST 5.9 SM FF

CL. 'B' RIP RAP
EST 2 MTN
EST 6 SM FF

CL. 'I' RIP RAP
EST 13.6 MTN
EST 25.1SM FF

+70.500 -L- 11.850 (38.88')

+94.000 -L- 12.302 (42.33')

+39.000 -L- 11.850 (38.88') 16.086 (52.78') 26.000 (85.30')

+44.000 -L- 11.850 (38.88') 26.000 (85.30')

SITE 3

(22ZY) RICKY L. EDWARDS & SHEILA R. EDWARDS DB 142, PG 536

1 @ 2.40m x 1.80m RCBC

(25Z) CAMDEN COUNTY
DB 31, PG 419
MB 18, PG 551A
DB 35, PG 511
DB 62, PG 15
DB 83, PG 451
DB 143, PG 441
DB 163, PG 762
DB 129, PG 705
PC-3, SL 91A (PLAT)

(25Z) CAMDEN COUNTY
DB 31, PG 419
MB 18, PG 551A
DB 35, PG 511
DB 62, PG 15
DB 83, PG 451
DB 143, PG 441
DB 163, PG 762
DB 129, PG 705
PC-3, SL 91A (PLAT)

(25Z) CAMDEN COUNTY
DB 31, PG 419
MB 18, PG 551A
DB 35, PG 511
DB 62, PG 15
DB 83, PG 451
DB 143, PG 441
DB 163, PG 762
DB 129, PG 70
PC-3, SL 91A

MATCHLINE -L- STA. 59+00.000

SEE SHEET NO. 8

(24Z) BLUE SKY DEVELOPMENT, LLC DB 138, PG 109 PC-3, SL 77-B (PLAT)

(24A) CAMDEN REAL DB 231

(26A) HOWARD S. STEVENS, HEIRS C/O F. W. STEVENS DB 62, PG 640 DB 15, PG 536

(26) CHARLES B. STEVENS WILL 96-E-15 (ITEM 26) DB 15, PG 537

C/O WINFRED M. SEYMOUR DB 108, PG 929

CHARLES H. HODGES, ET UX DB 59, PG 507

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

Natural Ground — 3:1 — D — 3:1 — b — .08m/m — Fill Slope

Min. D = 0.3 m
b = 0.9 m

-L- 57+24 to 57+47 (RT.)

-L-
PI Sta 58+15.59
Δ = 28° 46' 17.6" (RT)
L = 276.187
T = 141.071
R = 550.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

DETAIL P
LATERAL BASE DITCH
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — b — .08m/m — Fill Slope

Min. D = 0.3m
B = 2.4m
b = 0.9m

-L- 57+52 to 58+25 (RT.)

125mm MONOLITHIC CONCRETE ISLAND
750mm CONCRETE CURB AND GUTTER
REINFORCED CONCRETE BOX CULVERT

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

REVISIONS
11/07/06 - REVISED ROW,TCE & PDE ON PARCEL 36.(ABP)
R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.42 & ADDED DEED BOOK DESCRIPTION TO PARCEL NO.44. BAM

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC

F/F DENOTES FILL IN WETLAND

HC/HC DENOTES HAND CLEARING

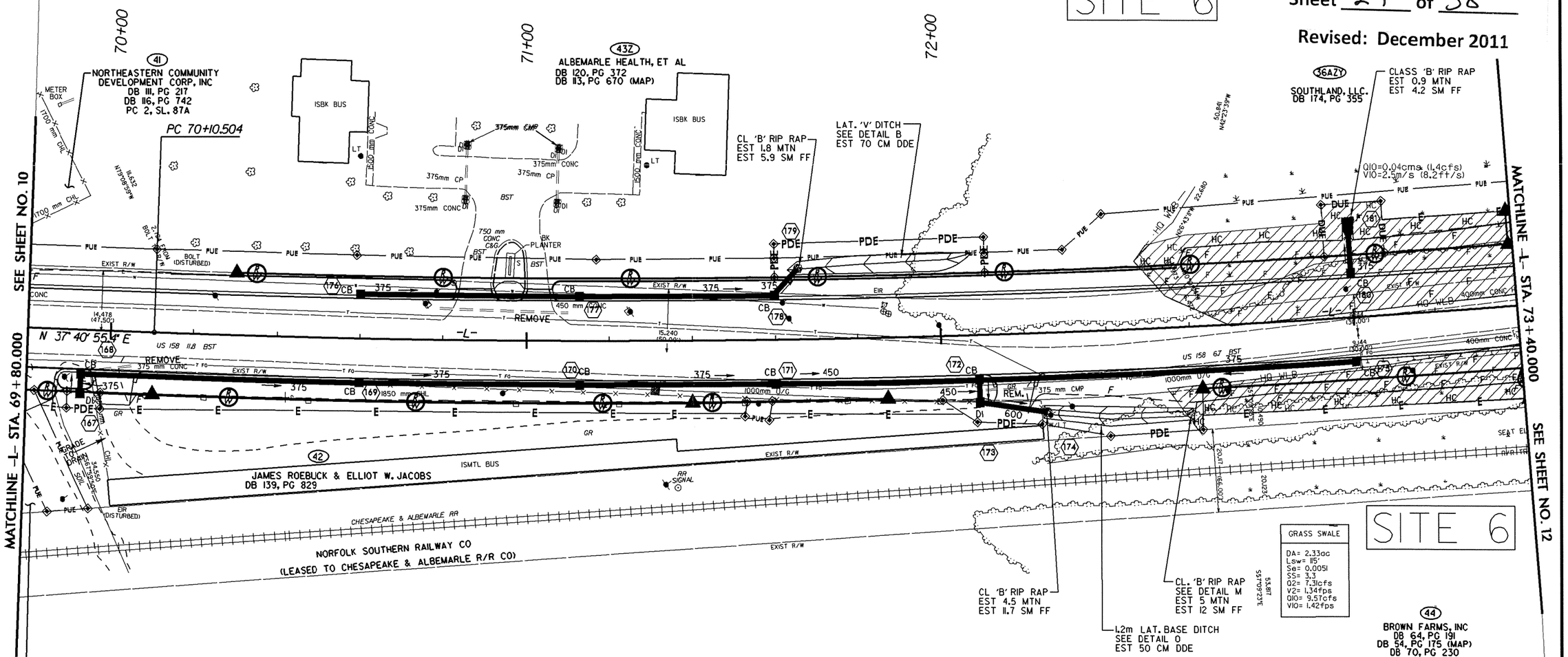
NAD 83 NC GRID

Permit Drawing

Sheet 29 of 38

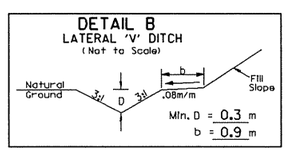
Revised: December 2011

SITE 6



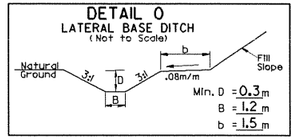
GRASS SWALE
DA= 2.33ac
Lsw= 115'
Se= 0.0051
SS= 3.3
Q2= 7.31cfs
V2= 1.34fps
Q10= 9.57cfs
V10= 1.42fps

SITE 6

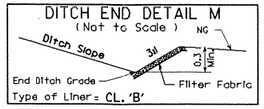


-L- 71+65 to 72+10 (LT.)

-L-
PI Sta 72+27.319
Δ = 8°51'20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H



-L- 72+25 to 72+60 (RT.)



-L- 72+60 (RT.)

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE SHEET NO. 22 FOR -L- GRADE AND PROFILE.

REVISIONS
11/07/06 - REVISED ROW,TCE & PDE ON PARCEL 36.(ABP)
R/W REVISION - REVISED PROPERTY OWNER NAME ON PARCEL NO.42 & ADDED DEED BOOK DESCRIPTION TO PARCEL NO.44. BAM

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W R

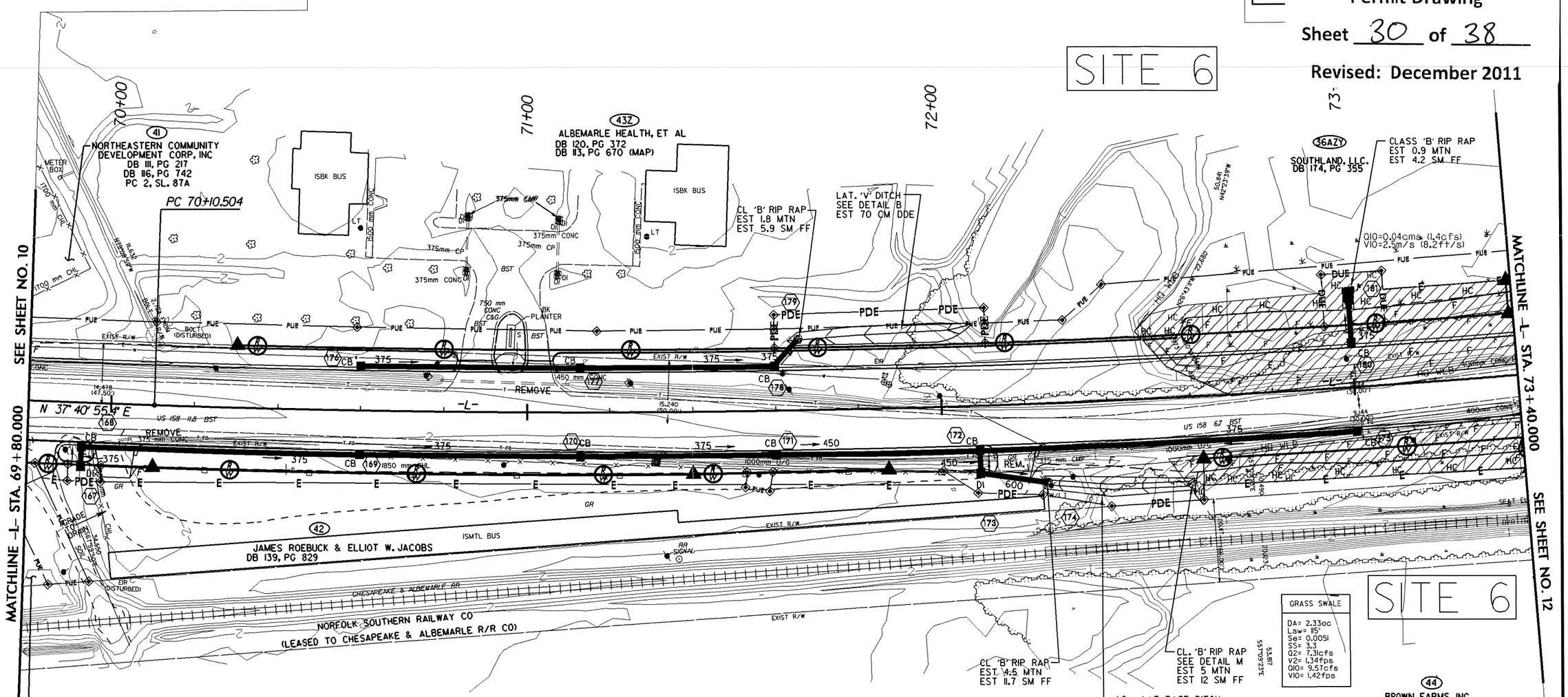
Permit Drawing

Sheet 30 of 38

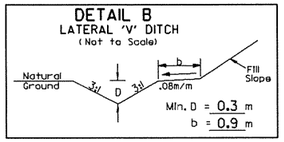
Revised: December 2011

F F DENOTES FILL IN WETLAND

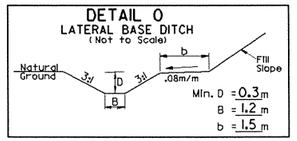
HC HC DENOTES HAND CLEARING



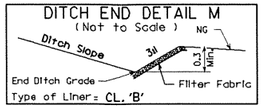
GRASS SWALE
DA= 2.33ac
Lsw= 115'
Se= 0.0051
SS= 3.3
Q2= 7.31cfs
V2= 1.34fps
Q10= 9.57cfs
V10= 1.42fps



-L- 71+65 to 72+10 (LT.)



-L- 72+25 to 72+60 (RT.)



-L- 72+60 (RT.)

-L-
PI Sta 72+27.319
Δ = 8° 51' 20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE SHEET NO. 22 FOR -L- GRADE AND PROFILE.

REVISIONS
R/W REVISION - REVISED PDE & TCE ON PARCEL NO.36.(BAM)
R/W REVISION - ADDED DEED BOOK DESCRIPTION TO PARCEL NO.44. BAM

F F	DENOTES FILL IN WETLAND
HC HC	DENOTES HAND CLEARING
E E	DENOTES EXCAVATION IN WETLAND

NAD 83 NC GRID

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	12
R /W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

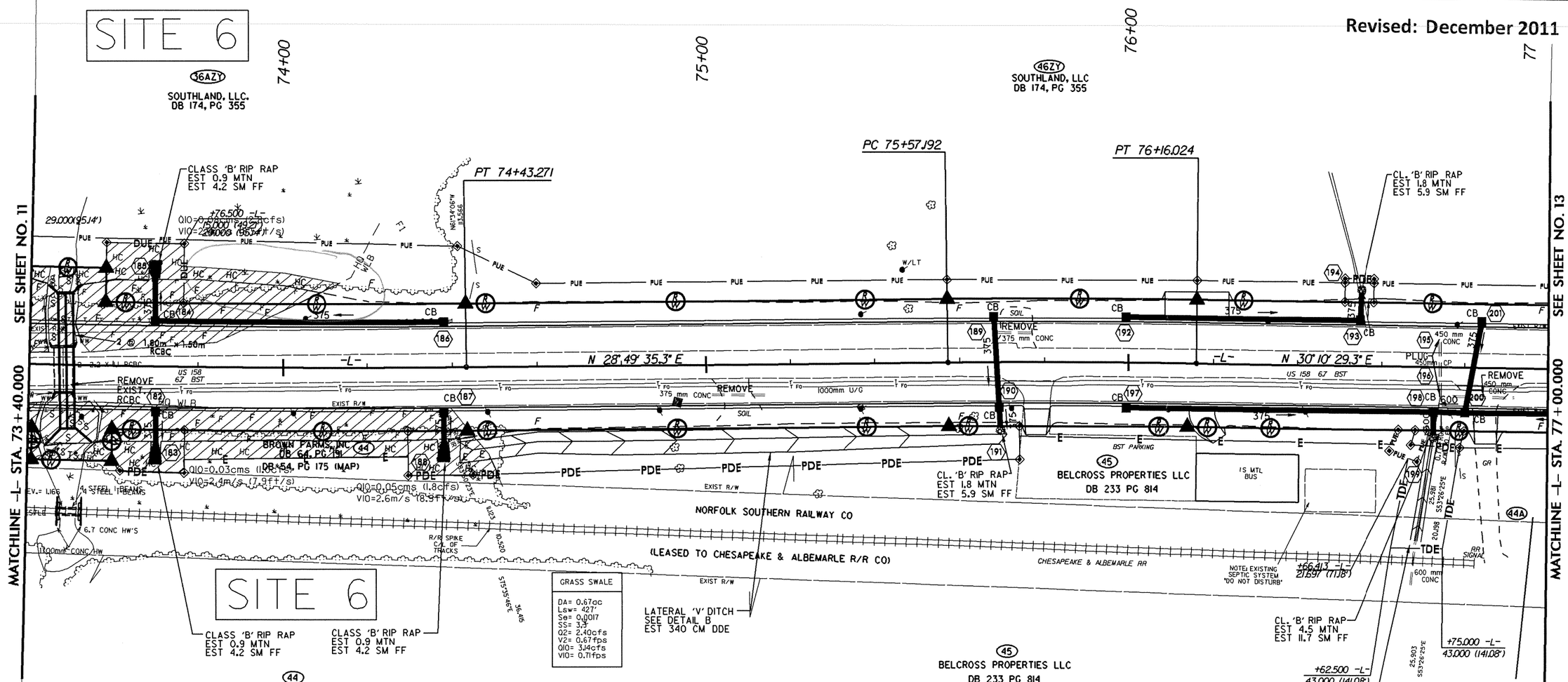
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

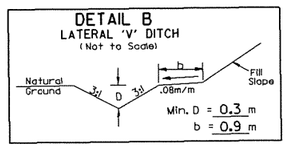
CONST.REV.
R /W REV

Permit Drawing

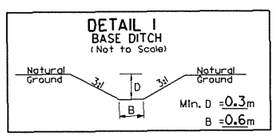
Sheet 31 of 38

Revised: December 2011





-L- 74+40 to 75+70 (RT.)



-L- 76+72 (RT.)

-L-
PI Sta 72+27.319
Δ = 8° 51' 20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H

-L-
PI Sta 75+86.610
Δ = 1° 20' 54.0" (RT)
L = 58.832
T = 29.418
R = 2,500.000
SE = NC
DS = 80 KM/H

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE SHEET NO. 23 FOR -L- GRADE AND PROFILE.

REVISIONS
R/W REVISION - REVISED PDE & TCE ON PARCEL NO.36.(BAM)
R/W REVISION - ADDED DEED BOOK DESCRIPTION TO PARCEL NO.44. BAM

F F	DENOTES FILL IN WETLAND
HC HC	DENOTES HAND CLEARING
E E	DENOTES EXCAVATION IN WETLAND

NAD 83 NC GRID

WETHERILL ENGINEERING
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

METRIC

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

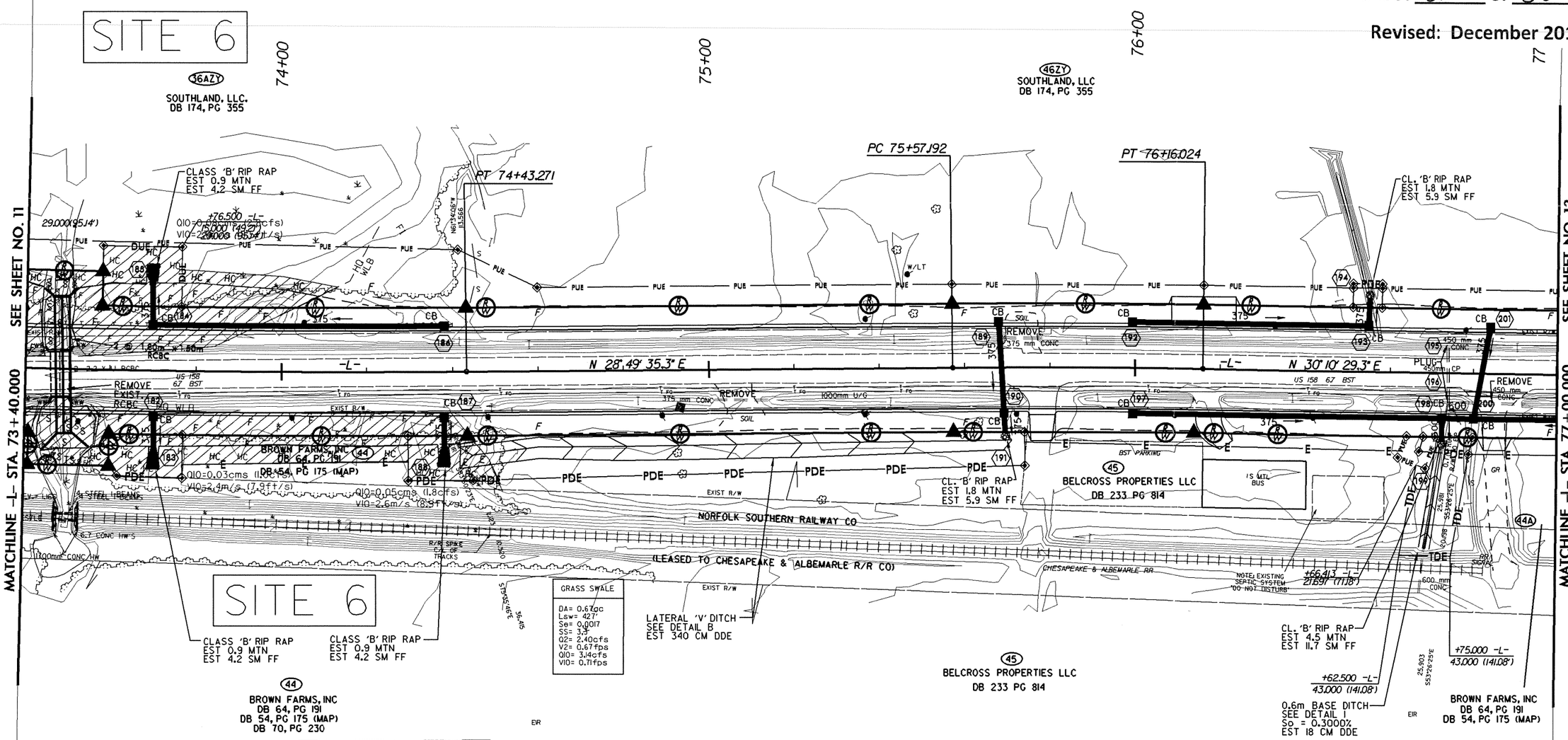
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

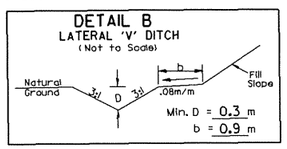
CONST.REV.
R/W REV.

Permit Drawing

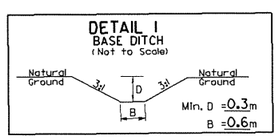
Sheet 32 of 38

Revised: December 2011





-L- 74+40 to 75+70 (RT.)



-L- 76+72 (RT.)

-L-
PI Sta 72+27.319
Δ = 8° 51' 20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H

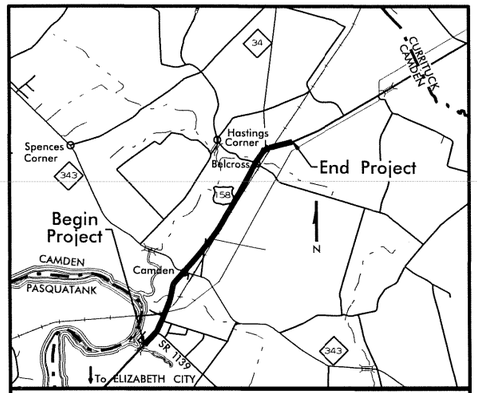
-L-
PI Sta 75+86.610
Δ = 1° 20' 54.0" (RT)
L = 58.832
T = 29.418
R = 2,500.000
SE = NC
DS = 80 KM/H

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE SHEET NO. 23 FOR -L- GRADE AND PROFILE.

CONTRACT: C202914 TIP PROJECT: R-2414B

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CAMDEN COUNTY

LOCATION: US 158 FROM SOUTH OF SR 1139 (COUNTRY CLUB RD.) TO EAST OF NC 34 IN BELCROSS

TYPE OF WORK: WIDENING, GRADING, DRAINAGE, PAVING, CURB & GUTTER, SIGNALS & CULVERTS

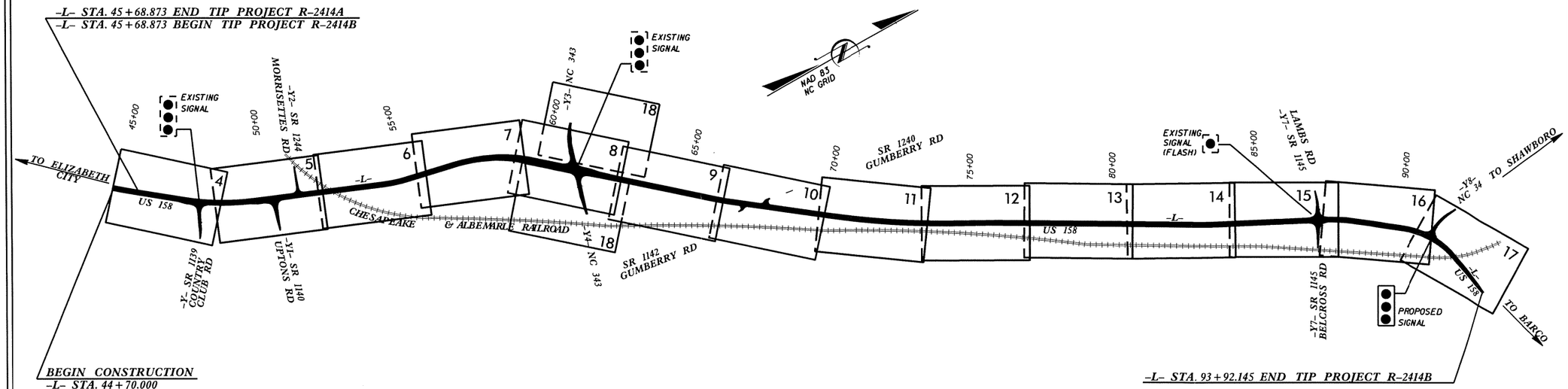
METRIC

ALL DIMENSIONS IN THESE PLANS ARE IN METERS UNLESS OTHERWISE SHOWN

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2414B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34430.1.1	STP-158(2)	PE
34430.2.5		ROW & UTILITIES
34430.3.3		CONST.

-L- STA. 45+68.873 END TIP PROJECT R-2414A
-L- STA. 45+68.873 BEGIN TIP PROJECT R-2414B



BEGIN CONSTRUCTION
-L- STA. 44+70.000

-L- STA. 93+92.145 END TIP PROJECT R-2414B

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GRAPHIC SCALES

5 0 10
PLANS

5 0 10
PROFILE (HORIZONTAL)

1 0 2
PROFILE (VERTICAL)

DESIGN DATA

ADT (2009) = 26,000
ADT (2029) = 41,500
DHV = 12%
D = 60%
T = 6% *
V = 80 km/h

* (TTST 2%+ DUAL 4%)

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2414B = 4.823 Km
TOTAL LENGTH TIP PROJECT R-2414B = 4.823 Km

WETHERILL ENGINEERING

Prepared for the North Carolina Department of Transportation in the Office of:
559 JONES FRANKLIN ROAD
SUITE 164
Raleigh, N.C. 27606
License No. F-0377
Bus. 919 851 8077
Fax 919 851 8107

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 15, 2006

LETTING DATE: FEBRUARY 21, 2012

NCDOT CONTACT:

EDWARD G. WETHERILL, PE
PROJECT ENGINEER

BOB A. MAY, PE
PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
ROADWAY DESIGN: ENGINEERING COORDINATION SECTION ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

07-DEC-2011 13:56
R:\Roadway\Proj\r2414b_rdy_tsh.dgn
$$$$USERNAME$$$$

REVISIONS

TRANSITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
Licensee No. C-1628

WETHERILL ENGINEERING
339 James Pronnitt Rd. Suite 164
Raleigh, N.C. 27606
Licensee No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GS/GPS - CONSTRUCTION OBSERVATION

METRIC

5 0 10

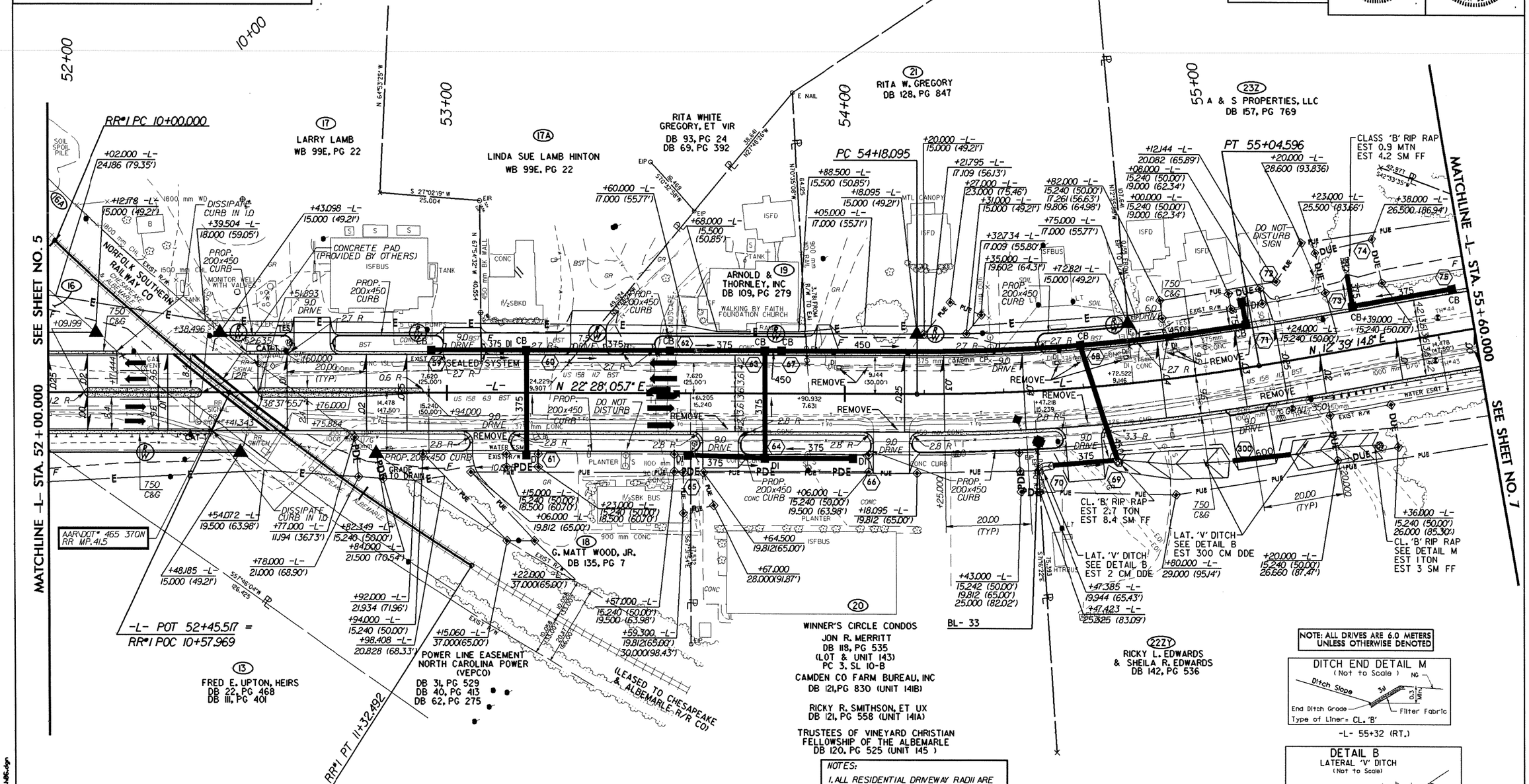
CONST.REV.

R /W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.

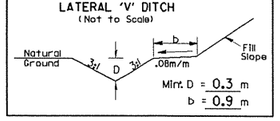


NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

DITCH END DETAIL M
(Not to Scale)

-L- 55+32 (RT.)

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



-L- 54+47 to 54+52 (RT.)
-L- 54+67 to 55+32 (RT.)

SEE SHEET NO. 20 FOR -L- GRADE AND PROFILE.

RR *1
PI Sta 10+66.452
Δ = 11° 02' 25.1" (LT)
L = 132.492
T = 66.452
R = 687.593

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

-L-
PI Sta 54+61.452
Δ = 9° 48' 50.9" (LT)
L = 86.501
T = 43.357
R = 505.000
SE = 0.04
R'OFF = 81.000
DS = 80 KM/H

REVISIONS

WETHERILL ENGINEERING
559 James Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8027
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CPM/SAFE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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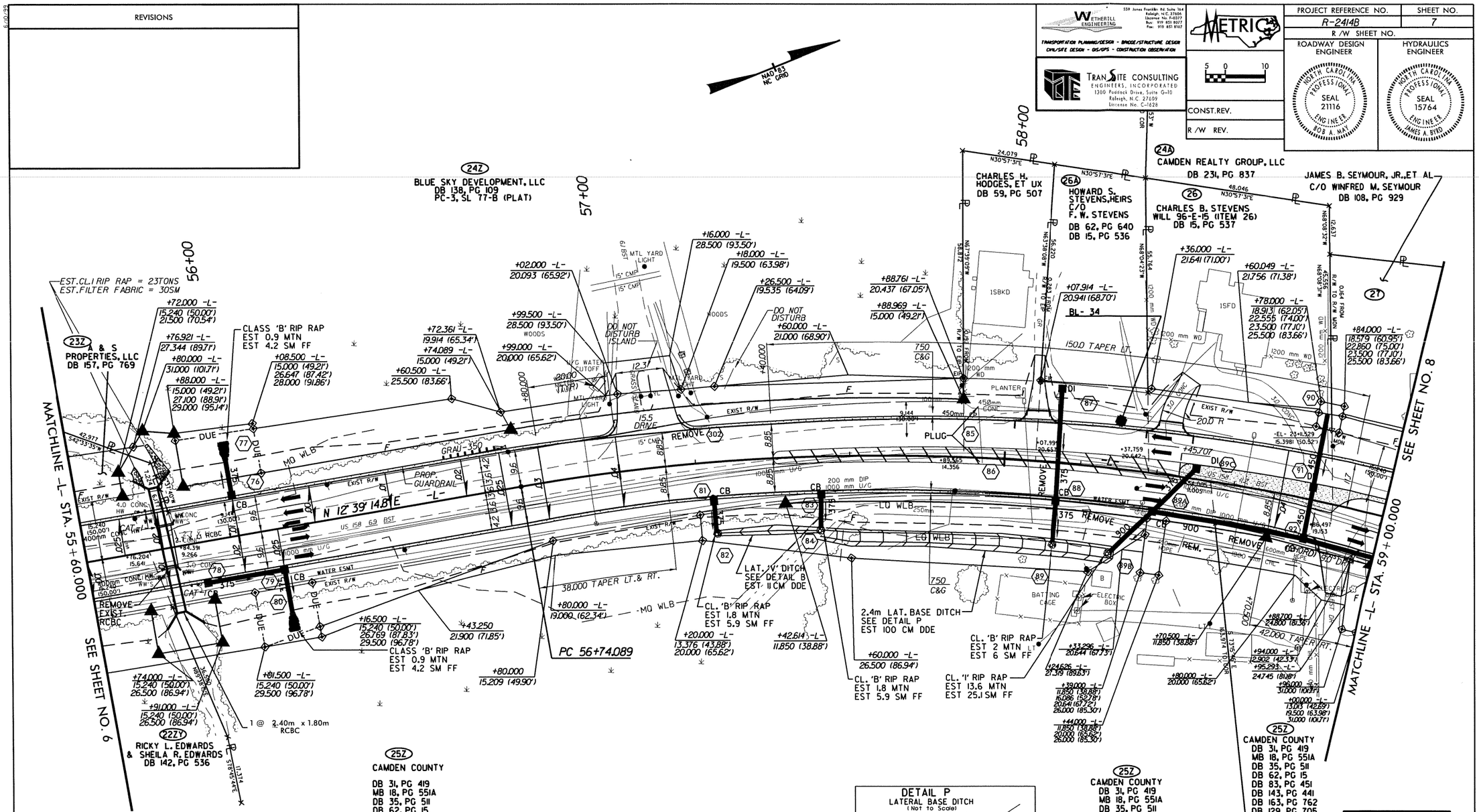
ENGINEERS, INCORPORATED
1300 Puddock Drive, Suite G-10
Raleigh, N.C. 27609
License No. C-1628

METRIC
5 0 10

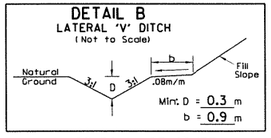
CONST. REV.

R/W REV.

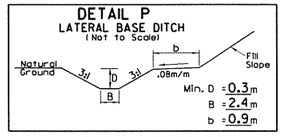
PROJECT REFERENCE NO.	SHEET NO.
R-2414B	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. WAY	NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD



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



DETAIL P
LATERAL BASE DITCH
(Not to Scale)



NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

SEE SHEETS C-1 THRU C-7 FOR CULVERT PLANS

SEE 2-V THRU 2-Y FOR MASS SOIL MIXING DETAILS

SEE 2-Z FOR DETAIL OF EMBANKMENT MONITORING

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE TCP-7 AND TCP-16 FOR LOCATION OF TEMPORARY SHORING

SEE SHEET NO. 20 FOR -L- FOR GRADE AND PROFILE.

SEE SHEET NO. 2-Q FOR DETAIL OF CONCRETE ISLAND

01-DEC-2004 22
R:\ROADWAY\PROJECTS\R-2414b_rdy_psh07.dgn

REVISIONS

NOTES:
1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

NAD 83 NC GRID

WETHERILL ENGINEERING
339 Jones Franklin Rd. Suite 164
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License No. F-0377
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Fax: 919 851 8137
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRAN SITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
License No. C-1628

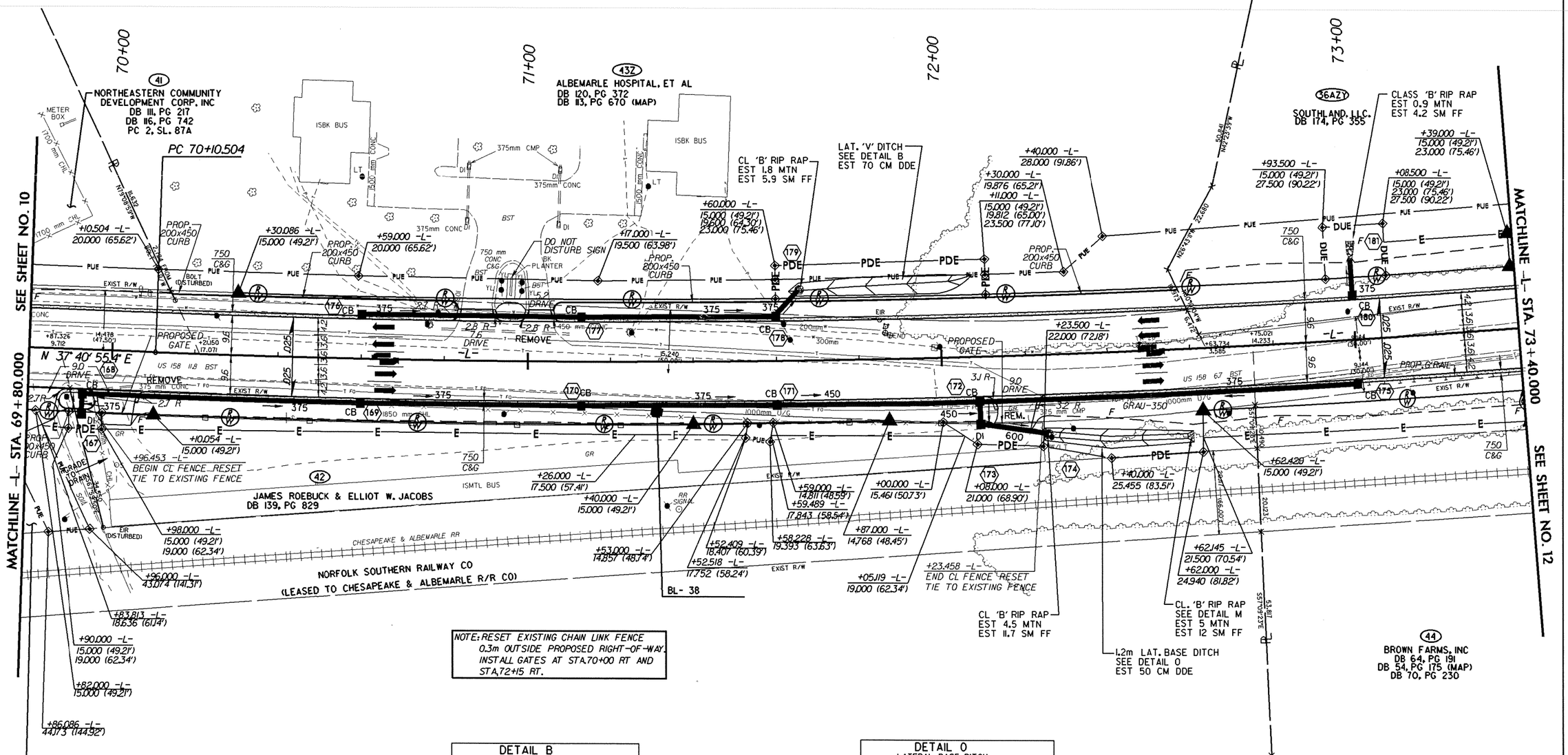
METRIC
5 0 10

CONST. REV.
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	11
R/W SHEET NO.	

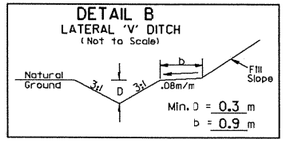
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. WAY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER, JR.



NOTE: RESET EXISTING CHAIN LINK FENCE 0.3m OUTSIDE PROPOSED RIGHT-OF-WAY. INSTALL GATES AT STA. 70+00 RT AND STA. 72+15 RT.

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

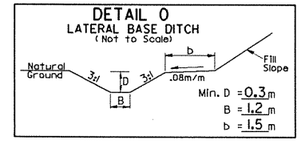


Min. D = 0.3 m
b = 0.9 m

-L- 71+65 to 72+10 (LT.)

-L-
PI Sta 72+27.319
Δ = 8° 51' 20.1" (LT)
L = 432.766
T = 216.815
R = 2,800.000
SE = NC
DS = 80 KM/H

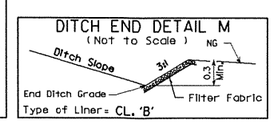
DETAIL O
LATERAL BASE DITCH
(Not to Scale)



Min. D = 0.3 m
B = 1.2 m
b = 1.5 m

-L- 72+25 to 72+60 (RT.)

DITCH END DETAIL M
(Not to Scale)



Type of Liner = CL. 'B'

-L- 72+60 (RT.)

125mm MONOLITHIC CONCRETE ISLAND, 150mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

SEE SHEET NO. 22 FOR -L- GRADE AND PROFILE.

REVISIONS

NOTES:

1. ALL RESIDENTIAL DRIVEWAY RADII ARE 1.5m UNLESS OTHERWISE NOTED.
2. COMMERCIAL DRIVEWAY RADII ARE AS SHOWN ON PLANS.
3. ALL CHANNELIZATION CURBING IS 200 x 450.

NAD 83 NC GRID

WETHERILL ENGINEERING
559 James Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. F-0377
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Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609
License No. C-1628

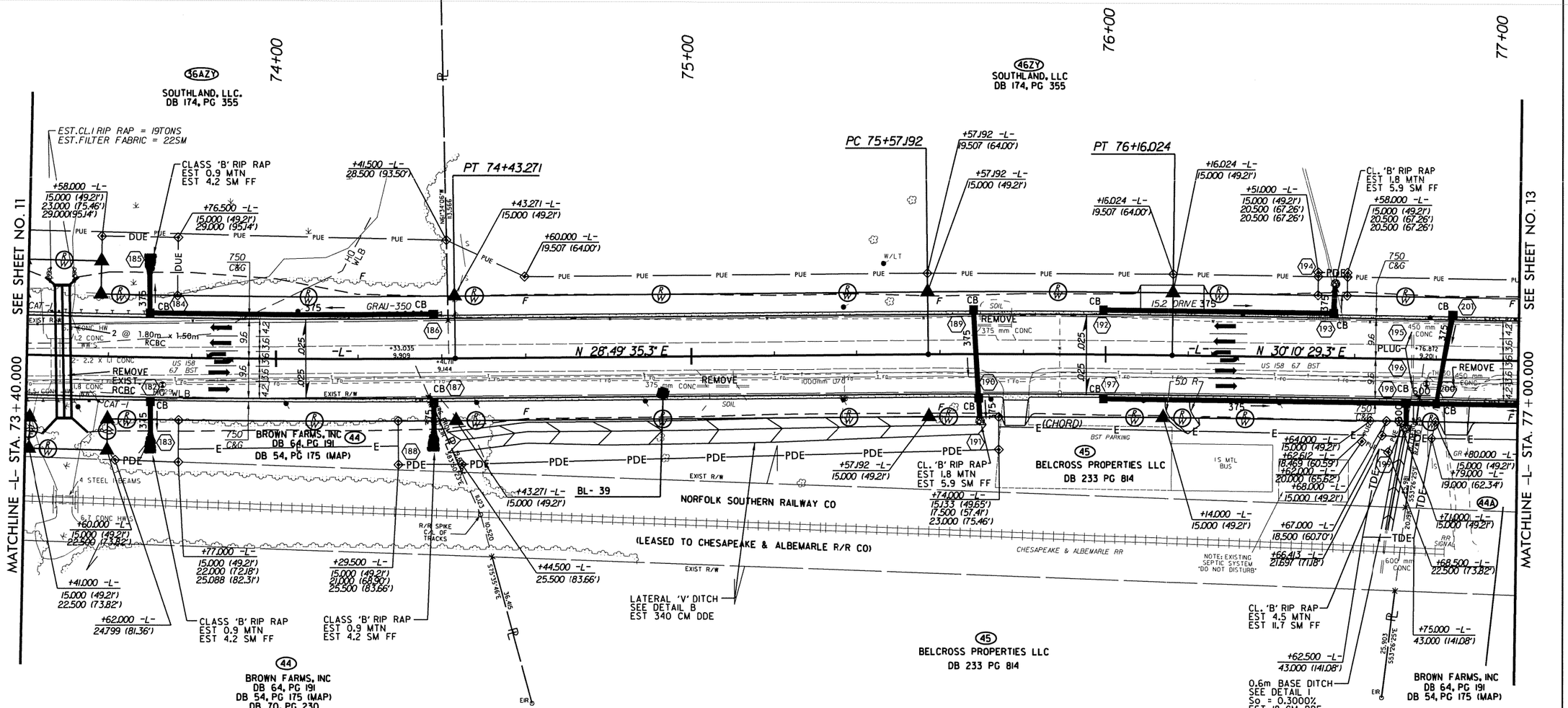
METRIC

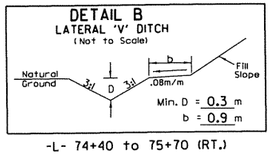
5 0 10

CONST.REV.

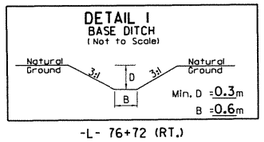
R/W REV.

PROJECT REFERENCE NO.	SHEET NO.
R-2414B	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 21116 ENGINEER BOB A. MAY	NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYRD





-L- 74+40 to 75+70 (RT.)



-L- 76+72 (RT.)

-L-	-L-
PI Sta 72+27.319	PI Sta 75+86.610
Δ = 8° 51' 20.1" (LT)	Δ = 1° 20' 54.0" (RT)
L = 432.766	L = 58.832
T = 216.815	T = 29.418
R = 2,800.000	R = 2,500.000
SE = NC	SE = NC
DS = 80 KM/H	DS = 80 KM/H

NOTE: ALL DRIVES ARE 6.0 METERS UNLESS OTHERWISE DENOTED

125mm MONOLITHIC CONCRETE ISLAND, 750mm CONCRETE CURB AND GUTTER, REINFORCED CONCRETE BOX CULVERT

SEE SHEETS C-8 THRU C-14 FOR CULVERT PLANS

SEE 2-V THRU 2-Y FOR MASS SOIL MIXING DETAILS

SEE 2-Z FOR DETAIL OF EMBANKMENT MONITORING

SEE TCP-8 AND TCP-17 FOR LOCATION OF TEMPORARY SHORING

SEE SHEET NO. 23 FOR -L- GRADE AND PROFILE.