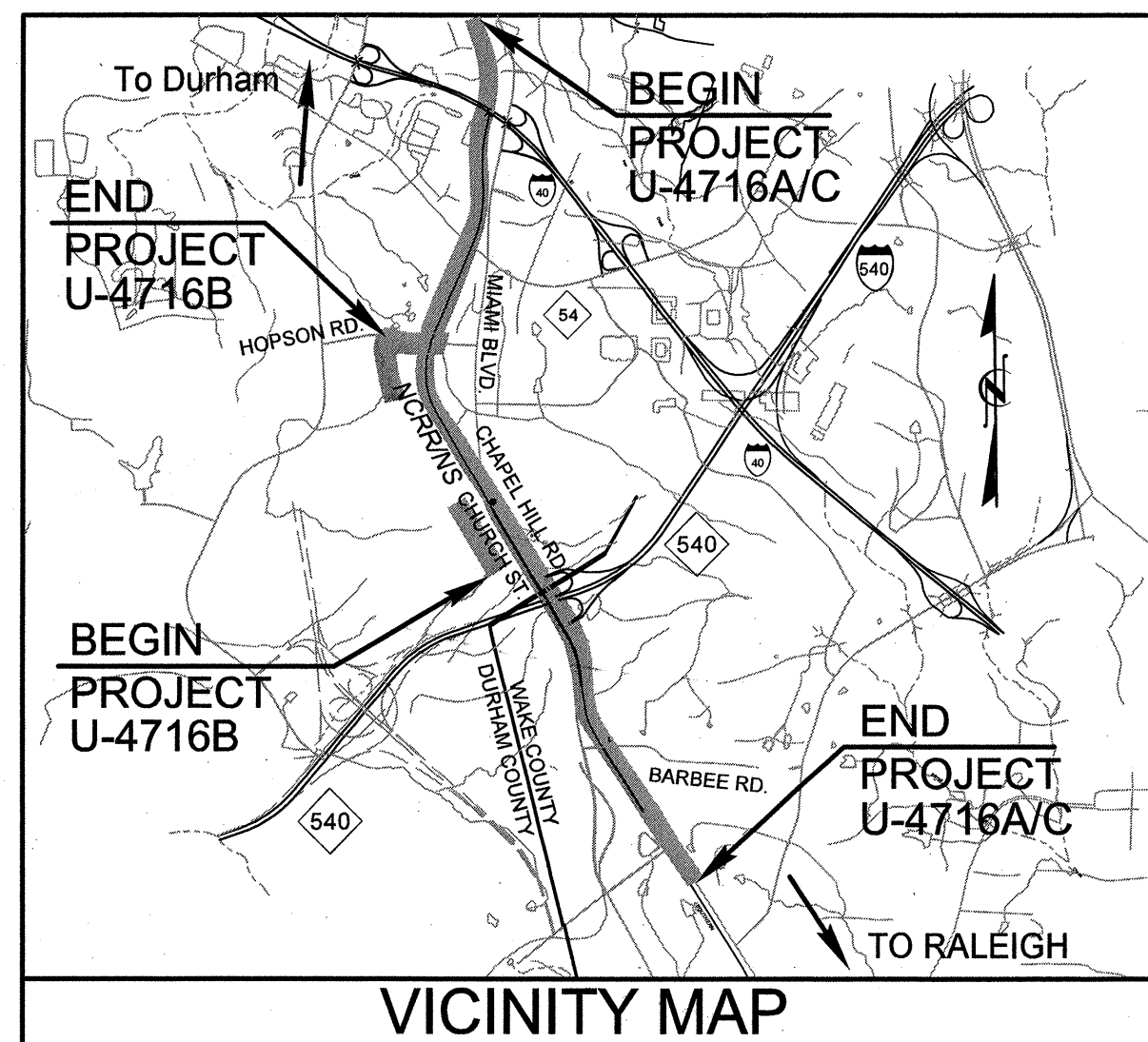


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CONTRACT: C203128 TIP PROJECT: U-4716B & U-4716A/C

SEE SHEET 1A FOR INDEX OF SHEETS



NCDOT
RAIL DIVISION

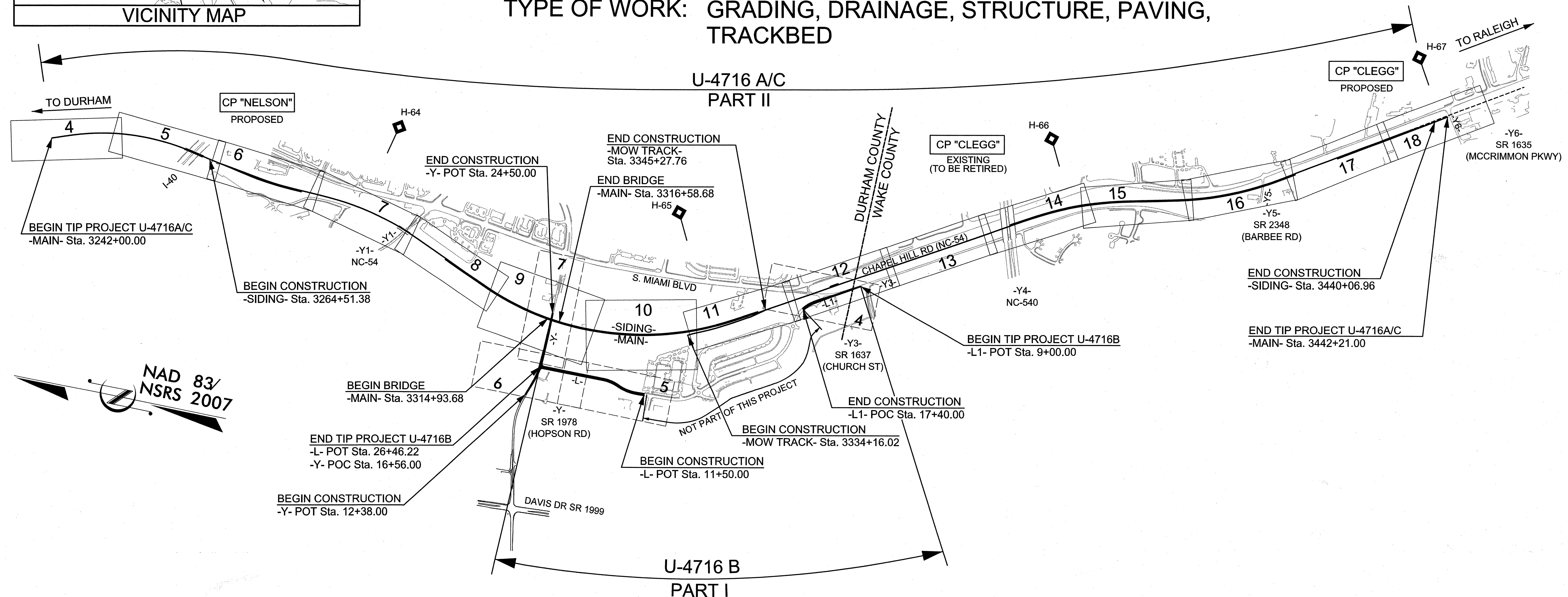


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4716B & U-4716A/C	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
54000.1 (U-4716A/B/C)		PE	
43219.2.STR12U4716B		ROW	
54000.3.STR01T4A (U-4716A/B/C)		UTL & CONST	

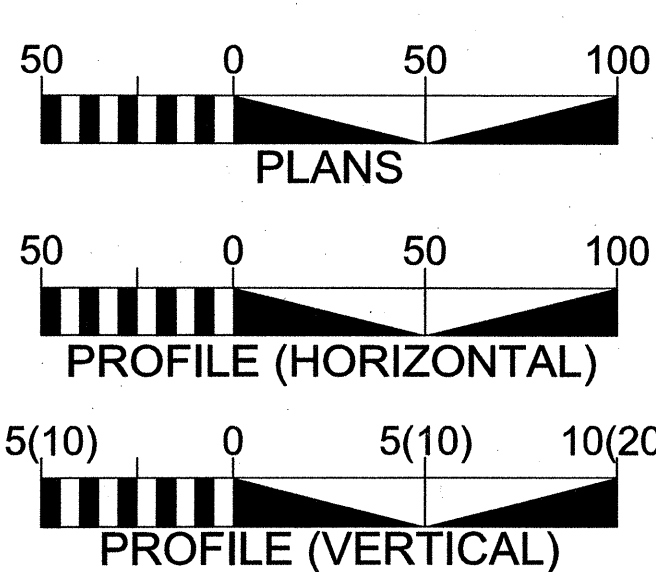
DURHAM AND WAKE COUNTIES

LOCATION: CLEGG PASSING SIDING AND HOPSON ROAD GRADE SEPARATION FROM NS/NCRR MP H-63.2 TO MP H-67.0 WITH SR 1637 (CHURCH ST) EXTENSION FROM KIT CREEK RD. TO KEYSTONE PARK DR. AND FROM PARK KNOLL DR. TO SR 1978 (HOPSON RD) INCLUDING SR 1978, AND THE CLOSING OF AT-GRADE RAILROAD CROSSINGS ON SR 1637 AND SR 1978.

TYPE OF WORK: GRADING, DRAINAGE, STRUCTURE, PAVING, TRACKBED



GRAPHIC SCALES



PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-4716B	0.442 mi.
TOTAL LENGTH OF TIP PROJECT U-4716B	0.442 mi.
LENGTH OF RAIL TIP PROJECT U-4716A/C	3.761 mi.
LENGTH OF STRUCTURES TIP PROJECT U-4716A/C	0.031 mi.
TOTAL LENGTH OF TIP PROJECT U-4716A/C	3.792 mi.
LENGTH OF ROADWAY/RAIL TIP PROJECTS U-4716B & U-4716A/C	4.203 mi.
LENGTH OF STRUCTURES TIP PROJECTS U-4716B & U-4716A/C	0.031 mi.
TOTAL LENGTH OF TIP PROJECTS U-4716B & U-4716A/C	4.234 mi.

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 14, 2012

LETTING DATE:
NOVEMBER 20, 2012

U-4716 B Prepared in the Office of:

Hatch Mott MacDonald

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FUQUAY-VARINA, NC 27526
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U-4716 A/C Prepared in the Office of:

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ROADWAY PROJECT ENGINEER

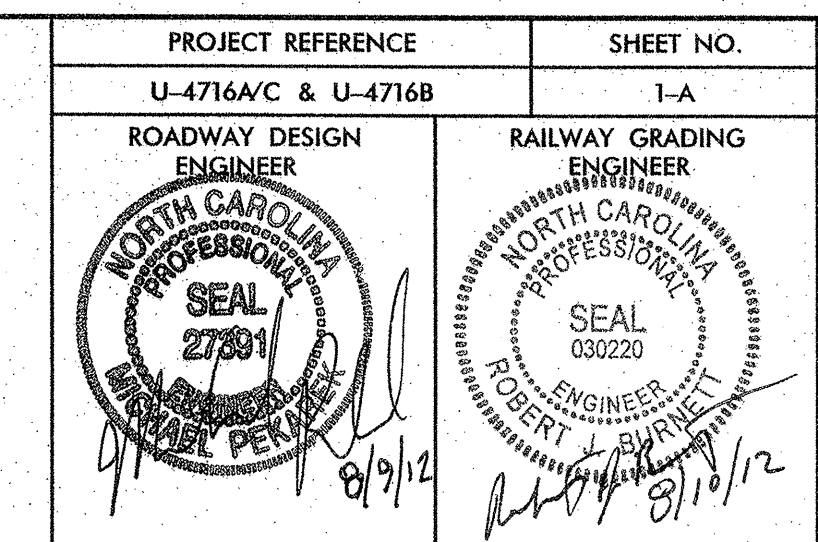
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NC DEPARTMENT OF
TRANSPORTATION
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1546 MAIL SERVICE CENTER
RALEIGH, NC 27699-1546



GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11/01/11

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

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

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

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

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

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:
NO ROADWAY SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE TOWN OF CARY, CITY OF DURHAM, DURHAM COUNTY, DUKE POWER, FIBERTECH NETWORKS, LEVEL 3 COMMUNICATIONS, VERIZON BUSINESS, TIME WARNER CABLE, FRONTIER, AND PSNC ENERGY.
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

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

GENERAL NOTES FOR RAILROAD GRADING:

THIS CONTRACT INCLUDES ALL WORK REQUIRED TO CONSTRUCT THE RAILROAD ROADBED UP TO AND INCLUDING THE SUBBALLAST LAYER. CONSTRUCTION OF TRACK, INCLUDING BALLAST AND SIGNALS, WILL BE DONE BY OTHERS AND IS DEPICTED FOR REFERENCE ONLY.

THE PROPOSED GRADE LINES SHOWN DENOTE THE FINAL ELEVATION OF THE PROPOSED TOP OF LOW RAIL AT THE CENTERLINE OF TRACK AS SHOWN ON THE TYPICAL SECTIONS. WHERE NO PROPOSED GRADE LINES ARE SHOWN, THE PROFILES SHOWN DEPICT THE EXISTING TOP OF LOW RAIL.

WHERE EXISTING MAINLINE TRACK IS TO BE REMOVED, THE REMOVED RAILS, OTM AND TIES SHOULD BE USED TO CONSTRUCT THE MOW SIDING IF THE MATERIAL IS DEEMED SATISFACTORY FOR REUSE BY THE RAILROAD ENGINEER.

CONTRACTOR SHALL CONSTRUCT HEADWALLS AT INLET AND OUTLET LOCATIONS FOR ALL DRAINAGE STRUCTURES CONSTRUCTED WITHIN NCRR RIGHT-OF-WAY.

CONTRACTOR SHALL REMOVE ALL HEADWALLS ON DRAINAGE STRUCTURES INDICATED TO BE FILLED WITH FLOWABLE MATERIAL.

CONTRACTOR SHALL CONSTRUCT HEADWALLS AT INLET AND OUTLET LOCATIONS FOR ALL DRAINAGE STRUCTURES CONSTRUCTED WITHIN NCRR RIGHT OF WAY.

RAILROAD OPERATIONS:
THE CONTRACTOR SHALL NOT ENTER ONTO RAILROAD RIGHT OF WAY WITHOUT PERMISSION FROM THE OWNER AND AN APPOINTED NORFOLK SOUTHERN FLAGMAN ON DUTY.
THE CONTRACTOR SHALL NOT INTERRUPT THE OPERATIONS OF THE RAILROAD WITHOUT PRIOR APPROVAL OF THE RAILROAD REPRESENTATIVE.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.05	Tying Proposed Pavement to Existing
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

SHEET NUMBER	DESCRIPTION
1	TITLE SHEET (U-4716B and U-4716A/C)
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
2	CONVENTIONAL SYMBOLS
2-A	CONVENTIONAL SYMBOLS
3	SUMMARY OF QUANTITIES
PART 1	
1	TITLE SHEET (U-4716B)
1-C THRU 1-E	SURVEY CONTROL SHEETS
2 THRU 2-A	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3-A	PARCEL INDEX SHEET
3-B	EARTHWORK SUMMARY, GUARDRAIL SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
3-C THRU 3-D	DRAINAGE SUMMARY
4-8	PLAN SHEETS AND PROFILE SHEETS
TMP-1 THRU TMP-7	TRANSPORTATION MANAGEMENT PLANS
SIGN/PMP-1 THRU SIGN/PMP-4	SIGNING AND PAVEMENT MARKING PLANS
SIGN-1 THRU SIGN-2	SIGNING DETAILS
EC-1 THRU EC-11	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UC-1 THRU UC-11	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-4	UTILITY BY OTHERS PLANS
X-1A THRU X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-15	CROSS-SECTIONS
PART 2	
1	TITLE SHEET (U-4716A/C)
1C THRU 1E	SURVEY CONTROL SHEETS
2 THRU 2B	TYPICAL SECTIONS
2C THRU 2F	RAILROAD HORIZONTAL ALIGNMENT GEOMETRY
2G	CHURCH ST GRADE CROSSING CLOSURE DETAIL
2H	RIP RAP AT OUTFALL DETAIL
2I	RIGHT OF WAY GATE DETAIL (NS PLAN 7-11)
2J	RAILROAD SIGNAL CABINET PAD DETAILS
2K	PIPE COLLAR DETAIL
2L	GEOGRID STABILIZATION DETAIL
3A THRU 3B	DRAINAGE SUMMARIES
3C	REMOVAL OF PAVEMENT AND GUARDRAIL SUMMARIES
3D	SUMMARY OF EARTHWORK
4 THRU 26	GRADING AND DRAINAGE SHEETS
27 THRU 28	TEMPORARY ALIGNMENT 1 (FOR REFERENCE ONLY)
29 THRU 30	TEMPORARY ALIGNMENT 2 (FOR REFERENCE ONLY)
CP-01 THRU CP-04	TRACK CONSTRUCTION PHASING SHEETS (FOR REFERENCE ONLY)
TMP-1 THRU TMP-5	TRAFFIC CONTROL PLANS
EC-01	EROSION CONTROL TITLE SHEET
EC-02A THRU EC-02F	EROSION CONTROL DETAIL SHEETS
EC-3 THRU EC-3A	SOIL STABILIZATION SHEETS
EC-04 THRU EC-12	CLEARING AND GRUBBING SHEETS
EC-13 THRU EC-21	EROSION CONTROL SHEETS
UC-01 THRU UC-19	UTILITY CONFLICT RELOCATION SHEETS
UO-01 THRU UO-04	UTILITIES BY OTHERS
X-0	CROSS SECTION INDEX
X-0A	CROSS SECTION SUMMARY
X-1 THRU X-7	PIPE PROFILE SHEETS
X-8 THRU X-90	CROSS SECTION SHEETS
S-0 THRU S-40	STRUCTURE DESIGN SHEETS
S-40A	STRUCTURE GENERAL NOTES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

***S.U.E. = Subsurface Utility Engineering**

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EIP
Property Corner	✕
Property Monument	◻ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	◻
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB
Known Soil Contamination: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	? ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	◻
Area Outline	◻
Cemetery	⊕
Building	◻
School	◻
Church	⊕
Dam	▬

HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	◻
Jurisdictional Stream	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	▬
Proposed Lateral, Tail, Head Ditch	▬
False Sump	◻

RAILROADS:

Standard Gauge	_____
RR Signal Milepost	○
Switch	◻
RR Abandoned	_____
RR Dismantled	_____

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	_____
Proposed Right of Way Line	○ R/W
Proposed Right of Way Line with Iron Pin and Cap Marker	○ R/W ▲
Proposed Right of Way Line with Concrete or Granite Marker	○ R/W ▲
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	E
Proposed Temporary Construction Easement	E
Proposed Temporary Drainage Easement	TDE
Proposed Permanent Drainage Easement	PDE
Proposed Permanent Drainage / Utility Easement	DUE
Proposed Permanent Utility Easement	PUE
Proposed Temporary Utility Easement	TUE
Proposed Aerial Utility Easement	AUE
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	_____
Woods Line	_____

Orchard	☼ ☼ ☼ ☼
Vineyard	◻ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	CB
Paved Ditch Gutter	_____
Storm Sewer Manhole	⊕
Storm Sewer	S

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	_____
H-Frame Pole	●
Recorded U/G Power Line	P
Designated U/G Power Line (S.U.E.*)	P

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	_____
Recorded U/G Telephone Cable	T
Designated U/G Telephone Cable (S.U.E.*)	T
Recorded U/G Telephone Conduit	TC
Designated U/G Telephone Conduit (S.U.E.*)	TC
Recorded U/G Fiber Optics Cable	T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	T FO

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	W
Designated U/G Water Line (S.U.E.*)	W
Above Ground Water Line	A/G Water

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	_____
Recorded U/G TV Cable	TV
Designated U/G TV Cable (S.U.E.*)	TV
Recorded U/G Fiber Optic Cable	TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	TV FO

GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	G
Designated U/G Gas Line (S.U.E.*)	G
Above Ground Gas Line	A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	SS
Above Ground Sanitary Sewer	A/G Sanitary Sewer
Recorded SS Forced Main Line	FSS
Designated SS Forced Main Line (S.U.E.*)	FSS

MISCELLANEOUS:

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

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CONVENTIONAL PLAN SHEET SYMBOLS AND ABBREVIATIONS

RAILROADS:

Existing Track to be Retained	
Existing Track to be Shifted	
Existing Track to be Removed	
Proposed Track	
Proposed Turnout	
Turnout Label	
Curve Label	
Curve Information	
Profile Grade Line	
Milepost	

ABBREVIATIONS:

TRACK ALIGNMENT - HORIZONTAL:

CD	Cant Deficiency
CS	Curve to Spiral
Dc	Degree of Curvature
Ea	Actual Superelevation (Inches)
Eu	Unbalance Elevation (Inches)
I	Curve Intersection Angle
L	Length of Curve
Ls	Length of Spiral
PC	Point of Curvature
PI	Point of Intersection
PI/TO	Point of Intersection / Turnout
POL	Point on Line
PS	Point of Switch
PT	Point on Tangent
R	Radius
SC	Spiral to Curve
ST	Spiral to Tangent
TO	Turnout
TS	Tangent to Spiral
X	Spiral Tangent Length to Offset
Y	Spiral Tangent Offset

TRACK ALIGNMENT - VERTICAL:

EL	Elevation
L	Vertical Curve Length
R	Rate of Change
T/R	Top of Rail
VPC	Vertical Point of Curve
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangent

DRAINAGE:

CIP	Cast Iron Pipe
BCCMP	Bituminous Coated Corrugated Metal Pipe
INV.	Invert
PSRM	Permanent Soil Reinforcement Matting
RCB	Reinforced Concrete Box Culvert
RCP	Reinforced Concrete Pipe
STB	Stone Box Culvert
SYFF	Square Yards Filter Fabric
WSP	Welded Steel Pipe

MISCELLANEOUS:

ABS	Absolute
AVE	Avenue
AH	Ahead
BK	Back
B	Baseline
BLDG	Building
BLVD	Boulevard
CB	Catch Basin
C	Centerline
CLR	Clear
CONC	Concrete
DWG	Drawing
E	East
EL	Elevation
ESMT	Easement
EXIST	Existing
EB	East Bound
FT	Feet
FND	Foundation
GRD	Ground
HW	Headwall
HORIZ	Horizontal
LT	Left
LH	Lefthand
MIN	Minimum
MOW	Maintenance of Way
MP	Milepost
MPH	Miles Per Hour
N	North
N/A	Not Applicable
NB	North Bound
NO.	Number
NCRR	North Carolina Railroad
NS	Norfolk Southern Railway
OTM	Other Track Material
PAVT	Pavement
PGL	Profile Grade Line
PROP	Proposed
RD	Road
RT	Right
RR	Railroad
RH	Righthand
R/W	Right-of-Way
REQ'D	Required
S	South
SEG	Segment
STA	Station
SR	State Route
SHLDR	Shoulder
SHT	Sheet
SWM	Storm Water Management
TRK	Track
V	Velocity (MPH)
VERT	Vertical
W	West
W/	With
WB	West Bound

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203128

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0001000000-E	200	Lump Sum		CLEARING & GRUBBING . ACRE(S)
0008000000-E	200	5	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0022000000-E	225	46,800	CY	UNCLASSIFIED EXCAVATION
0036000000-E	225	3,140	CY	UNDERCUT EXCAVATION
0106000000-E	230	201,680	CY	BORROW EXCAVATION
0134000000-E	240	13,964	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	260	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	4,950	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0195000000-E	265	2,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	5,800	SY	GEOTEXTILE FOR SOIL STABILIZA-TION
0241000000-E	SP	8,350	SY	GENERIC GRADING ITEM GEOGRID FOR SOIL STABILIZATION
0318000000-E	300	320	TON	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRUCTURES
0320000000-E	300	1,000	SY	FOUNDATION CONDITIONING GEO-TEXTILE
0335200000-E	305	340	LF	15" DRAINAGE PIPE
0335300000-E	305	60	LF	18" DRAINAGE PIPE
0335500000-E	305	16	LF	30" DRAINAGE PIPE
0366000000-E	310	64	LF	15" RC PIPE CULVERTS, CLASS III
0448200000-E	310	692	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	344	LF	18" RC PIPE CULVERTS, CLASS IV
0448400000-E	310	148	LF	24" RC PIPE CULVERTS, CLASS IV
0448500000-E	310	340	LF	30" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	32	LF	15" CS PIPE CULVERTS, 0.064" THICK
0594000000-E	310	20	LF	24" CS PIPE CULVERTS, 0.064" THICK

ItemNumber	Sec #	Quantity	Unit	Description
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	10	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	8	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54
2473000000-N	SP	2	EA	GENERIC DRAINAGE ITEM PIPE COLLARS UNDER RAILROAD
2549000000-E	846	3,430	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	1,920	SY	4" CONCRETE SIDEWALK
2612000000-E	848	140	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	50	SY	4" CONCRETE PAVED DITCH
2724000000-E	857	50	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED
3030000000-E	862	425	LF	STEEL BM GUARDRAIL
3045000000-E	862	50	LF	STEEL BM GUARDRAIL, SHOP CURVED
3105000000-N	862	2	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3210000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3578000000-N	SP	3	EA	GENERIC FENCING ITEM RIGHT OF WAY GATE
3628000000-E	876	89	TON	RIP RAP, CLASS I
3635000000-E	876	669	TON	RIP RAP, CLASS II
3649000000-E	876	97	TON	RIP RAP, CLASS B
3656000000-E	876	18,476	SY	GEOTEXTILE FOR DRAINAGE

SUMMARY OF QUANTITIES - U-4716 A, U-4716B, U-4716C

ItemNumber	Sec #	Quantity	Unit	Description
0636000000-E	310	1	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")
0636000000-E	310	1	EA	*** CS PIPE ELBOWS, ***** THICK (24", 0.064")
0973100000-E	330	52	LF	*** WELDED STEEL PIPE, ***** THICK, GRADE B IN SOIL (18", 0.5")
0973300000-E	330	52	LF	*** WELDED STEEL PIPE, ***** THICK, GRADE B NOT IN SOIL (18", 0.5")
0986000000-E	SP	100	LF	GENERIC PIPE ITEM 18" BCCMP PIPE CULVERTS, 0.079" THICK
0986000000-E	SP	341	LF	GENERIC PIPE ITEM 36" BCCMP PIPE CULVERTS, 0.109" THICK
0986000000-E	SP	91	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B IN SOIL
0986000000-E	SP	91	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	60	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B OPEN CUT
0986000000-E	SP	38	LF	GENERIC PIPE ITEM 42" BCCMP PIPE CULVERTS, 0.138" THICK
0986000000-E	SP	59	LF	GENERIC PIPE ITEM 42" WELDED STEEL PIPE, 0.625" THICK, GRADE B IN SOIL
0986000000-E	SP	59	LF	GENERIC PIPE ITEM 42" WELDED STEEL PIPE, 0.625" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	37	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B IN SOIL
0986000000-E	SP	37	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	60	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B OPEN CUT

ItemNumber	Sec #	Quantity	Unit	Description
3691000000-N	SP	10	EA	GENERIC EROSION CONTROL ITEM SUPPLEMENTAL RESPONSE FOR ERO-SION CONTROL
3832000000-E	SP	3,210	TF	RAILROAD TRACK TO BE REMOVED
3885000000-E	SP	41,600	TON	GENERIC TRACKWORK ITEM SUB-BALLAST
4072000000-E	903	225	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	3	EA	SIGN ERECTION, TYPE D
4102000000-N	904	17	EA	SIGN ERECTION, TYPE E
4155000000-N	907	19	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4238000000-N	907	1	EA	DISPOSAL OF SIGN, D, E OR F
4400000000-E	1110	543	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	320	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	122	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	1	EA	FLASHING ARROW BOARD
4422000000-N	1120	15	DAY	PORTABLE CHANGEABLE MESSAGE SIGN (SHORT TERM)
4430000000-N	1130	106	EA	DRUMS
4435000000-N	1135	100	EA	CONES
4445000000-E	1145	248	LF	BARRICADES (TYPE III)
4455000000-N	1150	81	DAY	FLAGGER
4465000000-N	1160	4	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	1	EA	RESET TEMPORARY CRASH CUSHION
4480000000-N	1165	1	EA	TMA
4485000000-E	1170	398	LF	PORTABLE CONCRETE BARRIER
4507000000-E	1170	104	LF	WATER FILLED BARRIER
4650000000-N	1251	90	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	3,180	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	9,162	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)

ItemNumber	Sec #	Quantity	Unit	Description
0986000000-E	SP	20	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B IN SOIL
0986000000-E	SP	20	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	21	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B OPEN CUT
0995000000-E	340	668	LF	PIPE REMOVAL
0996000000-N	350	2	EA	PIPE CLEAN-OUT
1011000000-N	500	Lump Sum		FINE GRADING
1099500000-E	505	2,450	CY	SHALLOW UNDERCUT
1121000000-E	520	430	TON	AGGREGATE BASE COURSE
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1264000000-E	SP	2,200	LF	DITCHING
1275000000-E	600	52	GAL	PRIME COAT
1330000000-E	607	240	SY	INCIDENTAL MILLING
1489000000-E	610	2,985	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	2,810	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	2,290	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1575000000-E	620	406	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	130	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	906	18	EA	RIGHT OF WAY MARKERS
2209000000-E	838	52	CY	ENDWALLS
2220000000-E	838	10	CY	REINFORCED ENDWALLS
2275000000-E	SP	58	CY	FLOWABLE FILL
2286000000-N	840	22	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	6	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.16

ItemNumber	Sec #	Quantity	Unit	Description
4695000000-E	1205	165	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4710000000-E	1205	24	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4725000000-E	1205	14	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	26,012	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	330	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	18	LF	PAINT PAVEMENT MARKING LINES (24")
4850000000-E	1205	300	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	18	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4905000000-N	1253	90	EA	SNOWFLOWABLE PAVEMENT MARKERS
5326200000-E	1510	1,156	LF	12" WATER LINE
5326600000-E	1510	399	LF	16" WATER LINE
5558000000-E	1515	1	EA	12" VALVE
5558600000-E	1515	2	EA	16" VALVE
5572200000-E	1515	4	EA	12" TAPPING VALVE
5643100000-E	1515	1	EA	3/4" WATER METER
5648000000-N	1515	4	EA	RELOCATE WATER METER
5649000000-N	1515	2	EA	RECONNECT WATER METER
5666000000-E	1515	1	EA	FIRE HYDRANT
5672000000-N	1515	6	EA	RELOCATE FIRE HYDRANT
5709000000-E	1520	572	LF	*** FORCE MAIN SEWER (18")
5709400000-E	1520	373	LF	8" FORCE MAIN SEWER
5801000000-E	1530	371	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	1,043	LF	ABANDON 12" UTILITY PIPE
5810000000-E	1530	385	LF	ABANDON 16" UTILITY PIPE
5811000000-E	1530	470	LF	ABANDON 18" UTILITY PIPE

SUMMARY OF QUANTITIES - U-4716 A, U-4716B, U-4716C

ItemNumber	Sec #	Quantity	Unit	Description
5812000000-E	1530	60	LF	ABANDON 20" UTILITY PIPE
5815000000-N	1530	1	EA	REMOVE WATER METER
5815500000-N	1530	1	EA	REMOVE FIRE HYDRANT
5828000000-N	1530	2	EA	REMOVE UTILITY MANHOLE
5835900000-E	1540	170	LF	20" ENCASEMENT PIPE
5836200000-E	1540	703	LF	30" ENCASEMENT PIPE
5872100000-E	1550	85	LF	TRENCHLESS INSTALLATION OF 20" IN SOIL
5872110000-E	1550	85	LF	TRENCHLESS INSTALLATION OF 20" NOT IN SOIL
5872300000-E	1550	95	LF	TRENCHLESS INSTALLATION OF 30" IN SOIL
5872310000-E	1550	95	LF	TRENCHLESS INSTALLATION OF 30" NOT IN SOIL
5882000000-N	SP	1	EA	GENERIC UTILITY ITEM SANITARY SEWER VALVE BOX
6000000000-E	1605	34,030	LF	TEMPORARY SILT FENCE
6006000000-E	1610	2,105	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	6,350	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	2,745	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	167	ACR	TEMPORARY MULCHING
6018000000-E	1620	3,450	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	16	TON	FERTILIZER FOR TEMPORARY SEED- ING
6024000000-E	1622	6,110	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,400	LF	SAFETY FENCE
6030000000-E	1630	18,940	CY	SILT EXCAVATION
6036000000-E	1631	81,280	SY	MATting FOR EROSION CONTROL
6037000000-E	SP	380	SY	COIR FIBER MAT
6038000000-E	SP	3,590	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	750	LF	1/4" HARDWARE CLOTH

ItemNumber	Sec #	Quantity	Unit	Description
6071012000-E	SP	6,710	LF	COIR FIBER WATTLE
6071020000-E	SP	4,800	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	6,900	LF	COIR FIBER BAFFLE
6071050000-E	SP	26	EA	*** SKIMMER (1-1/2")
6071050000-E	SP	1	EA	*** SKIMMER (2-1/2")
6084000000-E	1660	106.5	ACR	SEEDING & MULCHING
6087000000-E	1660	117	ACR	MOWING
6090000000-E	1661	1,750	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	5.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	2,550	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	76	TON	FERTILIZER TOPDRESSING
6114500000-N	1667	35	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	175	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.2	ACR	REFORESTATION
6126000000-E	SP	0.27	ACR	STREAMBANK REFORESTATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4716B	1	
WBS ELEMENT	F.A. PROJ. NO.	DESCRIPTION	
54000.1		P.E.	
43219.2.STR12U4716B		ROW	
54000.5.STR01T4A		UTIL & CON	

PART 1 OF 2

See Sheet U-4716A/C & U-4716B 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

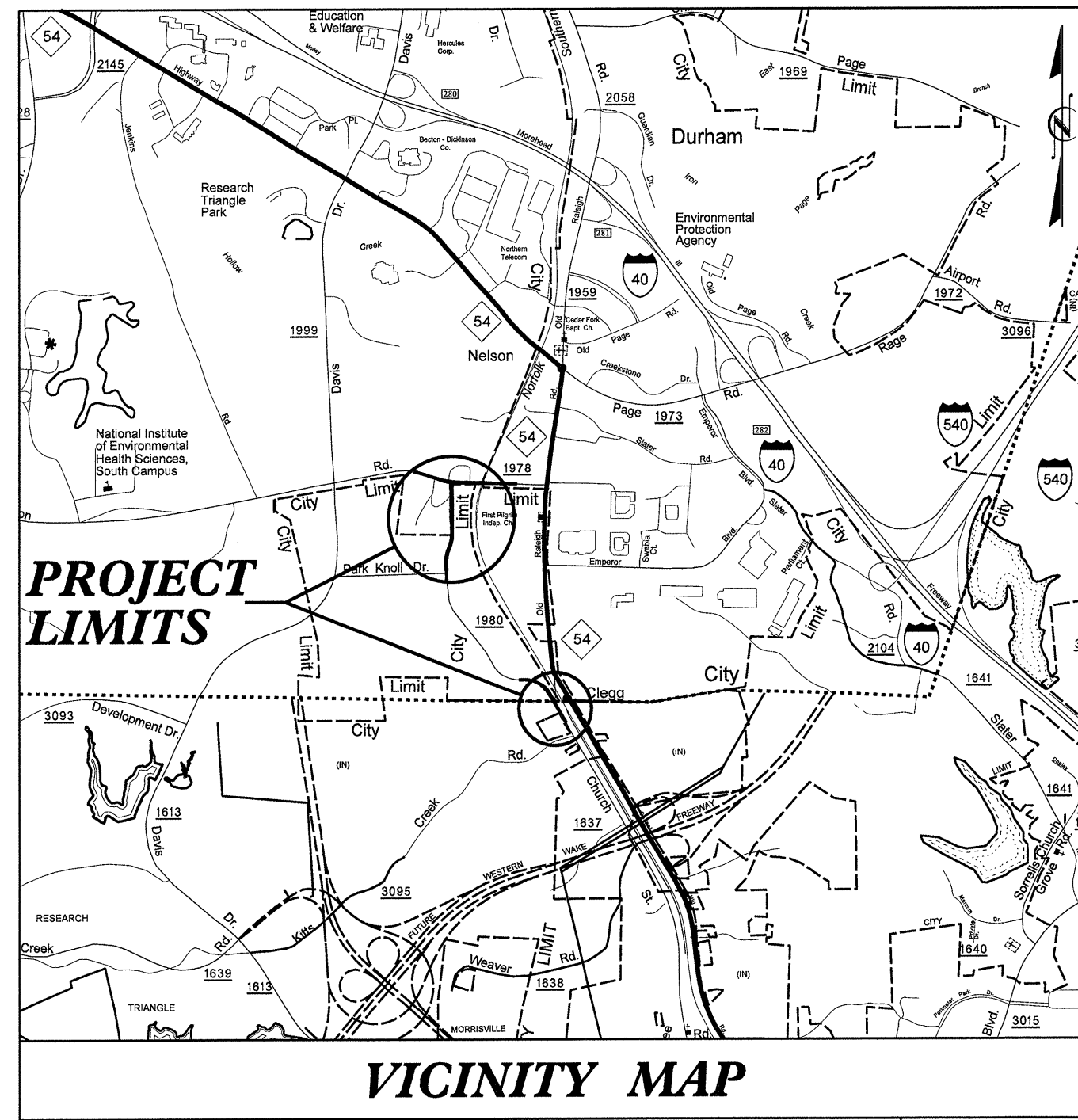
WAKE & DURHAM COUNTIES

LOCATION: HOPSON RD. AND CHURCH ST. EXTENSION IN DURHAM

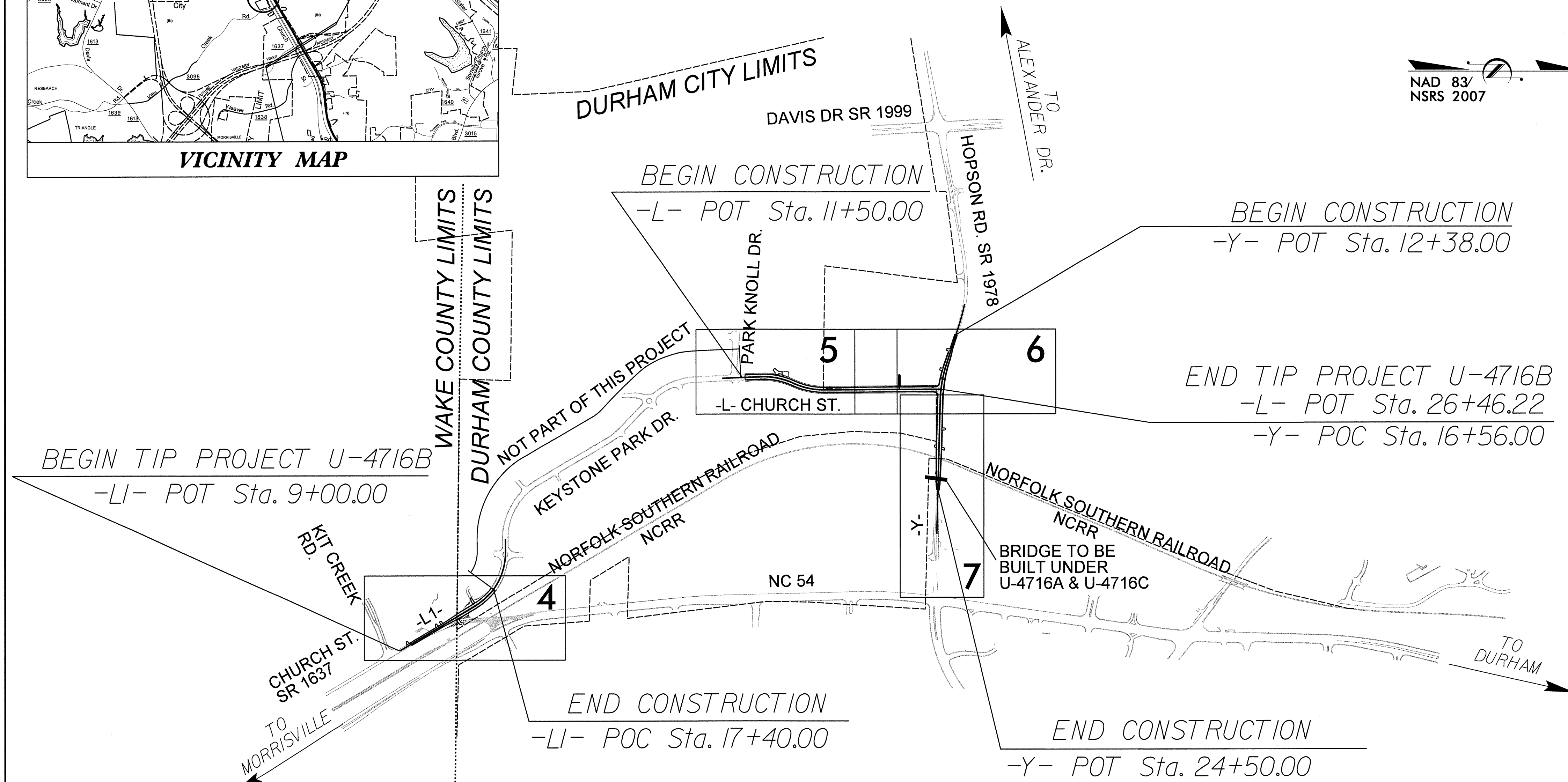
TYPE OF WORK: GRADING, PAVING, & DRAINAGE

TIP PROJECT: U-4716B

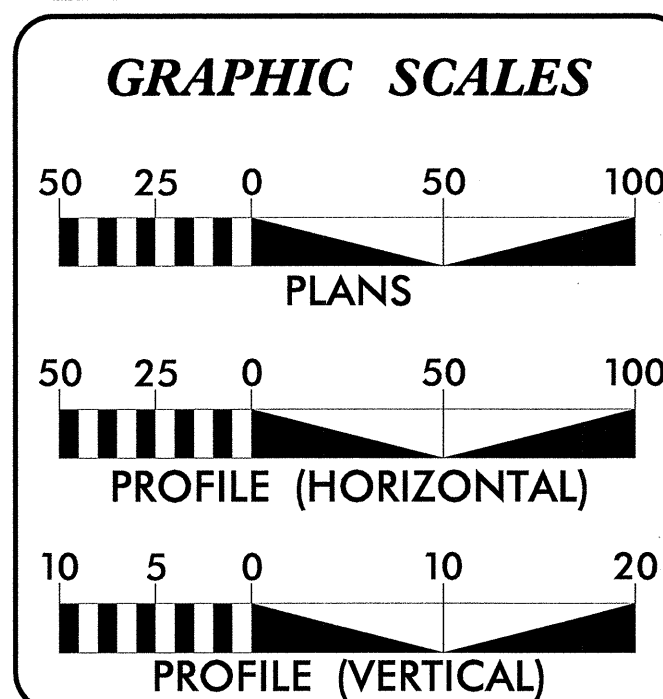
CONTRACT: C203128



VICINITY MAP



NAD 83 / NSRS 2007



DESIGN DATA

ADT 2012 = 2,220
ADT 2030 = 8,700

V = 40 MPH

LENGTH ROADWAY = 0.442 MI
TOTAL LENGTH = 0.442 MI

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

RAIL DIVISION

Prepared In the Office of:

Hatch Mott MacDonald
PO BOX 700
FUGUAY-VARINA, NC 27526
TEL (919) 552-2253
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915 JONES FRANKLIN ROAD
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ENG FIRM LICENSE NO. C-890

Prepared for:

ENGINEERING & SAFETY BRANCH

MAIL: 1556 MAIL SERVICE CENTER RALEIGH, NC 27659-1556 DELIVERY: 860 CAPITAL BOULEVARD RALEIGH, NC 27603 PHONE: (919) 715-8803 FAX: (919) 715-8804

2012 STANDARD SPECIFICATIONS NCDOT RAIL DIVISION - CONTACT: NANCY HORNE, PE

RIGHT OF WAY DATE: JUNE 14, 2012

LETTING DATE: OCT 16, 2012

HYDRAULIC ENGINEER

SEAL 9334

W. HENRY WELLS, JR. 8/14/12 P.E.

SIGNATURE:

ROADWAY DESIGN

SEAL 2791

MICHAEL PEKAREK 8/14/12 P.E.

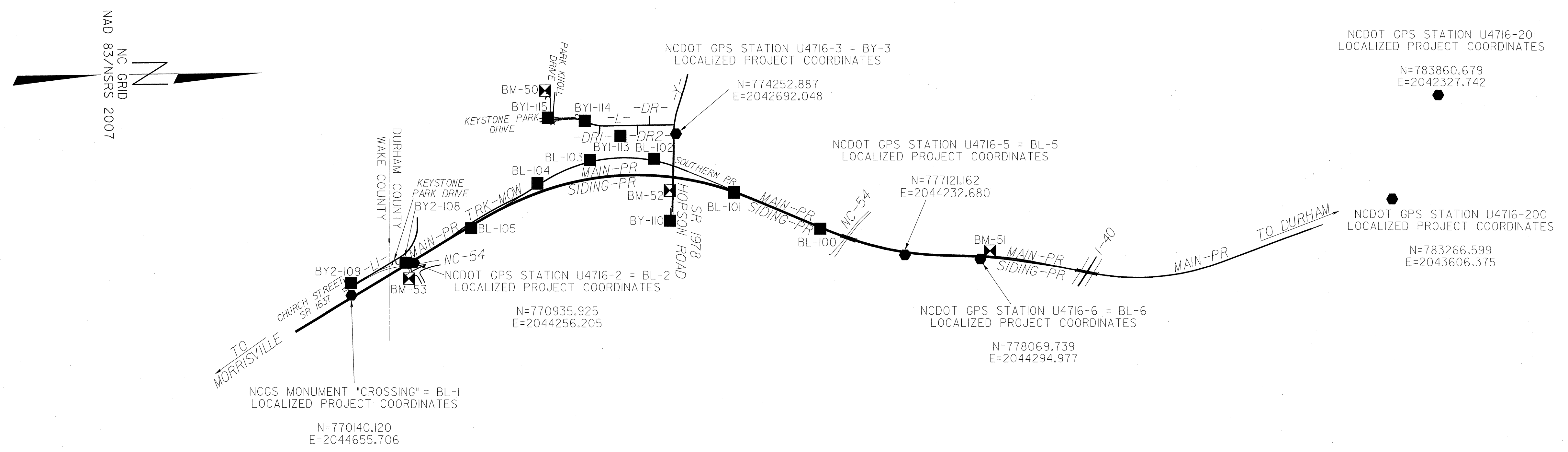
SIGNATURE:

MICHAEL PEKAREK, PE
PROJECT ENGINEER

0371DEL_P17-18
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SURVEY CONTROL SHEET U-4716B

0371DEL_P17-18
6/12/09



CONTROL DATA

BASELINE POINT	DESC.	NORTH	EAST	ELEVATION	MAIN-PR STATION	OFFSET
6	U4716-6-BL-6	778069.7390	2044294.9770	396.70	3275+24.02	38.28 LT
5	U4716-5-BL-5	777121.1620	2044232.6800	402.84	3284+71.04	40.99 LT
100	BL-100	776057.0970	2043888.9020	405.94	3295+84.25	22.33 LT
101	BL-101	774971.8160	2043427.2580	396.81	3307+64.92	15.75 LT
116	NOT SET	774219.1226	2043105.4246		3315+61.60	124.73 RT
102	BL-102	773974.9330	2043001.0150	389.17	3318+04.27	205.17 RT
103	BL-103	773166.8830	2043006.6690	388.80	3325+69.90	228.31 RT
104	BL-104	772500.8560	2043288.0730	384.42	3332+53.30	102.22 RT
105	BL-105	771659.6970	2043828.9870	389.85	3342+36.94	32.65 LT
2	U4716-2-BL-2	770935.9250	2044256.2060	394.83	3350+77.45	36.26 LT
1	NCGS CROSSING-BL-1	770140.1210	2044655.7060	393.17	3359+66.09	20.45 RT

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
110	BY-110	774165.1669	2043766.0026	388.29	OUTSIDE PROJECT LIMITS	
116	NOT SET	774219.1226	2043105.4246		21+81.03	3.32 LT
3	U4716-3-BY-3	774252.8870	2042692.0480	396.07	17+66.91	26.27 LT

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	U4716-3-BY-3	774252.8870	2042692.0480	396.07	OUTSIDE PROJECT LIMITS	
113	BY1-113	773553.2874	2042709.5792	390.22	19+65.39	125.64 RT
114	BY1-114	773105.9462	2042517.0848	383.36	15+06.61	7.12 LT
115	BY1-115	772641.9285	2042473.0981	374.08	10+41.57	25.28 LT

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	L1 STATION	OFFSET
105	BL-105	771659.6970	2043828.9870	389.85	20+15.50	677.16 RT
108	BY2-108	770827.7100	2044251.5640	397.22	15+75.28	94.22 RT
109	BY2-109	770137.6450	2044499.2160	390.02	8+59.94	41.39 LT

BENCHMARK DATA

BM 50	ELEVATION = 359.54	BM 52	ELEVATION = 379.87
N 772609	E 2042136	N 774167	E 2043394
L STATION 10+22.00	364 LEFT	Y STATION 24+71.00	41 RIGHT
X CUT IN C&G		R/R SPIKE SET IN 20" PINE	
BM 51	ELEVATION = 390.55	BM 53	ELEVATION = 394.62
N 778193	E 2044196	N 770868	E 2044451
MAIN-PR STATION 3274+07.00	68 RIGHT	MAIN-PR STATION 3352+34.00	170 LEFT
R/R SPIKE SET IN 15" TWIN SWEET GUM		*X* SCRIBE TOP OF WEST FLANGE BOLT ON FIRE HYDRANT	

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4716-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 774252.887(ft) EASTING: 2042692.048(ft) ELEVATION: 396.07'(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991814

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4716-3" TO -L- STATION 26+46.22 IS S 80°07'32.9" W 113.01'

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

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/doh/preconstruct/highway/location/project/)
U4716B_ls_control.txt
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

NOTE: DRAWING NOT TO SCALE

R:\8453_P17-18\external\Roadway\Proj\U4716B_ls_ls.dgn

SURVEY CONTROL SHEET U-4716

Design Alignments

0371DEL_P17-18
0001ADD_P17-18
8/2/99

REVISIONS

1 - 11/8/2012: CHANGED "U4713-3" TO "U4716-3" IN DATUM DESCRIPTION.

10:03:06 AM
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11/5/2012

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	772601.4166	2042500.0440
PC	12+87.00	772888.1802	2042488.3969
PRC	15+39.42	773133.6570	2042536.4036
PT	17+72.47	773359.7745	2042584.8491
POT	26+46.22	774233.5079	2042580.7147

L1			
TYPE	STATION	NORTH	EAST
POT	9+00.00	770193.1242	2044514.7077
PC	15+48.85	770753.1732	2044187.0550
PT	20+37.01	770983.3452	2043781.8147
POT	21+31.16	770982.5592	2043687.6626

Y			
TYPE	STATION	NORTH	EAST
PC	10+00.00	774410.2700	2041950.0146
PT	11+85.93	774361.5087	2042129.3468
PC	14+60.93	774275.5229	2042390.5583
PT	17+44.06	774227.2100	2042668.5184
POT	27+31.78	774201.4200	2043655.9010

MAIN-PR			
TYPE	STATION	NORTH	EAST
POT	3232+32.92	782246.5208	2043966.3397
TS	3242+89.14	781252.0125	2044322.0925
SC	3246+30.14	780928.8584	2044430.8066
CS	3259+14.58	779657.4918	2044522.0749
ST	3262+55.58	779322.1227	2044460.6341
TS	3267+46.26	778841.2406	2044363.0520
SC	3270+87.26	778506.1095	2044300.2225
CS	3273+57.08	778238.2902	2044267.8608
ST	3276+98.08	777897.8393	2044249.0576
TS	3279+22.85	777673.2461	2044240.0025
SC	3281+39.85	777456.5225	2044229.2085
CS	3291+83.51	776437.9301	2044017.0871
ST	3296+79.51	775978.3640	2043830.7466
TS	3302+49.40	775454.9927	2043605.2280
SC	3307+45.40	774995.4264	2043418.8877
CS	3338+24.09	772004.9001	2043601.7443
ST	3343+20.09	771571.4604	2043842.6880
TS	3381+24.35	768287.1868	2045762.5589
SC	3385+27.35	767936.1687	2045960.4567
CS	3394+43.26	767085.6960	2046295.7498
ST	3398+46.26	766694.0662	2046390.6359
TS	3401+16.26	766430.6967	2046450.1045
SC	3405+19.26	766039.0669	2046544.9905
CS	3415+82.17	765059.5379	2046950.6545
ST	3419+85.17	764715.4936	2047160.4419
POT	3441+98.33	762844.1585	2048342.0361
POT	3446+85.00	762433.2783	2048602.8574

SIDING-PR			
TYPE	STATION	NORTH	EAST
POT	3264+51.38	779130.3482	2044421.7186
POT	3265+42.38	779041.1659	2044403.6214
TS	3270+11.67	778577.7616	2044329.5293
SC	3271+97.67	778393.8669	2044301.6557
CS	3274+59.05	778133.8323	2044275.5696
ST	3276+45.05	777948.0654	2044266.3598
TS	3278+65.43	777727.8820	2044257.2342
SC	3282+06.43	777387.4524	2044238.0478
CS	3291+83.79	776434.9593	2044031.0514
ST	3296+79.79	775975.3932	2043844.7109
TS	3302+45.40	775455.9500	2043620.8849
SC	3307+41.40	774996.3838	2043434.5447
CS	3338+20.09	772005.8575	2043617.4013
ST	3343+16.09	771572.4178	2043858.3450
TS	3381+17.09	768290.9539	2045776.5734
SC	3385+20.09	767939.9357	2045974.4712
CS	3394+35.98	767089.4630	2046309.7643
ST	3398+38.98	766697.8332	2046404.6503
TS	3401+08.57	766434.8686	2046464.0275
SC	3405+11.57	766043.2388	2046558.9136
CS	3415+74.46	765063.7098	2046964.5775
ST	3419+77.46	764719.6655	2047174.3649
PC	3434+60.48	763465.6929	2047966.1455
PT	3436+99.18	763261.2664	2048089.3446
POT	3439+15.96	763073.3027	2048197.3504
POT	3440+06.96	762996.3576	2048245.9349

TRK-MOW			
TYPE	STATION	NORTH	EAST
TS	3312+66.62	774393.1529	2043164.9901
SC	3314+52.62	774220.2538	2043096.4742
CS	3329+32.01	772779.8233	2043164.4145
ST	3332+73.01	772480.4980	2043327.5132
PC	3334+16.02	772356.9316	2043399.5191
PT	3334+96.79	772285.2634	2043436.8026
PC	3335+98.68	772192.6665	2043479.3094
PT	3340+50.79	771791.7291	2043687.8760
PC	3342+64.57	771607.1752	2043795.7597
PT	3343+41.05	771543.1413	2043837.6259
POT	3345+27.76	771392.1729	2043947.4932
POT	3345+59.01	771365.1943	2043963.2640

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4716-3"
 WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 774252.887(±) EASTING: 2042692.048(±)
 ELEVATION: 396.07'(±)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991814
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4716-3" TO -MAIN-PR- STATION 3232+32.92 IS
 N 09°03'26.9" E 8094.56'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)

U4716_Is_control.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

● INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

SURVEY CONTROL SHEET U-4716

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+87.00	75.00	772891.2238	2042563.3351
L	13+65.00	-30.00	772969.1833	2042461.0230
L	13+65.00	-67.58	772973.0790	2042423.6459
L	14+29.91	-83.13	773048.5406	2042420.3986
L	14+75.00	-99.07	773103.5593	2042418.8703
L	14+75.00	31.00	773064.1837	2042542.8360
L	14+75.00	65.00	773053.8909	2042575.2406
L	15+00.00	-30.00	773107.6069	2042493.2662
L	15+39.42	70.00	773104.6767	2042600.1228
L	16+60.00	31.00	773241.7931	2042604.0669
L	16+60.00	55.00	773236.9415	2042627.5714
L	17+30.00	31.00	773315.0491	2042614.2958
L	17+30.00	45.00	773314.0152	2042628.2576
L	17+72.47	45.00	773359.9874	2042629.8486
L	19+00.00	45.00	773487.5137	2042629.2452
L	19+00.00	31.00	773487.4475	2042615.2453
L	25+40.00	-45.00	774127.0807	2042536.2178
L	25+40.00	-30.00	774127.1517	2042551.2177
L	25+40.53	53.34	774128.0714	2042634.5511
L	26+04.58	-45.00	774191.6615	2042535.9123

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+60.00	-31.79	772759.9945	2042461.7835
L	11+60.00	31.00	772762.5428	2042524.5253
L	11+60.00	29.27	772762.4727	2042522.7973
L	12+87.00	-30.00	772886.9627	2042458.4216
L	12+87.00	31.00	772889.4382	2042519.3713
L	15+39.42	31.00	773120.8228	2042564.6221
L	15+39.42	-30.00	773146.0771	2042509.0953
L	17+72.47	31.00	773359.9212	2042615.8487
L	17+72.47	-30.00	773359.6325	2042554.8494
L	25+25.00	31.00	774112.4405	2042612.2880
L	25+85.00	-30.00	774172.1511	2042551.0047

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L1	9+00.00	-35.00	770175.4502	2044484.4979
L1	9+00.00	-30.99	770177.4775	2044487.9632
L1	10+00.00	-45.00	770256.7140	2044425.3694
L1	14+63.93	-45.00	770657.1518	2044191.0962
L1	16+25.68	-40.09	770790.3290	2044112.1700
L1	16+45.00	-40.21	770803.5694	2044100.4990
L1	17+11.42	-35.00	770849.5082	2044060.0051
L1	17+40.00	-29.96	770869.7863	2044042.1305

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
L1	9+91.71	-30.00	770257.1314	2044442.5038
L1	14+45.39	-30.00	770648.7225	2044213.4061
L1	14+49.75	-36.97	770648.9656	2044205.1898

PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
Y	14+56.41	-54.21	774328.4277	2042403.2163
Y	14+60.00	29.95	774247.3650	2042380.3115
Y	14+60.00	45.00	774233.0696	2042375.6058
Y	15+47.00	-55.00	774305.8314	2042485.8999
Y	15+52.00	-30.60	774280.9860	2042485.0739
Y	15+69.00	-55.00	774301.3445	2042506.1612
Y	15+70.00	50.00	774198.3622	2042485.6520
Y	15+73.00	-31.52	774277.5748	2042505.1335
Y	16+90.00	-55.00	774284.9506	2042619.0421
Y	18+20.00	-65.00	774290.2124	2042746.1313
Y	19+65.00	-55.00	774276.4286	2042890.8196
Y	20+36.66	100.00	774119.6099	2042958.4036
Y	20+81.82	-50.00	774268.3790	2043007.4733
Y	24+77.32	100.00	774108.1003	2043398.9166
Y	24+95.00	-55.00	774262.5856	2043420.6399
Y	24+95.00	-29.76	774237.3576	2043419.9807
Y	25+15.00	-29.70	774236.7716	2043439.9722
Y	25+15.00	-55.00	774262.0632	2043440.6330
Y	25+30.00	100.00	774106.7243	2043451.5795
Y	25+30.00	30.35	774176.3523	2043453.3987

ROW MARKER CONCRETE OR GRANITE

ALIGN	STATION	OFFSET	NORTH	EAST
Y	15+50.00	29.54	774222.8047	2042469.6977
Y	16+00.00	30.00	774212.0973	2042520.1039
Y	17+40.00	80.00	774147.3693	2042662.0370
Y	20+41.95	80.00	774139.4648	2042964.2184

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCTHIGHWAYLOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCTHIGHWAYLOCATION/PROJECT/)

U4716_Is_control.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U4716-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 774252.887(++) EASTING: 2042692.048(++) ELEVATION: 396.07'(++)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991814

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U4716-3" TO -MAIN-PR- STATION 3232+32.92 IS N 09°03'26.9" E 8094.56'

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

NOTE: DRAWING NOT TO SCALE

REVISIONS

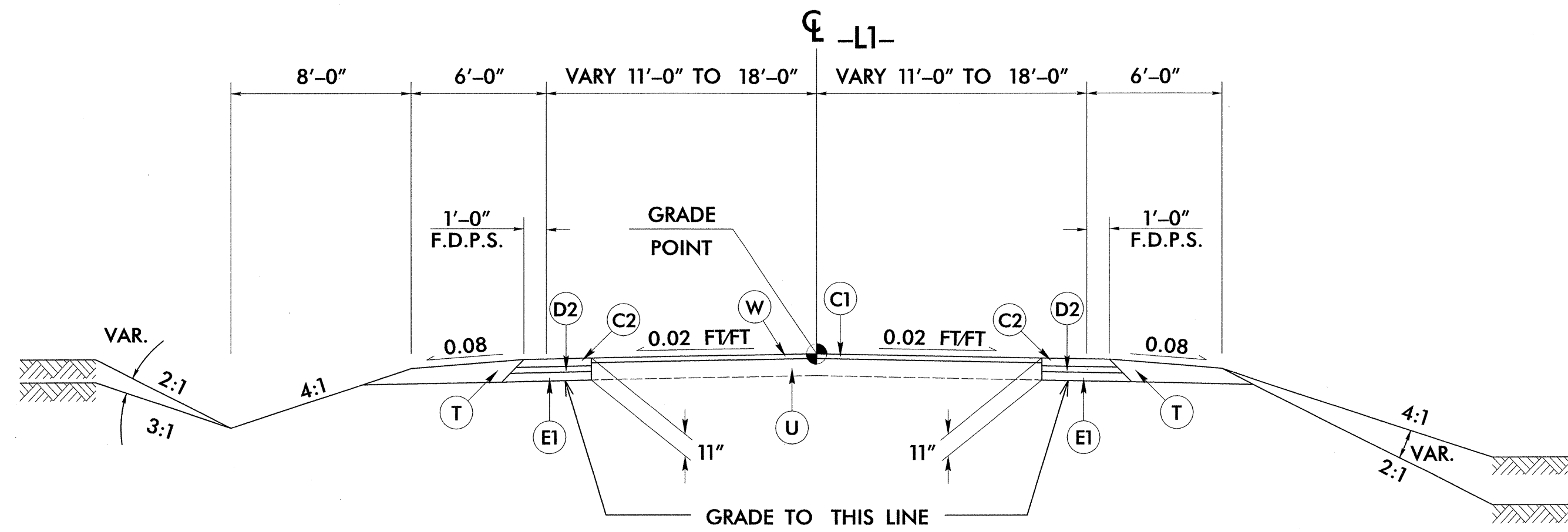
1 - 11/18/2012: CHANGED "U4713-3" TO "U4716-3" IN DATUM DESCRIPTION.

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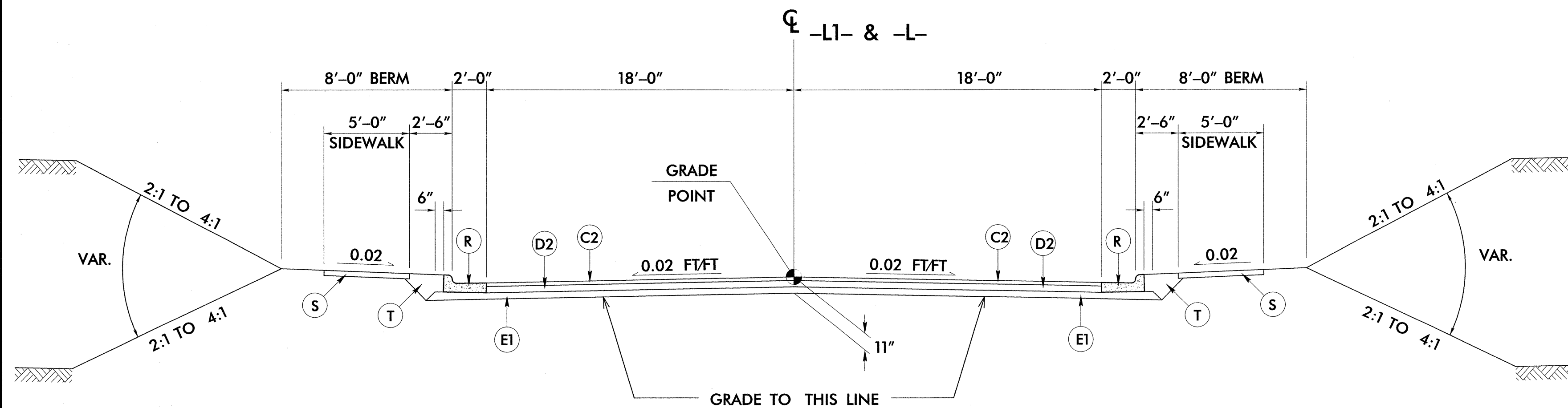
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PROJECT REFERENCE	SHEET NO.
U-4716B	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
HATCH MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	Prepared in the Office of:
Hatch Mott MacDonald PO Box 700 Fuquay-Varina, NC 27526 www.hatchmott.com	



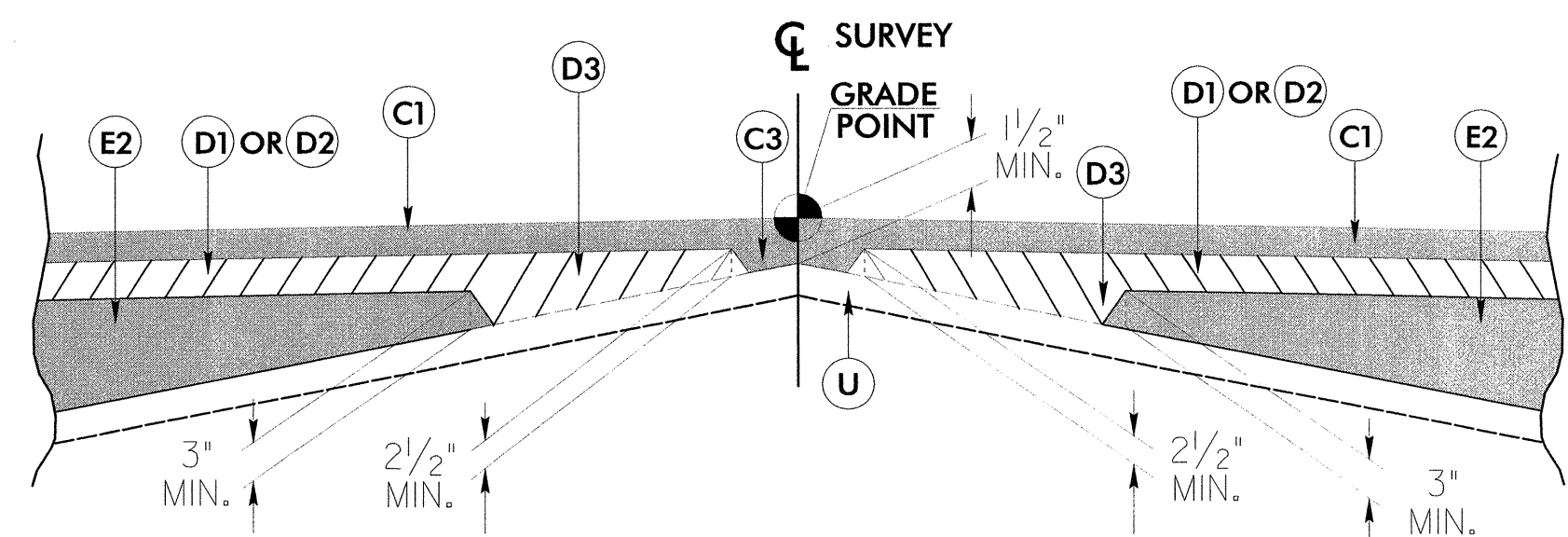
TYPICAL NO.1

USE TYPICAL SECTION NO. 1:
-L1- STA 10+00 TO 14+40



TYPICAL NO.2

USE TYPICAL SECTION NO. 2:
-L1- STA 14+40 TO 17+40
-L- STA 11+70 TO 26+28.08



W: DETAIL SHOWING METHOD OF WEDGING

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
FOR TAPERS AND AUXILIARY LANES SEE PLANVIEW

PAVEMENT SCHEDULE

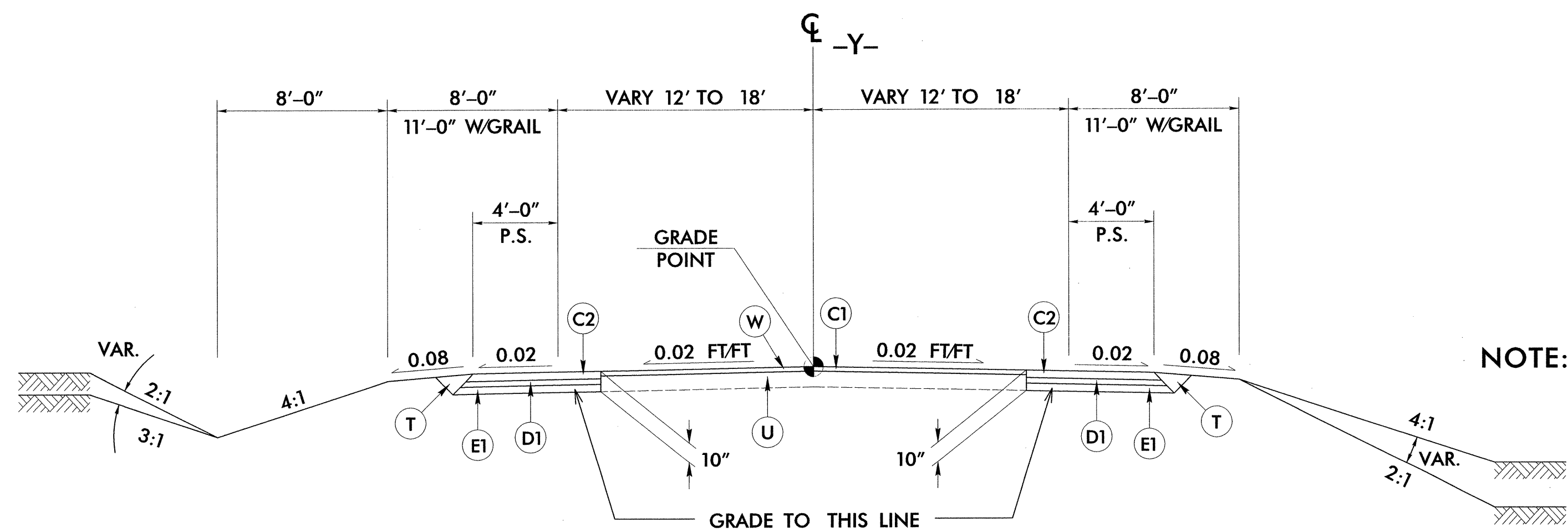
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1 1/2" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
J	PROP. 8" AGGREGATE BASE COURSE.
R	2'-6" CURB & GUTTER.
S	4" SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING BITUMINOUS PAVEMENT. VARIABLE DEPTH. (SEE DETAIL ON SHEET 2A)
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS SHEET)

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

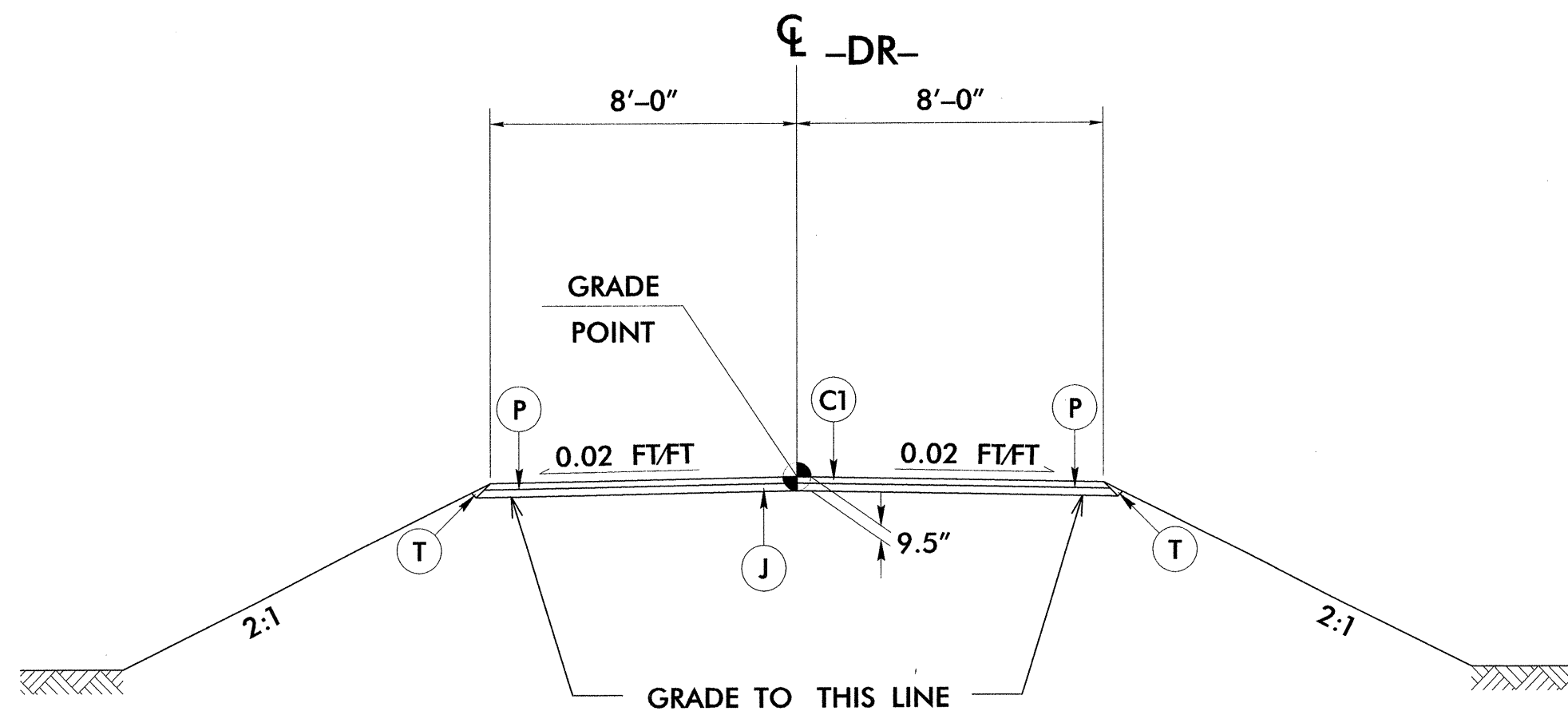
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PROJECT REFERENCE	SHEET NO.
U-4716B	2A
ROADWAY DESIGN	PAVEMENT DESIGN
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0569	
Prepared in the Office of: Hatch Mott MacDonald	

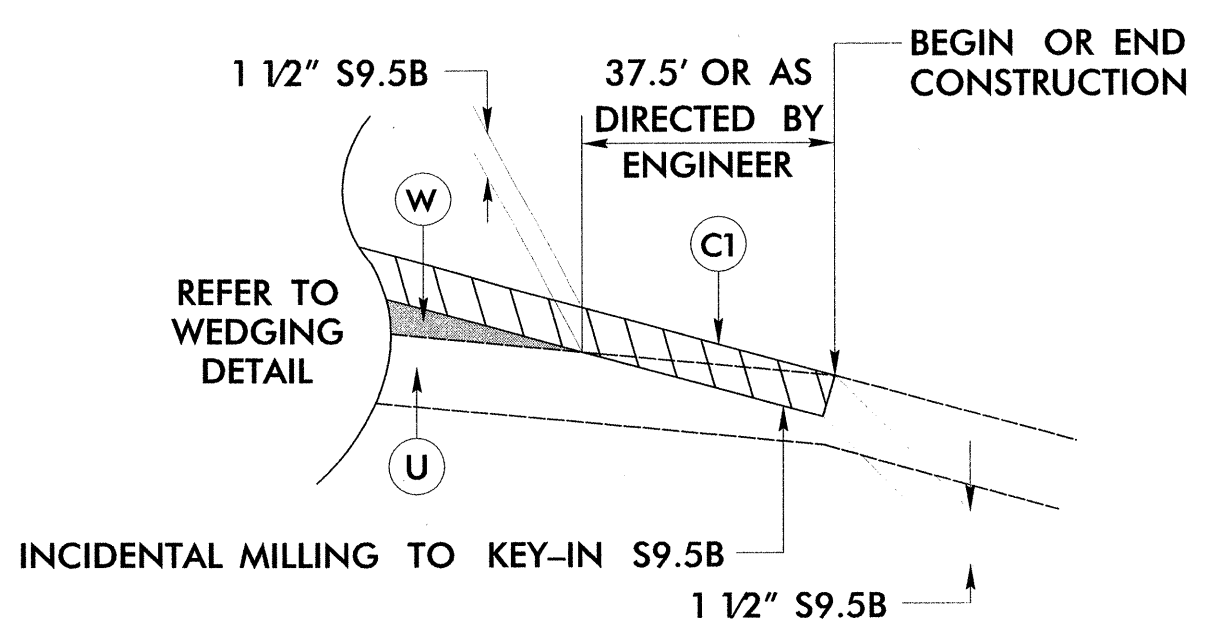


NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS FOR TAPERS AND AUXILIARY LANES SEE PLANVIEW

TYPICAL NO.3
USE TYPICAL SECTION NO. 3:
-Y- STA 13+50.00 TO 24+00.00



TYPICAL NO.4
USE TYPICAL SECTION NO. 4:
-DR- STA 10+10 TO 10+94.22



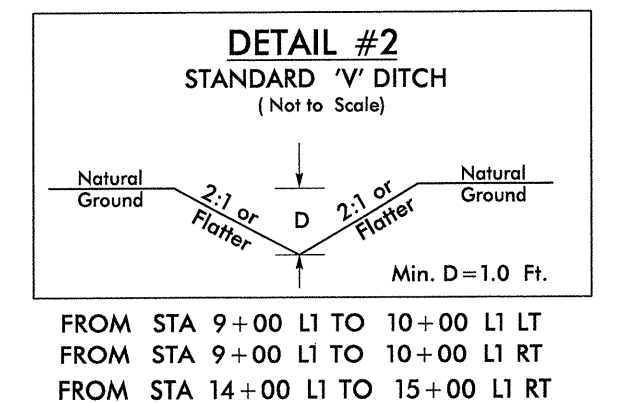
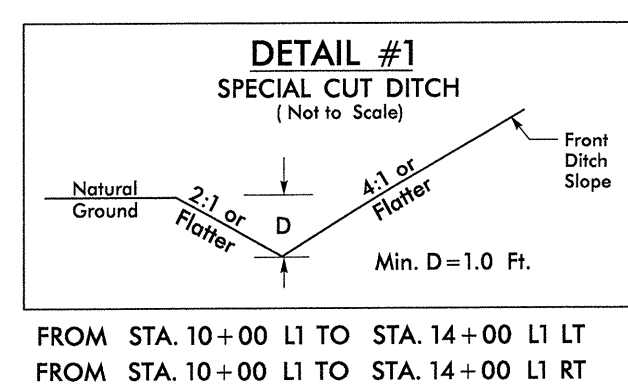
V: DETAIL SHOWING MILLED BUTT JOINT
DETAIL SHOWING PROFILE VIEW

C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	3" I19.0B
D2	4" I19.0B
D3	VAR. DEPTH I19.0B
E1	4" B25.0B
E2	VAR. DEPTH B25.0B
J	8" AGGREGATE BASE COURSE
P	.35 PRIME COAT
R	2'-6" CURB AND GUTTER
S	4" SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING BITUMINOUS PAVEMENT
W	WEDGING

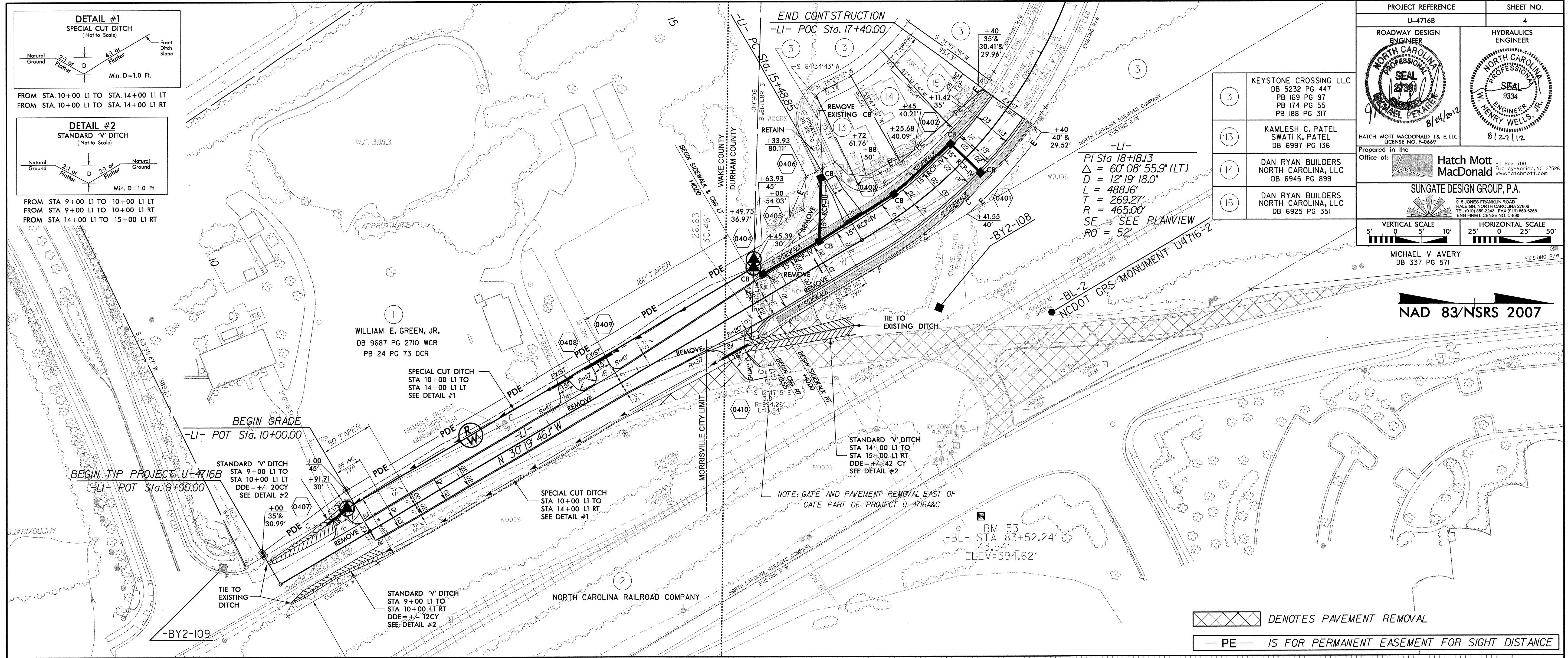
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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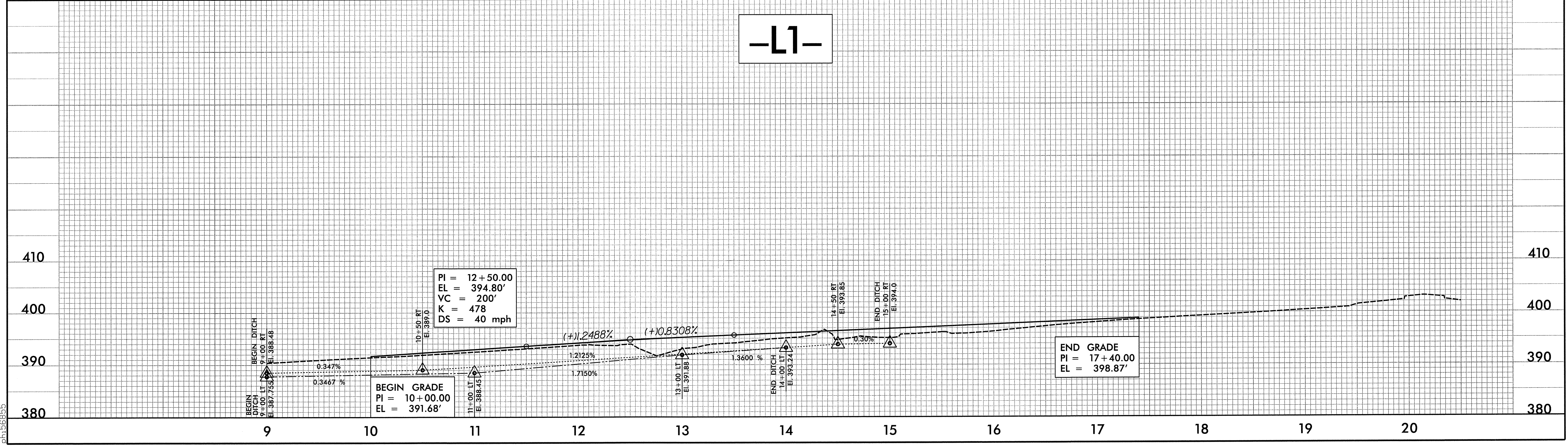
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PROJECT REFERENCE		SHEET NO.	
U-4716B		4	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
3 KEYSTONE CROSSING LLC DB 5232 PG 447 PB 169 PG 97 PB 174 PG 55 PB 188 PG 317		HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669 Prepared in the Office of:	
13 KAMLESH C. PATEL SWATI K. PATEL DB 6997 PG 136			
14 DAN RYAN BUILDERS NORTH CAROLINA, LLC DB 6945 PG 899		SUNGATE DESIGN GROUP, P.A. 915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL: (919) 888-2242 FAX: (919) 888-2288 ENG FIRM LICENSE NO. C-880	
15 DAN RYAN BUILDERS NORTH CAROLINA, LLC DB 6925 PG 351		VERTICAL SCALE 5' 0" 5' 10' HORIZONTAL SCALE 0 25' 50' MICHAEL V AVERY DB 337 PG 571	



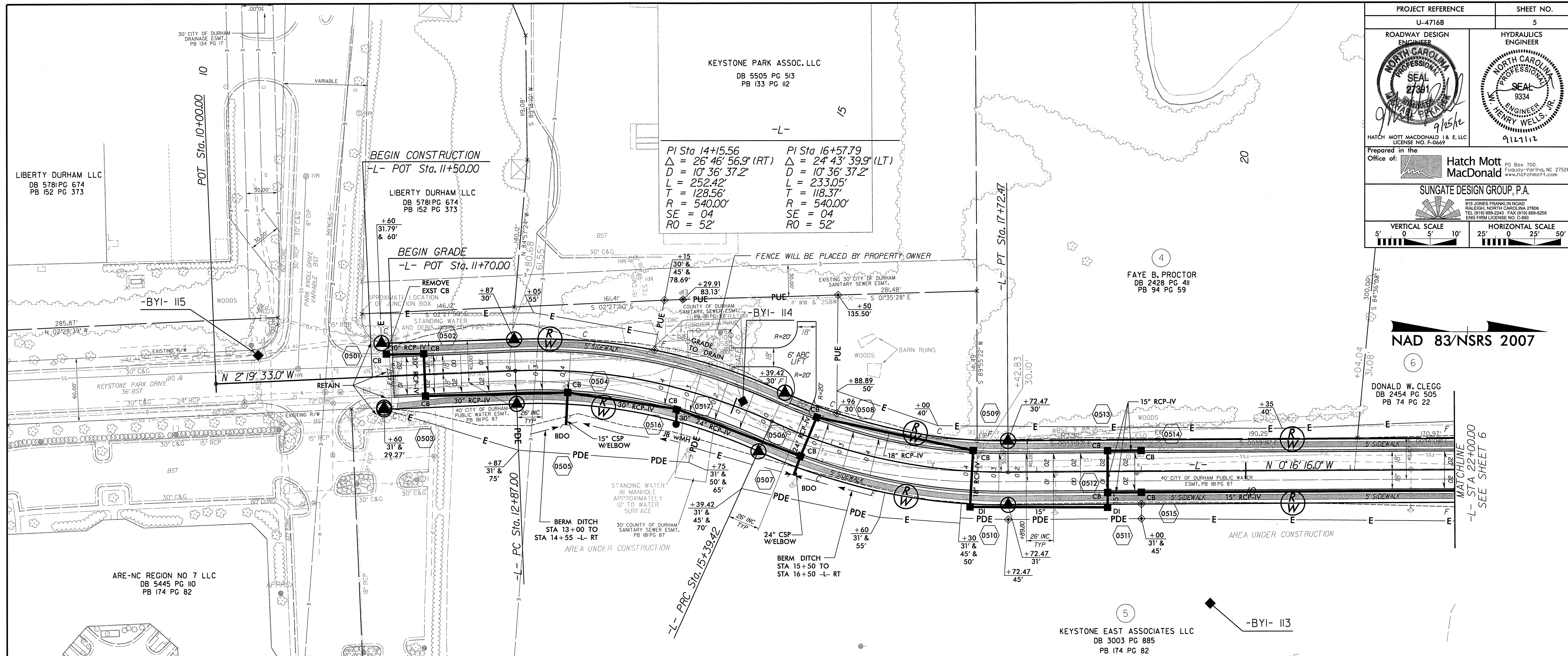
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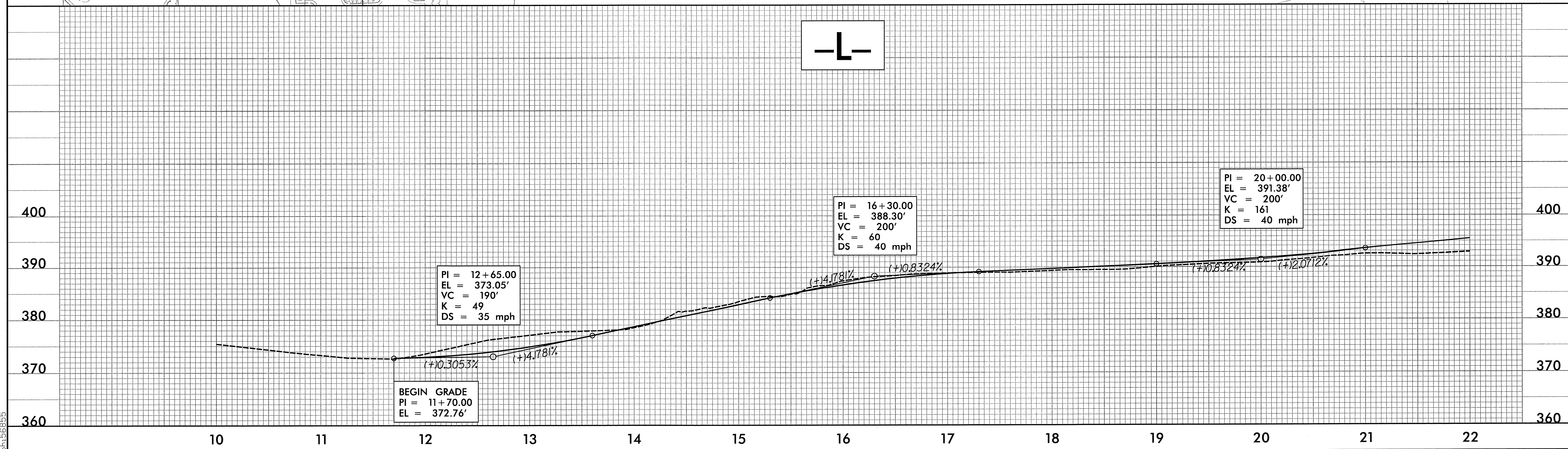
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PROJECT REFERENCE		SHEET NO.	
U-4716B		5	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669		912112	
Prepared in the Office of:		Hatch Mott MacDonald	
SUNGATE DESIGN GROUP, P.A.			
VERTICAL SCALE		HORIZONTAL SCALE	
5' 0 5' 10'		25' 0 25' 50'	

NAD 83/NSRS 2007



-L-

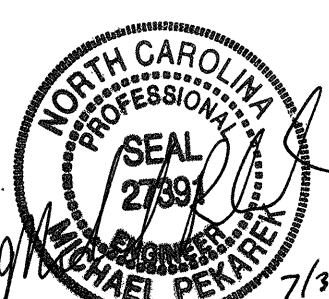
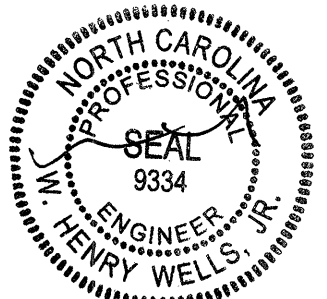
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VC = 190'
K = 49
DS = 35 mph

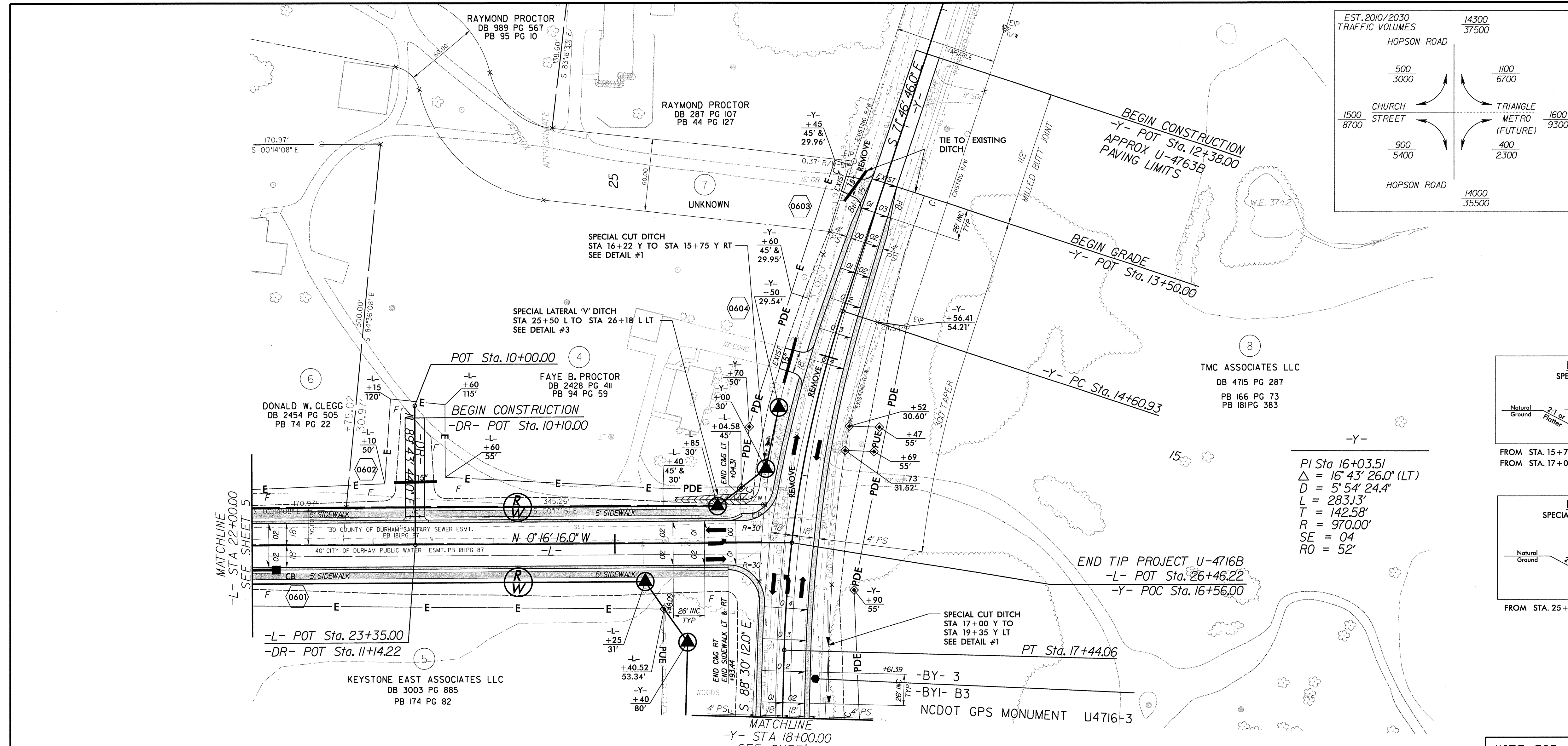
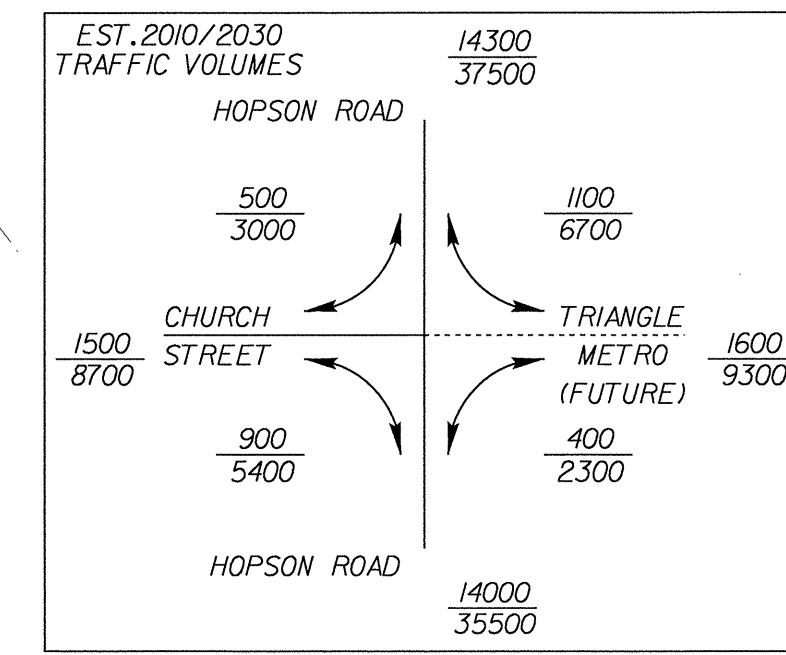
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EL = 388.30'
VC = 200'
K = 60
DS = 40 mph

PI = 20+00.00
EL = 391.38'
VC = 200'
K = 161
DS = 40 mph

BEGIN GRADE
PI = 11+70.00
EL = 372.76'

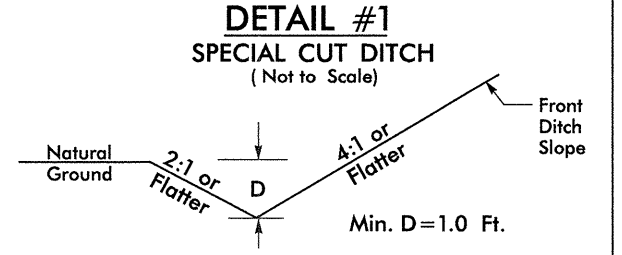
MATCHLINE
-L- STA 22+00.00
SEE SHEET 6

PROJECT REFERENCE		SHEET NO.	
U-4716B		6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			
HATCH MOTT MACDONALD I & E, LLC License No. F-06697 Prepared in the Office of: Hatch Mott MacDonald PO Box 700, Cary, NC 27513 www.hatchmott.com			
SUNGATE DESIGN GROUP, P.A. 915 JONES FRANKLIN ROAD, RALEIGH, NORTH CAROLINA 27606 TEL: (919) 859-2243 FAX: (919) 859-9259 ENG FIRM LICENSE NO. C-895			
VERTICAL SCALE		HORIZONTAL SCALE	
5' = 0" 5' 10'		25' = 0" 25' 50'	



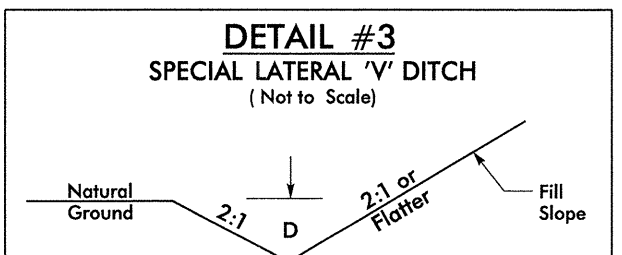
NAD 83/NSRS 2007

DETAIL #1
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 15+75 Y TO STA. 16+22 Y RT
FROM STA. 17+00 Y TO STA. 19+35 Y LT

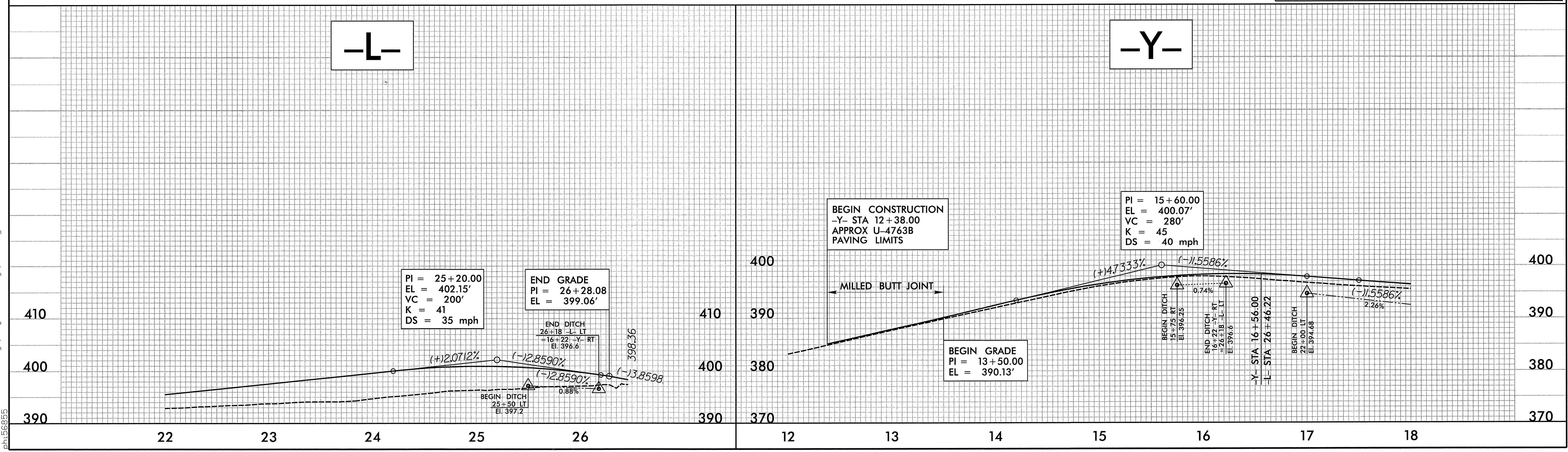
DETAIL #3
SPECIAL LATERAL 'Y' DITCH
(Not to Scale)



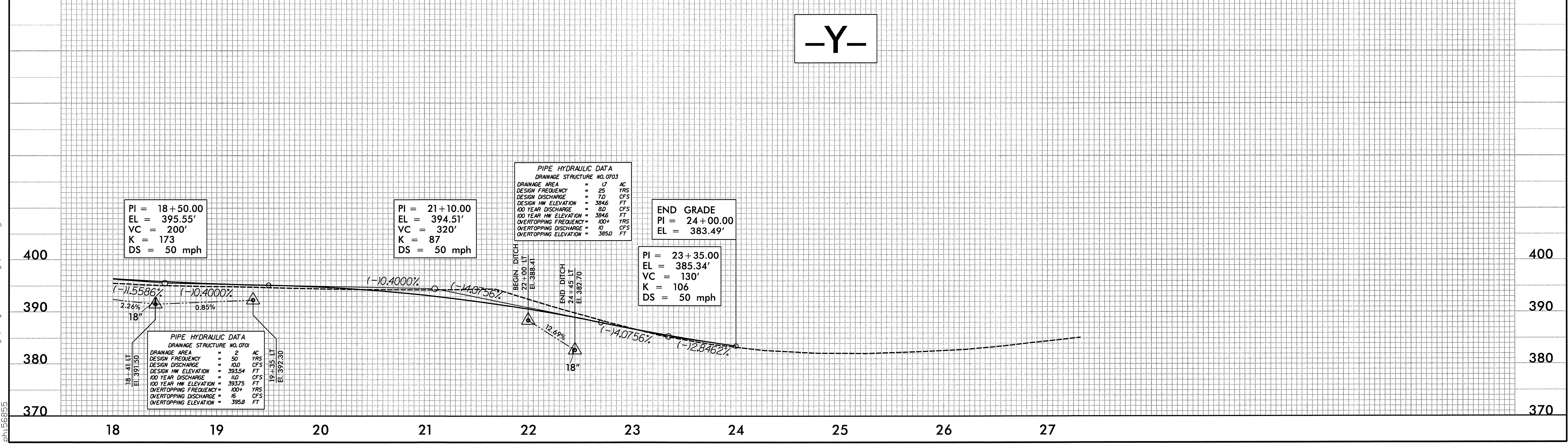
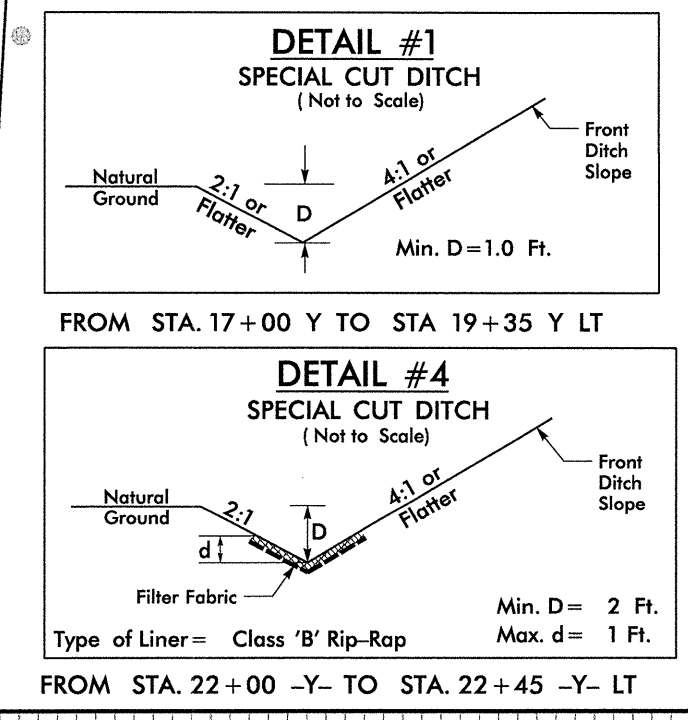
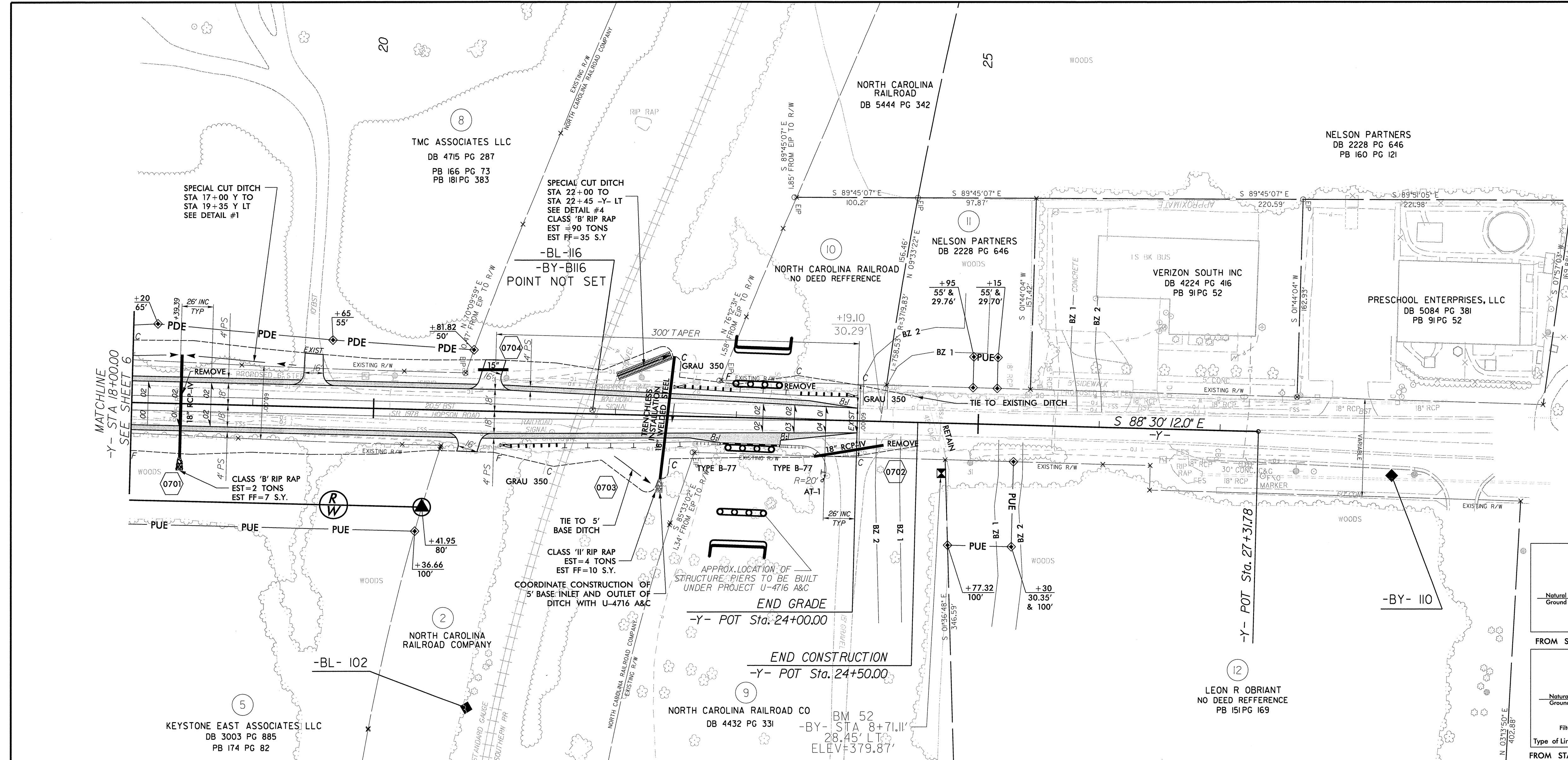
FROM STA. 25+50 L TO STA. 26+18 L LT

NOTE: FOR -DR- PROFILE SEE SHEET 8

-Y-
 PI Sta 16+03.51
 $\Delta = 16' 43'' 26.0''$ (LT)
 $D = 5' 54'' 24.4''$
 $L = 283.13'$
 $T = 142.58'$
 $R = 970.00'$
 $SE = 04'$
 $RO = 52'$

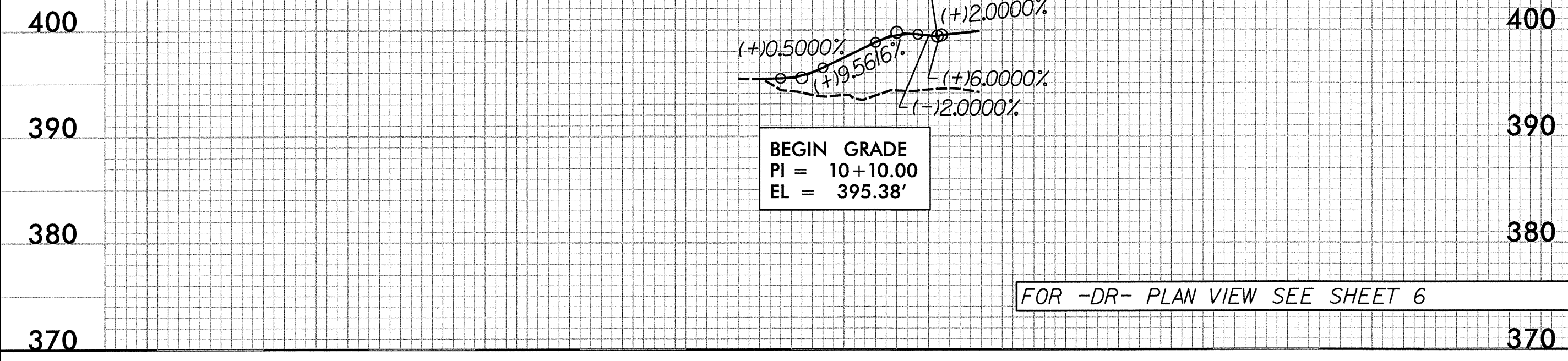


PROJECT REFERENCE U-4716B	SHEET NO. 7
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 27391 MICHAEL PEKAREK	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 9334 W. JERRY WELLS
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
Prepared in the Office of: Hatch Mott MacDonald	
SUNGATE DESIGN GROUP, P.A.	
915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 852-2249 FAX: (919) 856-6258 ENG FIRM LICENSE NO. C-880	
VERTICAL SCALE 5' 0" 5' 10'	HORIZONTAL SCALE 25' 0" 25' 50'



0371DEL_P17-18

-DR-



FOR -DR- PLAN VIEW SEE SHEET 6

PROJECT REFERENCE U-4716B	SHEET NO. 8
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
Prepared in the Office of: Hatch Mott MacDonald	
 SUNGATE DESIGN GROUP, P.A. <small>915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27608 TEL: (919) 888-2243 FAX: (919) 888-9298 ENG FIRM LICENSE NO. C-890</small>	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'

7/21/2012 5:45:25 PM
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