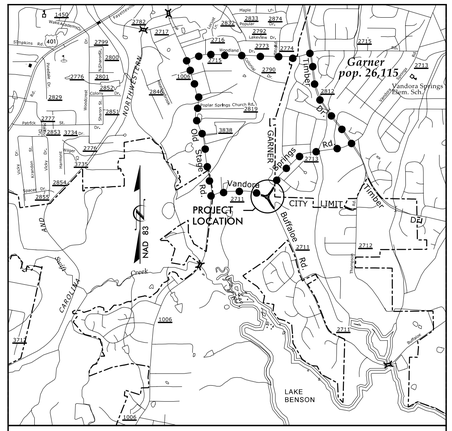
09/28/99

PROJECT: 39877

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

DENOTES DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

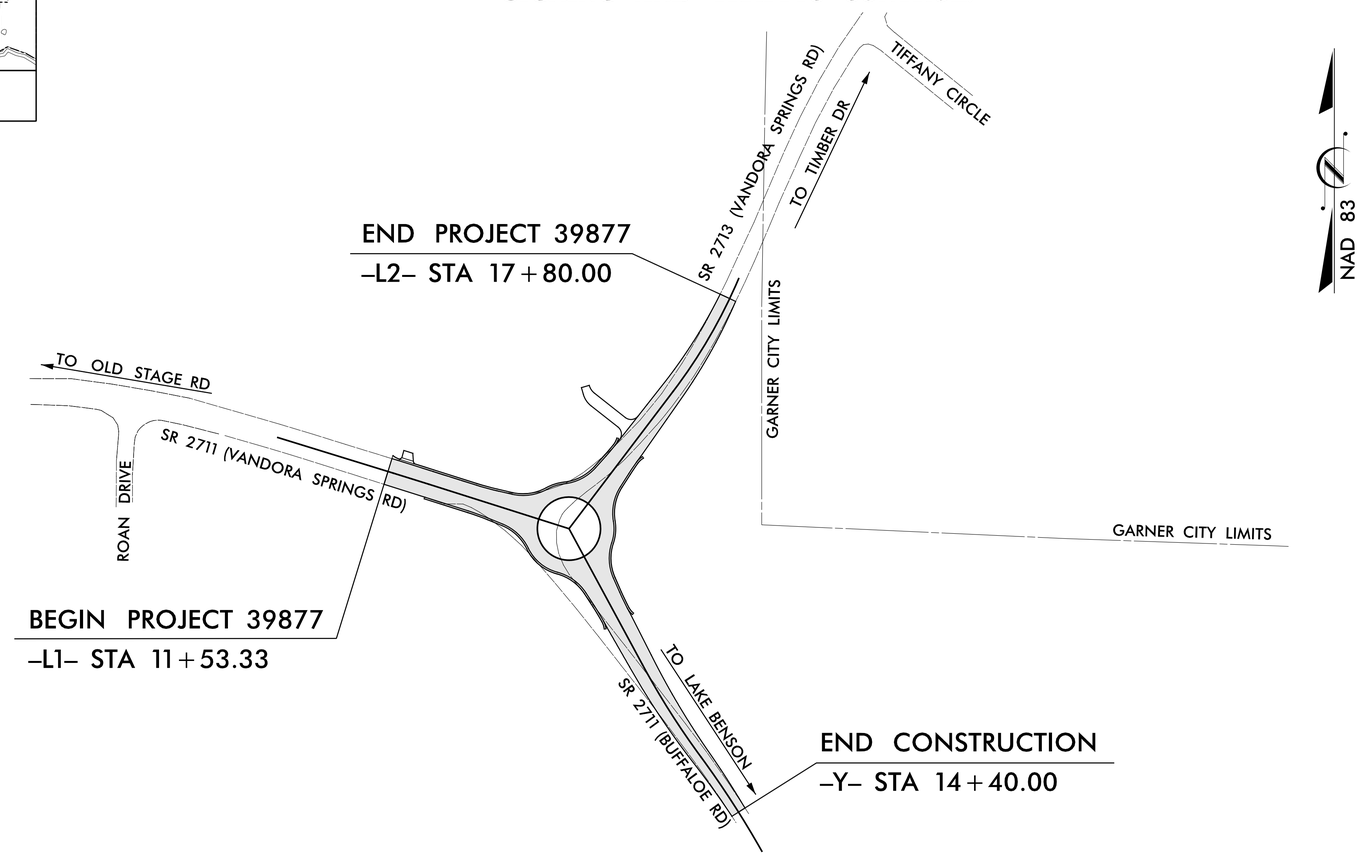
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	39877	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
39877		PE,R/W,CONST

LOCATION: INTERSECTION OF SR 2713 (VANDORA SPRINGS ROAD) AND SR 2711 (BUFFALOE ROAD) NEAR GARNER

TYPE OF WORK: GRADING, PAVING, DRAINAGE, PAVEMENT MARKINGS, SIGNING AND TRAFFIC CONTROL.



NCDOT CONTACT: BEN UPSHAW, P.E.
DIVISION 5 – DIVISION DESIGN ENGINEER

GRAPHIC SCALES

50 0 50 100
PLANS

50 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2012) = 12,900
ADT (2031) = 30,000
DHV = 10 %
D = 60 %
T = 3 % *
V = 40 MPH
* TTST = 1% DUAL 2%
FUNC CLASS =

MAJOR URBAN ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY PROJECT 39877	=	0.119 MI
TOTAL	=	0.119 MI

Prepared In the Office of:
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 15, 2010

LETTING DATE:
SUMMER 2012

DAVID C. WALLER, PE
PROJECT ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 24451 ENGINEER STACEY H. BAILEY P.E.
SIGNATURE: 5-23-12

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22606 ENGINEER DAVID C. WALLER P.E.
SIGNATURE: 5-23-12

5/23/2012
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Florence & Hutcheson, Inc.

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
39877	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22606 ENGINEER DAVID C. WALKER

7-27-12

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B	INTERSECTION DETAIL
2-C	PAVEMENT SLOPE TRANSITION DETAIL
3-A	SUMMARY OF EARTHWORK
3-B	SUMMARY OF DRAINAGE ITEMS
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
S-1 THRU S-6	SIGNING PLANS
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
X-1	CROSS SECTION SUMMARY
X-2 THRU X-16	CROSS-SECTIONS

GENERAL NOTES:

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

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE PLANS:

NO 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 PROGRESS ENERGY, AT&T, PSNC.

TIME WARNER CABLE & CITY OF RALEIGH.

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.

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.

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 Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
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
840.45	Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.05	Curb Ramp - Proposed Curb & Gutter
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
852.06	Method for Placement of Drop Inlets in Concrete Islands
876.02	Guide for Rip Rap at Pipe Outlets

7/27/2012
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Torsche & Hutchesson, Inc.

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
39877	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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
- 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- 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 — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- 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.

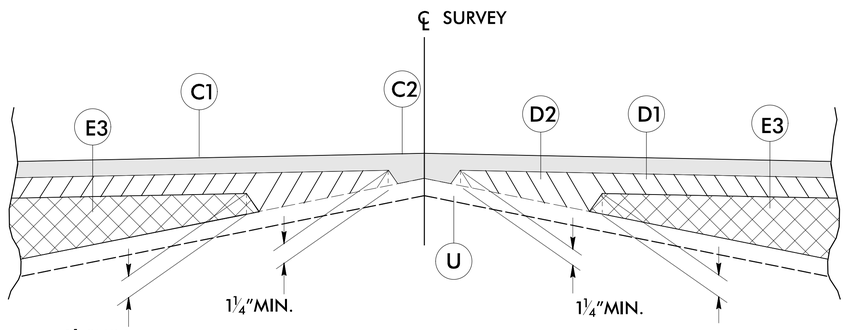
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
39877	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

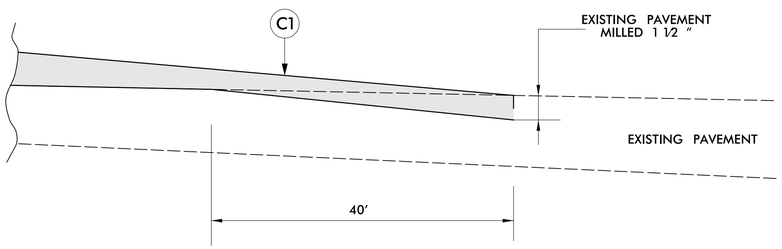
NORTH CAROLINA PROFESSIONAL SEAL 22606 ENGINEER DAVID C. WALLER
5-23-12

PAVEMENT SCHEDULE

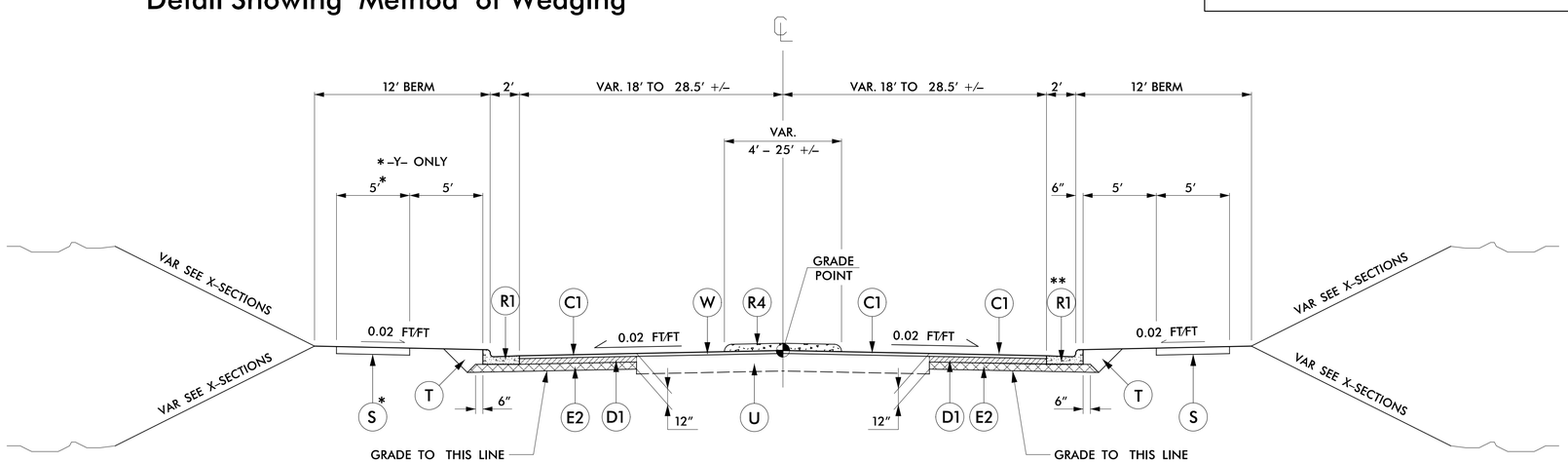
C1	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	1′-6″ CONCRETE CURB AND GUTTER.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1¼″ IN DEPTH OR GREATER THAN 1¾″ IN DEPTH.	R3	8″x18″ CONCRETE CURB.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	5″ MONOLITHIC CONCRETE ISLAND
D2	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 2¼″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.	R5	8″ CONCRETE TRUCK APRON
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	S	4″ CONCRETE SIDEWALK.
E2	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	T	EARTH MATERIAL
E3	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 5½″ IN DEPTH.	U	EXISTING PAVEMENT
R1	2′-6″ CONCRETE CURB AND GUTTER.	W	WEDGING (SEE DETAIL)



Detail Showing Method of Wedging



Incidental Milling Existing Pavement



USE TYPICAL SECTION NO. 1
–L1– STA. 11+53.33 TO STA. 13+45.87
–L2– STA. 14+65.87 TO STA. 15+40.61
–Y– STA. 10+60.00 TO STA. 11+40.00

TYPICAL SECTION NO. 1

** FROM 11+53.33 TO 12+10.00 RT MAINTAIN EXISTING CURB & GUTTER

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5/23/2012
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CONSULTING ENGINEERS
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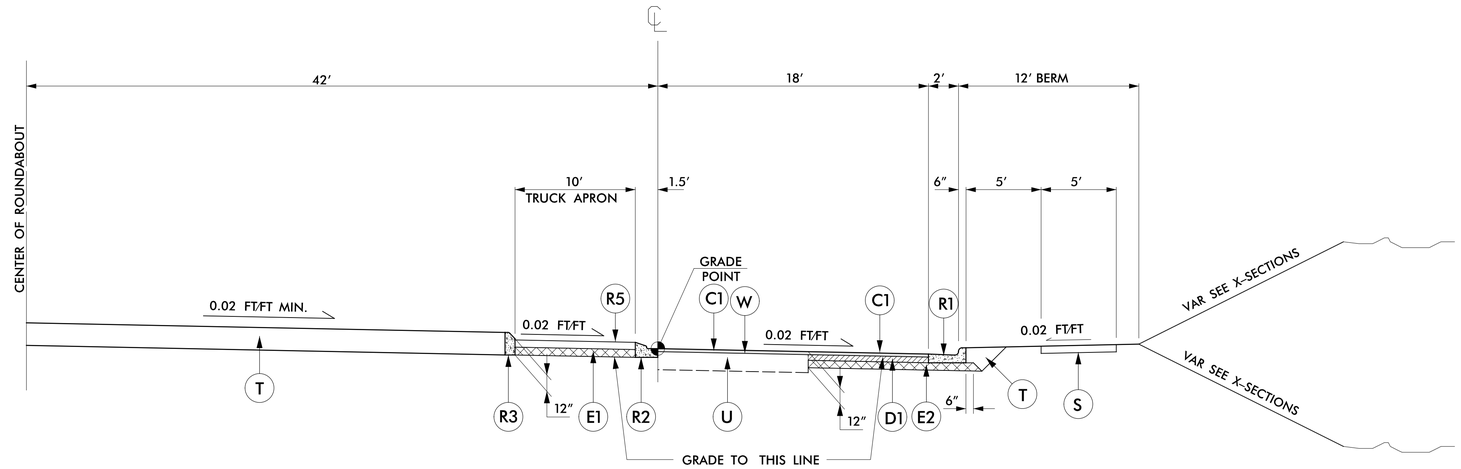
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
39877	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

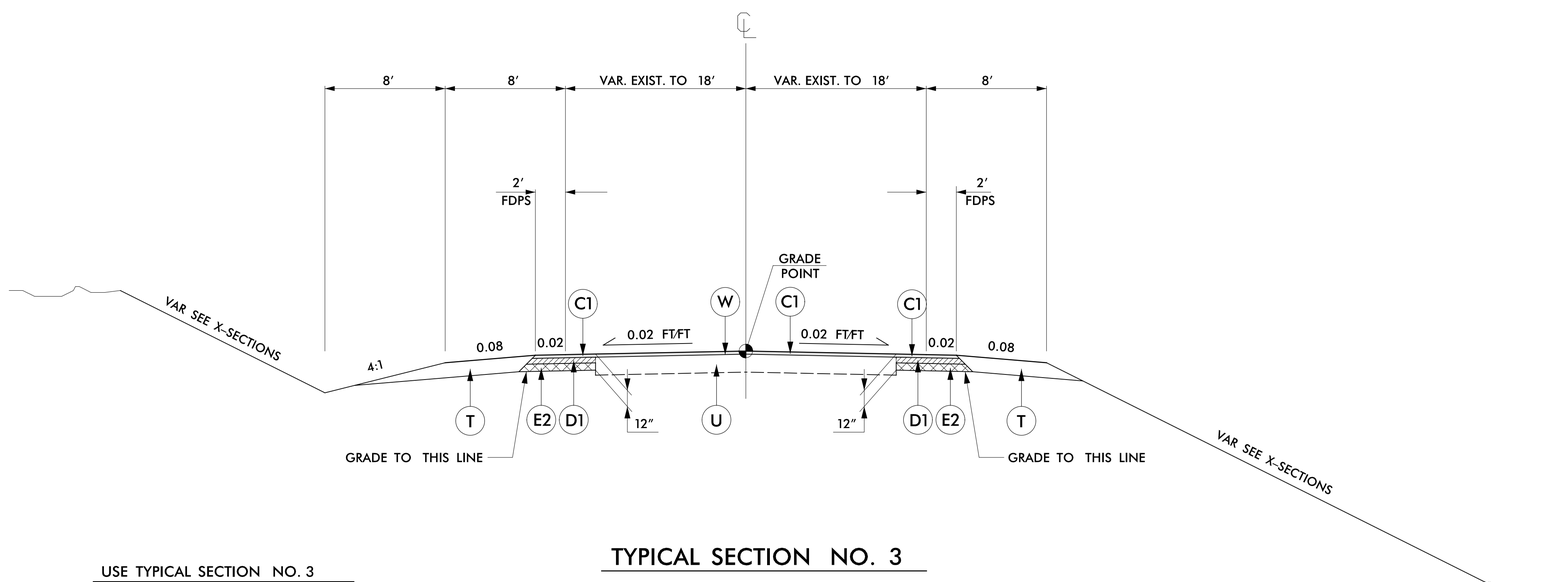
NORTH CAROLINA PROFESSIONAL SEAL 22606 ENGINEER DAVID C. WALKER
5-23-12

C1	3"S9.5B
C2	VAR.
D1	4"I19.0B
D2	VAR.
E1	4"B25.0B
E2	5"B25.0B
E3	VAR.
R1	2'-6" C&G
R2	1'-6" C&G
R3	8"x18" CURB
R4	5" MCI
R5	8" TRUCK APRON
S	4" SIDEWALK
T	EARTH MATERIAL
U	EX. PAVEMENT
W	WEDGING



USE TYPICAL SECTION NO. 2
–C1– STA. 10+00.00 TO STA. 12+63.89

TYPICAL SECTION NO. 2
ROUNDABOUT



USE TYPICAL SECTION NO. 3
–L2– STA. 15+40.61 TO STA. 17+80.00
–Y– STA. 11+40.00 TO STA. 14+40.00

TYPICAL SECTION NO. 3

6/2/99
5/23/2012
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CONSULTING ENGINEERS
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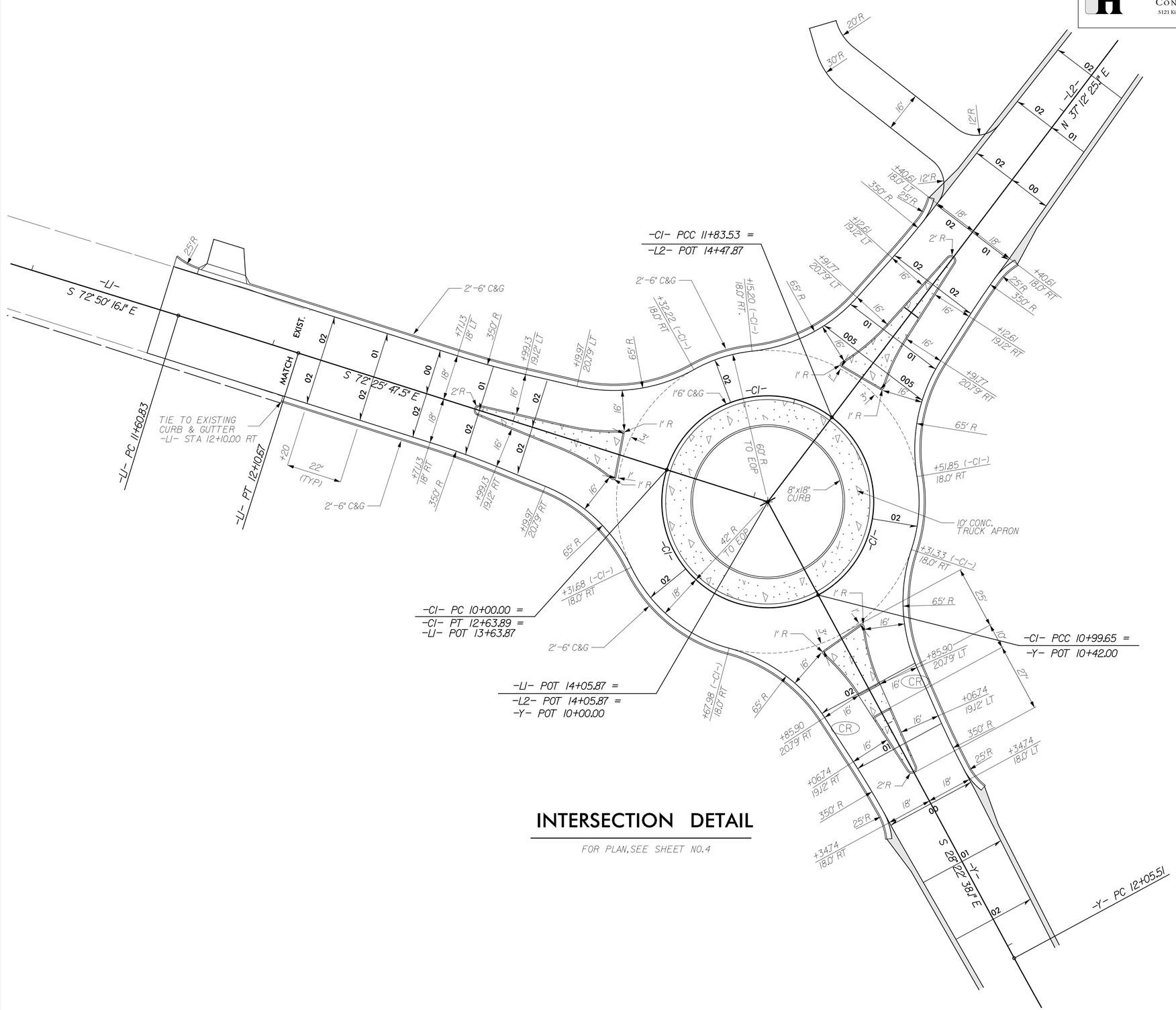
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
39877	2-B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 22606 DAVID C. WALLER 5-23-12	SEAL 24451 STACEY H. BAILEY 5-23-12

0 20 40 60
GRAPHIC SCALE



INTERSECTION DETAIL

FOR PLAN, SEE SHEET NO. 4

REVISIONS

8/17/99

5/23/2012
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Florence & Hutcheson, Inc.

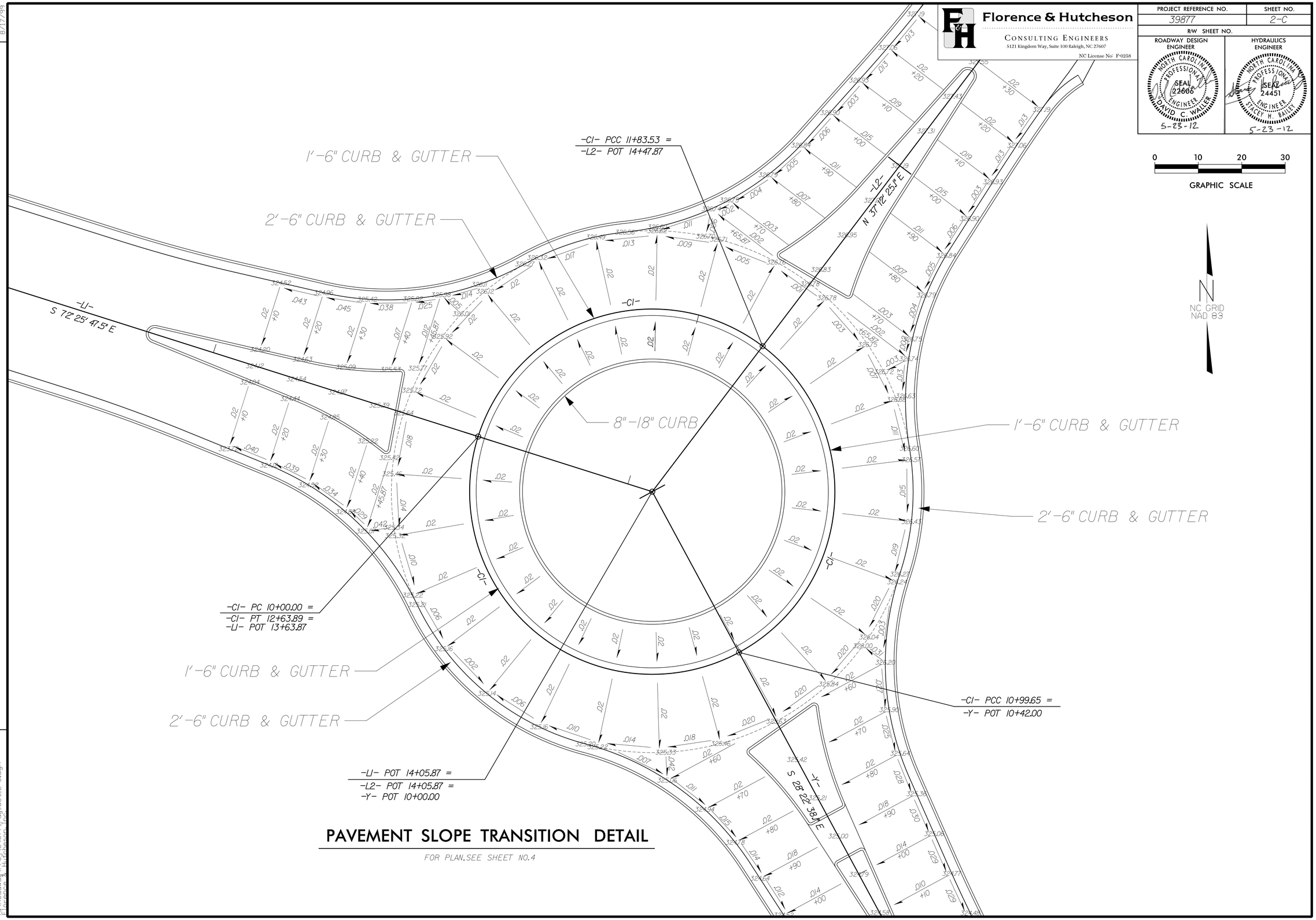
8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
39877	2-C
R/W SHEET NO.	

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22606 ENGINEER DAVID C. WALLER	NORTH CAROLINA PROFESSIONAL SEAL 24451 ENGINEER STACEY H. BAILEY
5-23-12	5-23-12



PAVEMENT SLOPE TRANSITION DETAIL

FOR PLAN, SEE SHEET NO. 4

5/23/2012
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Florence & Hutcheson, Inc.

COMPUTED BY: DCW DATE: 2-1-2012
CHECKED BY: YTM DATE: 2-2-2012

PROJECT REFERENCE NO.	SHEET NO.
39877	3-A

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L1- 11+53.33 TO 13+19.97	19		377	358	
-L2- 14+65.87 TO 17+80.00	323		356	33	
-Y- 10+60.00 TO 14+40.00	176		390	214	
-C1- 10+00.00 TO 12+63.89	5		1507	1502	
PROJECT SUB-TOTALS	523		2630	2107	
MATERIAL FOR SHOULDER CONSTRUCTION			1645	1645	
PROJECT TOTALS	523		4276	3753	
EST. 5% TO REPLACE TOPSOIL ON BORROW PITS				188	
GRAND TOTALS	523			3940	
SAY	525			3940	

Note: Approximate quantities only. Unclassified Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

6/4/99
5/23/2012
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Parsons Brinckerhoff, Inc.

COMPUTED BY: YTM DATE: 2/2/2012

CHECKED BY: DCW DATE: 2/8/2012

RD244542

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
39877	3-B

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 15"	R.C. PIPE CLASS III 15"	R.C. PIPE CLASS III 18"	R.C. PIPE CLASS IV 15"	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	PIPE REMOVAL LIN. FT.	REMARKS
C1 12+32	RT	401		326.0							1	1		1							
C1 12+32	RT	401	403		323.0	320.3		68													
L1 12+97	LT	402		323.6							1							1	1		
L1 12+97	LT	402	403		320.4	320.3				20											
L1 12+97	LT	403		323.6							1	1		1							
L1 12+97	LT	403	405		320.3	316.8				80											
L1 12+23	LT	415		320.0							1							1	1	7	REMOVE 7 L.F. OF EXISTING 18" RCP
L1 12+23	LT	415	404		317.0	316.9			4												
L1 12+17	LT	404		320.0							1							1	1		
L1 12+17	LT	404	405		316.9	315.7			16												
L1 12+17	LT	405		320.8							1	1		1							
L1 11+57	LT	414	405		319.0	316.8		64													
C1 10+50	RT	409		324.9							1	1	1								
C1 10+50		409	410		321.9	321.1		96													
Y 11+10	RT	410		324.1							1	1		1							
Y 11+10		410	412		321.1	321.0				24											
C1 11+30	RT	411		326.0							1	1			1						
C1 11+30		411	412		323.0	321.0				76											
Y 11+10	LT	412		324.6							1							1	1		
Y 11+10		412	413		321.0	320.7				56											
Y 14+29	LT	416			316.6	316.5	28														
SHEET TOTALS							28	228	20	256	10	6	1	4	1	0	0	4	4	7	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I.(N.S.)	(NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22606 DAVID C. WALLER 5-23-12
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24451 STACEY H. BAILEY 5-23-12

REVISIONS

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground; 2:1; D; 4:1 or Flatter; Fill Slope; Min. D= 1Ft.

FROM STA. 13+00 TO STA. 14+50 -Y- LT
FROM STA. 17+00 TO STA. 18+00 -L2- RT

DETAIL B
SPECIAL CUT DITCH
(Not to Scale)

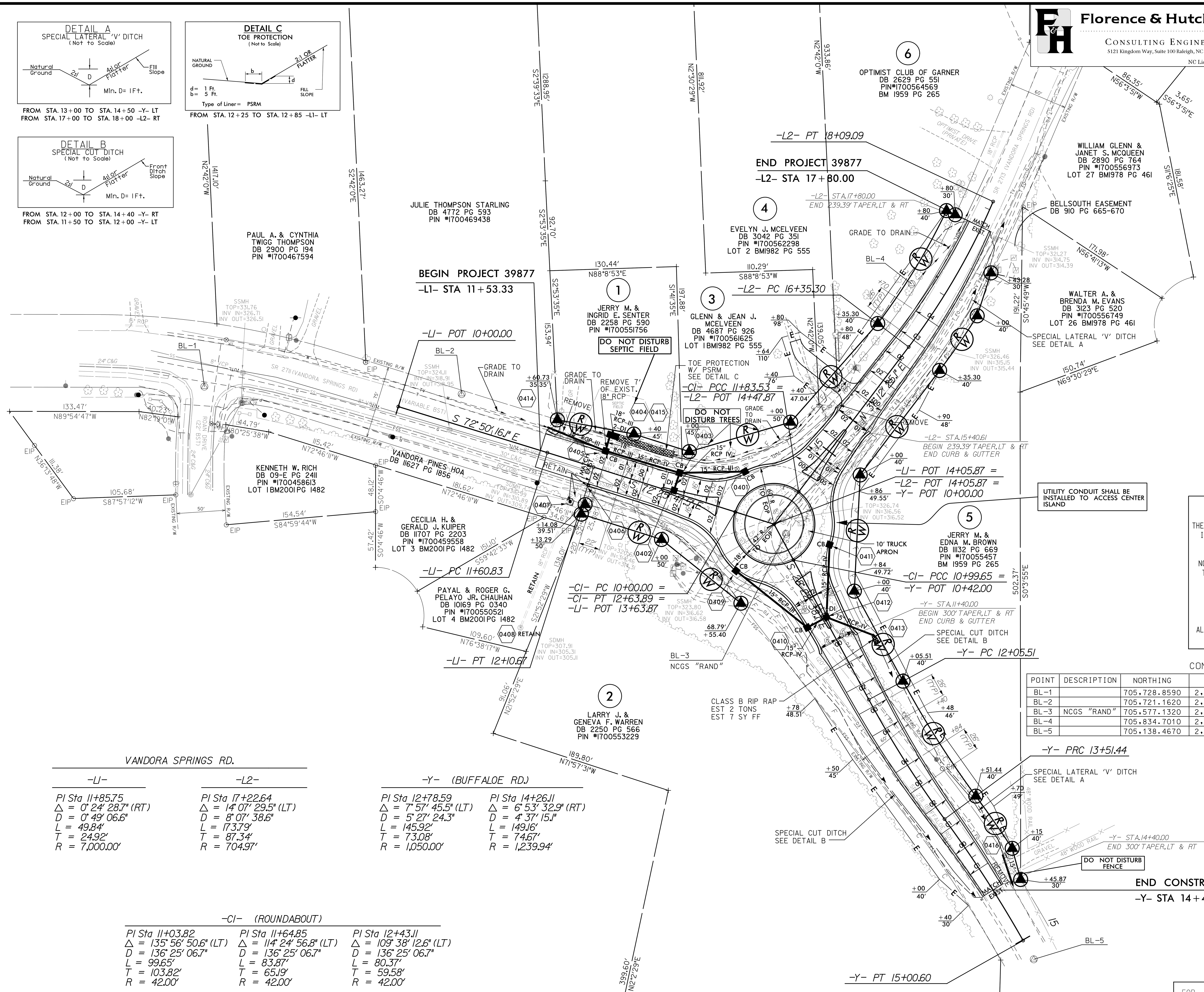
Natural Ground; 2:1; D; 4:1 or Flatter; Front Ditch Slope; Min. D= 1Ft.

FROM STA. 12+00 TO STA. 14+40 -Y- RT
FROM STA. 11+50 TO STA. 12+00 -Y- LT

DETAIL C
TOE PROTECTION
(Not to Scale)

NATURAL GROUND; b; 2:1 OR FLATTER; d; FILL SLOPE
d= 1 Ft.
b= 5 Ft.
Type of Liner= PSRM

FROM STA. 12+25 TO STA. 12+85 -L1- LT



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "RAND"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 705,577.132(ft) EASTING: 2,105,336.295(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99999879
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "RAND" TO -L1- STATION 11+53.33 IS
N 71° 15' 33.6" W , 267.260'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

CONTROL POINTS

POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION	ALIGN/STATION	OFFSET
BL-1		705,728.8590	2,104,736.7860	330.08	OUT OF PROJECT	LIMITS
BL-2		705,721.1620	2,105,002.0310	324.71	-L1- 10+58.61	31.62' LT
BL-3	NCGS "RAND"	705,577.1320	2,105,336.2950	324.43	-Y- 10+14.50	6.11' LT
BL-4		705,834.7010	2,105,465.8660	327.35	OUT OF PROJECT	LIMITS
BL-5		705,138.4670	2,105,591.7010	318.25	-L2- 16+91.77	34.68' LT

VANDORA SPRINGS RD.

-L1-
PI Sta 11+85.75
Δ = 0° 24' 28.7" (RT)
D = 0° 49' 06.6"
L = 49.84'
T = 24.92'
R = 7,000.00'

-L2-
PI Sta 17+22.64
Δ = 14° 07' 29.5" (LT)
D = 8° 07' 38.6"
L = 173.79'
T = 87.34'
R = 704.97'

-Y- (BUFFALOE RD.)

PI Sta 12+78.59
Δ = 7° 57' 45.5" (LT)
D = 5° 27' 24.3"
L = 145.92'
T = 73.08'
R = 1,050.00'

PI Sta 14+26.11
Δ = 6° 53' 32.9" (RT)
D = 4° 37' 15.1"
L = 149.16'
T = 74.67'
R = 1,239.94'

-C1- (ROUNDABOUT)

PI Sta 11+03.82
Δ = 135° 56' 50.6" (LT)
D = 136° 25' 06.7"
L = 99.65'
T = 103.82'
R = 42.00'

PI Sta 11+64.85
Δ = 114° 24' 56.8" (LT)
D = 136° 25' 06.7"
L = 83.87'
T = 65.19'
R = 42.00'

PI Sta 12+43.11
Δ = 109° 38' 12.6" (LT)
D = 136° 25' 06.7"
L = 80.37'
T = 59.58'
R = 42.00'

FOR -L1-, -L2-, -Y- & -C1- PROFILES, SEE SHEET NO. 5
FOR INTERSECTION DETAIL, SEE SHEET NO. 2-B
FOR DETAIL OF PAVEMENT SLOPE TRANSITIONS, SEE SHEET NO. 2-C

8/17/99
5/23/2012
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5/28/99

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CONSULTING ENGINEERS
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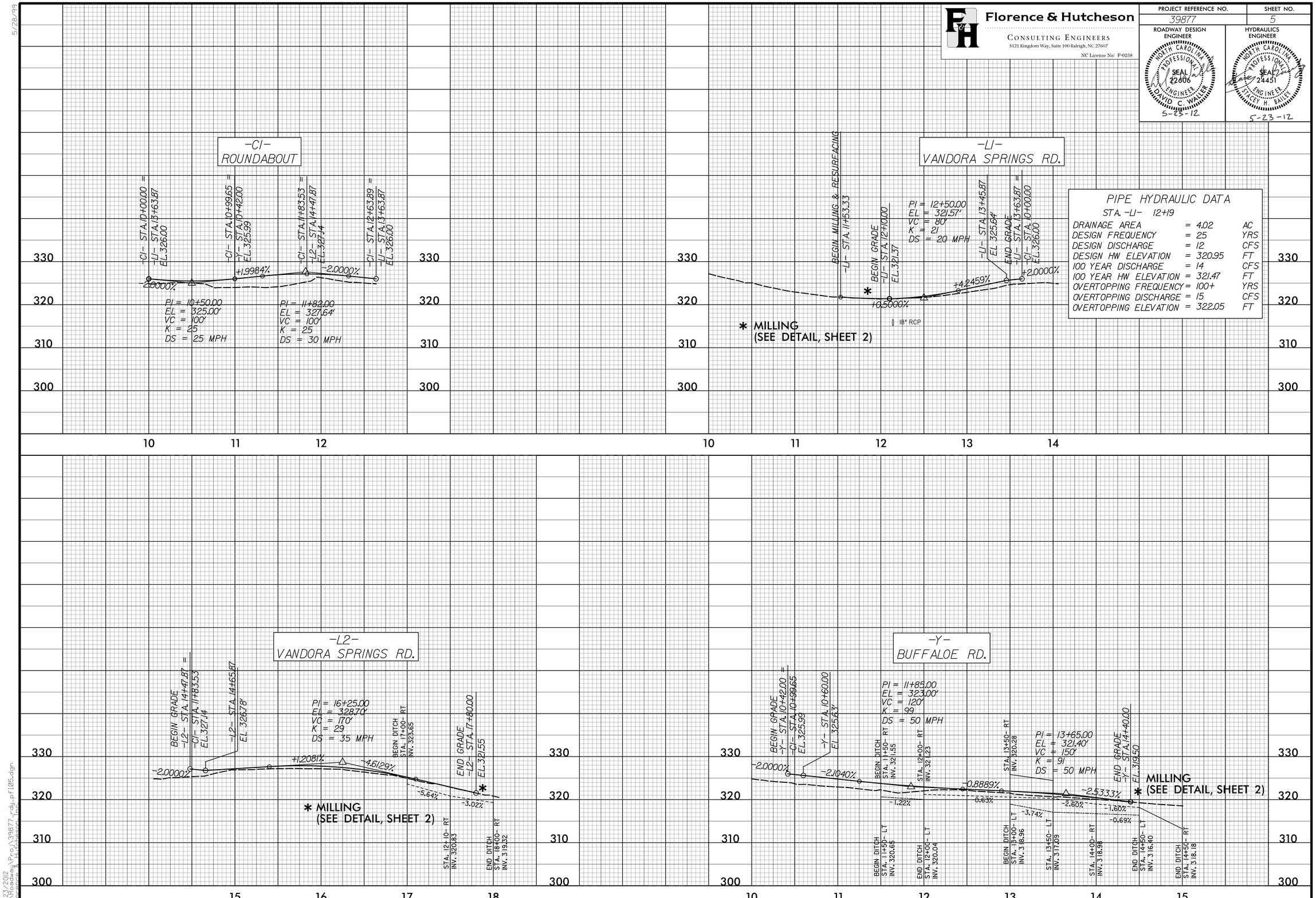
NC License No. F-0258

PROJECT REFERENCE NO.	SHEET NO.
39877	5

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 22806 ENGINEER DAVID C. WALLER — 5-23-12

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 24451 ENGINEER STACEY H. BAILEY — 5-23-12



PIPE HYDRAULIC DATA

STA. -LI- 12+19

DRAINAGE AREA	=	4.02	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	12	CFS
DESIGN HW ELEVATION	=	320.95	FT
100 YEAR DISCHARGE	=	14	CFS
100 YEAR HW ELEVATION	=	321.47	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	15	CFS
OVERTOPPING ELEVATION	=	322.05	FT

5/23/2012
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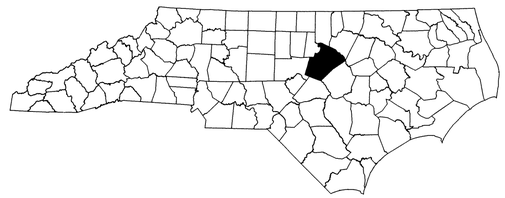
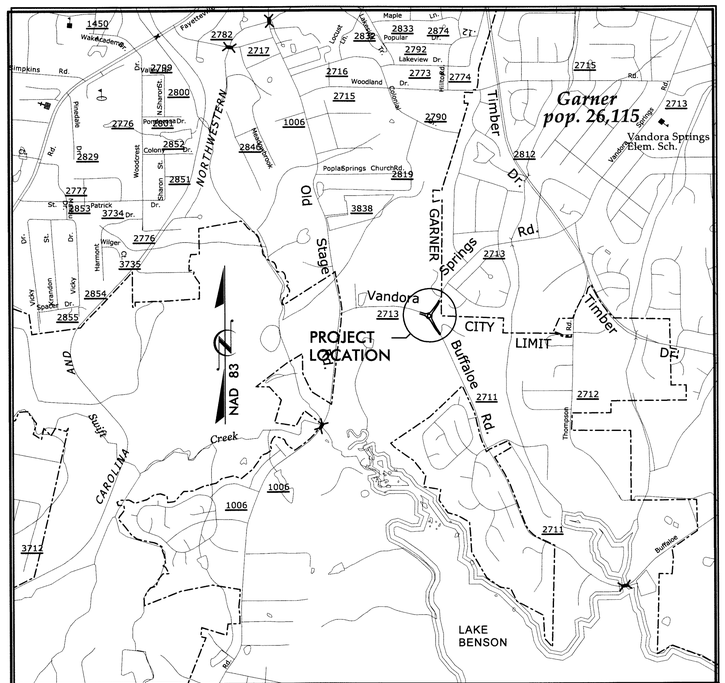
Florence & Hutcheson, Inc.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

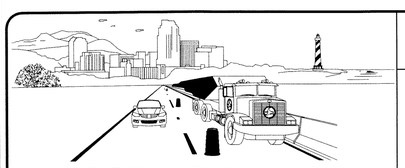
TRANSPORTATION MANAGEMENT PLAN

WAKE COUNTY





SKETCH MAP SHOWING THE VICINITY OF STATE PROJECT 39877



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER

_____ TRAFFIC CONTROL PROJECT ENGINEER

_____ TRAFFIC CONTROL PROJECT DESIGN ENGINEER

_____ TRAFFIC CONTROL DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, & LEGEND
TMP-2A	PROJECT NOTES & PHASING
TMP-3	DETOUR FOR CLOSING VANDORA SPRINGS RD., SR 2713 & BUFFALOE RD., SR 2711
TMP-4	SPECIAL SIGN DESIGNS

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingsdown Way, Suite 100 Raleigh, NC 27607
NC License No: P-0258

APPROVED: Michael T. Rzepka
DATE: 5-23-12

SEAL

SHEET NO.
TMP-1

39877

TIP PROJECT:

5/23/2012
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PROJ. REFERENCE NO.	SHEET NO.
39877	TMP-1A

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-ROADWAY DESIGN UNIT-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
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1110.02	PORTABLE WORK ZONE SIGNS
1145.01	BARRICADES

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- CONTINUING CONSTRUCTION
- REMOVAL

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM — SKINNY DRUM — TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING — PROPOSED — TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: Michael T. Rzepka DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS, & LEGEND

5/23/2012
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Florence & Hutcheson

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

A) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

TRAFFIC PATTERN ALTERATIONS

B) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

MISCELLANEOUS

G) MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

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PROJ. REFERENCE NO.	SHEET NO.
39877	TMP-2A

PHASING

STEP 1

USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1, INSTALL ALL DETOUR SIGNING KEEPING SIGNS COVERED.

WORK IN A CONTINUOUS MANNER TO COMPLETE THE WORK IN STEP 2 THROUGH STEP 4 IN 60 CONSECUTIVE DAYS.

STEP 2

USING ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 1 OF 9, CLOSE SR 2713 (VANDORA SPRINGS RD.) AND SR 2711 (BUFFALOE RD.) TO TRAFFIC, UNCOVER ALL DETOUR SIGNING, AND SHIFT TRAFFIC TO DETOUR.

STEP 3

COMPLETE CONSTRUCTION OF PROPOSED ROUNDABOUT, APPROACH ROADWAY TIE-INS, AND ASSOCIATED ITEMS.

STEP 4

PLACE FINAL PAVEMENT MARKINGS AND FINAL MARKERS ON SR 2713 (VANDORA SPRINGS RD.) AND SR 2711 (BUFFALOE RD.) AND OPEN TO TRAFFIC.

STEP 5

USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1, REMOVE ALL DETOUR SIGNING AND ALL TRAFFIC CONTROL DEVICES.

APPROVED: Michael T. Rzepka DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

GENERAL NOTES & PHASING

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS TRAFFIC ENGINEERING BRANCH TRAFFIC CONTROL UNIT

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

VANDORA SPRINGS RD. / BUFFALOE RD. INTERSECTION

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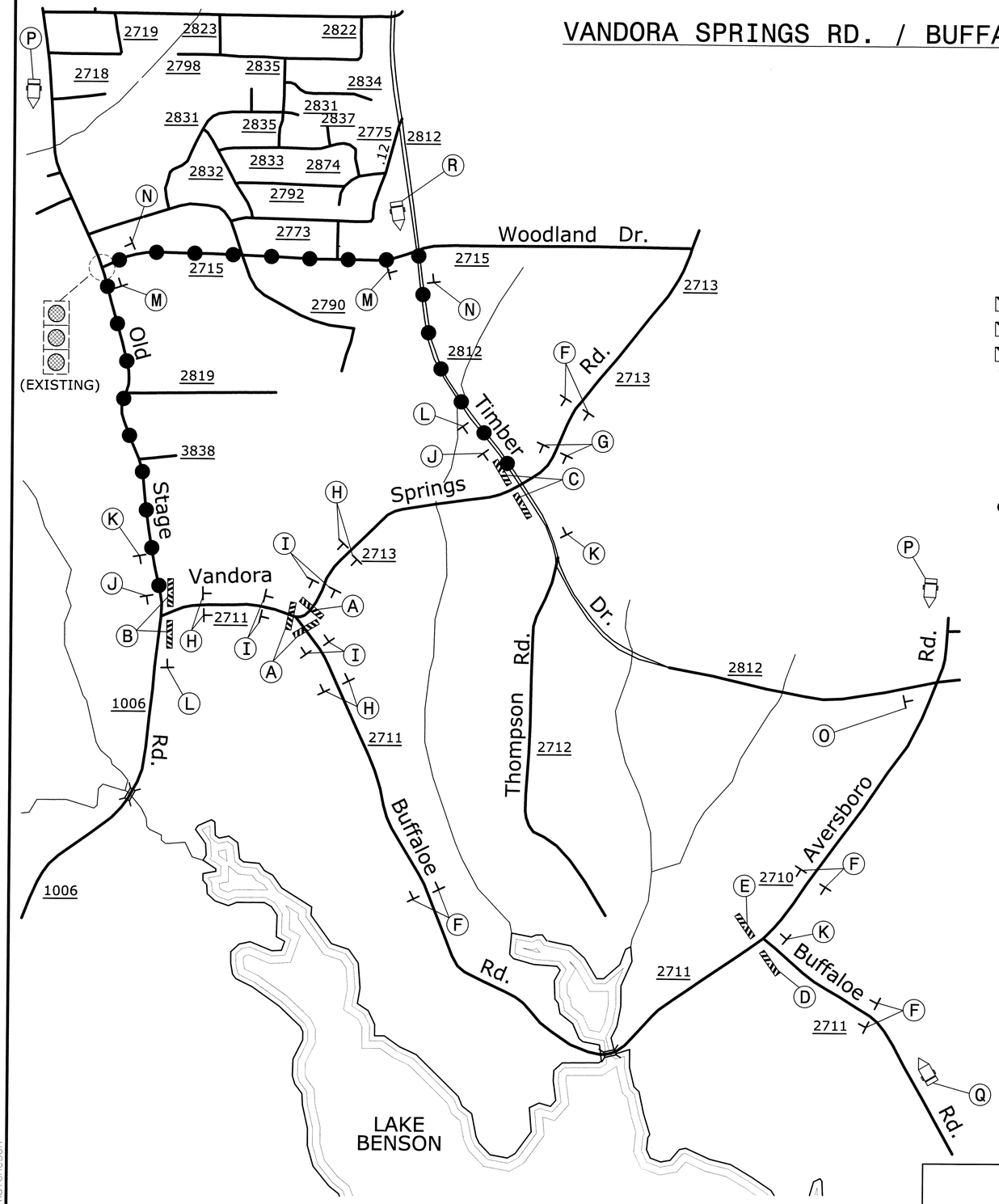
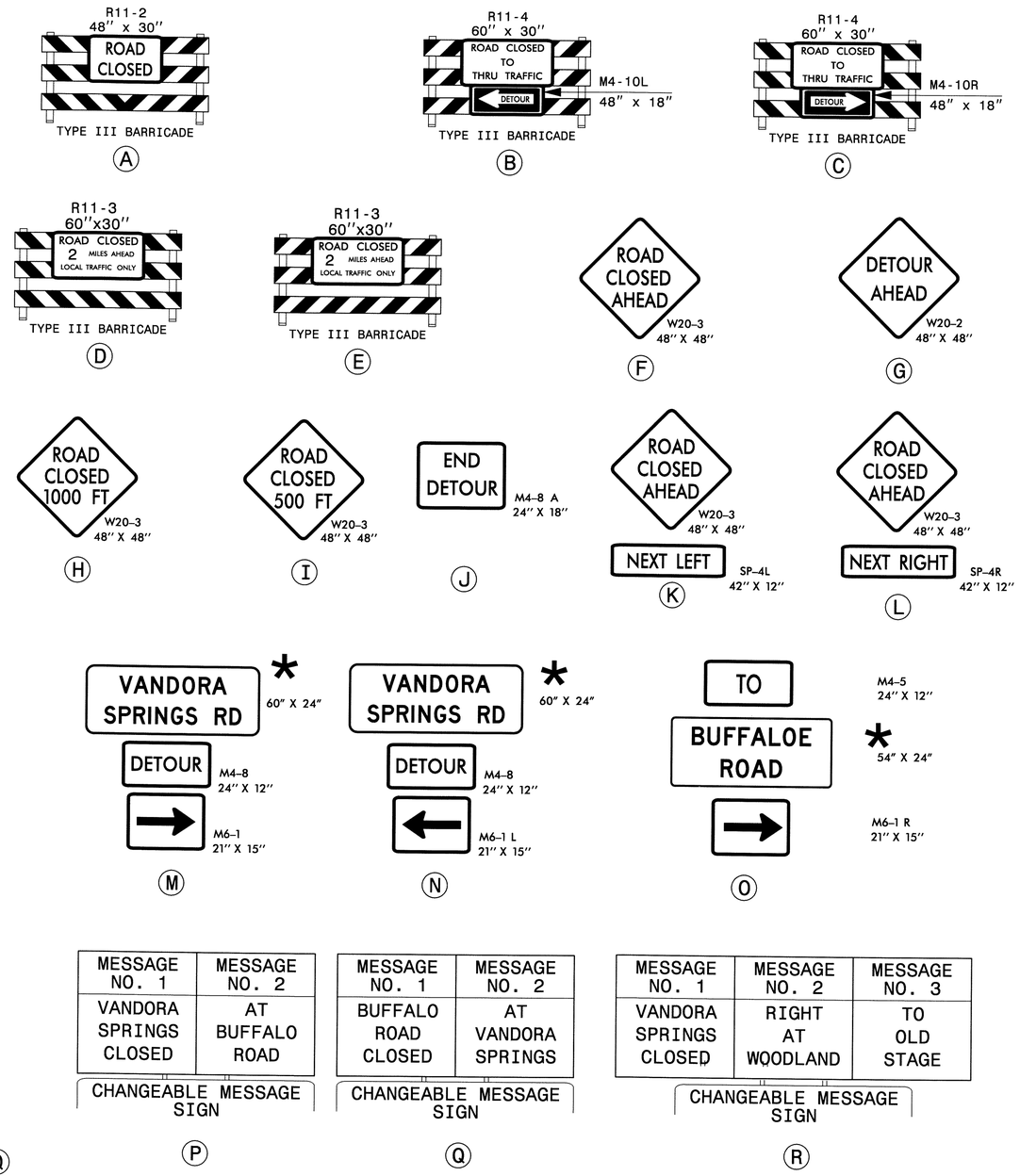
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJ. REFERENCE NO.	SHEET NO.
39877	TMP-3





MESSAGE NO. 1	MESSAGE NO. 2
VANDORA SPRINGS CLOSED	AT BUFFALO ROAD

CHANGEABLE MESSAGE SIGN

P

MESSAGE NO. 1	MESSAGE NO. 2
BUFFALO ROAD CLOSED	AT VANDORA SPRINGS

CHANGEABLE MESSAGE SIGN

Q

MESSAGE NO. 1	MESSAGE NO. 2	MESSAGE NO. 3
VANDORA SPRINGS CLOSED	RIGHT AT WOODLAND	TO OLD STAGE

CHANGEABLE MESSAGE SIGN

R

* SEE SHEET TMP-4 FOR SIGN DESIGN

LEGEND

DETOUR ROUTE

APPROVED: Michael T. Riemka DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RIEMKA

DETOUR FOR VANDORA SPRINGS RD. / BUFFALOE RD. INTERSECTION

SCALE:	NONE
DATE:	5-12
DWG. BY:	YTM
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS TRANSPORTATION MANAGEMENT UNIT TRAFFIC CONTROL

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

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CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJ. REFERENCE NO.	SHEET NO.
39877	TMP-4

SIGN NUMBER: name
TYPE: D
QUANTITY: SEE PLANS

SIGN WIDTH: 5'-0"
HEIGHT: 2'-0"
TOTAL AREA: 10.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.375"
WIDTH: 0.625"
RADII: 1.5"

NO. Z BARS:
LENGTH:

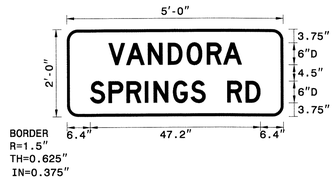
BACKG COLOR: FLUORESCENT ORANGE
COPY COLOR: BLACK

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

DESIGN BY: GEP
PROJECT ID: 39877
CHECKED BY: F & H
DIV: 05
DATE: Feb 11, 2011

USE NOTES: 1 & 2
1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be Type VII, VIII, or IX (prismatic) fluorescent orange retroreflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																										Series/Size Text Length
	V	A	N	D	O	R	A																			D 2000
11.5	4.9	6	5.5	5.3	5.6	4.6	5.1	11.5																		37
	S	P	R	I	N	G	S		R	D																D 2000
6.4	5.1	5	5.1	2.4	5.4	5	4.1	6	5.1	4.1	6.4															47.2

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: name
TYPE: D
QUANTITY: SEE PLANS

SIGN WIDTH: 4'-6"
HEIGHT: 2'-0"
TOTAL AREA: 9.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.375"
WIDTH: 0.625"
RADII: 1.5"

NO. Z BARS:
LENGTH:

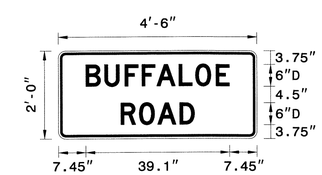
BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

DESIGN BY: GEP
PROJECT ID: 39877
CHECKED BY: F & H
DIV: 5
DATE: Feb 27, 2012

USE NOTES: 1 & 2
1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be Type VII, VIII, or IX (prismatic) fluorescent orange retroreflective sheeting.



BORDER
R=1.5"
TH=0.625"
IN=0.375"

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																										Series/Size Text Length
B	U	F	F	A	L	O	E																			D 2000
7.4	12.5	18.1	22.7	26.8	32.8	37.3	42.8																			39.1
R	O	A	D																							D 2000
17	21.9	27	33																							20.1

APPROVED: Michael T. Rzepka DATE: 5-23-12

SEAL

SPECIAL SIGN DESIGNS

SCALE:	NONE
DATE:	5-12
DWG. BY:	YTM
DESIGN BY:	GEP
REVIEWED BY:	MTR

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

PROJECT: 39877

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJ. REFERENCE NO.	SHEET NO.
39877	PMP - 1

PAVEMENT MARKING PLAN
WAKE COUNTY

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN COVER SHEET
PMP-2	PAVEMENT MARKING SCHEDULE & DETAIL

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS - TEMPORARY AND PERMANENT

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 2713 (VANDORA SPRINGS RD.)	THERMOPLASTIC	PERMANENT RAISED
SR 2711)BUFFALOE RD.)	THERMOPLASTIC	PERMANENT RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) ON ASPHALT SURFACES, USE HEATED-IN-PLACE THERMOPLASTIC OR EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS.

F) MARKERS SHALL BE INSTALLED ACCORDING TO THE NCDOT ROADWAY STANDARD DRAWING 1250.01.

PLAN REVIEWED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

CHRIS HOWARD — SIGNING & DELINEATION STANDARDS ENGINEER

MARK MANRIQUEZ — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL UNIT

APPROVED: Michael T. Rzepka DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

PAVEMENT MARKING PLAN COVER SHEET

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS · TRAFFIC ENGINEERING & WORK ZONE TRAFFIC CONTROL · DEPARTMENT OF TRANSPORTATION

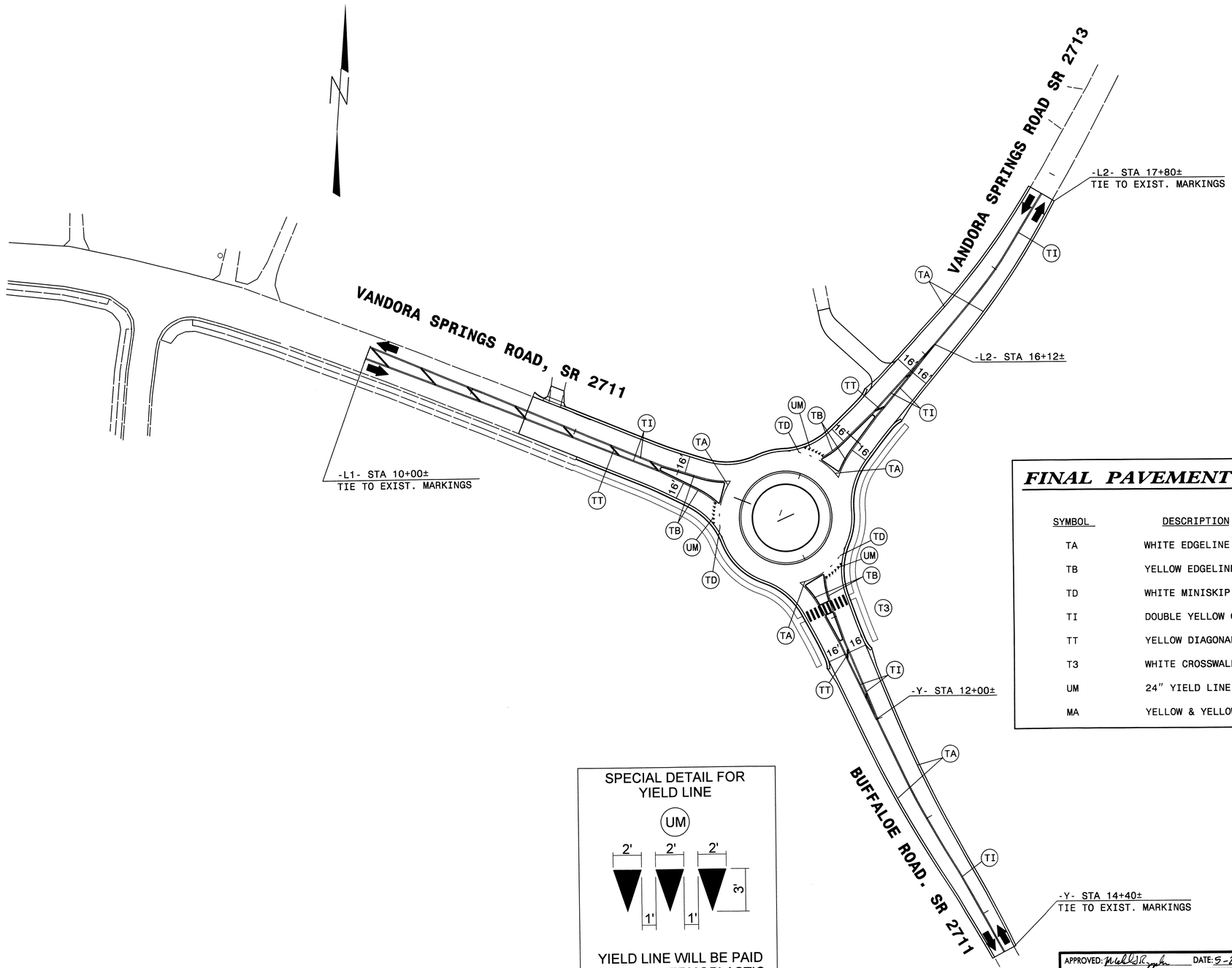
REVISIONS

CADD FILE

5/23/2012
P:\Roadway\DDC\Div05\vandora_buffaloe_int\Traffic\TrafficControl\TCP\39877_pm_title1_sheet.dgn
Florence & Hutcheson

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJ. REFERENCE NO.	SHEET NO.
39877	PMP-2



FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	PAY ITEM
TA	WHITE EDGELINE	THERMOPLASTIC (4", 90mils)
TB	YELLOW EDGELINE	THERMOPLASTIC (4", 90mils)
TD	WHITE MINISKIP (8' SPACING)	THERMOPLASTIC (4", 120 mils)
TI	DOUBLE YELLOW CENTER LINE	THERMOPLASTIC (4", 120 mils)
TT	YELLOW DIAGONAL	THERMOPLASTIC (8", 90 mils)
T3	WHITE CROSSWALK	THERMOPLASTIC (24", 120 mils)
UM	24" YIELD LINE TRIANGLE	THERMOPLASTIC (90 mils)
MA	YELLOW & YELLOW	PERMANENT RAISED

SPECIAL DETAIL FOR YIELD LINE

YIELD LINE WILL BE PAID FOR AS THERMOPLASTIC SYMBOL (EACH)

APPROVED: Michael T. Rzepka DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 15876 ENGINEER MICHAEL T. RZEPKA

FINAL PAVEMENT MARKING PLAN & FINAL PAVEMENT MARKING SCHEDULE

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING BRANCH
TRAFFIC CONTROL UNIT

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

TIP PROJECT: 39877

WBS:

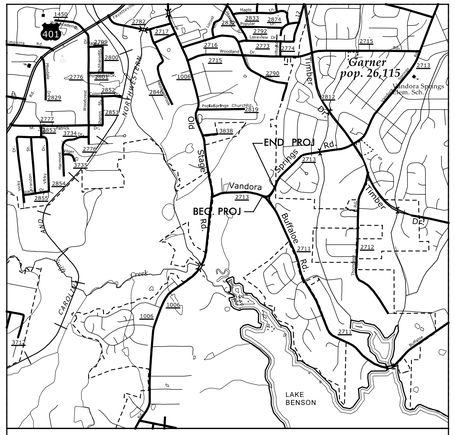
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	39877	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
39877		PE,R/W,CONST

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

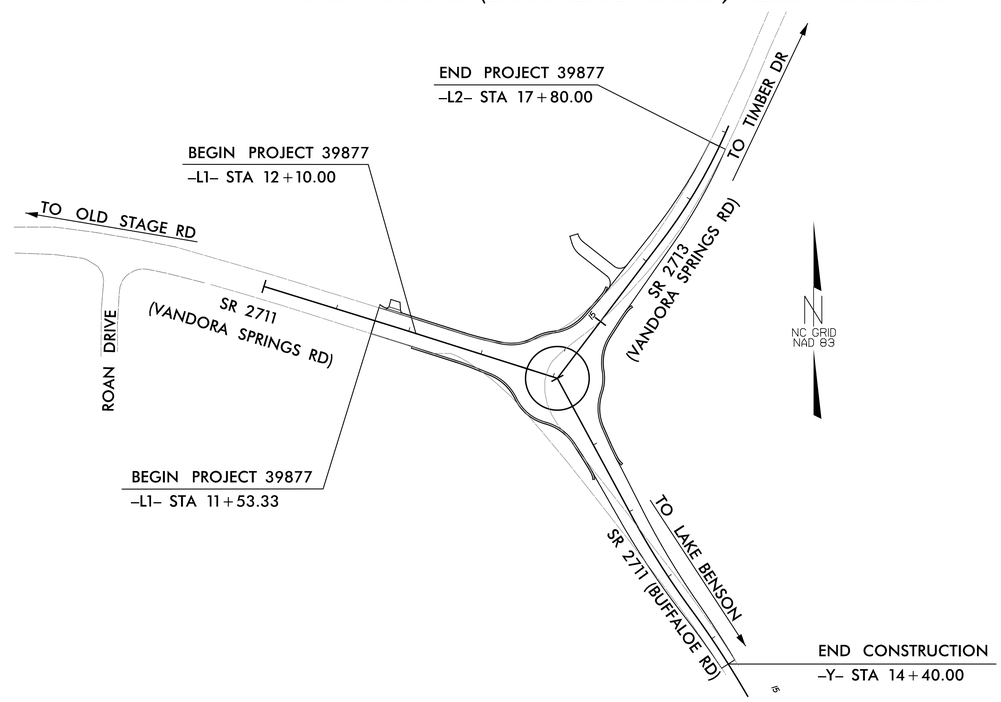
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY



VICINITY MAP

LOCATION: INTERSECTION OF SR 2713 (VANDORA SPRINGS ROAD) AND SR 2711 (BUFFALOE ROAD) NEAR GARNER



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
	Temporary Rock Silt Check Type-B	
	Wattle/ Coir Fiber Wattle	
	Wattle/ Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

HERB TURNER, P.E.
ROADSIDE ENVIRONMENTAL ENGINEER
3150
LEVEL III CERTIFICATION NUMBER

STACEY H. BAILEY, P.E.
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER
3074
LEVEL III CERTIFICATION NUMBER

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

GRAPHIC SCALE

25 0 50
PLANS

25 0 50
PROFILE (HORIZONTAL)

5 0 10
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MAY 23, 2012

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:

FLORENCE & HUTCHESON
5121 KINGDOM WAY, SUITE 100
RALEIGH NC 27607
NC License No: F-0258

2012 STANDARD SPECIFICATIONS

Roadway Standard Drawings

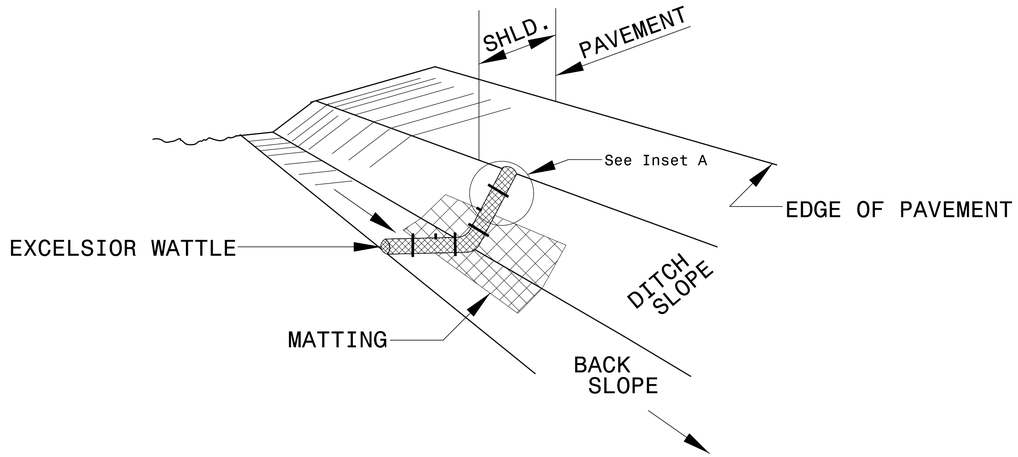
The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated July 18, 2006 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1630.06	Special Stilling Basin
1605.01	Temporary Silt Fence	1632.01	Rock Inlet Sediment Trap Type A
1606.01	Special Sediment Control Fence	1632.02	Rock Inlet Sediment Trap Type B
1607.01	Gravel Construction Entrance	1632.03	Rock Inlet Sediment Trap Type C
1622.01	Temporary Berms and Slope Drains	1633.01	Temporary Rock Silt Check Type A
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.03	Temporary Silt Ditch	1634.02	Temporary Rock Sediment Dam Type B
1630.04	Stilling Basin	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.05	Temporary Diversion	1635.02	Rock Pipe Inlet Sediment Trap Type B

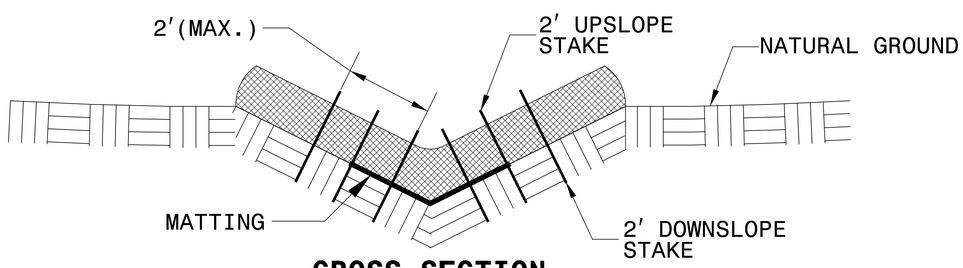
pdraulics\erosion control\heads\39877_hyd_erosion_tsh.dgn
5/23/2012
Florence & Hutcheson, Inc.

PROJECT REFERENCE NO.	SHEET NO.
39877	EC-2
R/W SHEET NO.	

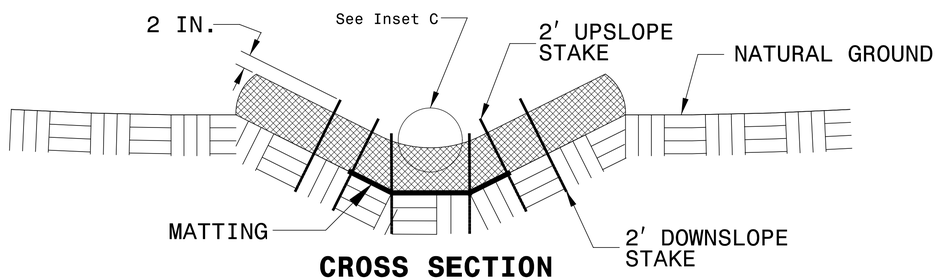
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

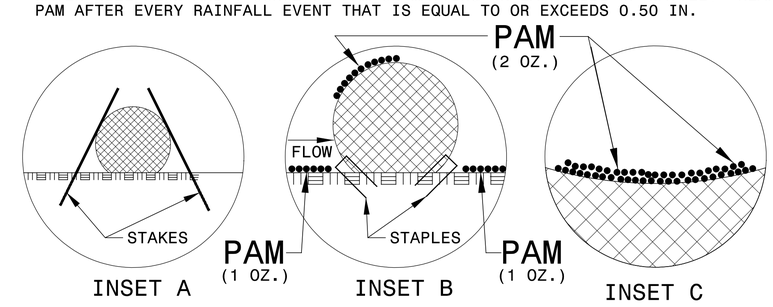
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

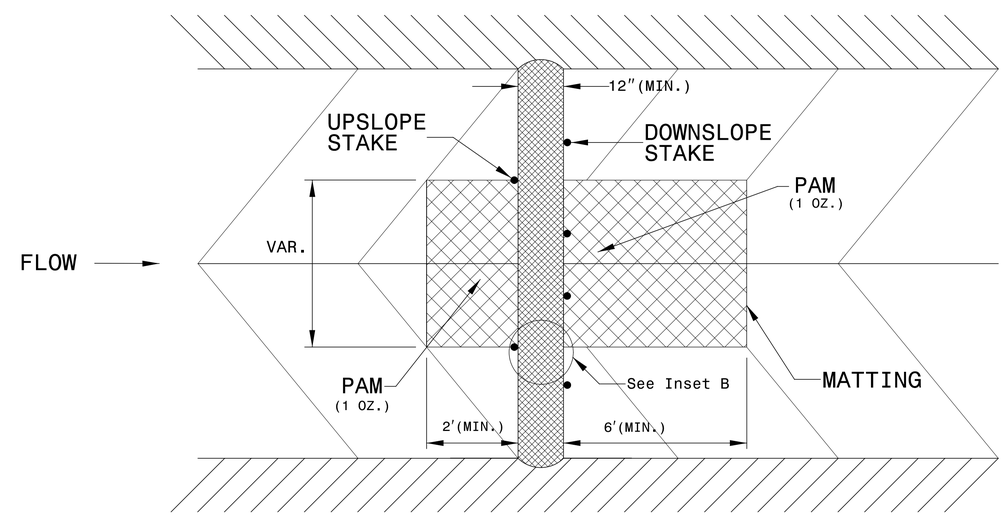
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

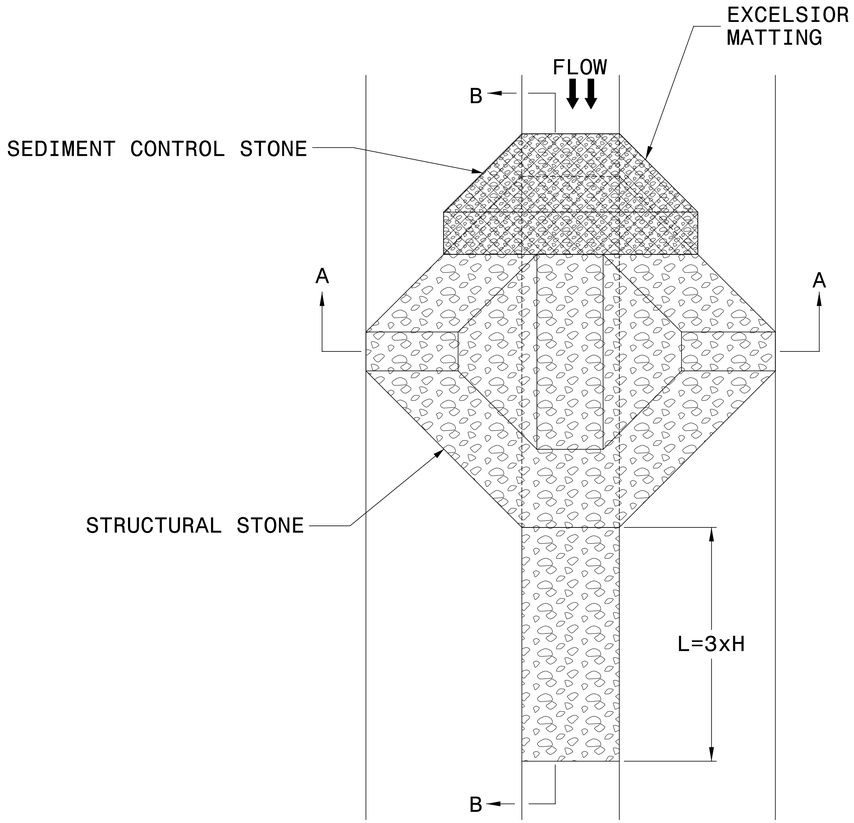




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
39877	EC-2A
R/W SHEET NO.	

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



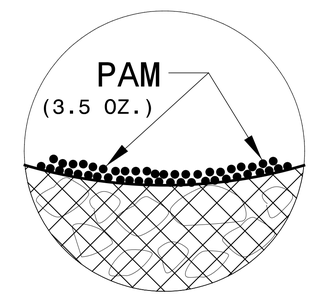
PLAN

NOTES

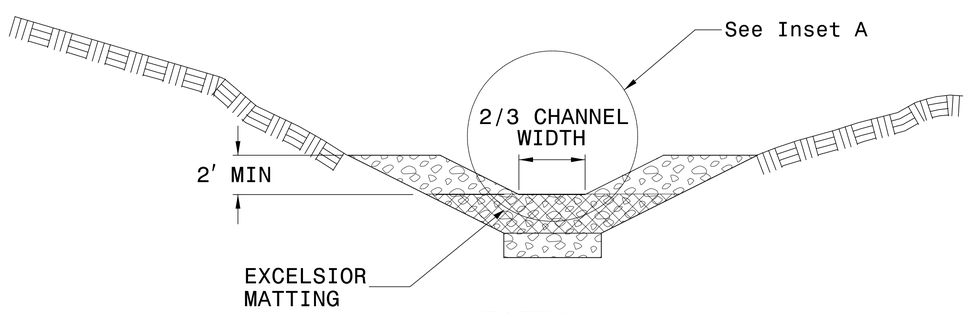
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

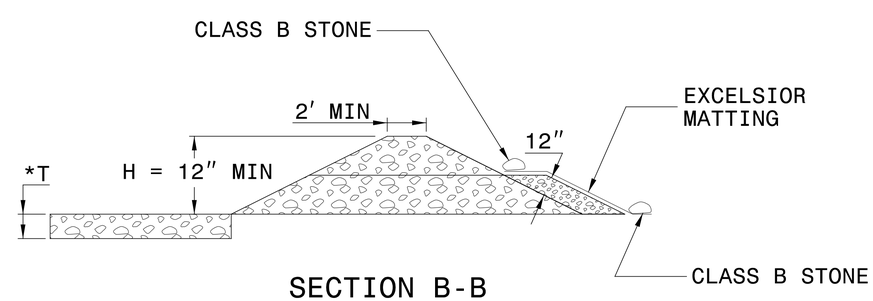
INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

*T = 12" MIN., 18" MAX.

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
39877	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L1-	11+85	12+70	LT	125
4	-L2-	15+75	17+75	LT	585
4	-L2-	16+00	18+00	RT	130
				SUBTOTAL	840
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					7525
				TOTAL	8365
				SAY	8365

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
39877	EC-3A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

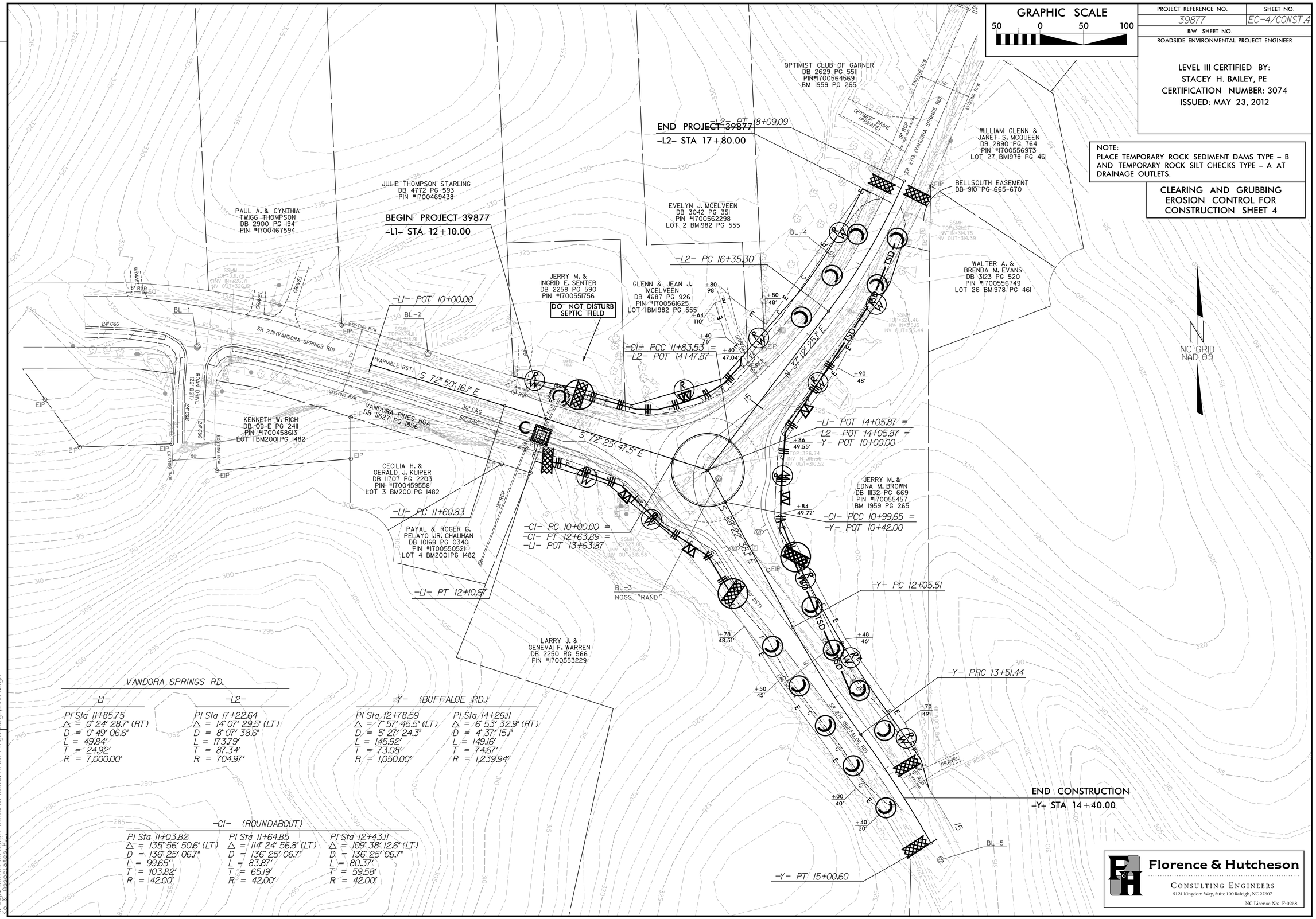
PROJECT REFERENCE NO.	SHEET NO.
39877	EC-4/CONST.4
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

GRAPHIC SCALE
50 0 50 100

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MAY 23, 2012

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4



VANDORA SPRINGS RD.

-L1-	-L2-
PI Sta 11+85.75	PI Sta 17+22.64
Δ = 0° 24' 28.7" (RT)	Δ = 14° 07' 29.5" (LT)
D = 0° 49' 06.6"	D = 8° 07' 38.6"
L = 49.84'	L = 173.79'
T = 24.92'	T = 87.34'
R = 7,000.00'	R = 704.97'

-Y- (BUFFALOE RD.)

PI Sta 12+78.59	PI Sta 14+26.11
Δ = 7° 57' 45.5" (LT)	Δ = 6° 53' 32.9" (RT)
D = 5° 27' 24.3"	D = 4° 37' 15.1"
L = 145.92'	L = 149.16'
T = 73.08'	T = 74.67'
R = 1,050.00'	R = 1,239.94'

-C1- (ROUNDABOUT)

PI Sta 11+03.82	PI Sta 11+64.85	PI Sta 12+43.11
Δ = 135° 56' 50.6" (LT)	Δ = 114° 24' 56.8" (LT)	Δ = 109° 38' 12.6" (LT)
D = 136° 25' 06.7"	D = 136° 25' 06.7"	D = 136° 25' 06.7"
L = 99.65'	L = 83.87'	L = 80.37'
T = 103.82'	T = 65.19'	T = 59.58'
R = 42.00'	R = 42.00'	R = 42.00'

REVISIONS

5/23/2012
R:\Hydraulics\erosion control\cadd\39877_hyd_e&g_psh04.dgn
Kci & Associates, PC

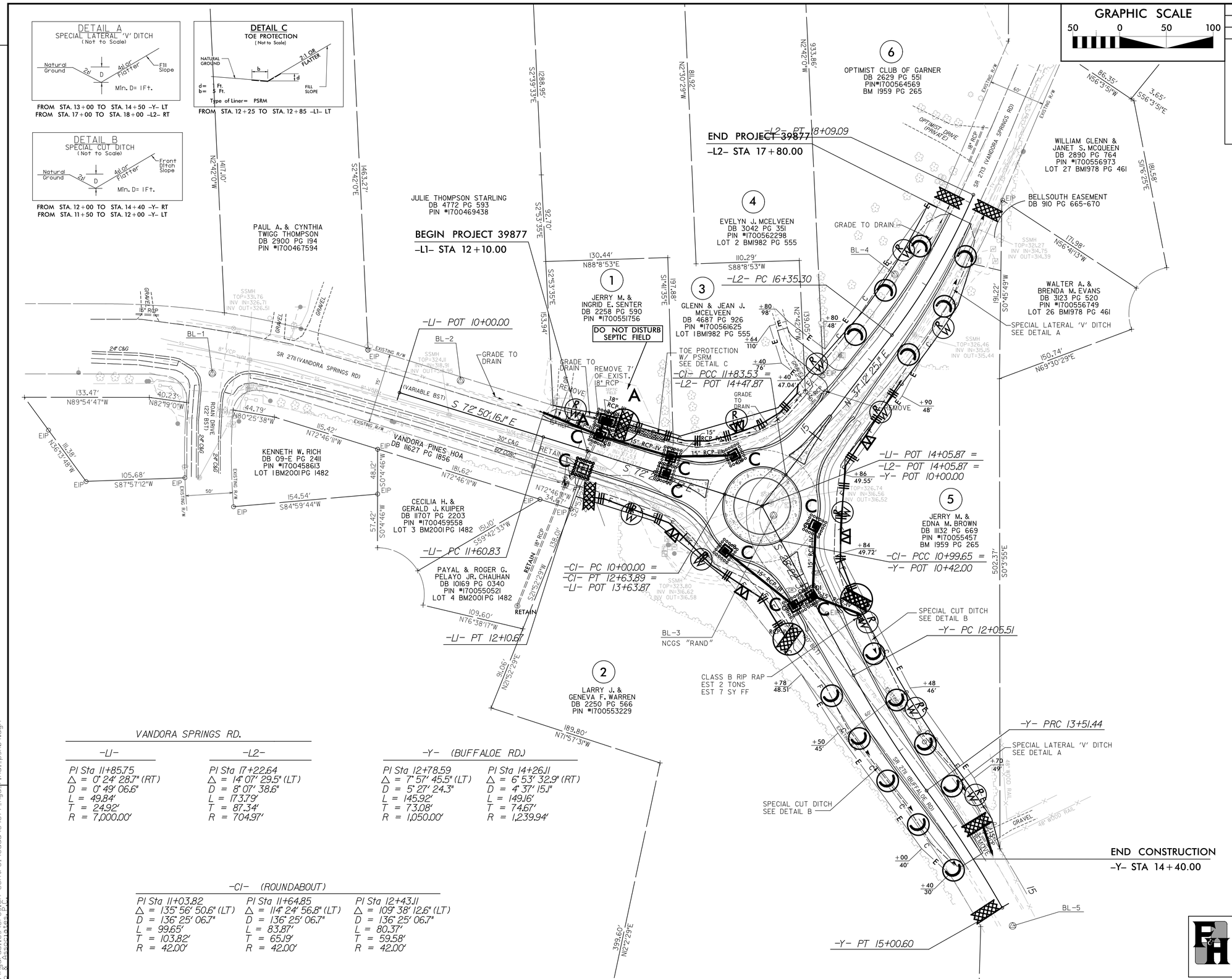
Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT REFERENCE NO.	SHEET NO.
39877	EC-5/CONST.4
R/W SHEET NO.	
ROADSIDE ENVIRONMENTAL PROJECT ENGINEER	

LEVEL III CERTIFIED BY:
STACEY H. BAILEY, PE
CERTIFICATION NUMBER: 3074
ISSUED: MAY 23, 2012

FINAL GRADE EROSION CONTROL FOR CONSTRUCTION SHEET 4

GRAPHIC SCALE
50 0 50 100



VANDORA SPRINGS RD.

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REVISIONS

5/23/2012
R:\Hydraulics\erosion control\cadd\39877_hyd_final_psh04.dgn
Ko & Associates, P.C.

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJECT: 39877

CONTRACT:

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

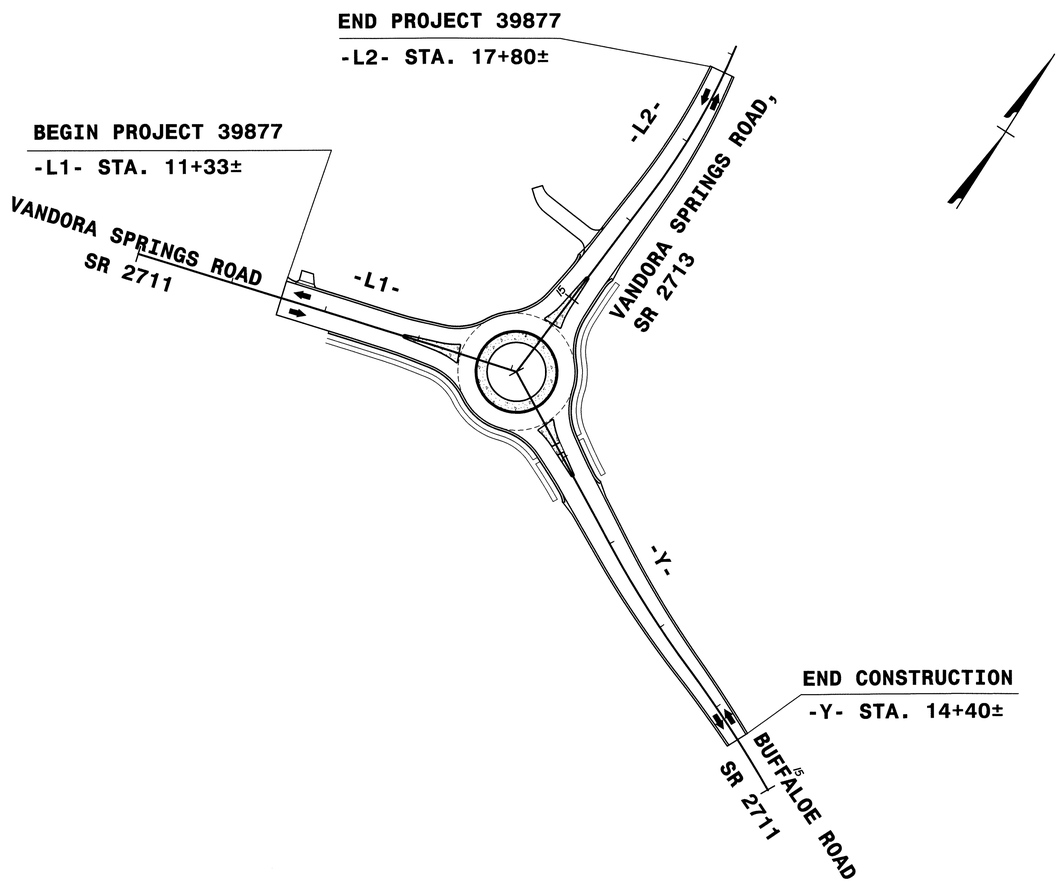
PROJ. REFERENCE NO.	SHEET NO.
39877	S-1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLANS

WAKE COUNTY

LOCATION: INTERSECTION OF SR 2713 (VANDORA SPRINGS ROAD) AND SR 2711 (BUFFALOE ROAD) NEAR GARNER



INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUMMARY OF QUANTITIES
3	NOTES
4	E SHEET
5	SIGN ROADWAY SHEET (EXISTING SIGNS)
6	SIGN ROADWAY SHEET (PROPOSED SIGNS)

PLAN PREPARED BY: FLORENCE & HUTCHESON

TYSON A. GRAVES, P.E. SIGNING ENGINEER
GARY E. PARKER SIGNING PROJECT ENGINEER
_____ SIGNING PROJECT DESIGN ENGINEER
_____ SIGNING DESIGN ENGINEER
_____ SIGNING DESIGNER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER TYSON A. GRAVES

5/23/2012
R:\Traffic\Signing\CADD\Signing_Layout_Plans\TITLE.dgn
Florence & Hutcheson

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License N. F-0970

PROJ. REFERENCE NO.	SHEET NO.
39877	S-2

SIGNS
SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
0001000000	800	MOBILIZATION		L.S.
4025000000	901	CONTRACTOR FURNISHED, TYPE A SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE B SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE D SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE F SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, OVERLAYS SIGN		S.F.
4025000000	901	CONTRACTOR FURNISHED, MILEMARKER SIGN		S.F.
4048000000	902	REINFORCED CONCRETE SIGN FOOTINGS		C.Y.
4054000000	902	PLAIN CONCRETE SIGN FOOTINGS		C.Y.
4056000000	902	OVERHEAD FOOTING		EA.
4060000000	903	SUPPORTS, BREAKAWAY STEEL BEAM		LB.
4066000000	903	SUPPORTS, SIMPLE STEEL BEAM		LB.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	387	L.F.
4078000000	903	SUPPORTS, 2 LB STEEL U-CHANNEL		EA.
4079000000	903	SUPPORTS, BARRIER (SMALL)		EA.
4080000000	903	SUPPORTS, BARRIER (LARGE)		EA.
4081000000	903	SUPPORTS, OVERHEAD STRUCTURE " "		L.S.
4081000000	903	SUPPORTS, OVERHEAD STRUCTURE " "		L.S.
4082000000	903	SUPPORTS, WOOD		L.F.
4109000000	904	SIGN ERECTION, TYPE A (OVERHEAD)		EA.
4109000000	904	SIGN ERECTION, TYPE B (OVERHEAD)		EA.
4110000000	904	SIGN ERECTION, TYPE A (GROUND MOUNTED)		EA.
4110000000	904	SIGN ERECTION, TYPE B (GROUND MOUNTED)		EA.
4096000000	904	SIGN ERECTION, TYPE D		EA.
4102000000	904	SIGN ERECTION, TYPE E	34	EA.
4108000000	904	SIGN ERECTION, TYPE F		EA.
4114000000	904	SIGN ERECTION, MILEMARKERS		EA.
4115000000	904	SIGN ERECTION, OVERLAY (OVERHEAD)		EA.
4116000000	904	SIGN ERECTION, OVERLAY (GROUND MOUNTED)		EA.
4116200000	904	SIGN ERECTION, REPOSITION OVERHEAD		EA.
4116300000	904	SIGN ERECTION, LOGO TO PANEL		EA.
4116400000	904	SIGN ERECTION, LOGO TRAILBLAZER		EA.
4116500000	904	SIGN ERECTION, WALKWAY		L.F.
4126000000	905	SIGN LIGHTING SYSTEM " "		L.S.
4126000000	905	SIGN LIGHTING SYSTEM " "		L.S.
4126000000	905	SIGN LIGHTING SYSTEM " "		L.S.
4126000000	905	SIGN LIGHTING SYSTEM " "		L.S.
4126000000	905	SIGN LIGHTING SYSTEM " "		L.S.
4129000000	906	RELOCATE SIGN, TYPE A (OVERHEAD)		EA.
4129000000	906	RELOCATE SIGN, TYPE B(OVERHEAD)		EA.
4129000000	906	RELOCATE SIGN, TYPE A (GROUND MOUNTED)		EA.
4129000000	906	RELOCATE SIGN, TYPE B (GROUND MOUNTED)		EA.
4129000000	906	RELOCATE SIGN, TYPE D	2	EA.
4129000000	906	RELOCATE SIGN, TYPE E		EA.
4129000000	906	RELOCATE SIGN, TYPE F		EA.
4129000000	906	RELOCATE SIGN, MILEMARKERS		EA.
4129200000	906	RELOCATE SUPPORT, OVERHEAD SIGN SYSTEM		EA.
4129300000	906	RELOCATE SUPPORT, STEEL BEAM		EA.
4129400000	906	RELOCATE LIGHTING SYSTEM		EA.

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4129500000	906	RELOCATE SUPPORT, WOOD		EA.
4138000000	907	DISPOSAL OF SUPPORT, STEEL BEAM		EA.
4141000000	907	DISPOSAL OF SUPPORT, WOOD		EA.
4143000000	907	DISPOSAL OF SUPPORT, OVERHEAD STRUCTURE		EA.
4149000000	907	DISPOSAL OF SIGN SYSTEM, OVERHEAD		EA.
4152000000	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM		EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	11	EA.
4158000000	907	DISPOSAL OF SIGN SYSTEM, WOOD		EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	2	EA.
4234000000	907	DISPOSAL OF SIGN, A OR B (OVERHEAD)		EA.
4236000000	907	DISPOSAL OF SIGN, A OR B (GROUND MOUNTED)		EA.
4238000000	907	DISPOSAL OF SIGN, D, E OR F		EA.
4238500000	907	DISPOSAL OF SIGN, MILEMARKERS		EA.
4241000000	907	DISPOSAL OF SIGN, OVERLAY (OVERHEAD)		EA.
4242000000	907	DISPOSAL OF SIGN, OVERLAY (GROUND MOUNTED)		EA.
4251000000	907	DISPOSAL OF LIGHTING SYSTEM		EA.
4258000000	907	DISPOSAL OF LIGHTING FIXTURES		EA.
4263000000	907	DISPOSAL OF WALKWAY		EA.
4132000000	907	STOCKPILE SUPPORT, STEEL BEAM		EA.
4140000000	907	STOCKPILE SUPPORT, WOOD		EA.
4142000000	907	STOCKPILE SUPPORT, OVERHEAD STRUCTURE		EA.
4148000000	907	STOCKPILE SIGN SYSTEM, OVERHEAD		EA.
4151000000	907	STOCKPILE SIGN SYSTEM, STEEL BEAM		EA.
4154000000	907	STOCKPILE SIGN SYSTEM, U-CHANNEL		EA.
4157000000	907	STOCKPILE SIGN SYSTEM, WOOD		EA.
4186000000	907	STOCKPILE SUPPORT, U-CHANNEL		EA.
4228000000	907	STOCKPILE SIGN, A OR B (OVERHEAD)		EA.
4235000000	907	STOCKPILE SIGN, A OR B (GROUND MOUNTED)		EA.
4237000000	907	STOCKPILE SIGN, D, E OR F		EA.
4237500000	907	STOCKPILE SIGN, MILEMARKERS		EA.
4250000000	907	STOCKPILE LIGHTING SYSTEM		EA.
4252000000	907	STOCKPILE LIGHTING FIXTURES		EA.
4262000000	907	STOCKPILE WALKWAY		EA.
4277000000	908	TEMPORARY SIGN, TYPE A		S.F.
4277000000	908	TEMPORARY SIGN, TYPE B		S.F.
4277000000	908	TEMPORARY SIGN, TYPE D		S.F.
4277000000	908	TEMPORARY SIGN, TYPE E		S.F.
4277000000	908	TEMPORARY SIGN, TYPE F		S.F.
4278000000	908	TEMPORARY RELOCATE SIGN, TYPE A		EA.
4278000000	908	TEMPORARY RELOCATE SIGN, TYPE B		EA.
4278000000	908	TEMPORARY RELOCATE SIGN, TYPE D		EA.
4278000000	908	TEMPORARY RELOCATE SIGN, TYPE E		EA.
4278000000	908	TEMPORARY RELOCATE SIGN, TYPE F		EA.
4279000000	908	TEMPORARY RELOCATE SIGN SUPPORT, STEEL BEAM		EA.
4280000000	908	TEMPORARY RELOCATE SIGN SUPPORT, WOOD		EA.
4285000000	908	TEMPORARY SIGN COVERS		EA.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4082200000	SP	OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4083200000	SP	OVERHEAD DYNAMIC MESSAGE SIGN ASSEMBLY "DMS-**"		L.S.
4083200000	SP	OVERHEAD DYNAMIC MESSAGE SIGN ASSEMBLY "DMS-**"		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127000000	SP	LIGHTING FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4127500000	SP	LRS LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4128000000	SP	STATIC LIGHTING SYSTEM FOR OVERHEAD SIGN ASSEMBLY AT STA ********		L.S.
4355000000	SP	INTEGRATION INTO EXISTING DMS SYSTEM		L.S.
4355100000	SP	DYNAMIC MESSAGE SIGN SYSTEM "DMS-**"		L.S.
4355100000	SP	DYNAMIC MESSAGE SIGN SYSTEM "DMS-**"		L.S.
4355200000	SP	DMS SYSTEM SERVER COMPUTER		EA.
4355210000	SP	DMS SYSTEM CLIENT COMPUTER		EA.
4355220000	SP	DMS SYSTEM LAPTOP COMPUTER		EA.
4355230000	SP	DMS SYSTEM CONTROL SOFWARE		EA.
4355300000	SP	DYNAMIC MESSAGE SIGN MAINTENANCE TRAINING		EA.
4355310000	SP	DYNAMIC MEESAGE SIGN SYSTEM DESIGN APPROVAL TESTS		EA.
4355320000	SP	DYNAMIC MESSAGE SIGN SYSTEM OPERATIONAL FACTORY TESTS		L.S.
4355330000	SP	DYNAMIC MESSAGE SIGN SYSTEM OPERATIONAL FIELD TESTS		L.S.
4355340000	SP	DYNAMIC MESSAGE SIGN BENCH TEST UNIT		
4355350000	SP	DYNAMIC MESSAGE SIGN SYSTEM NTCIP TESTS		

ROADWAY STANDARD DRAWINGS
APPLICABLE TO THESE SIGNING PLANS

901.70
904.10
904.50

APPROVED: [signature] DATE: 7-30-12

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER TYSON A GRAVES

SUMMARY OF QUANTITIES

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

REVISIONS

CADD FILE

7/30/2012
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Florence & Hutcheson, Inc.

Pay Item Notes:

1	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2	RELOCATE SIGN, TYPE D
3	DISPOSAL OF SUPPORT, U-CHANNEL

General Notes:

. SIGNS FURNISHED BY STATE

. ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TW0 U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. SIGNING PLANS DO NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING OR PAVEMENT MARKINGS. SEE TRAFFIC CONTROL PLANS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE III REFLECTIVE SHEETING.

. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT TO THE N.C.D.O.T. FOR APPROVAL, DETAIL DRAWINGS OF LUMINAIRE RETRIEVAL SYSTEM MOUNTING ON OHS ASSEMBLY.

. THE CONTRACTOR SHALL USE LUMINAIRE RETRIEVAL SYSTEM ON ALL OVERHEAD STRUCTURES. WALKWAY AND HANDRAIL IS NOT REQUIRED.

. INSTALLATION OF LUMINAIRE RETRIEVAL SYSTEM SHALL ALLOW LUMINAIRE MAINTENACE FROM THE SHOULDER WITHOUT THE NEED FOR LANE CLOSURE. THE DRIVE HANDLE OF THE LUMINAIRE RETRIEVAL SYSTEM SHALL BE LOCATED A MINIMUM OF 0.92M (3 ') FROM THE RIGHT EDGE OF THE SHOULDER AWAY FROM THE ROADWAY TRAFFIC.

. THE CONTRACTOR SHALL ENSURE THAT COORDINATION IS ESTABLISHED BETWEEN THE OHS ASSEMBLY AND LUMINAIRE RETRIEVAL SYSTEM FABRICATORS SO THAT A FULLY FUNCTIONAL SIGN AND LIGHTING SYSTEM IS INSTALLED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY OHS ASSEMBLY AND LUMINAIRE RETRIEVAL SYSTEM INCOMPATIBILITIES, OR INSTALLATION OF A LIGHTING SYSTEM NOT FUNCTIONING TO ITS INTENDED PURPOSE.

DO NOT BEGIN FABRICATION FOR TYPES A & B SIGNS MOUNTED ON OVERHEAD STRUCTURES OR STEEL SUPPORTS UNTIL "S" DIMENSIONS HAVE BEEN FIELD VERIFIED.

SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

Project Notes:

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

PROJ. REFERENCE NO.	SHEET NO.
39877	S-3

APPROVED: DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER TYSON A. GRAVES

NOTES

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	TAG

DIVISION OF HIGHWAYS · TRAFFIC ENGINEERING BRANCH · TRAFFIC CONTROL UNIT

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

PROJ. REFERENCE NO.	SHEET NO.
39877	S-4

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingsdown Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

(401) QUANTITY REQ'D 3

36 X 36
W3-2a

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 3

ROUNDABOUT

24 X 12
W16-17P

MOUNT BELOW SIGN 401
IN 3 INSTALLATIONS

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 3

36 X 36
W3-2a

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 6

36 X 36 X 36
R1-2

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 3

24 X 30
R4-7

MOUNT BELOW SIGN 404
IN 3 INSTALLATIONS

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D 2

30 X 30
W11-2

YELLOW/GREEN REFLECTIVE SHEETING

ONE "U" POST PER SIGN

(407) QUANTITY REQ'D 2

30 X 18
W16-7

YELLOW/GREEN REFLECTIVE SHEETING

MOUNT BELOW SIGN 406
IN 2 INSTALLATIONS

ONE "U" POSTS PER SIGN

(408) QUANTITY REQ'D 3

ONE WAY

36 X 12
R6-1 (R)

TWO "U" POSTS PER SIGN

(409) QUANTITY REQ'D 3

24 X 30
R4-7

ONE "U" POST PER SIGN

(410) QUANTITY REQ'D 3

18 X 18
W23-15

MOUNT BELOW SIGN 409
IN 3 INSTALLATIONS

ONE "U" POST PER SIGN

APPROVED: Tyson A. Gravel DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER TYSON A. GRAVEL

E SIGNS

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS
DESIGN ENGINEERS CERTIFICATION
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
CONTROL

REVISIONS

CADD FILE

5/23/2012
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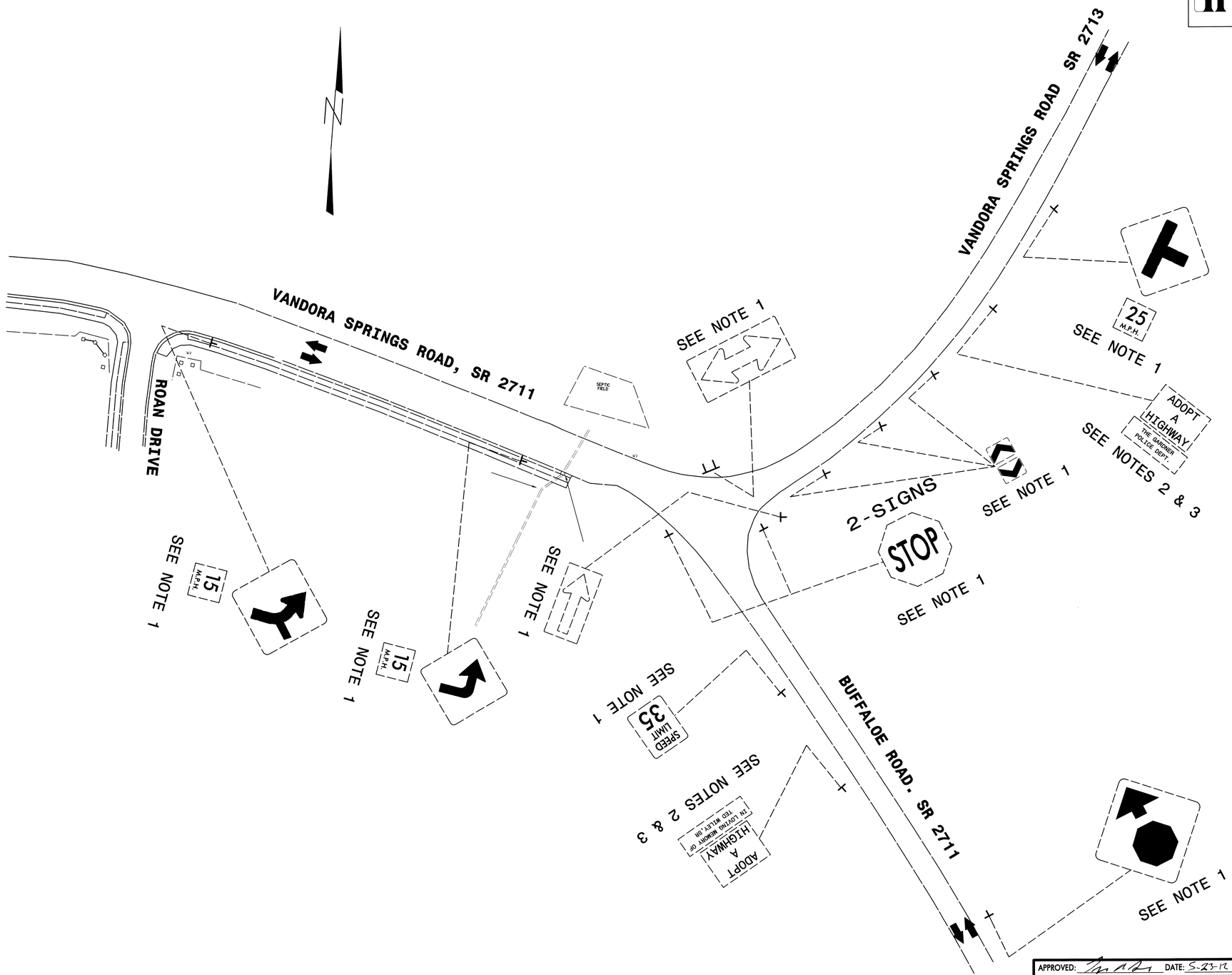
Florence & Hutcheson

Florence & Hutcheson	PROJ. REFERENCE NO.	SHEET NO.
CONSULTING ENGINEERS 5121 Kingdom Way, Suite 100 Raleigh, NC 27607 NC License No: F-0258	39877	S-5



APPROVED: DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER JASON A. GRAVES

EXISTING SIGNS SIGNING PLAN

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS TRAFFIC ENGINEERING BRANCH

REVISIONS	
CADD FILE	

5/23/2012
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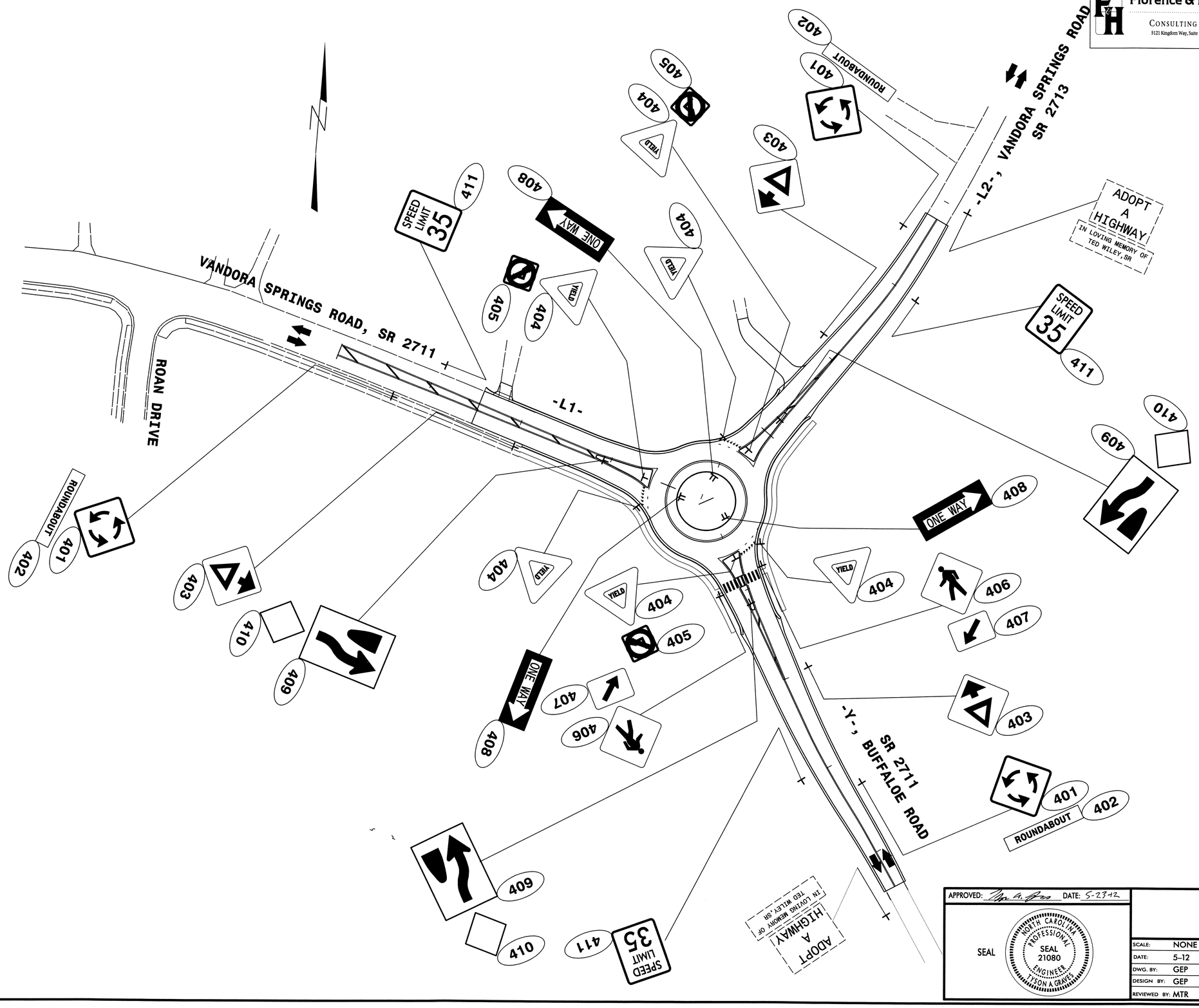
Florence & Hutcheson

PROJ. REFERENCE NO.	SHEET NO.
39877	S-6

Florence & Hutcheson
CONSULTING ENGINEERS
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258



APPROVED: DATE: 5-23-12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 21080 ENGINEER TYSON A. GRAVES

PROPOSED SIGNS SIGNING PLAN

SCALE:	NONE
DATE:	5-12
DWG. BY:	GEP
DESIGN BY:	GEP
REVIEWED BY:	MTR

DIVISION OF HIGHWAYS TRAFFIC ENGINEERING BRANCH TRAFFIC CONTROL

REVISIONS

CADD FILE

5/23/2012
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Florence & Hutcheson

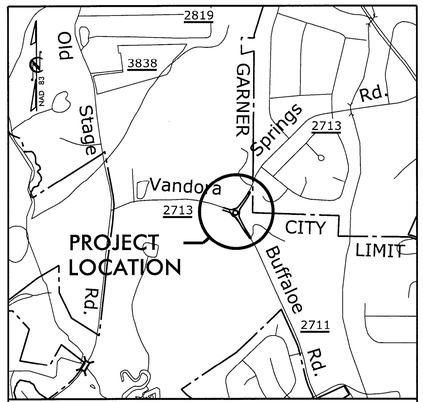
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	39877	UC-01	6

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

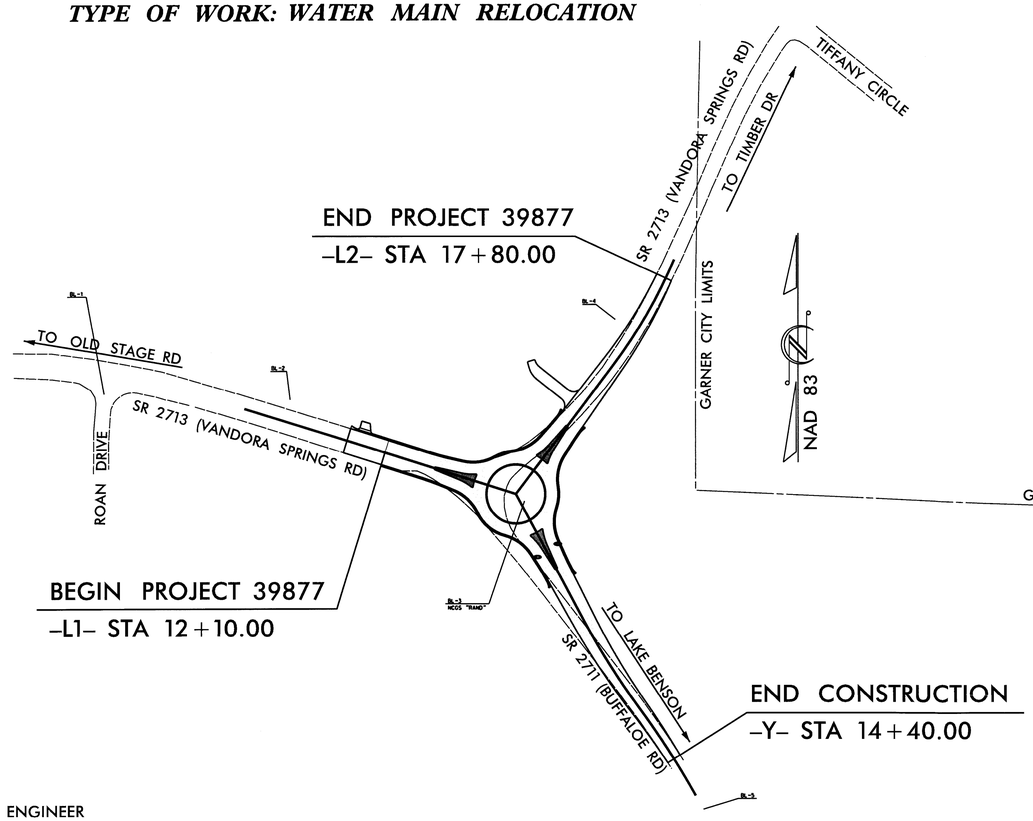
UTILITY CONSTRUCTION PLANS
WAKE COUNTY

LOCATION: INTERSECTION OF SR 2713 (VANDORA SPRINGS ROAD) AND SR 2711 (BUFFALOE ROAD) NEAR GARNER

TYPE OF WORK: WATER MAIN RELOCATION



VICINITY MAP



NCDOT CONTACT: BEN UPSHAW, P.E.
DIVISION 5 – DIVISION DESIGN ENGINEER

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER, SEWER, AND/OR REUSE, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR **CONTACTING** THE ~~PUBLIC WORK DEPARTMENT AT (919) 996-6810~~ AND THE PUBLIC UTILITY DEPARTMENT AT ~~(919) 857-4540~~ AT LEAST TWENTY FOUR HOURS PRIOR TO BEGINNING ANY OF THEIR CONSTRUCTION. 919 996-4540

FAILURE TO NOTIFY BOTH CITY DEPARTMENTS IN ADVANCE OF BEGINNING CONSTRUCTIONS, WILL RESULT IN THE ISSUANCE OF MONETARY FINES, AND REQUIRE REINSTALLATION OF ANY WATER OR SEWER FACILITIES NOT INSPECTED AS A RESULT OF THIS NOTIFICATION FAILURE.

FAILURE TO CALL FOR INSPECTION, INSTALL A DOWNSTREAM PLUG, HAVE PERMITTED PLANS ON THE JOBSITE, OR ANY OTHER VIOLATION OF CITY OF RALEIGH STANDARDS WILL RESULT IN A **FINE AND POSSIBLE EXCLUSSION** FROM WORK IN THE CITY OF RALEIGH.

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THESE PLANS. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITY HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES PERMIT # W-3074

AUTHORIZATION TO CONSTRUCT [signature]

DATE 3/27/12

* COORDINATE WATER SHUT DOWN WITH PATRICK BARNHOUSE AT 919 250 2737

PROJECT: 39877

CONTRACT:

GRAPHIC SCALES

50 0 50 100
PLANS

50 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET No.	DESCRIPTION
UC-01	TITLE SHEET
UC-04	PLAN SHEET
UC-05	PROFILE SHEET
UC-06	DETAIL SHEET
UC-07	DETAIL SHEET
UC-08	DETAIL SHEET

UTILITIES OWNERS ON PROJECT

(1) PROGRESS ENERGY	POWER
(2) AT&T	TELEPHONE
(3) TIME WARNER CABLE	CABLE TV
(4) PSNC	GAS
(5) CITY OF RALEIGH	SANITARY SEWER
(5) CITY OF RALEIGH	WATER

PREPARED BY:

KCI ASSOCIATES OF N.C.
CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY ENGINEERING
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOWE

CHARLES LEE FLOWE, PE

SIGNATURE: [signature] 3/27/2012

PREPARED FOR THE OFFICE OF:

DIVISION OF HIGHWAYS
UTILITIES ENGINEERING SECTION
1591 MAIL SERVICES CENTER
RALEIGH, NC 27699-1591
PHONE (919)250-4128
FAX (919) 250-4119

ROGER WORTHINGTON,P.E. — UTILITY SECTION ENGINEER

SCOTT RIDDLE — UTILITY DESIGN CONSULTANT

PROJECT REFERENCE NO.	SHEET NO.
39877	UC-04

KCI ASSOCIATES OF N.C.
CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY ENGINEERING
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

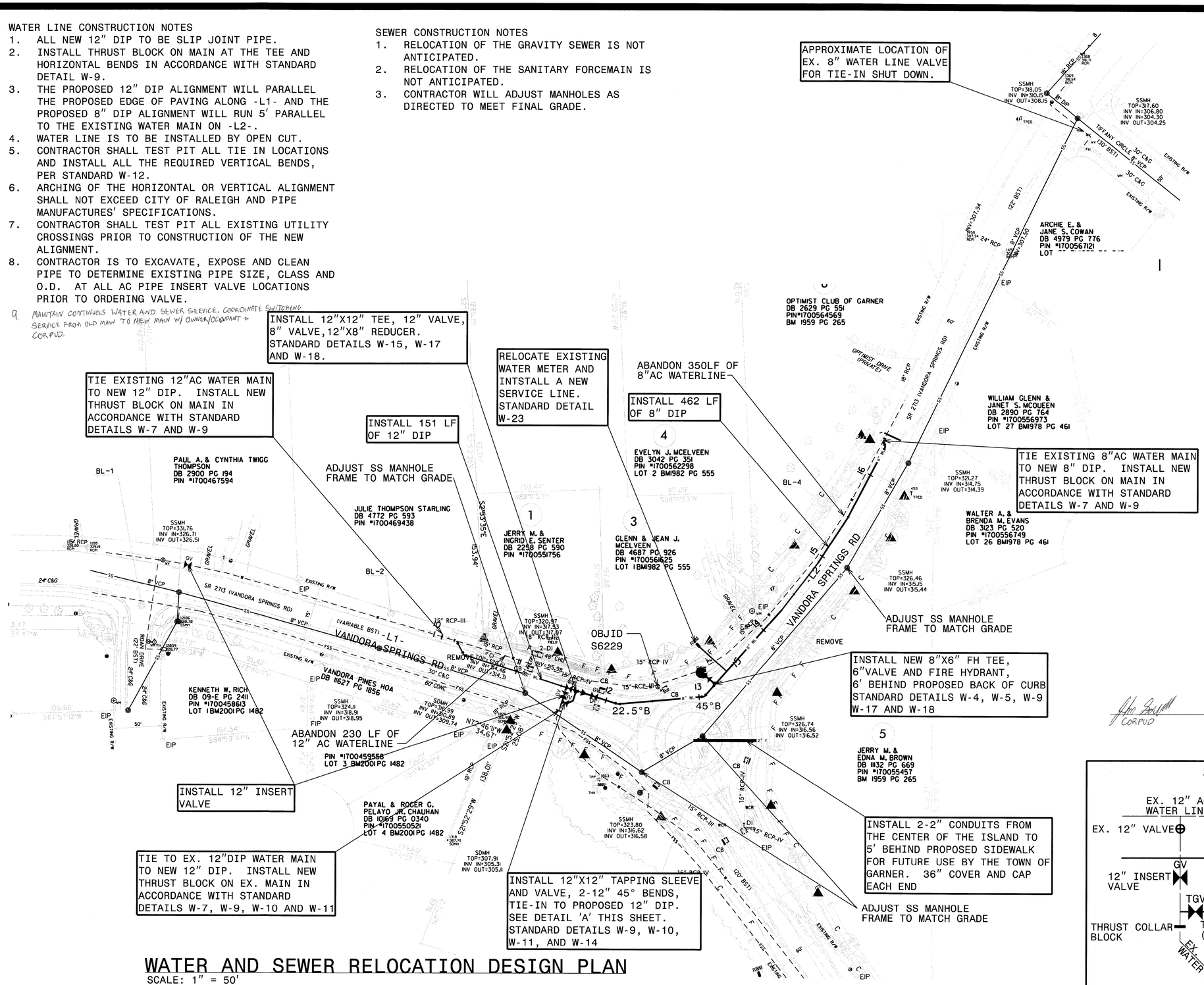
NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOWE 3/27/2012

WATER LINE CONSTRUCTION NOTES

1. ALL NEW 12" DIP TO BE SLIP JOINT PIPE.
2. INSTALL THRUST BLOCK ON MAIN AT THE TEE AND HORIZONTAL BENDS IN ACCORDANCE WITH STANDARD DETAIL W-9.
3. THE PROPOSED 12" DIP ALIGNMENT WILL PARALLEL THE PROPOSED EDGE OF PAVING ALONG -L1- AND THE PROPOSED 8" DIP ALIGNMENT WILL RUN 5' PARALLEL TO THE EXISTING WATER MAIN ON -L2-.
4. WATER LINE IS TO BE INSTALLED BY OPEN CUT.
5. CONTRACTOR SHALL TEST PIT ALL TIE IN LOCATIONS AND INSTALL ALL THE REQUIRED VERTICAL BENDS, PER STANDARD W-12.
6. ARCHING OF THE HORIZONTAL OR VERTICAL ALIGNMENT SHALL NOT EXCEED CITY OF RALEIGH AND PIPE MANUFACTURES' SPECIFICATIONS.
7. CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITY CROSSINGS PRIOR TO CONSTRUCTION OF THE NEW ALIGNMENT.
8. CONTRACTOR IS TO EXCAVATE, EXPOSE AND CLEAN PIPE TO DETERMINE EXISTING PIPE SIZE, CLASS AND O.D. AT ALL AC PIPE INSERT VALVE LOCATIONS PRIOR TO ORDERING VALVE.
9. MAINTAIN CONTINUOUS WATER AND SEWER SERVICE. COORDINATE SWITCHING SERVICE FROM OLD MAIN TO NEW MAIN W/ OWNER/OCCUPANT + CORPUD.

SEWER CONSTRUCTION NOTES

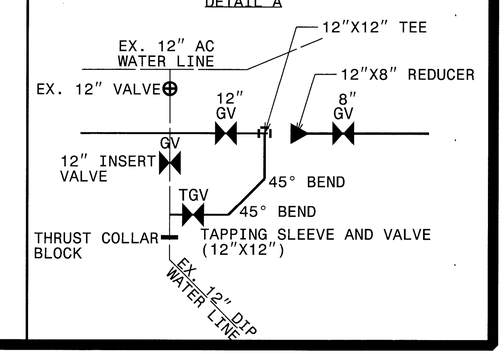
1. RELOCATION OF THE GRAVITY SEWER IS NOT ANTICIPATED.
2. RELOCATION OF THE SANITARY FORCEMAIN IS NOT ANTICIPATED.
3. CONTRACTOR WILL ADJUST MANHOLES AS DIRECTED TO MEET FINAL GRADE.



WATER AND SEWER RELOCATION DESIGN PLAN

SCALE: 1" = 50'

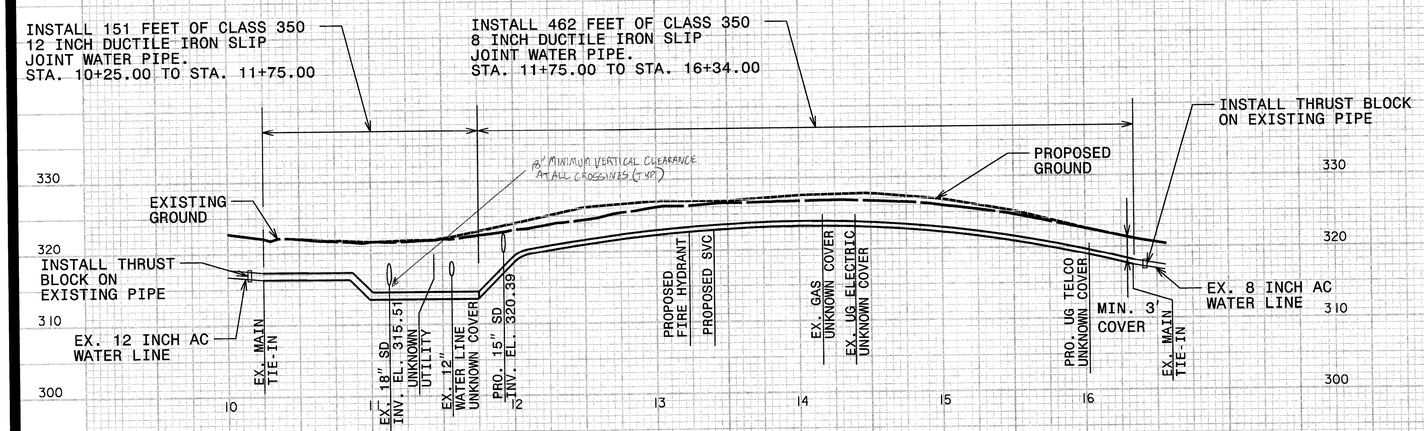
DETAIL A



REVISIONS

8/17/99

PROPOSED 12" AND 8" DUCTILE IRON SLIP JOINT WATER LINE



NOTES:
1. CONTRACTOR SHALL TEST PIT ALL TIE IN POINTS AND INSTALL ALL REQUIRED VERTICAL BENDS, PER STANDARD W-12.
2. MINIMUN COVER OF 3 FEET SHALL BE MAINTAINED DURING TEMPORARY AND FINAL CONDITIONS.
3. CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITY CROSSING PRIOR TO CONSTRUCTION OF THE NEW ALIGNMENT.

PROPOSED 12" AND 8" DIP PROFILE

SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=10'

KCI ASSOCIATES OF N.C.
CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY ENGINEERING
SUITE 220, LANDMARK CENTER II, 4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

PROJECT REFERENCE NO.	SHEET NO.
39877	UC-05
DESIGNED BY: CLO	
DRAWN BY: NEP	
CHECKED BY: DSR	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOYD 3/27/2012

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

W-3074
CORPIN

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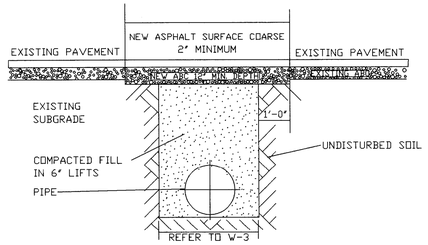
PROJECT REFERENCE NO.	SHEET NO.
39877	UC-06

KCI ASSOCIATES OF N.C.

CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY ENGINEERING

SUITE 220, LANDMARK CENTER II,
4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOWE 8/27/2012

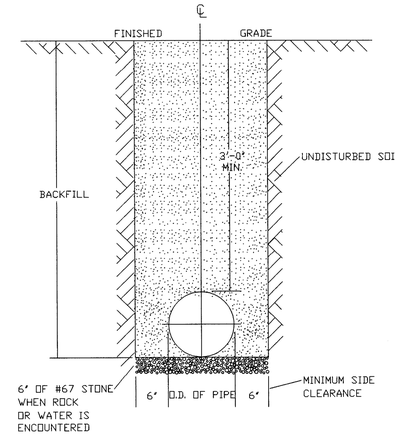


NOTES:

1. The pavement cut shall be defined by a straight edge and cut with an approved saw cut machine.
2. The trench subgrade material shall be backfilled with suitable material and compacted to a density of at least 95% of that obtained by compacting a sample of the material in accordance with AASHTO T-99 as modified by NCDOT.
3. The final 1' of fill shall consist of ABC material compacted to a density equal to 100% of that obtained by compacting a sample of the material in accordance with AASHTO T-80 as modified by NCDOT.
4. The entire thickness/ vertical edge of cut shall be tacked.
5. The same depth of pavement material which exists shall be reinstalled, but in no case shall the asphalt be less than 2" thick.
6. The asphalt pavement material shall be installed and compacted thoroughly with a smooth drum roller to achieve a smooth level patch.
7. Refer to City of Raleigh standards for trenches and pipe bedding, W-3. for additional details.
8. No Hand Patching allowed.
9. Pavement cuts within NCDOT ROW shall conform to the approved on site encroachment permit.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD ASPHALT PAVEMENT PATCH DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-2			D.W.C.	11-1-99
	RRH	3-31-00	A.B.B.	4-16-04

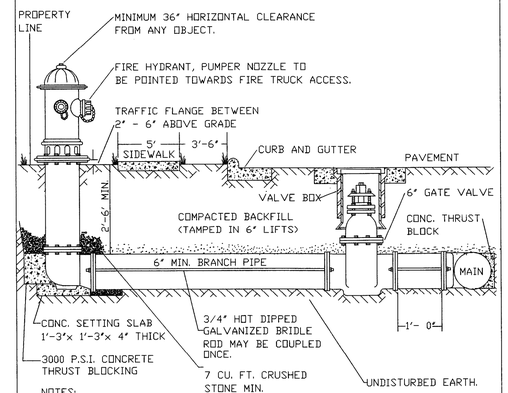


NOTES:

1. Trenches requiring shoring and bracing, dimensions shall be taken from the inside face of the shoring and bracing.
2. No rocks or boulders 4" or larger to be used in backfill.
3. All backfill material shall be suitable native material.
4. Backfill shall be tamped in 6" lifts.
5. Achieve 95% compaction in backfill.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
		3-1-87	RRH	3-31-00
W-3	D.W.C.	9-3-99	ABB	2-15-05



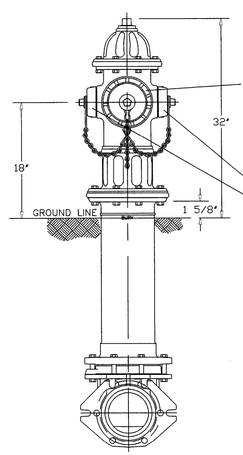
NOTES:

1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M & H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96.
3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT.
4. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSTION.
6. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20FT, THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10FT FROM HYDRANT AND POURED IN CONCRETE.
7. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW.

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

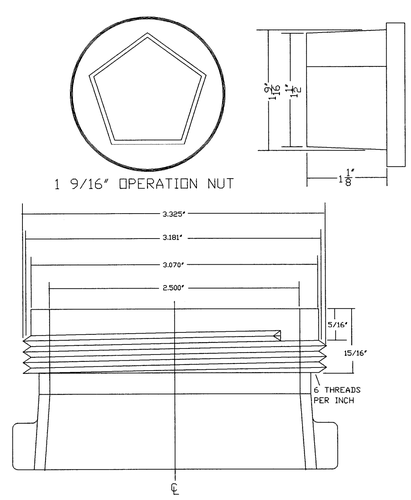
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04		



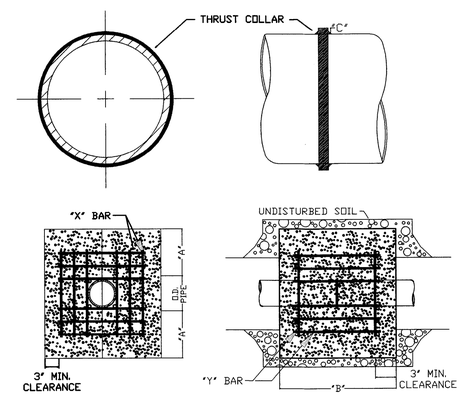
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
		3-1-87	ABB	7-21-05
W-5	RRH	3-31-00		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
HYDRANT OPERATING NUT AND 2 1/2" OUTLET THREADS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
		3-1-87	A.B.B	4-13-04
W-6	RRH	3-31-00		



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-3"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"-6"-16", 20"-24", 30"-36", 48"
6" - 36"	1'-4"	1'-7"	2" 3" 4"
48" & greater	1'-8"	1'-9"	6"

NOTES:

1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN DATA FOR WATER MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	1-21-00		

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
39877	UC-07

KCI ASSOCIATES OF N.C.

CIVIL ENGINEERS
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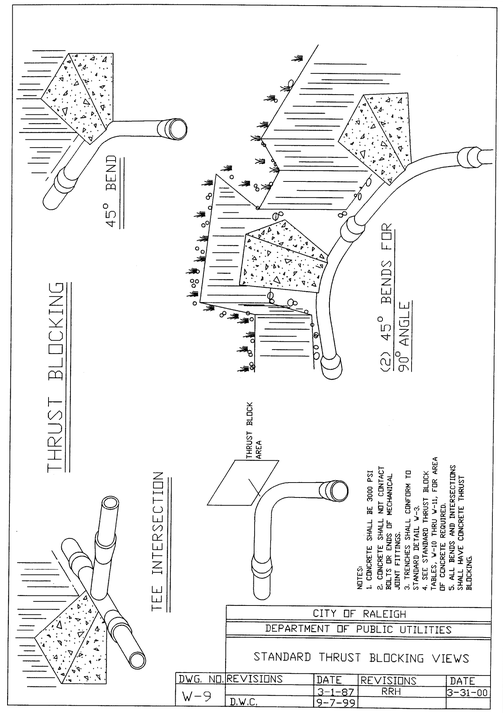
NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOWE 3/27/2012

REVISIONS

8/17/99



NOTES:
1. CONCRETE SHALL BE 2000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. THRUST BLOCKS SHALL CONFORM TO STANDARD DETAIL W-3.
4. SEE STANDARD THRUST BLOCK TABLES W-10 AND W-11 FOR AREA OF CONCRETE REQUIRED.
5. ALL VERTICAL BEND REACTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCKING VIEWS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9		3-1-87	RRH	3-31-00
	D.W.C.	9-7-99		

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	GRAVEL / COARSE SAND 1600 LBS/FT²	DRY CLAY - ALWAYS DRY 8000 LBS/FT²	SAND COMPACT FIRM 8000 LBS/FT²	SAND -CLEAN DRY 4000 LBS/FT²	QUICKSAND - VERY POOR SOIL 1000 LBS/FT²	ROCK - POOR 10,000 LBS/FT²
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	6-23-99		

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

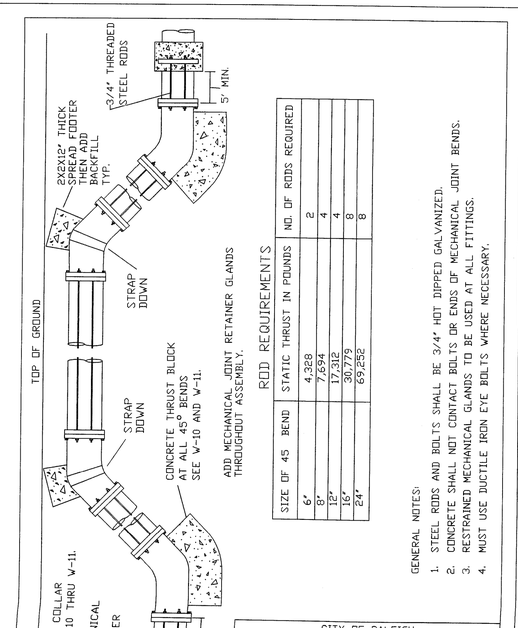
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	GRAVEL/COARSE SAND 1600LBS/FT²	DRY CLAY - ALWAYS DRY 8000 LBS/FT²	SAND, COMPACT FIRM 8000 LBS/FT²	SAND -CLEAN DRY 4000 LBS/FT²	QUICKSAND SOIL 1000 LBS/FT²	ROCK - POOR 10,000 LBS/FT²
24"									
11 1/4°	17,734	5	9	11	3	3	5	18	2
22 1/2°	35,305	9	18	22	5	5	9	36	4
45°	69,252	18	35	42	9	9	18	70	7
90°	127,936	32	64	77	16	16	32	128	13
PLUG	90,478	23	46	55	12	12	23	91	10
30"									
11 1/4°	27,709	7	14	17	4	4	7	2	3
22 1/2°	55,163	14	28	34	7	7	14	56	6
45°	108,206	28	55	65	14	14	28	109	11
90°	199,900	50	100	120	25	25	50	200	20
PLUG	141,372	36	71	85	18	18	36	142	15
36"									
11 1/4°	39,901	10	20	24	5	5	10	40	4
22 1/2°	79,439	20	40	48	10	10	20	30	8
45°	155,816	39	78	94	20	20	39	156	16
90°	287,855	72	144	172	36	36	72	288	29
PLUG	203,575	51	102	122	26	26	51	204	21
48"									
11 1/4°	70,935	18	36	43	9	9	18	71	8
22 1/2°	141,218	36	71	85	18	18	36	142	15
45°	277,007	70	139	166	35	35	70	277	28
90°	511,742	128	256	320	64	64	128	512	52
PLUG	361,911	91	181	217	46	46	91	362	37

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-11	D.W.C.	6-23-99		



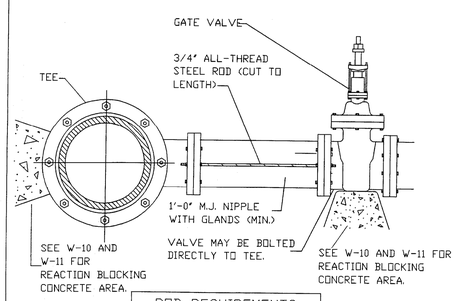
ROD REQUIREMENTS

SIZE OF 45 BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD VERTICAL BEND

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB	4-6-04		



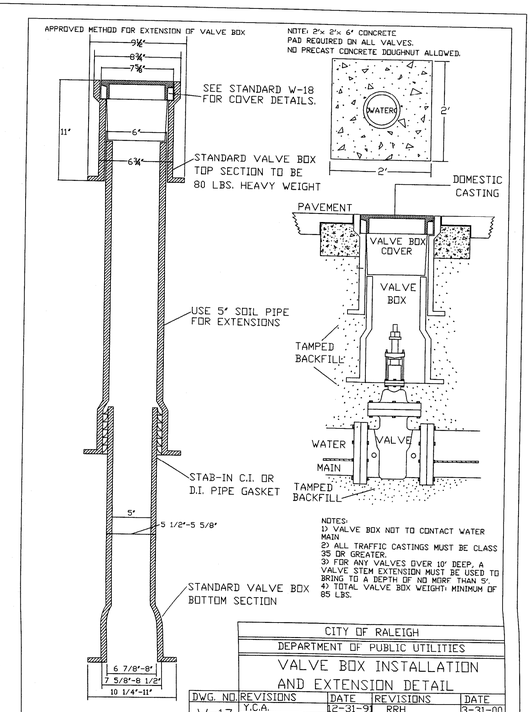
ROD REQUIREMENTS

BRANCH SIZE	NO. OF RODS
4"	2
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. SEE STANDARD THRUST BLOCK. TABLES W-10 AND W-11 FOR CONCRETE.
3. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL FITTINGS.
4. THIS RODDING REQUIREMENT DOES NOT APPLY TO FIRE HYDRANTS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RESTRAINED TEE AND VALVE INSTALLATION ON DEAD LINES (4"-24")

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-15	Y.C.A.	12-31-91	RRH	3-31-00
	D.W.C.	9-7-99	A.B.B.	4-19-04



NOTES:
1) VALVE BOX NOT TO CONTACT WATER MAIN
2) ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3) FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'.
4) TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE BOX INSTALLATION AND EXTENSION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	Y.C.A.	12-31-91	RRH	3-31-00
	D.W.C.	9-7-99	A.B.B.	4-15-04

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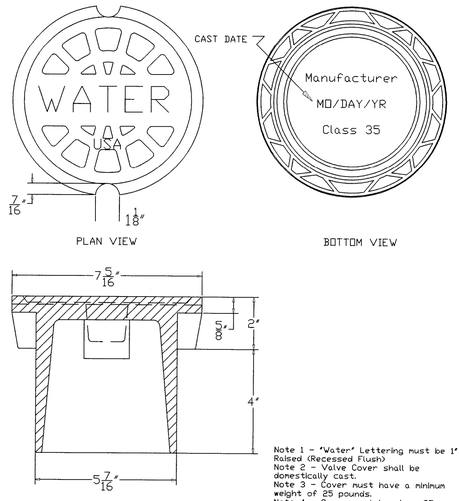
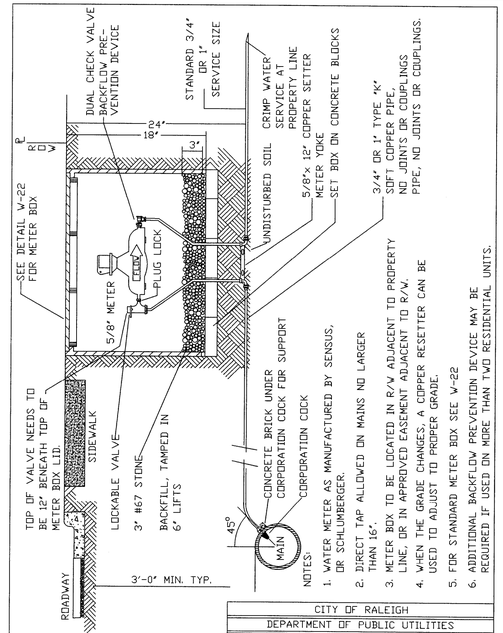


Note 1 - 'Water' Lettering must be 1' Raised (Recessed Flush)
Note 2 - Valve Cover shall be domestically cast.
Note 3 - Cover must have a minimum weight of 25 pounds.
Note 4 - Cover must be class 35 or greater.
Note 5 - Cover must meet or exceed AASHTO H-20 load requirements.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
5 1/4" Valve Box Drop Lid 4" Skirt				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18			ABB	2-12-04



NOTES:
1. WATER METER AS MANUFACTURED BY SENSUS, OR SCHLUMBERGER.
2. DIRECT TAP ALLOWED ON MAINS NO LARGER THAN 16".
3. METER BOX TO BE LOCATED IN R/W ADJACENT TO PROPERTY LINE, OR IN APPROVED EASEMENT ADJACENT TO R/W.
4. WHEN THE GRADE CHANGES, A COPPER RESETTER CAN BE USED TO ADJUST TO PROPER GRADE.
5. FOR STANDARD METER BOX SEE W-22
6. ADDITIONAL BACKFLOW PREVENTION DEVICE MAY BE REQUIRED IF USED ON MORE THAN TWO RESIDENTIAL UNITS.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD 3/4" & 1" WATER SERVICE INSTALLATION				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-23	ABB	4-6-04		

PROJECT REFERENCE NO.	SHEET NO.
39877	UC-08

KCI ASSOCIATES OF N.C.
CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
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NORTH CAROLINA PROFESSIONAL SEAL 12300 ENGINEER CHARLES LEE FLOWE
3/27/2012

REVISIONS

8/17/99

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PROJ. REFERENCE NO.	SHEET NO.
39877	X-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDES BACKFILL FOR UNDERCUT

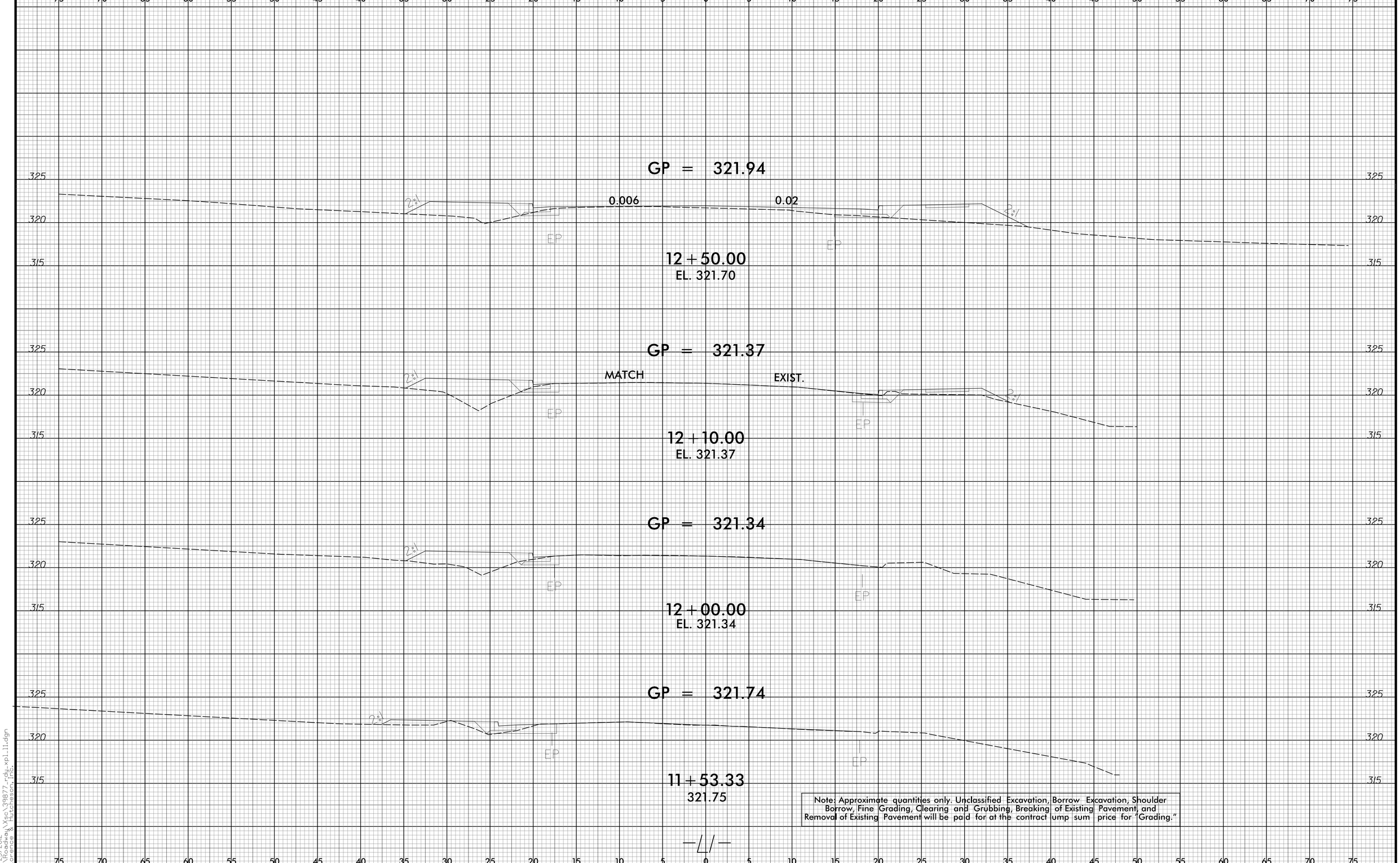
Station L1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	Station C1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+53.3300	0	0	11+75.0000	0	154
12+00.0000	7	22	12+00.0000	0	126
12+10.0000	2	10	12+15.2011	0	72
12+50.0000	8	58	12+25.0000	0	50
12+71.1268	2	39	12+32.2184	0	37
12+85.7104	0	30	12+50.0000	0	78
13+00.0000	0	32			
13+19.9658	0	49			
13+45.8704	0	74			

Station L2	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
14+65.8704	0	0
14+91.7750	5	94
15+00.0000	1	25
15+26.0304	4	67
15+40.6140	2	30
16+00.0000	49	60
16+50.1000	88	6
17+00.2000	104	6
17+50.3000	61	7
17+80.0000	9	2

Station Y	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+60.0000	0	0
10+85.9046	2	95
11+00.0000	1	42
11+20.1600	2	46
11+34.7436	2	27
11+50.0000	9	16
12+00.0000	42	11
12+50.0000	36	16
13+00.0000	29	23
13+50.0000	18	24
14+00.0000	19	19
14+40.0000	16	6

Station C1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+00.0000	0	0
10+25.0000	1	79
10+31.6753	0	24
10+50.0000	2	72
10+67.9793	1	76
10+75.0000	0	29
11+00.0000	1	105
11+25.0000	0	145
11+31.3300	0	48
11+51.8504	0	161

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	39877	X-2



Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

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8/23/99

5/23/2012
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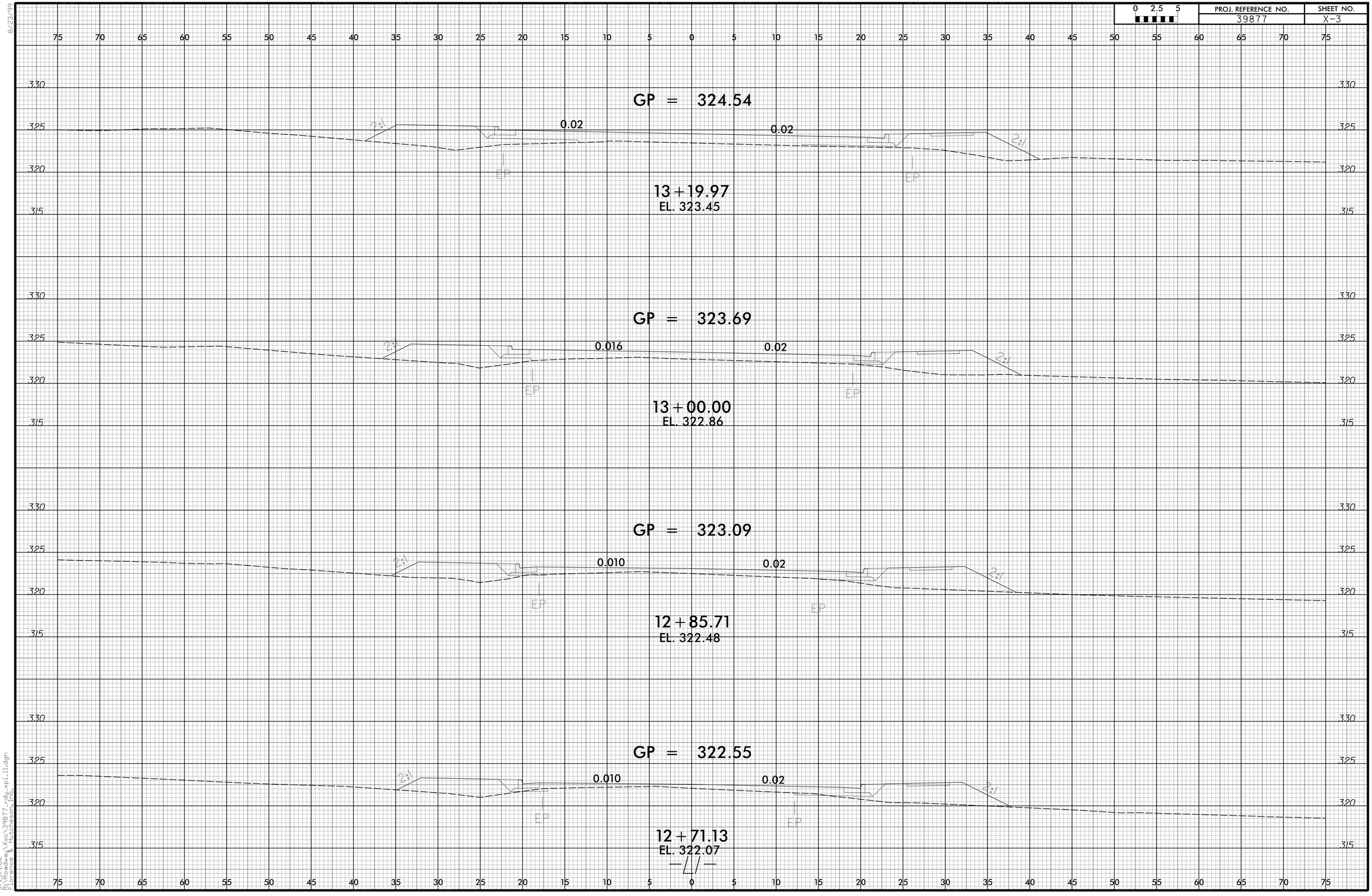
Hutchesson, Inc.
Phoadley

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	39877	X-3



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8/23/99

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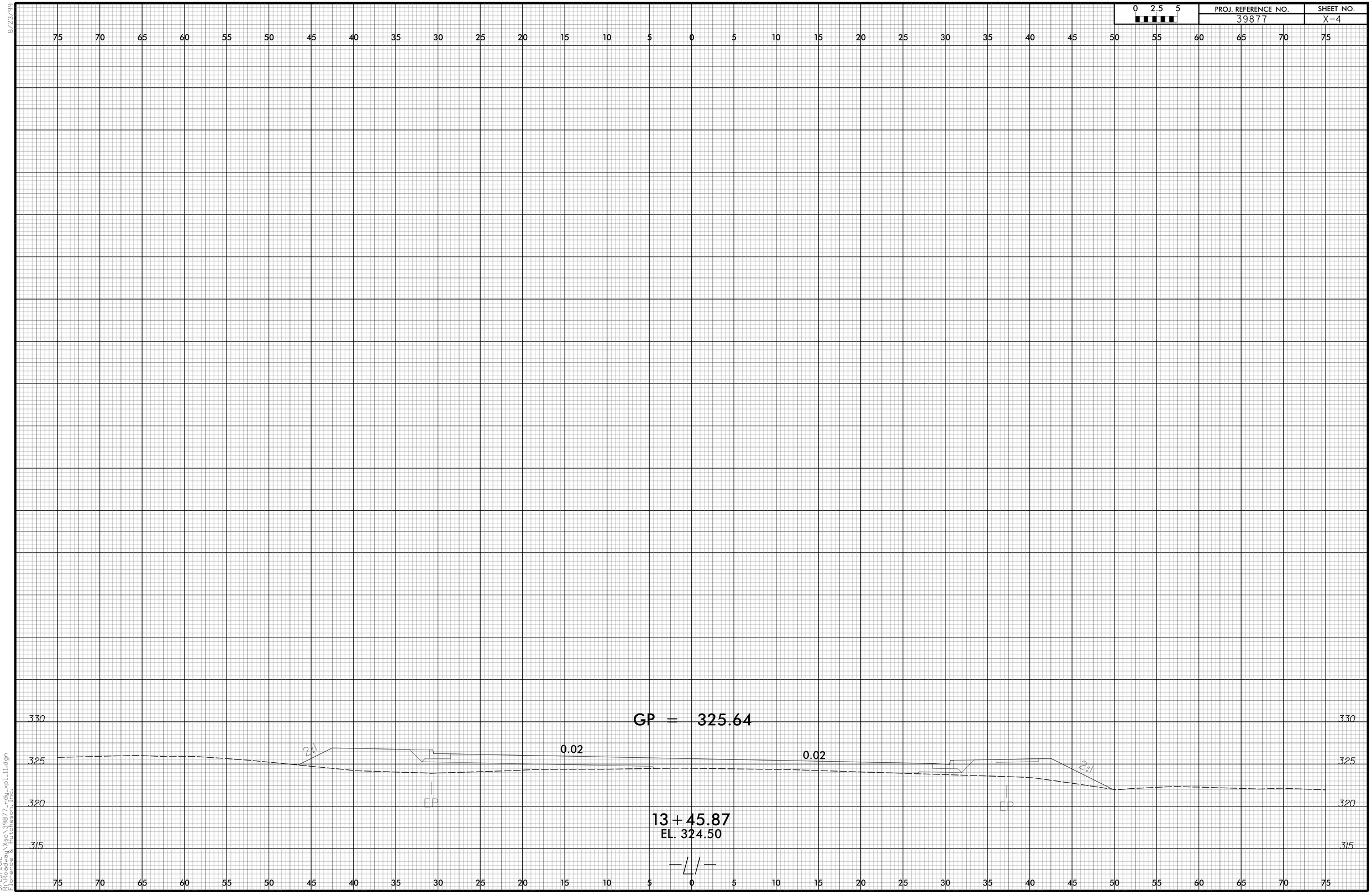

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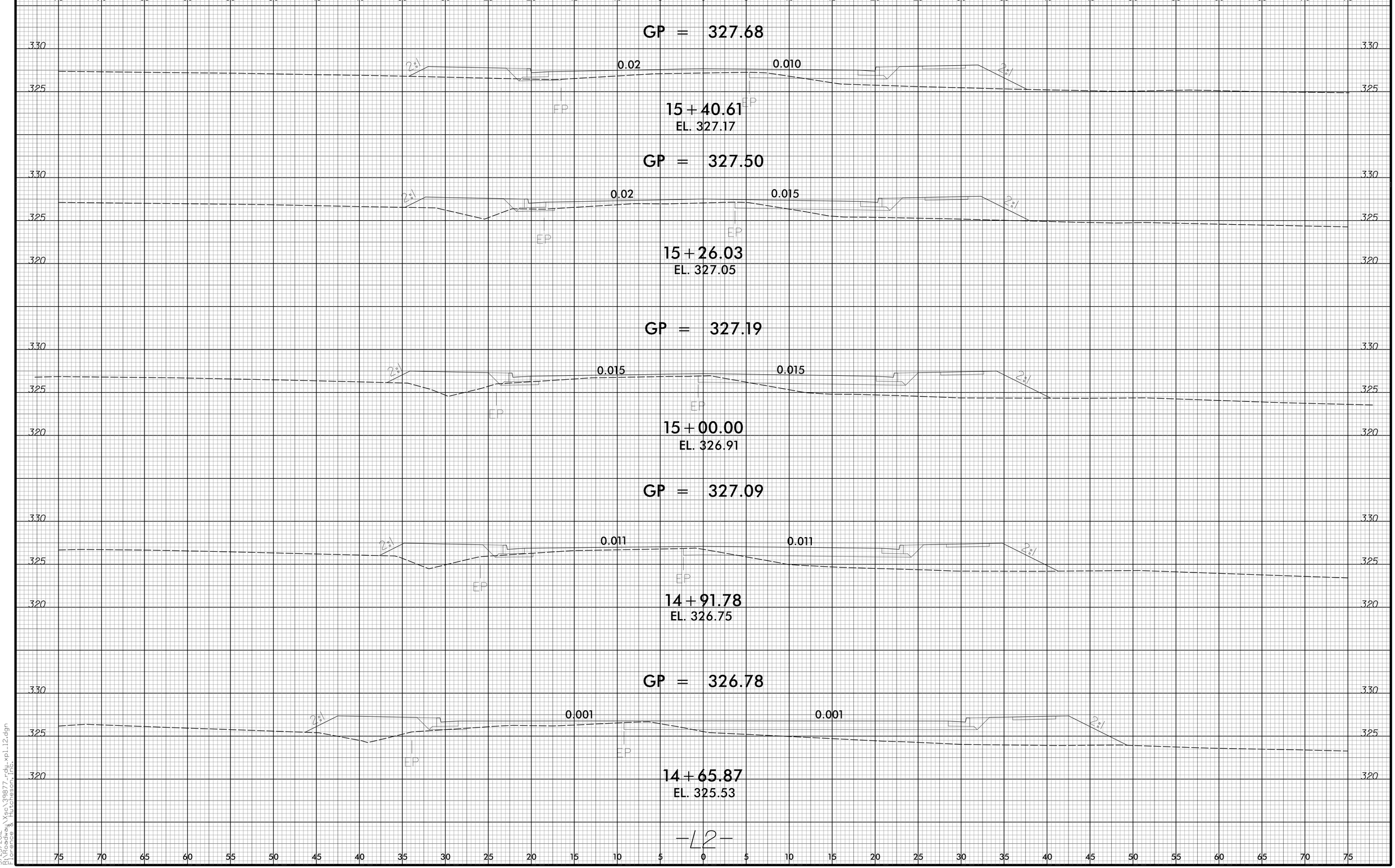

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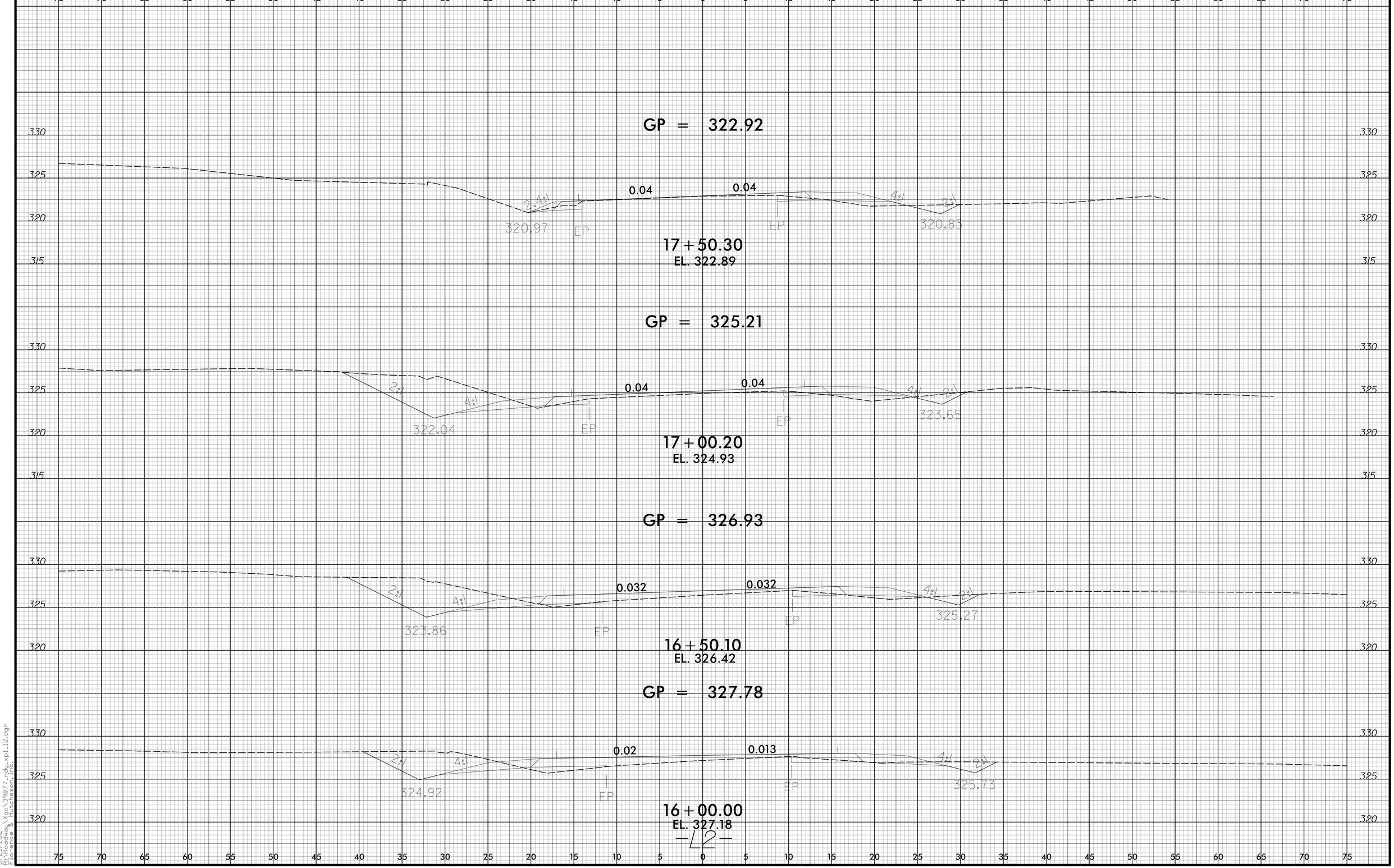

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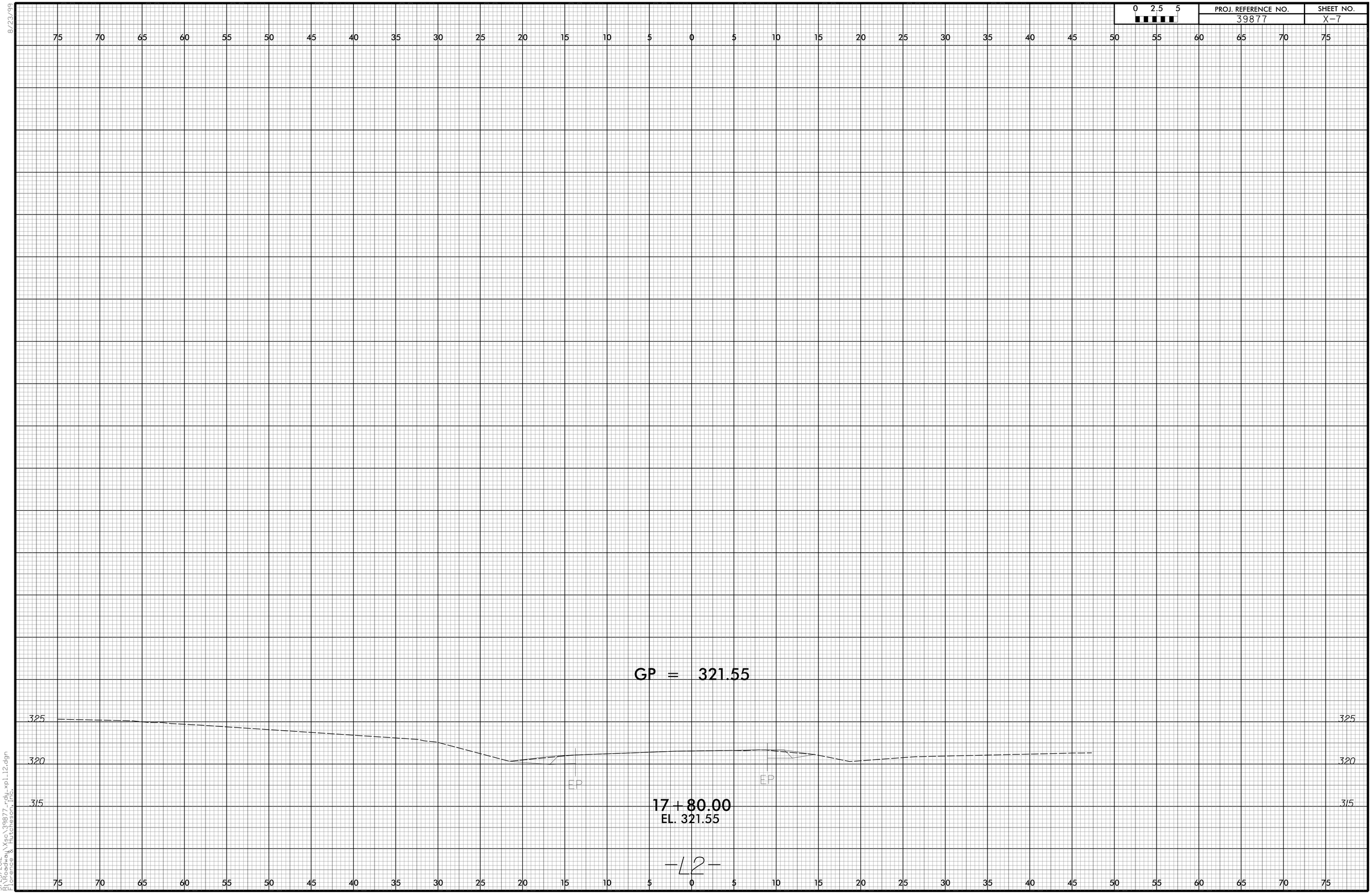

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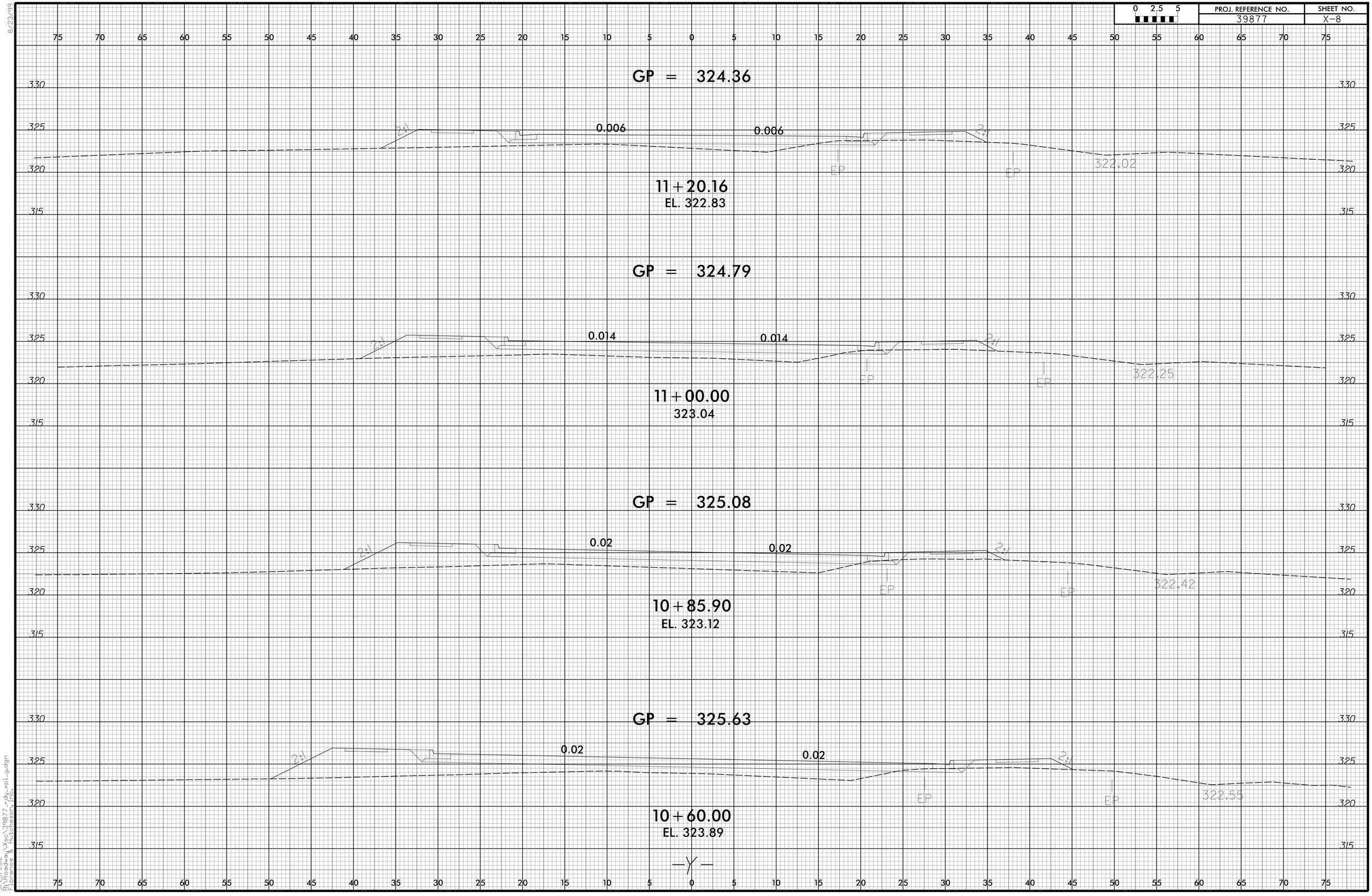

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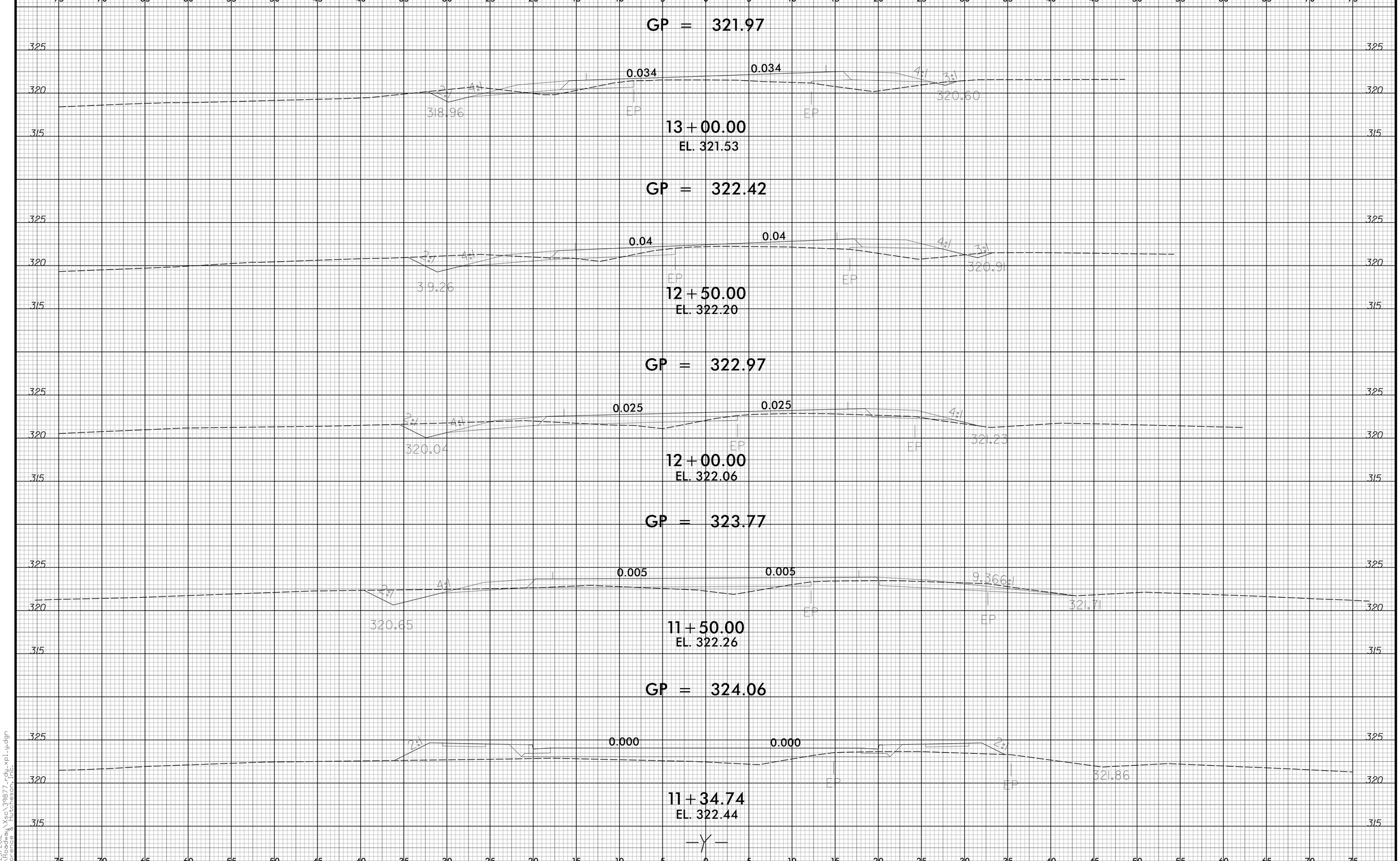

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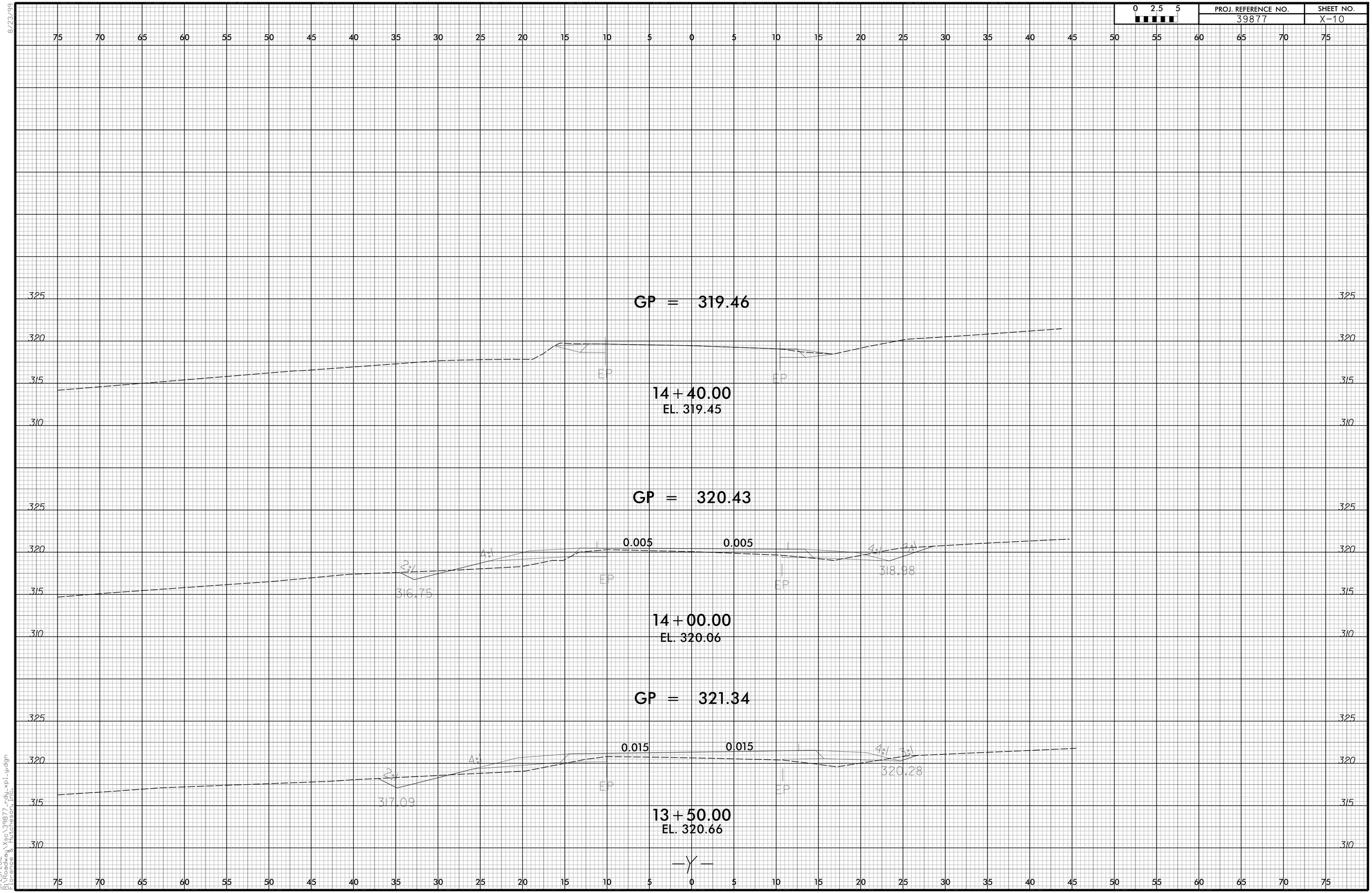

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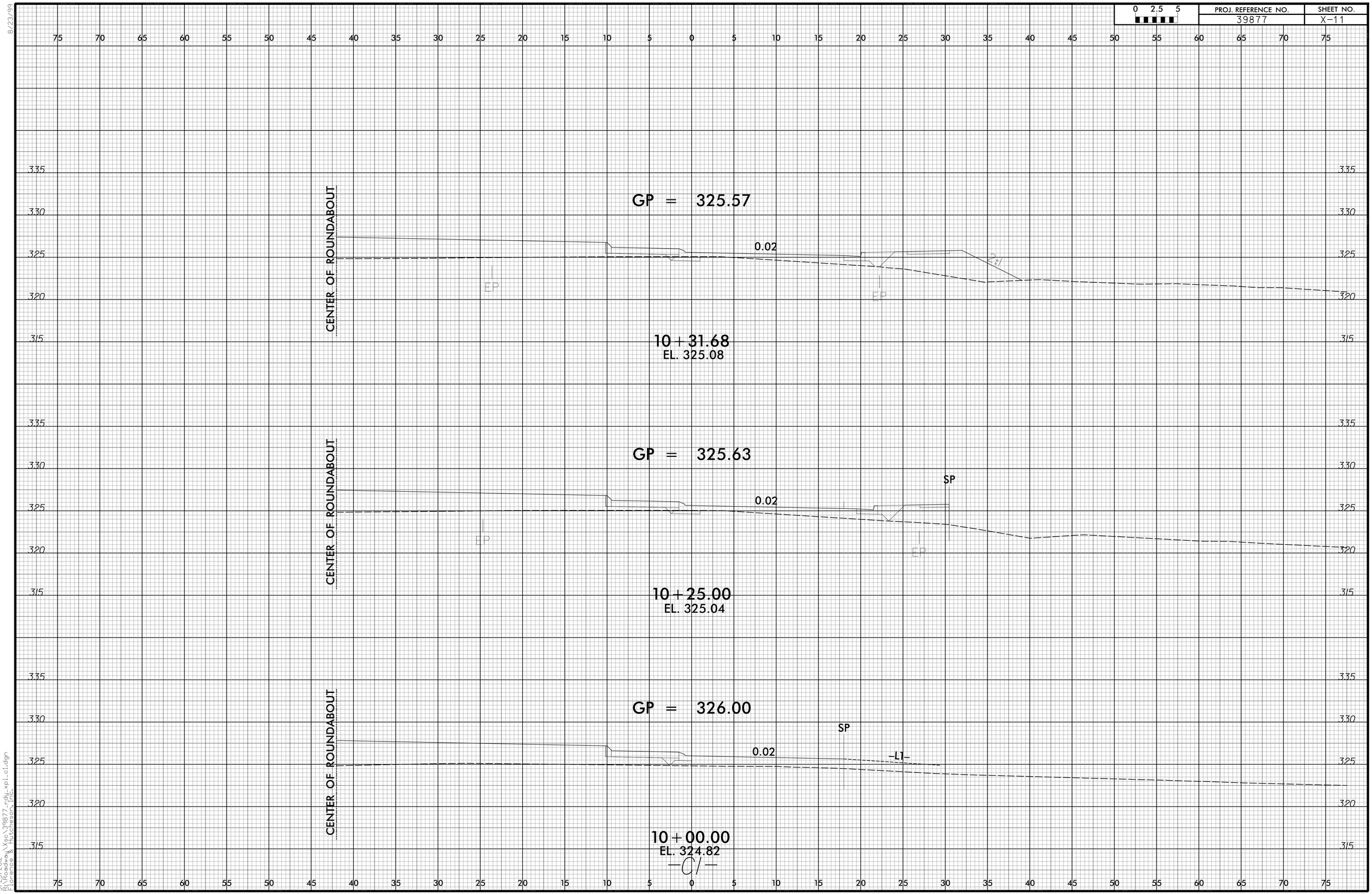

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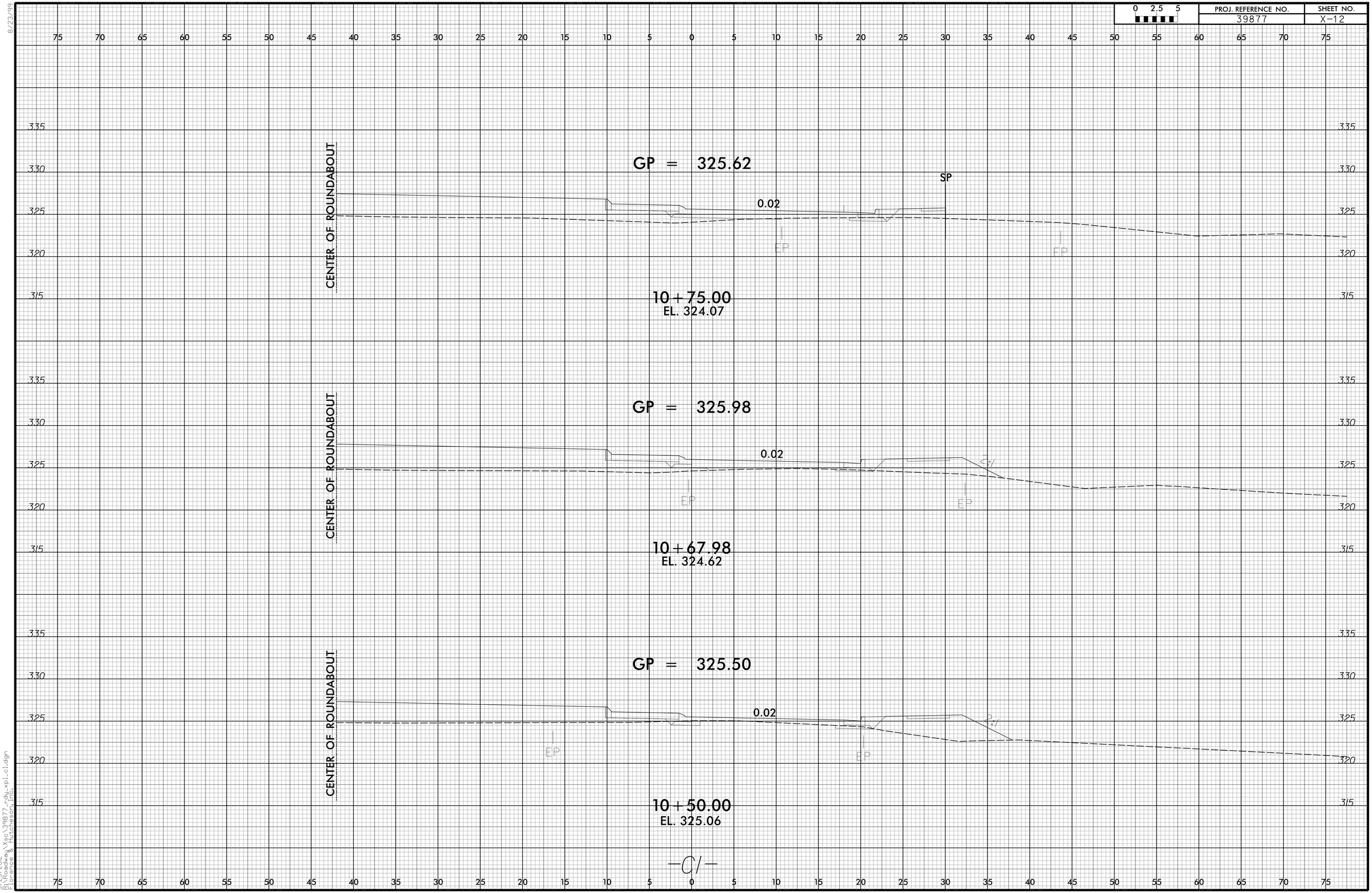

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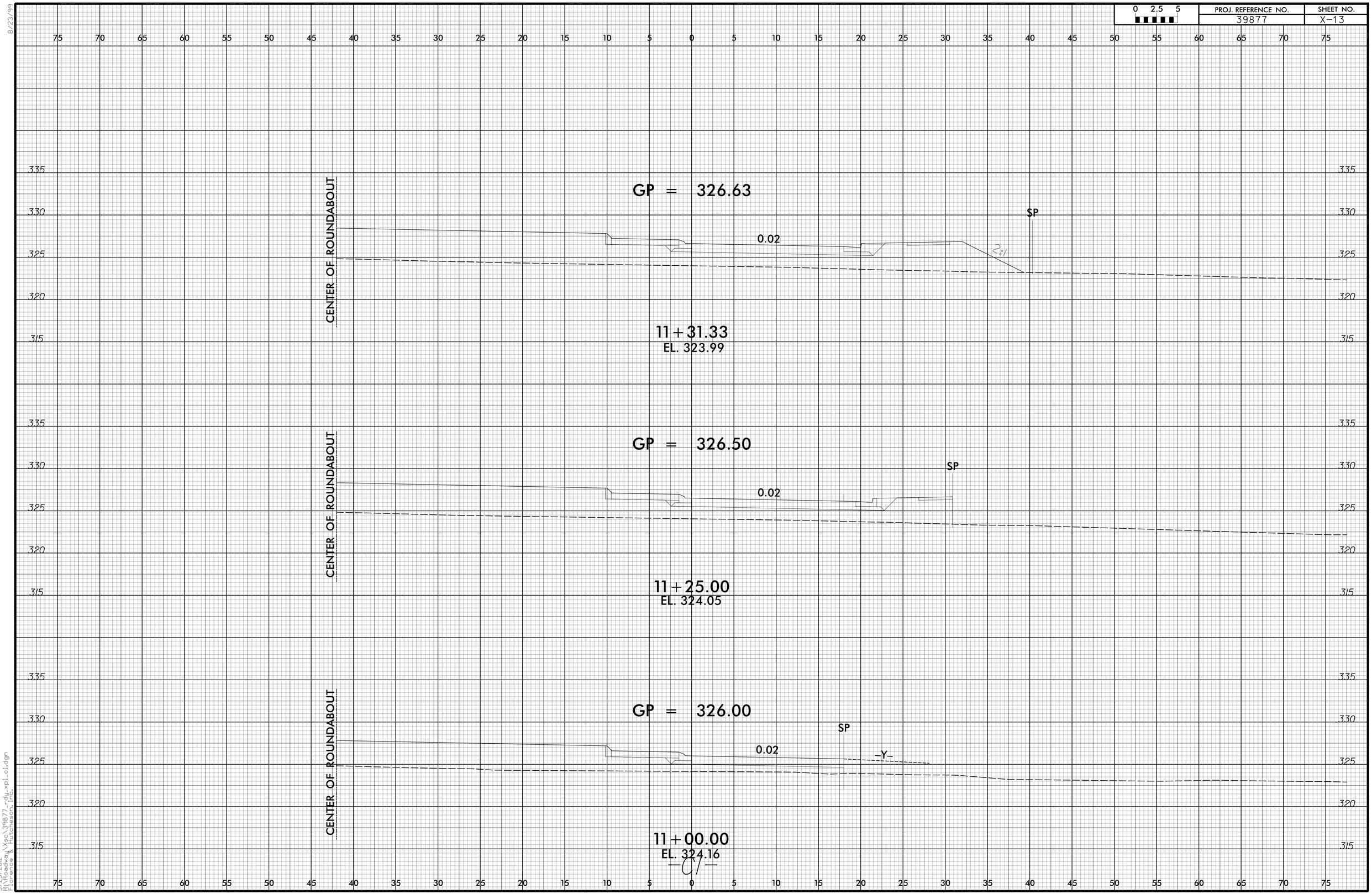

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Hutchesson, Inc.

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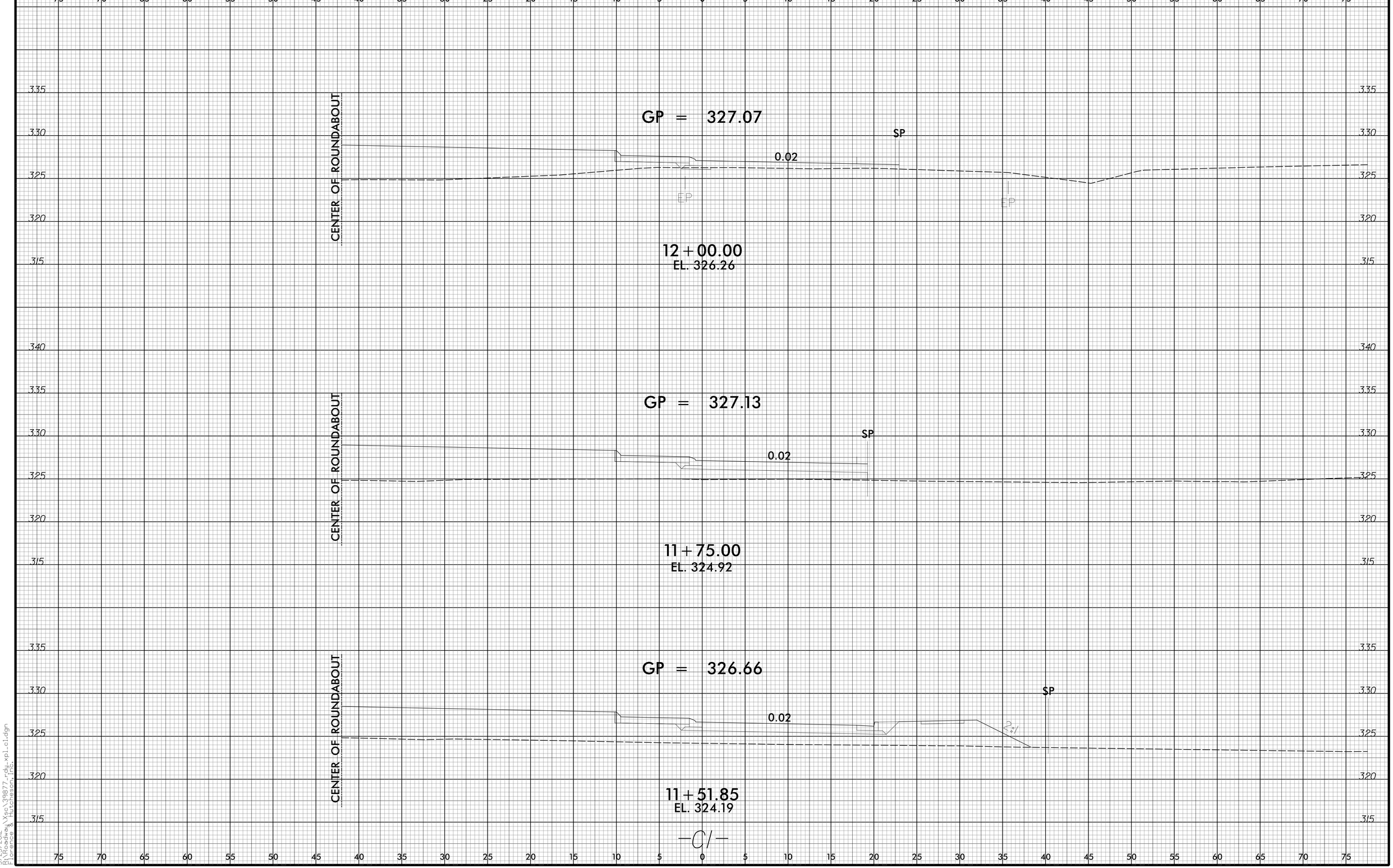

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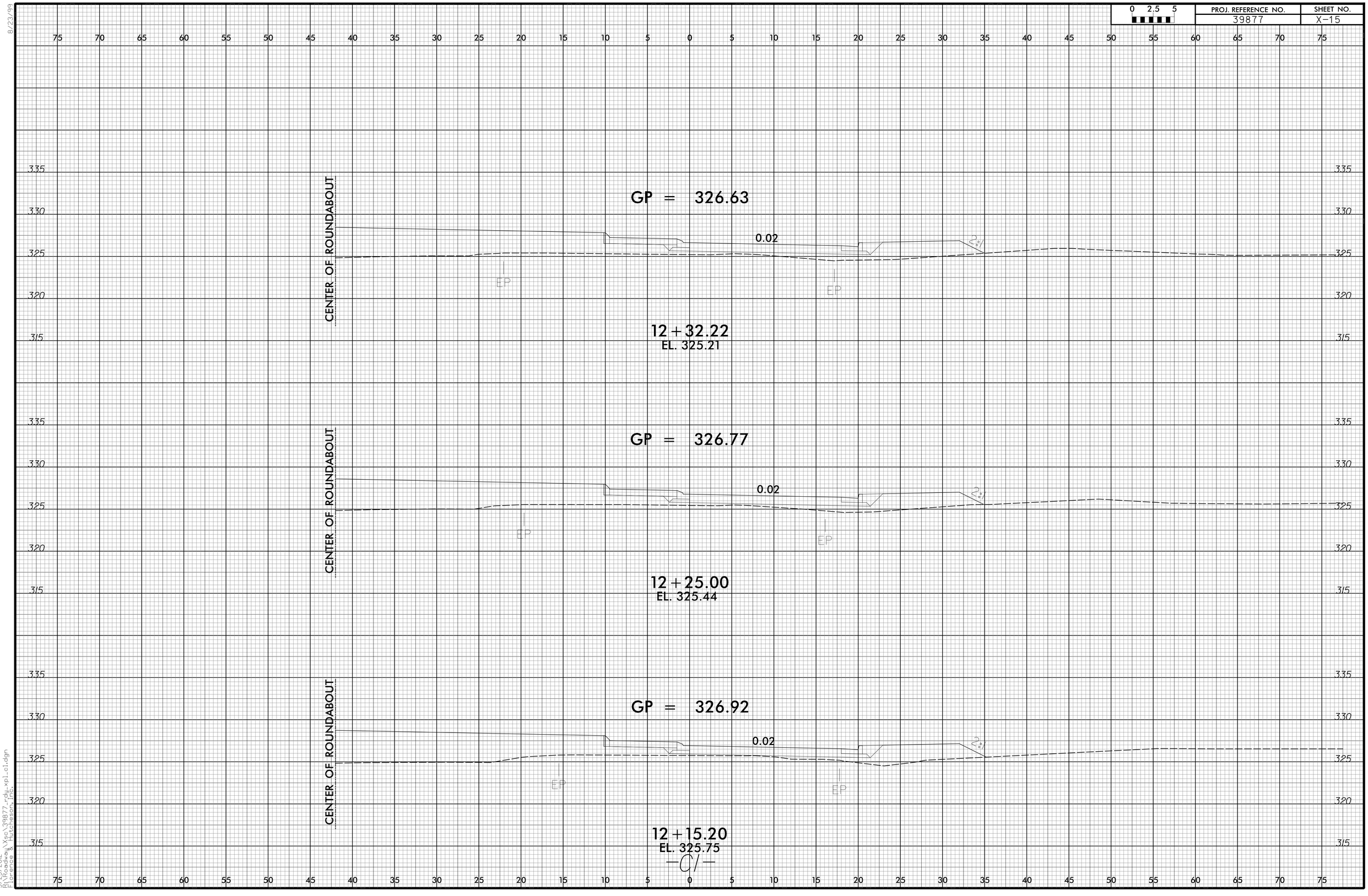

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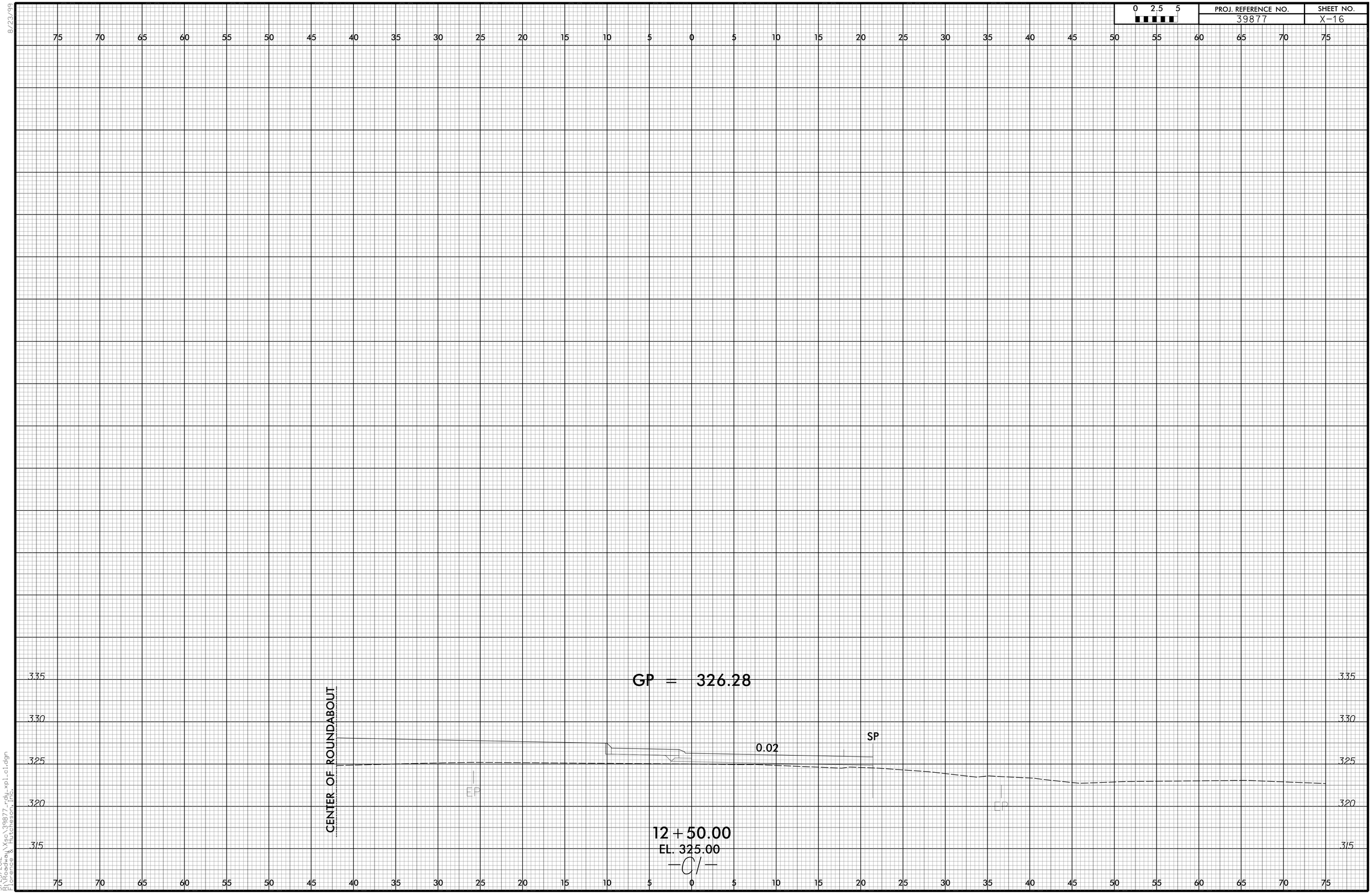

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