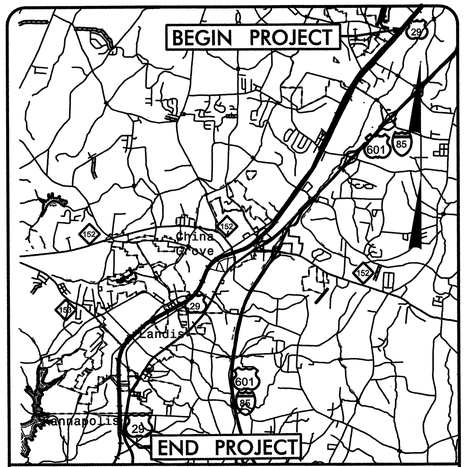
DGN 0164DEL_P10b2

CONTRACT: C203207 TIP PROJECT: P-5206B, P-5206C, & P-5206D

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
RAIL DIVISIONS

ROWAN COUNTY

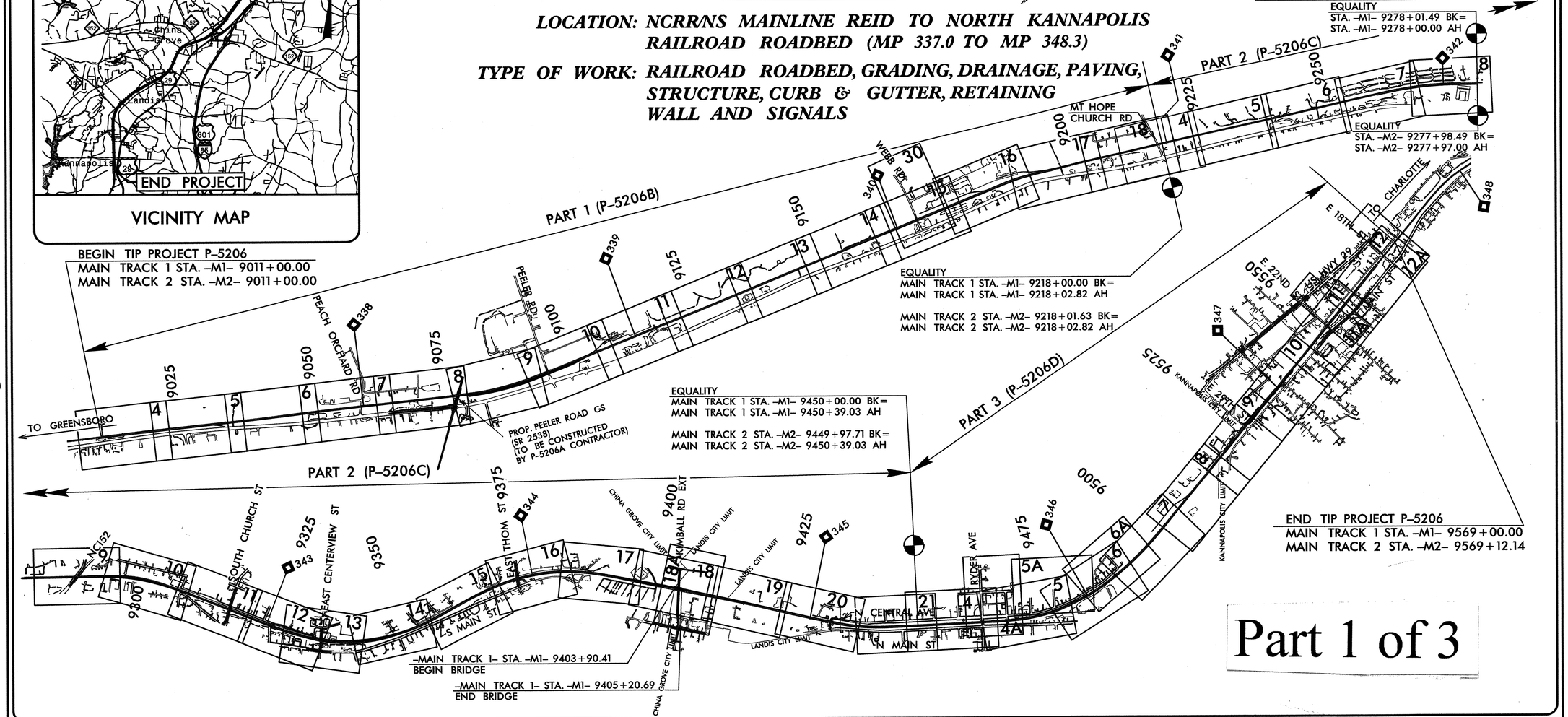
NAD 83/ NSRS 2007

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5206B, P-5206C, P-5206D	1	

WBS ELEMENT	F.A. PROJ. NO.	DESCRIPTION
52000.1.STR05T1B		PE,UTL PE
52000.1.STR06T3		PE, UTL PE
52000.1.STR07T1B		PE,UTL PE
52000.1.STR08T3		PE, UTL PE
52000.1.STR09T1B		PE,UTL PE
52000.1.STR10T3		PE, UTL PE
43219.2.STR08P5206		ROW
52000.3.STR02T4D	FRA-FR-HSR-0006-10-01-00	UTL CONST, CONST

LOCATION: ***NCRR/NS MAINLINE REID TO NORTH KANNAPOLIS RAILROAD ROADBED (MP 337.0 TO MP 348.3)***

TYPE OF WORK: ***RAILROAD ROADBED, GRADING, DRAINAGE, PAVING, STRUCTURE, CURB & GUTTER, RETAINING WALL AND SIGNALS***



Part 1 of 3

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PROJECT LENGTH

LENGTH OF RAIL TIP PROJECT P-5206B:	3.920 MILES
TOTAL LENGTH OF TIP PROJECT P-5206B:	3.920 MILES
LENGTH OF RAIL TIP PROJECT P-5206C:	4.369 MILES
LENGTH OF STRUCTURE TIP PROJECT P-5206C:	0.025 MILES
TOTAL LENGTH OF TIP PROJECT P-5206C:	4.394 MILES
LENGTH OF RAIL TIP PROJECT P-5206D:	2.246 MILES
TOTAL LENGTH OF TIP PROJECT P-5206D:	2.246 MILES
LENGTH OF RAIL TIP PROJECT P-5206:	10.535 MILES
LENGTH OF STRUCTURE TIP PROJECT P-5206:	0.025 MILES
TOTAL LENGTH OF TIP PROJECT P-5206:	10.560 MILES

PREPARED IN THE OFFICES OF:

STV/Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
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DONALD H. ARANT, PE
PROJECT ENGINEER

TONI R. WILSON, E.I.
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2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 31, 2012

LETTING DATE:
OCTOBER 15, 2013

NCDOT RAIL DIVISION CONTACT:
MATTHEW B. SIMMONS, PE

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
DESIGN AND CONSTRUCTION

$$$$$SYSTIME$$$$$
$$$$$DGN$$$$$
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DCN 0164DEL_P10b2

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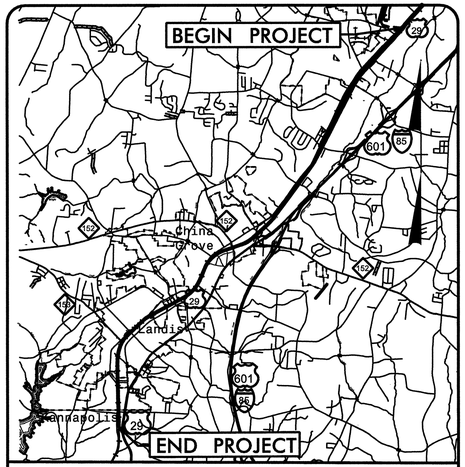

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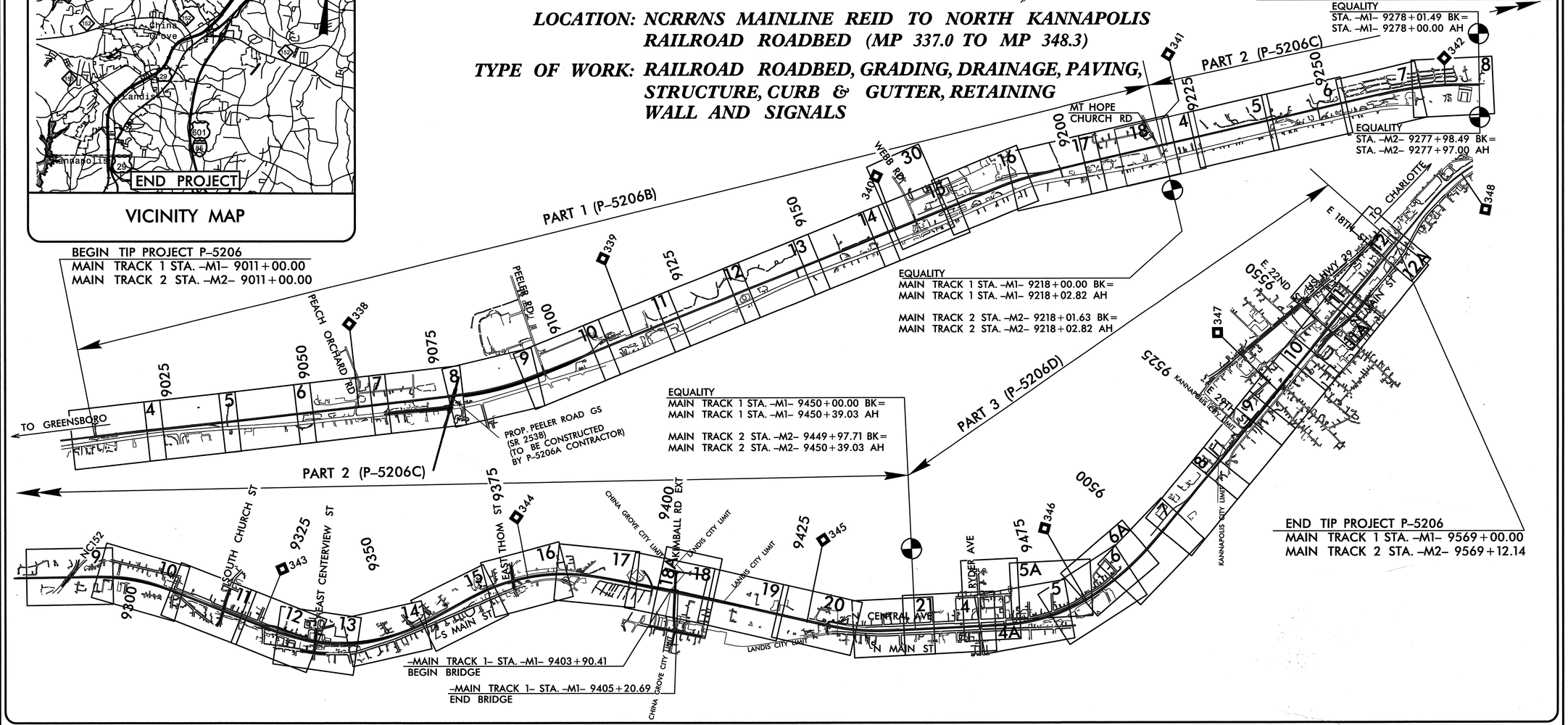

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NC DEPARTMENT OF TRANSPORTATION
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DESIGN AND CONSTRUCTION

$$$$USERNAME$$$$DGN$$$$SYSTIME$$$$

01640EL_P1052 8/17/99

PROJECT REFERENCE NO.	SHEET NO.
P-5206B, P-5206C, P-5206D	1-A

RAIL/ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 35018 ENGINEER JAMES L. TERRY 2/4/15

INDEX OF SHEETS

SHEET NO.	SHEET
1	Title Sheet Parts I, II, and III
1A	Index of Sheets, General Notes, and List of Standards
2 thru 2-A	Conventional Symbols
3 (2 Sheets)	Summary of Quantities
3-A	Earthwork, Guardrail, and Pavement Removal Summary
3-B and 3-C	Drainage Summary
Part I	
1	Title Sheet
1-A thru 1-C	Survey Control Sheets
2 thru 2-E	Pavement Schedule, Typical Sections, and Island Detail
2-F	Drainage Ditch Details
2-G thru 2-K	Track Geometry
2-L	Asphalt Underlayment Detail
2-M	Right of Way Detail
2-N	Railroad Signal Cabinet Pads Detail
3-A	Parcel Index Sheet
3-B	Summary of Quantities
3-C	Drainage Summary
4 thru 18	Plan Sheets and Main Track 2 Profile
19 thru 30	Main Track 1, and Auxiliary Tracks Profiles, Roadway Profiles
TMP-1 thru TMP-2	Traffic Management Plans
PMP-1 thru PMP-2	Signing & Pavement Marking Plans
EC-1 thru EC-33	Erosion Control Plans
SIG-1 thru SIG-5	Signalization Plans
UC-1 thru UC-6	Utility Construction Plans
UO-1 thru UO-16	Utilities By Others Plans
X-00	Cross Section Index
X-0A THRU X-0B	Cross Section Summary Sheets
X-01 thru X-81	Cross Sections
Part II	
1	Title Sheet
1-A thru 1-D	Survey Control Sheet
2 thru 2-C	Pavement Schedule, Typical Sections, and Bridge Typical
2-D	Curve Geometry Detail
2-E thru 2-F	Track Geometry
2-G thru 2-K	At-Grade Crossing Details
2-L	Non Mountable Concrete Island at RR Crossing Detail
2-M	Asphalt Underlayment Detail
2-N	Right of Way Gate Detail
2-O	Conversion of Drop Inlet or Junction Box to Catch Basin
2-P	Standard Embankment Monitoring
2-Q	Precast Concrete Parking Curb Detail
2-R	Concrete Flume Detail
2-S	Detail for Temporary Containment of Contaminated Soil
3-A	Earthwork, Guardrail, and Pavement Removal Summary
3-B thru 3-E	Drainage Summary
3-F	Parcel Index Sheet
3-G	Geotechnical Summary Tables
4 thru 21	Roadbed Grading Plan Sheets and Main Track 2 Profile
22 thru 32	Main Track 1, -Y7-, -SVC-, and Y10- Profiles
TMP-1 thru TMP-12	Traffic Management Plans
SD-1 and SD-2	Detour Sign Layout
PMP-1 thru PMP-6	Pavement Marking Plans
EC-1 thru EC-39	Erosion Control Plans
SIGN-1	Signing Plans
SIG-1 thru SIG-8	Signalization Plans
UC-1 thru UC-17	Utility Construction Plans
UO-1 thru UO-13	Utilities By Others Plans
X-INDEX	Cross Section Index
X-SUM1 and X-SUM2	Cross Section Earthwork Summary Sheets
X-1 thru X-118	Cross Sections
S-1 thru S-52	Structure Plans
Part III	
1	Title Sheet
1-A thru 1-E	Survey Control Sheets
2 thru 2-C	Pavement Schedule, and Typical Sections
2-D	Drainage Ditch Details
2-E thru 2-G	Track Geometry
2-H	Asphalt Underlayment Detail
2-I	Dimensions Detail Sheet
2-J	Right of Way Gate and Concrete Island Details
2-K	Special Details
2-L	Railroad Signal Cabinet Pads Detail
2-M	Temporary Shoring Detail
3-A	Parcel Index Sheet
3-B	Drainage Summary
3-C	Summary of Quantities
4 thru 20	Plan/Profile Sheets
TMP-1 thru TMP-14	Traffic Management Plans
PMP-1 thru PMP-7	Pavement Marking Plans
EC-1 thru EC-31	Erosion Control Plans
SIGN-1 thru SIGN-5	Signing Plans
SIG-1 thru SIG-17	Signalization Plans
UC-1 thru UC-13	Utility Construction Plans
UO-1 thru UO-8	Utilities By Others Plans
X-1	Cross Section Index
X-1A thru X-1B	Cross Section Summary Sheets
X-2 thru X-86	Cross Sections
S-1 thru S-5	Retaining Wall Envelope and Structure Plans

LIST OF STANDARD DRAWINGS

EFF. 01-17-2012
REV. 10-30-2012

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
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of 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
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
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
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
850.01	Concrete Paved Ditches
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
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES FOR RAILROAD GRADING

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

THE PROPOSED GRADE LINES SHOWN DENOTE THE FINAL ELEVATION OF THE PROPOSED TOP OF LOW RAIL. WHERE NO PROPOSED GRADE LINES ARE SHOWN, THE PROFILES SHOWN DEPICT THE EXISTING TOP OF RAIL.

CONTRACTOR SHALL CONSTRUCT HEADWALLS AT INLET AND OUTLET LOCATIONS FOR ALL DRAINAGE STRUCTURES CONSTRUCTED WITHIN NCRR RIGHT-OF-WAY. CONTRACTOR SHALL REMOVE ALL HEADWALLS ON DRAINAGE STRUCTURES INDICATED TO BE FILLED WITH FLOWABLE MATERIAL.

THE CONTRACTOR SHALL NOT ENTER ONTO RAILROAD RIGHT OF WAY WITHOUT PERMISSION FROM THE OWNER AND AN APPOINTED NORFOLK SOUTHERN FLAGMAN ON DUTY.

THE CONTRACTOR SHALL NOT INTERRUPT THE OPERATIONS OF THE RAILROAD WITHOUT PRIOR APPROVAL OF THE RAILROAD REPRESENTATIVE.

NORFOLK SOUTHERN IS RESPONSIBLE FOR REMOVAL/ RELOCATION OF ALL RAILROAD SIGNS AND SIGNALS. CONTRACTOR TO COORDINATE DETAILS WITH NORFOLK SOUTHERN.

REMOVAL OF EXISTING CROSSINGS TO BE DONE BY NORFOLK SOUTHERN CONTRACTOR WITHIN 10' OF EXISTING TRACK CENTER, INCLUDING PAVEMENT.

ALL RR SIGNS AND GATES ARE PROPERTY OF NORFOLK SOUTHERN. COORDINATE ANY CONFLICTS WITH NORFOLK SOUTHERN PRIOR TO DISTURBING.

GENERAL NOTES

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 07-30-2012

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.

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

BERM DITCHES:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

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

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, WINDSTREAM COMMUNICATIONS, PSNC ENERGY, TIME WARNER CABLE, TOWN OF LANDIS, ELECTRICITIES OF LANDIS, TOWN OF CHINA GROVE, SALISBURY-ROWAN UTILITIES, CITY OF KANNAPOLIS, TW TELECOM.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

DGN 0164DEL_P10b2

PROJECT REFERENCE NO.	SHEET NO.
P-5206B, P-5206C, P-5206D	2

Note: Not to Scale

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

STATE OF NORTH CAROLINA
RAIL DIVISION

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — IP
- 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:

- Existing Track To Be Retained
- Existing Track to be Removed
- Existing RR Signal Milepost — MILEPOST 35
- Proposed Milepost
- Proposed Track
- Proposed Turnout
- Existing 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. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

ABBREVIATIONS

TRACK ALIGNMENT – HORIZONTAL

CD	Cant Deficiency
CP	Control Point
CS	Curve to Spiral
Dc	Degree of Curvature (Chord Defined)
Ea	Actual Superelevation (Inches)
Eu	Unbalanced Superelevation (Inches)
I	Curve Intersection Angle
L	Length of Curve
LHTO	Left Hand Turnout
Ls	Length of Spiral
PC	Point of Curvature
PI	Point of Intersection
PI/TO	Point of Intersection/Turnout
PINC	Point of Intersection,No Curve
POT	Point on Tangent
PS	Point of Switch
PT	Point of Tangency
R	Radius
RHTO	Right Hand Turnout
SC	Spiral to Curve
SPI	Point of Intersection (Spiral)
ST	Spiral to Tangent
TO	Turnout
TS	Tangent to Spiral
X	Spiral Tangent Length to Offset
Y	Spiral Tangent Offset

TRACK ALIGNMENT – VERTICAL

EL/ELEV	Elevation
L	Vertical Curve Length
R	Rate of Change of Gradient, per 100 Ft
T/R / T/RAIL	Top of Rail
VPC	Vertical Point of Curvature
VPI	Vertical Point of Intersection
VPT	Vertical Point of Tangency

DRAINAGE

BCCMP	Bituminous Coated Corrugated Metal Piple
CI/CIP	Cast Iron Pipe
DI	Drop Inlet
DIA	Diameter
FF	Filter Fabric
INV	Invert
RCB	Reinforced Concrete Box Culvert
RCP	Reinforced Concrete Pipe
SCP	Steel Casing Pipe
STB	Stone Box Culvert

MISCELLANEOUS:

Δ_c	Curve Angle
Δ_s	Spiral Angle
θ_s	Spiral Deflection
A1	Prop. Siding Track 1
A2	Prop. Siding Track 2
A3	Prop. Spur Track 1
A4	Prop. Spur Track 2
ABS	Absolute
AEI	Automatic Equipment Identification
AH	Ahead
AVE	Avenue
℄	Baseline
BK	Back
BLDG	Building
BLVD	Boulevard
℄	Centerline
C	Cut
CB	Catch Basin
CL	Class
CLEAR	Clearance
CLR	Clear
CONC	Concrete
CONST	Construction
CTL&S	Cut, Throw, Line, and Surface
DR	Drive
DWG	Drawing
E	East
EB	Eastbound
ESMT	Easement
EST	Estimated
EX/EXIST	Existing
F	Fill
FND	Foundation
FT	Feet
GRD	Ground
HORIZ	Horizontal
HW	Headwall
L&S	Line & Surface
LF	Linear Feet
LH	Lefthand
LT	Left
M1	Prop. Main Track 1
M2	Prop. Main Track 2
MAX	Maximum
MIN	Minimum
MP	Milepost
MPH	Miles Per Hour
N	North
N/A	Not Applicable

MISCELLANEOUS (CONT'D):

NB	Northbound
NCRR	North Carolina Railroad
NO	Number
NS/NSR	Norfolk Southern Railway
OHU	Overhead Utility
PAV'T/PVMT	Pavement
PGL	Profile Grade Line
PROP	Proposed
PSRM	Permanent Soil Reinforcement Mat
R/W	Right -of-Way
RD	Road
REQ'D	Required
RH	Righthand
RR	Railroad
RT	Right
S.U.E.	Subsurface Utility Engineering
S	South
SB	Southbound
SEG	Segment
SHLDR	Shoulder
SHT	Sheet
SR	State Route
ST	Street
STA	Station
SWM	Storm Water Management
SY	Square Yards
TRK	Track
TYP	Typical
V	Velocity (MPH)
VAR	Varies
VERT	Vertical
W	West
W/	With
WB	Westbound

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B, P-5206C, P-5206D	3 (1 of 2)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203207

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	4	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	10,400	CY	UNDERCUT EXCAVATION
0127000000-N	SP	27	EA	EMBANKMENT SETTLEMENT GAUGES
0134000000-E	240	1,530	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	260	LF	BERM DITCH CONSTRUCTION
0195000000-E	265	6,200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	7,100	SY	GEOTEXTILE FOR SOIL STABILIZATION
0199000000-E	SP	3,760	SF	TEMPORARY SHORING
0255000000-E	SP	100	TON	GENERIC GRADING ITEM HAULING AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL
0318000000-E	300	837	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	1,360	SY	FOUNDATION CONDITIONING GEOTEXTILE
0335200000-E	305	68	LF	15" DRAINAGE PIPE
0366000000-E	310	360	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E	310	304	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E	310	60	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E	310	44	LF	36" RC PIPE CULVERTS, CLASS III
0448200000-E	310	1,106	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	8	LF	18" RC PIPE CULVERTS, CLASS IV
0448500000-E	310	684	LF	30" RC PIPE CULVERTS, CLASS IV
0448600000-E	310	32	LF	36" RC PIPE CULVERTS, CLASS IV
0582000000-E	310	68	LF	15" CS PIPE CULVERTS, 0.064" THICK
0588000000-E	310	196	LF	18" CS PIPE CULVERTS, 0.064" THICK
0600000000-E	310	56	LF	30" CS PIPE CULVERTS, 0.079" THICK
0986000000-E	SP	100	LF	GENERIC PIPE ITEM 30" BCCM PIPE CULVERT, 0.079" THICK
0986000000-E	SP	251	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.5" THICK, GRADE B, IN SOIL
0986000000-E	SP	251	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.5" THICK, GRADE B, NOT IN SOIL
0986000000-E	SP	290	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.5" THICK, GRADE B, OPEN CUT
0986000000-E	SP	85	LF	GENERIC PIPE ITEM 42" WELDED STEEL PIPE, 0.625" THICK, GRADE B, IN SOIL
0986000000-E	SP	85	LF	GENERIC PIPE ITEM 42" WELDED STEEL PIPE, 0.625" THICK, GRADE B, NOT IN SOIL
0986000000-E	SP	213	LF	GENERIC PIPE ITEM 42" WELDED STEEL PIPE, 0.625" THICK, GRADE B, OPEN CUT
0986000000-E	SP	40	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.625" THICK, GRADE B, IN SOIL
0986000000-E	SP	40	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.625" THICK, GRADE B, NOT IN SOIL
0986000000-E	SP	64	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.625" THICK, GRADE B, OPEN CUT
0986000000-E	SP	25	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.75" THICK, GRADE B, IN SOIL
0986000000-E	SP	25	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.75" THICK, GRADE B, NOT IN SOIL
0986000000-E	SP	90	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.75" THICK, GRADE B, OPEN CUT
0992000000-E	SP	2	EA	GENERIC PIPE ITEM 30" BCCM PIPE ELBOWS, 0.079" THICK
0995000000-E	340	1,625	LF	PIPE REMOVAL
0996000000-N	350	4	EA	PIPE CLEAN-OUT
1077000000-E	SP	1,060	TON	#57 STONE
1099500000-E	505	3,250	CY	SHALLOW UNDERCUT
1099700000-E	505	6,850	TON	CLASS IV SUBGRADE STABILIZATION
1110000000-E	510	1,100	TON	STABILIZER AGGREGATE
1121000000-E	520	269	TON	AGGREGATE BASE COURSE
1220000000-E	545	4,460	TON	INCIDENTAL STONE BASE
1275000000-E	600	72	GAL	PRIME COAT
1297000000-E	607	3,500	SY	MILLING ASPHALT PAVEMENT, ***" DEPTH (1-1/2")
1330000000-E	607	13,285	SY	INCIDENTAL MILLING
1489000000-E	610	6,205	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	1,640	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	3,550	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1575000000-E	620	571	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	925	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	109	EA	RIGHT OF WAY MARKERS
2022000000-E	815	403.2	CY	SUBDRAIN EXCAVATION
2033000000-E	815	302.4	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,800	LF	6" PERFORATED SUBDRAIN PIPE
2070000000-N	815	15	EA	SUBDRAIN PIPE OUTLET
2077000000-E	815	351	LF	6" OUTLET PIPE
2209000000-E	838	117	CY	ENDWALLS
2220000000-E	838	15	CY	REINFORCED ENDWALLS
2275000000-E	SP	336	CY	FLOWABLE FILL
2286000000-N	840	49	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	11.97	LF	MASONRY DRAINAGE STRUCTURES
2354200000-N	840	1	EA	FRAME WITH GRATE, STD 840.24
2364000000-N	840	8	EA	FRAME WITH TWO GRATES, STD 840.16
2366000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.24
2374000000-N	840	9	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	14	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	10	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	11	EA	FRAME WITH COVER, STD 840.54
2451000000-N	852	4	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLET
2484000000-E	SP	5,265	LF	GENERIC DRAINAGE ITEM SUBSURFACE DRAIN
2535000000-E	846	580	LF	**"X **" CONCRETE CURB (8" X 12")
2542000000-E	846	500	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	6,495	LF	2'-6" CONCRETE CURB & GUTTER
2570000000-N	SP	2	EA	MODIFIED CONCRETE FLUME
2591000000-E	848	3,275	SY	4" CONCRETE SIDEWALK
2605000000-N	848	47	EA	CONCRETE CURB RAMP
2612000000-E	848	490	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	10	SY	4" CONCRETE PAVED DITCH
2738000000-E	SP	380	SY	GENERIC PAVING ITEM SPECIAL MONOLITHIC CONCRETE ISLAND
2759000000-N	SP	1	EA	GENERIC PAVING ITEM CONCRETE FLUME
2759000000-N	SP	24	EA	GENERIC PAVING ITEM PRECAST CONCRETE PARKING BUMPER
2830000000-N	858	12	EA	ADJUSTMENT OF MANHOLES
2845000000-N	858	20	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
2920000000-N	859	1	EA	CONVERT EXISTING DROP INLET TO CATCH BASIN
2995000000-N	SP	5	EA	GENERIC DRAINAGE ITEM CONVERT EXISTING CATCH BASIN TO TRAFFIC BEARING JUNCTION BOX WITH MANHOLE
3030000000-E	862	462.5	LF	STEEL BM GUARDRAIL
3105000000-N	862	20	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3150000000-N	862	15	EA	ADDITIONAL GUARDRAIL POSTS
3270000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	179	LF	REMOVE EXISTING GUARDRAIL
3536000000-E	866	312	LF	CHAIN LINK FENCE, 48" FABRIC
3542000000-E	866	27	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE
3548000000-E	866	3	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE
3563000000-E	SP	190	LF	TEMP **" WOVEN WIRE FENCE, COMPLETE W/POSTS (60")
3578000000-N	SP	7	EA	GENERIC FENCING ITEM RIGHT OF WAY GATE
3628000000-E	876	1,530	TON	RIP RAP, CLASS I
3649000000-E	876	808	TON	RIP RAP, CLASS B
3656000000-E	876	9,640	SY	GEOTEXTILE FOR DRAINAGE
3832000000-E	SP	5,670	TF	RAILROAD TRACK TO BE REMOVED
3885000000-E	SP	127,390	TON	GENERIC TRACKWORK ITEM SUB-BALLAST
4025000000-E	901	345	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)
4025000000-E	901	57	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (F)
4072000000-E	903	755	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4078000000-E	903	7	EA	SUPPORTS, 2-LB STEEL U-CHANNEL
4096000000-N	904	12	EA	SIGN ERECTION, TYPE D
4102000000-N	904	75	EA	SIGN ERECTION, TYPE E
4155000000-N	907	35	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	1,952	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	950	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	269	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	1	EA	FLASHING ARROW BOARD
4420000000-N	1120	4	EA	PORTABLE CHANGEABLE MESSAGE SIGN
4430000000-N	1130	189	EA	DRUMS
4435000000-N	1135	165	EA	CONES
4445000000-E	1145	926	LF	BARRICADES (TYPE III)
4455000000-N	1150	135	DAY	FLAGGER
4490000000-E	1170	1,640	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
4516000000-N	1180	101	EA	SKINNY DRUM
4520000000-N	1266	152	EA	TUBULAR MARKERS (FIXED)
4685000000-E	1205	5,818	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	18,829	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	945	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	265	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4705000000-E	1205	824	LF	THERMOPLASTIC PAVEMENT MARKING LINES (16", 120 MILS)
4710000000-E	1205	1,095	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4721000000-E	1205	10	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	54	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	29,386	LF	PAINT PAVEMENT MARKING LINES (4")

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

PROJECT REFERENCE No.	SHEET No.
P-5206B, P-5206C, P-5206D	3 (2 of 2)

ItemNumber	Sec #	Quantity	Unit	Description
4820000000-E	1205	378	LF	PAINT PAVEMENT MARKING LINES (8")
4830000000-E	1205	448	LF	PAINT PAVEMENT MARKING LINES (16")
4835000000-E	1205	785	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	20	EA	PAINT PAVEMENT MARKING CHARACTER
4845000000-N	1205	26	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	10,422	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	24	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	4	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	401	EA	PERMANENT RAISED PAVEMENT MARKERS
5319000000-E	1505	1.5	CY	CLASS B CONCRETE FOR ENCASING UTILITY LINES
5325600000-E	1510	4,314	LF	6" WATER LINE
5325800000-E	1510	432	LF	8" WATER LINE
5326200000-E	1510	742	LF	12" WATER LINE
5540000000-E	1515	9	EA	6" VALVE
5558000000-E	1515	2	EA	12" VALVE
5571400000-E	1515	1	EA	4" TAPPING VALVE
5571600000-E	1515	4	EA	6" TAPPING VALVE
5571800000-E	1515	1	EA	8" TAPPING VALVE
5589200000-E	1515	2	EA	2" AIR RELEASE VALVE
5606000000-E	1515	2	EA	2" BLOW OFF
5648000000-N	1515	11	EA	RELOCATE WATER METER
5649000000-N	1515	24	EA	RECONNECT WATER METER
5666000000-E	1515	1	EA	FIRE HYDRANT
5672000000-N	1515	10	EA	RELOCATE FIRE HYDRANT
5691300000-E	1520	1,188	LF	8" SANITARY GRAVITY SEWER
5709100000-E	1520	10	LF	2" FORCE MAIN SEWER
5709300000-E	1520	460	LF	6" FORCE MAIN SEWER
5709400000-E	1520	195	LF	8" FORCE MAIN SEWER
5768000000-N	1520	4	EA	SANITARY SEWER CLEAN-OUT
5775000000-E	1525	12	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	46	LF	UTILITY MANHOLE WALL, 4' DIA
5800000000-E	1530	2,388	LF	ABANDON 6" UTILITY PIPE
5801000000-E	1530	1,915	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	1,007	LF	ABANDON 12" UTILITY PIPE
5811000000-E	1530	100	LF	ABANDON 18" UTILITY PIPE
5815000000-N	1530	5	EA	REMOVE WATER METER
5815500000-N	1530	2	EA	REMOVE FIRE HYDRANT
5816000000-N	1530	1	EA	ABANDON UTILITY MANHOLE
5828000000-N	1530	4	EA	REMOVE UTILITY MANHOLE
5835700000-E	1540	700	LF	16" ENCASEMENT PIPE
5835800000-E	1540	535	LF	18" ENCASEMENT PIPE
5835900000-E	1540	96	LF	20" ENCASEMENT PIPE
5836000000-E	1540	510	LF	24" ENCASEMENT PIPE
5871900000-E	1550	351	LF	TRENCHLESS INSTALLATION OF 16" IN SOIL
5871910000-E	1550	349	LF	TRENCHLESS INSTALLATION OF 16" NOT IN SOIL
5872000000-E	1550	268	LF	TRENCHLESS INSTALLATION OF 18" IN SOIL
5872010000-E	1550	267	LF	TRENCHLESS INSTALLATION OF 18" NOT IN SOIL
5872200000-E	1550	175	LF	TRENCHLESS INSTALLATION OF 24" IN SOIL
5872210000-E	1550	175	LF	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL
6000000000-E	1605	66,600	LF	TEMPORARY SILT FENCE
6006000000-E	1610	28,000	TON	STONE FOR EROSION CONTROL, CLASS A

ItemNumber	Sec #	Quantity	Unit	Description
6009000000-E	1610	17,180	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	7,720	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	214.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	5,050	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	22.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	3,215	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	600	LF	SAFETY FENCE
6030000000-E	1630	47,800	CY	SILT EXCAVATION
6036000000-E	1631	255,420	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	235	SY	COIR FIBER MAT
6038000000-E	SP	2,200	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	4,640	LF	1/4" HARDWARE CLOTH
6070000000-N	1639	24	EA	SPECIAL STILLING BASINS
6071010000-E	SP	140	LF	WATTLE
6071012000-E	SP	9,490	LF	COIR FIBER WATTLE
6071020000-E	SP	8,640	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	2,390	LF	COIR FIBER BAFFLE
6071050000-E	SP	15	EA	**" SKIMMER (1-1/2")
6071050000-E	SP	3	EA	**" SKIMMER (2")
6071050000-E	SP	1	EA	**" SKIMMER (2-1/2")
6084000000-E	1660	210	ACR	SEEDING & MULCHING
6087000000-E	1660	132	ACR	MOWING
6090000000-E	1661	2,200	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	6.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	3,250	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	96.75	TON	FERTILIZER TOPDRESSING
6114500000-N	1667	80	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	350	EA	RESPONSE FOR EROSION CONTROL
6132000000-N	SP	30	EA	GENERIC EROSION CONTROL ITEM SUPPLEMENTAL RESPONSE FOR EROSION CONTROL
7060000000-E	1705	4,060	LF	SIGNAL CABLE
7120000000-E	1705	38	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7132000000-E	1705	7	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
7144000000-E	1705	2	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7252000000-E	1710	80	LF	MESSENGER CABLE (1/4")
7264000000-E	1710	1,150	LF	MESSENGER CABLE (3/8")
7288000000-E	1715	120	LF	PAVED TRENCHING (**********) (1, 2")
7300000000-E	1715	2,470	LF	UNPAVED TRENCHING (**********) (1, 2")
7301000000-E	1715	130	LF	DIRECTIONAL DRILL (**********) (1, 2")
7301000000-E	1715	310	LF	DIRECTIONAL DRILL (**********) (2, 2")
7324000000-N	1716	41	EA	JUNCTION BOX (STANDARD SIZE)
7348000000-N	1716	8	EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)
7360000000-N	1720	10	EA	WOOD POLE
7372000000-N	1721	22	EA	GUY ASSEMBLY
7408000000-E	1722	3	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	15	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	3,590	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	7,135	LF	LEAD-IN CABLE (**********) (14-2)
7590000000-N	SP	2	EA	METAL POLE WITH DUAL MAST ARM
7613000000-N	SP	2	EA	SOIL TEST
7614100000-E	SP	12	CY	DRILLED PIER FOUNDATION (14-2)

ItemNumber	Sec #	Quantity	Unit	Description
7631000000-N	SP	2	EA	MAST ARM WITH METAL POLE DESIGN
7636000000-N	1745	16	EA	SIGN FOR SIGNALS
7675000000-N	1747	5	EA	LED BLANKOUT SIGN
7684000000-N	1750	5	EA	SIGNAL CABINET FOUNDATION
7756000000-N	1751	5	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	23	EA	DETECTOR CARD (TYPE 2070L)
7901000000-N	1753	5	EA	CABINET BASE EXTENDER
7948000000-N	1757	1	EA	TRAFFIC SIGNAL REMOVAL
7990000000-E	SP	175	LF	GENERIC SIGNAL ITEM 2" RIGID METALLIC CONDUIT

0164DEL_P10b2

COMPUTED BY:	DATE:
CHECKED BY:	DATE:

PROJECT NO.	SHEET NO.
P-5206B. P-5206C, P-5206D	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Line	Station	Station	Uncl. Excav.	Undercut Excav.	Embank. +%	Borrow	Waste
P-5206B GRAND TOTAL			75,000	5,500	38,891		36,054
P-5206C GRAND TOTAL			58,600	4,700	110,060	73,400	17,089
P-5206D GRAND TOTAL			64,500	200	10,784		53,653
TOTAL			198,100	10,400	159,735	73,400	106,796
WASTE IN LIEU OF BORROW						-44,854	-44,854
GRAND TOTAL			198,100	10,400		28,547	61,943

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

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

	SY
P5206B TOTAL	1,930
P5206C TOTAL	7,990
P5206D TOTAL	3,800
TOTAL	13,720

SUMMARY OF SETTLEMENT GAUGES

	EA
P-5206C TOTAL	27
P-5206B TOTAL	
P-5206D TOTAL	
P5206 TOTAL :	27

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH APPR. END	FLARE LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS GRAU 350	ANCHORS B-77	ANCHORS AT-1	ANCHORS III	ANCHORS III SHOP CUR.	TERMINAL END SECTION TES		IMP. ATTEN. TYPE 350 EA	IMP. ATTEN. TYPE 350 G	IMP. ATTEN. TYPE 350 NG	REMOVE EXISTING GRDRAIL	ADDITIONAL GUARDRAIL POSTS	REMARKS
P5206B TOTAL				75																4					25	5	
P5206C TOTAL				225																14					154	5	
P5206D TOTAL				162.5											2	2				2						5	
		GRAND TOTALS		462.50											2	2				20					179	15	
		SAY																									

0164DEL_P1052

SANDRA-LAPTOP

COMPUTED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
P-5206B, P-5206C, P-5206D	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	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE												C.S. PIPE SIZE						B.C.C.M. PIPE SIZE		R.C. PIPE CLASS III SIZE							R.C. PIPE CLASS IV SIZE						
								12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	12"	15"	18"	24"	30"		30"		12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																				.064	.064	.064	.064	.079		.079																
P-5206B TOTALS									36																			280		288												
P-5206C TOTALS									32																	100		80			60	44				600			684	32		
P-5206D TOTALS																				68	196		56							16						506	8					
P-5206 TOTALS									68											68	196		56			100		360		304	60	44				1106	8		684	32		

STATION	36" WELDED STEEL PIPE, 0.50" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE, 0.50" THICK GRADE B NOT IN SOIL	36" WELDED STEEL PIPE, 0.50" THICK GRADE B (OPEN CUT)	42" WELDED STEEL PIPE, 0.625" THICK GRADE B IN SOIL	42" WELDED STEEL PIPE, 0.625" THICK GRADE B NOT IN SOIL	42" WELDED STEEL PIPE, 0.625" THICK GRADE B (OPEN CUT)	48" WELDED STEEL PIPE, 0.625" THICK GRADE B IN SOIL	48" WELDED STEEL PIPE, 0.625" THICK GRADE B NOT IN SOIL	48" WELDED STEEL PIPE, 0.625" THICK GRADE B (OPEN CUT)	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A: 5.0' THRU 10.0'	LIN. FT. B: 10.0' AND ABOVE	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 DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.J.B. STD. 840.34	FRAME WITH COVER STD. 840.54	J.B. STD. 840.31 OR 840.32	CONVERT D.I. TO CB	CONVERT CB TO TB.JB	CONVERT CB TO JB	OPEN THROAT CB STD. 840.04 OR 840.05	FLOWABLE FILL, C.Y.	B.C.C.M.P. ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	MODIFIED CONC. FLUME	CONC. FLUME	PIPE CLEAN-OUT	PIPE REMOVAL LIN. FT.	REMARKS
P-5206B TOTALS	144	144	148				40	40	44	40	6								4		4	4					2	2					80						250	
P-5206C TOTALS	75	75	122	50	50	156				50	19		8	15	3	10	3			1	1	1	1	1	2	1	1		1				240	2 @ 30"			1	4	800	
P-5206D TOTALS	32	32	20	35	35	57			20	27	24	3.97		17	6	4	7			3	3					3	8			5		1	16			2			575	
P-5206 TOTALS	251	251	290	85	85	213	40	40	64	117	49	11.97		32	9	14	10	4		8	8	1	1	1	2	4	11	2	1	5		1	336	2 @ 30"		2	1	4	1625	

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

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SANDRA-LAPTOP

COMPUTED BY: _____ DATE: _____

CHECKED BY: _____ DATE: _____

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
P-5206B, P-5206C, P-5206D	3-C

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 54" & OVER)

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	C.S. PIPE 54" .109	54" .138	54" .168	SHOP ELON-GATED .138	SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .139	72" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	54" WELDED STEEL PIPE, 0.75" THICK GRADE B IN SOIL	54" WELDED STEEL PIPE, 0.75" THICK GRADE B NOT IN SOIL	54" WELDED STEEL PIPE, 0.75" THICK GRADE B (OPEN CUT)	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & Size	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
P-5206B TOTALS																																																
P-5206C TOTALS																														25	25	90		15														
P-5206D TOTALS																																																
P-5206 TOTALS																														25	25	90		15														

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.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING

DGN 0164DEL_P10b2

TIP PROJECT: P-5206B

CONTRACT: C203207

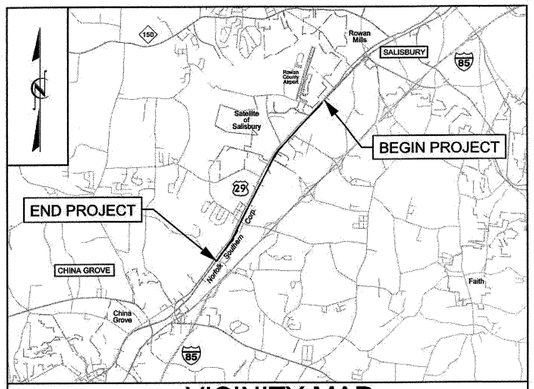
STATE OF NORTH CAROLINA
RAIL DIVISIONS

ROWAN COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5206B	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
52000.1.STR05T1B		PE, UTL PE
52000.1.STR06T3		PE, UTL PE
43219.2.STR08P5206		ROW
52000.3.STR02T4D	FRA-FR-HSR-0006-10-01-00	UTL CONST., CONST.

PART 1 OF 3

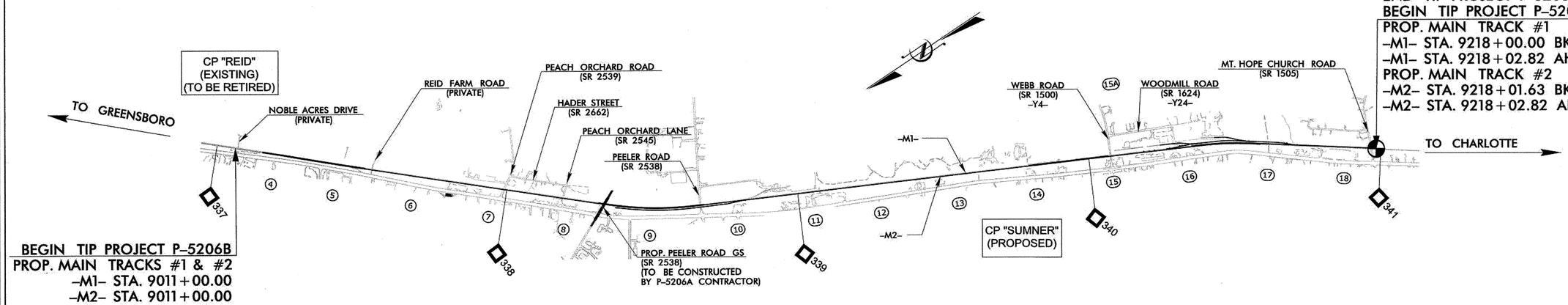


VICINITY MAP

LOCATION: NS MAINLINE RAILROAD ROADBED FROM CP "REID" (MP 337.0) TO SOUTH OF MT. HOPE CHURCH ROAD (SR 1505, MP 340.9)

TYPE OF WORK: RAILROAD ROADBED, GRADING, DRAINAGE, PAVING, AND CURB AND GUTTER

END TIP PROJECT P-5206B
BEGIN TIP PROJECT P-5206C
PROP. MAIN TRACK #1
-M1- STA. 9218+00.00 BK =
-M1- STA. 9218+02.82 AH
PROP. MAIN TRACK #2
-M2- STA. 9218+01.63 BK =
-M2- STA. 9218+02.82 AH



BEGIN TIP PROJECT P-5206B
PROP. MAIN TRACKS #1 & #2
-M1- STA. 9011+00.00
-M2- STA. 9011+00.00

GRAPHIC SCALES

50 0 50 100
PLANS

50 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

PROJECT LENGTH

LENGTH OF RAIL TIP PROJECT	3.92 MILES
LENGTH OF STRUCTURE TIP PROJECT	0.0 MILES
TOTAL LENGTH OF TIP PROJECT	3.92 MILES

Prepared In the Offices of:

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-3243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-555

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 2012

LETTING DATE:
OCTOBER 15, 2013

DONALD H. ARANT, P.E.
RAIL PROJECT ENGINEER
TONI R. WILSON, E.I.
RAIL DESIGNER
JOSH DALTON, P.E.
HYDROLOGY ENGINEER
NIKKI T. HONEYCUTT
ROADWAY ENGINEER
MATTHEW B. SIMMONS, P.E.
NCDOT PROJECT MANAGER

RAIL ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT
3-2-13
SIGNATURE: P.E.

ROADWAY ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 039234 ENGINEER NIKKI T. HONEYCUTT
2-26-13
SIGNATURE: P.E.

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
3-2-13
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
DESIGN AND CONSTRUCTION

8/1/2013
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simmondt

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	1-A
R/W SHEET NO.	

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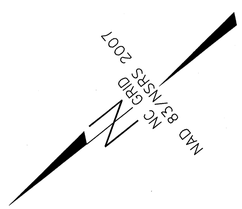
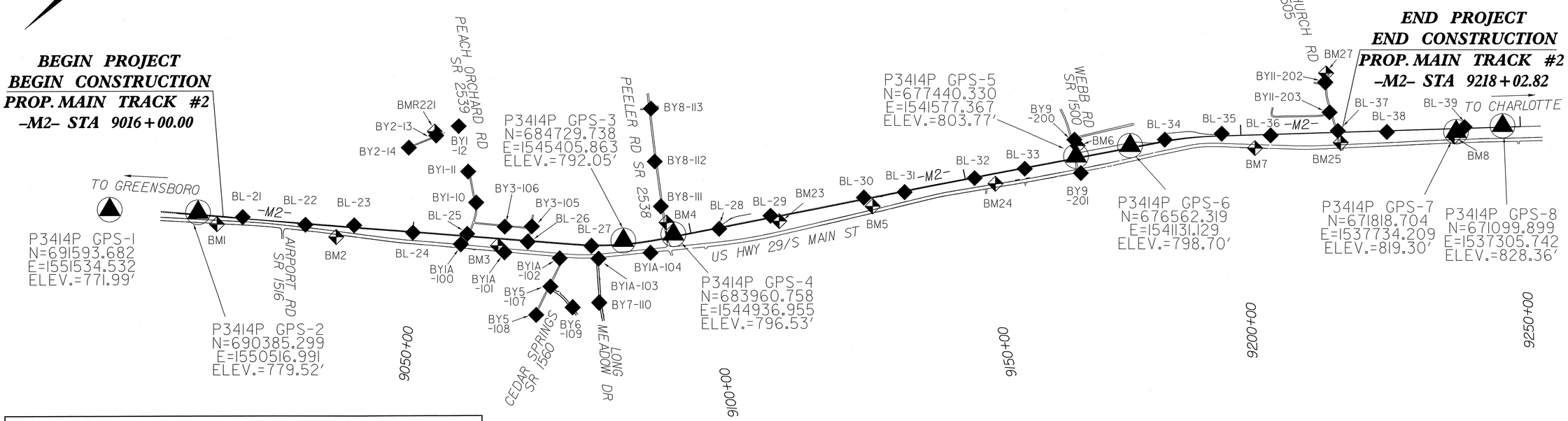
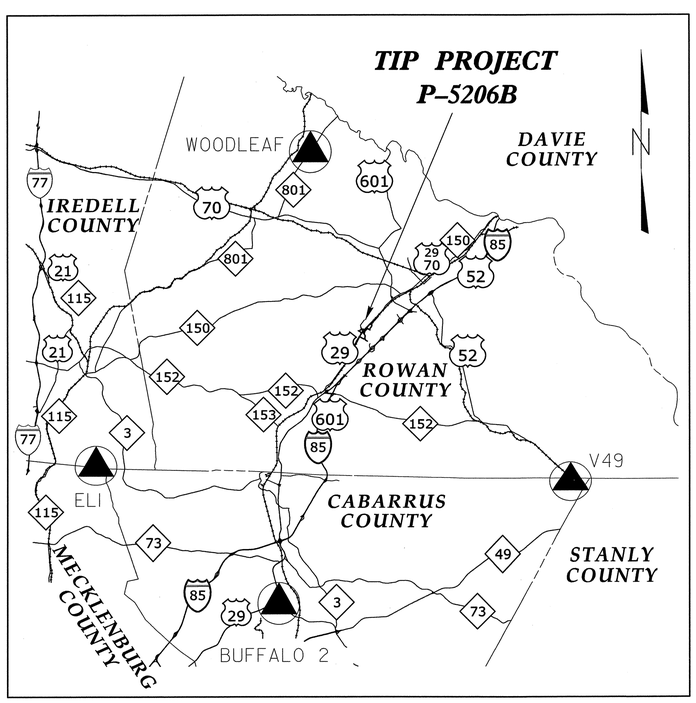
SURVEY CONTROL SHEET P-5206B







VICINITY MAP

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P3414P-10"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 666744.654(ft) EASTING: 1531939.796(ft)
ELEVATION: 821.60(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985378
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P3414P-10" TO -M2- STATION 9016+00.00 IS
N 37°59'50.6" E 29615.32'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/NSRS 2007 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.

2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
P5206B-P3414P_LS_GPSCALIB.HTML
P5206B-P3414P_LS_WGS84.TXT
P5206B-P3414P_LS_LOCAL.TXT
P5206B_LS_CONTROL.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

▲ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

5/9/2013
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tedmondson

SURVEY CONTROL SHEET P-5206B

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	1-B
R/W SHEET NO.	

GPS Calibration Report

Project : P3414PZ

TIP Number P3414P
User name tbovender Date & Time 6:15:58 AM 3/30/2009
Coordinate System US State Plane 1983(at ground) Zone North Carolina 3200
Horizontal Datum NAD 1983 (Conus)
Vertical Datum NAVD 88 Geoid Model G03NC
Coordinate Units US survey feet
Distance Units US survey feet
Height Units US survey feet

LOCAL SITE INFORMATION
Localized around
Latitude 35^34'18.46142"N
Longitude 80^34'26.64222"W
Site Scale Factor 1.0001462406
Height 719.931sft

The North Carolina Department of Transportation uses a Localized Coordinate System which is very similar to North Carolina Zone 3200 from which it is derived. Please take care in utilizing these coordinates to eliminate confusion of the two systems. This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center 667263.504sft
Easting coordinate of rotation center 1532682.097sft
Rotation about the center point 0^00'00"
Translation north 0.075sft
Translation east 0.003sft
Scale factor 0.99999875

Vertical Adjustment Parameters

Northing coordinate of origin point 691593.681sft
Easting coordinate of origin point 1551534.529sft
Vertical separation at origin 0.061sft
Slope north -0.708ppm
Slope east 0.902ppm

Geoid Model Definition

G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.003sft	0.001	1_GPS
Vertical	0.001sft	0.000	9_GPS
Three-dimensional	0.003sft	0.001	1_GPS

Datum Transformation Parameters

Datum Transformation computation not requested

Point P3414P GPS-1 Latitude 35^38'27.18153"N Longitude 80^30'34.06069"W Height 669.991sft	Northing 691593.681sft Easting 1551534.529sft Elevation 772.105sft Horz error 0.003sft Vert error 0.000sft 3D error 0.003sft	Point 1 Northing 691593.682sft Easting 1551534.532sft Elevation 772.105sft Utilized Horz and Vert Quality Adjusted quality
Point P3414P GPS -2 Latitude 35^38'15.07971"N Longitude 80^30'46.16340"W Height 677.436sft	Northing 690385.298sft Easting 1550516.988sft Elevation 779.520sft Horz error 0.003sft Vert error 0.000sft 3D error 0.003sft	Point 2 Northing 690385.299sft Easting 1550516.991sft Elevation 779.519sft Utilized Horz and Vert Quality Adjusted quality
Point P3414P GPS-3 Latitude 35^37'18.38221"N Longitude 80^31'47.01758"W Height 690.082sft	Northing 684729.738sft Easting 1545405.862sft Elevation 792.047sft Horz error 0.001sft Vert error 0.000sft 3D error 0.001sft	Point 3 Northing 684729.738sft Easting 1545405.863sft Elevation 792.047sft Utilized Horz and Vert Quality Adjusted quality
Point P3414P GPS-4 Latitude 35^37'10.70693"N Longitude 80^31'52.55258"W Height 694.583sft	Northing 683960.759sft Easting 1544936.955sft Elevation 796.530sft Horz error 0.000sft Vert error 0.000sft 3D error 0.000sft	Point 4 Northing 683960.758sft Easting 1544936.955sft Elevation 796.530sft Utilized Horz and Vert Quality Adjusted quality
Point 5_GPS Latitude 35^36'05.71756"N Longitude 80^32'32.01061"W Height 701.948sft	Northing 677440.331sft Easting 1541577.368sft Elevation 803.766sft Horz error 0.002sft Vert error 0.000sft 3D error 0.002sft	Point 5 Northing 677440.330sft Easting 1541577.367sft Elevation 803.766sft Utilized Horz and Vert Quality Adjusted quality
Point 6_GPS Latitude 35^35'56.96703"N Longitude 80^32'37.24806"W Height 696.894sft	Northing 676562.320sft Easting 1541131.131sft Elevation 798.696sft Horz error 0.002sft Vert error 0.000sft 3D error 0.002sft	Point 6 Northing 676562.319sft Easting 1541131.129sft Elevation 798.696sft Utilized Horz and Vert Quality Adjusted quality
Point 7_GPS Latitude 35^35'09.53698"N Longitude 80^33'17.47492"W Height 717.552sft	Northing 671818.705sft Easting 1537734.212sft Elevation 819.297sft Horz error 0.003sft Vert error 0.000sft 3D error 0.003sft	Point 7 Northing 671818.704sft Easting 1537734.209sft Elevation 819.296sft Utilized Horz and Vert Quality Adjusted quality
Point 8_GPS Latitude 35^35'02.36289"N Longitude 80^33'22.52512"W Height 726.624sft	Northing 671099.900sft Easting 1537305.744sft Elevation 828.358sft Horz error 0.003sft Vert error 0.000sft 3D error 0.003sft	Point 8 Northing 671099.899sft Easting 1537305.742sft Elevation 828.358sft Utilized Horz and Vert Quality Adjusted quality

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P3414P-10"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 666744.654(ft) EASTING: 1531939.796(ft)
ELEVATION: 821.60(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985378
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"P3414P-10" TO -M2- STATION 9016+00.00 IS
N 37°59'50.6" E 29615.32'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/NSRS 2007 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

THE FILES TO BE FOUND ARE AS FOLLOWS:
P5206B-P3414P_LS_GPSCALIB.HTML
P5206B-P3414P_LS_WGS84.TXT
P5206B-P3414P_LS_LOCAL.TXT
P5206B_LS_CONTROL.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

▲ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.*
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	1-C
R/W SHEET NO.	

SURVEY CONTROL SHEET P-5206B

BL

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
1	GPS P3414P-1	691593.6820	1551534.5320	771.99	OUTSIDE PROJECT LIMITS	
2	GPS P3414P-2	690385.2990	1550516.9910	779.52	9011+43.40	47.86 LT
21	BL-21	689811.5040	1549955.3930	782.82	9019+45.87	25.96 LT
22	BL-22	689015.3890	1549154.1400	781.73	9030+74.58	14.70 RT
23	BL-23	688335.9870	1548608.0370	778.24	9039+44.11	46.27 LT
24	BL-24	687593.7820	1547851.4750	781.72	9050+02.68	5.53 RT
25	BL-25	686845.7320	1547231.1750	786.52	9059+73.05	46.69 LT
26	BL-26	686082.5120	1546448.9100	790.33	9070+64.50	9.72 RT
27	BL-27	685236.3920	1545683.3430	793.03	9082+05.33	5.67 RT
3	GPS P3414P-3	684729.7380	1545405.8630	792.05	9087+81.05	76.63 LT
4	GPS P3414P-4	683960.7580	1544936.9550	796.53	9096+89.78	49.62 LT
28	BL-28	683256.8090	1544505.8800	801.95	9105+12.92	12.03 RT
29	BL-29	682393.0480	1544119.2340	807.66	9114+57.90	38.89 LT
30	BL-30	680884.9390	1543338.1800	804.49	9131+56.27	33.43 LT
31	BL-31	680251.8600	1542962.7340	803.96	9138+90.94	11.32 RT
32	BL-32	679113.7720	1542384.9560	806.21	9151+67.28	5.35 RT
33	BL-33	678303.0770	1541964.9480	805.57	9160+80.31	8.60 RT
5	GPS P3414P-5	677440.3300	1541577.3670	803.77	9170+24.82	40.77 LT
6	GPS P3414P-6	676562.3190	1541131.1290	798.70	9180+09.72	44.94 LT
34	BL-34	676005.5700	1540834.6900	795.88	9186+40.13	36.04 LT
35	BL-35	675137.5370	1540290.6390	803.57	9196+60.07	40.16 LT
36	BL-36	674467.9910	1539726.8360	807.18	9205+33.45	17.55 RT
37	BL-37	673472.8560	1539051.2240	812.89	9217+35.42	27.52 LT
38	BL-38	672795.2420	1538493.2310	816.86	9226+13.08	20.72 RT
7	GPS P3414P-7	671818.7040	1537734.2090	819.30	9238+49.50	53.43 RT
39	BL-39	671647.2040	1537706.1710	820.83	9240+04.23	25.67 LT
8	GPS P3414P-8	671099.8990	1537305.7420	828.36	9246+82.38	27.69 LT

BY1(RAIL 22)

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
R2212	BY1-12	685762.1835	1548851.1514	761.72	9056+69.18	1971.81 LT
R2211	BY1-11	686139.5559	1548099.3945	779.96	9059+02.32	1163.60 LT
R2210	BY1-10	686372.1023	1547573.4497	795.92	9060+88.54	619.53 LT

BY2(RAIL 22)

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
R2214	BY2-14	686703.6940	1549099.3450	759.55	9048+09.31	1515.01 LT
R2213	BY2-13	686183.8925	1548967.7024	764.03	9052+80.39	1771.15 LT

BY1A

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
100	BY1A-100	687047.4886	1547159.7685	790.29	9058+73.36	142.69 RT
101	BY1A-101	686523.9281	1546560.1021	787.76	9066+64.87	227.68 RT
102	BY1A-102	685817.7457	1545865.6258	795.02	9076+54.85	258.35 RT
103	BY1A-103	685277.0734	1545427.5002	792.27	9083+32.82	229.65 RT
104	BY1A-104	684485.2138	1544932.7088	789.18	9092+32.32	198.60 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
105	BY3-105	685856.5378	1546618.4278	782.23	9071+15.38	268.15 LT
106	BY3-106	686240.0944	1546916.3371	777.52	9066+31.51	226.58 LT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
107	BY5-107	686259.8283	1545570.2686	790.05	9075+30.68	775.31 RT
108	BY5-108	686768.2233	1545335.6759	790.13	9073+16.57	1292.67 RT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
109	BY6-109	686173.0008	1545036.3020	784.93	9079+45.55	1109.26 RT

BY7

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
110	BY7-110	685750.6302	1544804.6262	795.37	9083+47.84	1011.93 RT

BY8

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
113	BY8-113	682870.7977	1546965.8121	759.53	9097+31.85	2352.33 LT
112	BY8-112	683412.7597	1546169.2972	792.05	9096+13.89	1396.17 LT
111	BY8-111	683826.7224	1545467.1065	800.17	9095+66.31	582.40 LT

BY9

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
200	BY9-200	677278.8336	1541830.1878	794.07	9170+52.98	339.45 LT
201	BY9-201	677562.3121	1541283.4077	803.79	9170+50.61	276.44 RT

BY11

POINT	DESC.	NORTH	EAST	ELEVATION	M2 STATION	OFFSET
202	BY11-202	673107.5448	1539877.4510	798.80	9215+40.38	909.60 LT
203	BY11-203	673377.8816	1539407.8116	803.55	9216+00.73	371.08 LT

BENCHMARKS (NAVD88)

****

BM*1 ELEVATION = 785.02'
N 690252 E 1550140
M2 STATION 9014+98 138' RIGHT
CHISELED SQUARE IN TRAFFIC ISLAND OF
TRI STATE HOSPITAL SUPPLY CO

****
****

BM*2 ELEVATION = 777.50'
N 688718 E 1548643
M2 STATION 9036+40 187' RIGHT
CHISELED SQUARE AT SW CORNER OF CONC
PAD AT BELLSOUTH BUILDING

****
****

BM*3 ELEVATION = 788.72'
N 686544 E 1546727
M2 STATION 9065+37 119' RIGHT
PAINTED BOLT NEAREST TO RR ON BILLBOARD
AT ON TRACK AUTO SALES

****
****

BM*4 ELEVATION = 799.90'
N 683926 E 1545180
M2 STATION 9096+10 282' LEFT
CHISELED SQUARE IN NE CORNER OF
CONCRETE TAYLOR CLAY PRODUCTS SIGN PAD

****
****

BM*5 ELEVATION = 801.66'
N 680857 E 1543119
M2 STATION 9132+81 149' RIGHT
PAINTED SW BOLT ON BILLBOARD

****
****

BM*6 ELEVATION = 797.53'
N 677300 E 1541711
M2 STATION 9170+89 223' LEFT
CHISELED SQUARE ON ESSROC ITALCEMENTI
GROUP SIGN

****
****

BM*7 ELEVATION = 794.53'
N 674830 E 1539721
M2 STATION 9202+45 236' RIGHT
CHISELED SQUARE IN CONCRETE CURB
BETWEEN ADDRESS 6240 & 6230 ON HWY 29

****
****

BM*8 ELEVATION = 818.89'
N 671897 E 1537687
M2 STATION 9238+14 138' RIGHT
PAINTED BOLT

****

BENCHMARKS (NAVD88)

****

BM*12 ELEVATION = 829.64'
N 664717 E 1529017
M2 STATION 9353+74 86' RIGHT
CHISELED SQUARE IN CONCRETE SIDEWALK IN
FRONT OF 516 MAIN ST

****
****

BM*23 ELEVATION = 800.09'
N 682332 E 1543949
M2 STATION 9115+90 84 RIGHT
CHISELED SQUARE IN CONCRETE PAD AT CITY
AUTO & SALVAGE

****
****

BM*24 ELEVATION = 808.11'
N 678884 E 1542076
M2 STATION 9155+13 175' RIGHT
CHISELED SQUARE IN CONCRETE CURB IN
FRONT OF ALERT ALARMS & KING JAMES
BAPTIST CHURCH

****
****

BM*25 ELEVATION = 807.65'
N 673564 E 1538852
M2 STATION 9217+81 187' RIGHT
HIGH CORNER ON CONCRETE R/W MONUMENT AT
INTERSECTION OF US 29/S MAIN ST & MT
HOPE CHURCH RD. LOCATED IN SOUTHWEST
QUADRANT

****
****

BM*27 ELEVATION = 794.44'
N 672996 E 1539995
M2 STATION 9215+61 1071' LEFT
CHISELED CROSS IN SOUTH END OF 18"RCP
DRIVEWAY PIPE. DRIVE LEADS TO MOBILE
HOME. PIPE IS ON NORTH EDGE OF HIGH
TENSION LINE EASEMENT

****
****

BM*R221 ELEVATION = 762.74'
N 686159 E 1549041
M2 STATION 9052+49 1842' LEFT
RR SPIKE IN EASTERNMOST ROOT OF A 36"
WILLOW OAK

****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "P3414P-10"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 666744.654(ft) EASTING: 1531939.796(ft)
ELEVATION: 821.60(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.99985378
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"P3414P-10" TO -M2- STATION 9016+00.00 IS
N 37°59'50.6" E 29615.32'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. *THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/NSRS 2007 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

2. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   P5206B–P3414P_LS_GPSCALIB.HTML
   P5206B–P3414P_LS_WGS84.TXT
   P5206B–P3414P_LS_LOCAL.TXT
   P5206B_LS_CONTROL.TXT

   THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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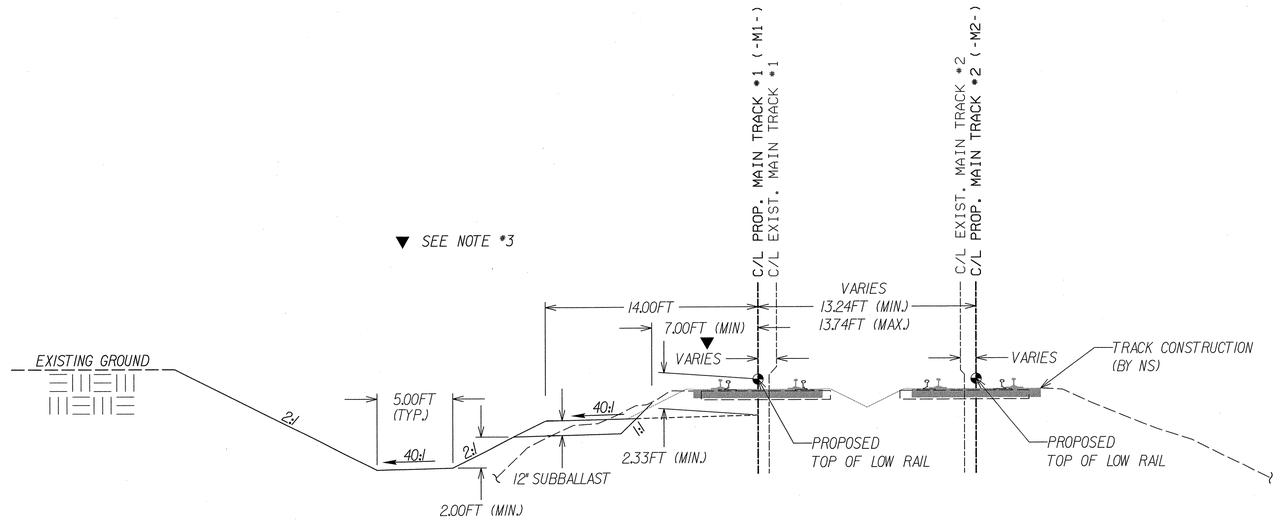
tomcobson

DGN 0164DEL_P10b2

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2
R/W SHEET NO.	TS-01
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT
5/10/13

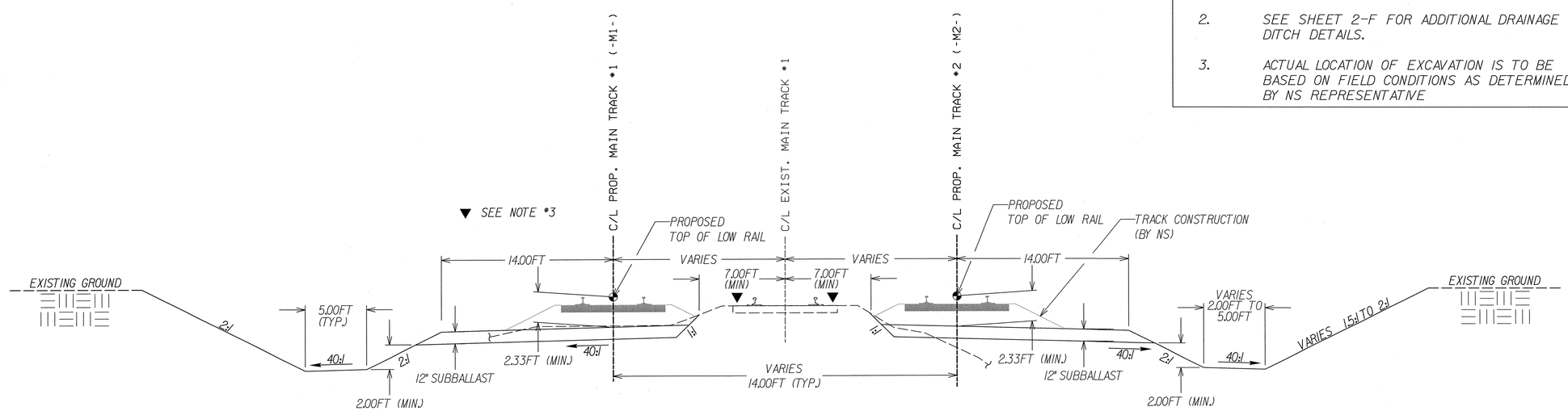


TYPICAL SECTION #1 - EXISTING MAIN TRACKS BETWEEN PROPOSED MAIN TRACKS #1 AND #2

-M1- STA. 9016+00.00 TO STA. 9020+04.22 -M2- STA. 9016+00.00 TO STA. 9020+04.20

NOTES:

1. ALL TRACK CONSTRUCTION, INCLUDING BALLAST, TIES, AND RAIL INSTALLATION, WILL BE PERFORMED BY NS. (ELEMENTS ARE CURRENTLY SHOWN IN GRAY)
2. SEE SHEET 2-F FOR ADDITIONAL DRAINAGE DITCH DETAILS.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY NS REPRESENTATIVE



TYPICAL SECTION #2 - EXISTING MAIN TRACK #1 BETWEEN PROPOSED MAIN TRACKS #1 AND #2

-M1- STA. 9020+04.22 TO STA. 9034+60.78 -M2- STA. 9020+04.20 TO STA. 9034+60.75

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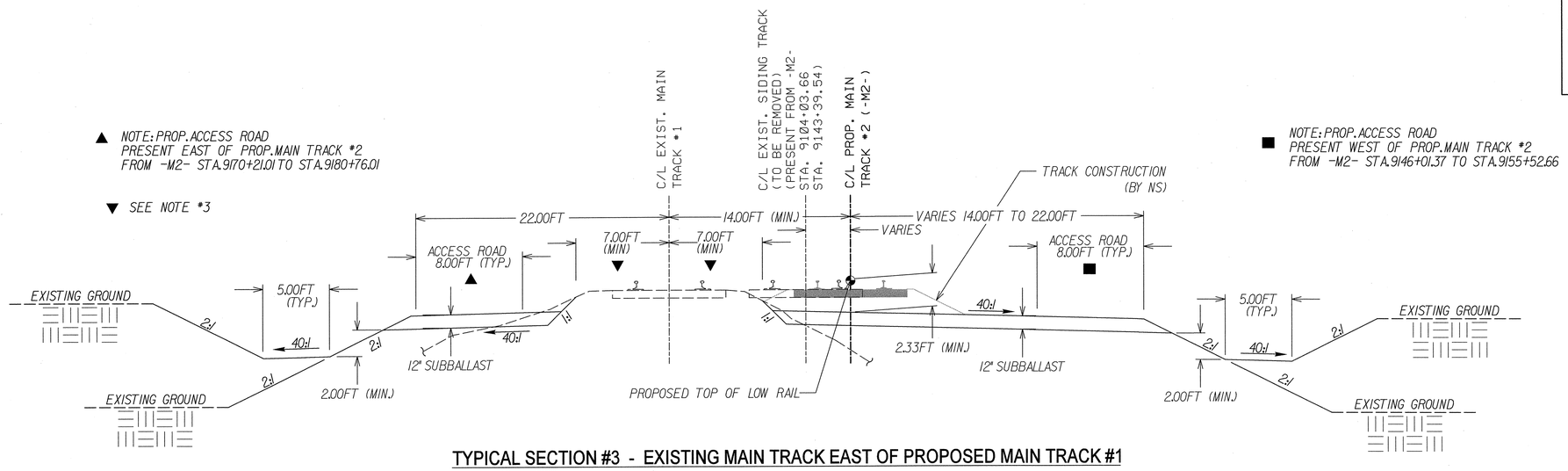
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-A
R/W SHEET NO.	TS-02
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARMINT
5/10/13



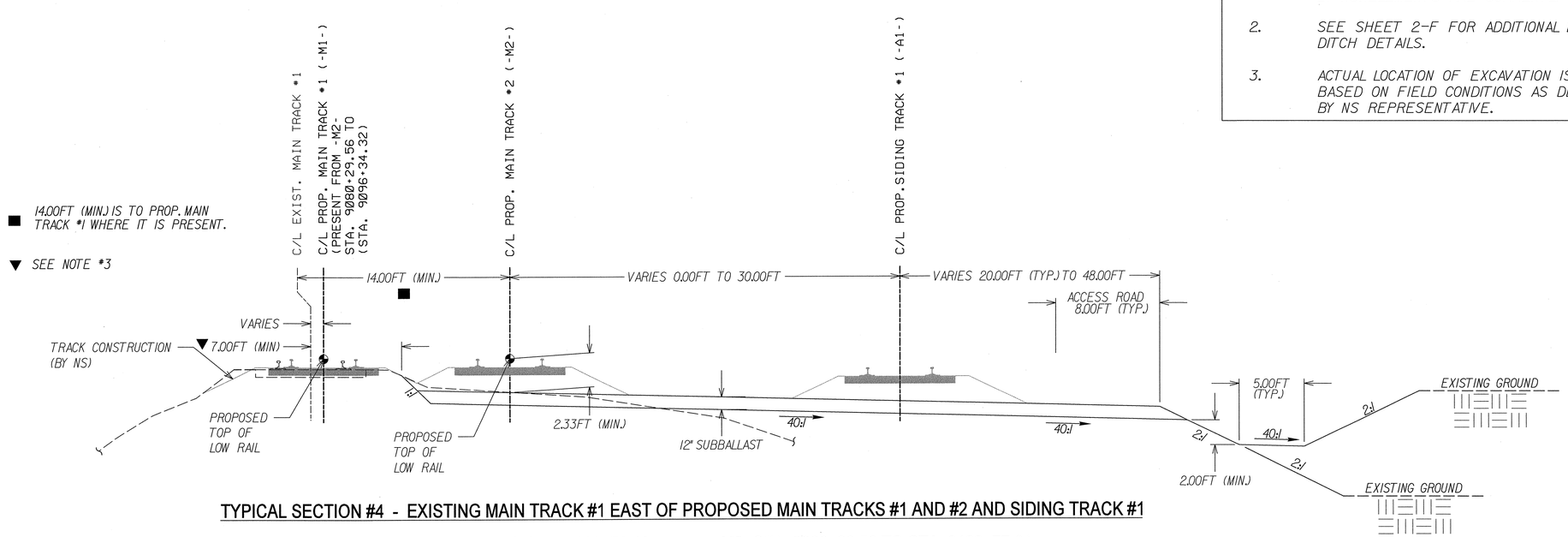
TYPICAL SECTION #3 - EXISTING MAIN TRACK EAST OF PROPOSED MAIN TRACK #1

-M1- STA. 9034+60.78 TO STA. 9080+29.24
-M1- STA. 9103+73.12 TO STA. 9155+48.77
-M1- STA. 9170+17.12 TO STA. 9180+73.88

-M2- STA. 9034+60.75 TO STA. 9080+29.56
-M2- STA. 9103+77.01 TO STA. 9155+52.66
-M2- STA. 9170+21.01 TO STA. 9180+76.01

NOTES:

1. ALL TRACK CONSTRUCTION, INCLUDING BALLAST, TIES, AND RAIL INSTALLATION, WILL BE PERFORMED BY NS. (ELEMENTS ARE CURRENTLY SHOWN IN GRAY)
2. SEE SHEET 2-F FOR ADDITIONAL DRAINAGE DITCH DETAILS.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY NS REPRESENTATIVE.



TYPICAL SECTION #4 - EXISTING MAIN TRACK #1 EAST OF PROPOSED MAIN TRACKS #1 AND #2 AND SIDING TRACK #1

-M1- STA. 9080+29.24 TO STA. 9103+73.12

-M2- STA. 9080+29.56 TO STA. 9103+77.01

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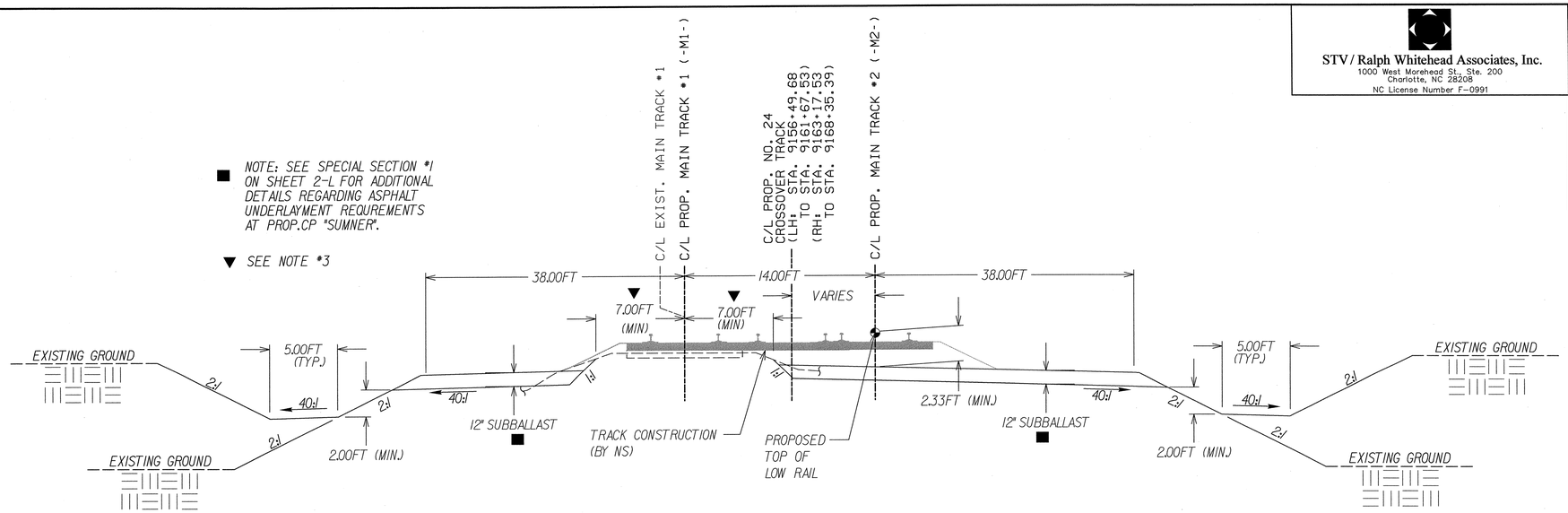
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-B
R/W SHEET NO.	TS-03
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT 5/10/13

■ NOTE: SEE SPECIAL SECTION #1 ON SHEET 2-L FOR ADDITIONAL DETAILS REGARDING ASPHALT UNDERLAYMENT REQUREMENTS AT PROP.CP "SUMNER".

▼ SEE NOTE #3



TYPICAL SECTION #5 - PROPOSED CP "SUMNER"

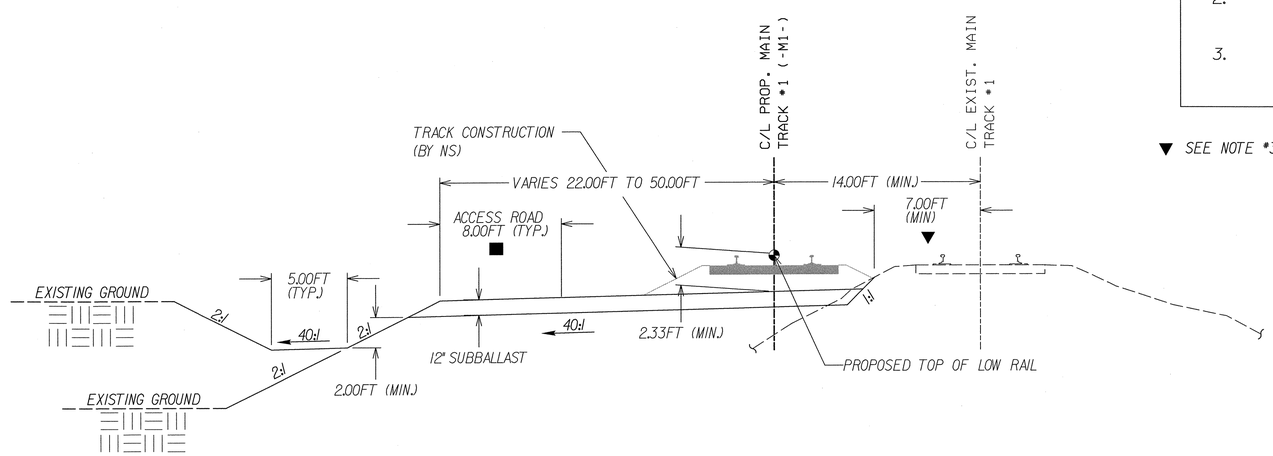
▲ -M1- STA. 9155+48.77 TO STA. 9170+17.12 -M2- STA. 9155+52.66 TO STA. 9170+21.01

▲ SEE SHEET 15A FOR PROP.WEBB ROAD ROADWAY IMPROVEMENTS FOR ROADBED FROM -M2- STA.9169+88.72 TO STA.9170+21.01

NOTES:

1. ALL TRACK CONSTRUCTION, INCLUDING BALLAST, TIES, AND RAIL INSTALLATION, WILL BE PERFORMED BY NS. (ELEMENTS ARE CURRENTLY SHOWN IN GRAY)
2. SEE SHEET 2-F FOR ADDITIONAL DRAINAGE DITCH DETAILS.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY NS REPRESENTATIVE.

▼ SEE NOTE #3



TYPICAL SECTION #6 - EXISTING MAIN TRACK WEST OF PROPOSED MAIN TRACK #1

-M1- STA. 9203+74.38 TO STA. 9218+02.82 -M2- STA. 9203+76.01 TO STA. 9218+01.63

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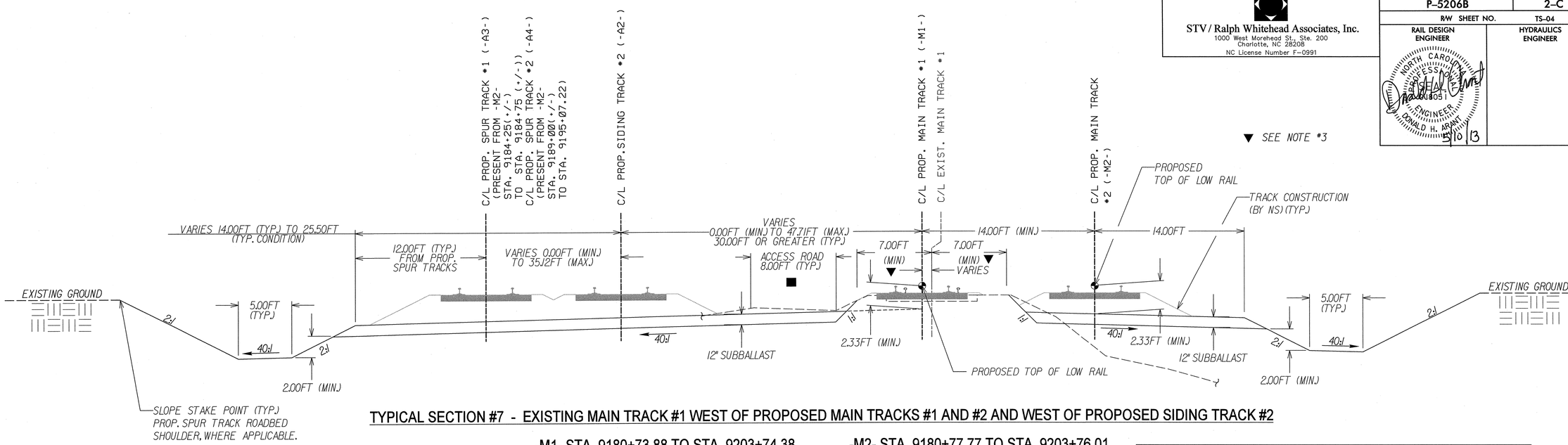
tedmondson

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-C
R/W SHEET NO.	TS-04
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 8051 DONALD H. ARANT 5/10/13

DCN 0164DEL_P10b2

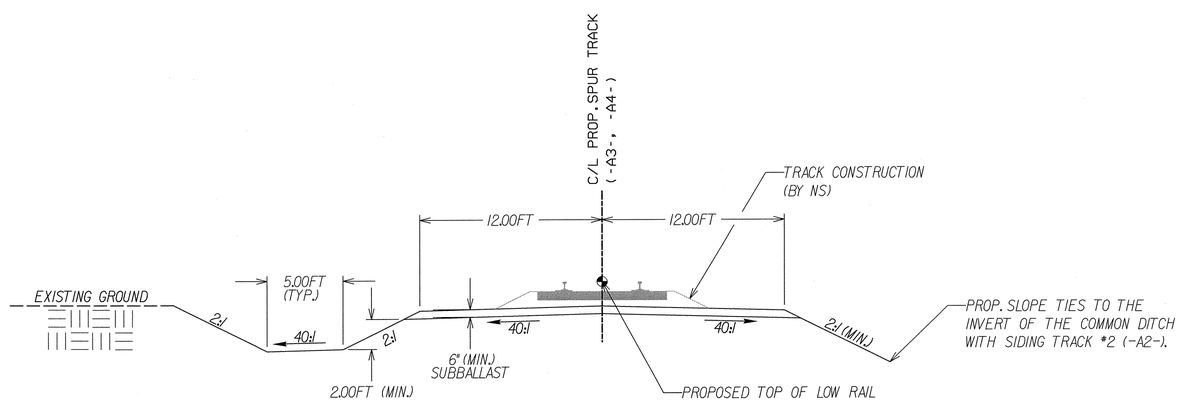


TYPICAL SECTION #7 - EXISTING MAIN TRACK #1 WEST OF PROPOSED MAIN TRACKS #1 AND #2 AND WEST OF PROPOSED SIDING TRACK #2

-M1- STA. 9180+73.88 TO STA. 9203+74.38 -M2- STA. 9180+77.77 TO STA. 9203+76.01

NOTES:

1. ALL TRACK CONSTRUCTION, INCLUDING BALLAST, TIES, AND RAIL INSTALLATION, WILL BE PERFORMED BY NS. (ELEMENTS ARE CURRENTLY SHOWN IN GRAY)
2. SEE SHEET 2-F FOR ADDITIONAL DRAINAGE DITCH DETAILS.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY NS REPRESENTATIVE.



TYPICAL SECTION #8 - NEW ROADBED FOR PROPOSED SPUR TRACK

-A3- STA. 9180+00 TO STA. 9184+59(+/-)
-A4- STA. 9189+40 TO STA. 9192+60(+/-)

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0164DEL_P10b2

DGN

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

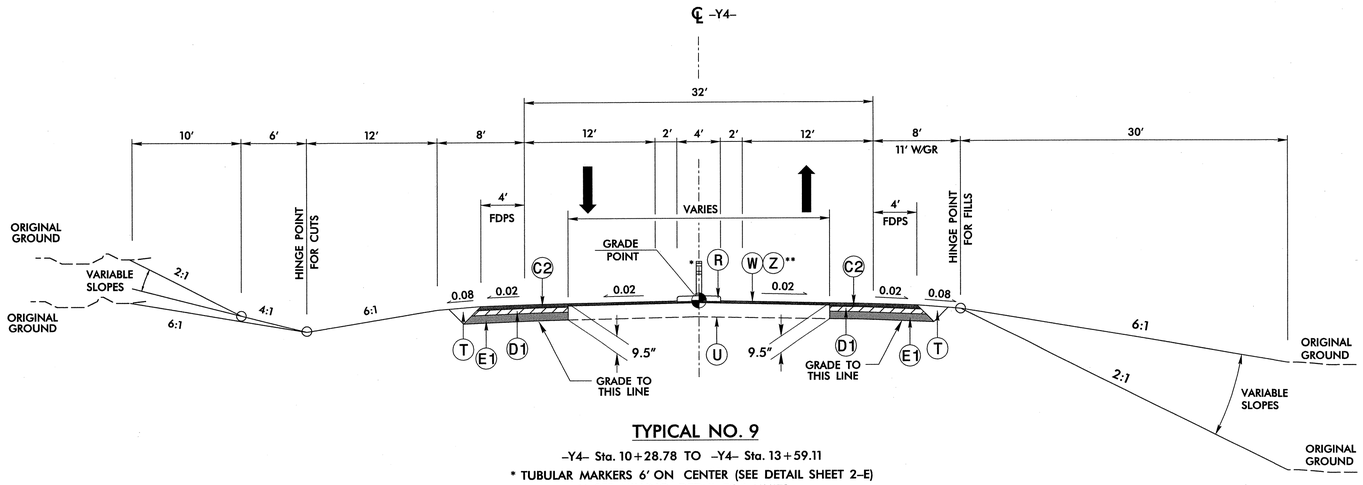
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-D
R/W SHEET NO. TS-05	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 027457 ENGINEER RICHARD A. ODYNSKI
5/10/13

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
5/10/13

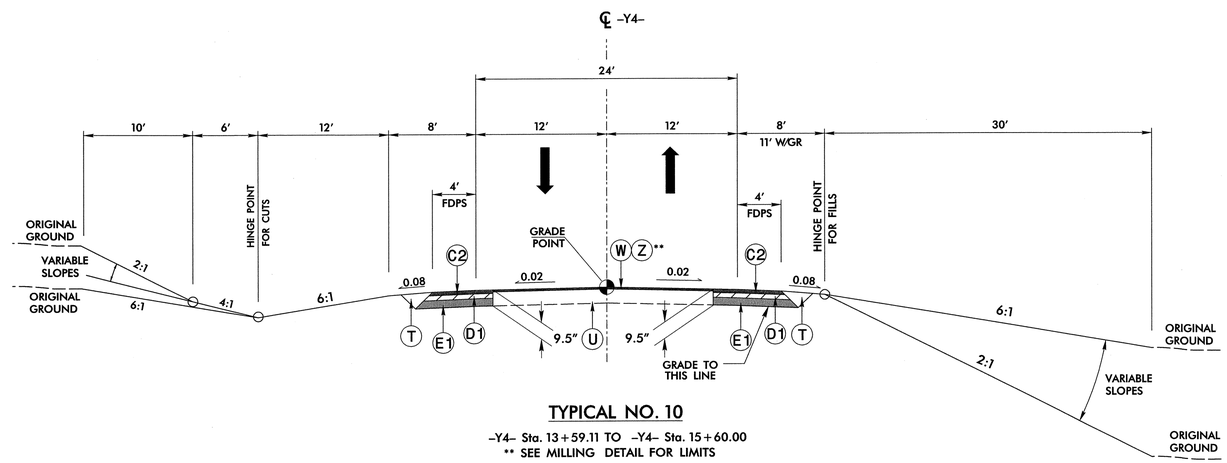


TYPICAL NO. 9

-Y4- Sta. 10+28.78 TO -Y4- Sta. 13+59.11

* TUBULAR MARKERS 6' ON CENTER (SEE DETAIL SHEET 2-E)

** SEE MILLING DETAIL FOR LIMITS



TYPICAL NO. 10

-Y4- Sta. 13+59.11 TO -Y4- Sta. 15+60.00

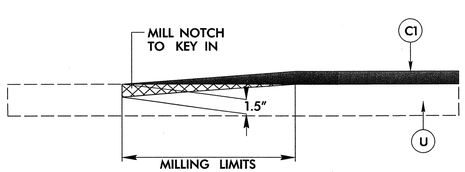
** SEE MILLING DETAIL FOR LIMITS

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ.YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ.YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ.YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ.YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
J1	PROPOSED 8" AGGREGATE BASE COURSE
P	PRIME COAT AT RATE 0.35 GAL/SY
R	6" NON-MOUNTABLE MONOLITHIC ISLAND (KEYED-IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL, THIS SHEET)
Z	MILLING

NOTES:

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

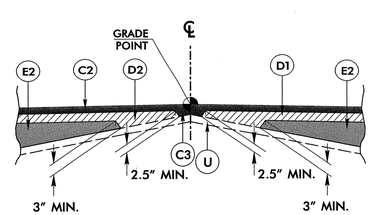


INCIDENTAL MILLING DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTIONS #9, AND 10

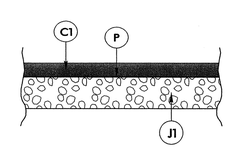
-Y4- Sta. 10+28.78 TO 10+68

-Y4- Sta. 15+34 TO 15+60



WEDGING DETAIL NO. 1

USE IN CONJUNCTION WITH TYPICAL SECTIONS #9 AND 10



DRIVEWAY AND PARKING LOT PAVEMENT REPAIR

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5/9/2013

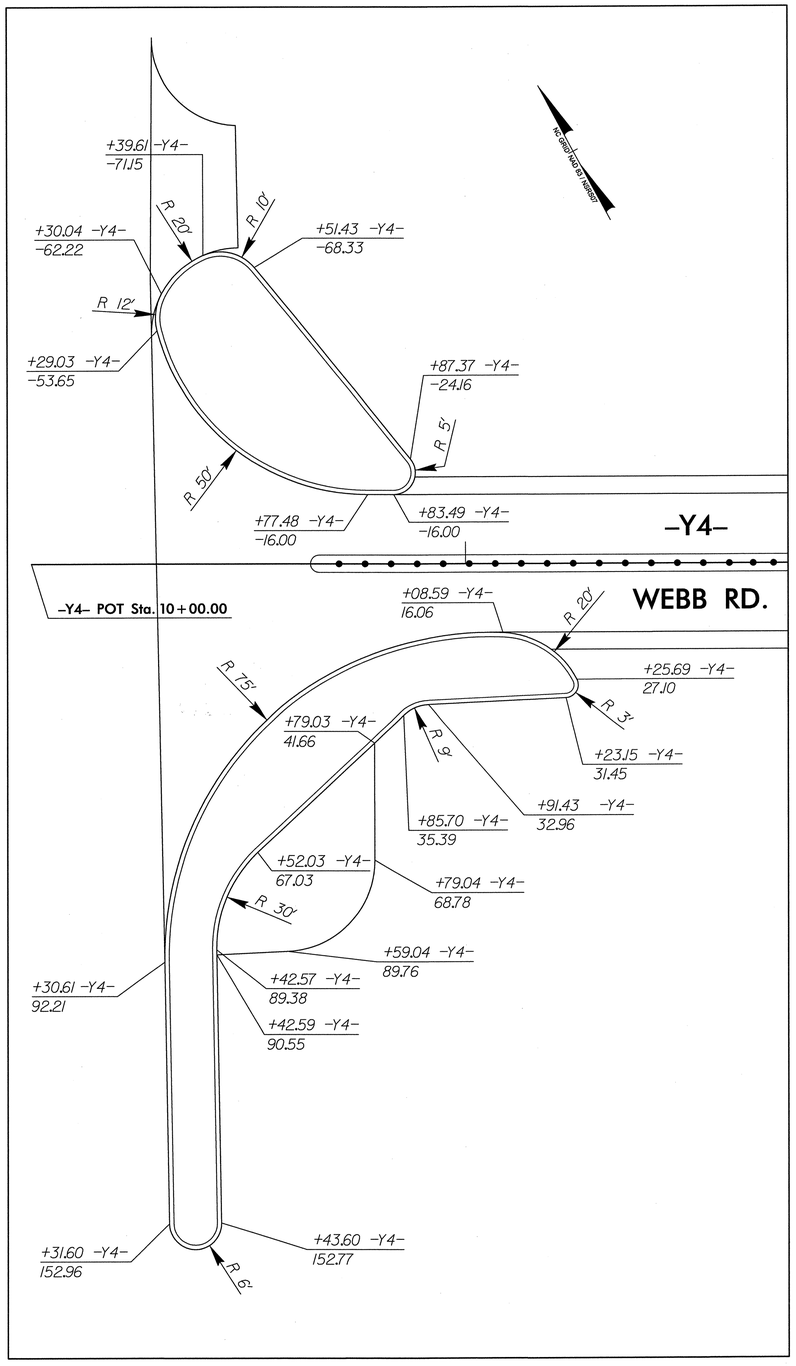
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-E
R/W SHEET NO.	

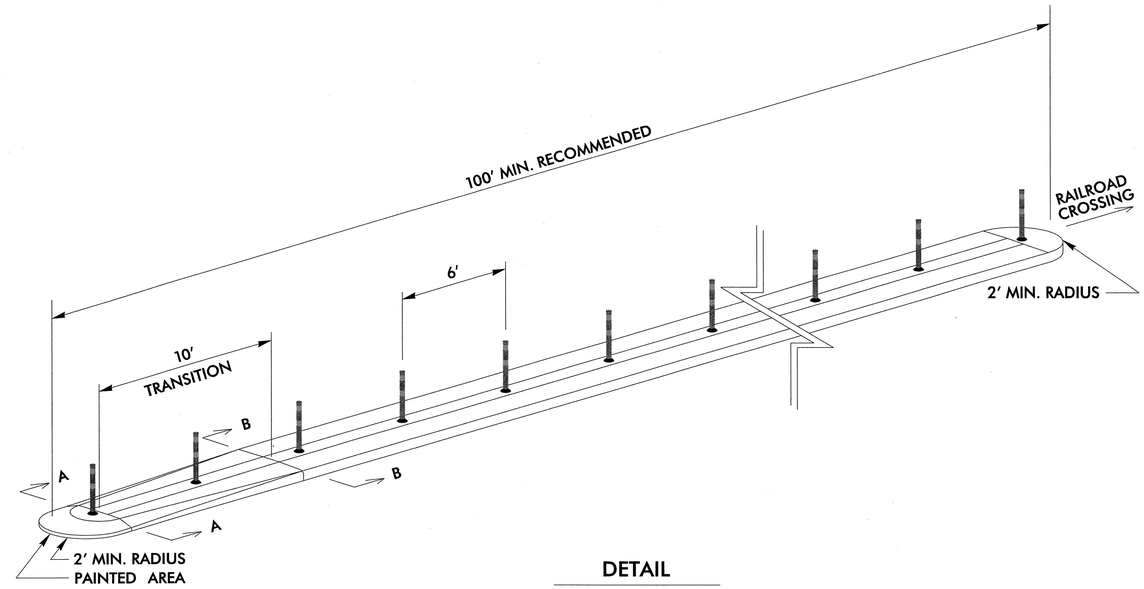
STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER RICHARD A. ODYNSKI
5/10/13

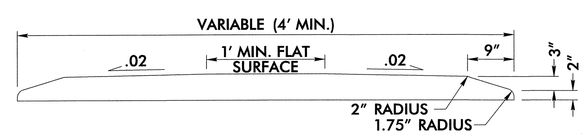
CURB DETAIL AT INTERSECTION OF WEBB RD. & US29 (S. MAIN ST.)





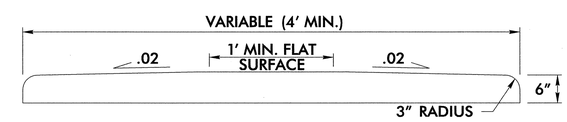
DETAIL

MONOLITHIC CONCRETE ISLAND DETAIL



SECTION A

MOUNTABLE 5" MONOLITHIC CONCRETE ISLAND



SECTION B

NON-MOUNTABLE 6" MONOLITHIC CONCRETE ISLAND

NON-MOUNTABLE MONOLITHIC ISLAND AND TUBULAR MARKER DETAIL
USE FOR ISLANDS ON WEBB ROAD
SEE PLAN SHEET 15A

DGN 0164DEL_P10b2

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5/9/2013

DGN 0164DEL_P1062

STV/ Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

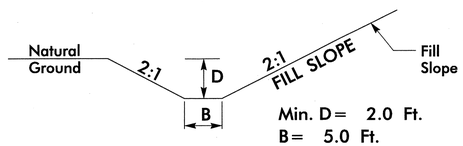
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-F
R/W SHEET NO.	RD-01
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER DONALD H. ARANT 5/10/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/10/13

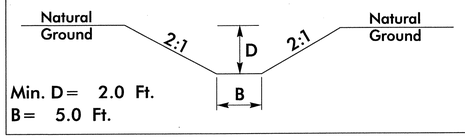
DETAIL 1
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 5.0 Ft.

FROM STA. 9011+00 TO STA. 9020+00 –M2– LT
FROM STA. 9020+00 TO STA. 9029+00 –M2– LT
FROM STA. 9029+00 TO STA. 9044+85 –M2– RT
FROM STA. 9050+00 TO STA. 9059+50 –M2– RT
FROM STA. 9060+00 TO STA. 9064+52 –M2– RT
FROM STA. 9064+52 TO STA. 9069+00 –M2– RT
FROM STA. 9070+50 TO STA. 9080+00 –M2– RT
FROM STA. 9080+50 TO STA. 9089+50 –M2– RT
FROM STA. 9089+50 TO STA. 9095+40 –M2– RT
FROM STA. 9096+00 TO STA. 9104+00 –M2– RT
FROM STA. 9105+30 TO STA. 9113+00 –M2– RT
FROM STA. 9113+00 TO STA. 9116+00 –M2– RT
FROM STA. 9131+00 TO STA. 9142+60 –M2– RT
FROM STA. 9142+60 TO STA. 9155+00 –M2– RT
FROM STA. 9155+00 TO STA. 9169+50 –M2– RT
FROM STA. 9157+50 TO STA. 9169+50 –M2– LT
FROM STA. 9170+60 TO STA. 9176+05 –M2– RT
FROM STA. 9176+05 TO STA. 9183+00 –M2– RT
FROM STA. 9171+50 TO STA. 9176+05 –M2– LT
FROM STA. 9176+05 TO STA. 9182+00 –M2– LT
FROM STA. 9181+00 TO STA. 9186+00 –A3– LT
FROM STA. 9186+00 TO STA. 9191+00 –M2– LT
FROM STA. 9183+00 TO STA. 9189+40 –M2– RT
FROM STA. 9189+42 TO STA. 9195+00 –M2– RT
FROM STA. 9191+00 TO STA. 9195+00 –A4– LT
FROM STA. 9195+00 TO STA. 9201+50 –M2– LT
FROM STA. 9203+70 TO STA. 9209+50 –M2– LT
FROM STA. 9209+50 TO STA. 9211+00 –M2– LT
FROM STA. 9212+85 TO STA. 9217+00 –M2– LT

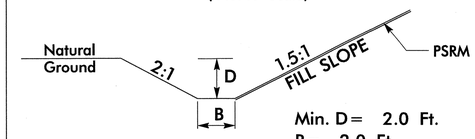
DETAIL 2
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 5.0 Ft.

STA. 9089+50 –M2– RT
FROM STA. 9105+00 TO STA. 9105+30 –M2– RT
STA. 9142+60 –M2– RT

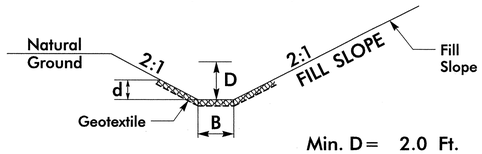
DETAIL 3
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 2.0 Ft.

FROM STA. 9020+00 TO STA. 9029+00 –M2– RT

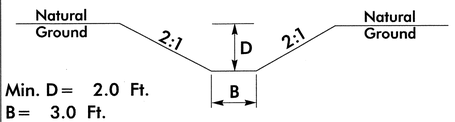
DETAIL 4
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 5.0 Ft.
Type of Liner = Class 'B' Rip-Rap

FROM STA. 9044+85 TO STA. 9050+00 –M2– RT

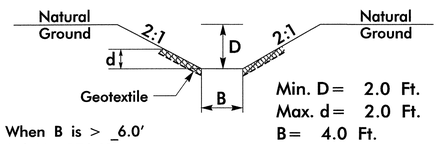
DETAIL 5
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 3.0 Ft.

STA. 9070+90 –M2– RT
STA. 9181+60 –A3– LT

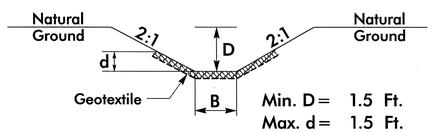
DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 4.0 Ft.
When B is > 6.0'
Std. No. 876.01
Type of Liner = Class 'I' Rip-Rap

STA. 9044+80 –M2– RT

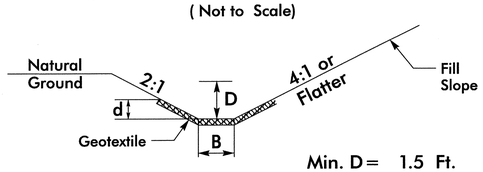
DETAIL 7
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 3.0 Ft.
*When B is < 6.0'
Type of Liner = Class 'I' Rip-Rap

STA. 9064+52 –M2– LT
STA. 9189+40 –M2– RT

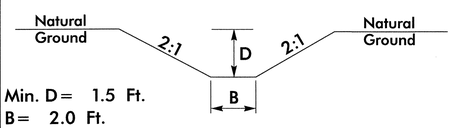
DETAIL 8
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.
Type of Liner = Class 'B' Rip-Rap

FROM STA. 12+95 TO STA. 15+50 –Y4– LT

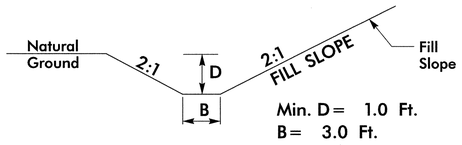
DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 2.0 Ft.

FROM STA. 15+50 TO STA. 16+12 –Y4– LT

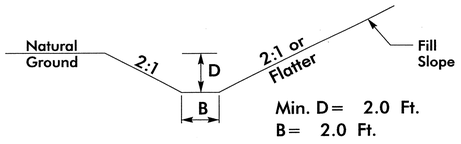
DETAIL 10
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 3.0 Ft.

FROM STA. 9211+00 TO STA. 9212+50 –M2– RT

DETAIL 11
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D = 2.0 Ft.
B = 2.0 Ft.

FROM STA. 9182+00 TO STA. 9183+00 –M2– LT
FROM STA. 9191+00 TO STA. 9192+00 –M2– LT

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-G
R/W SHEET NO.	RG-01

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008051 DONALD H. ARANT

5/10/13

HORIZONTAL CURVE GEOMETRY

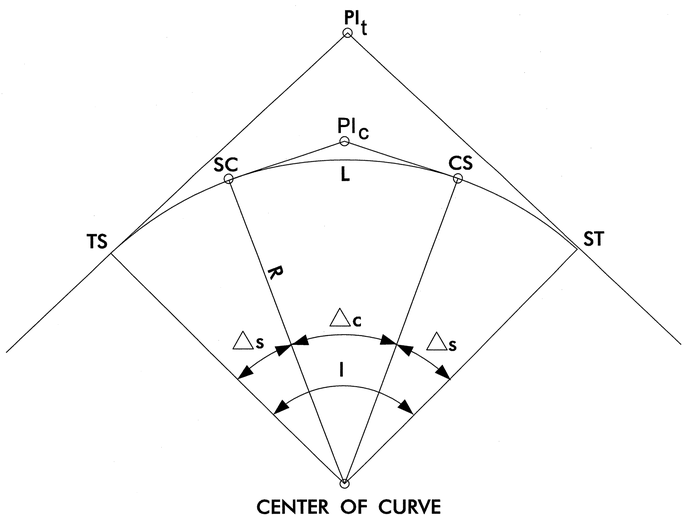

FIGURE A

CIRCULAR CURVE WITH SPIRAL TRANSITION CURVES

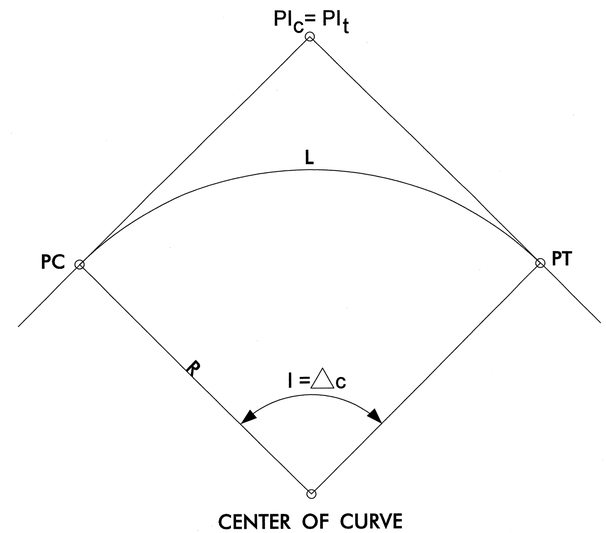

FIGURE B

SIMPLE CIRCULAR CURVE

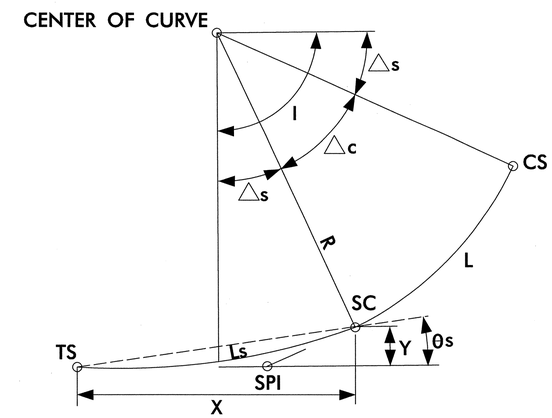

FIGURE C

SPIRAL TRANSITION CURVE

FIGURE D

DEFLECTION BETWEEN TANGENTS

R	RADIUS OF CURVATURE	PI_c	POINT OF INTERSECTION (CIRCULAR CURVE)
Dc	DEGREE OF CURVATURE (CHORD DEFINED)	PI_t	POINT OF INTERSECTION (TANGENT)
L	LENGTH OF CURVE (CHORD DEFINED)	SPI	POINT OF INTERSECTION (SPIRAL)
I	TOTAL INTERSECTION ANGLE	PC	TANGENT TO CIRCULAR CURVE
△c	CURVE ANGLE	PT	CIRCULAR CURVE TO TANGENT
△s	SPIRAL ANGLE	TS	TANGENT TO SPIRAL
θs	SPIRAL DEFLECTION	SC	SPIRAL TO CIRCULAR CURVE
Ls	LENGTH OF SPIRAL	CS	CIRCULAR CURVE TO SPIRAL
X	SPIRAL TANGENT LENGTH TO OFFSET	ST	SPIRAL TO TANGENT
Y	SPIRAL TANGENT OFFSET	PINC	POINT OF INTERSECTION NO CURVE

DCN 0164DEL_P10b2

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DGN 0164DEL_P10b2

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-H
R/W SHEET NO.	RG-02

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 21605 ENGINEER DONALD H. ARANT

5/10/13

TRACK GEOMETRY DATA
PROPOSED MAIN TRACK #1 (-M1-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	V (MPH) INTERMODAL PLAN 7-2	V (MPH) PASSENGER PLAN 7-2	V (MPH) PASSENGER FUTURE 4" CD	V (MPH) PASSENGER FUTURE 5" CD
	POT	9010+00.00	690,513.7628	1,550,589.2879			*** EXISTING ALIGNMENT ***															
					S 42° 49' 14.41" W	100.0000																
	POT	9011+00.00	690,440.4201	1,550,521.3111			*** BEGIN ROADBED CONSTRUCTION ***															
					S 42° 49' 14.41" W	785.3361																
	TS	9018+85.34	689,864.3823	1,549,987.5197								0° 03' 43.20" (RT)	0° 01' 14.40"	93.0000	93.0000	0.0335						
	SC	9019+78.34	689,796.1910	1,549,924.2825																		
M1C3372	PI	9020+49.92	689,743.7416	1,549,875.5731			42,971.8443	0° 08' 00.00"	143.1577	0° 18' 53.55" (RT)	0° 11' 27.16" (RT)						1.0"	50	60	80 Eu = -0.40"	90 Eu = -0.24"	90 Eu = -0.24"
	CS	9021+21.49	689,691.4548	1,549,826.6892								0° 03' 43.20" (RT)	0° 01' 14.40"	93.0000	93.0000	0.0335						
	ST	9022+14.49	689,623.5663	1,549,763.1271																		
					S 43° 08' 07.96" W	687.2273																
	TS	9029+01.72	689,122.0702	1,549,293.2515								0° 02' 19.50" (LT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	SC	9029+94.72	689,054.1902	1,549,229.6803																		
M1C3374	PI	9031+81.25	688,917.9867	1,549,102.2376			68,754.9415	0° 05' 00.00"	373.0569	0° 23' 18.17" (LT)	0° 18' 39.17" (LT)						1.0"	50	60	80 Eu = -0.63"	90 Eu = -0.53"	90 Eu = -0.53"
	CS	9033+67.78	688,781.0937	1,548,975.5357								0° 02' 19.50" (LT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	ST	9034+60.78	688,712.8128	1,548,912.3953			*** END ROADBED CONSTRUCTION *** *** EXISTING ALIGNMENT ***															
					S 42° 44' 49.79" W	4,262.0076																
	TS	9077+22.79	685,582.9816	1,546,019.4962			*** BEGIN ROADBED CONSTRUCTION ***															
	SC	9081+25.79	685,283.7620	1,545,749.5749								2° 04' 55.70" (LT)	0°41' 38.54"	403.0000	402.9468	4.8812						
M1C3383	PI	9086+78.44	684,864.5587	1,545,389.4481			5,544.8280	1° 02' 00.00"	1,101.6479	15° 32' 52.69" (LT)	11° 23' 01.30" (LT)						2.5"	50	60	80 Eu = 2.13"	90 Eu = 3.36"	90 Eu = 3.36"
	CS	9092+27.43	684,382.5210	1,545,119.1477								2° 04' 55.70" (LT)	0°41' 38.54"	403.0000	402.9468	4.8812						
	ST	9096+30.43	684,026.3621	1,544,930.6251			*** END ROADBED CONSTRUCTION *** *** EXISTING ALIGNMENT ***															
					S 27° 11' 57.10" W	3,115.8463																
1	PINC	9127+46.28	681,255.0573	1,543,506.4172						0° 00' 55.03" (LT)												
					S 27° 11' 02.07" W	3,326.3618																
3	PI/TO	9160+72.64	678,296.1097	1,541,986.7751																		
					S 27° 11' 02.07" W	91.0000																
NO. 24 LH	PS	9161+63.64	678,215.1611	1,541,945.2020																		
					S 27° 11' 02.07" W	150.0000																
4	PS	9163+13.64	678,081.7294	1,541,876.6747																		
					S 27° 11' 02.07" W	91.0000																
NO. 24 RH	PI/TO	9164+04.64	678,000.7808	1,541,835.1016																		
					S 27° 11' 02.07" W	1,669.2403																
6	PS	9180+73.88	676,515.9170	1,541,072.5123																		
					S 27° 11' 02.07" W	31.2500																
NO. 10 LH	PI/TO	9181+05.13	676,488.1187	1,541,058.2358																		
					S 27° 11' 02.07" W	369.5884																
	TS	9184+74.72	676,159.3533	1,540,889.3901			*** BEGIN ROADBED CONSTRUCTION ***															
	SC	9188+46.72	675,830.4756	1,540,715.5848								2° 00' 53.89" (RT)	0° 40' 17.94"	372.0000	371.9540	4.3604						
M1C3403	PI	9190+82.56	675,624.6002	1,540,600.5302			5,288.9200	1° 05' 00.00"	471.3680	9° 08' 11.13" (RT)	5° 06' 23.35" (RT)						3"	50	60	80 Eu = 1.85"	90 Eu = 3.14"	90 Eu = 3.14"
	CS	9193+18.09	675,429.7826	1,540,467.6079								2° 00' 53.89" (RT)	0° 40' 17.94"	372.0000	371.9540	4.3604						
	ST	9196+90.09	675,127.5099	1,540,250.8132																		
					S 36° 19' 13.20" W	653.0441																
9	PI/TO	9203+43.13	674,601.3404	1,539,864.0157																		
					S 36° 19' 13.20" W	31.2500																
NO. 10 RH	PS	9203+74.38	674,576.1617	1,539,845.5063																		
					S 36° 19' 13.20" W	1,425.6176																
	POT	9218+00.00	673,427.5157	1,539,001.1142			*** END ROADBED CONSTRUCTION *** *** TIE TO PROJECT P-5206C *** *** EQUATION: 9218+00.00 (BK) = 9218+02.82 (AH) ***															

*SPIRAL LENGTHS ARE BASED ON NCDOT DESIGN CRITERIA (MIN Ls = 1.22*Eu*V) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31 FT. INCREMENTS, WHERE GREATER THAN NS STANDARDS.

SEE SHEET 2-G AND COMBINED PLAN SHEET 2-A FOR NOMENCLATURE AND ABBREVIATIONS.

5/9/2013
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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-I
R/W SHEET NO.	RG-03

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026309 ENGINEER DONALD H. ARANT

5/10/13

0164DEL_P10b2

DGN

TRACK GEOMETRY DATA

PROPOSED MAIN TRACK #2 (-M2-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	V (MPH) INTERMODAL PLAN 7-2	V (MPH) PASSENGER PLAN 7-2	V (MPH) PASSENGER FUTURE 4" CD	V (MPH) PASSENGER FUTURE 5" CD
	POT	9010+00.00	690,523.0552	1,550,579.2604			*** EXISTING ALIGNMENT ***															
					S 42° 46' 49.34" W	100.0000																
	POT	9011+00.00	690,449.6785	1,550,511.3203			*** BEGIN ROADBED CONSTRUCTION ***															
					S 42° 46' 49.34" W	518.1120																
	TS	9016+18.11	690,069.3841	1,550,159.4450																		
												0° 02' 19.50" (RT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	SC	9017+11.11	690,001.1398	1,550,096.2649																		
M2C3372	PI	9018+77.72	689,878.9354	1,549,983.0266			68,754.9415	0° 05' 00.00"	333.2066	0° 21' 18.62" (RT)	0° 16' 39.62" (RT)						1.0"	50	60	80 Eu = -0.63"	90 Eu = -0.53"	90 Eu = -0.53"
	CS	9020+44.32	689,757.2813	1,549,869.1974																		
												0° 02' 19.50" (RT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	ST	9021+37.32	689,689.4013	1,549,805.6261																		
					S 43° 08' 07.96" W	764.3748																
	TS	9029+01.69	689,131.6078	1,549,283.0028																		
												0° 02' 19.50" (LT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	SC	9029+94.69	689,063.7278	1,549,219.4315																		
M2C3374	PI	9031+81.22	688,927.5243	1,549,091.9888			68,754.9415	0° 05' 00.00"	373.0565	0° 23' 18.17" (LT)	0° 18' 39.17" (LT)						1.0"	50	60	80 Eu = -0.63"	90 Eu = -0.53"	90 Eu = -0.53"
	CS	9033+67.75	688,790.6313	1,548,965.2870																		
												0° 02' 19.50" (LT)	0° 00' 46.50"	93.0000	93.0000	0.0210						
	ST	9034+60.75	688,722.3504	1,548,902.1465																		
					S 42° 44' 49.79" W	4,279.4890																
	TS	9077+40.24	685,579.6815	1,545,997.3816																		
												1° 55' 19.11" (LT)	0° 38' 26.35"	372.0000	371.9581	4.1592						
	SC	9081+12.24	685,303.7087	1,545,747.9640																		
M2C3383	PI	9086+80.55	684,873.6649	1,545,376.4301			5,544.8280	1° 02' 00.00"	1132.6474	15° 32' 52.69" (LT)	11° 42' 14.49" (LT)						2.5"	50	60	80 Eu = 2.13"	90 Eu = 3.36"	90 Eu = 3.36"
	CS	9092+44.89	684,377.1945	1,545,099.8579																		
												1° 55' 19.11" (LT)	0° 38' 26.35"	372.0000	371.9581	4.1592						
	ST	9096+16.89	684,048.2675	1,544,926.1420																		
					S 27° 11' 57.10" W	728.8774																
1	PI/TO	9103+45.76	683,399.9873	1,544,592.9828																		
					S 27° 11' 57.10" W	31.2500																
NO. 10 LH	PS	9103+77.01	683,372.1929	1,544,578.6989																		
					S 27° 11' 57.10" W	2,373.1548																
2	PINC	9127+50.17	681,261.4548	1,543,493.9644						0° 00' 55.03" (LT)												
					S 27° 11' 02.07" W	2,899.5095																
2	PS	9156+49.68	678,682.2114	1,542,169.3290																		
					S 27° 11' 02.07" W	91.0000																
NO. 24 LH	PI/TO	9157+40.68	678,601.2629	1,542,127.7558																		
					S 27° 11' 02.07" W	1,003.7083																
5	PI/TO	9167+44.39	677,708.4194	1,541,669.2136																		
					S 27° 11' 02.07" W	91.0000																
NO. 24 RH	PS	9168+35.39	677,627.4708	1,541,627.6404																		
					S 27° 11' 02.07" W	1,626.5928																
	TS	9184+61.98	676,180.5437	1,540,884.5346																		
												2° 10' 58.38" (RT)	0°43' 39.43"	403.0000	402.9415	5.1174						
	SC	9188+64.98	675,824.4471	1,540,695.8994																		
M2C3403	PI	9190+85.29	675,632.4431	1,540,587.8573			5,288.9200	1° 05' 00.00"	440.3685	9° 08' 11.13" (RT)	4° 46' 14.37" (RT)						3"	50	60	80 Eu = 1.85"	90 Eu = 3.14"	90 Eu = 3.14"
	CS	9193+05.35	675,450.0899	1,540,464.2210																		
												2° 10' 58.38" (RT)	0°43' 39.43"	403.0000	402.9415	5.1174						
	ST	9197+08.35	675,122.4016	1,540,229.6822			*** END ROADBED CONSTRUCTION *** *** EXISTING ALIGNMENT ***															
					S 36° 19' 13.20" W	2,093.2801																
	POT	9218+01.63	673,435.8079	1,538,989.8341			*** EQUATION: 9218+01.63 (BK) = 9218+02.82 (AH) ***															

*SPIRAL LENGTHS ARE BASED ON NCDOT DESIGN CRITERIA (MIN Ls = 1.22*Eu*V) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31 FT. INCREMENTS, WHERE GREATER THAN NS STANDARDS.

SEE SHEET 2-G AND COMBINED PLAN SHEET 2-A FOR NOMENCLATURE AND ABBREVIATIONS.

5/9/2013
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0164DEL_P10b2

DRAWN

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-J
R/W SHEET NO.	RG-04

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT

5/10/13

TRACK GEOMETRY DATA

PROPOSED SIDING TRACK #1 (-A1-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	INTERMODAL PLAN 7-2	PASSENGER PLAN 7-2	PASSENGER FUTURE 4" CD	PASSENGER FUTURE 5" CD
	POT	9080+29.56	685,386.3240	1,545,779.4285			*** BEGIN ROADBED CONSTRUCTION ***															
					S 40° 42' 20.36" W	100.0000																
	PC	9081+29.56	685,310.5170	1,545,714.2112																		
A1C3385	PI	9087+88.81	684,810.7601	1,545,284.2667			5,567.2761	1° 01' 45.00"	1,312.3689	13° 30' 23.27" (LT)	13°30'23.27" (LT)						0.0"	10				
	PT	9094+41.93	684,224.4091	1,544,982.9336																		
					S 27° 11' 57.10" W	574.0219																
	PC	9100+15.95	683,713.8610	1,544,720.5566																		
A1C3388	PI	9100+54.17	683,679.8638	1,544,703.0850			764.4894	7° 30' 00.00"	76.3296	5° 43' 29.00" (LT)	5°43'29.00" (LT)						0.0"	10				
	PT	9100+92.28	683,644.2934	1,544,689.0918																		
					S 21° 28' 28.10" W	262.5307																
	PI/TO	9103+54.81	683,399.9873	1,544,592.9828						5° 43' 29.00" (RT)												
1					S 27° 11' 57.10" W	31.2500																
NO. 10 LH	PS	9103+86.06	683,372.1929	1,544,578.6989			*** END ROADBED CONSTRUCTION *** *** TIE TO PROP. MAIN TRACK #2 ***															

TRACK GEOMETRY DATA

PROPOSED SIDING TRACK #2 (-A2-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	INTERMODAL PLAN 7-2	PASSENGER PLAN 7-2	PASSENGER FUTURE 4" CD	PASSENGER FUTURE 5" CD
6	PS	9180+73.88	676,515.9170	1,541,072.5123			*** BEGIN ROADBED CONSTRUCTION *** *** TIE TO EXIST. MAIN TRACK #1 ***															
					S 27° 11' 02.07" W	31.2500																
NO. 10 LH	PI/TO	9181+05.13	676,488.1187	1,541,058.2358						5° 43' 29.00" (LT)												
					S 21° 27' 33.07" W	262.5307																
	PC	9183+67.66	676,243.7870	1,540,962.1920																		
A2C3403	PI	9184+05.89	676,208.2129	1,540,948.2083			764.4894	7° 30' 00.00"	76.3296	5° 43' 29.00" (RT)	5°43'29.00" (RT)						0.0"	10				
	PT	9184+43.99	676,174.2110	1,540,930.7458																		
					S 27° 11' 02.07" W	116.3568																
7	PI/TO	9185+60.35	676,070.7064	1,540,877.5884																		
					S 27° 11' 02.07" W	31.2500																
NO. 10 RH	PS	9185+91.60	676,042.9081	1,540,863.3119																		
					S 27° 11' 02.07" W	312.4316																
	PC	9189+04.03	675,764.9863	1,540,720.5781																		
A2C3405	PI	9190+87.16	675,602.0828	1,540,636.9149			2,292.0130	2° 30' 00.00"	365.4571	9° 08' 11.14" (RT)	9°08'11.14" (RT)						0.0"	10				
	PT	9192+69.49	675,454.5307	1,540,528.4464																		
					S 36° 19' 13.20" W	211.7486																
8	PI/TO	9194+81.24	675,283.9210	1,540,403.0279																		
					S 36° 19' 13.20" W	31.2500																
NO. 10 RH	PS	9195+12.49	675,258.7423	1,540,384.5186																		
					S 36° 19' 13.20" W	500.4956																
	PC	9200+12.98	674,855.4840	1,540,088.0755																		
A2C3407	PI	9200+51.21	675,147.3728	1,540,302.6487			764.4894	7° 30' 00.00"	76.3296	5° 43' 29.00" (RT)	5°43'29.00" (RT)						0.0"	10				
	PT	9200+89.31	674,824.6863	1,540,065.4355																		
					S 42° 02' 42.20" W	262.5307																
9	PI/TO	9203+51.84	674,601.3404	1,539,864.0157						5° 43' 29.00" (LT)												
					S 36° 19' 13.20" W	31.2500																
NO. 10 RH	PS	9203+83.09	674,576.1617	1,539,845.5063			*** END ROADBED CONSTRUCTION *** *** TIE TO PROP. MAIN TRACK #1 ***															

*SPIRAL LENGTHS ARE BASED ON NCDOT DESIGN CRITERIA (MIN Ls = 1.22*Eu*V) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31 FT. INCREMENTS, WHERE GREATER THAN NS STANDARDS.

SEE SHEET 2-G AND COMBINED PLAN SHEET 2-A FOR NOMENCLATURE AND ABBREVIATIONS.

5/9/2013
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PROJECT REFERENCE NO.	SHEET NO.
P5206B	2–K
R/W SHEET NO.	RG–05

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 021605 ENGINEER DONALD H. ARANT

5/10/13

TRACK GEOMETRY DATA

PROPOSED SPUR TRACK #1 (-A3-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	INTERMODAL PLAN 7-2	PASSENGER PLAN 7-2	PASSENGER FUTURE 4" CD	PASSENGER FUTURE 5" CD
	POT	9179+17.08	676,624.8971	1,541,218.8401			*** EXISTING ALIGNMENT ***															
					S 27° 13' 20.03" W	82.9175																
	POT	9180+00.00	676,551.1636	1,541,180.9101			*** BEGIN ROADBED CONSTRUCTION ***															
					S 27° 13' 20.03" W	197.2089																
	PC	9181+97.21	676,375.7978	1,541,090.6982																		
A3C3403	PI	9182+54.88	676,324.5116	1,541,064.3156			573.6857	10° 00' 00.00"	114.8164	11° 28' 53.89" (RT)	11° 28' 53.89" (RT)						0.0"	10				
	PT	9183+12.03	676,279.5033	1,541,028.2521																		
					S 38° 42' 13.92" W	100.1833																
	PC	9184+12.21	676,201.3175	1,540,965.6048																		
A3C3404	PI	9184+41.25	676,178.6568	1,540,947.4477			573.6857	10° 00' 00.00"	57.9524	5° 47' 42.85" (LT)	5° 47' 42.85" (LT)						0.0"	10				
	PT	9184+70.17	676,154.2785	1,540,931.6714																		
					S 32° 54' 31.07" W	99.5453																
	PI/TO	9185+69.71	676,070.7064	1,540,877.5884						5° 43' 29.00" (LT)												
7					S 27° 11' 02.07" W	31.2500																
NO. 10 RH	PS	9186+00.96	676,042.9081	1,540,863.3119			*** END ROADBED CONSTRUCTION *** *** TIE TO PROP. SIDING TRACK #2 ***															

TRACK GEOMETRY DATA

PROPOSED SPUR TRACK #2 (-A4-)

FEATURE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R (ft)	Dc	L (ft)	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls* (ft)	X (ft)	Y (ft)	Ea.(in)	V (MPH) FREIGHT PLAN 7-2	INTERMODAL PLAN 7-2	PASSENGER PLAN 7-2	PASSENGER FUTURE 4" CD	PASSENGER FUTURE 5" CD
	POT	9188+98.81	675,736.0178	1,540,788.4127			*** EXISTING ALIGNMENT ***															
					S 32° 43' 04.34" W	41.1908																
	POT	9189+40.00	675,701.3622	1,540,766.1490			*** BEGIN ROADBED CONSTRUCTION ***															
					S 32° 43' 04.34" W	110.3320																
	PC	9190+50.33	675,608.5353	1,540,706.5143																		
A4C3404	PI	9191+25.53	675,545.2675	1,540,665.8692			573.6857	10° 00' 00.00"	149.3549	14° 56' 07.78" (RT)	14° 56'07.78" (RT)						0.0"	10				
	PT	9191+99.69	675,494.6126	1,540,610.2912																		
					S 47° 39' 12.12" W	103.0223																
	PC	9193+02.71	675,425.2153	1,540,534.1491																		
A4C3405	PI	9193+30.81	675,406.2870	1,540,513.3811			573.6857	10° 00' 00.00"	56.0831	5° 36' 29.91" (LT)	5° 36'29.91" (LT)						0.0"	10				
	PT	9193+58.79	675,385.4197	1,540,494.5624																		
					S 42° 02' 42.20" W	136.6768																
	PI/TO	9194+95.47	675,283.9210	1,540,403.0279						5° 43' 29.00" (LT)												
8					S 36° 19' 13.20" W	31.2500																
NO. 10 RH	PS	9195+26.72	675,258.7423	1,540,384.5186			*** END ROADBED CONSTRUCTION *** *** TIE TO PROP. SIDING TRACK #2 ***															

*SPIRAL LENGTHS ARE BASED ON NCDOT DESIGN CRITERIA (MIN Ls = 1.22*Eu*V) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31 FT. INCREMENTS, WHERE GREATER THAN NS STANDARDS.

SEE SHEET 2-G AND COMBINED PLAN SHEET 2-A FOR NOMENCLATURE AND ABBREVIATIONS.

0164DEL_P10b2

DKN

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-L
R/W SHEET NO.	

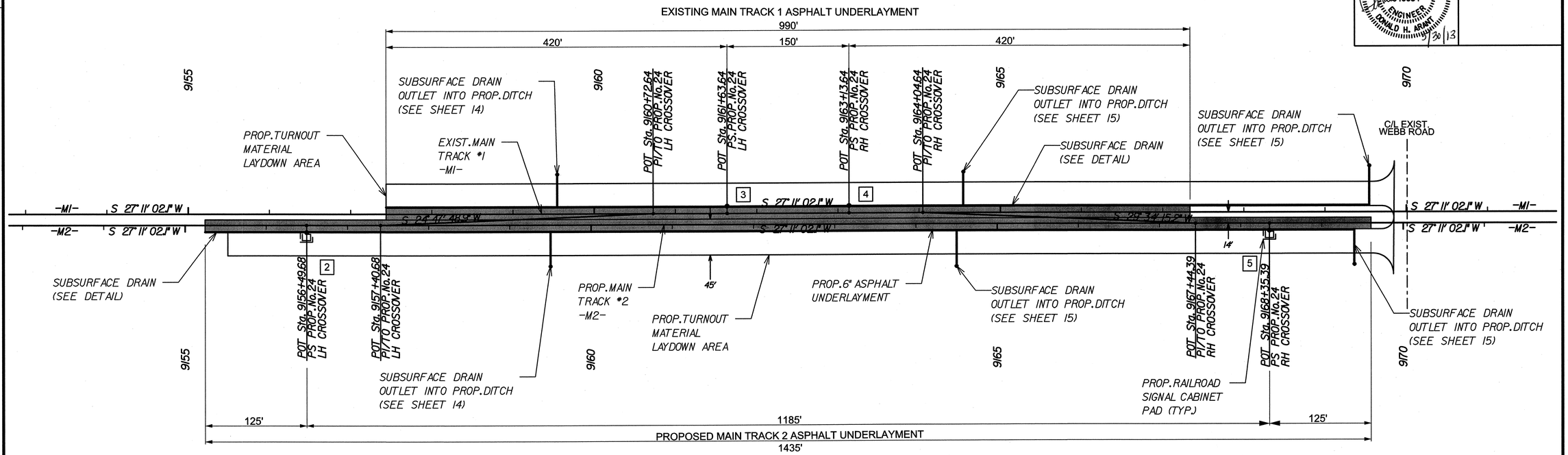
RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 018051 DONALD H. ARANT

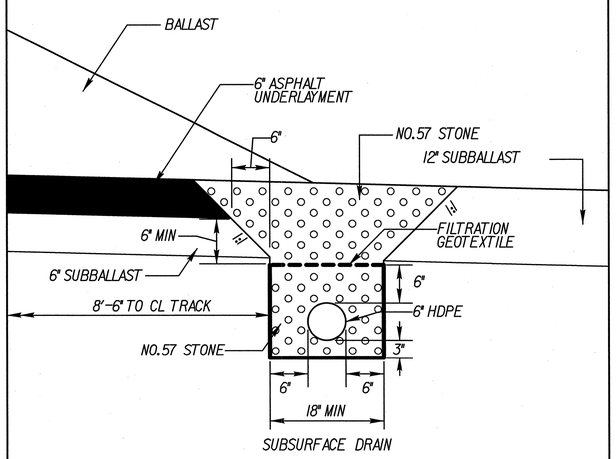
5/30/13

ASPHALT UNDERLAYMENT DETAIL

PROPOSED CP "SUMNER"

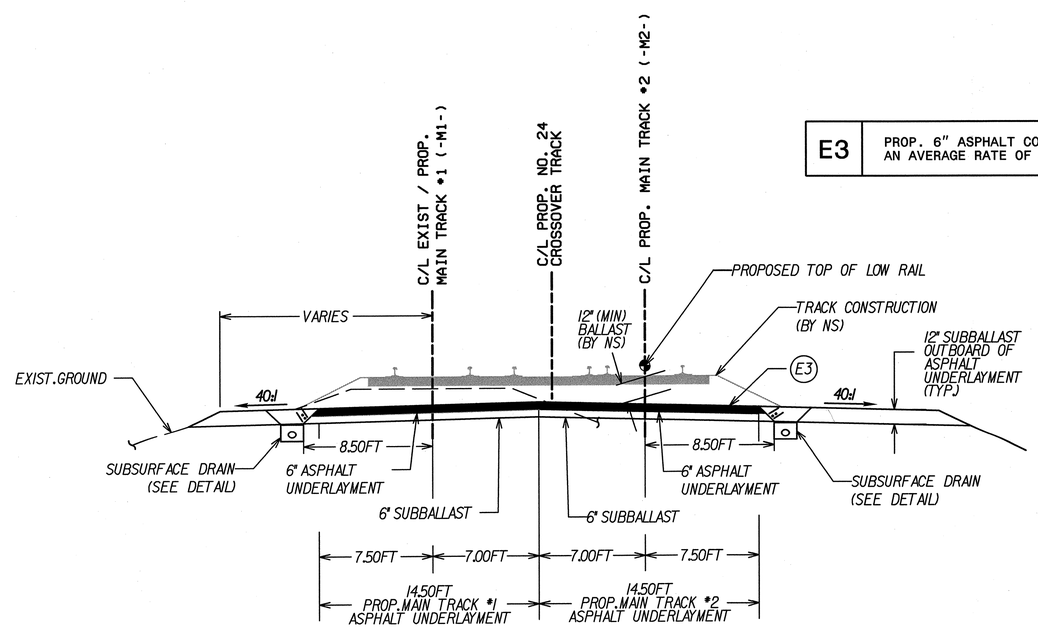


SUBSURFACE DRAIN DETAIL



*PROVIDE SUBDRAIN OUTLETS IN ACCORDANCE WITH STD. DWG. 815.02

E3	PROP. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER EACH OF THE TWO LAYERS.



NOTE: SEE TYPICAL SECTION #5 ON SHEET 2-B FOR ROADBED DETAILS AT PROP.CP "SUMNER" NOTED PROVIDED HEREIN.

5/30/2013
R:\Projects\2515412\2515412.0001\90_CAD Models and Sheets\04_CK_Track_Rail\plot sheets\P5206_R2NK_SHT_2-M.dgn
tadmondson

DCN 0164DEL_P10b2

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

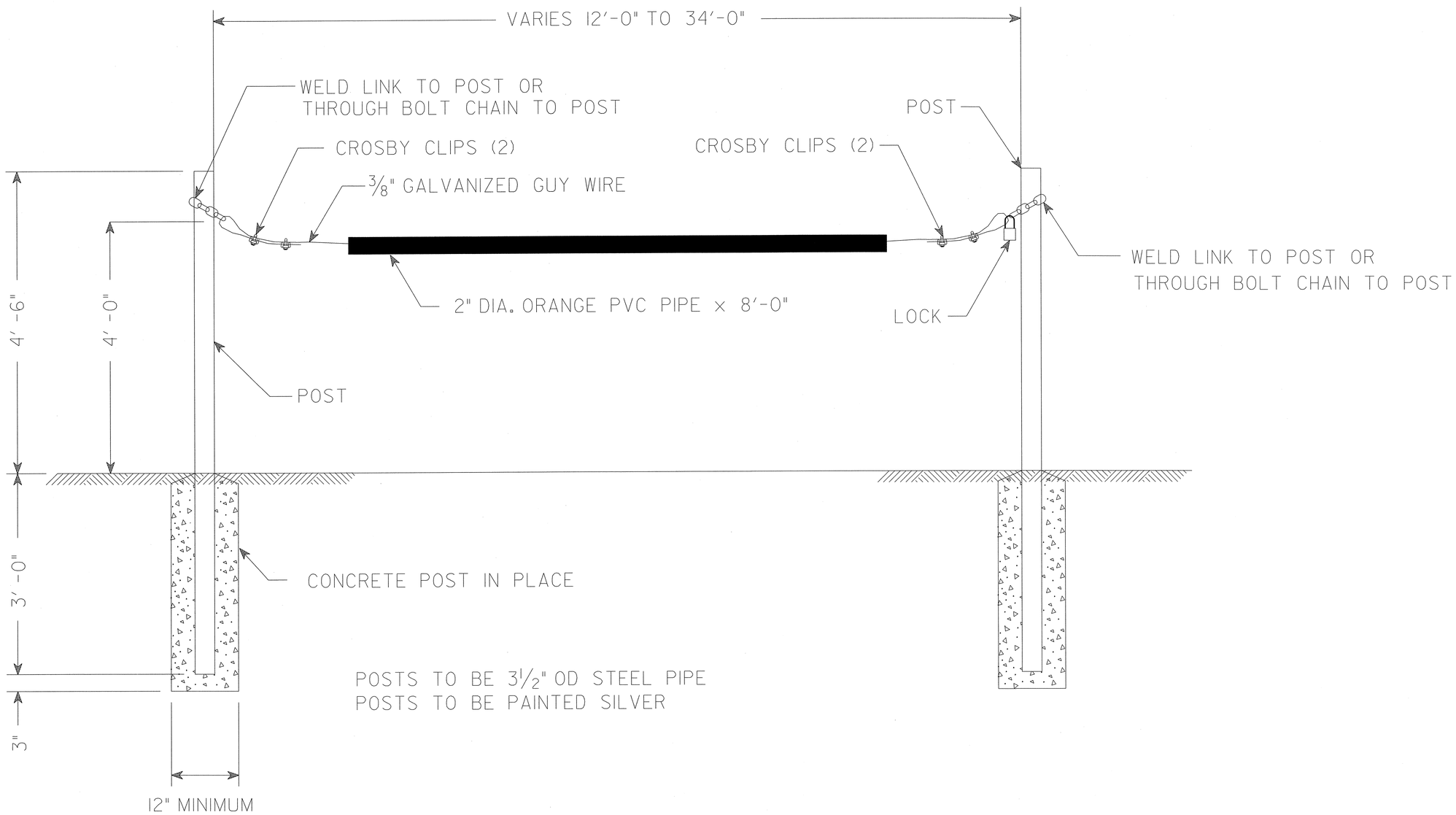
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	2-M
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 8051 ENGINEER DONALD H. ARANT

5/10/13

RIGHT OF WAY GATE DETAIL



POSTS TO BE 3 1/2" OD STEEL PIPE
POSTS TO BE PAINTED SILVER

5/9/2013
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tedmondson

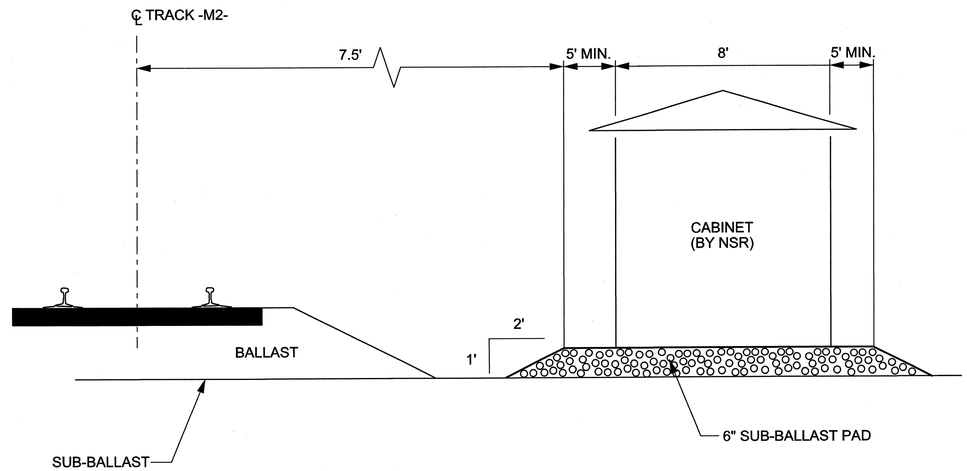
PROJECT REFERENCE NO.	SHEET NO.
P5206B	2–N
R/W SHEET NO.	RG–05

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT

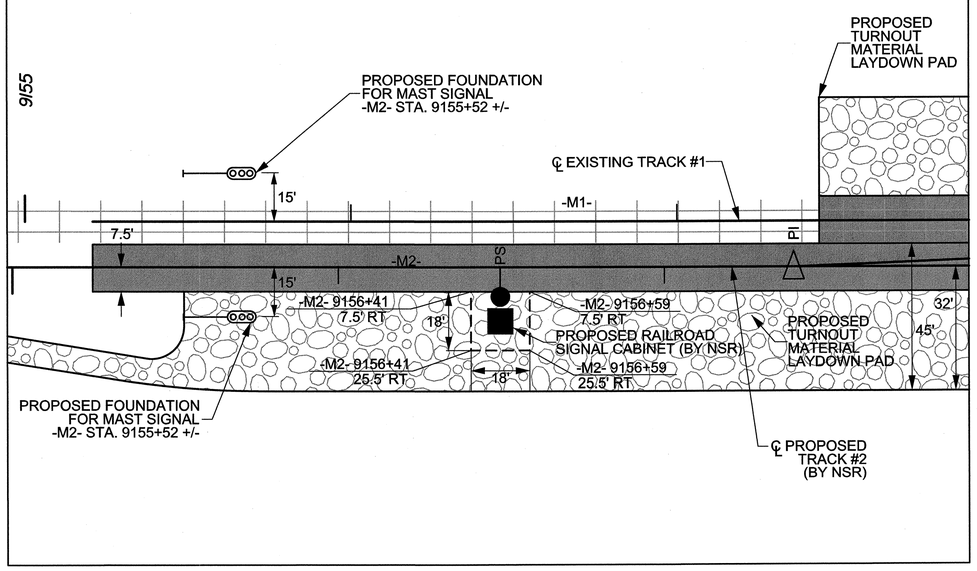
5/30/13

RAILROAD SIGNAL CABINET PAD DETAILS

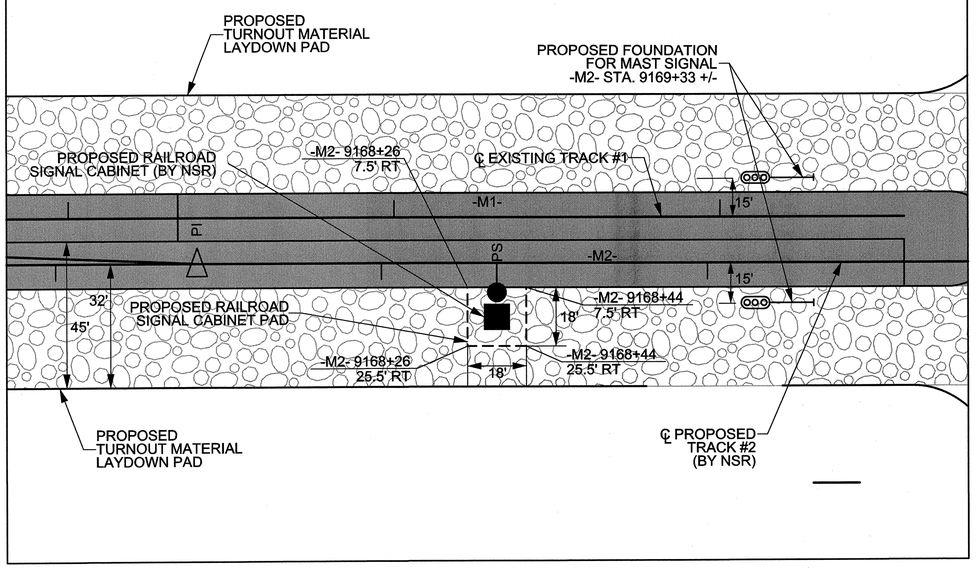


RAILROAD SIGNAL CABINET PAD SECTION

SIGNAL CABINET PAD AT CP "SUMNER" (-M2- PS STA. 9156+50)



SIGNAL CABINET PAD AT CP "SUMNER" (-M2- PS STA. 9168+35)



9/55

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5/30/2013
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0164DEL_P10b2

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	3-A
R/W SHEET NO.	
RAIL DESIGN ENGINEER	

PARCEL INDEX

PROPERTY OWNER SUMMARY

PARCEL No.	DRAWING No.	PROPERT OWNERS NAME
1B	6 & 7	KEEN, JOHNNY L
2B	8	STOUT, MARK A & SHARON W
3B	8	DEMARCUS, CORINNE S.
4B	8 & 9	ROSS, SHERRY R
5B	11 & 12	ROYAL CURTIS D & SHERIE
6B	11 & 12	PLATINUM CONSTRUCTION CORP
7B	12	DUKE ENERGY CORP
8B	14	ALLEN, DARYL & GLENDA B
9B	14	REID, MICHAEL W
10B	14 & 15	MYERS, NELLIE L
11B	15	BRADSHAW, GEORGE W
12B	15	BRADSHAW, GEORGE W
13B	15 & 16	ESSROC CEMENT CORP
14B	16	DEMBYS USED CARS INC
15B	16	UNIVERSAL FOREST PRODUCTS
16B	16 & 17	UNIVERSAL FOREST PRODUCTS
17B	16	GAINER, ROBERT W
18B	17	UNIVERSAL FOREST PRODUCTS
19B	18	MARTIN, JEFF C & JANET I
20B	26	CH CORNERSTONE UNITED PENTECOSTAL
21B	26	MORRIS, JAMES FREDERICK JR.
22B	8	DEMARCUS, CORINNE S. & BEATRICE S
23B	8	NOONER, TIMOTHY L. & CYNTHIA C.
24B	8	DEMARCUS, CORINNE S.
25B	8	AMHART CORP
26B	18	VANESELTINE, HENRY JR & MARY LOU
27B	18	VANESELTINE, HENRY JR & MARY LOU
28B	17 & 18	BARBEE, HOWARD G. & MYRNA L.
29B	7	TYLER NORTH AMERICA
30B	7	ROWAN BOLT & SUPPLY INC
31B	10	WALK-ON PRODUCTS, INC
32B	10	NORTH CAROLINA STATE HWY PWC

5/9/2013
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tedmondson

0164DEL_P10b2

SUMMARY OF QUANTITIES

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	3-B
R/W SHEET NO.	

SUMMARY OF EARTHWORK (IN CUBIC YARDS)

CHAIN	FROM STATION	TO STATION	SIDE	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-M2-	9011+00.00	9041+00.00	LT & RT	14,234		1,291		12,943
SUBTOTAL SUMMARY NO. 1				14,234		1,291		12,943
-M2-	9041+00.00	9071+00.00	LT & RT	6,842		7,013	171	
SUBTOTAL SUMMARY NO. 2				6,842		7,013	171	
-M2-	9071+00.00	9101+00.00	LT & RT	11,218		7,710		3,508
SUBTOTAL SUMMARY NO. 3				11,218		7,710		3,508
-M2-	9101+00.00	9131+00.00	LT & RT	4,145		2,808		1,337
SUBTOTAL SUMMARY NO. 4				4,145		2,808		1,337
-M2-	9131+00.00	9161+00.00	LT & RT	10,730		1,169		9,561
SUBTOTAL SUMMARY NO. 5				10,730		1,169		9,561
-M2-	9161+00.00	9169+50.00	LT & RT	11,342		78		11,264
-Y4-	10+28.78	12+50.00	LT & RT	23		390	367	
-Y4-	12+50.00	15+60.00	LT & RT	164		424	260	
SUBTOTAL SUMMARY NO. 6				11,529		892	627	11,264
-M2-	9170+50.00	9200+50.00	LT & RT	14,280		9,294		4,986
SUBTOTAL SUMMARY NO. 7				14,280		9,294		4,986
-M2-	9200+50.00	9218+00.00	LT & RT	1,379		7,274	5,895	
SUBTOTAL SUMMARY NO. 8				1,379		7,274	5,895	
TOTAL				74,357		37,451	6693	43,599
REDUCTION OF UNCLASSIFIED EXCAVATION				1,200		1,440	1,440	1,200
LOSS DUE TO CLEARING AND GRUBBING				-612				-612
WASTE IN LIEU OF BORROW							-8,133	-8,133
GRAND TOTAL				74,945		38,891		36,054
SAY				75,000	5,500			

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

PAVEMENT REMOVAL SUMMARY

CHAIN	STATION - STATION	SIDE	LOCATION	AREA (SY)
-M2-	9011+50 - 9011+60	RT & LT	NOBLE ACRES DR.	180
-M2-	9035+90 - 9036+00	RT & LT	REID FARM RD.	221
-M2-	9059+90 - 9060+10	RT & LT	PEACH ORCHARD RD.	482
-M2-	9095+50 - 9095+70	RT & LT	PEELER RD.	354
-M2-	9117+30 - 9117+50	RT & LT	PRIVATE DR.	122
-M2-	9217+00 - 9217+30	RT & LT	MT. HOPE CHURCH RD.	489
-Y4-	12+20 - 12+50	RT & LT	WEBB RD.	79
			TOTAL :	1,927
			SAY :	1,930

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W*		ANCHORS								TERMINAL END SECTION		IMPACT ATTENUATOR TYPE 350			SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	B-77	GRAU 350	M-350	TYPE III	CAT-1	VI MOD	BIC	AT-1	TES		EA	G	NG				
-M2-	9217+00	9217+30	LT	37.5																				2								
-M2-	9217+00	9217+30	RT	37.5																				2								
-M2-	9070+80	9071+00	RT																											25		EX. GUARDRAIL NOT SURVEYED
			TOTAL:	75			ANCHOR	DEDUCTIONS		TOTAL														4						25		
			TOTAL ANCHOR LENGTH:	0			GRAU 350	X @ 50.00																								
			TOTAL GUARDRAIL LENGTH:	75			AT-1	X @ 6.25																								
			SAY:	75				TOTAL DEDUCTIONS =																								
			ADDITIONAL GUARDRAIL POST 5 EACH																													

* W MEASURED FROM "N" AT THE BEGINNING OF THE ANCHOR TO "N" AT THE END OF THE ANCHOR.
"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

8/7/2013
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dgnuser

DCN 0164DEL_P10b2

DRAINAGE SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	3-C
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

COMPUTED BY: Joshua G. Dalton, P.E. DATE: 2/19/2013

CHECKED BY: Brian N. Elam, P.E. DATE: 2/20/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
P-5206B	

JOSH-HP

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".

Choose Project Tier

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	SLOPE CRITICAL
9011+50 -M2-	RT						
9015+18 -M2-	LT						
9015+18 -M2-	RT						
9033+00 -M2-	RT						
9035+91 -M2-	RT						
9035+91 -M2-	RT						
9044+99 -M2-	LT	B601					
9044+80 -M2-	RT	B602					
9044+88 -M2-	CL	B601	B602		759.0	758.0	
9050+00 -M2-	RT						
9059+83 -M2-	LT						
9064+52 -M2-	RT	B701					
9064+52 -M2-	LT	B702					
9064+52 -M2-	CL	B701	B702		775.3	775.0	
9070+79 -M2-	RT	B801			785.3	785.1	
9095+70 -M2-	RT	B1001			791.3	791.0	
9085+49 -M2-	CL						
9095+65 -M2-	LT						
9146+00 -M2-	RT	B1301			797.7	797.3	
9170+06 -M2-	RT	B1501			797.2	796.76	
9174+06 -M2-	CL						
9176+05 -M2-	RT	B1502					
9176+05 -M2-	LT	B1503					
9176+05 -M2-	CL	B1502	B1503		790.2	789.0	
10+85 -Y4-	LT	B1504		802.7	800.45		
		B1504	B1505		800.45	800.3	
10+54 -Y4-	LT	B1505		803.0	800.3		
		B1505	B1506		800.3	800.2	
10+34.5 -Y4-	LT	B1506		804.5	800.2		
10+83 -Y4-	RT	B1507		801.8	799.5		
		B1507	B1508		799.5	799.3	
10+52 -Y4-	RT	B1508		801.8	799.3		
		B1508	B1509		799.3	799.1	
10+35.5 -Y4-	RT	B1509		802.8	799.1		
		B1506	B1509		800.2	799.1	
9189+42 -M2-	LT	B1601					
9189+42 -M2-	RT	B1602					
9189+42 -M2-	CL	B1601	B1602		787.5	783.5	
9191+06 -A4-	LT	B1603					
9191+06 -A4-	RT	B1604					
9191+06 -A4-	CL	B1603	B1604		790.2	790.0	
9181+30 -A3-	LT	B1605			790.6	789.0	
9211+60 -M2-	RT	B1801					
9211+60 -M2-	LT	B1802					
9211+60 -M2-	CL	B1801	B1802		804.3	804.0	
9212+18 -M2-	CL						
SHEET TOTALS							
SAY							

SIZE / THICKNESS OR GAUGE:

STATION	STRUCTURE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
9011+50 -M2-																					
9015+18 -M2-																					
9015+18 -M2-																					
9033+00 -M2-																					
9035+91 -M2-																					
9035+91 -M2-																					
9044+99 -M2-	B601																				
9044+80 -M2-	B602																				
9044+88 -M2-	B601–B602																				
9050+00 -M2-																					
9059+83 -M2-																					
9064+52 -M2-	B701																				
9064+52 -M2-	B702																				
9064+52 -M2-	B701–B702																				
9070+79 -M2-	B801		36																		
9095+70 -M2-	B1001																				
9085+49 -M2-																					
9095+65 -M2-																					
9146+00 -M2-	B1301																				
9170+06 -M2-	B1501																				
9174+06 -M2-																					
9176+05 -M2-	B1502																				
9176+05 -M2-	B1503																				
9176+05 -M2-	B1502–B1503																				
10+85 -Y4-	B1504																				
	B1504–B1505																				
10+54 -Y4-	B1505																				
	B1505–B1506																				
10+34.5 -Y4-	B1506																				
10+83 -Y4-	B1507																				
	B1507–B1508																				
10+52 -Y4-	B1508																				
	B1508–B1509																				
10+35.5 -Y4-	B1509																				
	B1506–B1509																				
9189+42 -M2-	B1601																				
9189+42 -M2-	B1602																				
9189+42 -M2-	B1601–B1602																				
9191+06 -A4-	B1603																				
9191+06 -A4-	B1604																				
9191+06 -A4-	B1603–B1604																				
9181+30 -A3-	B1605																				
9211+60 -M2-	B1801																				
9211+60 -M2-	B1802																				
9211+60 -M2-	B1801–B1802																				
9212+18 -M2-																					
SHEET TOTALS			36																		
SAY			36																		

STATION	STRUCTURE	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
9011+50 -M2-																	
9015+18 -M2-																	
9015+18 -M2-																	
9033+00 -M2-																	
9035+91 -M2-																	
9035+91 -M2-																	
9044+99 -M2-	B601																
9044+80 -M2-	B602																
9044+88 -M2-	B601–B602																
9050+00 -M2-																	
9059+83 -M2-																	
9064+52 -M2-	B701																
9064+52 -M2-	B702																
9064+52 -M2-	B701–B702																
9070+79 -M2-	B801																
9095+70 -M2-	B1001				60												
9085+49 -M2-																	
9095+65 -M2-																	
9146+00 -M2-	B1301				36												
9170+06 -M2-	B1501				112												
9174+06 -M2-																	
9176+05 -M2-	B1502																
9176+05 -M2-	B1503																
9176+05 -M2-	B1502–B1503																
10+85 -Y4-	B1504																
	B1504–B1505		52														
10+54 -Y4-	B1505																
	B1505–B1506		24														
10+34.5 -Y4-	B1506																
10+83 -Y4-	B1507																
	B1507–B1508		44														
10+52 -Y4-	B1508																
	B1508–B1509		24														
10+35.5 -Y4-	B1509																
	B1506–B1509		136														
9189+42 -M2-	B1601																
9189+42 -M2-	B1602																
9189+42 -M2-	B1601–B1602																
9191+06 -A4-	B1603																
9191+06 -A4-	B1604																
9191+06 -A4-	B1603–B1604																
9181+30 -A3-	B1605				80												
9211+60 -M2-	B1801																
9211+60 -M2-	B1802																
9211+60 -M2-	B1801–B1802																
9212+18 -M2-																	
SHEET TOTALS			280		288												
SAY			280		288												

STATION	STRUCTURE	36" WELDED STEEL PIPE, 0.532" THICK GRADE B IN SOIL	36" WELDED STEEL PIPE, 0.532" THICK GRADE B NOT IN SOIL	36" WELDED STEEL PIPE, 0.532" THICK GRADE B (OPEN CUT)	48" WELDED STEEL PIPE, 0.688" THICK GRADE B IN SOIL	48" WELDED STEEL PIPE, 0.688" THICK GRADE B NOT IN SOIL	48" WELDED STEEL PIPE, 0.688" THICK GRADE B (OPEN CUT)	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	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 DROP INLET	CATCH BASIN
9011+50 -M2-																				
9015+18 -M2-																				
9015+18 -M2-																				
9033+00 -M2-																				
9035+91 -M2-																				
9035+91 -M2-																				
9044+99 -M2-	B601										4.9									
9044+80 -M2-	B602										4.9									
9044+88 -M2-	B601–B602				40	40	44													
9050+00 -M2-																				
9059+83 -M2-																				
9064+52 -M2-	B701										2.8									
9064+52 -M2-	B702										2.8									
9064+52 -M2-	B701–B702	32	32	24																
9070+79 -M2-	B801																			
9095+70 -M2-	B1001																			
9085+49 -M2-																				
9095+65 -M2-																				
9146+00 -M2-	B1301																			
9170+06 -M2-	B1501																			
9174+06 -M2-																				
9176+05 -M2-	B1502										2.8									
9176+05 -M2-	B1503										2.8									
9176+05 -M2-	B1502–B1503	32	32	32																
10+85 -Y4-	B1504											1							1	
	B1504–B1505																			
10+54 -Y4-	B1505											1							1	
	B1505–B1506																			
10+34.5 -Y4-	B1506											1								
10+83 -Y4-	B1507											1							1	
	B1507–B1508																			
10+52 -Y4-	B1508											1							1	
	B1508–B1509																			
10+35.5 -Y4-	B1509											1								
	B1506–B1509																			
9189+42 -M2-	B1601										2.8									
9189+42 -M2-	B1602										2.8									
9189+42 -M2-	B1601–B1602	36	36	64																
9191+06 -A4-	B1603										2.8									
9191+06 -A4-	B1604										2.8									
9191+06 -A4-	B1603–B1604	24	24																	
9181+30 -A3-	B1605																			
9211+60 -M2-	B1801										2.8									
9211+60 -M2-	B1802										2.8									
9211+60 -M2-	B1801–B1802	20	20	28																
9212+18 -M2-																				
SHEET TOTALS		144	144	148	40	40	44				37.8	6							4	
SAY		144	144	148	40	40	44				40	6							4	

STATION	STRUCTURE	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	MH FRAME AND COVER STD. 840.54				DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE MATERIAL C.Y.	PIPE REMOVAL LIN. FT.	REMARKS
9011+50 -M2-																			24	REMOVE 24 LF OF 12" RCP
9015+18 -M2-																			20	REMOVE 20 LF OF 18" PLASTIC
9015+18 -M2-																			20	REMOVE 20 LF OF 18" PLASTIC
9033+00 -M2-																			26	REMOVE 26 LF OF 15" CMP
9035+91 -M2-																			20	REMOVE 20 LF OF 18" CMP & HWS
9035+91 -M2-																			24	REMOVE 24 LF OF 12" RCP
9044+99 -M2-	B601																	19.9		
9044+80 -M2-	B602																		24	REMOVE 24 LF OF 30" CMP
9044+88 -M2-	B601–B602																			
9050+00 -M2-																			21	REMOVE 21 LF OF 12" RCP & HW
9059+83 -M2-																			20	REMOVE 20 LF OF 15" PLASTIC
9064+52 -M2-	B701																			REMOVE HWS
9064+52 -M2-	B702																	15.0		PLUG AND FILL EXIST. 36" X 30" CULV
9064+52 -M2-	B701–B702																			
9070+79 -M2-	B801																			
9095+70 -M2-	B1001																			
9085+49 -M2-																		9.5		PLUG AND FILL EXISTING 30" CI
9095+65 -M2-																			48	REMOVE 48 LF OF 15" RCP
9146+00 -M2-	B1301																			
9170+06 -M2-	B1501																	1.1		PLUG AND FILL EXISTING 12" RCP
9174+06 -M2-																		9.6		PLUG AND FILL EXISTING 30" CI
9176+05 -M2-	B1502																			
9176+05 -M2-	B1503																			REMOVE EXISTING DI
9176+05 -M2-	B1502–B1503																			
10+85 -Y4-	B1504	1	1																	
	B1504–B1505																			
10+54 -Y4-	B1505	1	1																	
	B1505–B1506																			
10+34.5 -Y4-	B1506										1	1								
10+83 -Y4-	B1507	1	1																	
	B1507–B1508																			
10+52 -Y4-	B1508	1	1																	
	B1508–B1509																			
10+35.5 -Y4-	B1509										1	1								REMOVE CB; INSTALL JB W/MH
	B1506–B1509																			REMOVE 136 LF OF 15" RCP
9189+42 -M2-	B1601																			
9189+42 -M2-	B1602																	15.7		PLUG AND FILL EXISTING 36" DI & 28" CULV
9189+42 -M2-	B1601–B1602																			
9191+06 -A4-	B1603																			
9191+06 -A4-	B1604																			
9191+06 -A4-	B1603–B1604																			
9181+30 -A3-	B1605																			
9211+60 -M2-	B1801																			
9211+60 -M2-	B1802																			
9211+60 -M2-	B1801–B1802																			
9212+18 -M2-																		3.1		PLUG AND FILL EXISITING 18" CI
SHEET TOTALS		4	4								2	2						73.9	247	
SAY		4	4								2	2						80	250	

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

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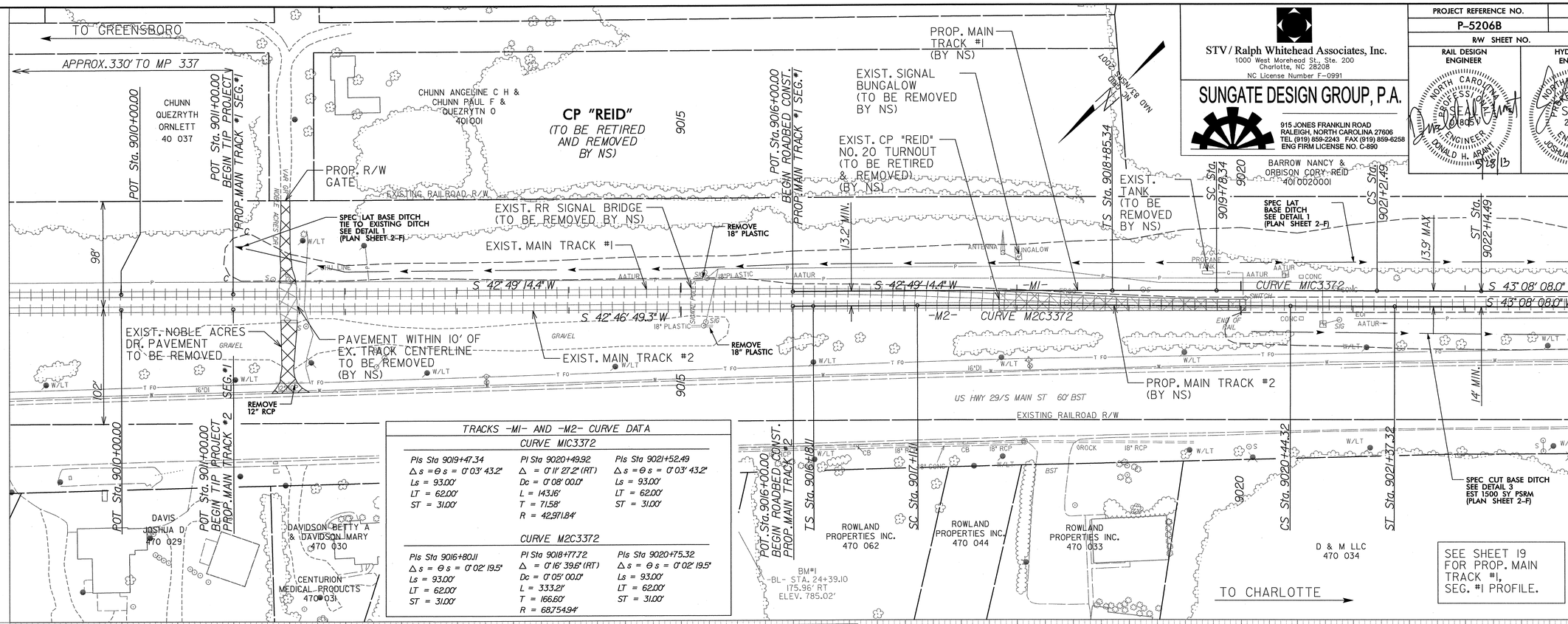
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	4
R/W SHEET NO.	RR-01

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER DONALD H. APANT 26805 — 5/28/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL ENGINEER JOSHUA G. DALTON 26971 — 5/28/13

STV / Ralph Whitehead Associates, Inc.
1000 West Morehead St., Ste. 200
Charlotte, NC 28208
NC License Number F-0991

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890



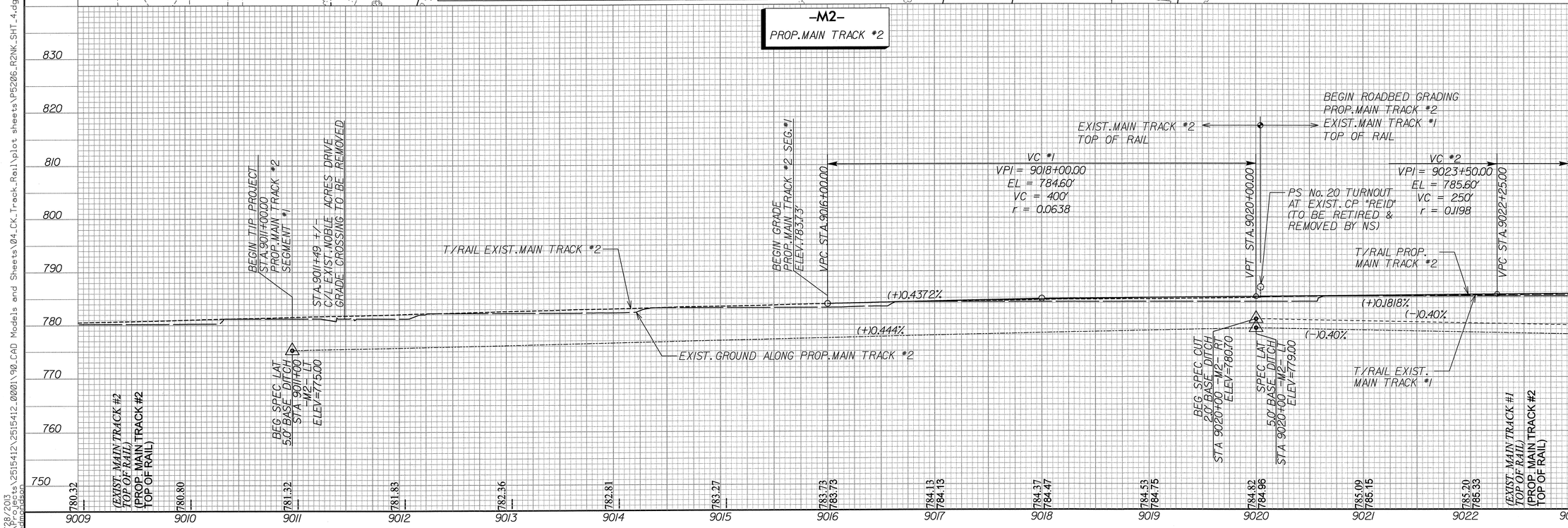
TRACKS -M1- AND -M2- CURVE DATA

CURVE M1C3372

PIs Sta 9019+47.34	PI Sta 9020+49.92	PIs Sta 9021+52.49
Δs = Θs = 0°03' 43.2"	Δ = 0°11' 27.2" (RT)	Δs = Θs = 0°03' 43.2"
Ls = 93.00'	Dc = 0°08' 00.0"	Ls = 93.00'
LT = 62.00'	L = 143.16'	LT = 62.00'
ST = 31.00'	T = 71.58'	ST = 31.00'
	R = 42,971.84'	

CURVE M2C3372

PIs Sta 9016+80.11	PI Sta 9018+77.72	PIs Sta 9020+75.32
Δs = Θs = 0°02' 19.5"	Δ = 0°16' 39.6" (RT)	Δs = Θs = 0°02' 19.5"
Ls = 93.00'	Dc = 0°05' 00.0"	Ls = 93.00'
LT = 62.00'	L = 333.21'	LT = 62.00'
ST = 31.00'	T = 166.60'	ST = 31.00'
	R = 68,754.94'	



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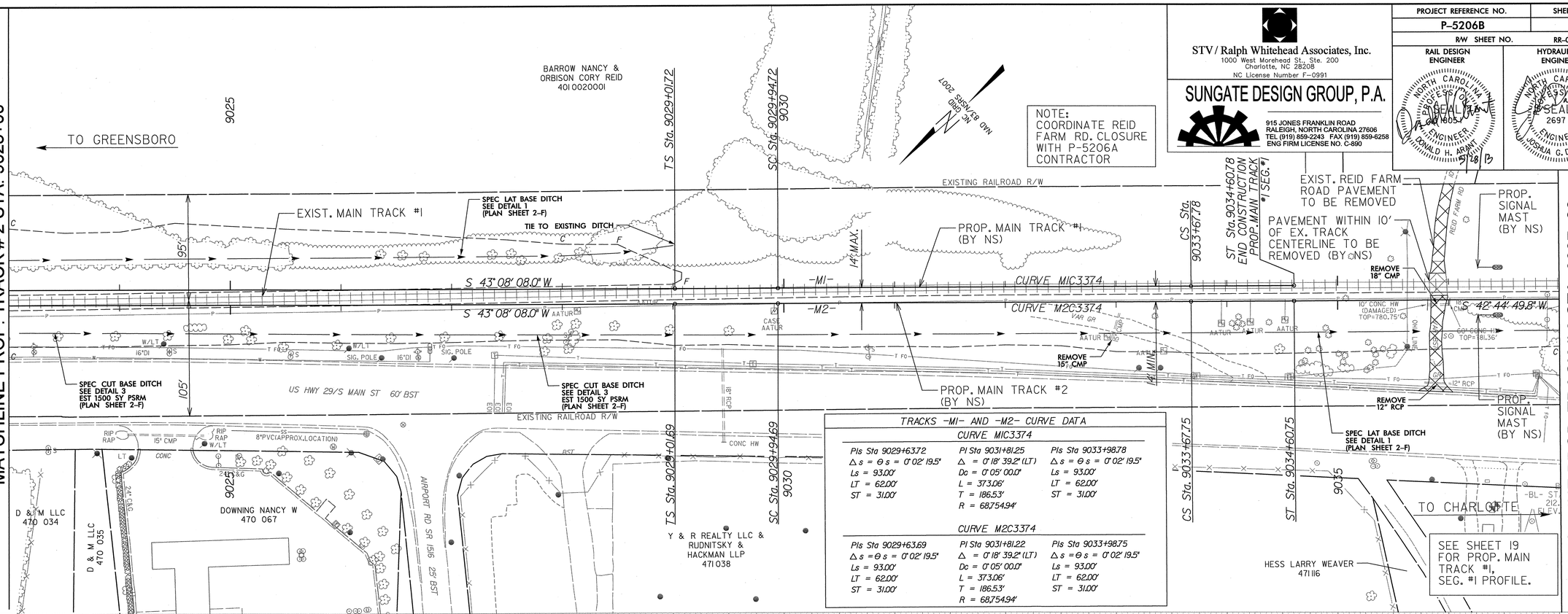
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	5
R/W SHEET NO.	RR-02
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19605 ENGINEER DONALD H. ARANT 5/28/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13

NOTE:
COORDINATE REID FARM RD. CLOSURE WITH P-5206A CONTRACTOR



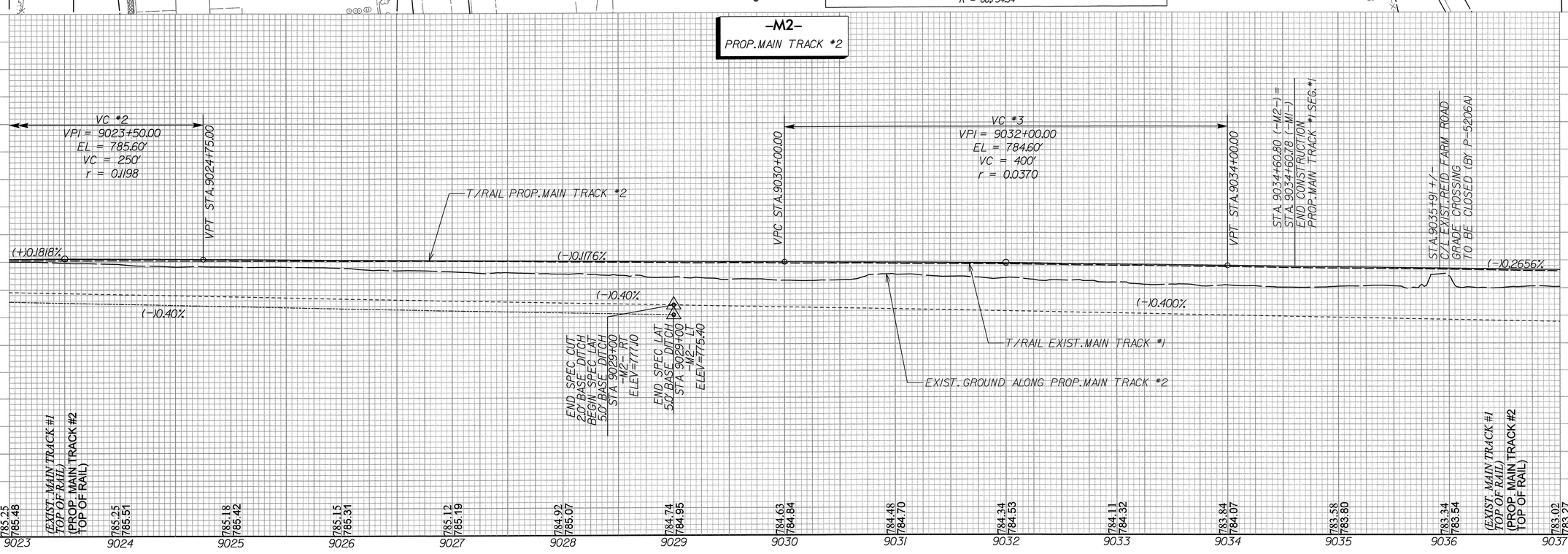
TRACKS -M1- AND -M2- CURVE DATA

CURVE M1C3374

PIs Sta 9029+63.72	PI Sta 9031+81.25	PIs Sta 9033+98.78
Δs = Θs = 0°02' 19.5"	Δ = 0°18' 39.2" (LT)	Δs = Θs = 0°02' 19.5"
Ls = 93.00'	Dc = 0°05' 00.0"	Ls = 93.00'
LT = 62.00'	L = 373.06'	LT = 62.00'
ST = 31.00'	T = 186.53'	ST = 31.00'
	R = 68,754.94'	

CURVE M2C3374

PIs Sta 9029+63.69	PI Sta 9031+81.22	PIs Sta 9033+98.75
Δs = Θs = 0°02' 19.5"	Δ = 0°18' 39.2" (LT)	Δs = Θs = 0°02' 19.5"
Ls = 93.00'	Dc = 0°05' 00.0"	Ls = 93.00'
LT = 62.00'	L = 373.06'	LT = 62.00'
ST = 31.00'	T = 186.53'	ST = 31.00'
	R = 68,754.94'	



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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	6
R/W SHEET NO.	RR-03

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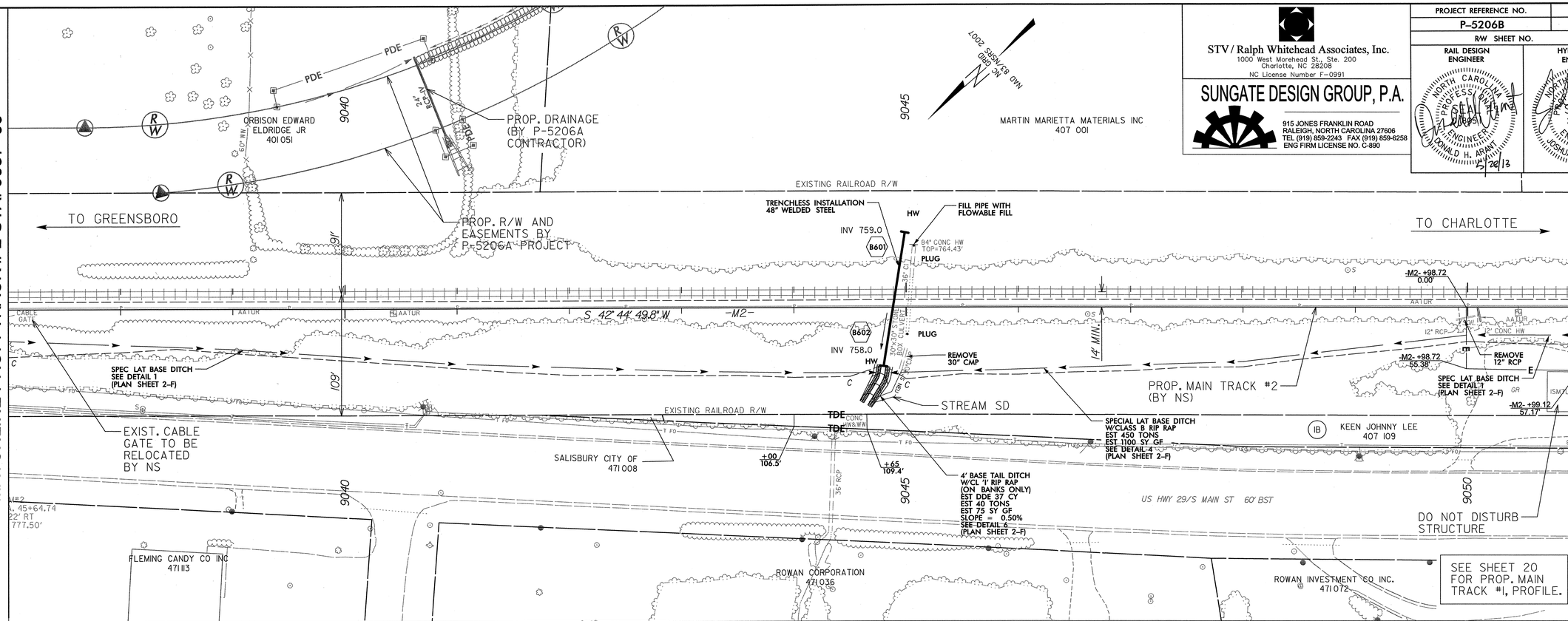
ENG FIRM LICENSE NO. C-890

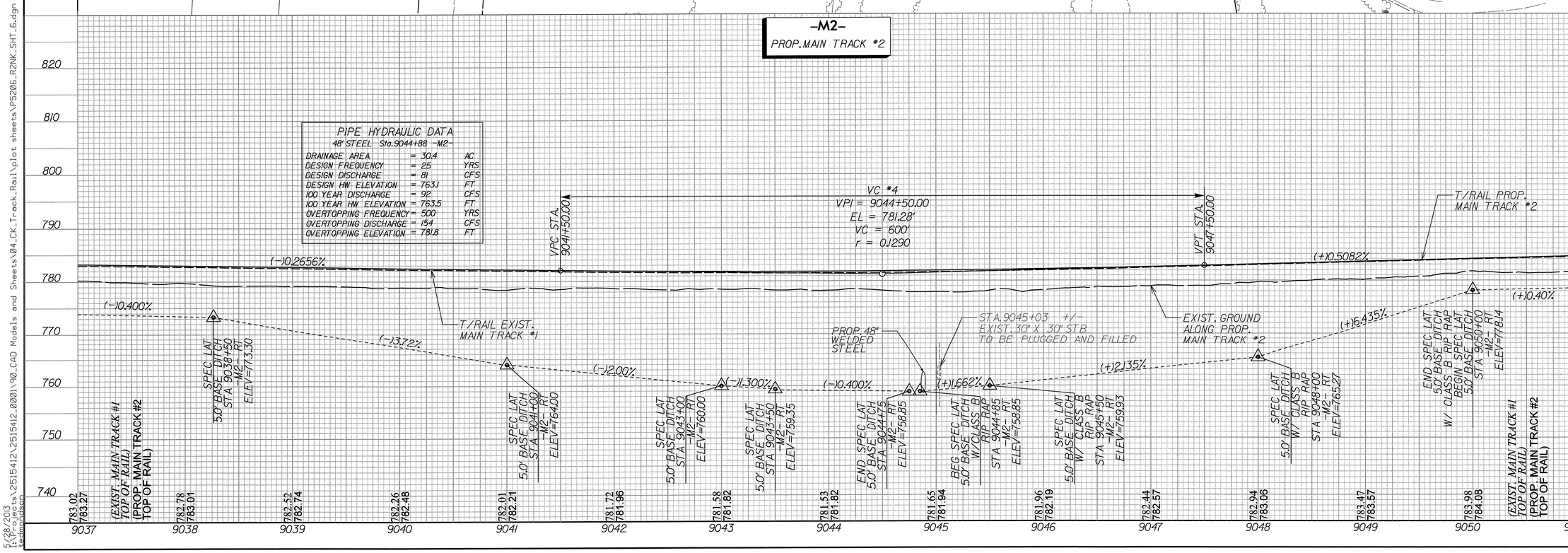
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL ENGINEER DONALD H. ARANT 5/20/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/29/13

SEE SHEET 5
MATCHLINE PROP. TRACK # 2 STA. 9037+00



MATCHLINE PROP. TRACK # 2 STA. 9051+00
SEE SHEET 7



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SEE SHEET 6
MATCHLINE PROP. TRACK # 2 STA. 9051+00

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	7
R/W SHEET NO.	RR-04

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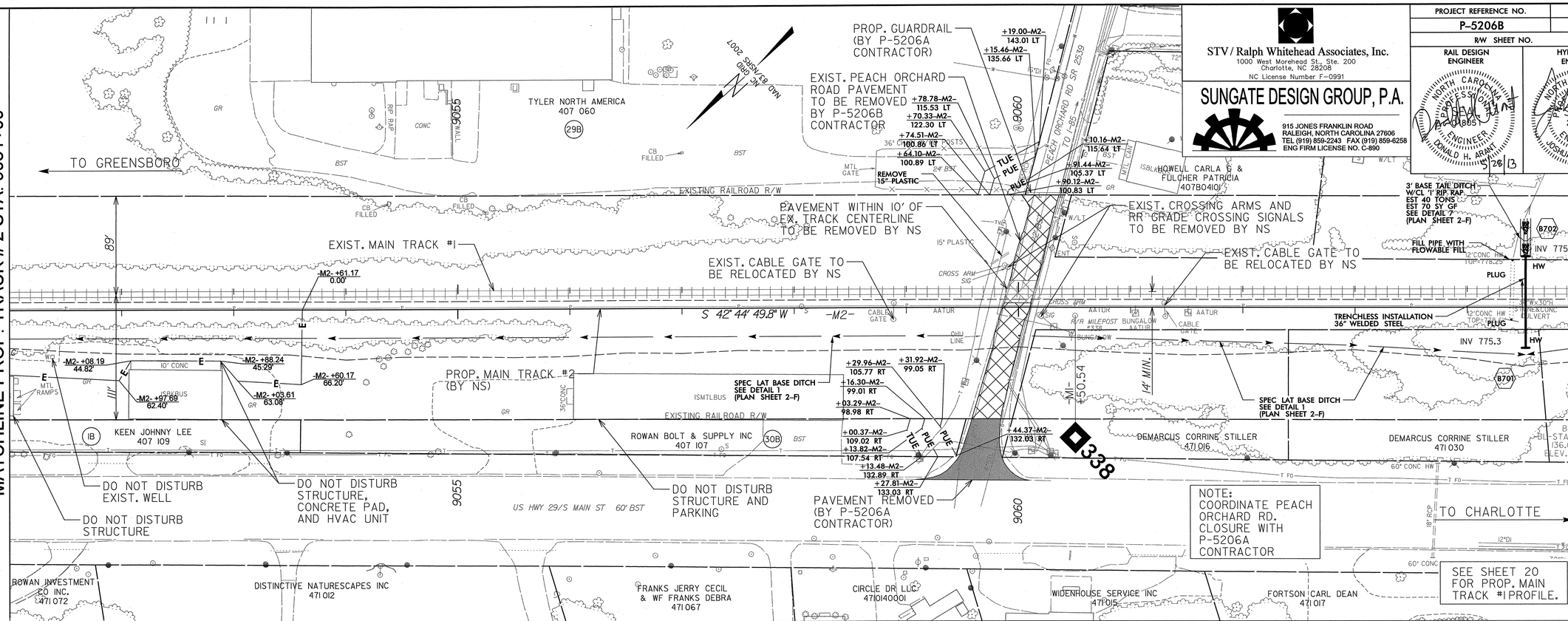
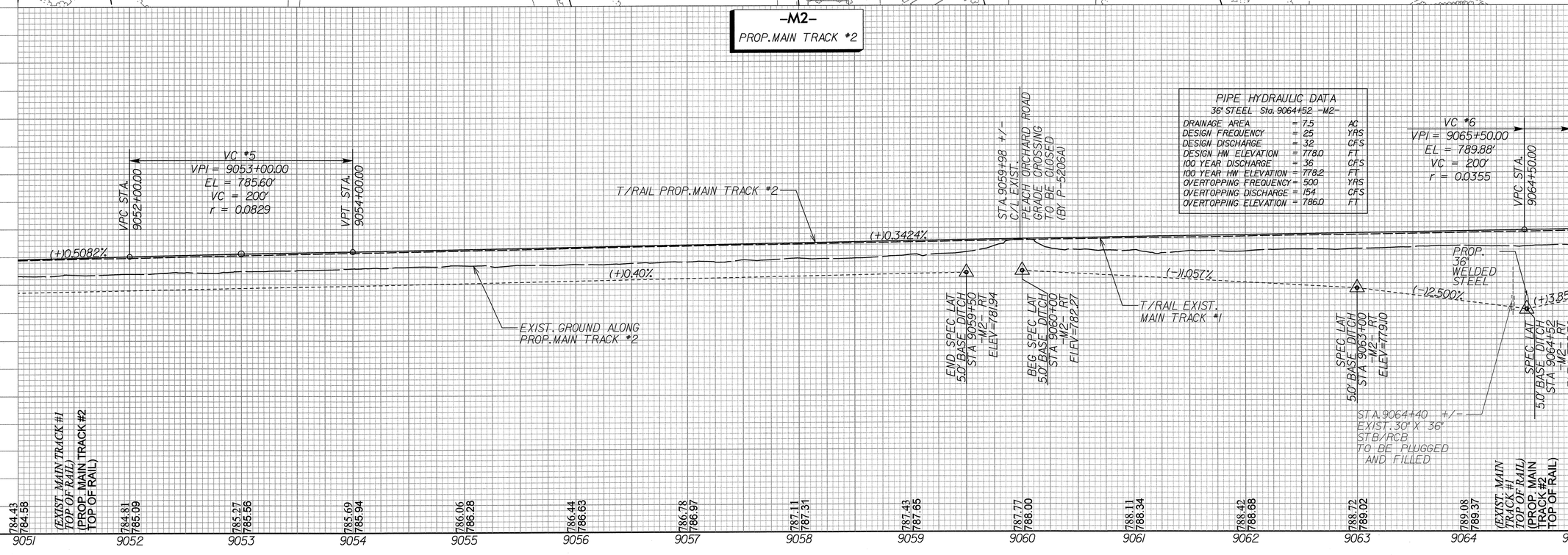
ENG FIRM LICENSE NO. C-890

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19805 ENGINEER DONALD H. ARANT — 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/28/13





PIPE HYDRAULIC DATA
36" STEEL Sta. 9064+52 -M2-

DRAINAGE AREA	= 7.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 32	CFS
DESIGN HW ELEVATION	= 778.0	FT
100 YEAR DISCHARGE	= 36	CFS
100 YEAR HW ELEVATION	= 778.2	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 154	CFS
OVERTOPPING ELEVATION	= 786.0	FT

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	8
R/W SHEET NO.	RR-05

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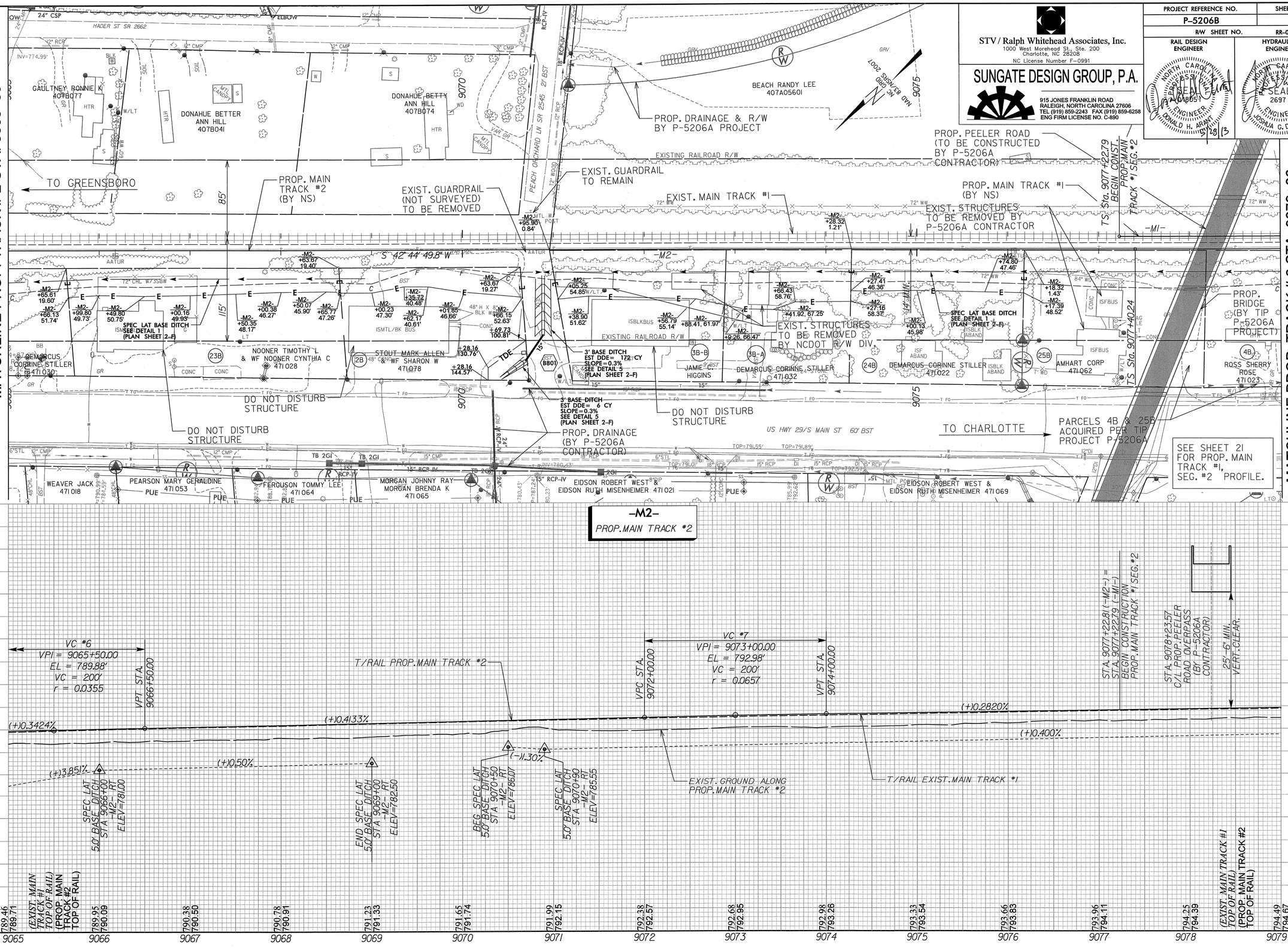
ENG FIRM LICENSE NO. C-890

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24001 ENGINEER DONALD H. ARANT — 3/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 3/28/13

SEE SHEET 7
MATCHLINE PROP. TRACK # 2 STA. 9065+00

MATCHLINE PROP. TRACK # 2 STA. 9079+00
SEE SHEET 9



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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	9
R/W SHEET NO.	RR-06

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 30351 ENGINEER DONALD H. ARANT 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13

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SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
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ENG FIRM LICENSE NO. C-890

TRACKS -M1-, -M2- AND -A1- CURVE DATA

CURVE M1C3383

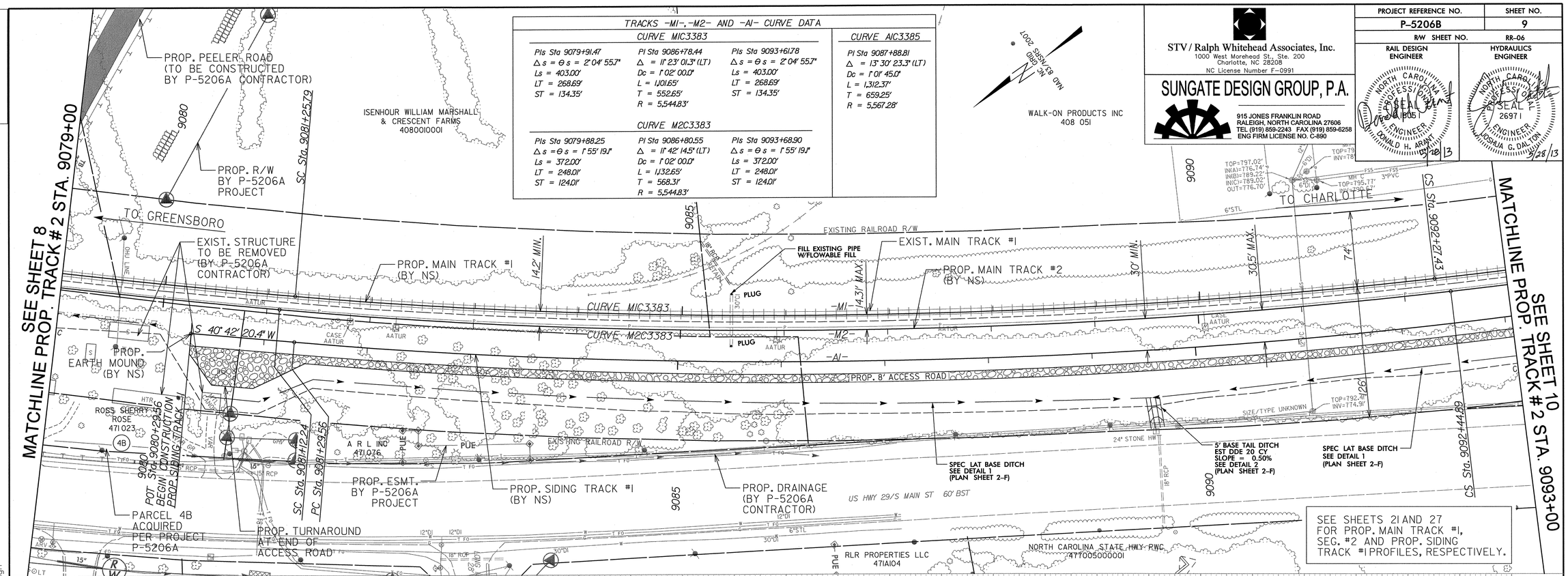
PIs Sta 9079+91.47	PI Sta 9086+78.44	PIs Sta 9093+61.78
Δs = Θs = 2° 04' 55.7"	Δ = 11° 23' 01.3" (LT)	Δs = Θs = 2° 04' 55.7"
Ls = 403.00'	Dc = 1° 02' 00.0"	Ls = 403.00'
LT = 268.69'	L = 1,101.65'	LT = 268.69'
ST = 134.35'	T = 552.65'	ST = 134.35'
	R = 5,544.83'	

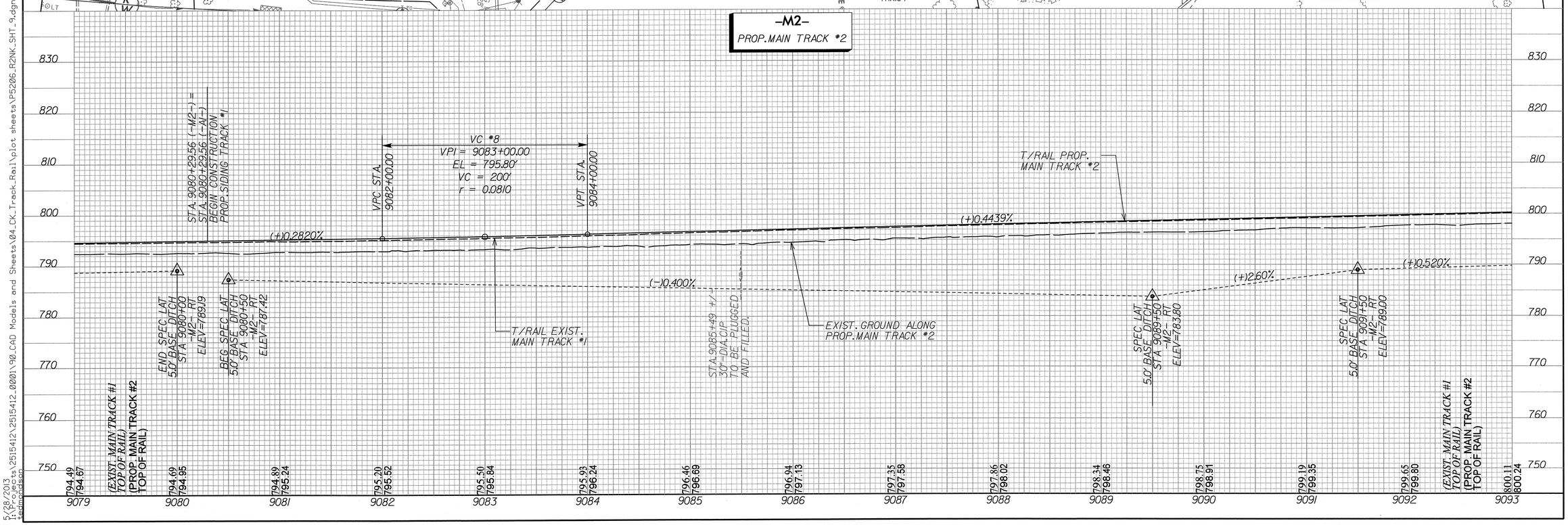
CURVE M2C3383

PIs Sta 9079+88.25	PI Sta 9086+80.55	PIs Sta 9093+68.90
Δs = Θs = 1° 55' 19.1"	Δ = 11° 42' 14.5" (LT)	Δs = Θs = 1° 55' 19.1"
Ls = 372.00'	Dc = 1° 02' 00.0"	Ls = 372.00'
LT = 248.01'	L = 1,132.65'	LT = 248.01'
ST = 124.01'	T = 568.31'	ST = 124.01'
	R = 5,544.83'	

CURVE A1C3385

PI Sta 9087+88.81
Δ = 13° 30' 23.3" (LT)
Dc = 1° 01' 45.0"
L = 1,312.37'
T = 659.25'
R = 5,567.28'





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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	10
R/W SHEET NO.	RR-07

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SUNGATE DESIGN GROUP, P.A.
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ENG FIRM LICENSE NO. C-890

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19805 ENGINEER DONALD H. ARANT — 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/23/13

TRACKS -MI-, -M2- AND -AI- CURVE DATA

CURVE MIC3383

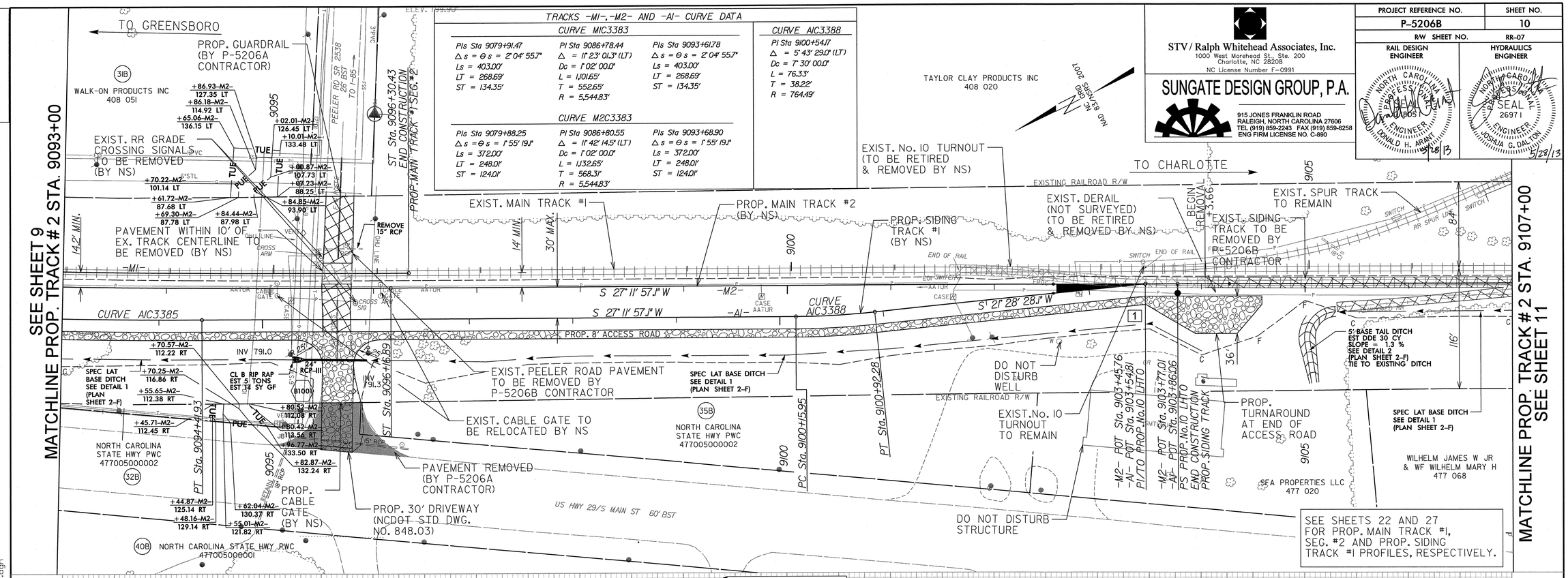
PIs Sta 9079+91.47	PI Sta 9086+78.44	PIs Sta 9093+61.78
Δs = Θs = 2° 04' 55.7"	Δ = 11° 23' 01.3" (LT)	Δs = Θs = 2° 04' 55.7"
Ls = 403.00'	Dc = 1° 02' 00.0"	Ls = 403.00'
LT = 268.69'	L = 1,101.65'	LT = 268.69'
ST = 134.35'	T = 552.65'	ST = 134.35'
	R = 5,544.83'	

CURVE MIC3383

PIs Sta 9079+88.25	PI Sta 9086+80.55	PIs Sta 9093+68.90
Δs = Θs = 1° 55' 19.1"	Δ = 11° 42' 14.5" (LT)	Δs = Θs = 1° 55' 19.1"
Ls = 372.00'	Dc = 1° 02' 00.0"	Ls = 372.00'
LT = 248.01'	L = 1,132.65'	LT = 248.01'
ST = 124.01'	T = 568.31'	ST = 124.01'
	R = 5,544.83'	

CURVE AIC3388

PI Sta 9100+54.17
Δ = 5° 43' 29.0" (LT)
Dc = 1° 30' 00.0"
L = 76.33'
T = 38.22'
R = 764.49'



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DGN 0164DEL_P10b2

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	11
R/W SHEET NO.	RR-08

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Charlotte, NC 28208
NC License Number F-0991

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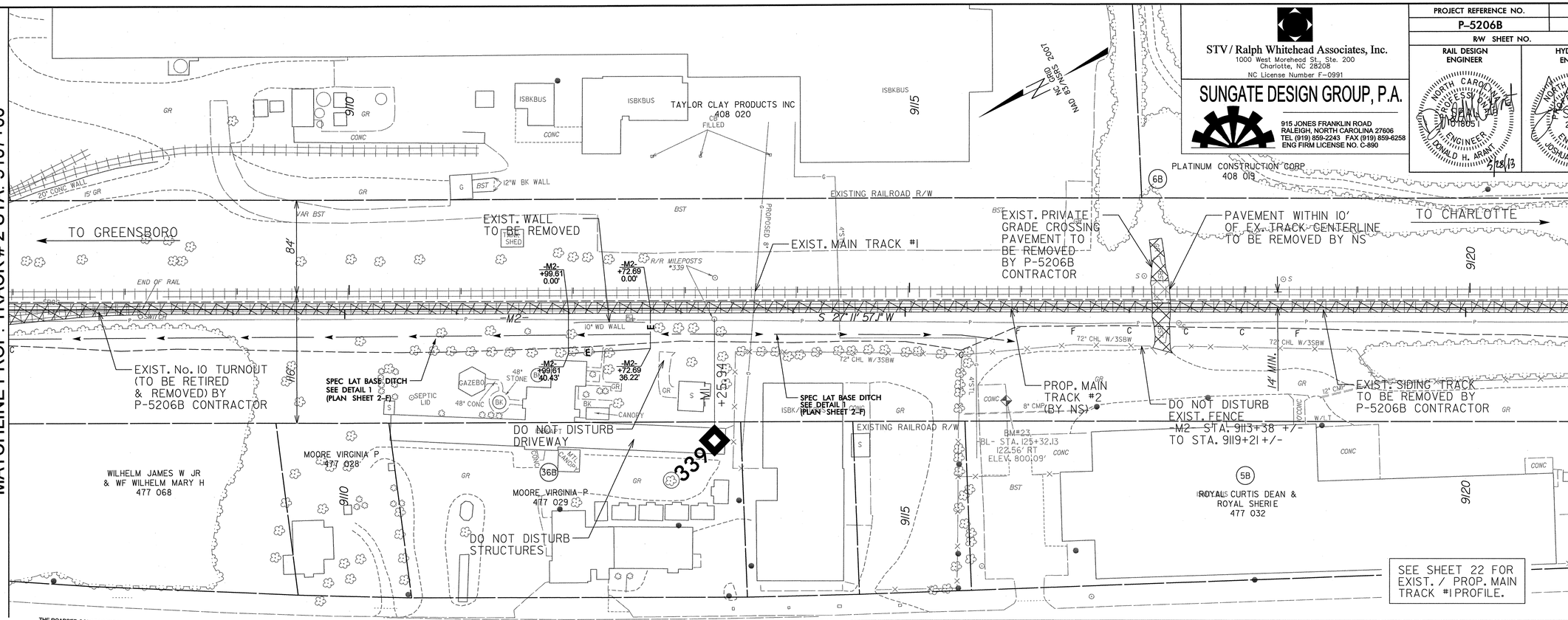
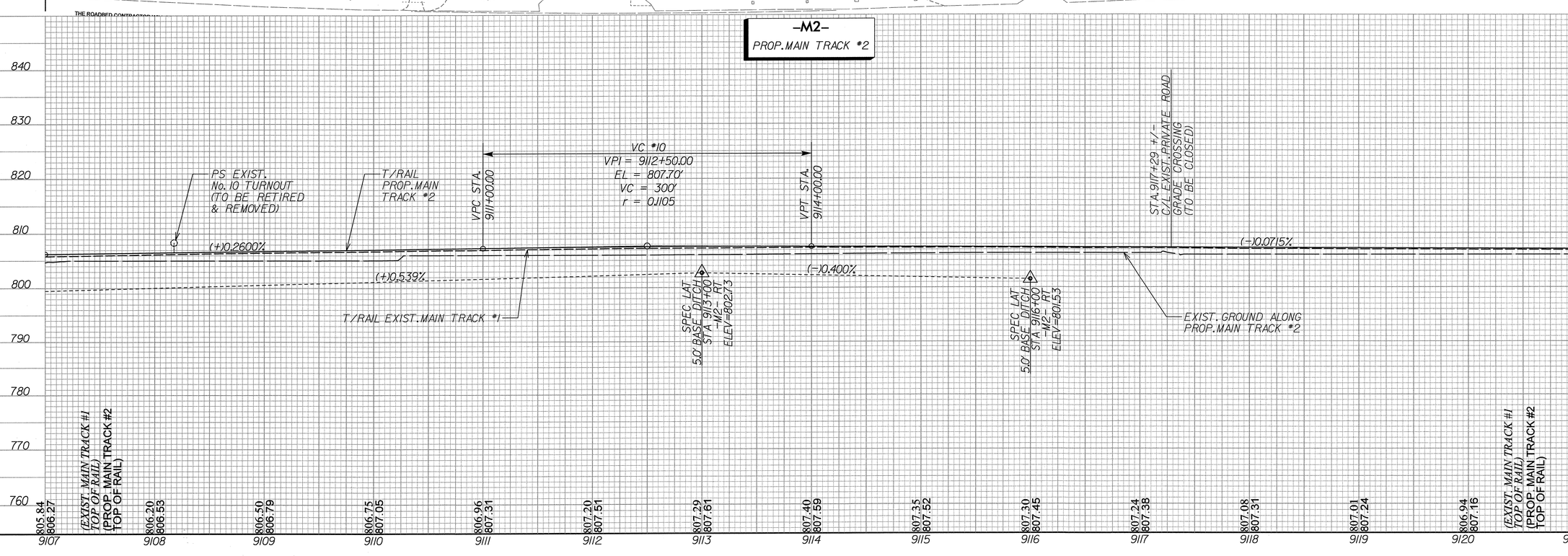
ENG FIRM LICENSE NO. C-890

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13





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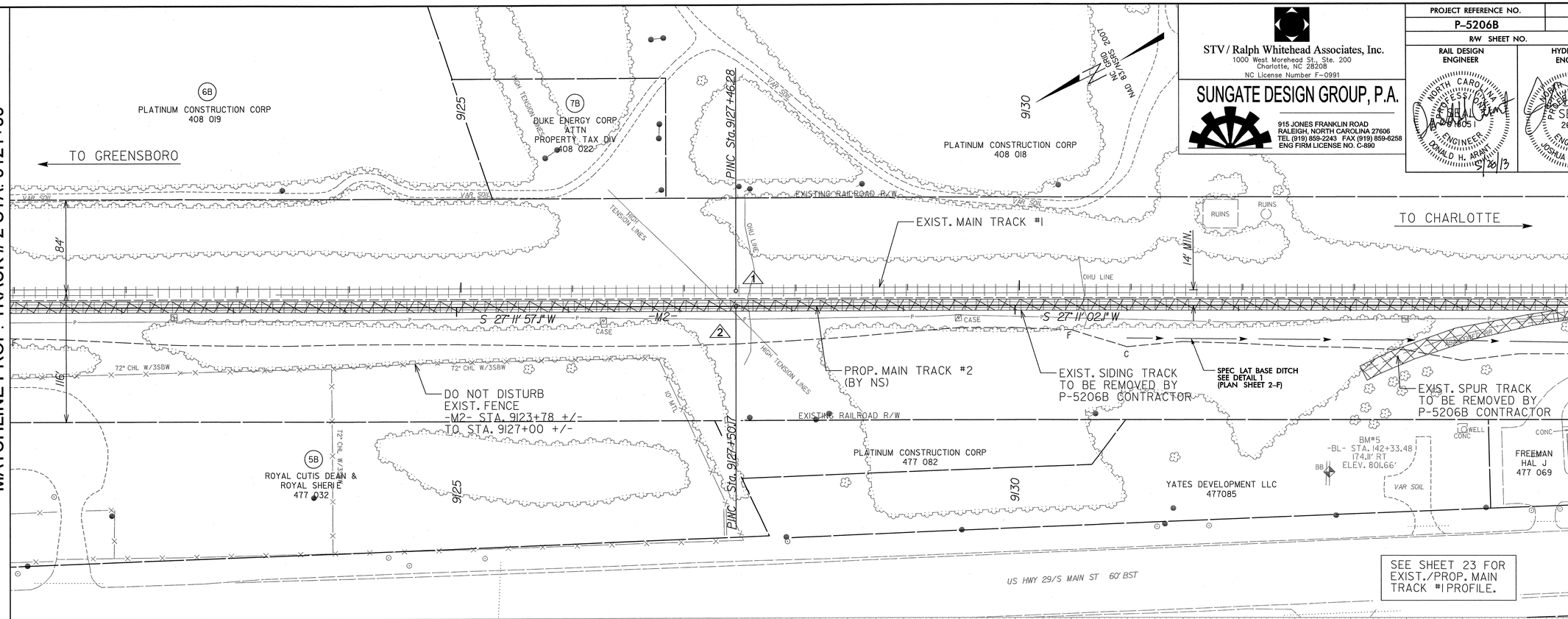
DGN 0164DEL_P10b2

SEE SHEET 11
MATCHLINE PROP. TRACK # 2 STA. 9121+00



MATCHLINE PROP. TRACK # 2 STA. 9135+00
SEE SHEET 13

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Charlotte, NC 28208
NC License Number F-0991

SUNGATE DESIGN GROUP, P.A.
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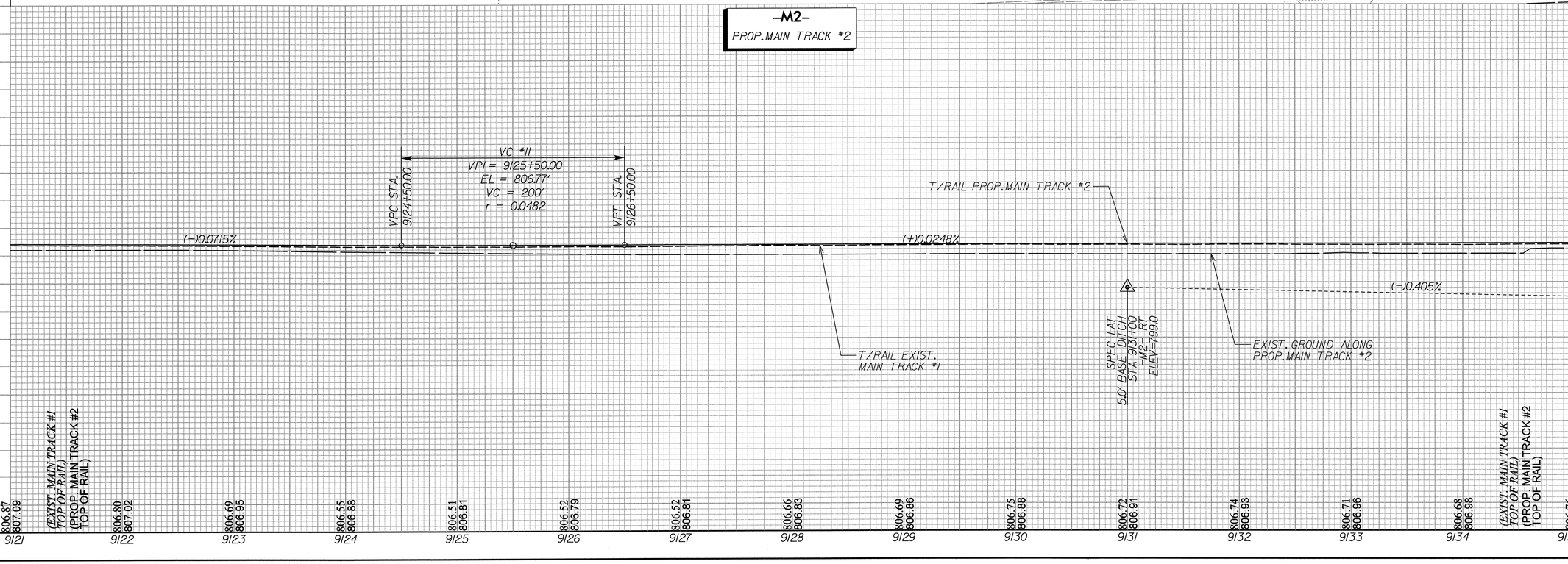
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	12
R/W SHEET NO.	RR-09
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26801 ENGINEER DONALD H. ARANT 5/20/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13



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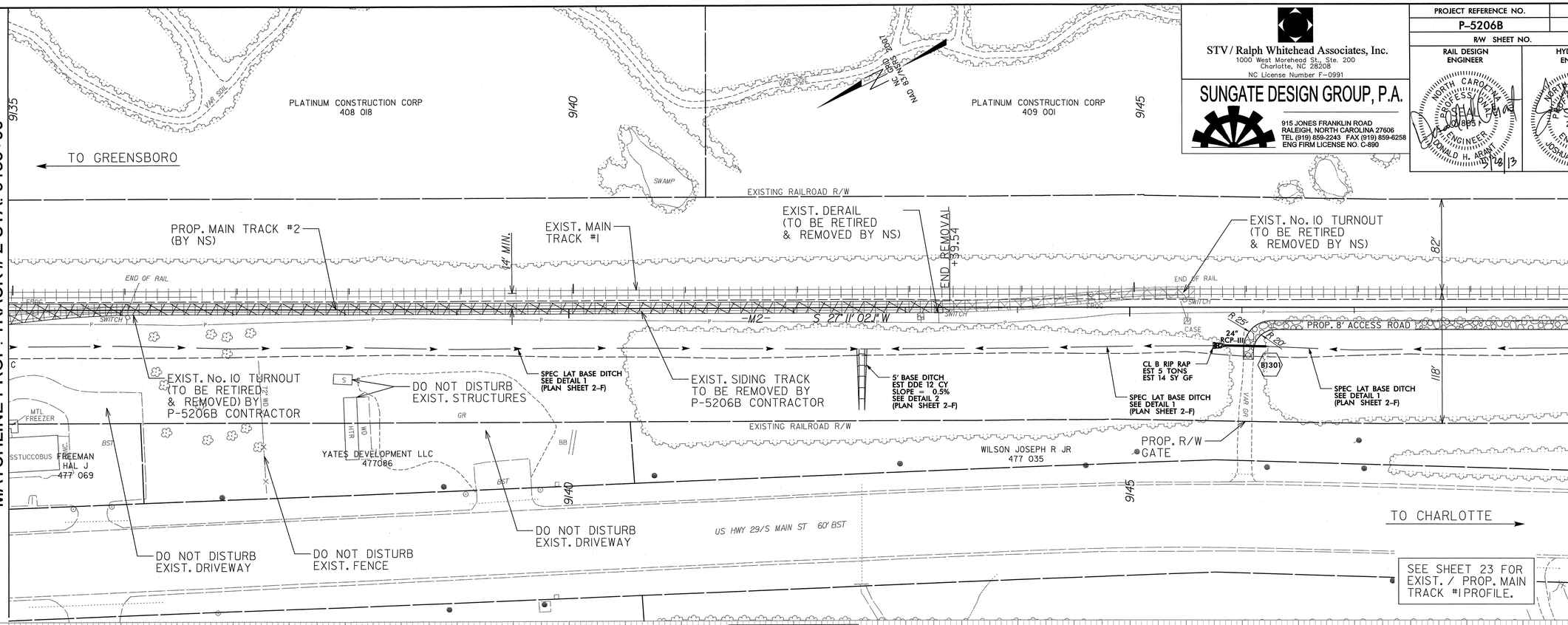
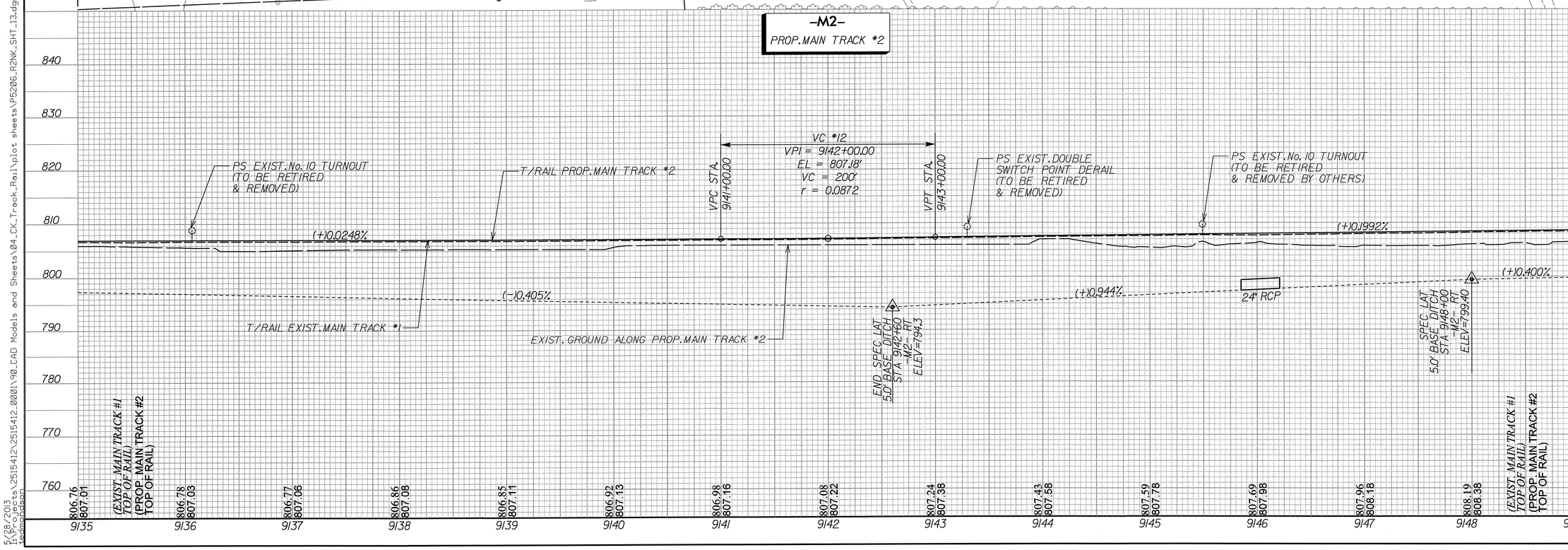
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	13
R/W SHEET NO.	RR-10
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 10895 ENGINEER DONALD H. ARANT 5/28/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13





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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	14
R/W SHEET NO.	RR-11

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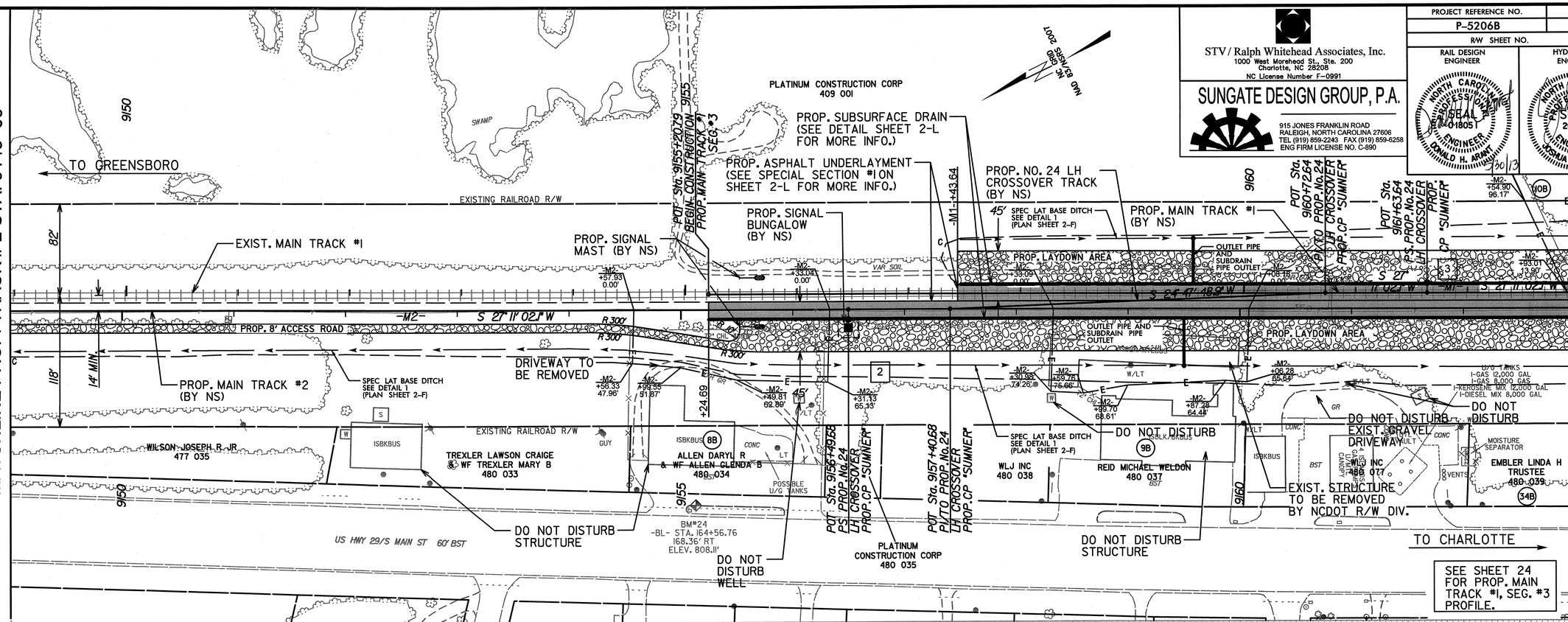
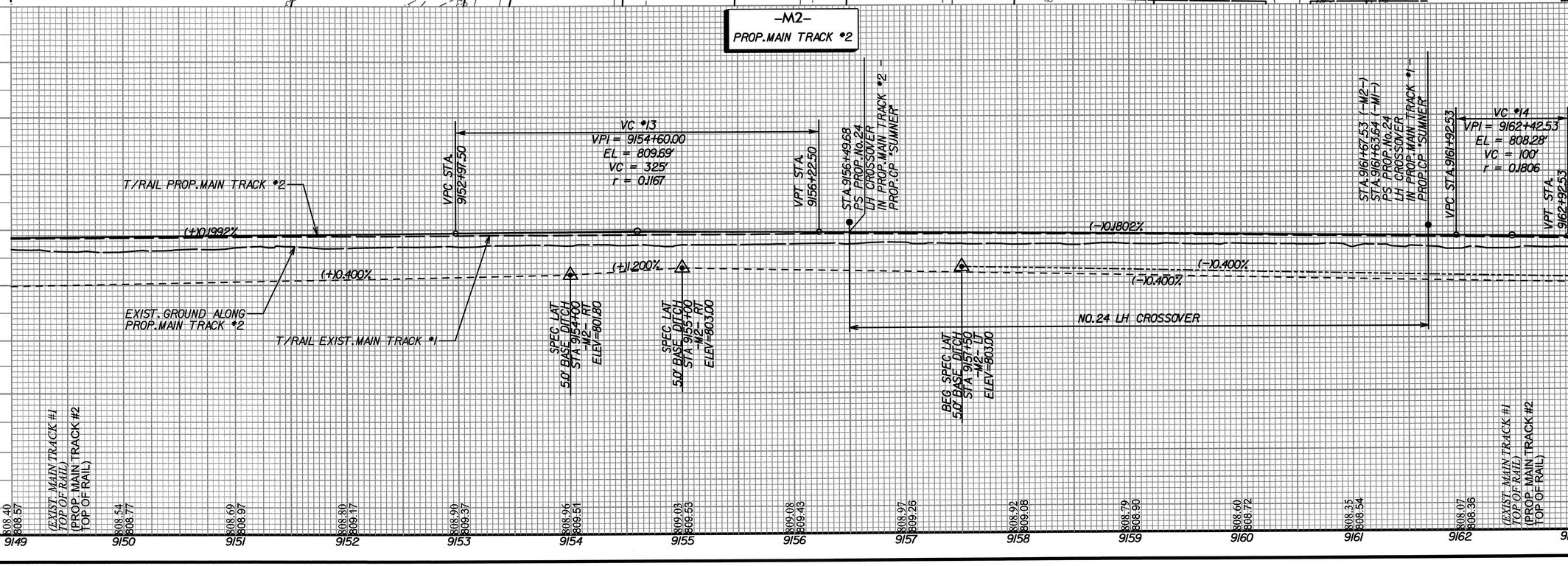
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 018051 — DONALD L. GRANT — 5/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 — JOSHUA G. DALTON — 5/30/13





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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	15
R/W SHEET NO.	RR-12

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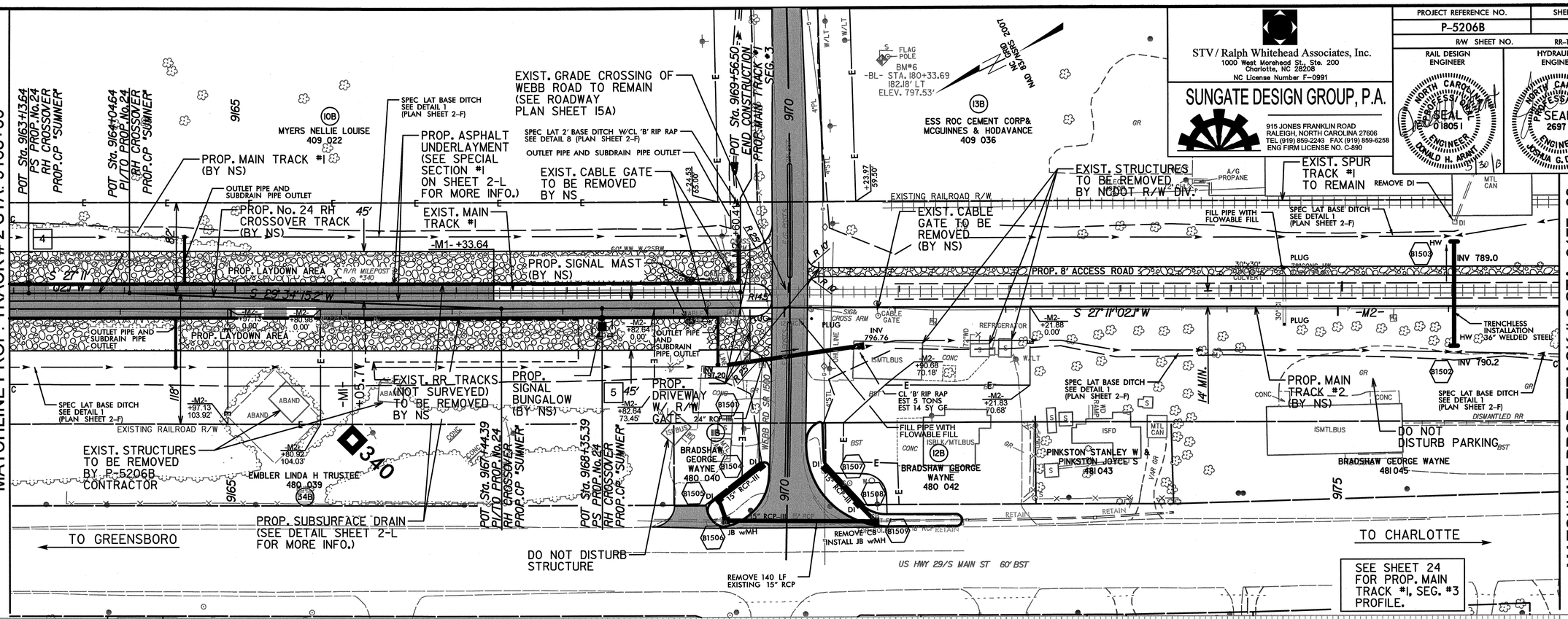
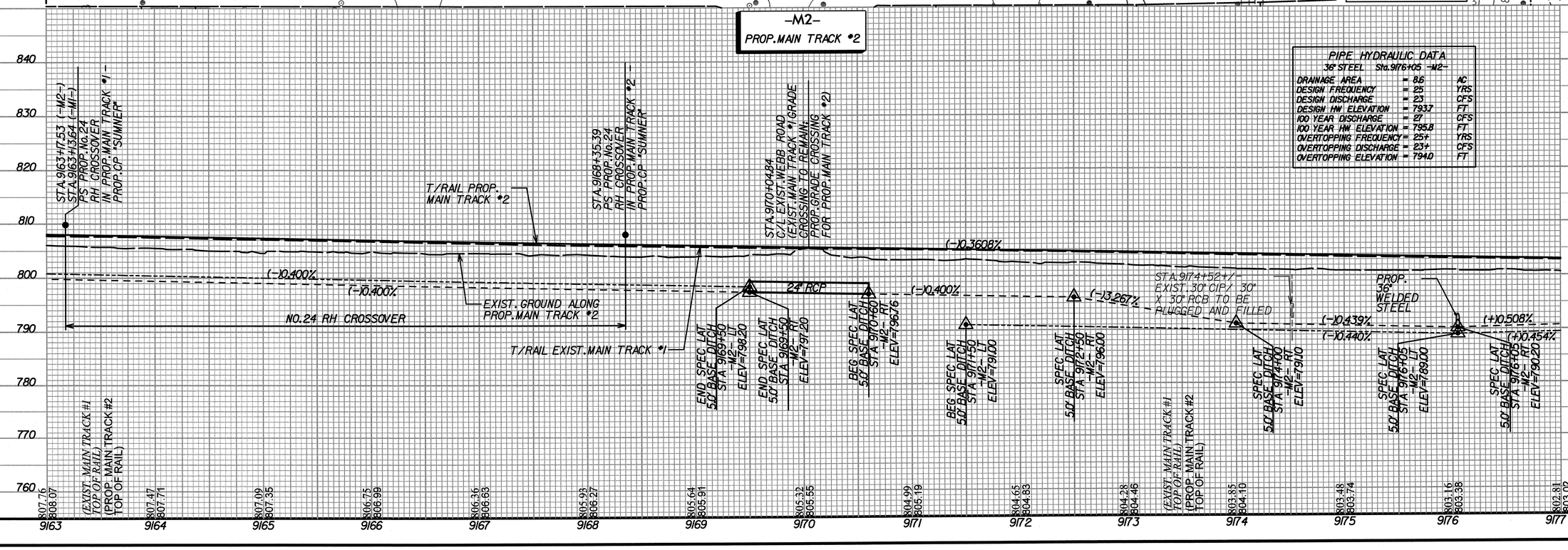
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 018051 ENGINEER DONALD H. ARANT — 5/30/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/30/13





PIPE HYDRAULIC DATA
36" STEEL Sta. 9176+05 -M2-

DRAINAGE AREA	= 8.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 793.7	FT
100 YEAR DISCHARGE	= 27	CFS
100 YEAR HW ELEVATION	= 795.8	FT
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING DISCHARGE	= 23+	CFS
OVERTOPPING ELEVATION	= 794.0	FT

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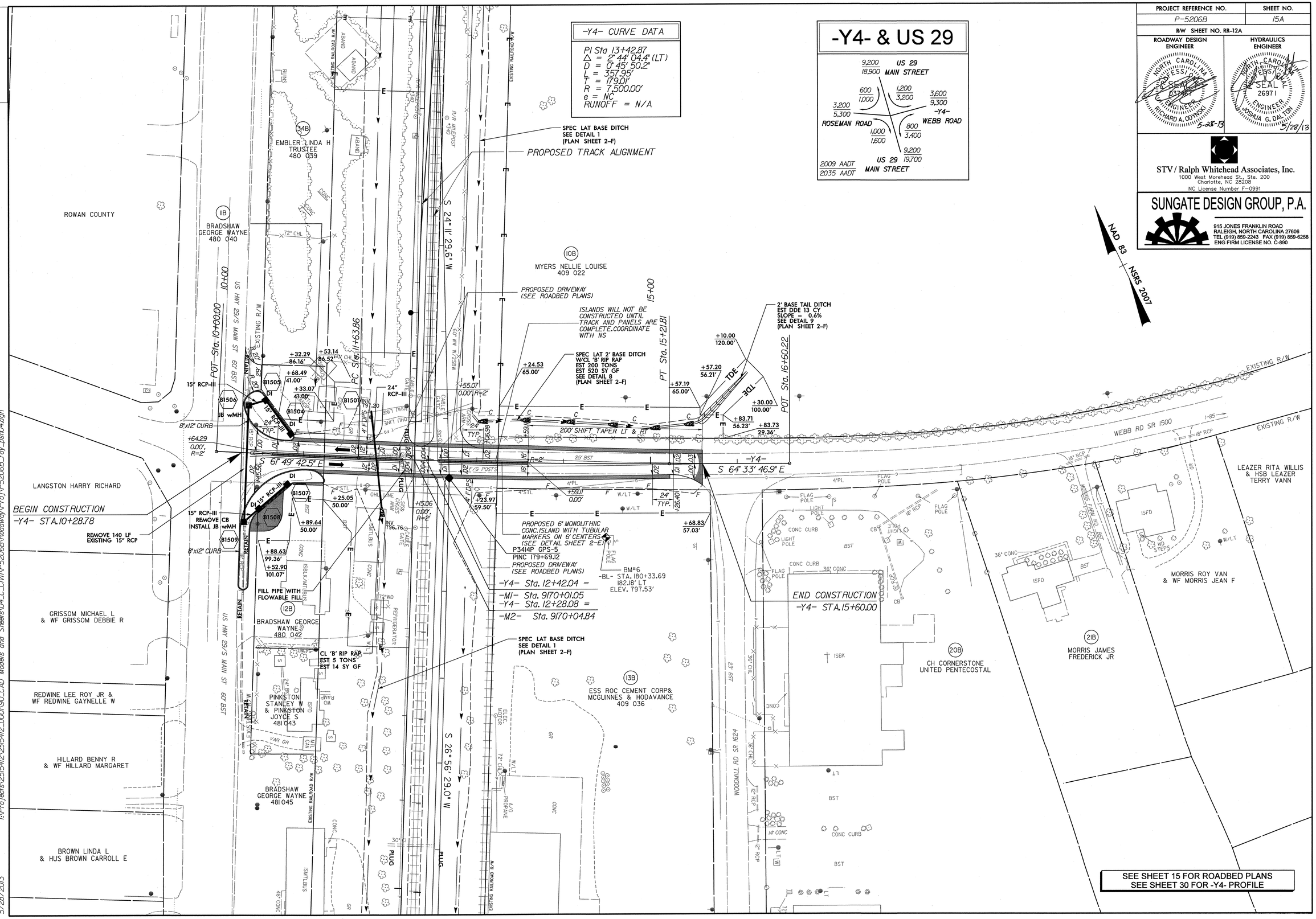

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	15A
R/W SHEET NO. RR-12A	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A. ODYNSKI 5-28-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	16
R/W SHEET NO.	RR-13

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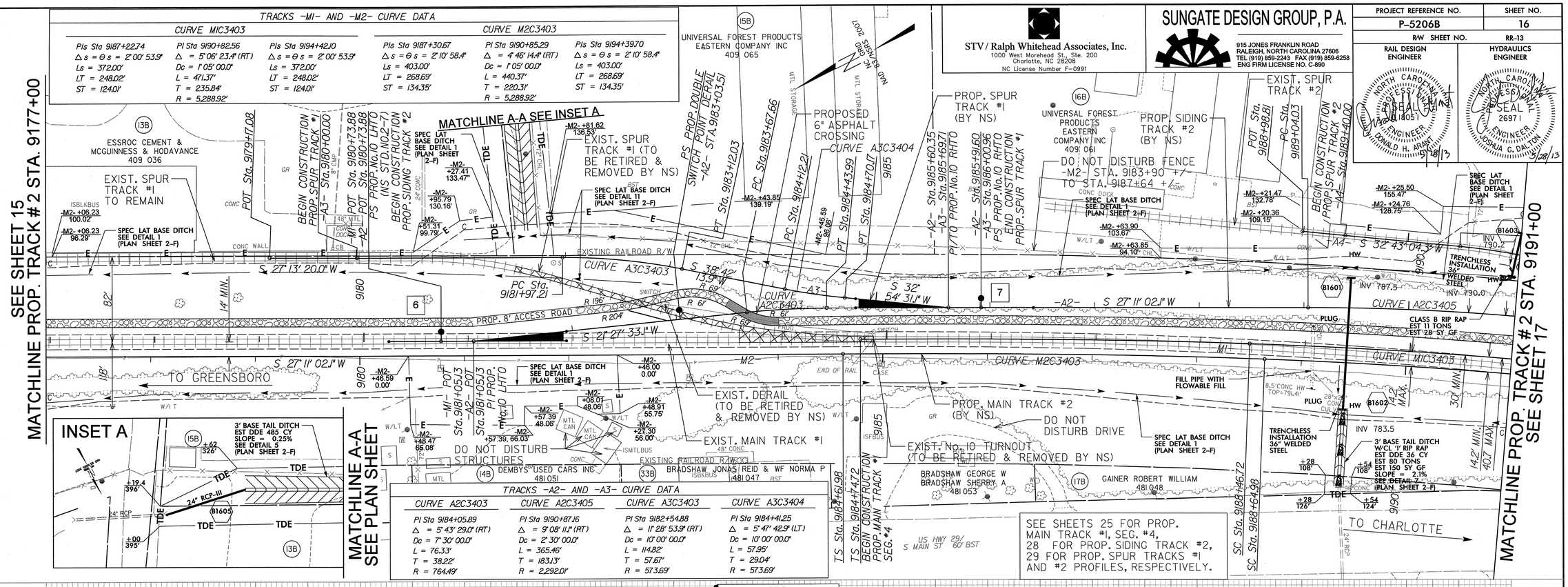
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 18051 — ENGINEER DONALD H. ARANT — 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 — ENGINEER JOSHUA G. DALTON — 5/28/13

TRACKS -M1- AND -M2- CURVE DATA

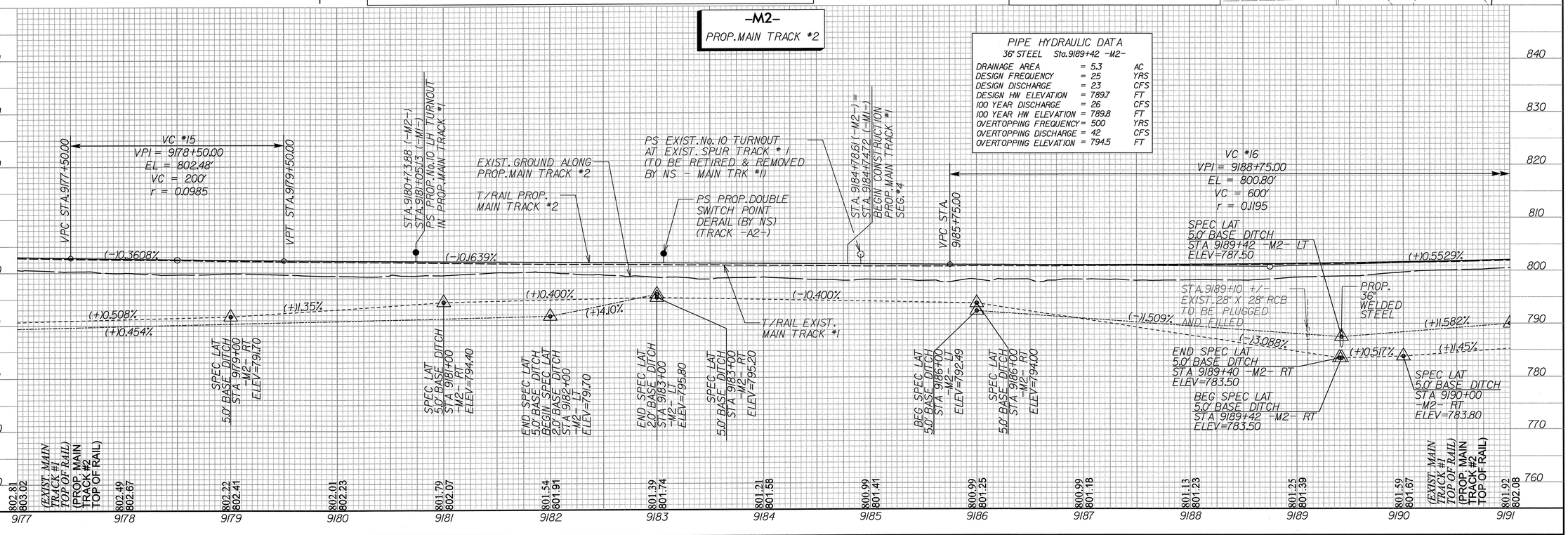
CURVE M1C3403			CURVE M2C3403		
PIs Sta 9187+22.74	PI Sta 9190+82.56	PIs Sta 9194+42.10	PIs Sta 9187+30.67	PI Sta 9190+85.29	PIs Sta 9194+39.70
Δs = Θs = 2°00'53.9"	Δ = 5°06'23.4" (RT)	Δs = Θs = 2°00'53.9"	Δs = Θs = 2°10'58.4"	Δ = 4°46'14.4" (RT)	Δs = Θs = 2°10'58.4"
Ls = 372.00'	Dc = 1°05'00.0"	Ls = 372.00'	Ls = 403.00'	Dc = 1°05'00.0"	Ls = 403.00'
LT = 248.02'	L = 471.37'	LT = 248.02'	LT = 268.69'	L = 440.37'	LT = 268.69'
ST = 124.01'	T = 235.84'	ST = 124.01'	ST = 134.35'	T = 220.31'	ST = 134.35'
	R = 5,288.92'			R = 5,288.92'	



TRACKS -A2- AND -A3- CURVE DATA

CURVE A2C3403	CURVE A2C3405	CURVE A3C3403	CURVE A3C3404
PI Sta 9184+05.89	PI Sta 9190+87.16	PI Sta 9182+54.88	PI Sta 9184+41.25
Δ = 5°43'29.0" (RT)	Δ = 9°08'11.1" (RT)	Δ = 11°28'53.9" (RT)	Δ = 5°47'42.9" (LT)
Dc = 7°30'00.0"	Dc = 2°30'00.0"	Dc = 10°00'00.0"	Dc = 10°00'00.0"
L = 76.33'	L = 365.46'	L = 114.82'	L = 57.95'
T = 38.22'	T = 183.13'	T = 57.67'	T = 29.04'
R = 764.49'	R = 2,292.01'	R = 573.69'	R = 573.69'

-M2- PROP. MAIN TRACK #2



PIPE HYDRAULIC DATA

36" STEEL Sta. 9189+42 -M2-

DRAINAGE AREA	= 5.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 23	CFS
DESIGN HW ELEVATION	= 789.7	FT
100 YEAR DISCHARGE	= 26	CFS
100 YEAR HW ELEVATION	= 789.8	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 42	CFS
OVERTOPPING ELEVATION	= 794.5	FT

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	17
R/W SHEET NO.	RR-14

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 20805 ENGINEER DONALD H. ARANT 5/28/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/28/13

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RALEIGH, NORTH CAROLINA 27606
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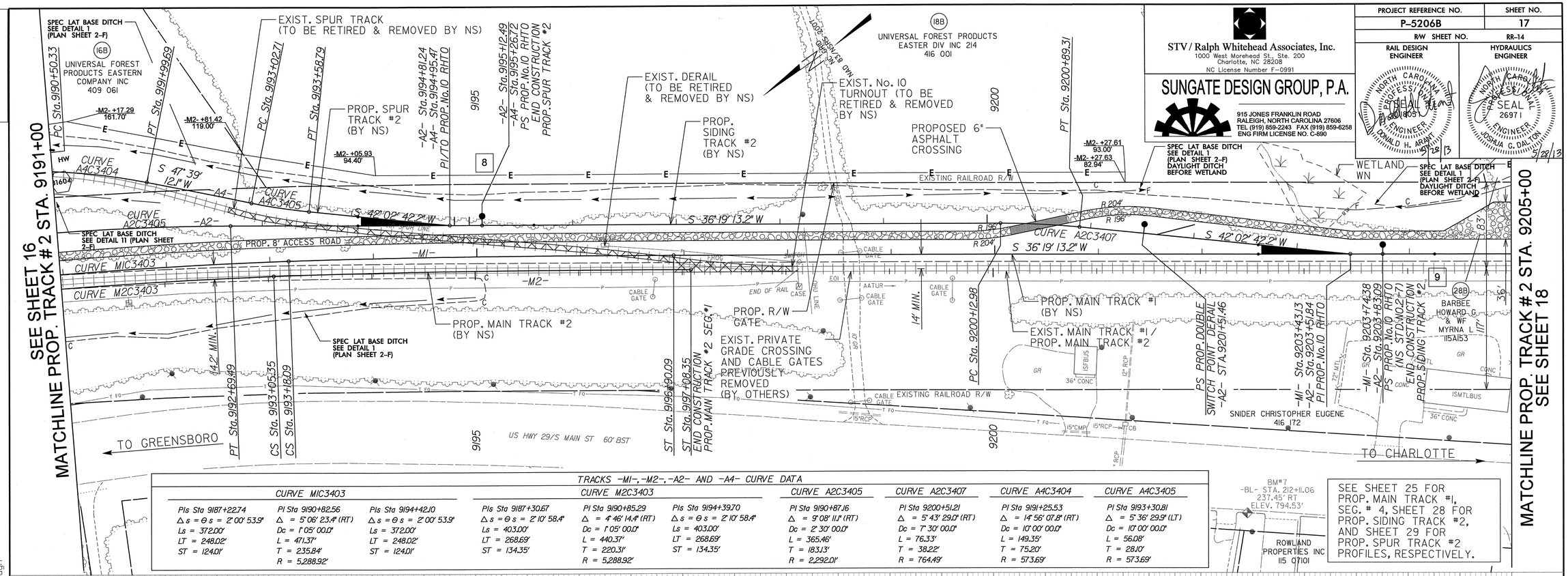
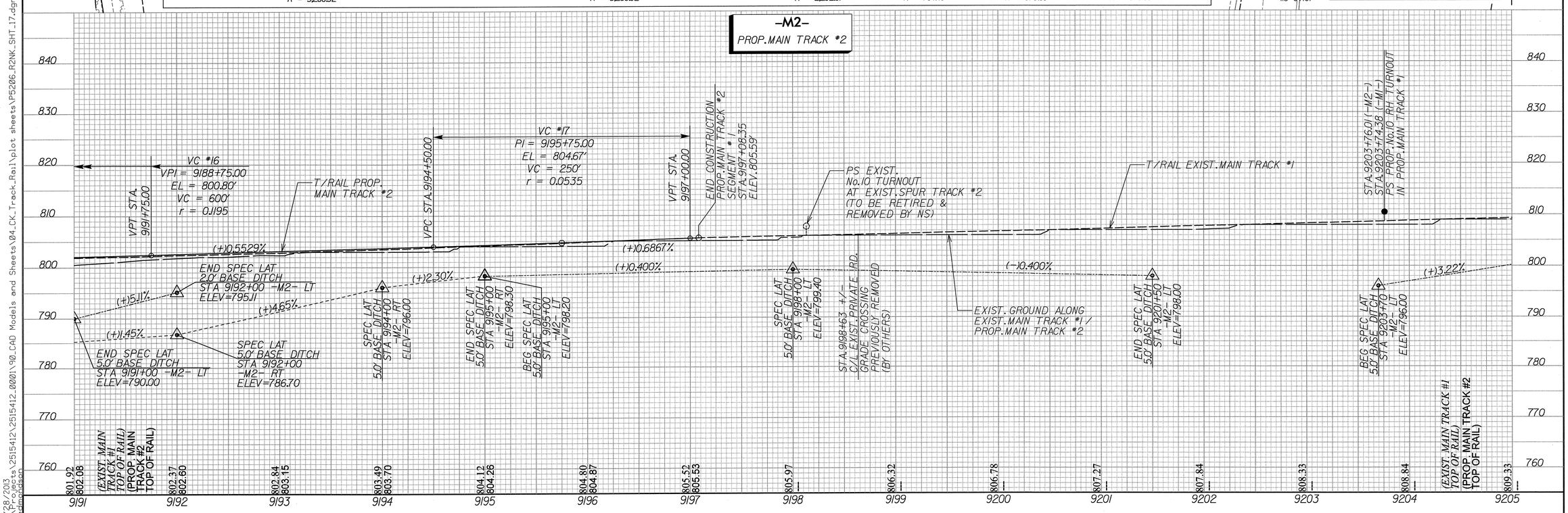


TRACKS -M1-, -M2-, -A2- AND -A4- CURVE DATA

CURVE MIC3403			CURVE M2C3403			CURVE A2C3405	CURVE A2C3407	CURVE A4C3404	CURVE A4C3405
PIs Sta 9187+22.74	PI Sta 9190+82.56	PIs Sta 9194+42.10	PIs Sta 9187+30.67	PI Sta 9190+85.29	PIs Sta 9194+39.70	PI Sta 9190+87.16	PI Sta 9200+51.21	PI Sta 9191+25.53	PI Sta 9193+30.81
Δs = Θs = 2°00'53.9"	Δ = 5°06'23.4" (RT)	Δs = Θs = 2°00'53.9"	Δs = Θs = 2°10'58.4"	Δ = 4°46'14.4" (RT)	Δs = Θs = 2°10'58.4"	Δ = 9°08'11.1" (RT)	Δ = 5°43'29.0" (RT)	Δ = 14°56'07.8" (RT)	Δ = 5°36'29.9" (LT)
Ls = 372.00'	Dc = 1°05'00.0"	Ls = 372.00'	Ls = 403.00'	Dc = 1°05'00.0"	Ls = 403.00'	Dc = 2°30'00.0"	Dc = 1°30'00.0"	Dc = 10°00'00.0"	Dc = 10°00'00.0"
LT = 248.02'	L = 471.37'	LT = 248.02'	LT = 268.69'	L = 440.37'	LT = 268.69'	L = 365.46'	L = 76.33'	L = 149.35'	L = 56.08'
ST = 124.01'	T = 235.84'	ST = 124.01'	ST = 134.35'	T = 220.31'	ST = 134.35'	T = 183.13'	T = 38.22'	T = 75.20'	T = 28.10'
	R = 5,288.92'			R = 5,288.92'		R = 2,292.01'	R = 764.49'	R = 573.69'	R = 573.69'

SEE SHEET 25 FOR PROP. MAIN TRACK #1, SEG. # 4, SHEET 28 FOR PROP. SIDING TRACK #2, AND SHEET 29 FOR PROP. SPUR TRACK #2 PROFILES, RESPECTIVELY.



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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	18
R/W SHEET NO.	RR-15

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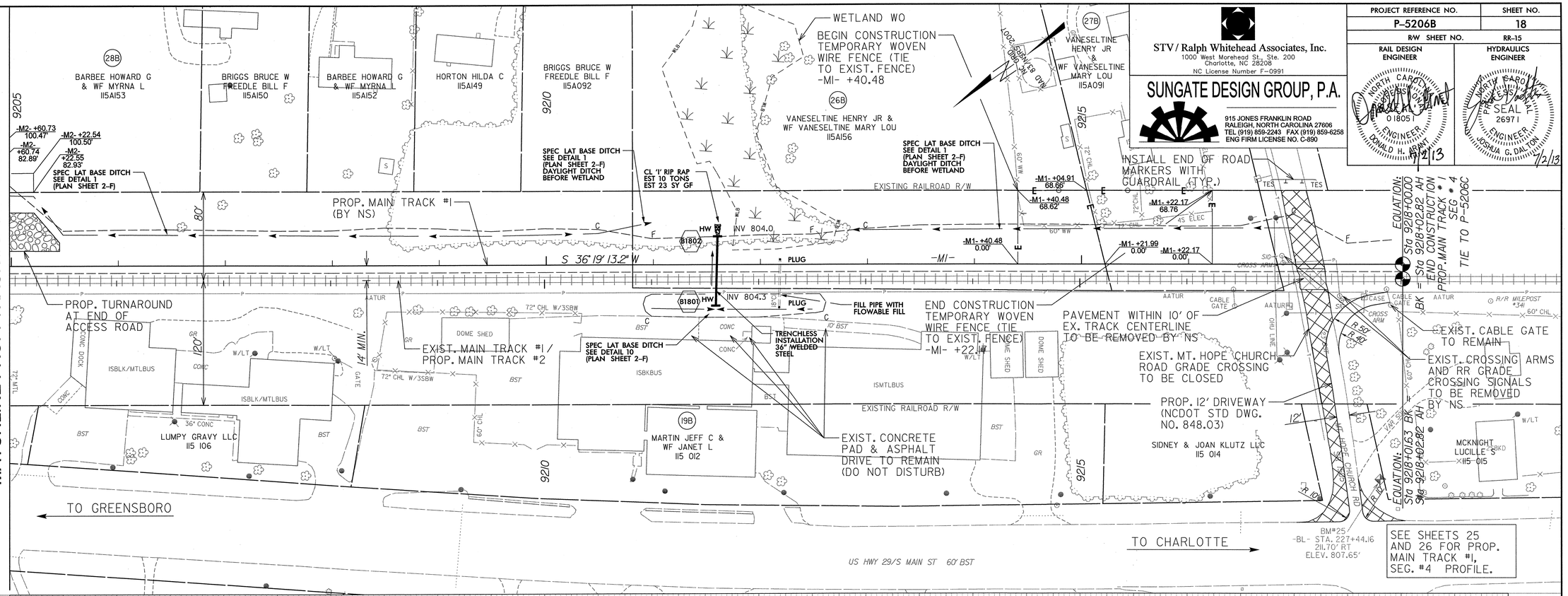
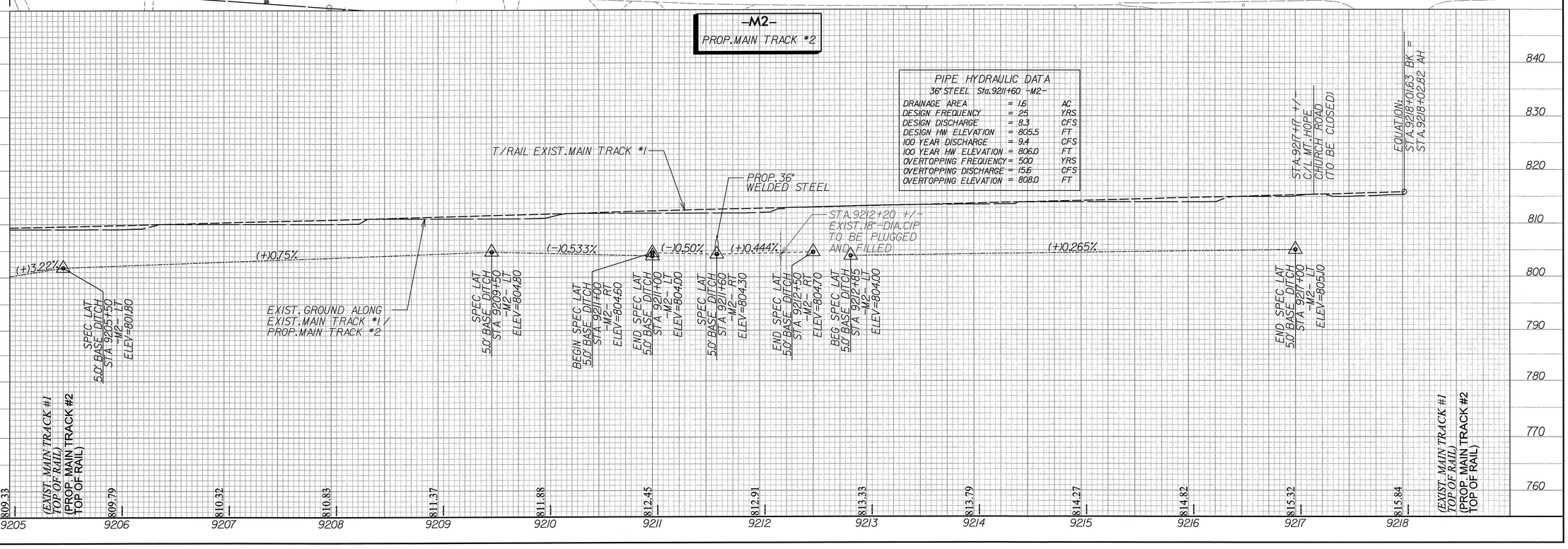
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 01805 ENGINEER DONALD H. ARANT — 7/2/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 7/2/13

SEE SHEET 17
MATCHLINE PROP. TRACK # 2 STA. 9205+00





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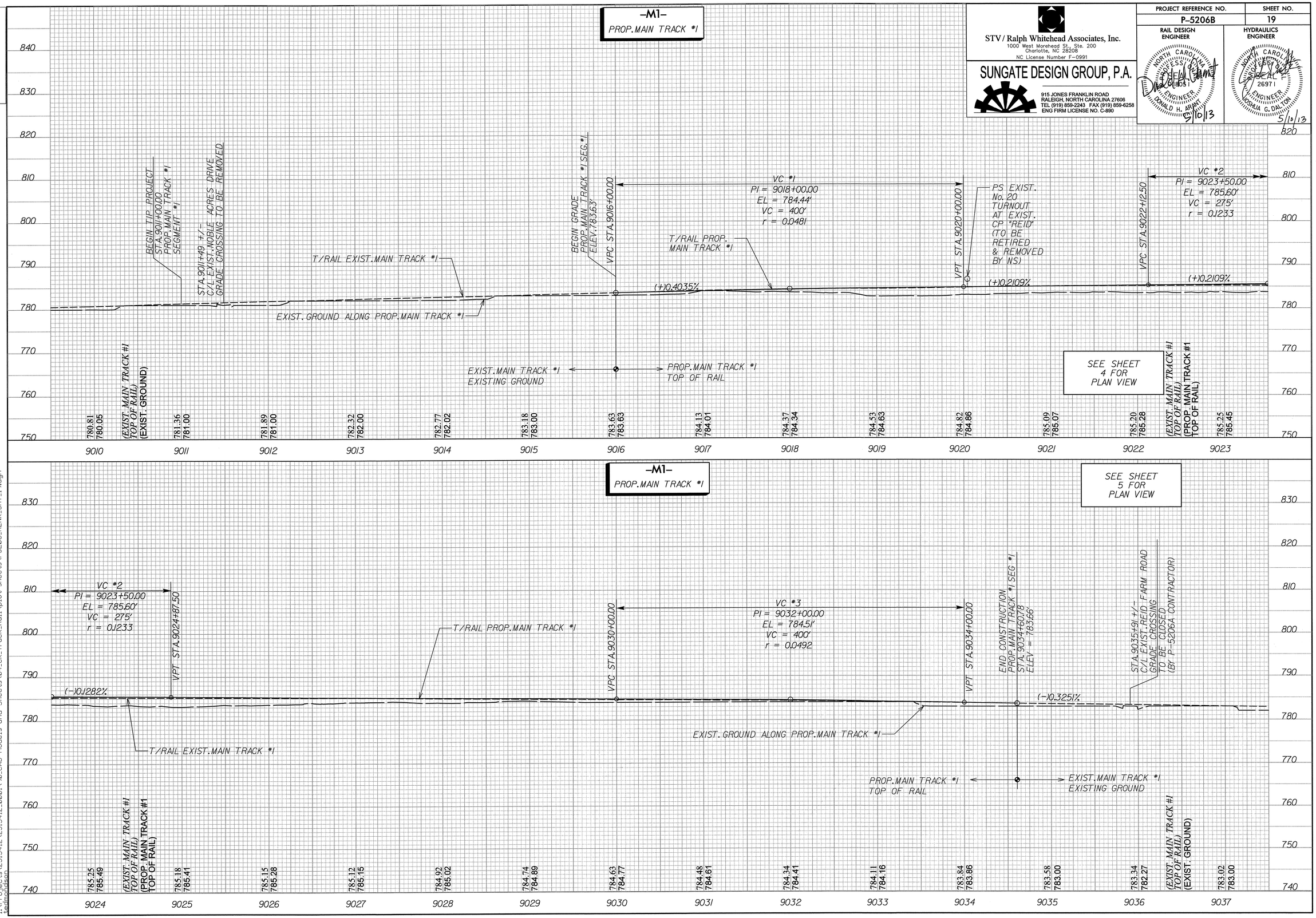
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	19

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER 18051 DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER 26971 JOSHUA G. DALTON 5/10/13



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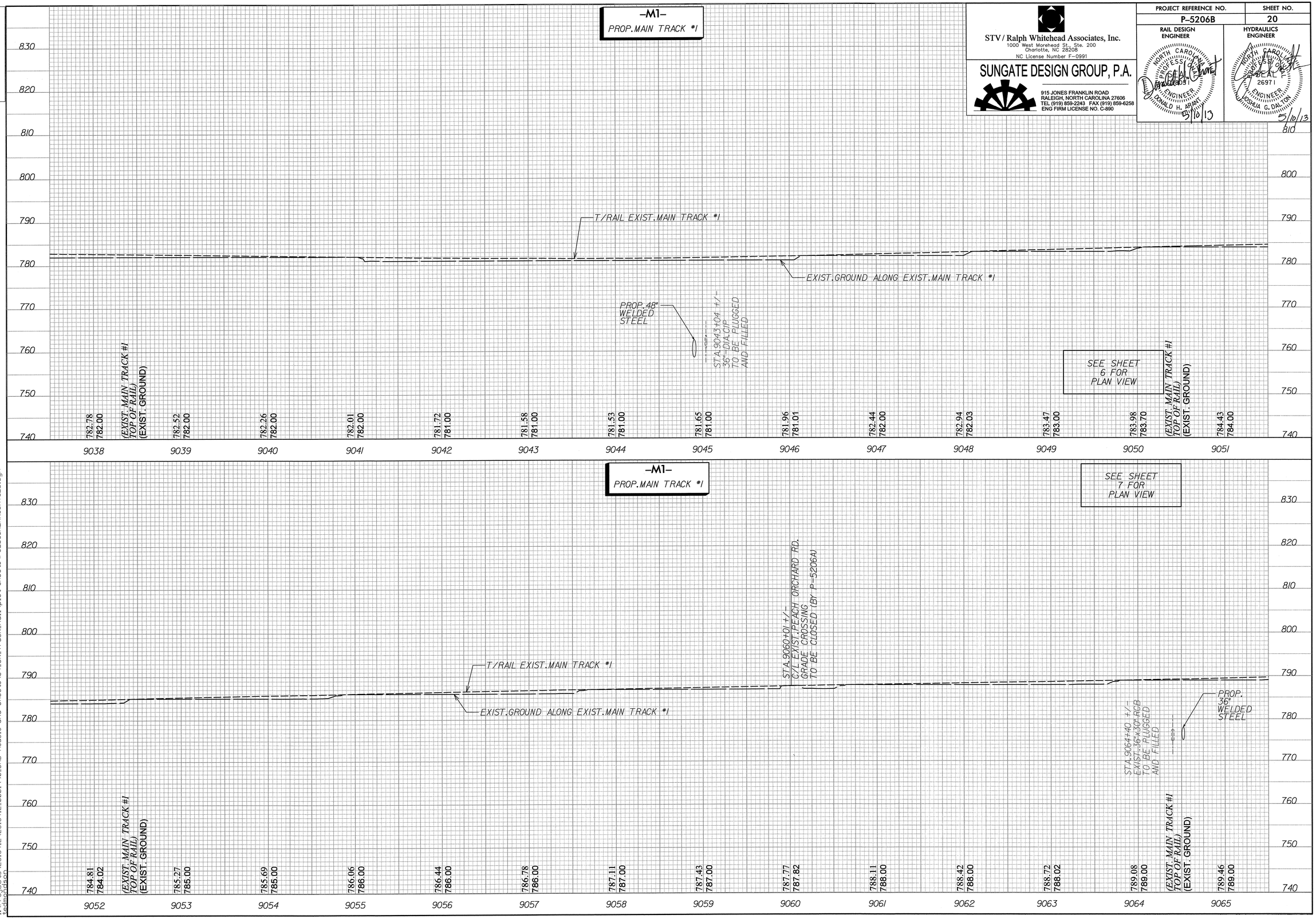
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	20
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26991 ENGINEER DONALD H. ARANT 5/10/13

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA C. DALTON 5/10/13



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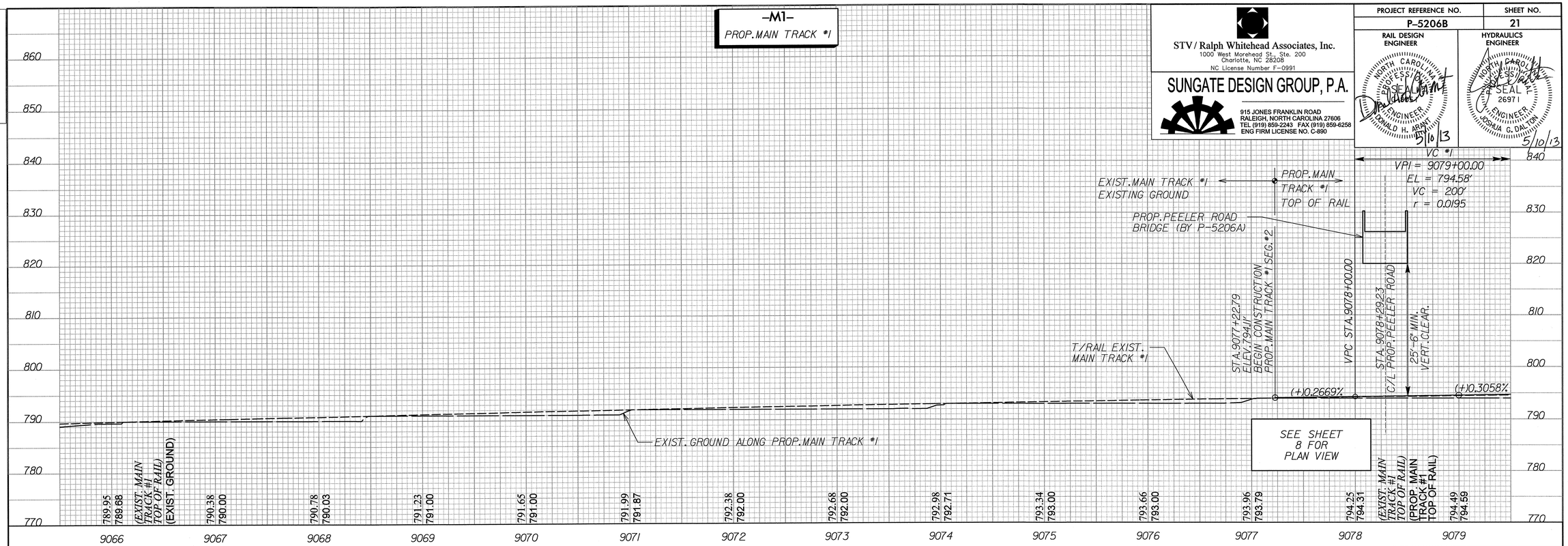
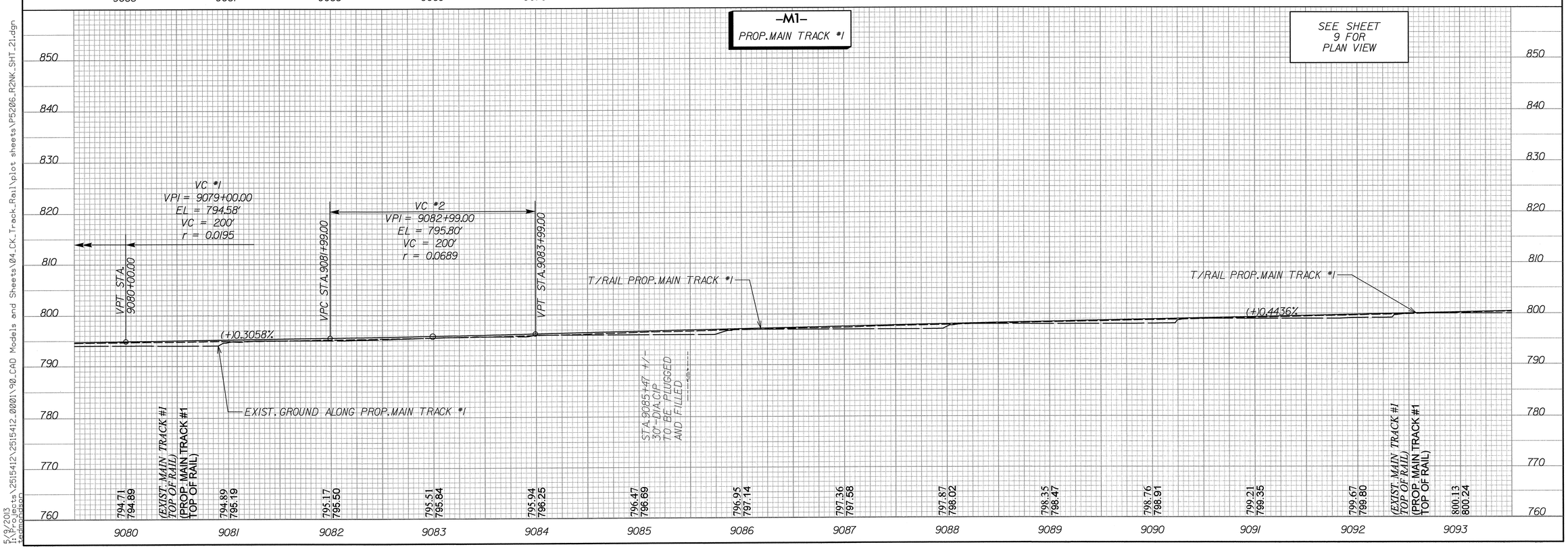
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	21

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16805 ENGINEER DONALD H. ARANT — 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/10/13





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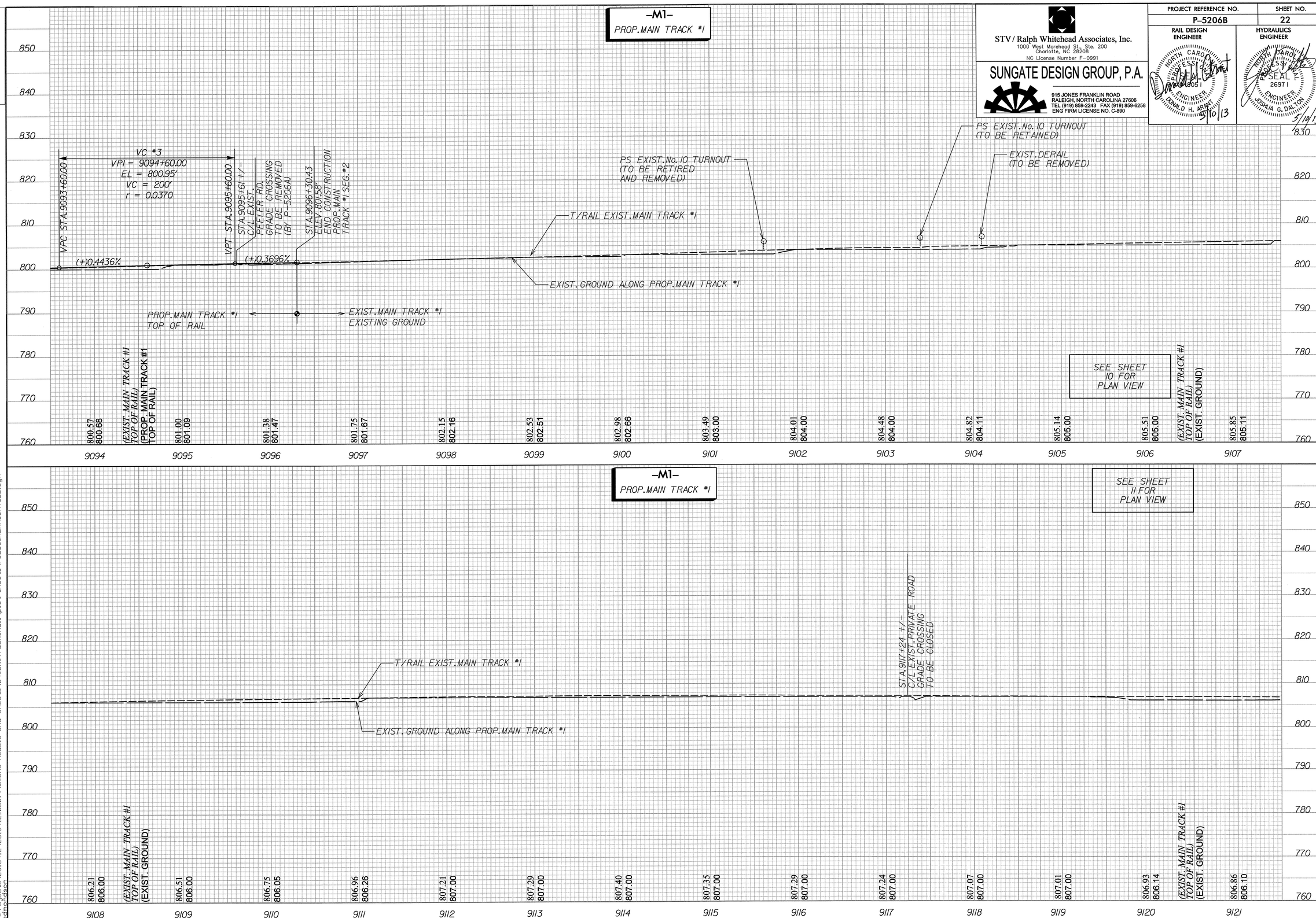
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	22

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 8051 ENGINEER DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON 5/10/13



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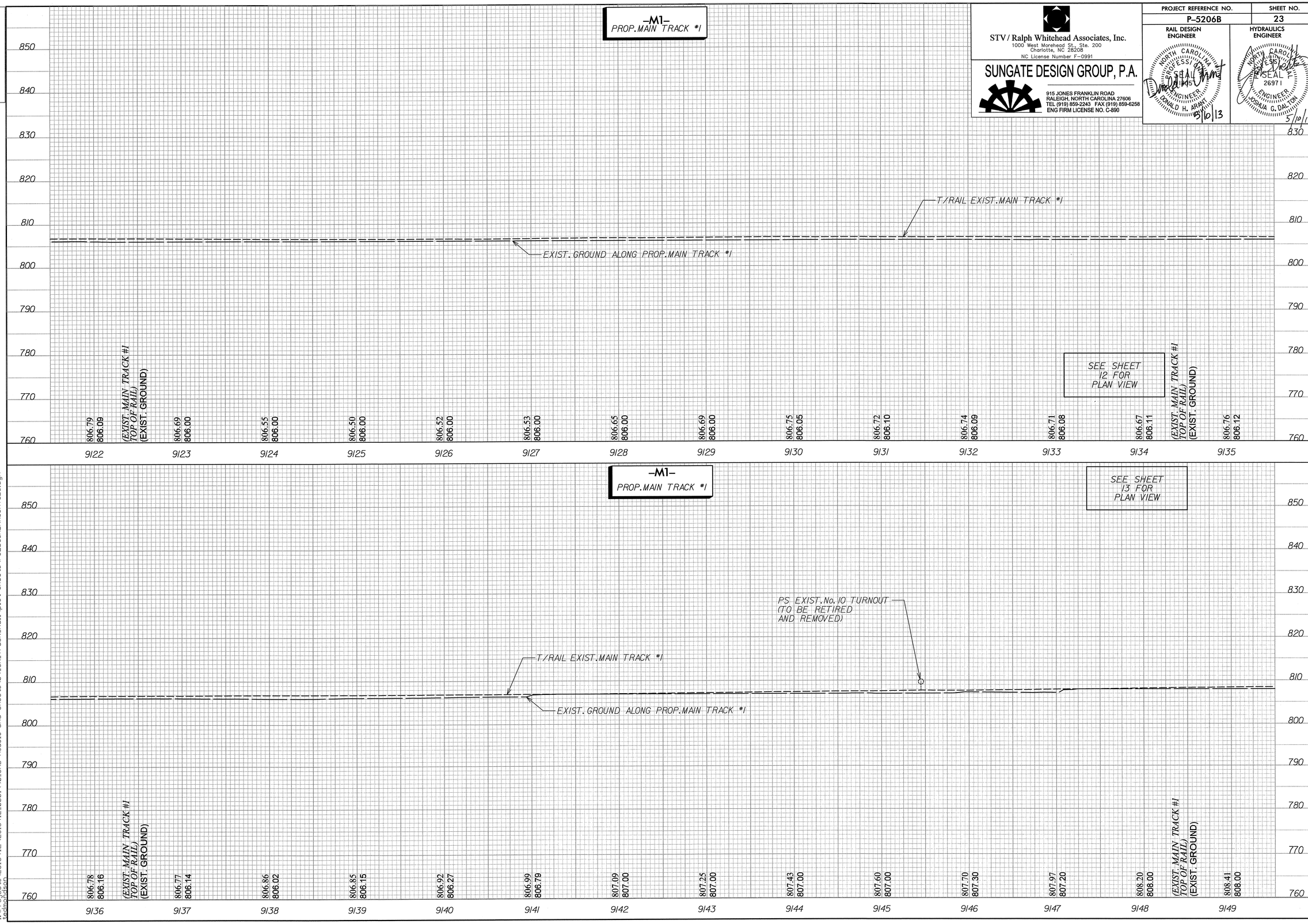
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	23

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18051 DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON 5/10/13



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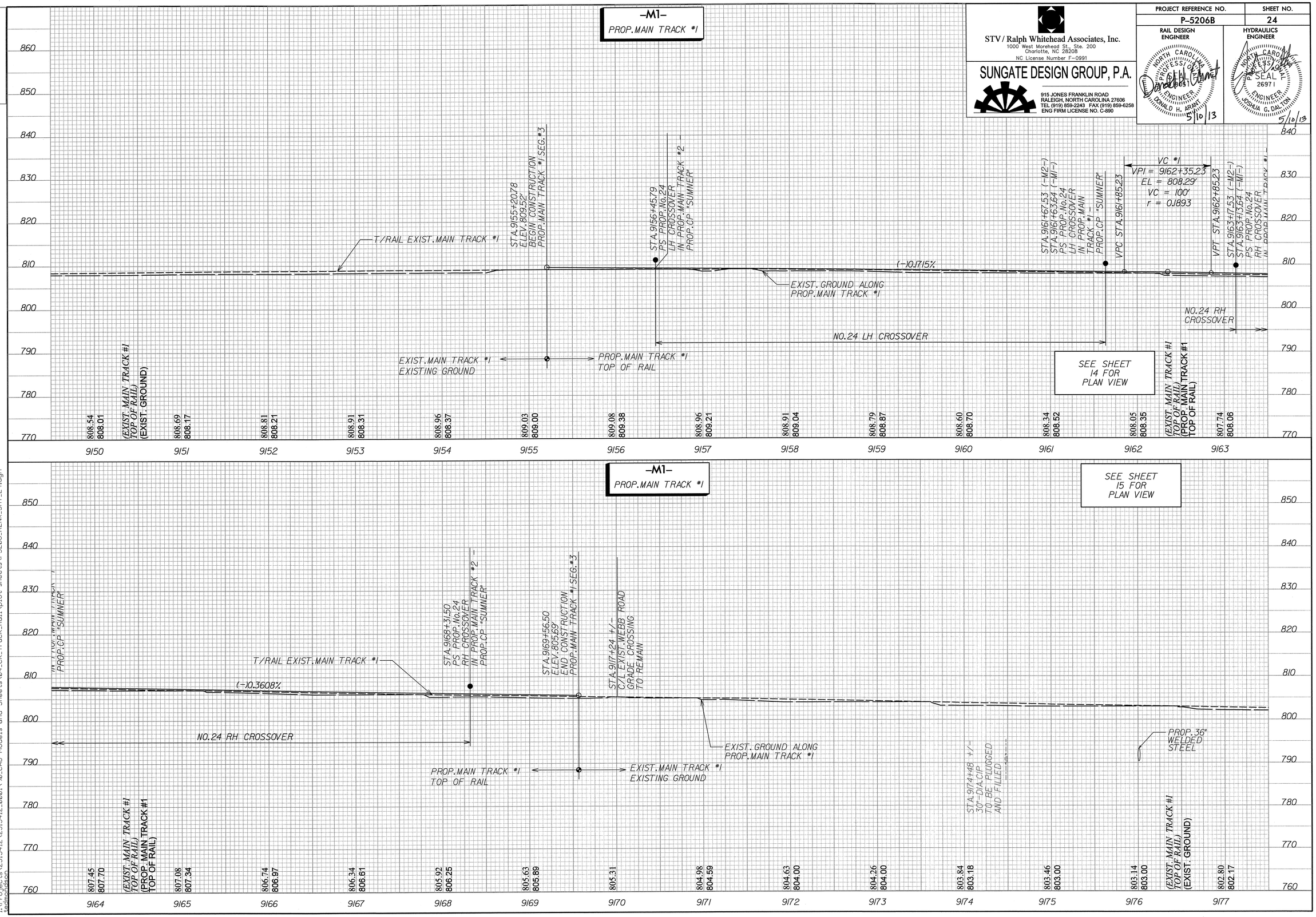
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	24

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON 5/10/13



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tedmondson

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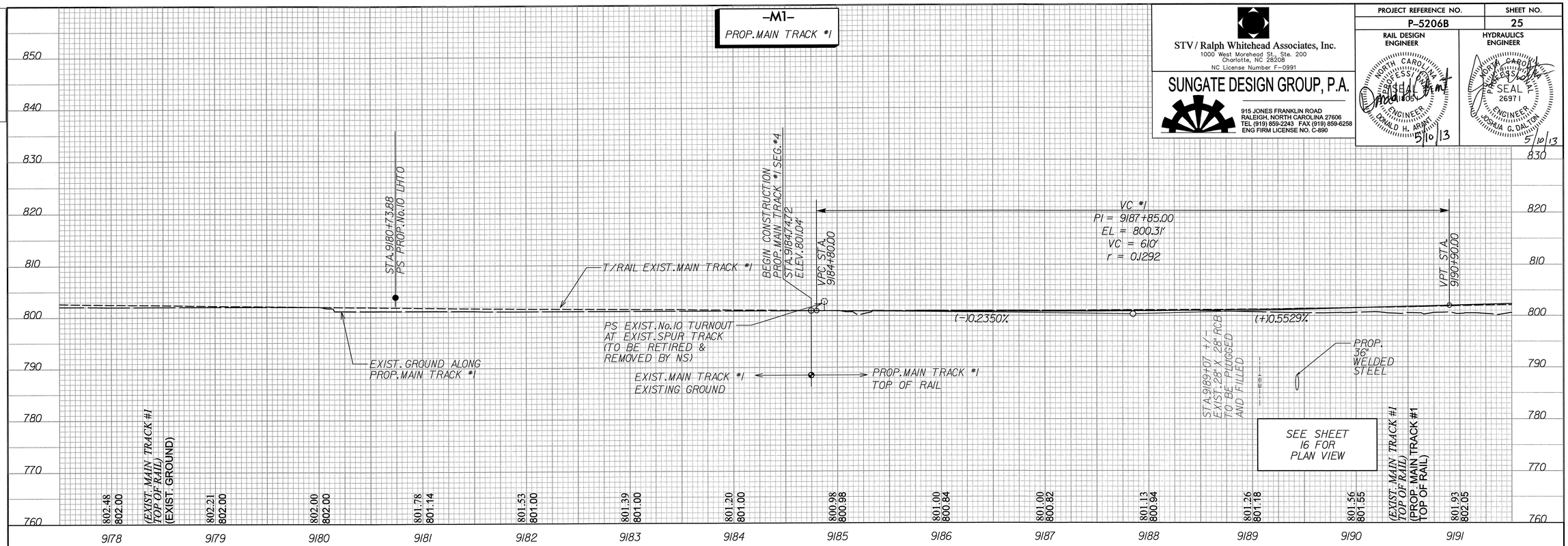
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
P-5206B	25

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER DONALD H. ARANT — 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/10/13



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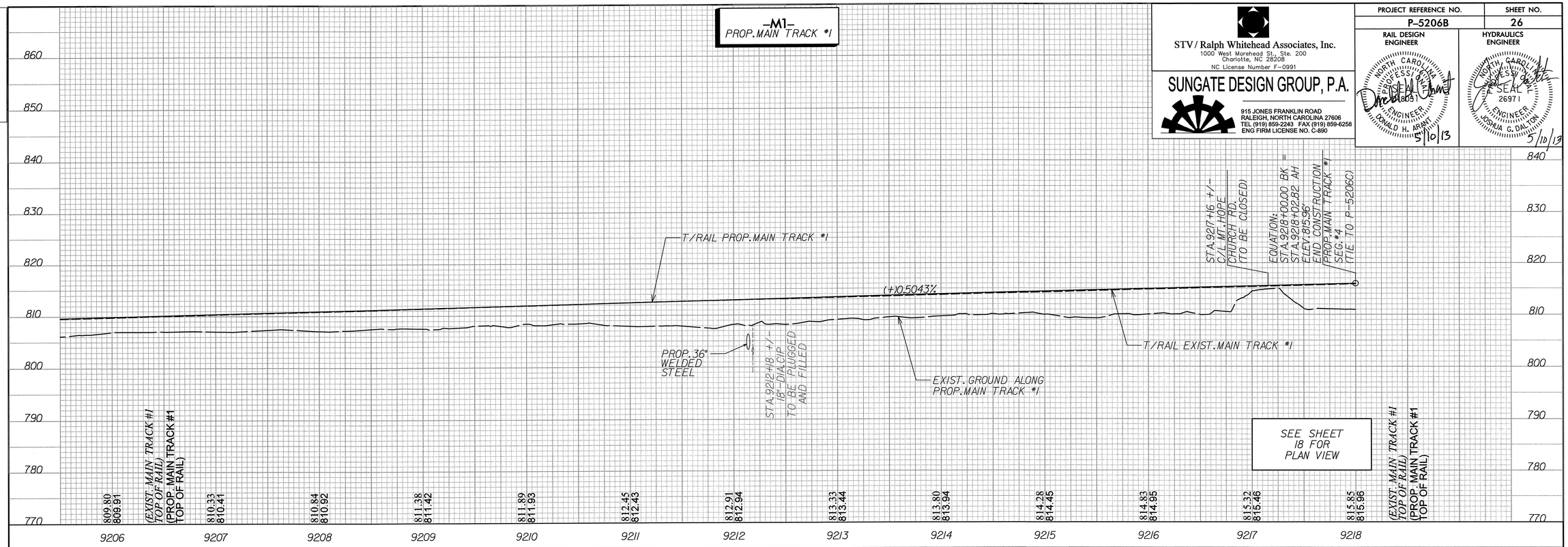

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	26

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18051 DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON 5/10/13

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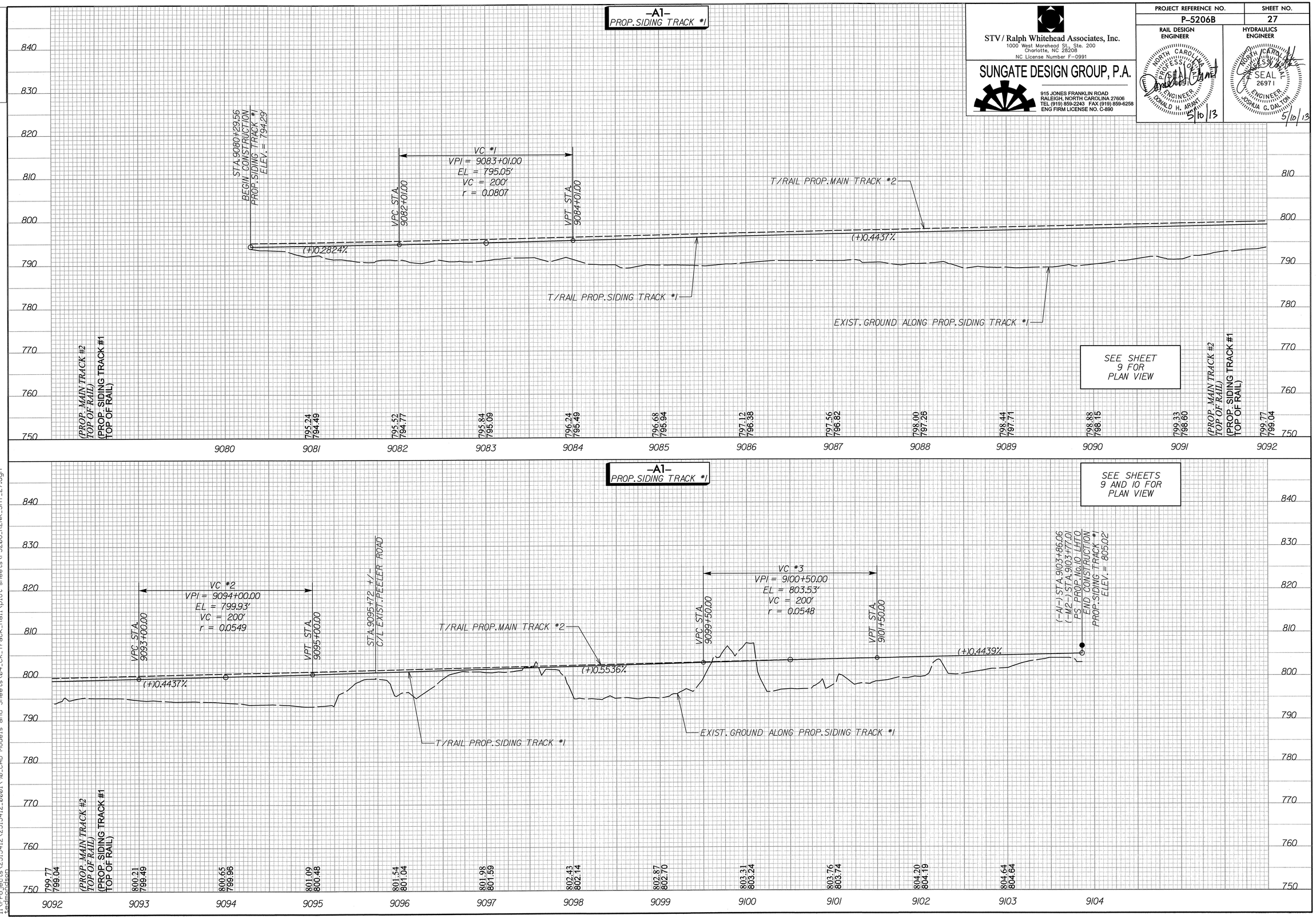
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	27

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26091 ENGINEER DONALD H. ARANT — 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON — 5/10/13



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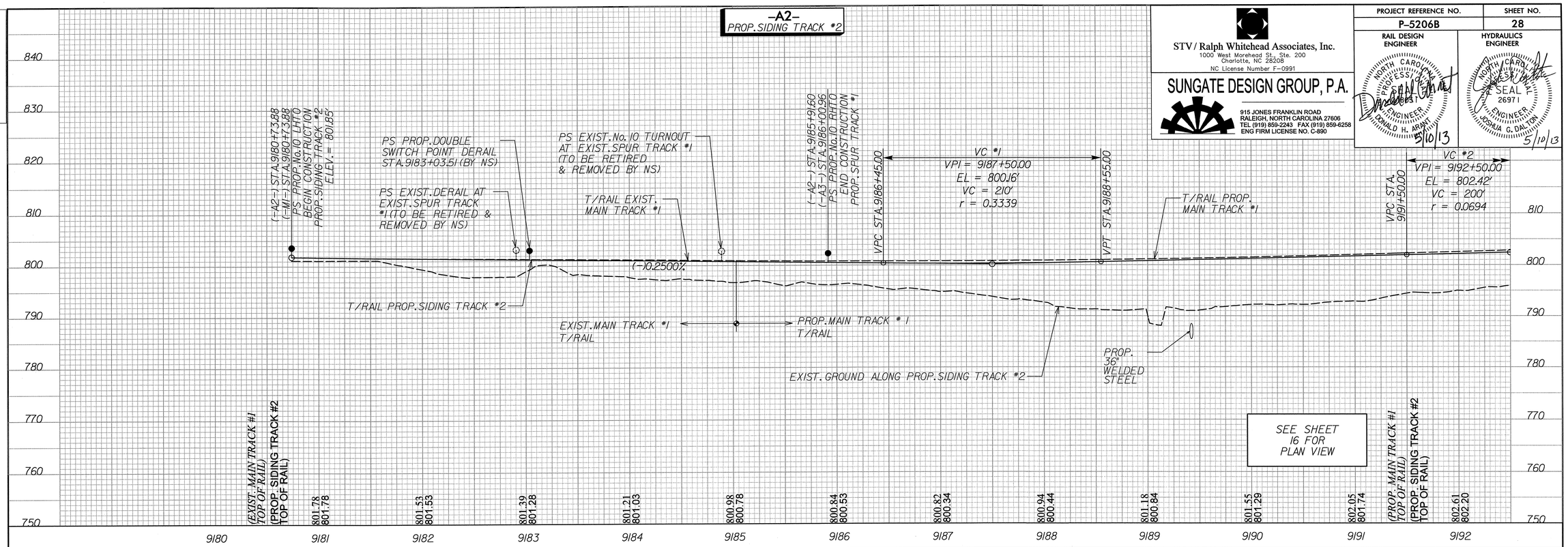
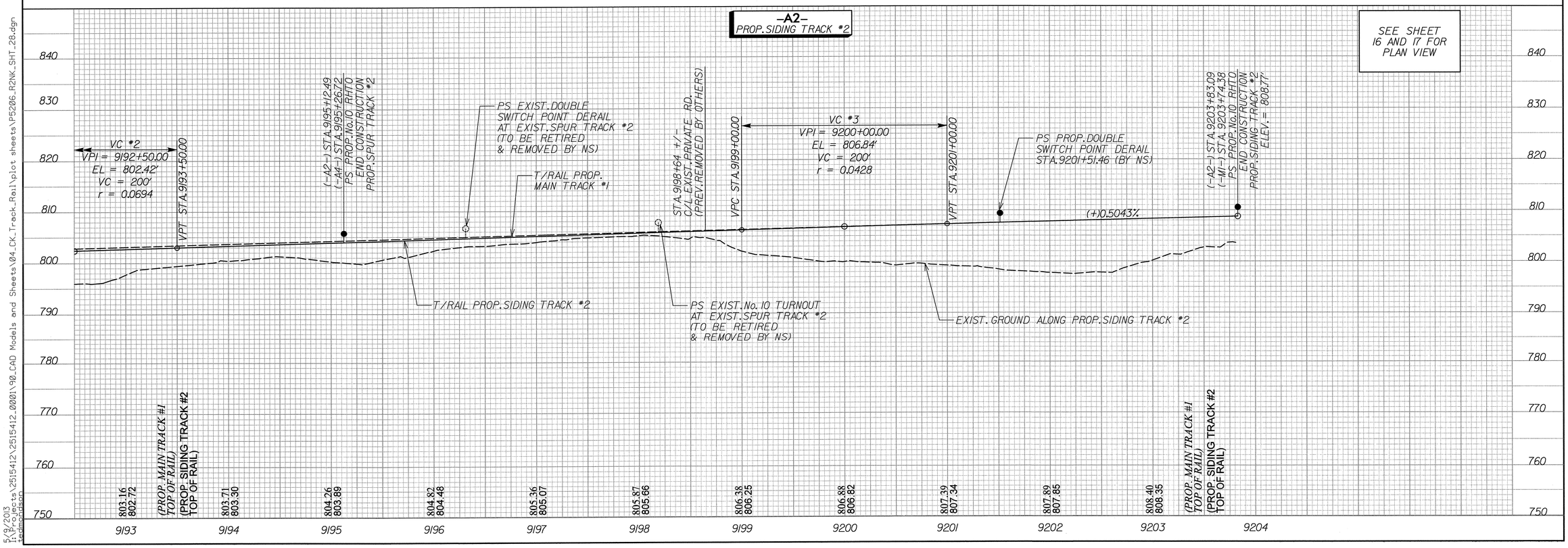
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	28

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 DONALD H. ARANT 5/10/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON 5/10/13





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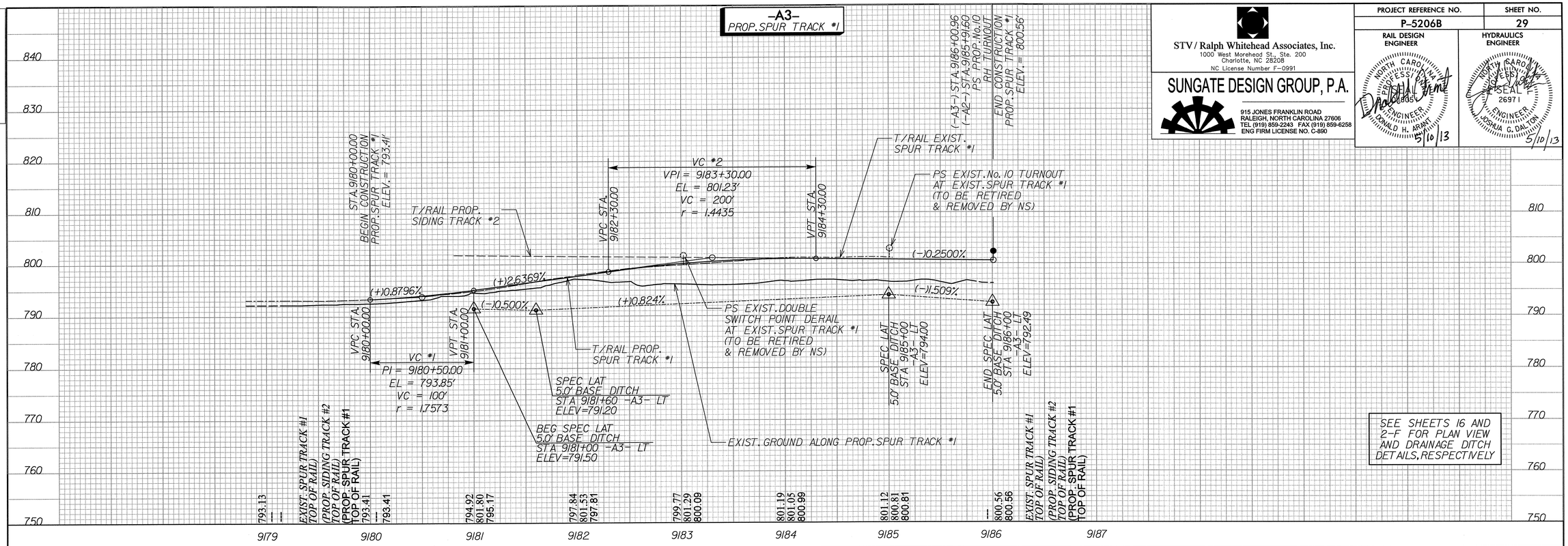
PROJECT REFERENCE NO.	SHEET NO.
P-5206B	29
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21605 DONALD H. GRANT 5/10/13

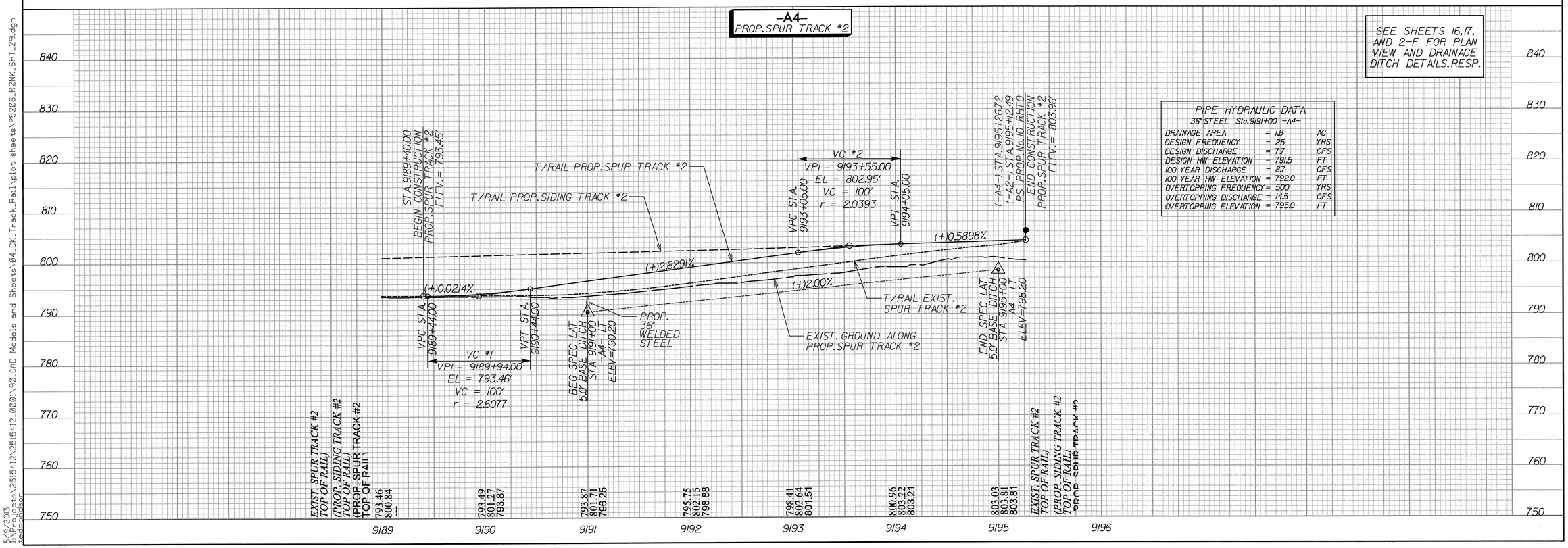
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26971 JOSHUA G. DALTON 5/10/13

-A3- PROP. SPUR TRACK #1



SEE SHEETS 16 AND 2-F FOR PLAN VIEW AND DRAINAGE DITCH DETAILS, RESPECTIVELY

-A4- PROP. SPUR TRACK #2



SEE SHEETS 16,17, AND 2-F FOR PLAN VIEW AND DRAINAGE DITCH DETAILS, RESP.

PIPE HYDRAULIC DATA
36" STEEL Sta.9191+00 -A4-

DRAINAGE AREA	= 1.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 77	CFS
DESIGN HW ELEVATION	= 791.5	FT
100 YEAR DISCHARGE	= 87	CFS
100 YEAR HW ELEVATION	= 792.0	FT
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING DISCHARGE	= 14.5	CFS
OVERTOPPING ELEVATION	= 795.0	FT

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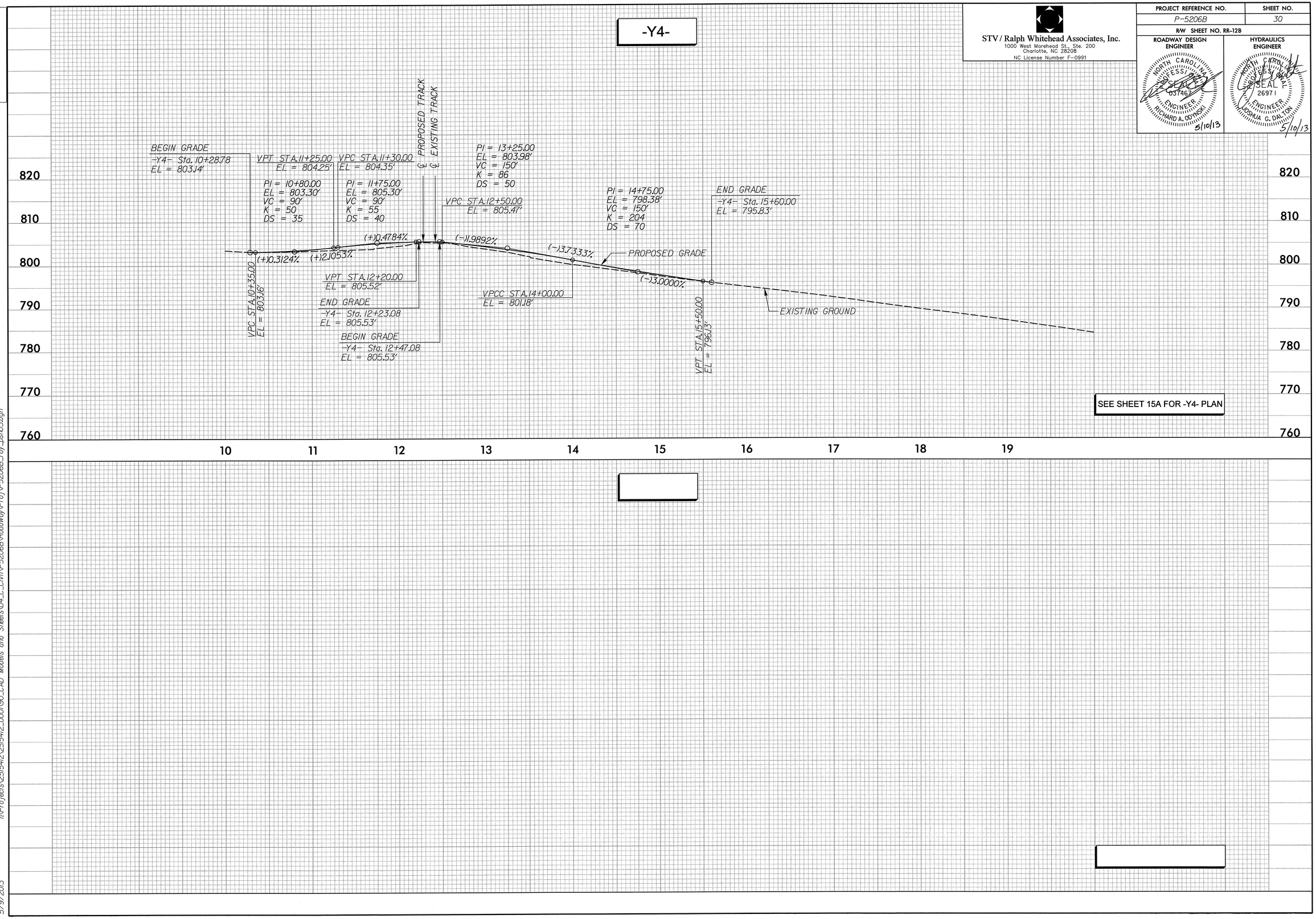

SEE SHEET 15A FOR -Y4- PLAN

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PROJECT REFERENCE NO.	SHEET NO.
P-5206B	30
R/W SHEET NO. RR-12B	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 037467 ENGINEER RICHARD A. ODYNSKI
5/10/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
5/10/13

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