0016DEL_P01

TIP PROJECT: P-5205

CONTRACT: C203129

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

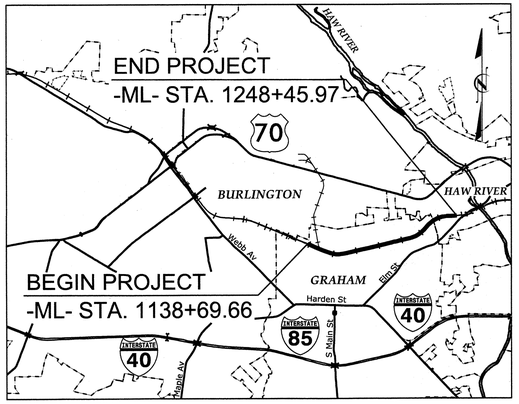
ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5205	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
52500.1.STR03T1B		PE/UTIL PE
52500.1.STR04T3		PE/UTIL PE
39364		ROW
52500.3.STR01T4	FRA-FR-0006-10-01-00	CONST/UTIL CONST

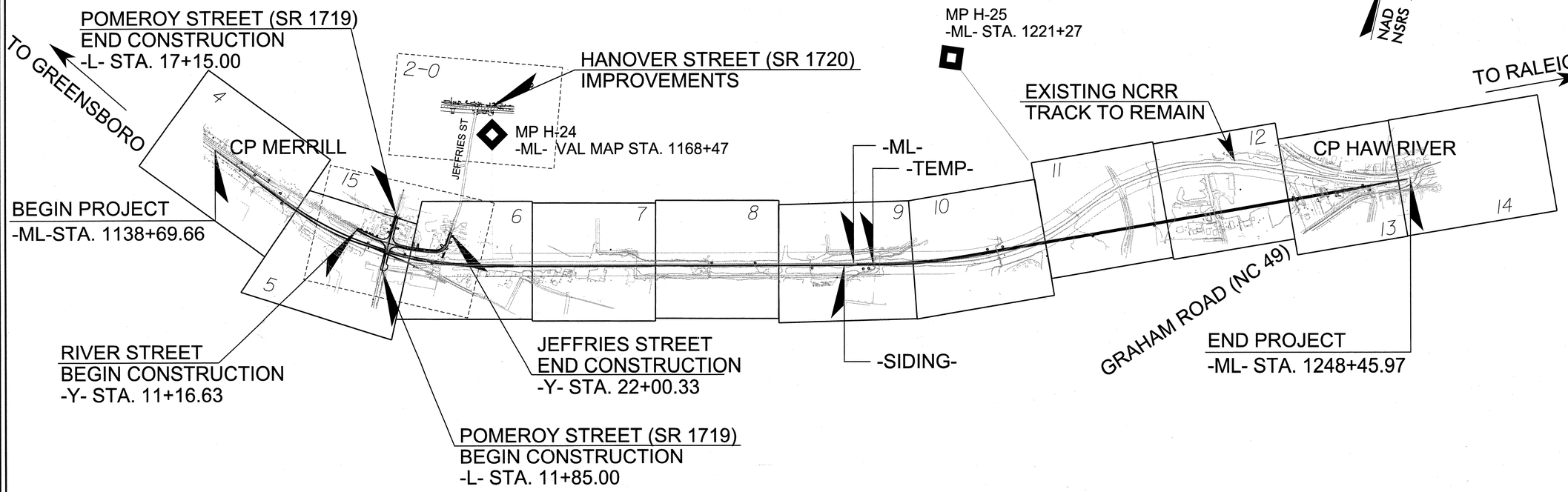
LOCATION: HAW RIVER PASSING SIDING AND MAINLINE REALIGNMENT FROM NS/NCRR MP H-23.4 WEST OF POMEROY STREET (SR 1719) CROSSING TO MP H-25.5 AT THE NC 49 UNDERPASS.

TYPE OF WORK: RAILROAD ROADBED, DRAINAGE, GRADING, PAVING



VICINITY MAP

NAD 83/ NSRS 2007



GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 5 2.5 0 5 10

DESIGN DATA
-L-

ADT 2013	=	7,900
ADT 2035	=	12,300
DHV	=	10 %
D	=	55 %
T	=	1.1%
V	=	40 MPH

PROJECT LENGTH

LENGTH RAILWAY TIP PROJECT P-5205	=	2.079 mi.
TOTAL LENGTH TIP PROJECT P-5205	=	2.079 mi.
LENGTH OF ROADWAY TIP PROJECT P-5205	=	0.306 mi.

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

2012 STANDARD SPECIFICATIONS

R/W PLAN SET DATE: SEPTEMBER 16, 2009

LETTING DATE: AUGUST 20, 2013

EDGAR LEICHT, P.E.
RAIL PROJECT ENGINEER
EDGAR LEICHT, P.E.
RAIL PROJECT DESIGN ENGINEER
RONYELL THIGPEN, P.E.
ROADWAY PROJECT ENGINEER
MICHAEL DARBY, P.E.
HYDRAULICS PROJECT ENGINEER
MATTHEW SIMMONS, P.E.
NCDOT PROJECT MANAGER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MATTHEW SIMMONS
SIGNATURE: P.E. 6-12-13

RAIL ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHT
SIGNATURE: P.E. 6-11-13

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

0016DEL_P01

DGN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-A
R/W SHEET NO.	

RAIL DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 27664 ENGINEER EDGAR N. LEIGH
6-27-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036236 ENGINEER MICHAEL M. DARBY
6-26-2013

INDEX OF SHEETS

DRAWING NO.	TITLE
1	COVER SHEET
1-A	INDEX OF DRAWINGS (SHEET 1 OF 1)
1-B	ABBREVIATIONS AND SYMBOLS (SHEET 1 OF 2)
1-C	ABBREVIATIONS AND SYMBOLS (SHEET 2 OF 2)
1-D	SURVEY CONTROL (SHEET 1 OF 3)
1-E	SURVEY CONTROL (SHEET 2 OF 3)
1-F	SURVEY CONTROL (SHEET 3 OF 3)
1-G	HORIZONTAL CURVE GEOMETRY
2 THRU 2-B	TRACK TYPICAL SECTIONS
2-C THRU 2-E	ROADWAY TYPICAL SECTIONS
2-F	CONCRETE ISLAND DETAIL
2-G	ALIGNMENT DATA
2-H	SIDING ALIGNMENT DATA
2-I THRU 2-J	TEMPORARY MAINLINE TRACK CONNECTION
2-K	TRACK AND ROADWAY DRAINAGE DETAILS
2-L	WASTE AREA DETAIL SHEET
2-M	RIGHT-OF-WAY GATE DETAIL
2-N	TYPICAL BENCHING DETAIL OPTION AT ROCK LOCATIONS
2-O	SIGHT INTERSECTION IMPROVEMENT SHEET
2-P	CONCRETE COLLAR FOR JOINING PIPES OF DISSIMILAR MATERIALS WHEN JOINT WILL BE UNDER TIE
2-Q	DETAIL FOR TEMPORARY CONTAINMENT OF CONTAMINATED SOIL
3	SUMMARY OF QUANTITIES
3-A	PAVEMENT REMOVAL, GUARDRAIL AND EARTHWORK SUMMARIES
3-B THRU 3-C	DRAINAGE SUMMARY SHEETS
3-D	PARCEL INDEX
4 THRU 14	MAINLINE PLAN AND PROFILE
15	ROADWAY PLAN SHEET
16 THRU 20	SIDING TRACK PROFILE
21	ROADWAY PROFILE SHEET
TMP-1 THRU TMP-6	TRANSPORTATION MANAGEMENT PLAN SHEETS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLAN SHEETS
EC-1 THRU EC-29	EROSION CONTROL PLANS
RF-1	REFORESTATION
S-1 THRU S-3	SIGNING PLANS SHEETS
UC-1	UTILITY RELOCATION SHEETS COVER
UC-2 THUR UC-9	UTILITY RELOCATION SHEETS (WET)
UO-1 THRU UO-5	UTILITY BY OTHERS PLANS
X-0	CROSS SECTION INDEX
X-0A	CROSS SECTION SUMMARY
X-1 THRU X-28	MAINLINE PROPOSED CROSS SECTION SHEETS
X-29 THRU X-34	TEMP. MAINLINE CONNECTION CROSS SECTION SHEETS
X-35 THRU X-51	ROADWAY CROSS SECTION SHEETS

GENERAL NOTES

1. THIS CONTRACT INCLUDES ALL WORK REQUIRED TO CONSTRUCT THE RAILROAD ROADBED UP TO AND INCLUDING THE SUBBALLAST LAYER. CONSTRUCTION OF TRACK, INCLUDING BALLAST AND SIGNALS, WILL BE DONE BY OTHERS AND IS DEPICTED FOR REFERENCE ONLY.
2. THE PROPOSED GRADE LINES SHOWN DENOTE THE FINAL ELEVATION OF THE PROPOSED TOP OF LOW RAIL AT THE CENTERLINE OF TRACK AS SHOWN ON THE TYPICAL SECTIONS. WHERE NO PROPOSED GRADE LINES ARE SHOWN, THE PROFILES SHOWN DEPICT THE EXISTING TOP OF LOW RAIL.
3. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.
4. EROSION CONTROL MEASURES AND PRACTICES SHALL BE INSTALLED PRIOR TO OR CONCURRENT WITH LAND-DISTURBING ACTIVITES.
5. ALL CONSTRUCTION WORK WILL BE PERFORMED IN SUCH A MANNER AS TO CONTROL EROSION AND PREVENT SEDIMENTATION FROM LEAVING THE SITE.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION AND RESTORATION OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT. THEIR ACCURACY OR COMPLETENESS IS NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY LOCATIONS WITH THE UTILITY COMPANIES AND (OR) CALL THE NORTH CAROLINA ONE-CALL CENTER, INC. 1-800-632-4949 NOT LESS THAN 48 HOURS BEFORE STARTING EXCAVATION ACTIVITIES.
7. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
8. SUBSURFACE INFORMATION IS AVAILABLE FOR THIS PROJECT.
9. CUT AREAS ON THE PROJECT WHERE THE TESTED UNCLASSIFIED EXCAVATION EXHIBITED PI VALUES ABOVE 25 WERE:
   B-R4: -Y- STATION 17+26, DEPTH 0-2 FEET
   B-R5: -Y- STATION 18+80, DEPTH 0-2 FEET
   B-T43: -ML- STATION 1227+50, DEPTH 0-2 FEET
   B-T45: -ML- STATION 1230+95, DEPTH 0-7 FEET
   B-T52: -ML- STATION 1242+84, DEPTH 0-7 FEET
10. ROCK WAS ENCOUNTERED ABOVE PROPOSED GRADE IN THE RE-LOCATED PORTION OF THE ALIGNMENT. BASED ON BORING INFORMATION, AREAS WHERE THE ROCK IS ANTICIPATED TO BE EXCAVATED ARE APPROXIMATE -ML- STATIONS: 1221+00 TO 1222+50, 1226+00, 1230+50, AND 1231+50 TO 1236+00.
11. SOFT SOILS ENCOUNTERED ARE NEAR PROPOSED PIPES AT -ML- STATIONS: 1185+42, 1189+60 1199+15, AND 1238+00, UNDERCUT IS ANTICIPATED IN THESE AREAS.
12. ALL STATIONS AND OFFSETS ARE BASED FROM -ML-.

ROADWAY GENERAL NOTES: 2012 SPECIFICATIONS

GRADE LINE:
GRADING AND SURFACING:

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

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND/OR STD. NO. 225.05 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 AND/OR STD. NO. 560.02

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

City of Graham, AT&T, Duke Energy, and Time Warner Cable

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

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

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.

BERM DITCHES:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 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.

BLASTING:

SEE SECTIONS 220 AND 410-9 OF THE NCDOT 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

TRACK OPERATIONS

1. THE CONTRACTOR SHALL NOT ENTER ONTO RAILROAD RIGHT OF WAY WITHOUT PERMISSION FROM NCRR AND AN APPOINTED NORFOLK SOUTHERN FLAGMAN ON DUTY.
2. THE CONTRACTOR SHALL NOT INTERRUPT THE OPERATIONS OF THE RAILROAD WITHOUT PRIOR APPROVAL OF THE RAILROAD REPRESENTATIVE.
3. THE CONTRACTOR SHALL NOT REMOVE RAILROAD SIGNAGE WITHOUT PERMISSION FROM APPOINTED NORFOLK SOUTHERN FLAGMAN ON DUTY.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

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

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
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II (Sheet 2 of 3 is no longer applicable)
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
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall for Single 54" Pipe 90 Skew
838.28	Reinforced Concrete Endwall for Double and Triple 60" Pipes 90 Skew
838.80	Precast Concrete Endwall for Single 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
848.02	Driveway Turnout - Radius Type
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
852.01	Concrete Islands
862.01	Guardrail Placement
862.02	Guardrail Installation
866.02	Woven Wire Fence - with Wood Post
866.03	Woven Wire Fence - with Steel Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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

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Note: Not to Scale

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

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	I-B
RW SHEET NO.	

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37669 ENGINEER DARIN N. LEIGH — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 040324 ENGINEER MICHAEL M. DAVIS — 5-10-13

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- 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 Wheel Chair Ramp — WCR
- 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 — HH
- 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
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- Contaminated Soil

USER NAME = $$USER
PLOT SCALE = $$SCALE
PLOT DATE = $$DATE
$$TIME

DCN 0016DEL_P01

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PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-C

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHT — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY — 5-10-13

CONVENTIONAL PLAN SHEET SYMBOLS (cont'd) AND ABBREVIATIONS

RAILROADS:

Existing Track to be Retained
Existing Track to be Shifted
Existing Track to be Removed
Proposed Detour Track
Proposed Track
Proposed Turnout
Turnout Label
Curve Label
Profile Grade Line
Milepost (H-64, STA. X+XX)
Proposed NCRR Right of Way

ABBREVIATIONS:

TRACK ALIGNMENT - HORIZONTAL:

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

TRACK ALIGNMENT - VERTICAL:

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

ROAD ALIGNMENT - HORIZONTAL

PINC	Point of Intersection No Curve
POT	Point on Tangent
POC	Point on Curve
POS	Point on Spiral

DRAINAGE:

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

MISCELLANEOUS:

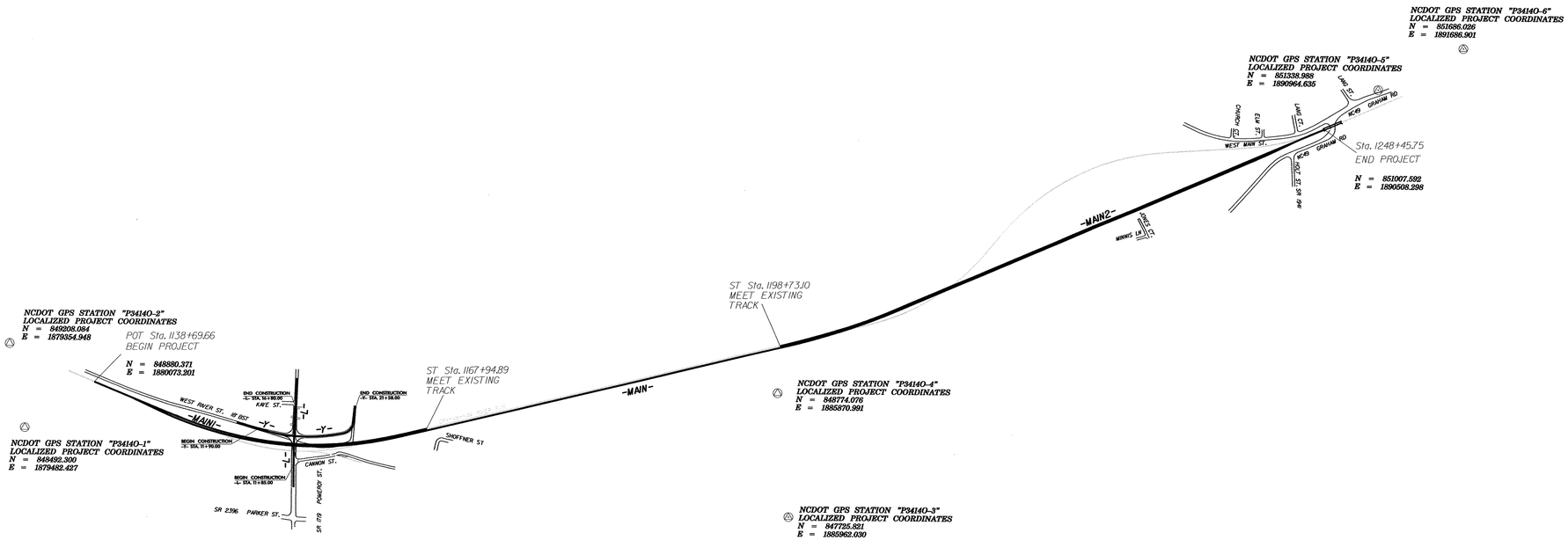
ABS	Absolute
AVE	Avenue
AH	Ahead
BK	Back
BL	Baseline
BLDG	Building
BLVD	Boulevard
CB	Catch Basin
CL	Centerline
CLR	Clear
CONC	Concrete
CP	Control Point
DWG	Drawing
E	East
EL	Elevation
ESMT	Easement
EXIST	Existing
EB	East Bound
FT	Feet
FND	Foundation
GRD	Ground
HW	Headwall
HORIZ	Horizontal
LT	Left
LH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

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

DGN 0016DEL_P01

PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-D

SURVEY CONTROL SHEET P-5205



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P34140-4" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 848774.076(ft) EASTING: 1885870.991(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99995440 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P34140-4" TO -MAIN1- STATION 1138+69.66 IS N88°56'58.83"W 5798.7643' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

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   P5205_LS_GPSCALIB.PDF
   P5205_LS_WGS84.TXT
   P5205_LS_LOCAL.TXT
   P5205_LS_CONTROL.TXT

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NOTE: DRAWING NOT TO SCALE

SYCTLINE SHEET DGN
USER NAME = $$USERNAME$$

DGN 0016DEL_P01

PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-E

SURVEY CONTROL SHEET

DESIGN ALIGNMENTS

GPS Calibration Report

Project : p34140

TIP Number	p34140		
User name	asmith	Date & Time	8:39:12 AM 1/31/2013
Coordinate System	US State Plane 1983(at ground)	Zone	North Carolina 3200
Horizontal Datum	NAD 1983 (Conus)		
Vertical Datum	NAVD 88	Geoid Model	Geoid03 (Conus) NC Sub Grid
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

LOCAL SITE INFORMATION

Localized around	P34140-4
Latitude	36°04'53.25550"N
Longitude	79°23'10.40386"W
Site Scale Factor	1.0000456000
Height	488.086sft

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.

Datum Transformation Parameters

Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

Northing coordinate of rotation center	849537.536sft
Easting coordinate of rotation center	1885553.668sft
Rotation about the center point	0°00'00"
Translation north	0.014sft
Translation east	-0.013sft
Scale factor	1.00000040

Vertical Adjustment Parameters

Northing coordinate of origin point	848492.301sft
Easting coordinate of origin point	1879482.427sft
Vertical separation at origin	0.203sft
Slope north	-11.040ppm
Slope east	2.116ppm

Geoid Model Definition

Geoid03 (Conus) NC Sub Grid

Residual Differences Between GPS (WGS84) And Local Coordinates

Summary

	Maximum error	Root Mean Square error	Point
Horizontal	0.004sft	0.001	P34140-3_GPS
Vertical	0.019sft	0.003	p3414o-5_GPS
Three-dimensional	0.019sft	0.003	p3414o-5_GPS

Point Residuals

WGS84 Coordinates		Calculated point FOR DISPLAY ONLY		Local Coordinates	
Point	P34140-1_GPS	Northing	848492.301sft	Point	P34140-1
Latitude	36°04'50.21626"N	Easting	1879482.427sft	Northing	848492.300sft
Longitude	79°24'28.21536"W	Elevation	648.224sft	Easting	1879482.427sft
Height	548.925sft	Horz error	0.001sft	Elevation	648.222sft
		Vert error	0.002sft	Utilized	Horz and Vert
		3D error	0.002sft	Quality	Adjusted quality
Point	P34140-2_GPS	Northing	849208.087sft	Point	P34140-2
Latitude	36°04'57.73921"N	Easting	1879354.948sft	Northing	849208.084sft
Longitude	79°24'29.80418"W	Elevation	653.708sft	Easting	1879354.948sft
Height	554.408sft	Horz error	0.003sft	Elevation	653.709sft
		Vert error	0.001sft	Utilized	Horz and Vert
		3D error	0.003sft	Quality	Adjusted quality
Point	P34140-3_GPS	Northing	847725.817sft	Point	P34140-3
Latitude	36°04'42.89301"N	Easting	1885962.031sft	Northing	847725.821sft
Longitude	79°23'09.24499"W	Elevation	609.799sft	Easting	1885962.030sft
Height	510.473sft	Horz error	0.004sft	Elevation	609.796sft
		Vert error	0.003sft	Utilized	Horz and Vert
		3D error	0.005sft	Quality	Adjusted quality
Point	P34140-4_GPS	Northing	848774.076sft	Point	P34140-4
Latitude	36°04'53.25534"N	Easting	1885870.992sft	Northing	848774.076sft
Longitude	79°23'10.40369"W	Elevation	587.407sft	Easting	1885870.991sft
Height	488.084sft	Horz error	0.002sft	Elevation	587.410sft
		Vert error	0.003sft	Utilized	Horz and Vert
		3D error	0.004sft	Quality	Adjusted quality
Point	p3414o-5_GPS	Northing	851338.988sft	Point	p3414o-5
Latitude	36°05'18.81047"N	Easting	1890964.634sft	Northing	851338.988sft
Longitude	79°22'08.46880"W	Elevation	505.425sft	Easting	1890964.635sft
Height	406.076sft	Horz error	0.001sft	Elevation	505.445sft
		Vert error	0.019sft	Utilized	Horz and Vert
		3D error	0.019sft	Quality	Adjusted quality
Point	p3414o-6_GPS	Northing	851686.030sft	Point	p3414o-6
Latitude	36°05'22.26871"N	Easting	1891686.899sft	Northing	851686.026sft
Longitude	79°21'59.68497"W	Elevation	534.233sft	Easting	1891686.901sft
Height	434.880sft	Horz error	0.004sft	Elevation	534.215sft
		Vert error	0.018sft	Utilized	Horz and Vert
		3D error	0.019sft	Quality	Adjusted quality

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

DGN 0016DEL_P01

PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-F

SURVEY CONTROL SHEET

DESIGN ALIGNMENTS

BL

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
101	BL-101	849014.8300	1079708.9510	650.24	OUTSIDE PROJECT LIMITS	
102	BL-102	848795.8530	1080319.9550	641.32	1141+30.14	17.41 LT
103	BL-103	848459.2130	1081027.8830	635.42	1149+10.70	30.98 RT
104	BL-104	848267.4750	1081791.8670	630.88	1156+84.88	79.37 RT
105	BL-105	848352.5550	1082258.8760	624.38	1161+47.59	3.54 RT
106	BL-106	848467.3790	1082936.5160	616.30	1168+34.58	16.35 RT
107	BL-107	848692.2360	1083723.6850	600.96	1176+52.17	23.97 LT
108	BL-108	848819.4860	1084444.1070	599.89	1183+82.82	15.67 RT
109	BL-109	849042.3430	1085244.5230	594.04	1192+12.85	19.70 LT
110	BL-110	849105.3080	1085679.3870	580.55	1196+50.66	17.69 RT
111	BL-111	849290.7070	1086325.7560	580.66	1203+22.81	7.19 LT
112	BL-112	849357.7690	1086735.8480	577.16	1207+30.35	62.10 RT
113	BL-113	849685.5640	1087272.4630	574.04	1213+19.69	37.20 RT
114	BL-114	849710.4570	1087456.2260	577.85	1215+29.74	11.86 RT
115	BL-115	849882.8350	1087652.4160	571.21	1217+46.40	2.78 RT
116	BL-116	849903.0730	1087879.0530	569.65	1219+94.10	1.73 LT
117	BL-117	849980.5750	1088051.5370	584.90	1221+83.22	6.28 LT
118	BL-118	850035.5220	1088192.6500	580.33	1223+34.60	2.21 LT
119	BL-119	850140.1900	1088447.4680	578.45	1226+10.07	0.12 RT
120	BL-120	850221.1350	1088637.7230	589.14	1228+16.82	0.72 LT
121	BL-121	850354.2990	1088890.7020	575.28	1231+01.64	25.36 LT
122	BL-122	850408.9680	1089114.6180	573.00	1233+29.24	11.07 RT
123	BL-123	850540.7520	1089381.9640	567.44	1236+26.77	6.73 LT
124	BL-124	850632.3980	1089601.0550	552.59	1238+64.25	6.25 LT
125	BL-125	850855.4830	1089592.7480	553.25	1239+43.10	215.10 LT
126	BL-126	850841.1580	1089399.8810	546.62	1242+20.57	82.82 LT
127	BL-127	850871.2230	1090136.2410	541.74	1244+50.17	18.86 LT
128	BL-128	850946.7810	1090272.4890	537.97	1246+05.06	35.67 LT
129	BL-129	851133.8450	1090572.4270	516.65	1249+54.07	91.79 LT
GPS5	P34140-5	851338.9880	1090964.6350	505.44	1253+95.21	128.72 LT

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
130	BY1-130	848976.1790	1081816.4780	647.43	OUTSIDE PROJECT LIMITS	
131	BY1-131	848675.3900	1081743.1560	642.27	16+98.59	38.18 LT
132	BY1-132	848426.6640	1081734.0810	634.15	14+42.22	35.70 LT
A104		848267.4750	1081791.8670	630.88	12+84.79	26.55 RT
133	BY1-133	847811.5980	1081732.4060	613.03	OUTSIDE PROJECT LIMITS	

BY1A

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
134	BY1A-134	849982.6730	1080001.0220	652.69	1137+63.26	65.53 LT
135	BY1A-135	849670.8880	1080732.2520	641.78	1145+98.79	63.35 LT
A132		848426.6640	1081734.0810	634.15	1156+16.48	75.55 LT

BY1B

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
B104		848267.4750	1081791.8670	630.88	1156+84.88	79.37 RT
137	BY1B-137	848237.3960	1082105.4440	626.16	1159+89.31	107.61 RT
138	BY1B-138	848155.1440	1082624.8020	629.44	1164+68.88	253.85 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
136	BY2-136	848626.9880	1082282.8860	627.78	1162+23.86	264.46 LT
A105		848352.5550	1082258.8760	624.38	1161+47.59	3.54 RT

BY3

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
A113		849685.5640	1087272.4630	574.04	1213+19.69	37.20 RT
139	BY3-139	850046.8960	1087732.1090	565.69	1219+14.19	190.54 LT
140	BY3-140	850372.5340	1087990.4660	562.58	1222+78.92	391.26 LT
141	BY3-141	850692.5570	1088523.9340	565.26	1228+94.74	479.38 LT
142	BY3-142	850709.8430	1089076.2280	549.15	1234+41.54	354.89 LT
A125		850855.4830	1089592.7480	553.25	1239+43.10	215.10 LT

BY4

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
A121		850354.2990	1088890.7020	575.28	1231+01.64	25.36 LT
143	BY4-143	850101.7920	1089010.0470	583.00	1231+21.05	257.08 RT

BY5

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
144	BY5-144	851041.0590	1089306.9310	529.47	1237+51.61	496.99 LT
145	BY5-145	850905.3530	1089723.8260	550.29	1240+83.26	210.24 LT
146	BY5-146	850911.8110	1089992.8810	550.85	1243+33.77	111.86 LT
A128		850946.7810	1090272.4890	537.97	1246+05.06	35.67 LT
A129		851133.8450	1090572.4270	516.65	1249+54.07	91.79 LT
147	BY5-147	851262.0460	1090747.2260	508.34	1251+64.90	142.18 LT
AGPS5		851330.9880	1090964.6350	505.44	1253+95.21	128.72 LT

BY6

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
148	BY6-148	850298.4480	1089725.5500	562.89	1238+49.51	349.85 RT
149	BY6-149	850605.0140	1089931.9620	551.51	1241+58.65	147.31 RT
150	BY6-150	850846.2370	1090250.6100	532.87	1245+45.91	48.52 RT
151	BY6-151	850940.9470	1090575.8100	518.69	1248+82.39	87.33 RT
B129		851133.8450	1090572.4270	516.65	1249+54.07	91.79 LT

BY6A

POINT	DESC.	NORTH	EAST	ELEVATION	MAIN STATION	OFFSET
A150		850846.2370	1090250.6100	532.87	1245+45.91	48.52 RT
152	BY6A-152	850554.3560	1090231.7010	542.25	1244+15.29	310.23 RT

BM1 ELEVATION - 655.03
N 849987 E 1080823
MAIN STATION 1137+91.08 82 LEFT
RR SPIKE IN BASE OF POWER POLE (DUKE POWER • 25080L)

BM2 ELEVATION - 617.30
N 847900 E 1081740
MAIN STATION 1156+58.00 450 RIGHT
RR SPIKE IN BASE OF POWER POLE (DUKE POWER • 108165)

BM3 ELEVATION - 608.16
N 848797 E 1083705
MAIN STATION 1176+58.00 130 LEFT
RR SPIKE IN BASE OF 12" CEDAR

BM4 ELEVATION - 578.17
N 849007 E 1085725
MAIN STATION 1196+72.00 124 RIGHT
RR SPIKE IN BASE OF 15" PINE

BM5 ELEVATION - 588.22
N 849685 E 1087586
MAIN STATION 1215+35.00 129 RIGHT
RR SPIKE IN BASE OF 8" PINE

BM6 ELEVATION - 559.25
N 850959 E 1089054
MAIN STATION 1233+35.00 160 LEFT
RR SPIKE IN BASE OF 12" PINE

BM7 ELEVATION - 586.25
N 851368 E 1091068
MAIN STATION 1254+68.56 N87°30'18"W 115' X MARK ON NW WING WALL OF BRIDGE

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SYSTIME $$DATE $$TIME
DESIGN $$DESIGN
USERNAME $$USERNAME
FILE $$FILENAME

DCN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	1-G
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH
5-13-13

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	POINT OF INTERSECTION (CIRCULAR CURVE)
Dc	DEGREE OF CURVATURE (CHORD DEFINED)	PI$_T$	POINT OF INTERSECTION (TANGENT)
L	LENGTH OF CURVE (CHORD DEFINED)	PIs	POINT OF INTERSECTION (SPIRAL)
I	TOTAL INTERSECTION ANGLE	PC	POINT OF CURVATURE
△c	CURVE ANGLE	PT	POINT OF TANGENCY
△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
T	TANGENT OF CIRCULAR CURVE	POL	POINT ON LINE

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

DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

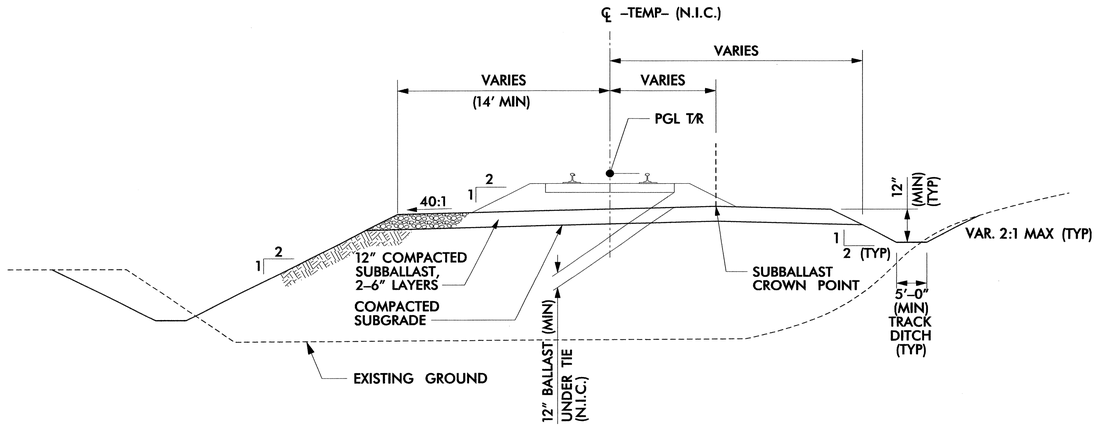
PROJECT REFERENCE NO.	SHEET NO.
P-5205	2
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH
6-20-13

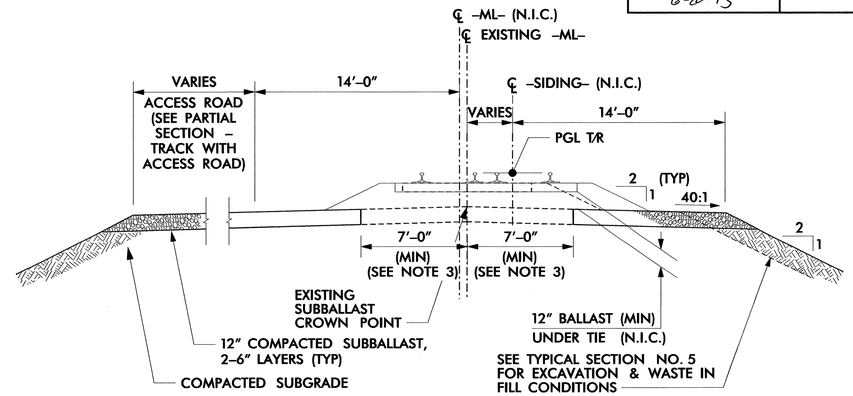
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20028 ENGINEER MICHAEL M. DARBY
6-18-13



TYPICAL SECTION NO. 1 – TEMPORARY MAINLINE TRACK

MAINLINE TRACK STA. 1202+65.62 TO 1218+75.06
(SUPERELEVATION NOT SHOWN)

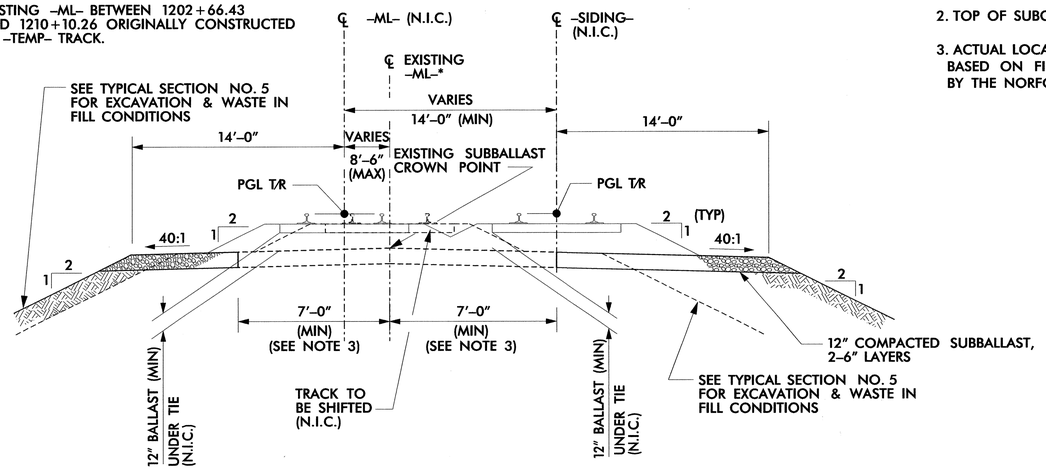


TYPICAL SECTION NO. 2 – SIDING TRACK WEST TIE–IN TO MAINLINE TRACK

MAINLINE TRACK STA. 1141+48.63 TO 1145+24.52

NOTES

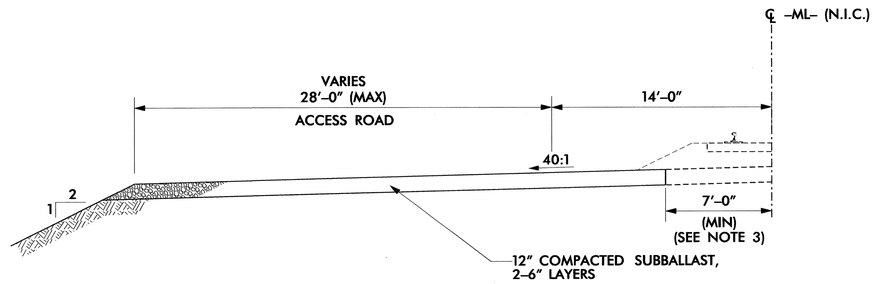
1. BALLAST, RAIL AND TIE CONSTRUCTION NOT IN CONTRACT (N.I.C.)
2. TOP OF SUBGRADE IS TO BE CROWNED.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.



TYPICAL SECTION NO. 3 – MAINLINE TRACK SHIFT

MAINLINE TRACK STA. 1145+24.52 TO 1148+27.23
MAINLINE TRACK STA. 1163+78.51 TO 1167+89.86
MAINLINE TRACK STA. 1202+30.38 TO 1211+00.00

TYPICAL SECTION NO. 4 OMITTED FROM PROJECT



PARTIAL SECTION – TRACK WITH ACCESS ROAD

MAINLINE TRACK STA. 1140+81 TO 1145+25

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$LOGIN$$$$$$$$$$$$$$$$$$$$
$$$$$$$$USERNAME$$$$$$$$

HDR Engineering, Inc. of the Carolinas
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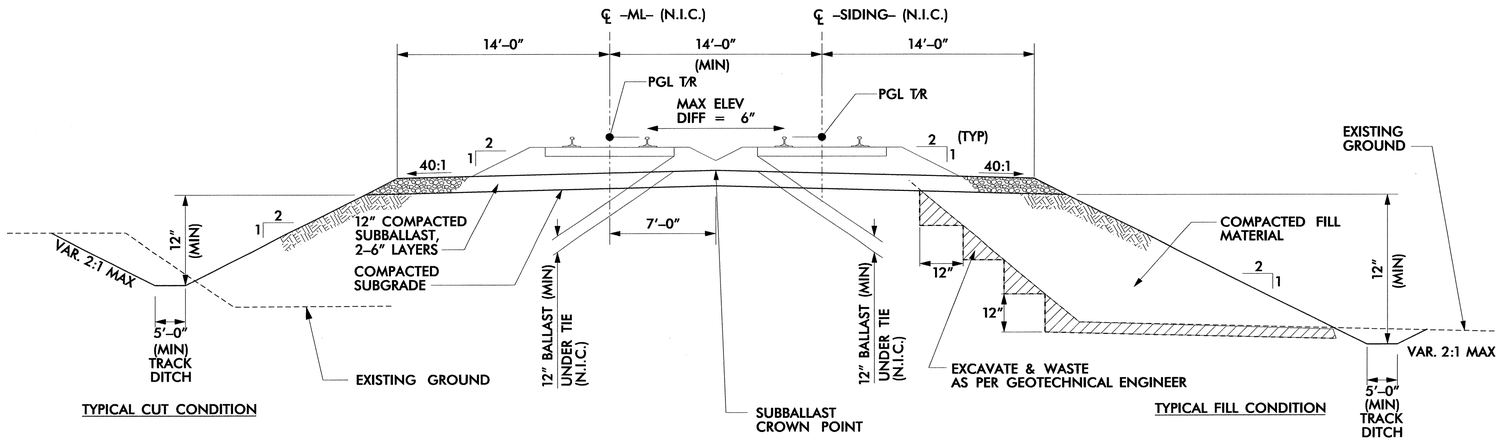
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-A
R/W SHEET NO.	

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH — 6-20-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DARER — 6-18-13

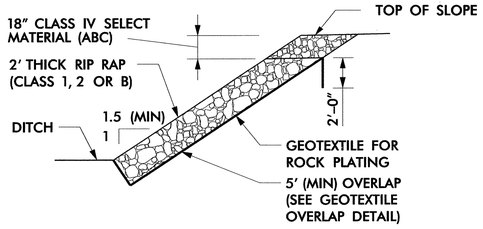


TYPICAL SECTION NO. 5 – REALIGNED MAINLINE WITH NEW SIDING TRACK

MAINLINE TRACK STA. 1213+12.86 TO 1241+61.91
(SUPERELEVATION NOT SHOWN)

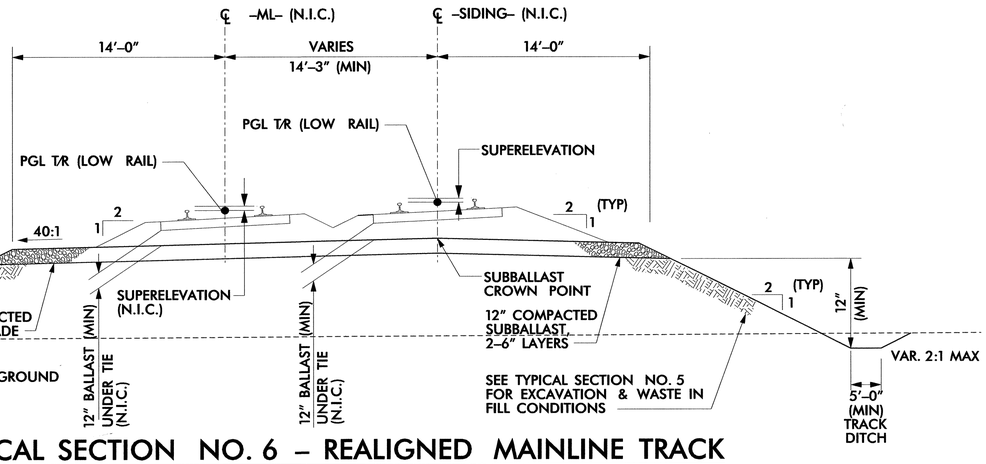
NOTES

1. BALLAST, RAIL AND TIE CONSTRUCTION NOT IN CONTRACT (N.I.C.)
2. TOP OF SUBGRADE IS TO BE CROWNED.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.
4. FOR STANDARD ROCK PLATING, SEE SECTION 275 OF THE SPECIFICATIONS.
5. PROVIDE 25′ SLOPE TRANSITION FROM 2:1 TO 1.5:1.
6. PROVIDE RIP–RAP SLOPE PROTECTION ON 25′ SLOPE TRANSITION.



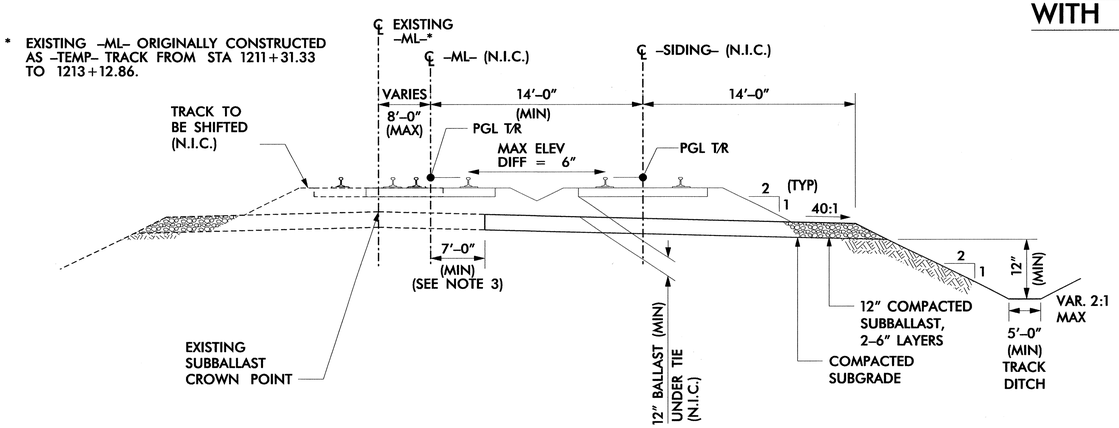
PARTIAL SECTION – CUT WITH 1.5:1 SLOPE WITH ROCK PLATING

MAINLINE TRACK STA. 1168+40 TO 1171+65, RIGHT



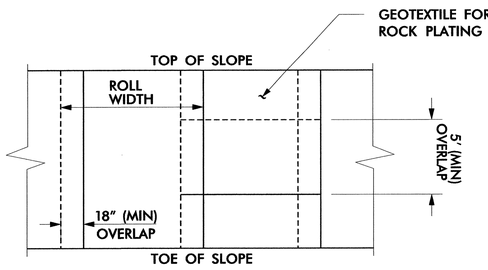
TYPICAL SECTION NO. 6 – REALIGNED MAINLINE TRACK WITH NEW SIDING TRACK (CROWN BENEATH SIDING TRACK)

MAINLINE TRACK STA. 1148+27.23 TO 1163+78.51



TYPICAL SECTION NO. 7 – MAINLINE TRACK SHIFT WITH NEW SIDING TRACK

MAINLINE TRACK STA. 1167+89.86 TO 1202+30.38
MAINLINE TRACK STA. 1211+00.00 TO 1213+12.86



GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)

SYSTEM=
DGN=
FILENAME=

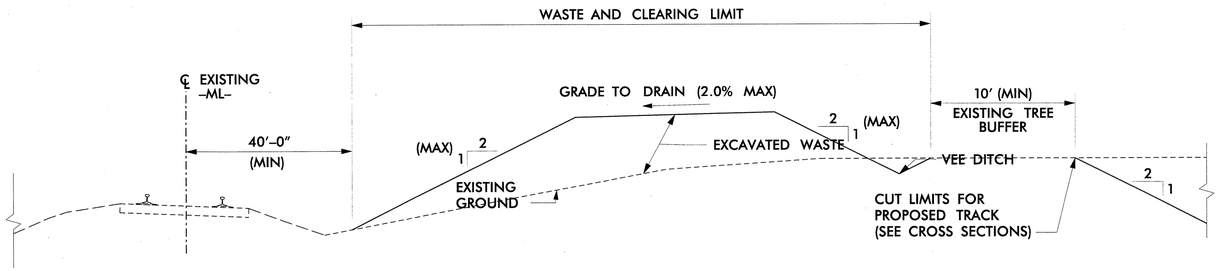
DKN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-B
R/W SHEET NO.	

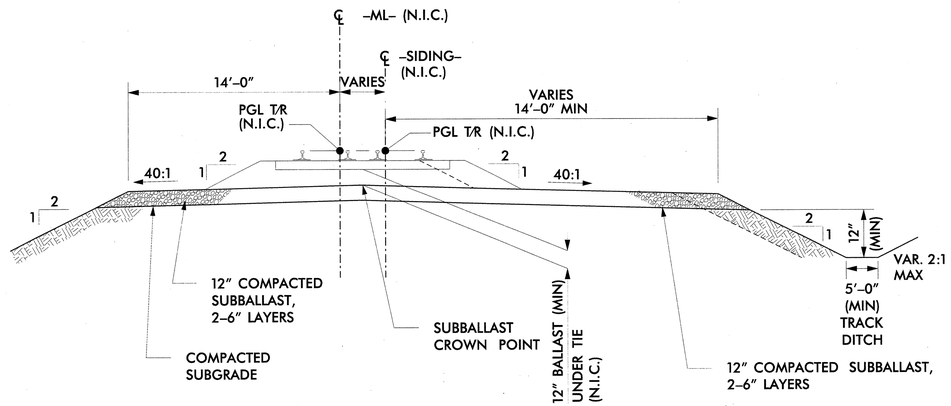
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHLITER — 6-11-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 30826 ENGINEER MICHAEL M. DARBY — 6-12-13



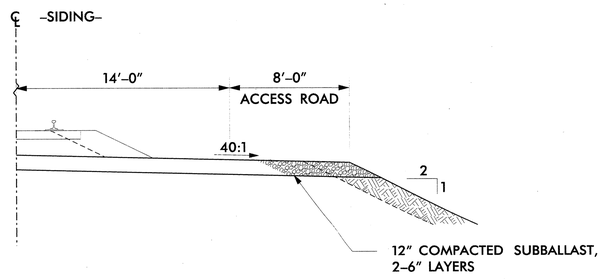
TYPICAL SECTION NO. 8 – WASTE AREA TYPICAL SECTION

MAINLINE TRACK STA. 1220+00 TO 1224+00
MAINLINE TRACK STA. 1227+00 TO 1237+00



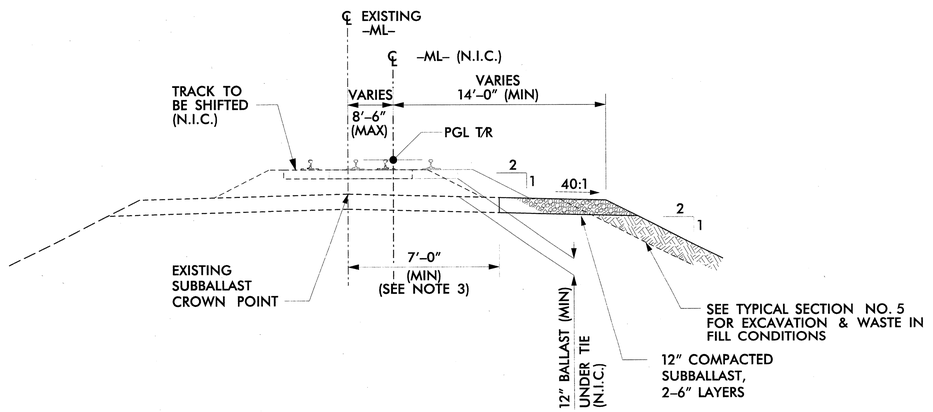
TYPICAL SECTION NO. 9 – SIDING TRACK EAST TIE–IN TO MAINLINE TRACK

MAINLINE TRACK STA. 1241+61.91 TO 1245+98.27



PARTIAL SECTION – TRACK WITH ACCESS ROAD

MAINLINE TRACK STA. 1242+22+/– TO 1246+66 +/–



TYPICAL SECTION NO. 10 – MAINLINE TRACK SHIFT

MAINLINE TRACK STA. 1245+98.27 TO 1248+45.97

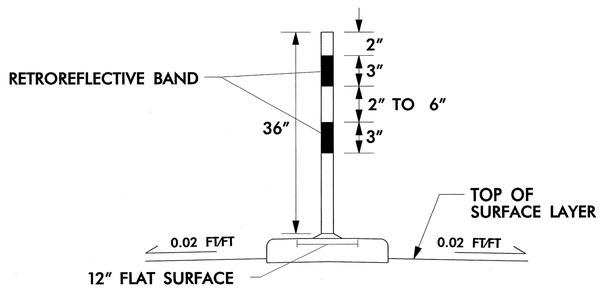
NOTES

1. BALLAST, RAIL AND TIE CONSTRUCTION NOT IN CONTRACT (N.I.C.)
2. TOP OF SUBGRADE IS TO BE CROWNED.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.

DGN 0016DEL_P01

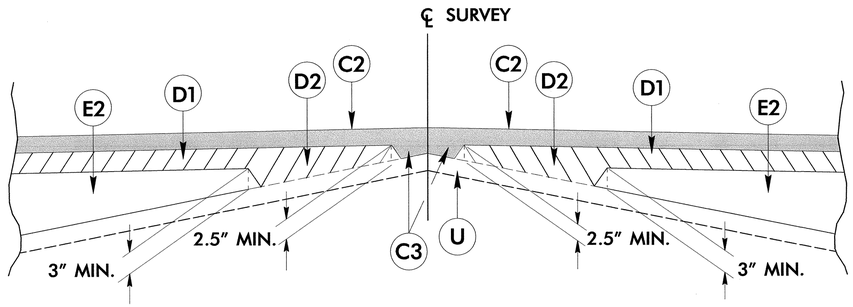
Roadway Typicals

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" 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 TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J1	PROP. 8" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YARD.
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	MONOLITHIC CONCRETE ISLAND (KEYED IN)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

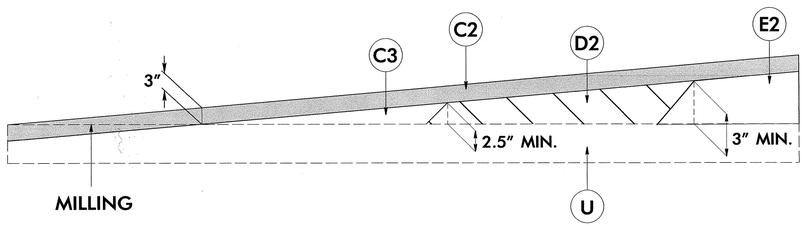


TUBULAR MARKER DETAIL

PLACE MARKERS ON 6 FOOT CENTERS ON MONOLITHIC ISLANDS



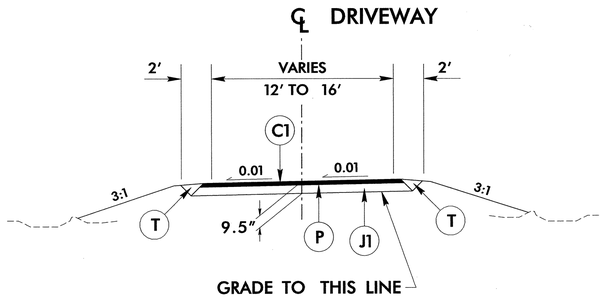
Detail Showing Method of Wedging



DETAIL FOR RESURFACING AT TIE–IN LOCATIONS

USE IN CONJUNCTION WITH TYPICAL SECTIONS 1, 2, 3, & 4

LINE	FROM STATION	TO STATION
–L–	11+85	12+50
–L–	16+50	16+80
–Y–	11+90	12+30
–Y–	20+50	21+58



DRIVEWAY TYPICAL SECTION

LINE	STATION
–Y–	12+75 LT
–Y–	13+09 LT
–Y–	13+35 LT
–Y–	13+76 LT
–Y–	17+16 LT
–Y–	17+59 LT
–Y–	20+05 LT
–L–	15+82 RT
–L–	16+71 RT

ALL OTHER DRIVEWAYS ARE CONSTRUCTED WITH 8" ABC AND NO ASPHALT SURFACE COURSE.

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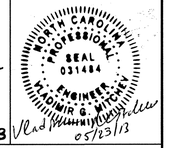
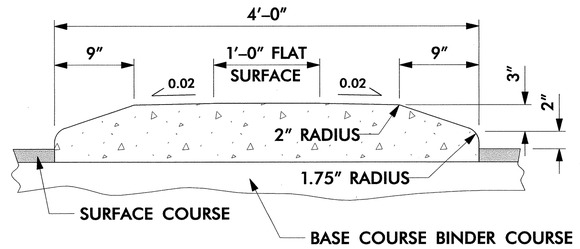
PROJECT REFERENCE NO.	SHEET NO.
P–5205	2–C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

PAVEMENT DESIGN ENGINEER



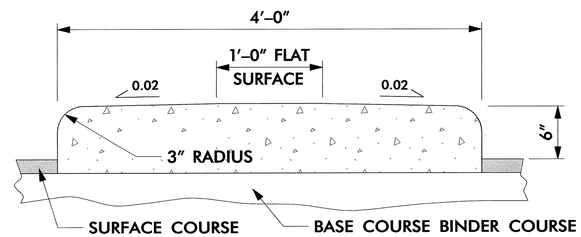


MOUNTABLE MONOLITHIC CONCRETE ISLAND (KEYED IN)

LINE	FROM STATION	TO STATION
–L–	11+85.50	11+87.50
–L–	15+05.00	15+07.00

TRANSITION FROM MOUNTABLE CONCRETE ISLAND (KEYED IN) TO NON–MOUNTABLE CONCRETE ISLAND (KEYED IN)

LINE	FROM STATION	TO STATION
–L–	11+87.50	11+97.50
–L–	14+95.00	15+05.00



NON–MOUNTABLE MONOLITHIC CONCRETE ISLAND (KEYED IN)

LINE	FROM STATION	TO STATION
–L–	11+97.50	13+37.50
–L–	13+78.00	14+95.00

NOTE: SEE DETAIL SHEET 2–F FOR ADDITIONAL CONCRETE ISLAND DETAILS.

5/23/2013
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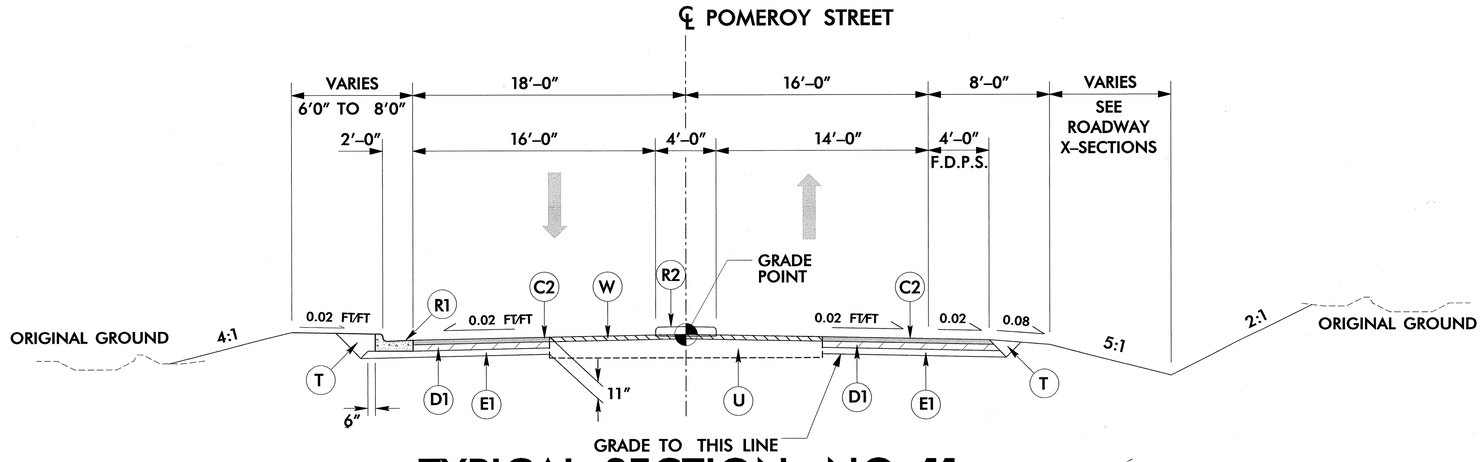
PAVEMENT SCHEDULE	
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	4" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J1	8" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	MONO. CONC. ISL.
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

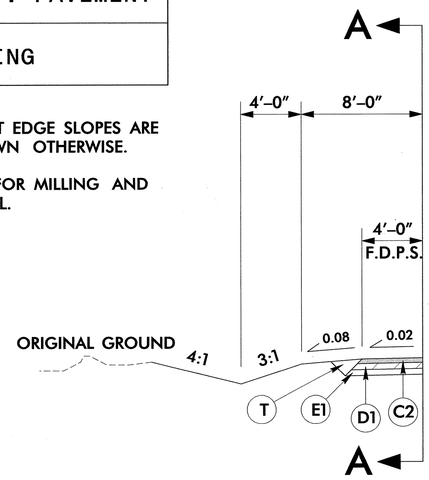
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

SEE SHEET 2-C FOR MILLING AND WEDGING DETAIL.



TYPICAL SECTION NO. 11

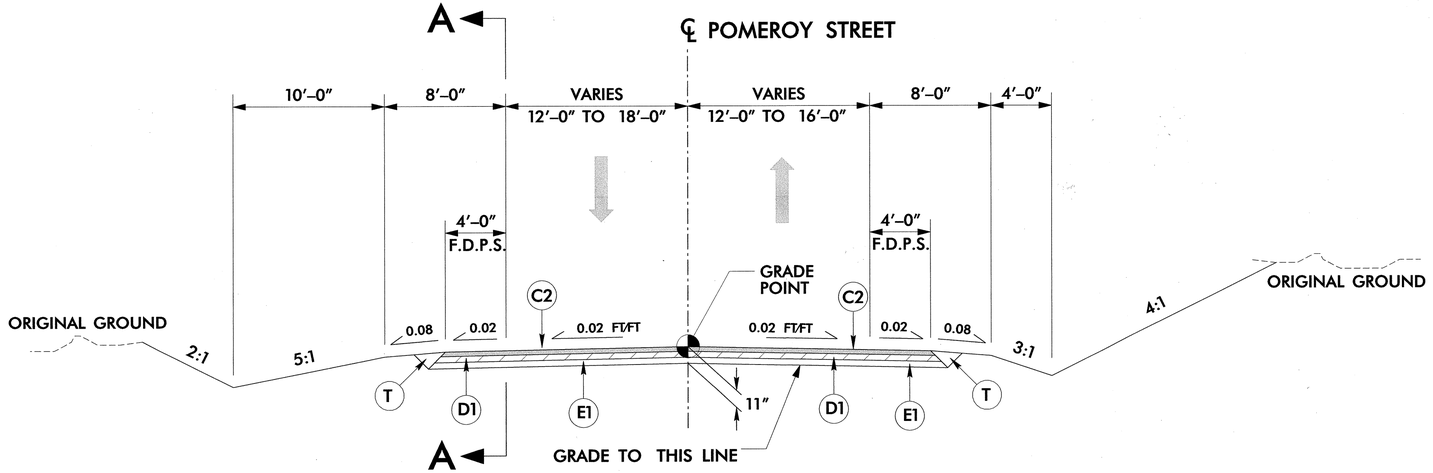
LINE	FROM STATION	TO STATION
-L-	11+85.00	12+65.00



TYPICAL SECTION NO. 12A

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 12

LINE	FROM STATION	TO STATION
-L-	15+07.00	16+00.00



TYPICAL SECTION NO. 12

LINE	FROM STATION	TO STATION
-L-	12+65.00	16+80.00

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PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONNELL A. THIGPEN — 05/23/13

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV — 05/23/13

PAVEMENT SCHEDULE	
C1	1.5" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
D1	4" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J1	8" ABC
P	PRIME COAT
R1	2'-6" C & G
R2	MONO. CONC. ISL.
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

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

SEE SHEET 2-C FOR MILLING AND WEDGING DETAIL.

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

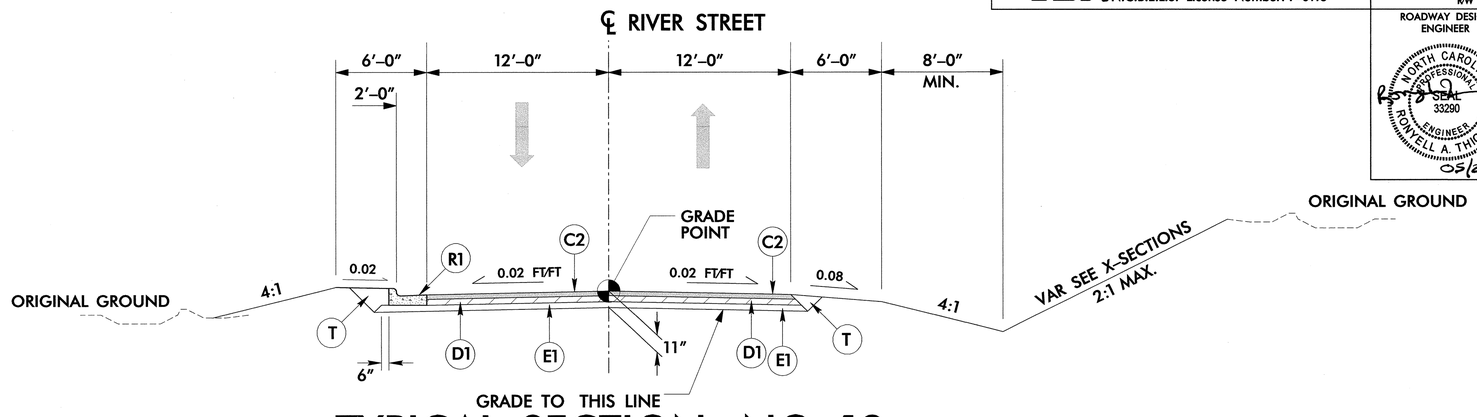
PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-E
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONNELL A. THIGPEN
05/23/13

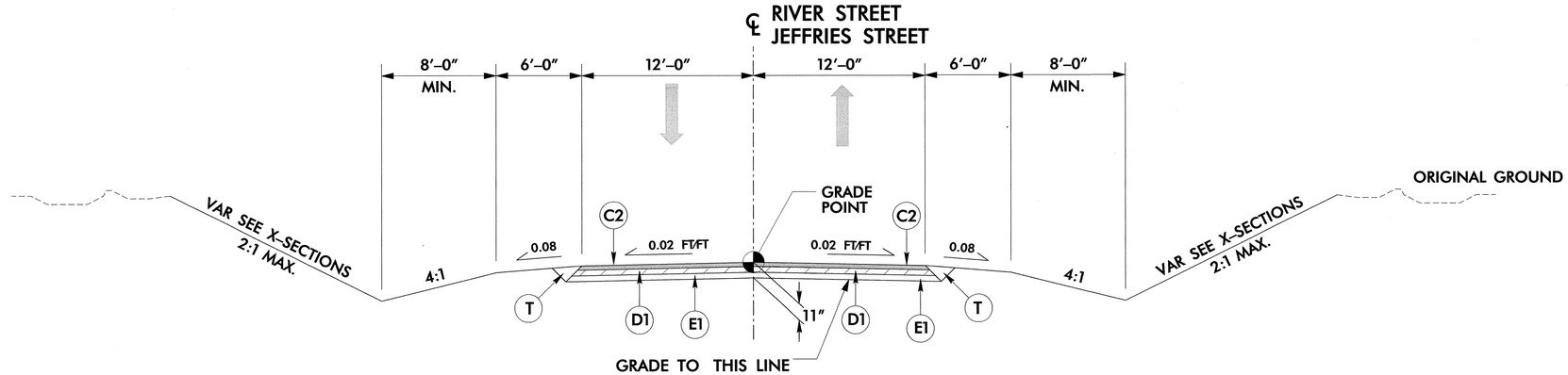
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV
05/23/13



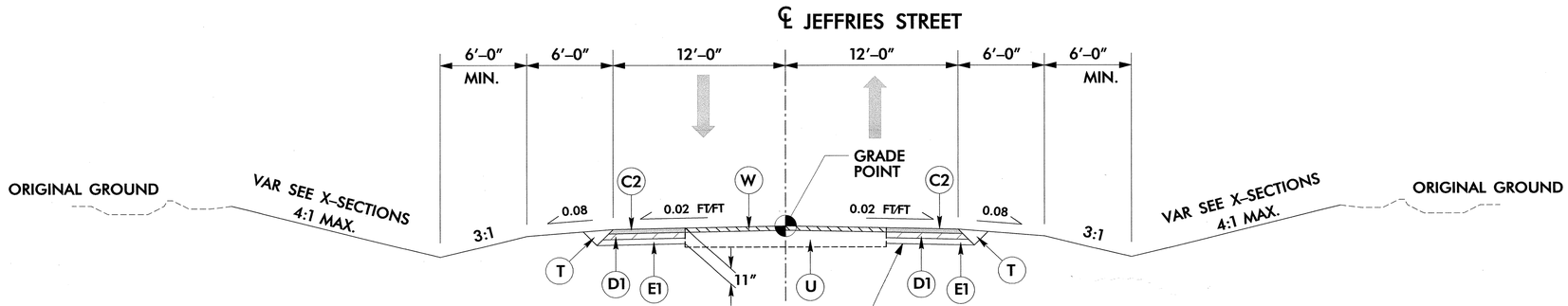
TYPICAL SECTION NO. 13

LINE	FROM STATION	TO STATION
-Y-	11+90.00	14+86.90



TYPICAL SECTION NO. 14

LINE	FROM STATION	TO STATION
-Y-	15+18.94	20+50.00



TYPICAL SECTION NO. 15

LINE	FROM STATION	TO STATION
-Y-	20+50.00	21+58.00

5/23/2013
10:26:20 AM
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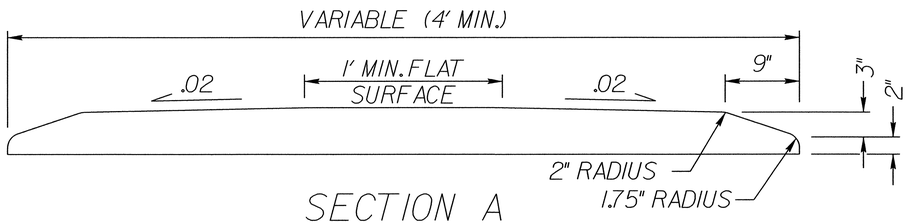
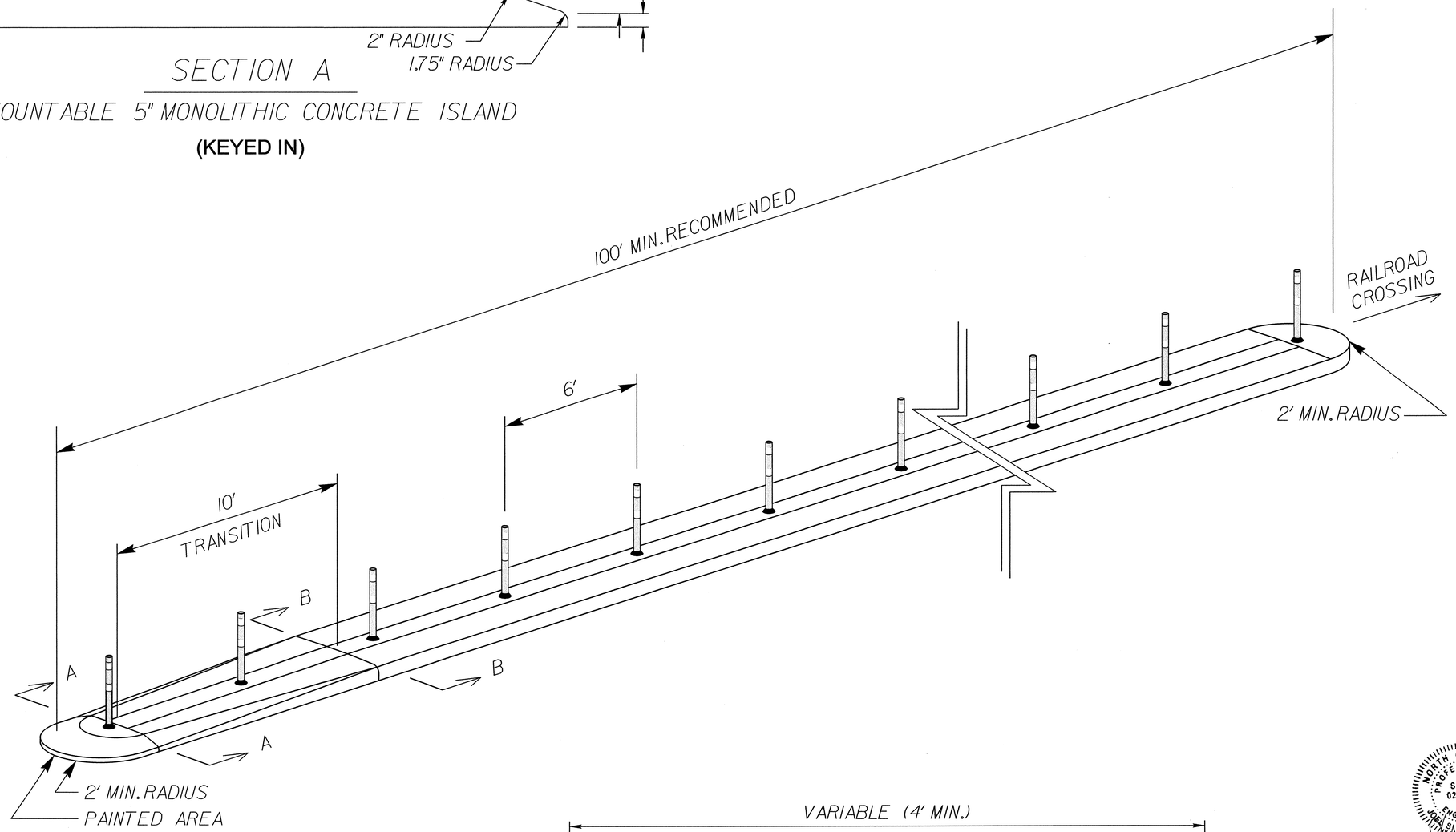
PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-F

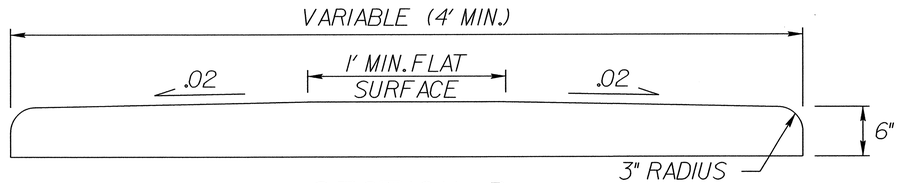


SECTION A

MOUNTABLE 5" MONOLITHIC CONCRETE ISLAND

(KEYED IN)





SECTION B

NON-MOUNTABLE 6" MONOLITHIC CONCRETE ISLAND

(KEYED IN)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWARD 4/25/13

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

CONCRETE ISLAND DETAIL

ORIGINAL BY: KKempf DATE: 5-15-09
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC: c:/pricward/stds/stdstodetails/30001/0300d01.dgn

$$$$SYSTIME$$$$
$$$$SESSION$$$$
$$$$USERNAME$$$$

DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-G
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37961 ENGINEER EDGAR N. LEICHT
5-13-13

HYDRAULICS ENGINEER

TRACK GEOMETRY DATA

-ML- TRACK CURVE DATA

CURVE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R	Dc	L	T	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls	X	Y	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	1138+69.66	848880.3765	1880073.1875																			
					S 67° 04' 24.74" E	278.9698'																	
RH #20 T/O [1]	PS	1141+48.63	848771.7040	1880330.1203																			
					S 67° 04' 24.74" E	61.0400'																	
	PITO	1142+09.67	848747.9259	1880386.3385																			
					S 67° 04' 24.74" E	190.8207'																	
	TS	1144+00.49	848673.5918	1880562.0854																			
													4° 42' 42.42" (LT)	1° 34' 13.82"	496.0000'	495.6647'	13.5898'						
	SC	1148+96.49	848493.0223	1881023.8892																			
MAIN CURVE	PI	1156+07.98	848270.6247	1881699.7316			3015.7055'	1° 54' 00.00"	1397.3694'	711.4939'	35° 58' 24.91" (LT)	26° 33' 00.07" (LT)						4.0"	50	60	70	75	80
(1)																						Eu=3.48"	Eu=4.51"
	CS	1162+93.86	848373.7675	1882403.7096																			
													4° 42' 42.42" (LT)	1° 34' 13.82"	496.0000'	495.6647'	13.5898'						
	ST	1167+89.86	848472.4261	1882889.6465																			
					N 76° 57' 10.35" E	3037.5183'																	
	TS	1198+27.38	849158.1531	1885848.7504																			
													2° 31' 07.32" (LT)	0° 50' 22.39"	403.0000'	402.9221'	5.9044'						
	SC	1202+30.38	849254.8657	1886239.9380																			
MAIN CURVE	PI	1204+18.93	849305.4618	1886421.5710			4583.7533'	1° 15' 00.00"	376.8770'	188.5485'	9° 44' 54.10" (LT)	4° 42' 39.46" (LT)						3.0"	50	60	79	90	90
(2)																		4.0" (FUTURE) SEE NOTE 2				Eu=3.09" SEE NOTE 2	Eu=3.09" SEE NOTE 2
	CS	1206+07.26	849370.8044	1886598.4350																			
													2° 31' 07.32" (LT)	0° 50' 22.39"	403.0000'	402.9221'	5.9044'						
	ST	1210+10.26	849521.4705	1886972.1740																			
					N 67° 12' 16.24" E	3526.9715																	
	PITO	1245+37.23	850887.9709	1890223.6667																			
LH #20 T/O [2]					N 67° 12' 16.24" E	61.0400'																	
	PS	1245+98.27	850911.6204	1890279.9390																			
					N 67° 12' 16.24" E	247.7059																	
	POT	1248+45.97	851007.5923	1890508.2976																			

NOTE 1: SPIRAL LENGTHS ARE BASED ON AREMA FORMULA (Ls=1.22EuV) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31FT INCREMENTS, WHERE GREATER THAN NS STANDARDS.
NOTE 2: FUTURE 4" CD AND 5" CD PASSENGER SPEEDS ARE BASED ON AN INCREASE OF ACTUAL SUPERELEVATION TO 4.0" (90 MPH) FOR FUTURE DOUBLE TRACK OPERATION.

-TEMP- TRACK CONNECTION CURVE DATA

CURVE NO.	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R	Dc	L	T	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls	X	Y	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
	TS	1201+92.63	849246.3394	1886203.9517																			
													0° 38' 44.87" (LT)	0° 12' 54.96"	62.0000	61.9992	0.2329						
	SC	1202+54.63	849260.6804	1886264.2700																			
MAIN CURVE	PI	1204+55.28	849308.5575	1886459.1238			2750.3489	2° 05' 00.00"	400.5672	200.6495	9° 38' 12.28" (LT)	8° 20' 42.54" (LT)						1.0"	25	35	35		
(T1)																							
	CS	1206+55.20	849384.2081	1886644.9657																			
													0° 38' 44.87" (LT)	0° 12' 54.96"	62.0000	61.9992	0.2329						
	ST	1207+17.20	849408.0145	1886702.2126																			
					N 67° 12' 16.42" E	413.8467																	
	TS	1211+31.04	849568.3562	1887083.7354																			
													1° 14' 23.09" (LT)	0° 24' 47.69"	62.0000	61.9971	0.4472						
	SC	1211+93.04	849592.7888	1887140.7169																			
MAIN CURVE	PI	1215+07.21	849720.7491	1887427.6453			1432.6854	4° 00' 00.00"	618.4206	314.1684	27° 12' 58.75" (LT)	24° 44' 12.57" (LT)						1.0"	25	35	35		
(T2)																							
	CS	1218+11.46	849957.0331	1887634.7000																			
													1° 14' 23.09" (LT)	0° 24' 47.69"	62.0000	61.9971	0.4472						
	ST	1218+73.46	850004.2465	1887674.8837																			

SYSTEM FILE NAME = $$CELL$$

DCN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-H
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHT
5-13-13

-SIDING- TRACK CURVE DATA

	DESC.	STATION	NORTHING	EASTING	BEARING	DISTANCE	R	Dc	L	T	I	DELTA (CURVE)	DELTA (SPIRAL)	THETA	Ls	X	Y	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
RH #20 T/O 1	PS	1141+48.63	848771.7040	1880330.1203																			
					S 67° 04' 24.74" E	61.0400'																	
	PITO	1142+09.67	848747.9259	1880386.3385																			
					S 64° 12' 33.74" E	210.2787'																	
SIDING CURVE 3	TS	1144+19.95	848656.4370	1880575.6713																			
													0° 51' 36.77" (LT)	0° 17' 12.25"	93.0000'	92.9979'	0.4654'						
	SC	1145+12.95	848616.3942	1880659.6082																			
	PI	1154+75.74	848210.5596	1881532.6900			3097.2037'	1° 51' 00.00"	1866.8481	962.7947	38° 50' 15.92" (LT)	34° 32' 12.09" (LT)						1.0"	40	50	45		
	CS	1163+79.80	848371.2277	1882481.9842																			
													3° 26' 27.06" (LT)	1° 08' 48.89"	372.0000	371.8659	7.4448						
	ST	1167+51.80	848447.9247	1882845.9309																			
					N 76° 57' 10.35" E	3,091.9721																	
SIDING CURVE 4	TS	1198+43.77	849145.9448	1885858.0829																			
													2° 33' 08.21" (LT)	0° 51' 02.69"	403.0000	402.9200	5.9831						
	SC	1202+46.77	849242.7336	1886249.2508																			
	PI	1204+30.18	849292.0549	1886425.9069			4,523.4431	1° 16' 00.00"	366.6157	183.4120	9° 44' 54.10" (LT)	4° 38' 37.68" (LT)						1.0" 4.0" (FUTURE) SEE NOTE 2	40	50	45	90 Eu=3.18" SEE NOTE 2	90 Eu=3.18" SEE NOTE 2
	CS	1206+13.38	849355.5166	1886597.9900																			
													2° 33' 08.21" (LT)	0° 51' 02.69"	403.0000	402.9200	5.9831						
	ST	1210+16.38	849506.1093	1886971.7575																			
					N 67° 12' 16.24" E	6.3312																	
EQUATION		1210+22.72BK	849508.5623	1886977.5942																			
		1210+10.26 AH	849508.5623	1886977.5942																			
					N 67° 12' 16.24" E	3151.6535'																	
SIDING CURVE 5	PC	1241+61.91	850729.6483	1889883.0836																			
	PI	1242+57.41	850766.6471	1889971.1196			3819.8277'	1° 30' 00.00"	190.9444'	95.4948'	2° 51' 51.00" (LT)	2° 51' 51.00" (LT)						0.0"	40	50	45		
	PT	1243+52.86	850807.9987	1890057.1970																			
					N 64° 20' 25.24" E	184.6827'																	
LH #20 T/O 2	PITO	1245+37.54	850887.9709	1890223.6667																			
					N 67° 12' 16.24" E	61.0400'																	
	PS	1245+98.58	850911.6204	1890279.9390																			

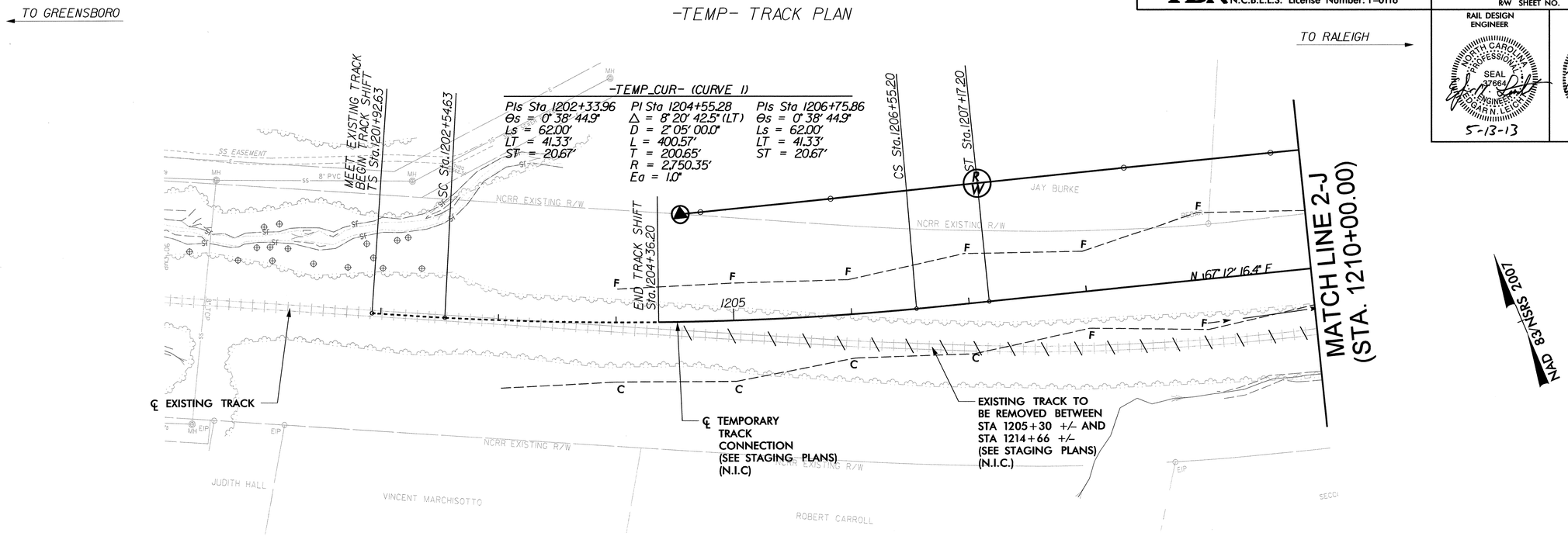
NOTE 1: SPIRAL LENGTHS ARE BASED ON AREMA FORMULA (Ls=1.22EuV) FOR RIDE COMFORT AT MAXIMUM PROPOSED SPEED ROUNDED UP TO 31FT INCREMENTS, WHERE GREATER THAN NS STANDARDS.
NOTE 2: FUTURE 4" CD AND 5" CD PASSENGER SPEEDS ARE BASED ON AN INCREASE OF ACTUAL SUPERELEVATION TO 4.0" (90 MPH) FOR FUTURE DOUBLE TRACK OPERATION.

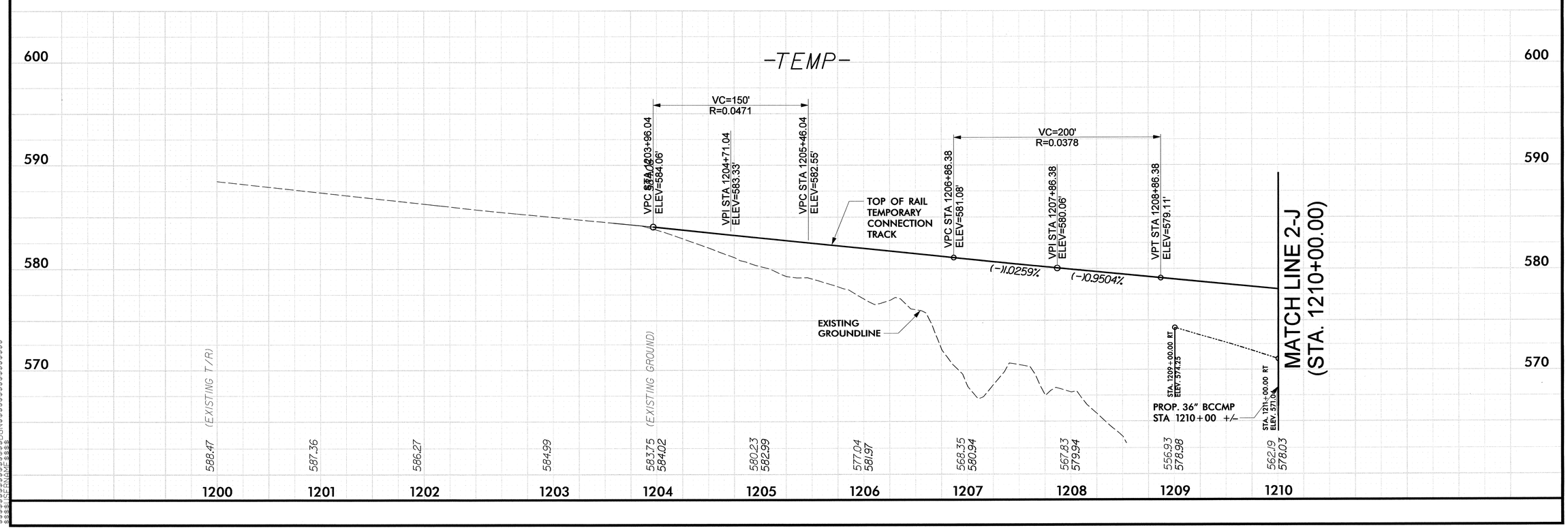
$$$$$$SYSTIME$$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$

HDR Engineering, Inc. of the Carolinas 440 S. Church Street, Suite 1000, Charlotte, NC 28202 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	P-5205	2-1
	R/W SHEET NO.	
	RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
	NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH 5-13-13	NORTH CAROLINA PROFESSIONAL SEAL 000324 ENGINEER MICHAEL M. DARBY 5.10.13

DGN 0016DEL_P01

-TEMP- TRACK PLAN





0016DEL_P01

DCN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-J
R/W SHEET NO.	

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37664 EDGAR N. LEICHT — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030328 MICHAEL M. DARBY — 5.10.13

-TEMP- TRACK PLAN

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

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

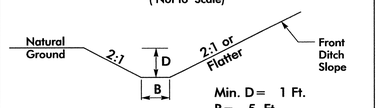
PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-K
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER M. A. THIGPEN
05/13/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030126 ENGINEER MICHAEL M. DARBY
5.10.13

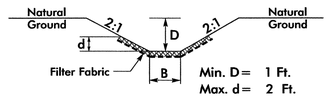
TRACK WORK DRAINAGE DETAILS

DETAIL A
SPECIAL CUT BASE DITCH
(Not to Scale)



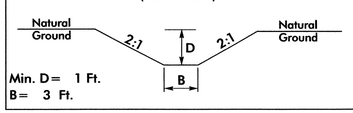
FROM –ML– STA. 1153+00 TO –ML– STA. 1156+00 LT
FROM –ML– STA. 1153+00 TO –ML– STA. 1156+00 RT
FROM –ML– STA. 1157+00 TO –ML– STA. 1165+00 LT
FROM –ML– STA. 1157+00 TO –ML– STA. 1159+00 RT
FROM –ML– STA. 1160+84 TO –ML– STA. 1184+00 RT
FROM –ML– STA. 1200+00 TO –ML– STA. 1204+00 RT
FROM –ML– STA. 1209+00 TO –ML– STA. 1211+00 RT
FROM –ML– STA. 1212+00 TO –ML– STA. 1218+00 RT
FROM –ML– STA. 1219+00 TO –ML– STA. 1237+00 LT
FROM –ML– STA. 1219+84 TO –ML– STA. 1239+00 RT
FROM –ML– STA. 1243+00 TO –ML– STA. 1246+00 LT
FROM –ML– STA. 1243+00 TO –ML– STA. 1244+00 LT

DETAIL B
2' BASE TAIL DITCH
(Not to Scale)



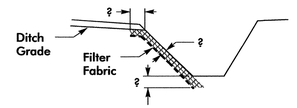
Type of Liner= CLASS I Rip-Rap
–ML– STA. 1160+90 RT
FROM –ML– STA. 1218+24 TO –ML– STA. 1219+00 RT
–ML– STA. 1238+00 LT

DETAIL C
3' BASE HEAD DITCH
(Not to Scale)



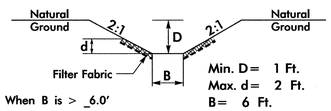
–ML– STA. 1185+42 LT

DETAIL D
RIP RAP AT EMBANKMENT
(Not to Scale)



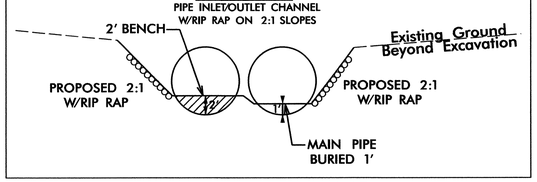
Type of Liner= 5 TONS,CL B Rip-Rap
Filter Fabric= 11 sy
–ML– STA. 1185+45 LT

DETAIL E
6' BASE TAIL DITCH
(Not to Scale)



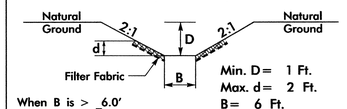
Type of Liner= CLASS I Rip-Rap
–ML– STA. 1185+43 RT
–ML– STA. 1199+90 LT

DETAIL F
PIPE INLET/OUTLET CHANNEL
W/RIP RAP ON 2:1 SLOPES



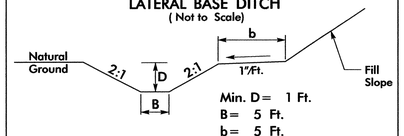
–ML– STA. 1190+20 RT
–ML– STA. 1190+90 LT

DETAIL G
6' BASE HEAD DITCH
(Not to Scale)



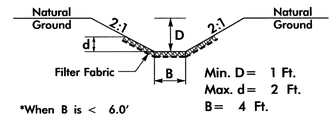
Type of Liner= CLASS I Rip-Rap
–ML– STA. 1199+20 RT

DETAIL H
LATERAL BASE DITCH
(Not to Scale)



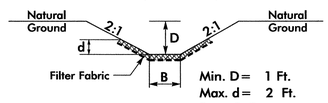
FROM –ML– STA. 1199+55 TO –ML– STA. 1200+00 RT
FROM –ML– STA. 1217+00 TO –ML– STA. 1218+50 LT
FROM –ML– STA. 1218+00 TO –ML– STA. 1219+84 RT
FROM –ML– STA. 1237+00 TO –ML– STA. 1240+00 LT

DETAIL I
4' BASE HEAD DITCH
(Not to Scale)



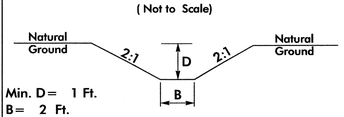
Type of Liner= CLASS I Rip-Rap
–ML– STA. 1211+27 RT

DETAIL J
5' BASE TAIL DITCH
(Not to Scale)



Type of Liner= CLASS I Rip-Rap
–ML– STA. 1211+49 LT

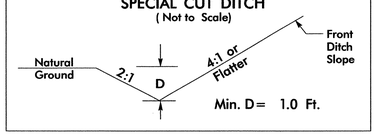
DETAIL K
2' BASE TAIL DITCH
(Not to Scale)



–ML– STA. 1225+34 LT

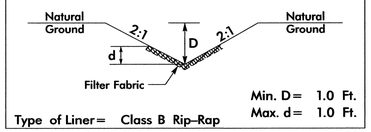
ROADWAY DRAINAGE DETAILS

DETAIL L
SPECIAL CUT DITCH
(Not to Scale)



FROM –L– STA. 12+50 TO STA. 13+25 RT
FROM –Y– STA. 11+50 TO STA. 13+50 RT.
FROM –Y– STA. 13+50 TO STA. 14+50 RT.
FROM –Y– STA. 15+50 TO STA. 19+14 LT.
FROM –Y– STA. 19+14 TO STA. 20+00 LT.
FROM –Y– STA. 15+50 TO STA. 19+14 RT.
FROM –Y– STA. 19+14 TO STA. 20+00 RT.

DETAIL M
'V' TAIL DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap
–Y– STA. 19+14 RT
FROM –Y– STA. 19+50 TO STA. 20+00 RT

USTIMES
USER
DGN

DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
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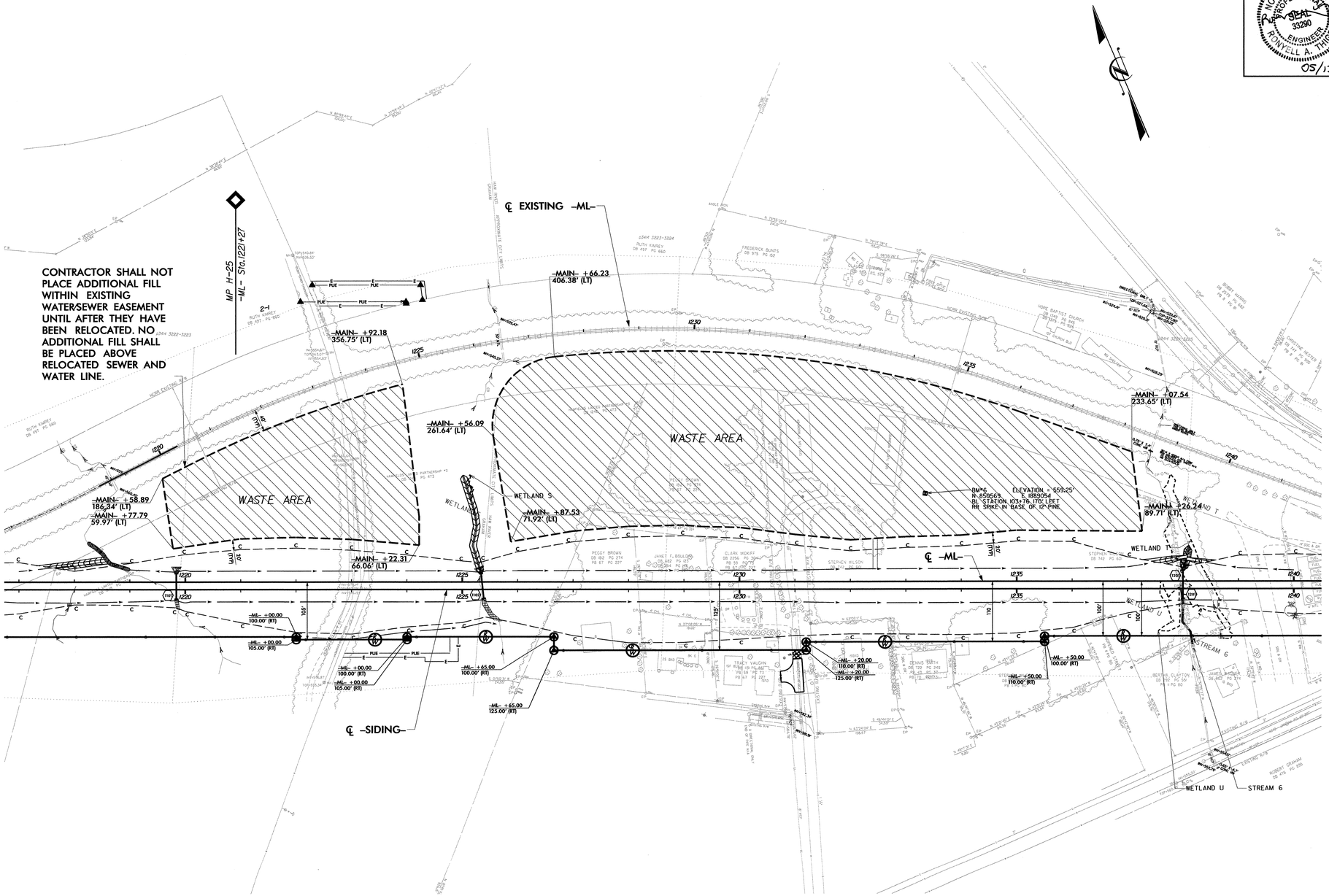
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-L
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONWELL A. THIGPEN
05/13/13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030238 ENGINEER MICHAEL M. DARDI
5.10.13

WASTE AREA DETAIL



DESIGN FILE NAME: C:\PROJECTS\5205\ROADWAY\DESIGN\SHEETS\0016DEL_P01.DGN

0016DEL_P01

DGN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

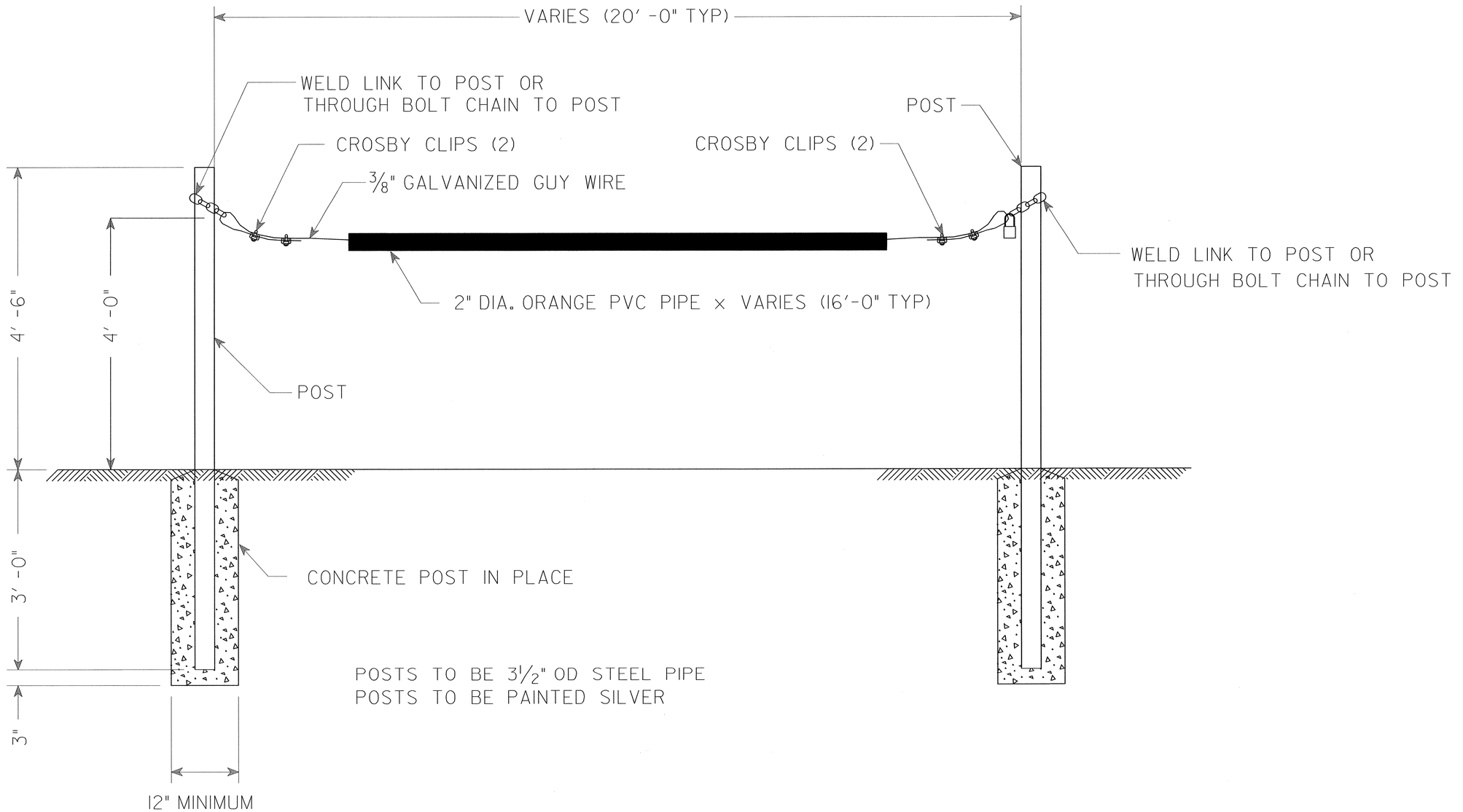
PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-M
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 025441 ENGINEER DOMINIC M. WAINWRIGHT
6/26/13

HYDRAULICS ENGINEER

RIGHT OF WAY GATE DETAIL



POSTS TO BE 3½" OD STEEL PIPE
POSTS TO BE PAINTED SILVER

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

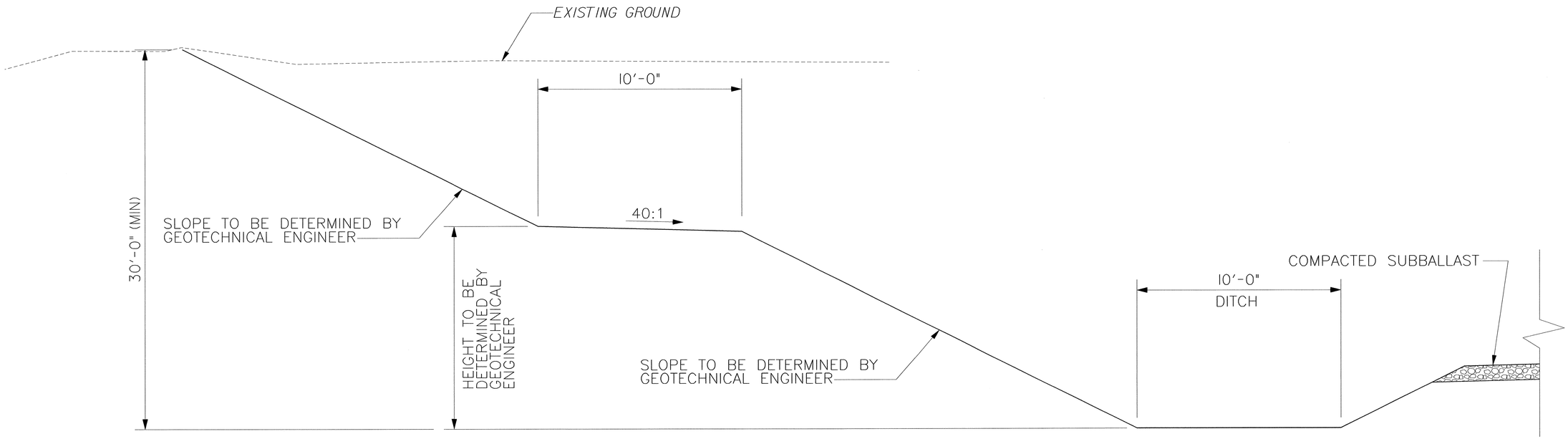
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-N
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEIGH 5-13-13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARDI 5-10-13

TYPICAL BENCHING DETAIL OPTION AT ROCK LOCATIONS



ROCK MAY BE ENCOUNTERED BETWEEN -ML- STA 1215+00 AND STA 1241+00.
SEE GEOTECHNICAL REPORT.

PROJECT REFERENCE NO.	SHEET NO.
P-2505	2-0
R/W SHEET NO.	

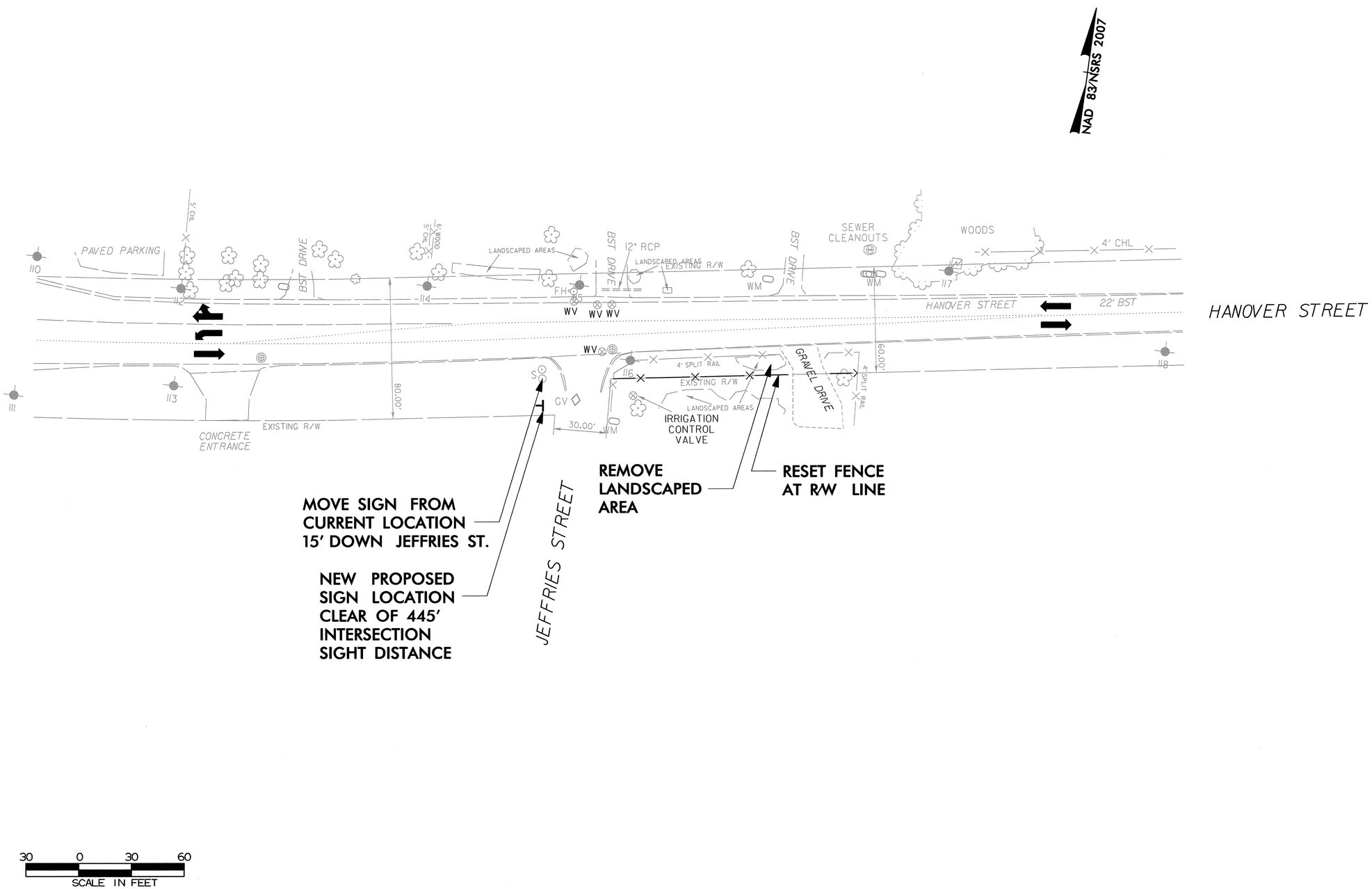
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONYELL A. THIGPEN

04/18/13

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

GRAHAM-HAW RIVER SIDING AND MAINLINE RELOCATION
INTERSECTION SIGHT DISTANCE IMPROVEMENT



REVISIONS

0016DEL_P01

8/17/99

4/11/2013
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4:17:53 PM

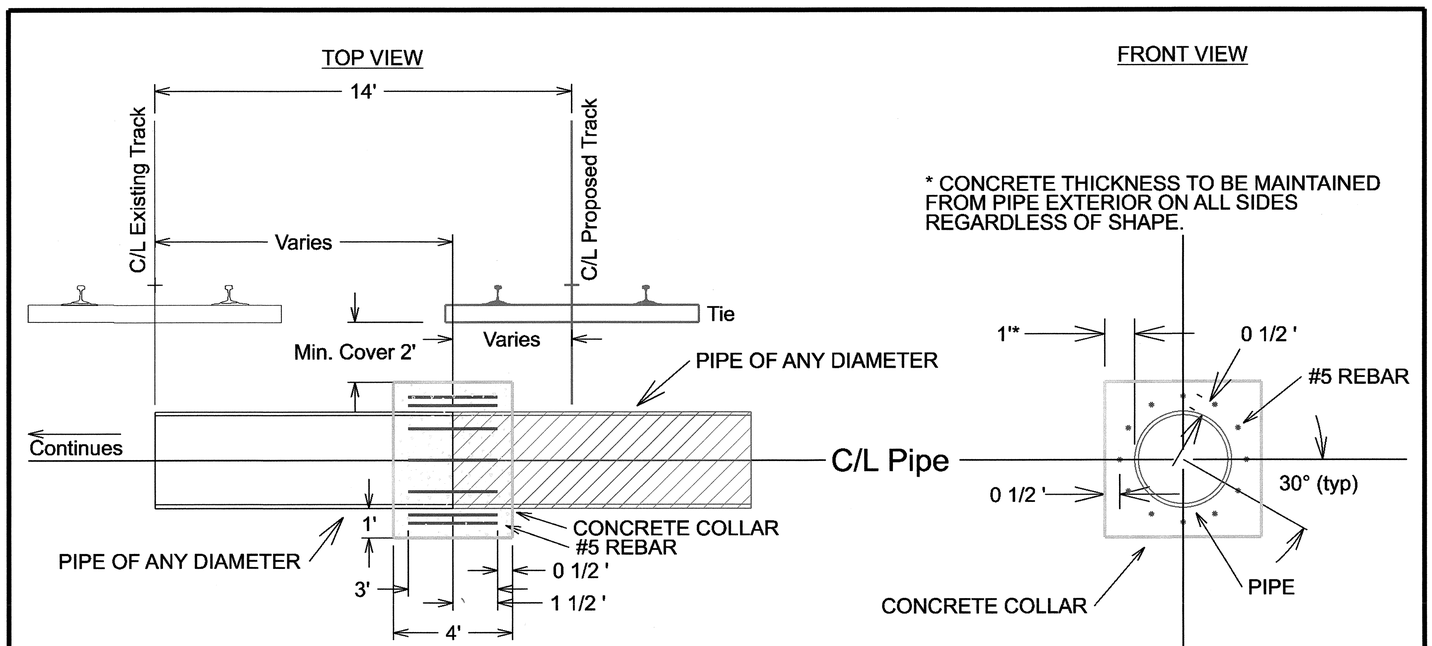
DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-P
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030228 ENGINEER MICHAEL M. DARBY
5.10.13

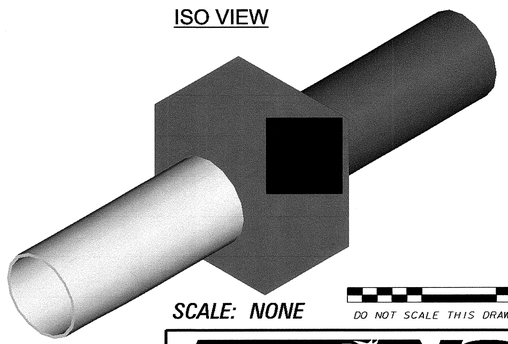
CONCRETE COLLAR FOR JOINING PIPES OF DISSIMILAR MATERIALS WHEN JOINT WILL BE UNDER TIE



ALL MATERIALS AND CONSTRUCTION SHOULD BE IN ACCORDANCE WITH THE NS "STANDARD SPECIFICATIONS FOR MATERIALS AND CONSTRUCTION", LATEST EDITION, SECTION "DR - DRAINAGE".

INCREASE COLLAR WIDTH WHEN NECESSARY TO ACCOUNT FOR PIPE ELONGATION OR BELL-ENDED INLETS IN ORDER TO MAINTAIN 6 INCH SPACING FROM PIPE TO REBAR.

ISO VIEW



SCALE: NONE

DO NOT SCALE THIS DRAWING FOR DIMENSIONS NOT GIVEN

REV	BY	DATE	DESCRIPTION

NORFOLK SOUTHERN

NORFOLK SOUTHERN RAILWAY COMPANY
OWNING COMPANY
DESIGN & CONSTRUCTION
OPERATING DIVISION
OFFICE OF THE CHIEF ENGINEER - DESIGN AND CONSTRUCTION - ATLANTA, GA.

LOCATION	ATLANTA, GEORGIA		
TITLE	CONCRETE COLLAR FOR JOINING PIPES OF DISSIMILAR MATERIALS WHEN JOINT WILL BE UNDER TIE		
DGN	PID No.	VRN	MILE POST
DWN JRT	FILE No.		DRAWING NUMBER
CHK	DATE FEBRUARY 14, 2006		TA-2006-1

CADD FILE:

SHEET OF

DCN 0016DEL_P01

PROJECT REFERENCE NO.	SHEET NO.
P-5205	2-Q
R/W SHEET NO.	

Detail for Temporary Containment of Contaminated Soil

Cross-Soction View

NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section for off-site temporary storage.

Map View

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203129

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	3	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0022000000-E	225	203,340	CY	UNCLASSIFIED EXCAVATION
0036000000-E	225	200	CY	UNDERCUT EXCAVATION
0134000000-E	240	290	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	340	LF	BERM DITCH CONSTRUCTION
0156000000-E	250	3,140	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0192000000-N	260	10	HR	PROOF ROLLING
0195000000-E	265	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	500	SY	GEOTEXTILE FOR SOIL STABILIZATION
0223000000-E	275	330	SY	ROCK PLATING
0255000000-E	SP	200	TON	GENERIC GRADING ITEM HAULING & DISPOSAL OF PETROLEUM CONTAMINATED SOIL
0318000000-E	300	150	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	450	SY	FOUNDATION CONDITIONING GEOTEXTILE
0335200000-E	305	176	LF	15" DRAINAGE PIPE
0335300000-E	305	680	LF	18" DRAINAGE PIPE
0335400000-E	305	72	LF	24" DRAINAGE PIPE
0335800000-E	305	16	LF	48" DRAINAGE PIPE
0448200000-E	310	32	LF	15" RC PIPE CULVERTS, CLASS IV
0448300000-E	310	72	LF	18" RC PIPE CULVERTS, CLASS IV
0448400000-E	310	204	LF	24" RC PIPE CULVERTS, CLASS IV
0986000000-E	SP	387	LF	GENERIC PIPE ITEM 36" BCCM PIPE CULVERTS, 0.079" THICK
0986000000-E	SP	30	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B (OPEN CUT)

SUMMARY OF QUANTITIES - P-5205

ItemNumber	Sec #	Quantity	Unit	Description
0986000000-E	SP	46	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B IN SOIL
0986000000-E	SP	46	LF	GENERIC PIPE ITEM 36" WELDED STEEL PIPE, 0.532" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	14	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B (OPEN CUT)
0986000000-E	SP	23	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B IN SOIL
0986000000-E	SP	23	LF	GENERIC PIPE ITEM 48" WELDED STEEL PIPE, 0.688" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	80	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B (OPEN CUT)
0986000000-E	SP	23	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B IN SOIL
0986000000-E	SP	23	LF	GENERIC PIPE ITEM 54" WELDED STEEL PIPE, 0.781" THICK, GRADE B NOT IN SOIL
0986000000-E	SP	160	LF	GENERIC PIPE ITEM 60" WELDED STEEL PIPE, 0.844" THICK, GRADE B (OPEN CUT)
0986000000-E	SP	52	LF	GENERIC PIPE ITEM 60" WELDED STEEL PIPE, 0.844" THICK, GRADE B IN SOIL
0986000000-E	SP	52	LF	GENERIC PIPE ITEM 60" WELDED STEEL PIPE, 0.844" THICK, GRADE B NOT IN SOIL
0995000000-E	340	520	LF	PIPE REMOVAL
1011000000-N	500	Lump Sum		FINE GRADING
1066000000-E	501	100	TON	LIME FOR LIME TREATED SOIL
1110000000-E	510	100	TON	STABILIZER AGGREGATE
1121000000-E	520	287	TON	AGGREGATE BASE COURSE
1176000000-E	542	1,000	SY	SOIL CEMENT BASE
1187000000-E	542	100	TON	PORTLAND CEMENT FOR SOIL CEMENT BASE
1198000000-E	542	100	TON	AGGREGATE FOR SOIL CEMENT BASE

ItemNumber	Sec #	Quantity	Unit	Description
1220000000-E	545	600	TON	INCIDENTAL STONE BASE
1231000000-E	560	110	CY	SHOULDER BORROW
1275000000-E	600	100.45	GAL	PRIME COAT
1330000000-E	607	650	SY	INCIDENTAL MILLING
1489000000-E	610	1,040	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	990	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	900	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1575000000-E	620	150	TON	ASPHALT BINDER FOR PLANT MIX
2000000000-N	806	42	EA	RIGHT OF WAY MARKERS
2209000000-E	838	67.9	CY	ENDWALLS
2220000000-E	838	28	CY	REINFORCED ENDWALLS
2275000000-E	SP	190	CY	FLOWABLE FILL
2286000000-N	840	10	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	0.38	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.16
2365000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.22
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24
2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	2	EA	FRAME WITH COVER, STD 840.54
2473000000-N	SP	2	EA	GENERIC DRAINAGE ITEM PIPE COLLARS UNDER RAILROAD
2549000000-E	846	300	LF	2'-6" CONCRETE CURB & GUTTER
2612000000-E	848	60	SY	6" CONCRETE DRIVEWAY
2655000000-E	852	130	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)

ItemNumber	Sec #	Quantity	Unit	Description
3030000000-E	862	25	LF	STEEL BM GUARDRAIL
3105000000-N	862	2	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS
3503000000-E	866	4,830	LF	WOVEN WIRE FENCE, 47" FABRIC
3506000000-E	866	300	EA	4" TIMBER FENCE POSTS, ***** LONG (8')
3512000000-E	866	100	EA	5" TIMBER FENCE POSTS, ***** LONG (8')
3574000000-E	867	120	LF	GENERIC FENCING ITEM RESET SPLIT RAIL FENCE
3578000000-N	SP	2	EA	GENERIC FENCING ITEM RIGHT OF WAY GATE
3628000000-E	876	540	TON	RIP RAP, CLASS I
3649000000-E	876	166	TON	RIP RAP, CLASS B
3656000000-E	876	1,340	SY	GEOTEXTILE FOR DRAINAGE
3885000000-E	SP	29,200	TON	GENERIC TRACKWORK ITEM SUB-BALLAST
4025000000-E	901	131.25	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)
4072000000-E	903	252	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4102000000-N	904	18	EA	SIGN ERECTION, TYPE E
4192000000-N	907	7	EA	DISPOSAL OF SUPPORT, U-CHANNEL
4360000000-N	SP	1	EA	GENERIC SIGNING ITEM REMOVE & RESET WOOD SIGN POST
4400000000-E	1110	654	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	188	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4435000000-N	1135	50	EA	CONES
4445000000-E	1145	112	LF	BARRICADES (TYPE III)
4450000000-N	1150	20	HR	FLAGGER
4520000000-N	1266	48	EA	TUBULAR MARKERS (FIXED)
4810000000-E	1205	9,205	LF	PAINT PAVEMENT MARKING LINES (4")

ItemNumber	Sec #	Quantity	Unit	Description
4830000000-E	1205	172	LF	PAINT PAVEMENT MARKING LINES (16")
4835000000-E	1205	336	LF	PAINT PAVEMENT MARKING LINES (24")
4840000000-N	1205	8	EA	PAINT PAVEMENT MARKING CHARACTER
4900000000-N	1251	14	EA	PERMANENT RAISED PAVEMENT MARKERS
5325600000-E	1510	10	LF	6" WATER LINE
5325800000-E	1510	1,516	LF	8" WATER LINE
5326200000-E	1510	530	LF	12" WATER LINE
5540000000-E	1515	1	EA	6" VALVE
5546000000-E	1515	4	EA	8" VALVE
5558000000-E	1515	2	EA	12" VALVE
5643100000-E	1515	5	EA	3/4" WATER METER
5666000000-E	1515	1	EA	FIRE HYDRANT
5691300000-E	1520	2,237	LF	8" SANITARY GRAVITY SEWER
5768000000-N	1520	3	EA	SANITARY SEWER CLEAN-OUT
5775000000-E	1525	14	EA	4' DIA UTILITY MANHOLE
5777000000-E	1525	3	EA	6' DIA UTILITY MANHOLE
5781000000-E	1525	38.3	LF	UTILITY MANHOLE WALL, 4' DIA
5783000000-E	1525	31.4	LF	UTILITY MANHOLE WALL, 6' DIA
5800000000-E	1530	225	LF	ABANDON 6" UTILITY PIPE
5801000000-E	1530	2,122	LF	ABANDON 8" UTILITY PIPE
5804000000-E	1530	480	LF	ABANDON 12" UTILITY PIPE
5815000000-N	1530	5	EA	REMOVE WATER METER
5815500000-N	1530	2	EA	REMOVE FIRE HYDRANT
5816000000-N	1530	8	EA	ABANDON UTILITY MANHOLE
5835900000-E	1540	660	LF	20" ENCASEMENT PIPE
5836000000-E	1540	140	LF	24" ENCASEMENT PIPE
5872100000-E	1550	130	LF	TRENCHLESS INSTALLATION OF 20" IN SOIL

ItemNumber	Sec #	Quantity	Unit	Description
5872110000-E	1550	130	LF	TRENCHLESS INSTALLATION OF 20" NOT IN SOIL
5872200000-E	1550	70	LF	TRENCHLESS INSTALLATION OF 24" IN SOIL
5872210000-E	1550	70	LF	TRENCHLESS INSTALLATION OF 24" NOT IN SOIL
5888000000-E	SP	110	LF	GENERIC UTILITY ITEM 20" SPLIT ENCASEMENT
6000000000-E	1605	12,500	LF	TEMPORARY SILT FENCE
6006000000-E	1610	320	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	2,400	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	1,000	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	100	ACR	TEMPORARY MULCHING
6018000000-E	1620	2,800	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	12	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	2,800	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	100	LF	SAFETY FENCE
6030000000-E	1630	8,700	CY	SILT EXCAVATION
6036000000-E	1631	75,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	400	SY	COIR FIBER MAT
6042000000-E	1632	1,070	LF	1/4" HARDWARE CLOTH
6070000000-N	1639	5	EA	SPECIAL STILLING BASINS
6071012000-E	SP	400	LF	COIR FIBER WATTLE
6071020000-E	SP	325	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	1,700	LF	COIR FIBER BAFFLE
6071050000-E	SP	13	EA	*** SKIMMER (1-1/2")
6071050000-E	SP	1	EA	*** SKIMMER (2-1/2")
6084000000-E	1660	75	ACR	SEEDING & MULCHING
6087000000-E	1660	69	ACR	MOWING

SUMMARY OF QUANTITIES - P-5205

ItemNumber	Sec #	Quantity	Unit	Description
6090000000-E	1661	1,150	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	3	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	1,775	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	53	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	110	LF	IMPERVIOUS DIKE
6114500000-N	1667	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	100	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	9	ACR	REFORESTATION
6132000000-N	SP	10	EA	GENERIC EROSION CONTROL ITEM SUPPLEMENTAL RESPONSE FOR EROSION CONTROL

DGN 0016DEL_P01

COMPUTED BY: MCT DATE: 03/13/13
CHECKED BY: KVL DATE: 03/13/13

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	3-A
R/W SHEET NO.	

PAVEMENT REMOVAL, GUARDRAIL AND EARTHWORK SUMMARIES

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
–L–	12+50	16+50	CL	1080.15
–Y–	12+30	14+94	CL	650.49
–Y–	15+17	20+50	CL / RT	1406.46
			TOTAL:	3,137.10
			SAY:	3,140

2'–6" CURB & GUTTER

SURVEY LINE	STATION	STATION	DEDUCTIONS	LENGTH
–L–	11+85.00	12+65.00		80
–Y–	11+90.00	14+83.43	111	212
			TOTAL:	292
			SAY:	300

SUMMARY OF EARTHWORK

LINE	STATION	STATION	UNCL. EXCAV.	EMBANK. +20%	BORROW	WASTE
–ML– SECTION 1	1141+00	1156+28	8800	4078	0	4722
–ML– SECTION 2	1156+88	1186+00	32621	3266	0	29355
–ML– SECTION 3	1186+00	1216+00	8063	34522	26459	0
–ML– SECTION 4	1216+00	1246+00	175569	1936	0	173633
–ML– SECTION 5	1246+00	1248+46	60	648	588	0
–L–	11+85	13+00	170	8	0	162
–L–	14+00	16+80	2228	7	0	2221
–Y–	11+90	14+50	1328	6	0	1322
–Y–	15+50	21+58	10216	2	0	10214
SUBTOTALS:			239055	44474	27047	221628
ROCK WASTE TO REPLACE BORROW					–22539	–22539
ADJUST FOR ROCK WASTE				–4508	–4508	[illegible]
WASTE DUE TO CLEARING AND GRUBBING			–35723			–35723
WASTE TO REPLACE BORROW						3799
PROJECT TOTAL:			203332	39966	0	167163
GRAND TOTALS:			203332	39966		167163
SAY:			203340	39970		167170

DRAINAGE DITCH EXCAVATION	290 CY
SHOULDER BORROW	110 CY
UNDERCUT	200 CY
SELECT GRANULAR MATERIAL	200 CY

Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

"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

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								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	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	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	TES	AT-1	EA	G	NG				
–MAINLINE–	1230+88.34	1231+14.32	RT	25																		2								
			TOTAL:	25																		2								

SYSTIME=9/9/99 @ 09:09:09 CIN=9/9/99 @ 09:09:09 LEVELS=ALL

0016DEL_P01

CRLE-1093978

COMPUTED BY:	MMD	DATE	4/12/2013
CHECKED BY:	BRS	DATE	4/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
P-5205	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 / SIZE / THICKNESS OR GAUGE	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) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	B.C.C.M. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	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)			R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	** " R.C. PIPE (CLASS V)	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	ENDWALLS STD. 838.01 OR 838.80 (CLASS 'B' CONCRETE NOT ALLOWED IN RR ROW) 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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.17 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO GRATES 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	TRAFFIC BEARING G.D.I. STD. 840.35	MH FRAME AND COVER STD 840.54	TRAFFIC BEARING JB STD. 840.34	BERM DRAINAGE OUTLET STRUCTURE STD 850.10 OR 850.11	DRAINAGE STRUCTURE REMOVAL	FLOWABLE FILL, C.Y.	CONC. COLLARS CL. "AA" EA NS STD. TA-2006-1	PIPE REMOVAL LIN. FT.	REMARKS
		401	402		639.12	636.14				128																																																																		
1142+66	LT	402		641.52	636.14																																												1	0.38																	1		1							JBw/MH
		402	403		636.14	634.71				220																																																																			
1144+88	LT	403		637.32	634.71																																												1													1		1													2GI(D)
		403	404		634.71	634.38				60																																																																			
1146+39	RT	405			628.70	628.34																			16																							2.8																											1		COLLAR & EXTEND 36" BCCMP
1154+83	CL	501			626.06	625.86																			52																							5.6																													36" BCCMP
1158+00	CL	502			624.12	622.99																			45																							5.6																													36" BCCMP
1160+83	CL	601			620.19	619.94																						23	23	19																		5.6																										4.9			36" SMOOTH STEEL - TRENCHLESS
1185+42	CL	801			591.30	590.65																									23	23	14															9.8																										11			48" SMOOTH STEEL - TRENCHLESS
1189+55	CL	802			590.36	588.01																						23	23	11																		5.6																										7.1			36" SMOOTH STEEL - TRENCHLESS
1194+34	RT	901			581.65	580.25									16																																	4.9																											1		COLLAR & EXTEND 48" BCCMP
1210+00	CL	1001			571.04	557.81																			74																							5.6																													36" BCCMP
1219+84	CL	1101			561.93	561.76																			47																							5.6																													36" BCCMP
1225+35	CL	1102			556.71	556.40																			45																							5.6																													36" BCCMP
1238+00	CL	1201			544.66	543.01																			52																							5.6																													36" BCCMP
1244+00	CL	1301			536.49	536.33																			56																							5.6																													36" BCCMP
1245+00	RT	1302			536.00	531.02				36																																																																	3.3			
Y 11+88	LT	2003		635.15	631.23																																												1									1	1																	DI
		2003	2004		631.23	631.17			12																																																																					
Y 11+90	LT	2004		634.93	631.17																																												1			1			1																		1				CB
		2001	2004		634.27	631.17																																72																																							72	REMOVE 15" RCP
Y 12+50	LT	2005		634.84	631.67																																												1									1	1																	DI
		2005	2006		631.67	631.63			8																																																																					
Y 12+50	LT	2006		634.13	630.38																																												1			1			1																						CB
		2004	2006		631.17	630.38																																	60																																					160	REMOVE 18" RCP
L 15+38	LT	2007		634.36	631.61																																												1												1					1											2GI
		2007	2008		631.61	628.31			76																																																																					22	
Y 14+50	LT	2008		631.96	628.31																																												1																		1		1							JBw/MH
		2008	2009		628.31	628.01			60																																																																					
Y 13+90	LT	2009		631.36	628.01																																												1			1	1																								CB
		2009	2010		628.01	627.85																															32																																							28	REMOVE 18" RCP
Y 13+56	LT	2010		631.95	627.85																																												1			1	1																						1				CB
		2006	2010		630.38	627.85																																	104																																						
		2010	OUT		627.85	627.65																																	40																																					33	REMOVE 12" RCP
L 15+92	LT	2011							20																																																																			20	DRIVEWAY PIPE
L 16+72	RT	2012								24																																																																	16	DRIVEWAY PIPE
L 15+80	RT	2013								24																																																																	24	DRIVEWAY PIPE
Y 17+14	LT	2014								24																																																																	24	DRIVEWAY PIPE
Y 17+58	LT	2015								28																																																																			DRIVEWAY PIPE
Y 19+14	CL	2016			623.25	621.00					72																																																															1			28	CROSS PIPE
Y 20+00	LT	2017								36																																																																	19	DRIVEWAY PIPE
Y 20+20	RT	2018								40																																																																	21	DRIVEWAY PIPE
Y 20+73	RT	2019								32																																																																	31	DRIVEWAY PIPE
Y 21+30	RT	2020								28																																																																	22	DRIVEWAY PIPE
SHEET TOTALS									176	680	72				16										387			46	46	30	23	23	14				32	72	204									67.9	10	0.38		4	2		2			2	2		1	1		1		1	2		2			3	26.3	2	520	
PROJECT TOTALS									176	680	72				16										387			46	46	30	23	23	14				32	72	204									67.9	10	0.38		4	2		2			2	2		1	1		1		1	2		2			3	190	2	520	

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

CRLE-1093978 0016DEL_P01

COMPUTED BY: MMD DATE: 4/12/2013

CHECKED BY: BRS DATE: 4/12/2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
P-5205	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	54" WELDED STEEL PIPE 0.781" THICK, GRADE B (IN SOIL)	54" WELDED STEEL PIPE 0.781" THICK, GRADE B (NOT IN SOIL)	54" WELDED STEEL PIPE 0.781" THICK, GRADE B (OPEN CUT)	60" WELDED STEEL PIPE 0.844" THICK, GRADE B (IN SOIL)	60" WELDED STEEL PIPE 0.844" THICK, GRADE B (NOT IN SOIL)	60" WELDED STEEL PIPE 0.844" THICK, GRADE B (OPEN CUT)
1199+47	CL	902			564.72	562.49					26	26	80
1199+59	CL	903			564.72	562.49					26	26	80
1211+40	CL	1002			557.37	553.2		23	23	80			
SHEET TOTALS								23	23	80	52	52	160
PROJECT TOTALS								23	23	80	52	52	160

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 54" .109	54" .138	54" .168	54" SHOP ELON-GATED .138	54" 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
1199+47																	
1199+59																	
1211+40																	
SHEET TOTALS																	
PROJECT TOTALS																	

STATION	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	CONCRETE TRANSITIONAL SECTION 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	FLOWABLE FILL, C.Y.	PIPE REMOVAL LIN. FT.	REMARKS
1199+47		8.8														60" SMOOTH STEEL - TRENCHLESS
1199+59		8.8												137.5		60" SMOOTH STEEL - TRENCHLESS
1211+40		10.4												26.2		54" SMOOTH STEEL - TRENCHLESS
SHEET TOTALS		28												163.7		
PROJECT TOTALS		28												SEE 3-B		

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

0016DEL_P01

DGN

COMPUTED BY: MCT DATE: 03/13/13

CHECKED BY: KVL DATE: 03/13/13

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	3-D
RW SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH

6-20-13

HYDRAULICS ENGINEER

PARCEL INDEX

PARCEL INDEX

PARCEL NUMBER	PLAN SHEET NUMBER	PROPERTY OWNER NAME	PARCEL NUMBER	PLAN SHEET NUMBER	PROPERTY OWNER NAME
1	10	JAY BURKE	18	15	ROSIE WALKER
2	10, 11	HAWFIELDS LIMITED PARTNERSHIP #3	19	5, 15	ALMA LATHAN
3	10, 11	SECCO LAND, L.L.C.	20	5, 15	ADRIENNE L. BANTUM
4	12	PEGGY BROWN	21	5, 15	RAY McALLISTER
5	12	UNOPENED STREET	22	5, 15	VERNA PARKER
6	12	30' UNOPENED STREET	23	5, 15	MARGARET BOOKER
7	12	JANET F. BOULDIN	24	5, 6, 15	PATSY MORROW
8	12	CLARK MIDKIFF	25	6, 15	H.C. EULISS TRUST
9	12	TRACY VAUGHN	26	6, 15	TYRE POOLE HEIRS
10	12	SIRRENO CLAPP	27	15	BRIAN CONGDON
11	12, 13	STEPHEN WILSON	28	6, 15	PEDRO CASTANEDA
12	12	STEPHEN WILSON	29	6, 15	JOSEPH WHITE
13	12	UNOPENED STREET	30	6, 15	WILLIAM TALLEY
14	13	JAMES WAGNER	31	15	MARVIN McBROOM
15	13	PAYNE OIL COMPANY, INC.	32	5, 15	CULP, INC.
16	5, 15	NICK COLLINS	33	11	RUTH ISLEY KIMREY
17	15	NICK COLLINS			

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

HDR Engineering, Inc. of the Carolinas 440 S. Church Street, Suite 1000, Charlotte, NC 28202 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	P-5205	4
	R/W SHEET NO.	RW-06

RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37664 EDGAR N. LEIGH 6-26-13	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL MICHAEL M. DARBY 6-25-2013

NOTES:

1. LIMITS OF ASPHALT UNDERLAYMENT: -ML- STA 1141+45.63 TO -ML- STA 1143+71.63.
2. CONTRACTOR TO CONSTRUCT 6" SUBBALLAST WITHIN LIMITS OF PROPOSED ASPHALT UNDERLAYMENT.

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES PLACED IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

PLAN SUMMARY DATA	
DRAINAGE AREA	25.65 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	36 CFS
DESIGN HW ELEVATION	633.97 FT
Q100 DISCHARGE	57 CFS
Q100 HW ELEVATION	635.21 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	110 CFS
OVERTOPPING ELEVATION	640.88 FT

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

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	5
R/W SHEET NO.	RW-07

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHT — 6-20-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY — 6-18-13

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES PLACED IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

NOTE:

SEE SHEET NO. 15 FOR ROADWAY PLAN

PLAN SUMMARY DATA

DRAINAGE AREA	21.41 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	31 CFS
DESIGN HW ELEVATION	629.09 FT
Q100 DISCHARGE	50 CFS
Q100 HW ELEVATION	630.70 FT
OVERTOPPING FREQUENCY	100+ YEAR
OVERTOPPING DISCHARGE	63 CFS
OVERTOPPING ELEVATION	631.99 FT

PLAN SUMMARY DATA

DRAINAGE AREA	0.46 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	0.45 CFS
DESIGN HW ELEVATION	624.66 FT
Q100 DISCHARGE	0.56 CFS
Q100 HW ELEVATION	624.67 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	64 CFS
OVERTOPPING ELEVATION	629.29 FT

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DGN

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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
P-5205	6
R/W SHEET NO.	RW-08

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37664 EDGAR N. LEICHT — 6-20-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030328 MICHAEL M. DARBY — 6-18-13

-ML- (CURVE 1)

PI Sta 1156+07.98	PIs Sta 1164+59.30
Δ = 26° 33' 00.1" (LT)	Δs = 4° 42' 42.4"
Dc = 1° 54' 00.0"	Ls = 496.00'
L = 1,397.37'	LT = 330.78'
T = 711.49'	ST = 165.44'
R = 3,015.71'	
Ea = 4.0"	

-SIDING- (CURVE 3)

PI Sta 1154+75.74	PIs Sta 1165+03.84
Δ = 34° 32' 12.1" (LT)	Δs = 3° 26' 27.1"
Dc = 1° 51' 00.0"	Ls = 372.00'
L = 1,866.85'	LT = 248.05'
T = 962.79'	ST = 124.04'
R = 3,097.20'	
Ea = 1.0"	

PLAN SUMMARY DATA

DRAINAGE AREA	13.58 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	28 CFS
DESIGN HW ELEVATION	623.11 FT
Q100 DISCHARGE	45 CFS
Q100 HW ELEVATION	623.81 FT
OVERTOPPING FREQUENCY	200+ YEAR
OVERTOPPING DISCHARGE	70 CFS
OVERTOPPING ELEVATION	626.06 FT

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES PLACED IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

NOTE:

SEE SHEET NO. 15 FOR ROADWAY PLAN

0016DEL_P01

DCN

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

0016DEL_P01
DCN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	7
R/W SHEET NO.	RW-09
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH — 6-20-13	NORTH CAROLINA PROFESSIONAL SEAL 030328 ENGINEER MICHAEL M. DARBY — 6-18-13

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES PLACED IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

$$$$SYSTIME$$$$
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$$$USERNAME$$$$

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	8
R/W SHEET NO.	RW-10

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICH — 5-13-13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030324 ENGINEER MICHAEL M. DARBY — 5.10.13

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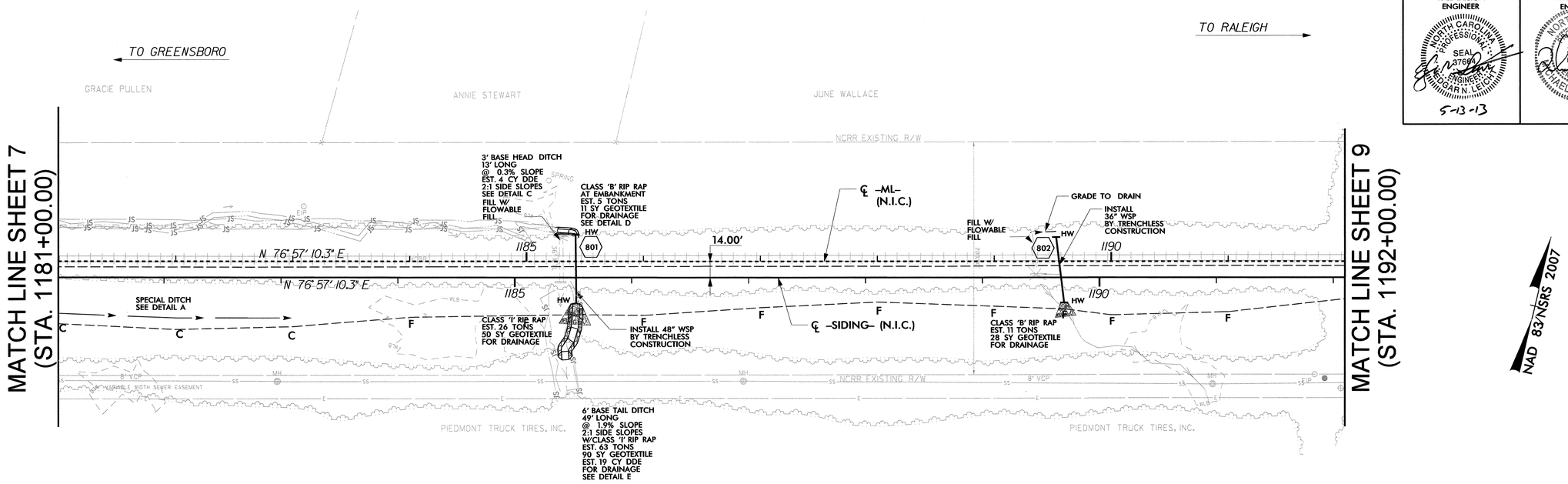

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

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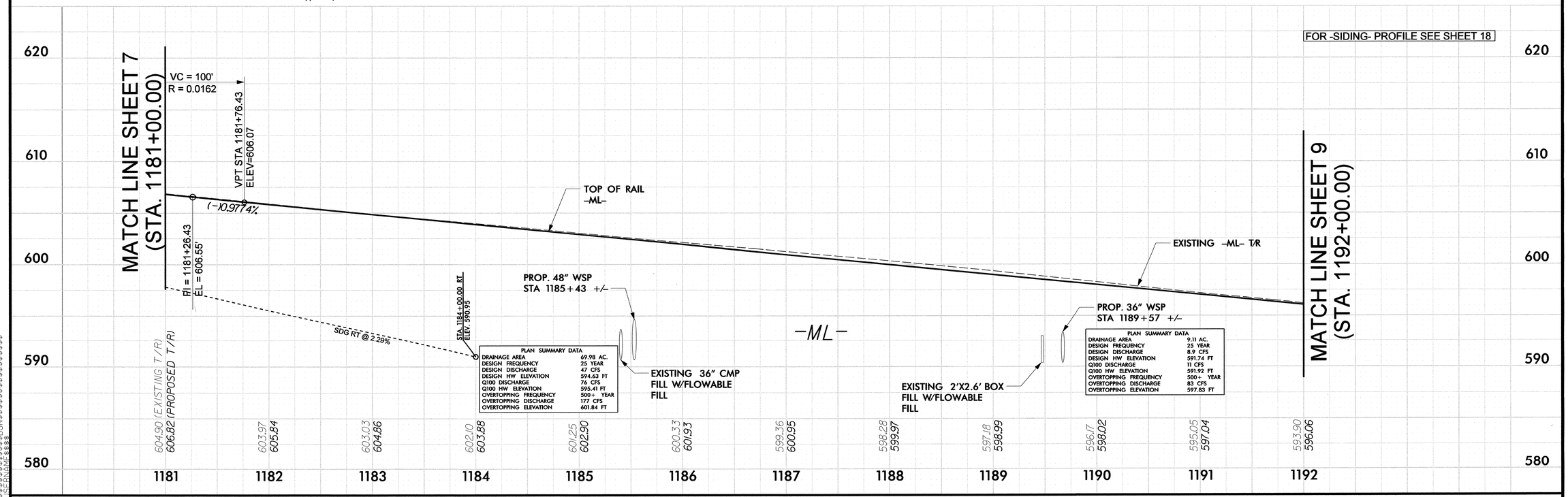

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HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	9
R/W SHEET NO.	RW-11

RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37664 EDGAR N. LEICHT 5-13-13	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036321 MICHAEL M. DARBY 5.10.13

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

PLAN SUMMARY DATA

DRAINAGE AREA	8.48 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	8.3 CFS
DESIGN HW ELEVATION	587.94 FT
Q100 DISCHARGE	10 CFS
Q100 HW ELEVATION	588.03 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	108 CFS
OVERTOPPING ELEVATION	592.83 FT

PLAN SUMMARY DATA

DRAINAGE AREA	158.04 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	260 CFS
DESIGN HW ELEVATION	569.77 FT
Q100 DISCHARGE	370 CFS
Q100 HW ELEVATION	571.56 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	1028 CFS
OVERTOPPING ELEVATION	587.56 FT

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$$$$USERNAME$$$$

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HDR Engineering, Inc. of the Carolinas
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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	10
R/W SHEET NO.	RW-12

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37680 ENGINEER EDGAR N. LEICHE — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 035705 ENGINEER MICHAEL M. DARE — 5-10-13

TO GREENSBORO

MATCH LINE SHEET 9 (STA. 1204+00.00)

-ML- +56.65
82.78' (LT)

CS Sta. 1206+07.26

-ML- (CURVE 2)
PI Sta 1204+18.93
Δ = 4° 42' 39.5" (LT)
Dc = 1° 15' 00.0"
L = 376.88'
T = 188.55'
R = 4,583.75'
Ea = 3.0"
PIs Sta 1207+41.61
Δs = 2° 31' 07.3"
Ls = 403.00'
LT = 268.69'
ST = 134.36'

CHORD

TIE TO EXISTING TRACK ORIGINALLY CONSTRUCTED AS -TEMP- TRACK
END TRACK SHIFT
ST Sta. 1210+0.26

HAWFIELDS LIMITED PARTNERSHIP #3

TIE TO EXISTING TRACK ORIGINALLY CONSTRUCTED AS -TEMP- TRACK
BEGIN TRACK SHIFT
Sta. 1211+31.34

END TRACK SHIFT
Sta. 1213+12.86

TO RALEIGH

5' BASE TAIL DITCH
37' LONG
@ 5.7% SLOPE
2:1 SIDE SLOPES
W/CLASS I RIP RAP
EST. 44 TONS
62 SY GEOTEXTILE
FOR DRAINAGE
EST. 13 CY DDE
SEE DETAIL J

JAY BURKE

NCRR EXISTING R/W

14.25' MAX
+29.00

℄ -TEMP-
(N.I.C.)

14.19' MIN
+ 07.26

1205

8.75' MIN
+5.82

CLASS 'I' RIP RAP
EST. 33 TONS
60 SY GEOTEXTILE
FOR DRAINAGE

INSTALL
54" WSP
BY TRENCHLESS
CONSTRUCTION

36" BCCMP
14.00'
1210

(100)

℄ -TEMP-
(N.I.C.)

(100)

℄ -ML-
(N.I.C.)

N 67° 12' 16.2" E

-ML- +87.45
100.00' (LT)

℄ -TEMP-
(N.I.C.)

1215

SPECIAL DITCH
SEE DETAIL A

SPECIAL DITCH
SEE DETAIL A

SPECIAL DITCH
SEE DETAIL A

FILL W/
FLOWABLE
FILL

℄ -SIDING-
(N.I.C.)

CS Sta. 1206+13.38

ST Sta. 1210+16.38

EQUATION:
STA 1210+22.72 BK
1210+10.26 AH

4' BASE HEAD DITCH
58' LONG
@ 5.7% SLOPE
2:1 SIDE SLOPES
W/CLASS I RIP RAP
EST. 64 TONS
90 SY GEOTEXTILE
FOR DRAINAGE
EST. 18 CY DDE
SEE DETAIL I

EXISTING TRACK
TO BE REMOVED BETWEEN
STA 1205+31 +/- AND
STA 1214+64 +/-
(SEE STAGING PLANS)
(N.I.C.)

-SIDING- (CURVE 4)
PI Sta 1204+30.18
Δ = 4° 38' 37.7" (LT)
Dc = 1° 16' 00.0"
L = 366.62'
T = 183.41'
R = 4,523.44'
Ea = 1.0"
PIs Sta 1207+47.74
Δs = 2° 33' 08.2"
Ls = 403.00'
LT = 268.69'
ST = 134.36'

-ML- +11.11
100.00' (RT)

3

SECCO LAND

ROBERT CARROLL

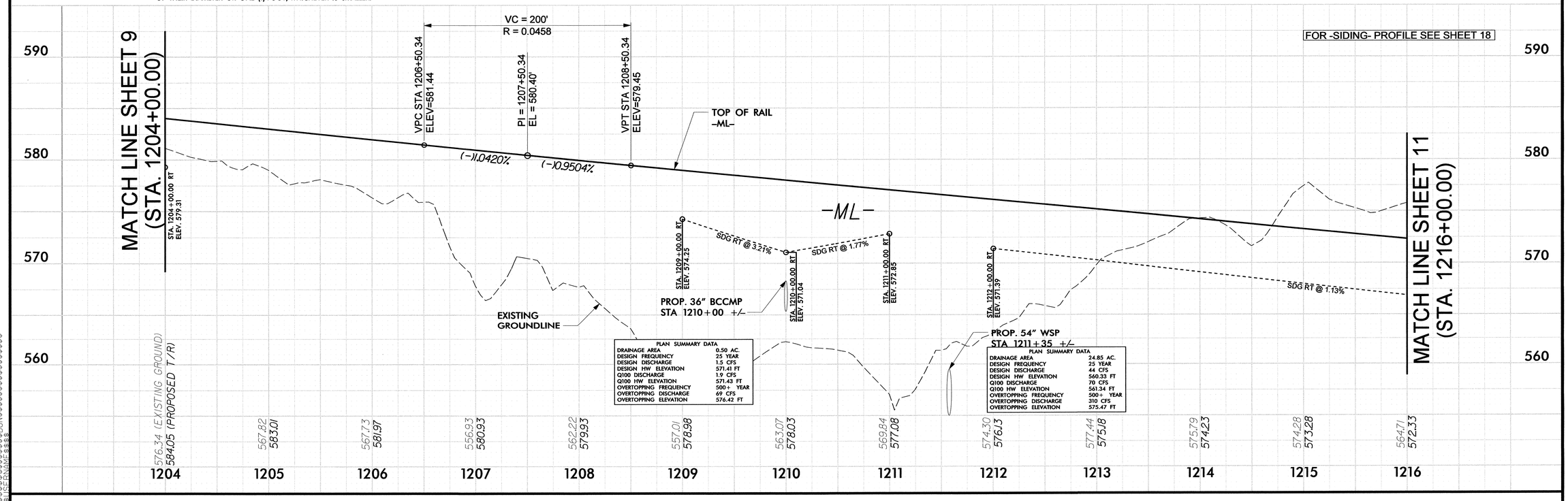
BM#5 ELEVATION = 588.22'
N 849605 E 1887506
BL STATION 85+85 117' RIGHT
RR SPIKE IN BASE OF 8" PINE

MATCH LINE SHEET 11 (STA. 1216+00.00)

NAD 83/NSRS 2007

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.



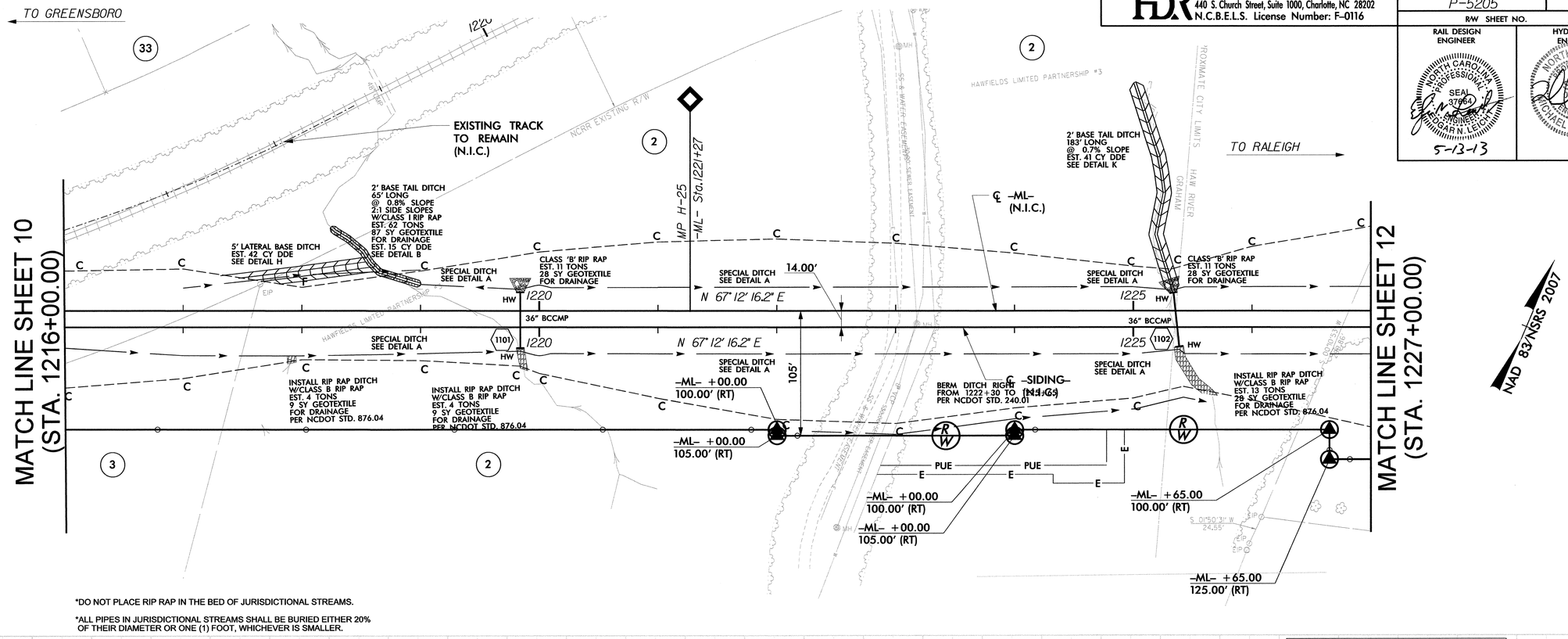
$$$$SYSTIME$$$$
$$$$USERNAME$$$$

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	11
R/W SHEET NO.	RW-13

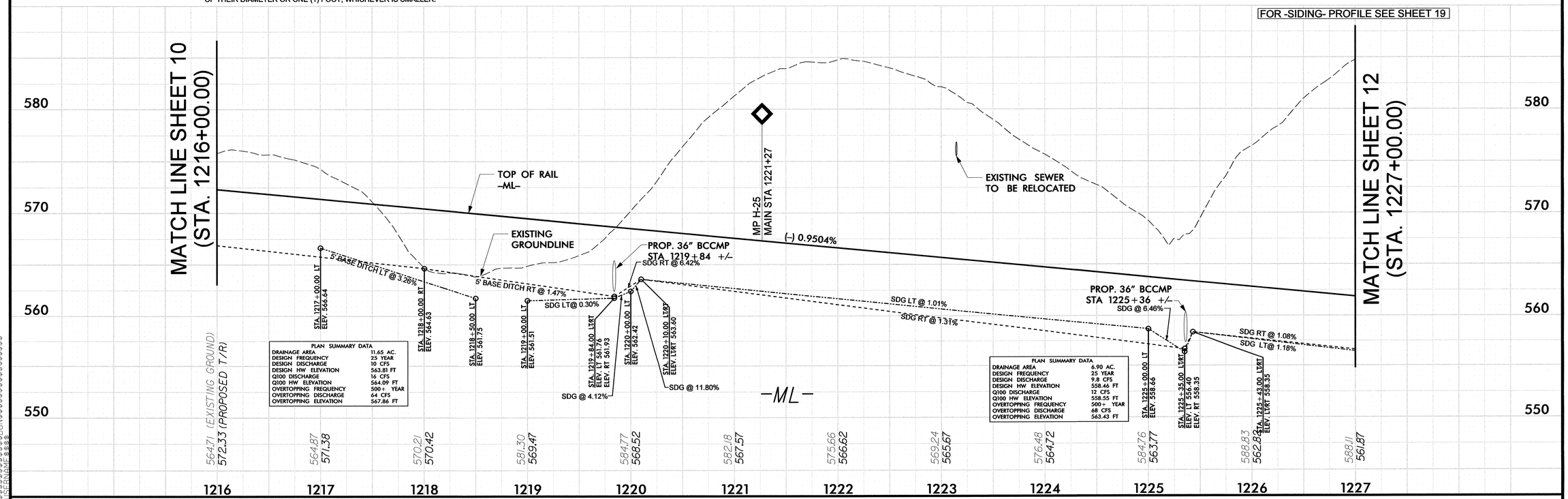
RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEIGH — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DARBY — 5.10.13



*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.



PLAN SUMMARY DATA

DRAINAGE AREA	11.65 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	10 CFS
DESIGN HW ELEVATION	563.81 FT
Q100 DISCHARGE	16 CFS
Q100 HW ELEVATION	564.09 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	64 CFS
OVERTOPPING ELEVATION	567.86 FT

PLAN SUMMARY DATA

DRAINAGE AREA	6.90 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	9.8 CFS
DESIGN HW ELEVATION	558.46 FT
Q100 DISCHARGE	12 CFS
Q100 HW ELEVATION	558.55 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	68 CFS
OVERTOPPING ELEVATION	563.43 FT

0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	12
R/W SHEET NO.	RW-14, RW-15

RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 37604 ENGINEER EDGAR N. LEICHT 5-13-13	NORTH CAROLINA PROFESSIONAL SEAL 030225 ENGINEER MICHAEL M. DARBY 5-10-13

*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

NOTE:

SEE SHEET NO. 2-L FOR WASTE AREA DETAIL SHEET.

PLAN SUMMARY DATA	
DRAINAGE AREA	17.98 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	34 CFS
DESIGN HW ELEVATION	547.56 FT
Q100 DISCHARGE	55 CFS
Q100 HW ELEVATION	548.98 FT
OVERTOPPING FREQUENCY	100+ YEAR
OVERTOPPING DISCHARGE	64 CFS
OVERTOPPING ELEVATION	549.80 FT

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

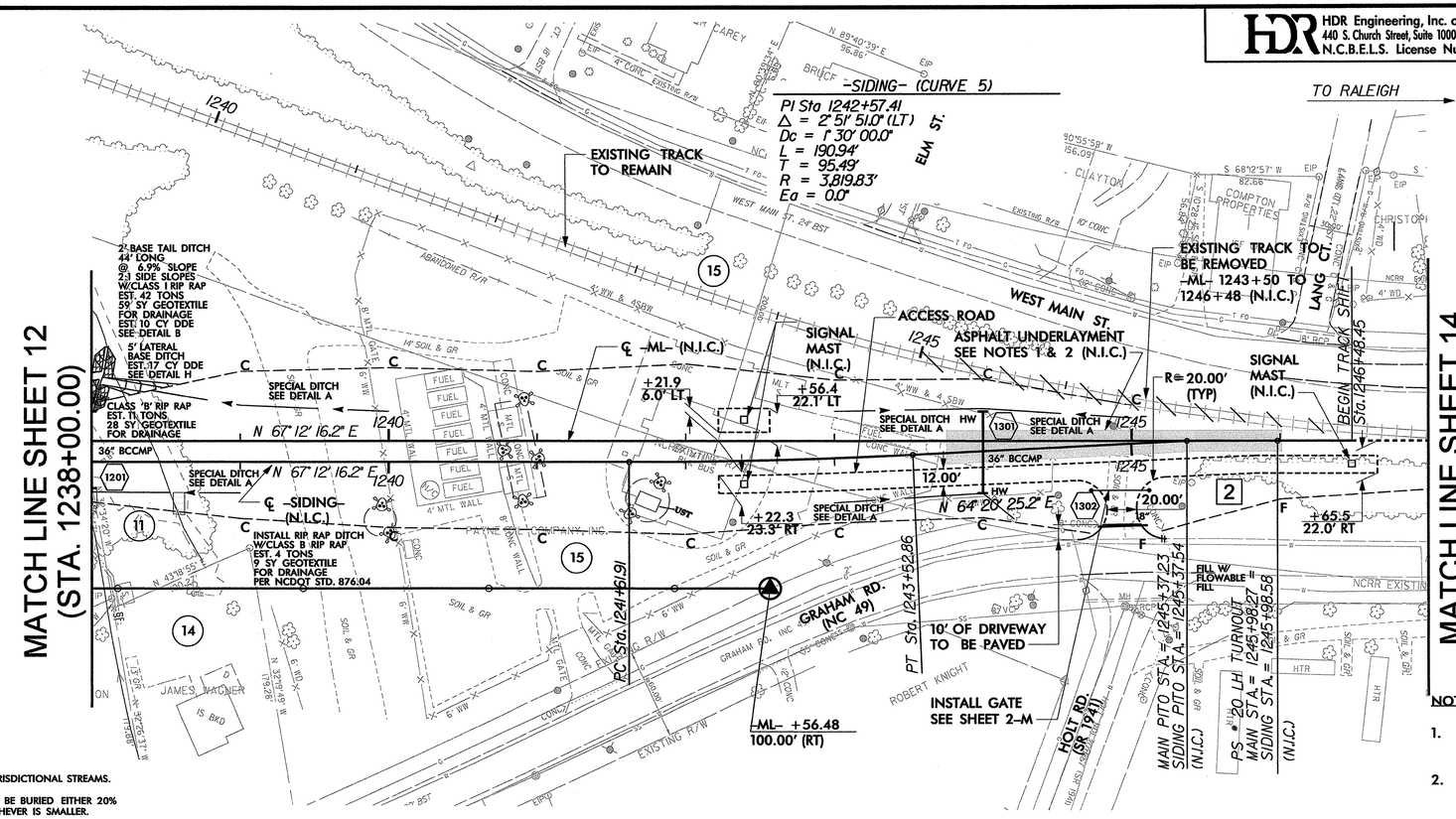
DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	13
R/W SHEET NO.	RW-15

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICHT — 6-26-13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 030462 ENGINEER MICHAEL M. DATO — 6-25-2013



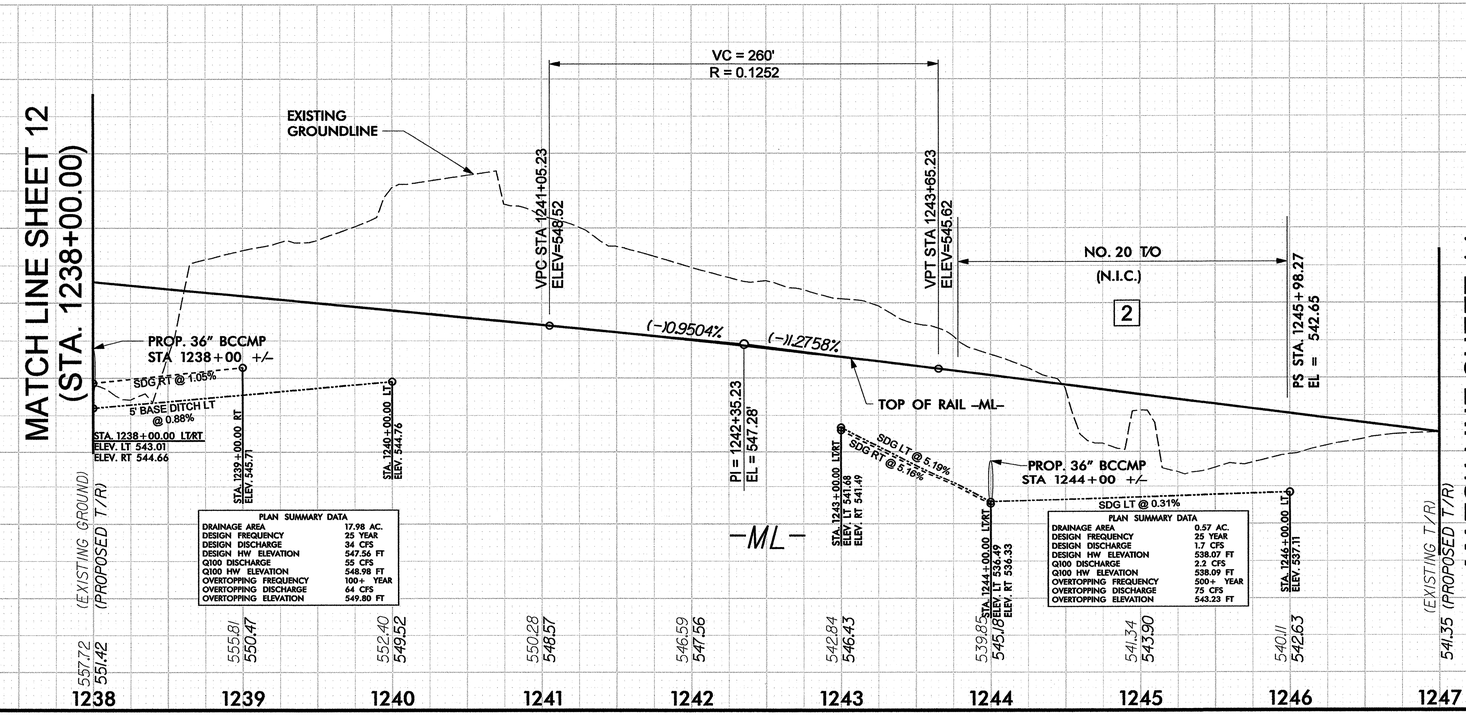
*DO NOT PLACE RIP RAP IN THE BED OF JURISDICTIONAL STREAMS.

*ALL PIPES IN JURISDICTIONAL STREAMS SHALL BE BURIED EITHER 20% OF THEIR DIAMETER OR ONE (1) FOOT, WHICHEVER IS SMALLER.

NOTES:

1. LIMITS OF ASPHALT UNDERLAYMENT: -ML- STA 1243+75.27 TO -ML- STA 1246+01.27.
2. CONTRACTOR TO CONSTRUCT 6" SUBBALLAST WITHIN LIMITS OF PROPOSED ASPHALT UNDERLAYMENT.

FOR -SIDING- PROFILE SEE SHEET 20



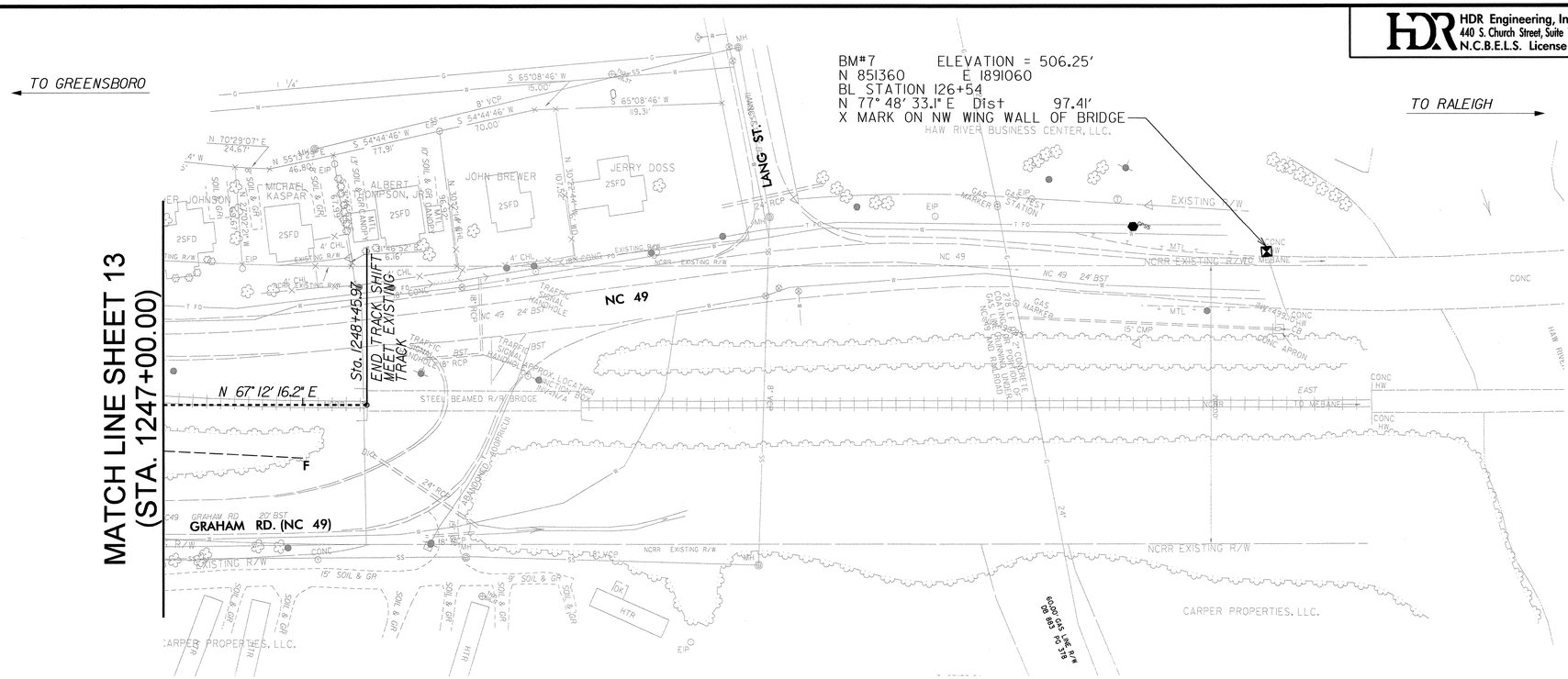
$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN

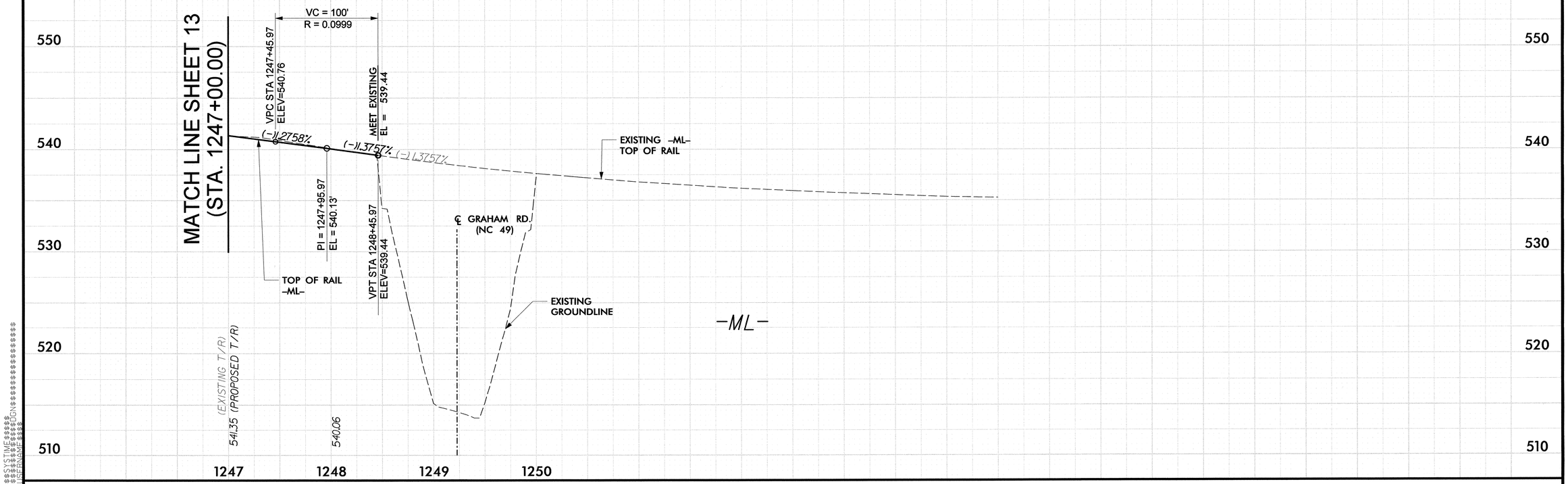
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	14
R/W SHEET NO.	RW-16

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37664 ENGINEER EDGAR N. LEICK — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 030324 ENGINEER MICHAEL M. DARBY — 5-10-13





PROJECT REFERENCE NO.	SHEET NO.
P-5205	15
RW SHEET NO.	RW-07,RW-08

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026441 DOMINIC M. WAINWRIGHT
6/20/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040328 MICHAEL M. DARBY
6-19-2013

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

NAD 83/NSRS 2007

-Y-
PI Sta 15+62.72
Δ = 27° 53' 54.3" (LT)
D = 3° 49' 11.0"
L = 730.38'
T = 372.58'
R = 1,500.00'
DS = 40 MPH
SE = 3%

PI Sta 20+03.21
Δ = 7° 3' 52.5" (LT)
D = 52° 05' 13.5"
L = 141.81'
T = 82.69'
R = 110.00'
DS = 20 MPH
SE = 2%

-BYI- 130 POT 5+00.00
-L- POT Sta. 19+24.39
-Y- POT Sta. 10+00.00
-BYI- 131 PINC 8+09.60
-L- POT 16+90.59 (38.10 LT)
-L- POC Sta.14+31.74 =
-Y- POC Sta.15+02.93
-Y- PC Sta. 11+90.14
END CONSTRUCTION -L- STA. 17+15.00
END PAVING -L- STA. 16+80.00
END CONSTRUCTION -Y- STA. 22+00.33
END PAVING -Y- STA. 21+58.00
BY2- 136 POT 5+00.0
-Y- POT 21+57.04 (19.81'
-Y- POT Sta. 22+00.33
-Y- PCC Sta. 19+20.52
-Y- PT Sta. 20+62.33
-L- PT Sta. 15+83.31
BEGIN CONSTRUCTION -Y- STA. 11+16.63
BEGIN PAVING -Y- STA. 11+90.00
-BYL- 132 PINC 10+58.49 =
-BYIA- 132 POT 23+26.09 =
-L- POC 14+42.22 (35.70' LT)
-L- POC Sta.13+65.30 = Mainline Track Sta.1156+55.77
-L- POC Sta.13+50.80 = Siding Track Sta.1156+62.20
-L- PC Sta. 11+24.52
-L- POT Sta. 10+00.00
-BL- 104 PINC 27+20.93 =
-BYI- 104 PINC 12+27.84 =
-BYIB- 104 POT 5+00.00 =
-L- POC 12+84.79 (26.55' RT)
-BL- 105 PINC 31+95.63 =
-BY2- 105 POT 7+77.73 =
-Y- POC 19+49.96 (103.89' RT)
-BYIB- 137 POT 8+15.02

-L-
PI Sta 13+53.96
Δ = 2° 37' 43.3" (RT)
D = 0° 34' 22.6"
L = 458.79'
T = 229.44'
R = 10,000.00'
DS = 40 MPH
SE = NC

BEGIN CONSTRUCTION
BEGIN PAVING
-L- STA. 11+85.00

NOTES:

1. ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE SHOWN.
2. ALL CONCRETE DRIVEWAY CURB TURNOUTS ARE 16' WIDE UNLESS OTHERWISE SHOWN.
3. SEE SHEET 5, 6, 16, & 17 FOR -ML- AND -SIDING- TRACK PLAN AND PROFILES.
4. SEE SHEET 21 FOR -L- PROFILE & -Y- PROFILE.
5. SEE SHEET 2-K FOR DITCH DETAILS.

PAVEMENT TO BE OBLITERATED.

REVISIONS

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0016DEL_P01

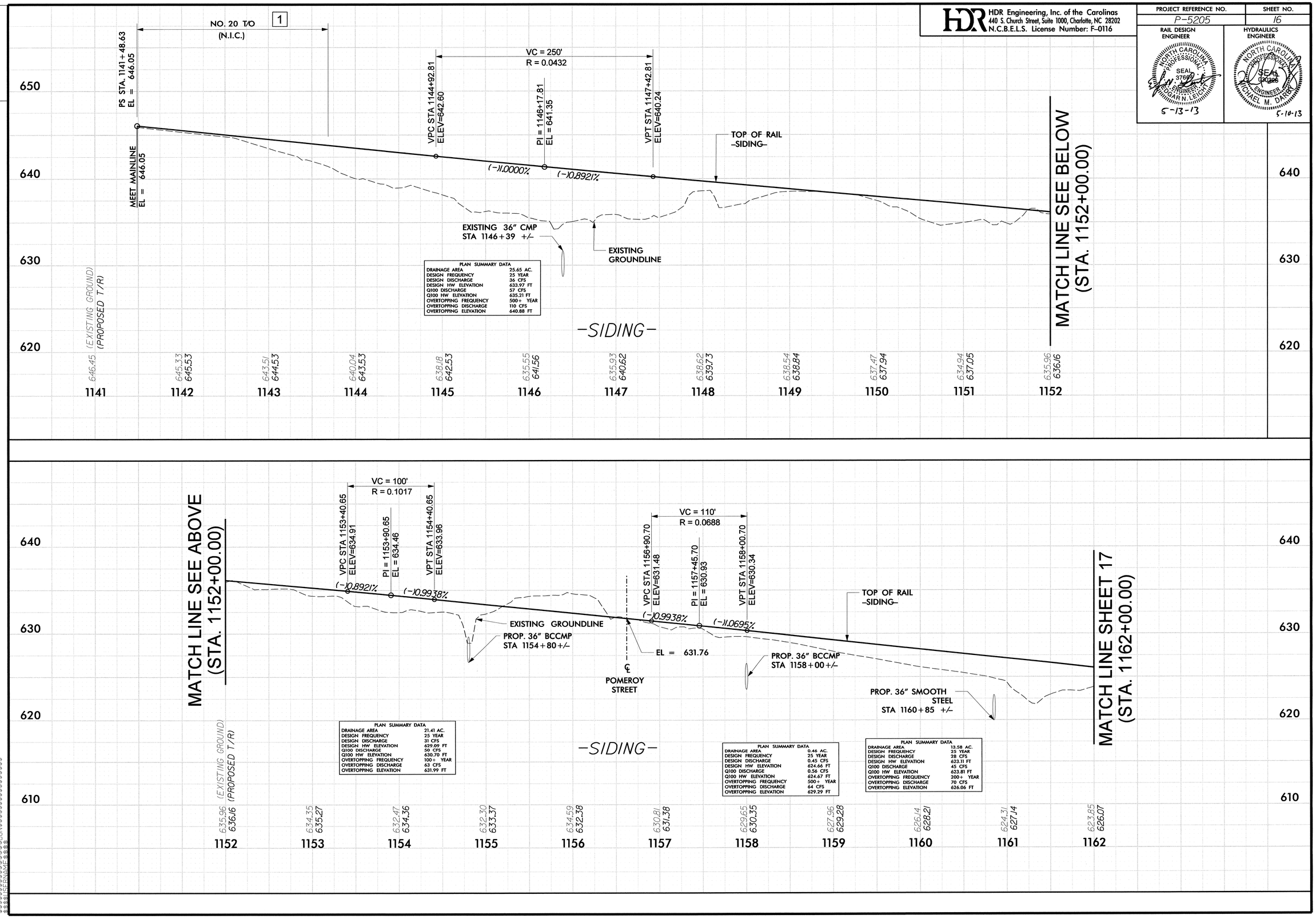
DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	16

RAIL DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 37680 ENGINEER EDGAR N. LECK
5-13-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DARR
5-10-13



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$$$$USERNAME$$$$

DGN
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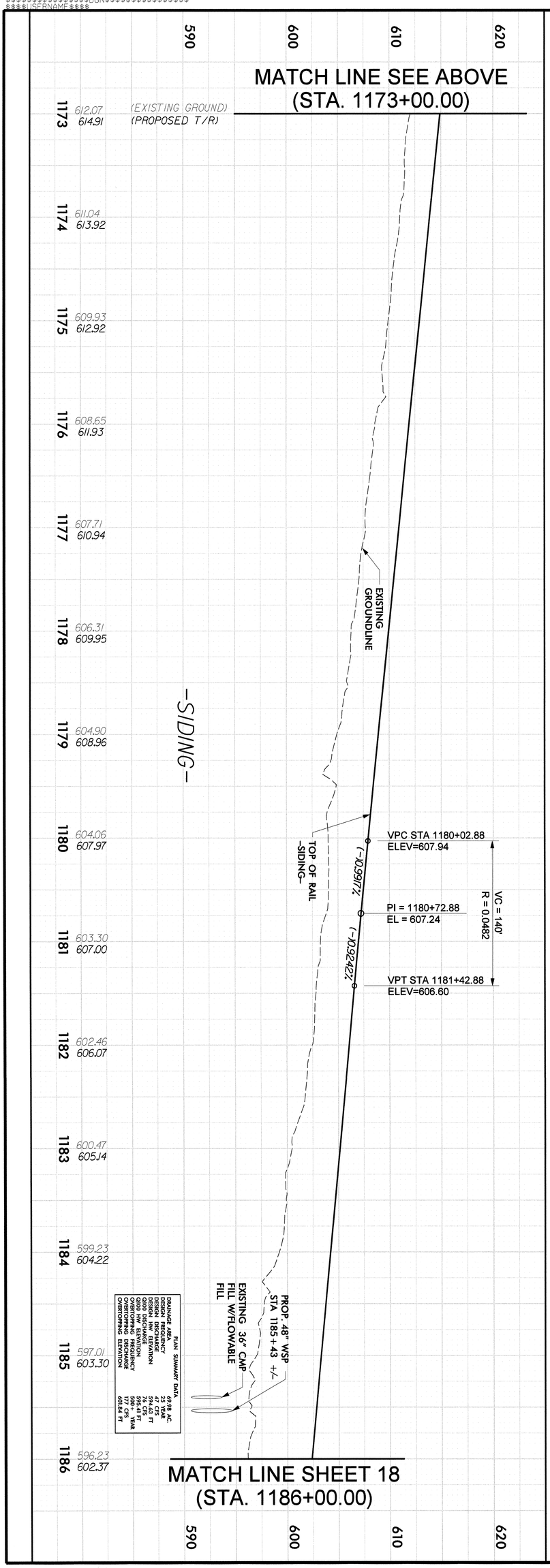


HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

RAIL DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037841 JAMES M. CAMPBELL
5-23-13

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026281 MICHAEL N. DARBY
5.10.13

PROJECT REFERENCE NO. P-5205
SHEET NO. 17

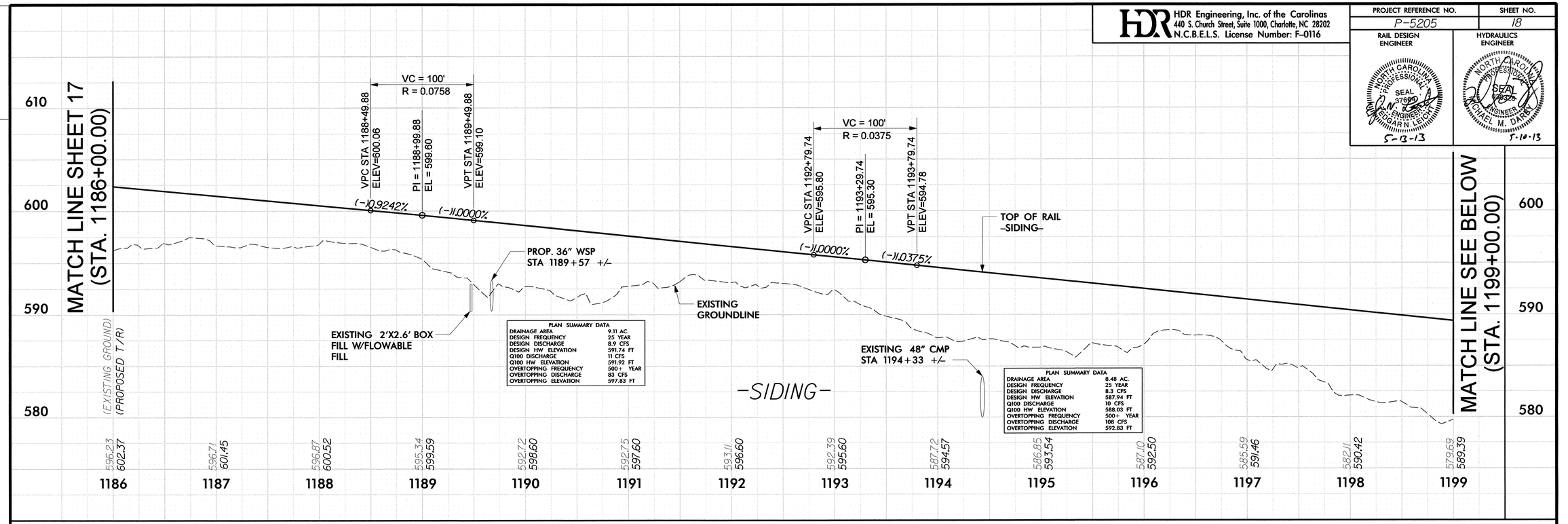
DGN 0016DEL_P01

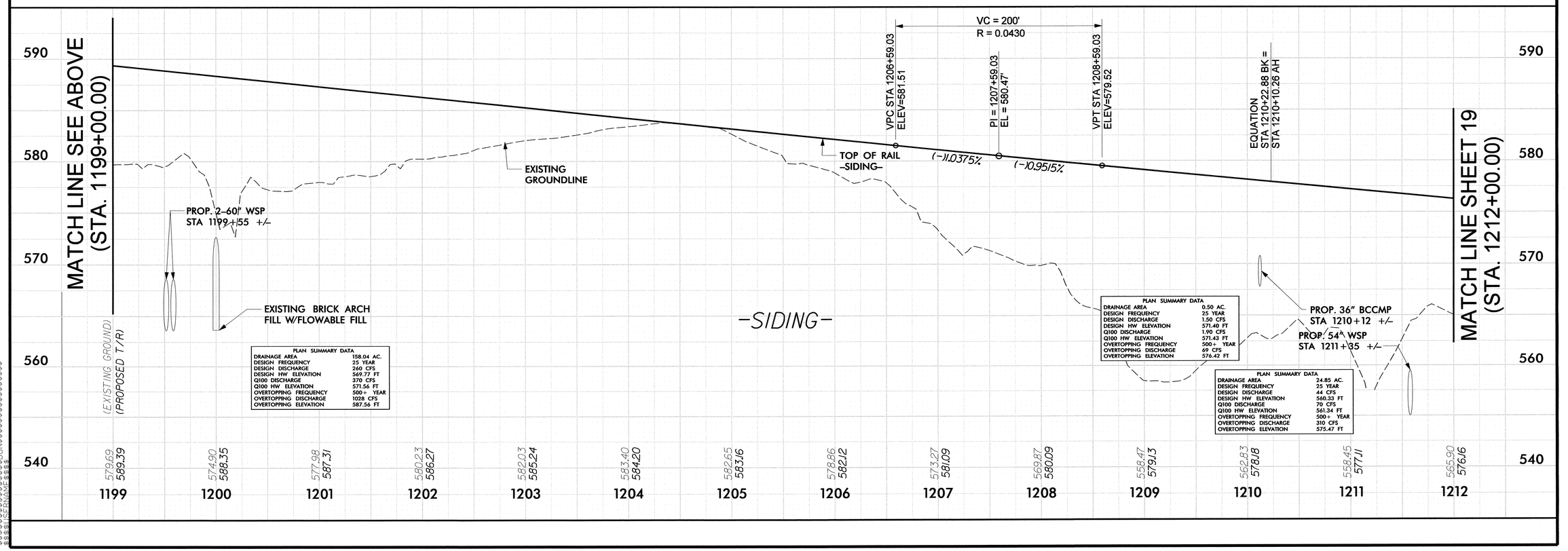
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	18

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 37690 ENGINEER EDGAR N. LEICHT — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19325 ENGINEER MICHAEL M. DARBY — 5-10-13





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

DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

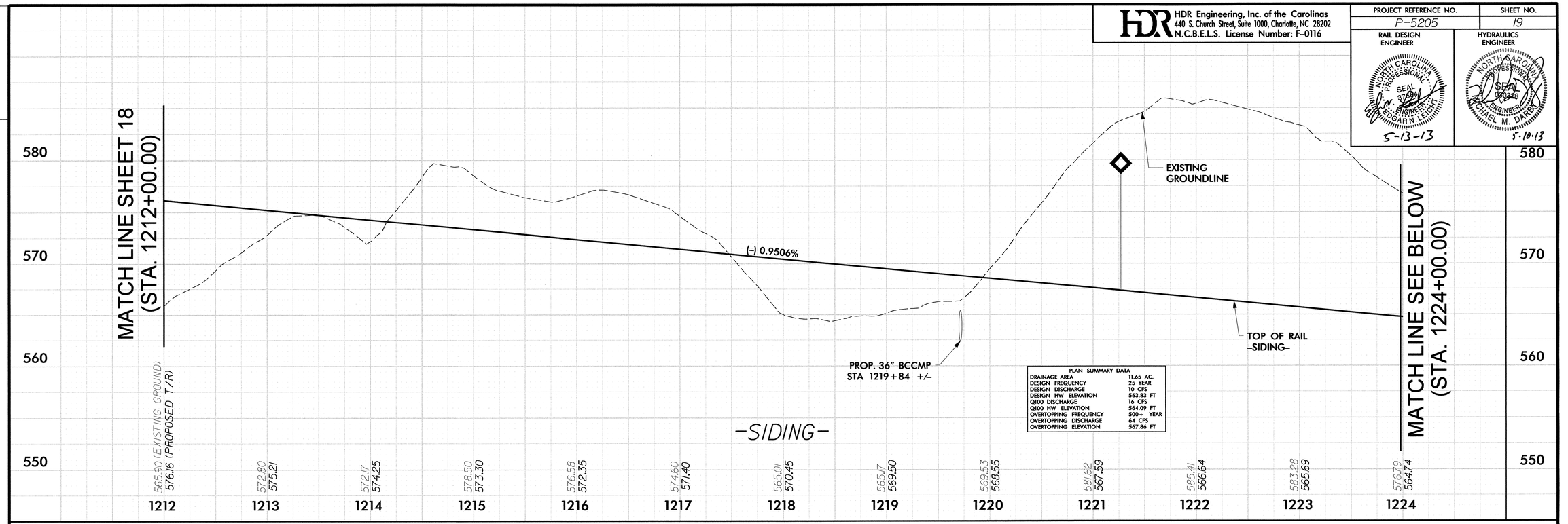
PROJECT REFERENCE NO.	SHEET NO.
P-5205	19

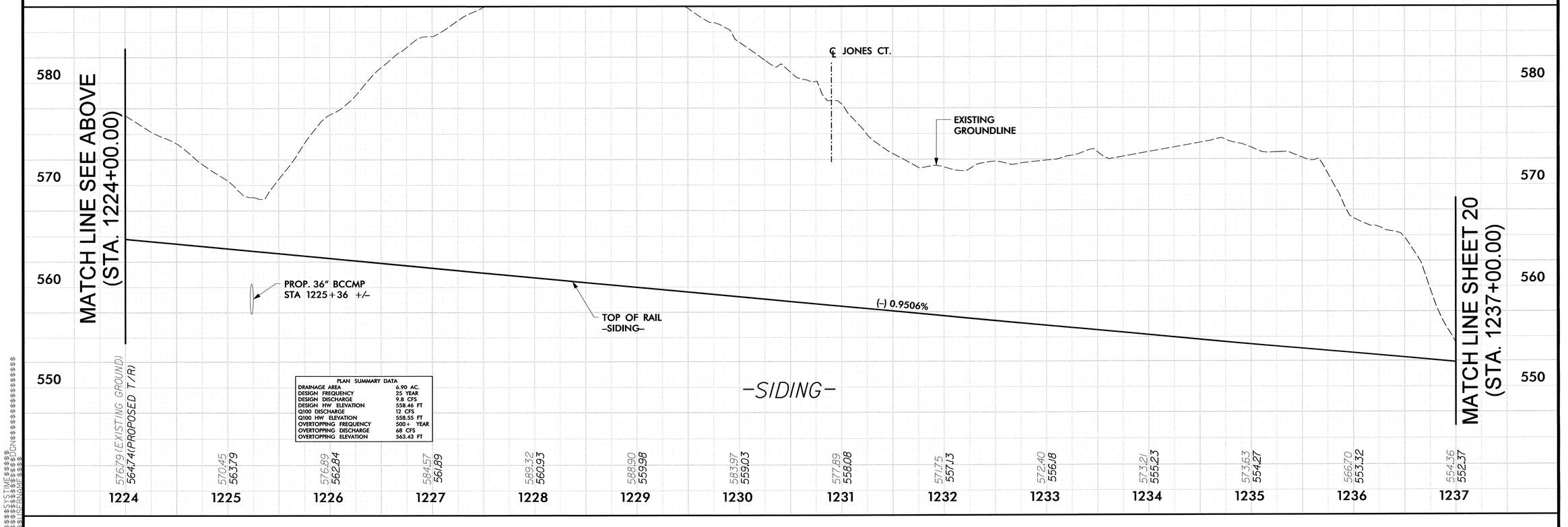
RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 37691 ENGINEER EDGAR N. LEACH
5-13-13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030348 ENGINEER MICHAEL M. DARBY
5-10-13





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

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	20

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 37662 EDGAR N. LEICHT — 5-13-13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030328 MICHAEL M. DARBY — 5-10-13

0016DEL_P01
DGN

PLAN SUMMARY DATA	
DRAINAGE AREA	17.98 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	34 CFS
DESIGN HW ELEVATION	547.56 FT
Q100 DISCHARGE	55 CFS
Q100 HW ELEVATION	548.98 FT
OVERTOPPING FREQUENCY	100+ YEAR
OVERTOPPING DISCHARGE	64 CFS
OVERTOPPING ELEVATION	549.80 FT

PLAN SUMMARY DATA	
DRAINAGE AREA	0.57 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	1.7 CFS
DESIGN HW ELEVATION	538.07 FT
Q100 DISCHARGE	2.2 CFS
Q100 HW ELEVATION	538.09 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	75 CFS
OVERTOPPING ELEVATION	543.23 FT

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

PROJECT REFERENCE NO.	SHEET NO.
P-5205	21

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 33290 ENGINEER RONTELL A. THIGPEN 04/18/13

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030326 ENGINEER MICHAEL M. DARBY 4-16-13

-L-

BM#2 ELEVATION = 617.30'
N 847,900 E 1,881,740
-BY1- STA. 15+99 4' RIGHT
RR SPIKE IN BASE OF POWER POLE
(DUKE POWER # 188165)

BEGIN GRADE
-L- STA 11+85.00
EL. 628.38'

PI = 12+95.00
EL = 632.52'
VC = 100'
K = 20
V = 30 MPH

(+)3.7630%

(-)11.2477%

SDG @ 1.08%

STA 12+50.00 RT
ELEV. 628.03

STA 13+25.00 RT
ELEV. 627.22

SIDING TRACK
(-)11.7412%

PI = 13+46.55
EL = 631.88'

PI = 13+55.05
EL = 631.73'

PI = 13+61.05
EL = 631.57'

PI = 13+69.56
EL = 630.97'

PI = 14+10.00
EL = 630.12'
VC = 80'
K = 11
V = 15 MPH

MAIN TRACK
(-)17.0388%

(-)12.6167%

(-)12.1070%

EXISTING GROUND

(+)4.8179%

PROPOSED GRADE

PI = 16+20.00
EL = 640.36'
K = 46
VC = 80'
V = 40 MPH

(+)14.8779%

(+)13.1417%

END GRADE
-L- STA 16+80.00
EL. 642.28'

(+)13.4986%

PI = 16+70.00
EL = 641.93'
VC = 20'
K = 56
V = 35 MPH

SEE SHEET NO. 15 FOR -L- PLAN

-Y-

BEGIN GRADE
-Y- STA 11+90.00
EL. 635.58'

(-)11.4383%

(-)12.1788%

SDG @ 3.52%

PI = 12+60.00
EL = 634.57'
VC = 120'
K = 162
V = 60 MPH

STA 11+50.00 RT
ELEV. 635.00

STA 12+50.00 RT
ELEV. 628.46

END GRADE
-Y- STA 14+86.90 =
-L- STA 14+32.66 (16' LT)
EL. 631.04'

PI = 14+30.00
EL = 630.87'
VC = 100'
K = 40
V = 30 MPH

(-)12.1788%

(+)10.3000%

SDG @ 0.50%

STA 13+50.00 RT
ELEV. 627.96

BEGIN GRADE
-Y- STA 15+18.94 =
-L- STA 14+30.98 (16' RT)
EL. 630.98'

PI = 15+85.00
EL = 629.79'
VC = 120'
K = 41
V = 30 MPH

SDG @ 1.80%

PROPOSED GRADE

(+)11.1329%

SDG @ 0.50%

SDG @ 0.28%

STA 14+50.00 LT
ELEV. 628.69

STA 15+50.00 RT
ELEV. 627.56

STA 15+00.00 LT
ELEV. 627.79

(-)11.8000%

POMEROY ST.
(-)12.1549%

POMEROY ST.
(+)11.8091%

PI = 17+25.00
EL = 631.38'
VC = 160'
K = 44
V = 35 MPH

STA 17+00.00 LT
ELEV. 627.04

STA 18+00.00 RT
ELEV. 626.87

EXISTING GROUND

(-)12.5158%

SDG @ 2.54%

SDG @ 2.39%

SDG @ 2.06%

24" RCP

SDG @ 0.49%

SDG @ 3.97%

STA 18+50.00 RT
ELEV. 624.52

STA 19+11.00 RT
ELEV. 621.00

STA 19+43.15 LT
ELEV. 623.15

PI = 20+00.00
EL = 624.46'
VC = 316'
K = 64
V = 40 MPH

(+)12.4179%

STA 20+00.00 LT
ELEV. 623.67

STA 20+00.00 RT
ELEV. 624.41

END GRADE
-Y- STA 21+58.00
EL. 628.28'

PLAN SUMMARY DATA

DRAINAGE AREA	8.13 AC.
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE	11 CFS.
DESIGN HW ELEVATION	625.20 FT
Q100 DISCHARGE	15 CFS
Q100 HW ELEVATION	625.44 FT
OVERTOPPING FREQUENCY	500+ YEAR
OVERTOPPING DISCHARGE	24 CFS
OVERTOPPING ELEVATION	626.41 FT

SEE SHEET NO. 15 FOR -Y- PLAN

REVISIONS

0016DEL_R01

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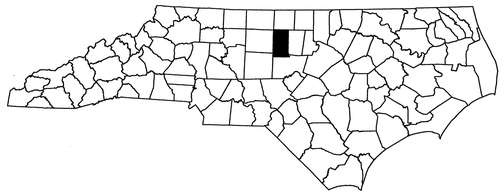
0016DEL_P01

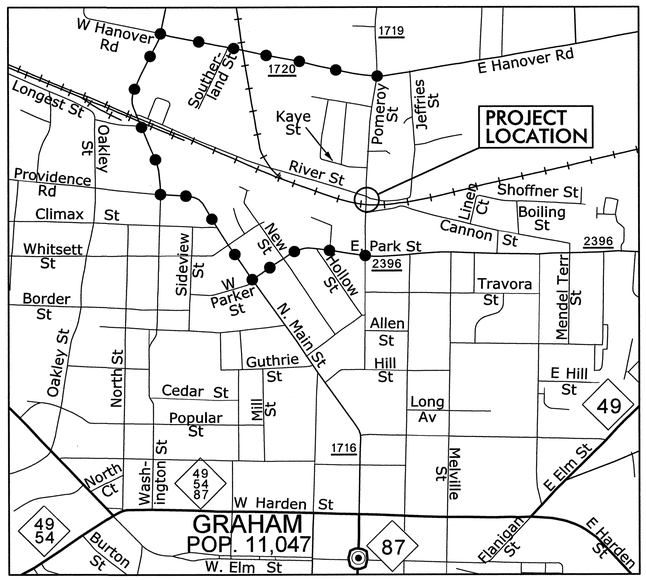
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ALAMANCE COUNTY



LOCATION: SR 1179 (POMEROY ST.) FROM SOUTH OF CANNON ST. TO SOUTH OF KAYE ST.



DETOUR ROUTE

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS & LEGEND
TMP-1B	GENERAL NOTES
TMP-1C	PHASING
TMP-2	SPECIAL SIGN DESIGNS
TMP-3	OFF-SITE DETOUR SIGNING (CLOSURE OF RIVER ST. EAST OF POMEROY ST.)
TMP-4	RIVER ST CONSTRUCTION (EAST OF POMEROY ST.)
TMP-5	OFF-SITE DETOUR SIGNING (CLOSURE OF POMEROY ST.)
TMP-6	POMEROY ST. CONSTRUCTION

SHEET NO.
TMP-1

P-5205

PROJECT:

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING AND SAFETY BRANCH
CLIFTON E. YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

PLAN PREPARED BY: HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

D. WAINWRIGHT, P.E.	*PROJECT MANAGER*
MICHELLE WARD, P.E.	*TRAFFIC CONTROL PROJECT ENGINEER*
MICHELLE WARD, P.E.	*TRAFFIC CONTROL PROJECT DESIGN ENGINEER*
CHRIS HARNDEN	*TRAFFIC CONTROL DESIGN ENGINEER*

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

APPROVED: _____
DATE: _____

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
4/16/13

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt
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PENTABLE: NCDOT_tap_Conven.tbl
DATE: 4/12/2013
TIME: 3:06:49 PM

0016DEL_P01

PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-1A

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1180.01	SKINNY-DRUM

LEGEND

GENERAL

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

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

EXISTING PROPOSED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033789 MICHELLE WARD
4/16/13

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

ROADWAY STANDARD DRAWINGS & LEGEND

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PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-1B

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

GENERAL NOTES

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

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

TIME RESTRICTIONS

A) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIRMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

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

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.R TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

PAVEMENT EDGE DROP OFF REQUIREMENTS

G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THEN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

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

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

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

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

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

TRAFFIC CONTROL DEVICES

N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

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

PAVEMENT MARKINGS AND MARKERS

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

SEAL
NORTH CAROLINA PROFESSIONAL 033789 ENGINEER MICHELLE WARD
4/16/13

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

GENERAL NOTES

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PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-1C

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
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PHASING

NOTES:
INSTALL WORK ZONE ADVANCE WARNING SIGNS USING RSD 1101.01, SHEET 3 OF 3.

MAINTAIN VEHICULAR ACCESS TO ALL RESIDENCES AND BUSINESSES DURING THE LIFE OF THE CONTRACT UNLESS OTHERWISE NOTED IN THE PHASING OR DIRECTED BY THE ENGINEER.

PHASING BELOW IS FOR THE CONSTRUCTION OF POMEROY STREET, RIVER STREET, AND JEFFRIES STREET. RSD 1101.04 (SHOULDER CLOSURES) AND RSD 1101.02, SHEET 1 OF 15 (FLAGGERS) SHALL BE USED FOR ALL OTHER WORK (SUCH AS CONSTRUCTION OF GRAVEL ACCESS ROADS), AS NECESSARY.
(SEE GENERAL NOTES - LANE CLOSURE REQUIREMENTS, ON SHEET TMP-1B)

STEP 1:
INSTALL OFF-SITE DETOUR SIGNS AS SHOWN ON SHEET TMP-3, THEN USING RSD 1101.03, SHEETS 1 AND 2 OF 9, CLOSE RIVER STREET (EAST OF POMEROY STREET).

STEP 2:
WHILE TRAFFIC IS ON THE OFF-SITE DETOUR, CONSTRUCT JEFFRIES STREET AND RIVER STREET (EAST OF POMEROY STREET). ACCESS TO ALL RESIDENCES AND/OR BUSINESSES SHALL BE MAINTAINED ALONG EITHER EXISTING OR PROPOSED RIVER STREET AND JEFFRIES STREET, USING INCIDENTAL STONE, AS NECESSARY.
(SEE SHEET TMP-4)

(NOTE: REALIGNMENT OF JEFFRIES STREET/RIVER STREET (EAST OF POMEROY STREET) NEEDS TO BE COMPLETE BEFORE CONSTRUCTION OF NEW RAIL MAINLINE CAN BEGIN IN THE AREA OF EXISTING RIVER STREET (EAST OF POMEROY STREET). COORDINATE WITH THE RAIL CONTRACTOR TO ENSURE THAT THIS REALIGNMENT IS COMPLETE BEFORE RAIL WORK WILL BEGIN IN THIS AREA.)

STEP 3:
INSTALL AND COVER OFF-SITE DETOUR SIGNS AS SHOWN ON SHEET TMP-5 FOR CLOSURE OF POMEROY STREET AND RIVER STREET (WEST OF POMEROY STREET). OFF-SITE DETOUR SIGNS SHOWN ON SHEET TMP-3 THAT ARE TO BE REMOVED OR RELOCATED SHALL REMAIN IN PLACE UNTIL STEP 4.

COMPLETE THE WORK REQUIRED IN STEPS 4 THRU 6 IN SIXTY (60) CONSECUTIVE DAYS. (SEE INTERMEDIATE CONTRACT TIME AND LIQUIDATED DAMAGES.)

STEP 4:
USING RSD 1101.03, SHEET 1 OF 9, UNCOVER OFF-SITE DETOUR SIGNS PLACED IN STEP 3, ADJUST ADDITIONAL SIGNS FROM TMP-3 AS SHOWN ON TMP-5, AND CLOSE RIVER STREET ON WEST SIDE OF POMEROY STREET, AND POMEROY STREET AT EACH END OF PROPOSED CONSTRUCTION.

(NOTE: RIVER STREET (EAST OF POMEROY STREET) THAT WAS CLOSED IN STEP 1 WILL REMAIN CLOSED DURING CLOSURE OF RIVER STREET (WEST OF POMEROY STREET) AND POMEROY STREET.)

STEP 5:
WHILE TRAFFIC IS ON THE OFF-SITE DETOUR, AND USING RSD 1101.02, SHEET 1 OF 15 AS NECESSARY AT THE CANNON STREET INTERSECTION, CONSTRUCT POMEROY STREET AND RIVER STREET. ACCESS TO ALL RESIDENCES AND/OR BUSINESSES SHALL BE MAINTAINED, USING INCIDENTAL STONE, AS NECESSARY. (SEE SHEET TMP-6)

(NOTE: CONSTRUCTION IN STEP 5 WILL OCCUR SIMULTANEOUSLY WITH CONSTRUCTION OF THE RAIL MAINLINE IN THIS AREA. COORDINATE WITH RAIL CONTRACTOR TO COMPLETE THE WORK IN STEP 5. MAINLINE RAIL WORK WILL NEED TO BE COMPLETED, TRAIN TRAFFIC SWITCHED TO NEW MAINLINE, AND EXISTING RAIL CROSSING REMOVED, BEFORE COMPLETING ALL WORK ALONG POMEROY STREET.)

STEP 6:
WHILE TRAFFIC IS ON THE OFF-SITE DETOUR, AND USING RSD 1101.02, SHEET 1 OF 15 AS NECESSARY AT THE CANNON STREET INTERSECTION, PLACE FINAL MARKINGS AND MARKERS ON ALL ROADS, AS SHOWN ON THE FINAL PAVEMENT MARKING PLANS, THEN OPEN ALL ROADS TO TRAFFIC, MOVE CLOSURE BARRICADES AND COVER OFFSITE DETOUR SIGNING.

(NOTE: DETOUR SIGNS WILL REMAIN IN PLACE AND COVERED AT THE END OF THE 60 DAY ICT. IF ALL TRACK WORK IS NOT COMPLETED DURING THE 60 DAY ICT, AND IF ADDITIONAL CLOSURES OF POMEROY STREET ARE NECESSARY TO COMPLETE ADDITIONAL TRACK WORK, UNCOVER NECESSARY DETOUR SIGNS AND PLACE BARRICADES TO CLOSE POMEROY STREET. DURATION AND APPROVAL OF ADDITIONAL CLOSURES FOR NORFOLK SOUTHERN AND/OR THEIR CONTRACTOR WILL BE DETERMINED BY THE ENGINEER.)

STEP 7:
ONCE ALL ROADWAY AND RAIL WORK AT POMEROY STREET IS COMPLETE, REMOVE ALL OFF-SITE DETOUR SIGNS AND OTHER TRAFFIC CONTROL SIGNING AND DEVICES.

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER 033789 MICHELLE WARD
4/16/13

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

PHASING

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PROJ. REFERENCE NO. P-5205 | SHEET NO. TMP-2
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

0016DEL_P01

SIGN NUMBER:
TYPE: D
QUANTITY: 1

BACKG COLOR: Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

SIGN WIDTH: 4'-0"
HEIGHT: 1'-0"
TOTAL AREA: 4.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.38"
WIDTH: 0.38"
RADII: 1.5"

NO. Z BARS:
LENGTH:

MAT'L: 0.125" (3.2 mm) ALUMINUM

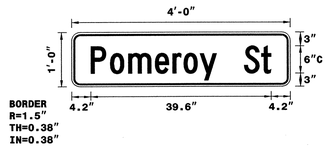
DESIGN BY: D KERNS
PROJECT ID: ID

CHECKED BY:
DIV: DIV

DATE: Jan 03, 2013

USE NOTES:

1. Legend and border shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

Series/Size C 2000 Text Length 39.6

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	4.2	4.3	4	5.9	3.8	2.5	3.5	3.7	6	3.8	2.2	4.2															

FILENAME: TCPSignDesigns

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER:
TYPE: D
QUANTITY: 1

BACKG COLOR: Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

SIGN WIDTH: 3'-0"
HEIGHT: 1'-0"
TOTAL AREA: 3.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0.38"
WIDTH: 0.38"
RADII: 1.5"

NO. Z BARS:
LENGTH:

MAT'L: 0.125" (3.2 mm) ALUMINUM

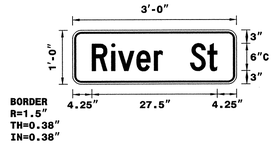
DESIGN BY: D KERNS
PROJECT ID: ID

CHECKED BY:
DIV: DIV

DATE: Jan 03, 2013

USE NOTES:

1. Legend and border shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

Series/Size C 2000 Text Length 27.5

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FILENAME: TCPSignDesigns

NORTH CAROLINA D.O.T. SIGN DETAIL

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033789 MICHELLE WARD
4/16/13

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

SPECIAL SIGN DESIGNS

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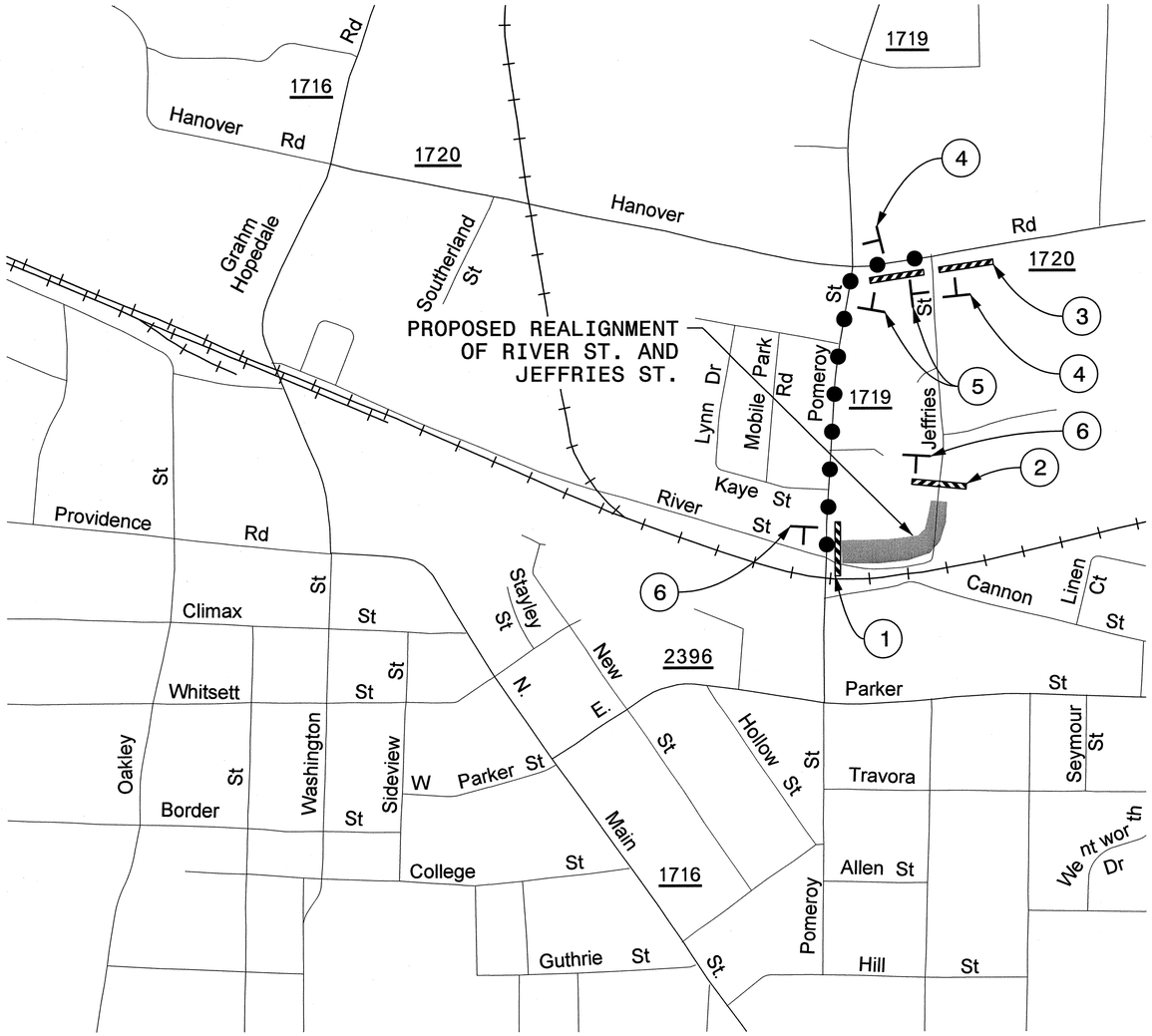

DETOUR ROUTE

REFER TO RSD 1101.03, SHEETS 1 & 2 OF 9, FOR ADDITIONAL SIGN AND BARRICADE PLACEMENT.

SEE SPECIAL SIGN DESIGN ON SHEET TMP-2.

RIVER ST. (EAST OF POMEROY ST.) SHALL REMAIN CLOSED DURING CLOSURE OF POMEROY ST.

OFF-SITE DETOUR SIGNS AND BARRICADES FOR CLOSURE OF RIVER ST. AS SHOWN ON THIS SHEET, SHALL BE REMOVED OR RELOCATED AS SHOWN ON SHEET TMP-5 DURING THE CLOSURE OF POMEROY ST.

(1) R11-2 48" x 30" ROAD CLOSED DETOUR M4-10L 48" x 18"
TYPE III BARRICADE TYPE III BARRICADE

(2) R11-2 48" x 30" ROAD CLOSED
TYPE III BARRICADE(S)

(3) R11-4 60" x 30" ROAD CLOSED TO THRU TRAFFIC DETOUR M4-10R 48" x 18"
TYPE III BARRICADE

(4) River St SSD 36" X 12" / DETOUR M4-8 24" X 12" / M6-1 L 21" X 15"

(5) River St SSD 36" X 12" / DETOUR M4-8 24" X 12" / M6-1 21" X 15"

(6) River St SSD 36" X 12" / END DETOUR M4-8 A 24" X 18"

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
4/16/13

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

OFF-SITE DETOUR SIGNING (CLOSURE OF RIVER ST. EAST OF POMEROY ST.)

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PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-4

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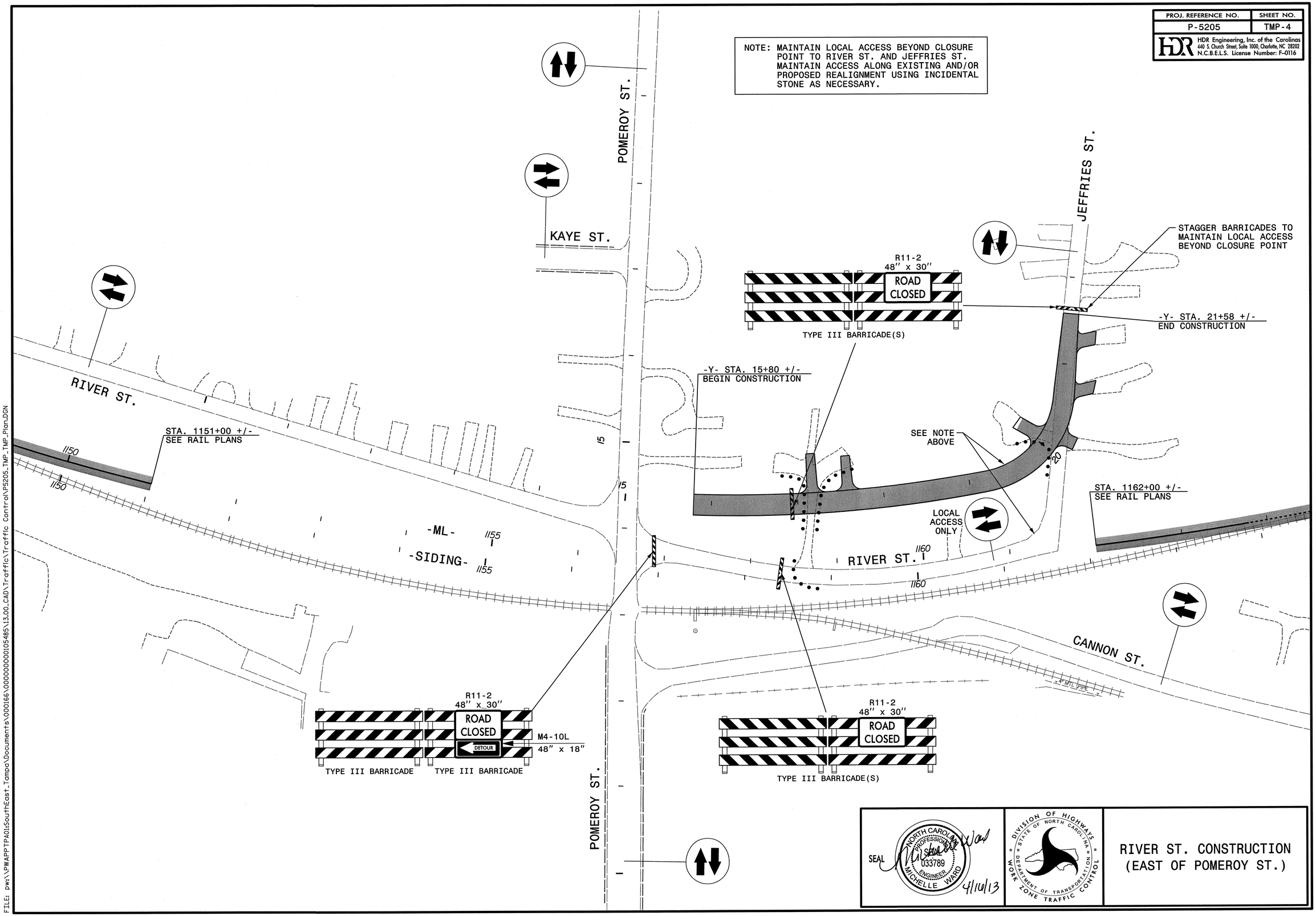
N.C.B.E.L.S. License Number: F-0116

NOTE: MAINTAIN LOCAL ACCESS BEYOND CLOSURE POINT TO RIVER ST. AND JEFFRIES ST. MAINTAIN ACCESS ALONG EXISTING AND/OR PROPOSED REALIGNMENT USING INCIDENTAL STONE AS NECESSARY.



SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

4/16/13

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

RIVER ST. CONSTRUCTION
(EAST OF POMEROY ST.)

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PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-5

HDR Engineering, Inc. of the Carolinas
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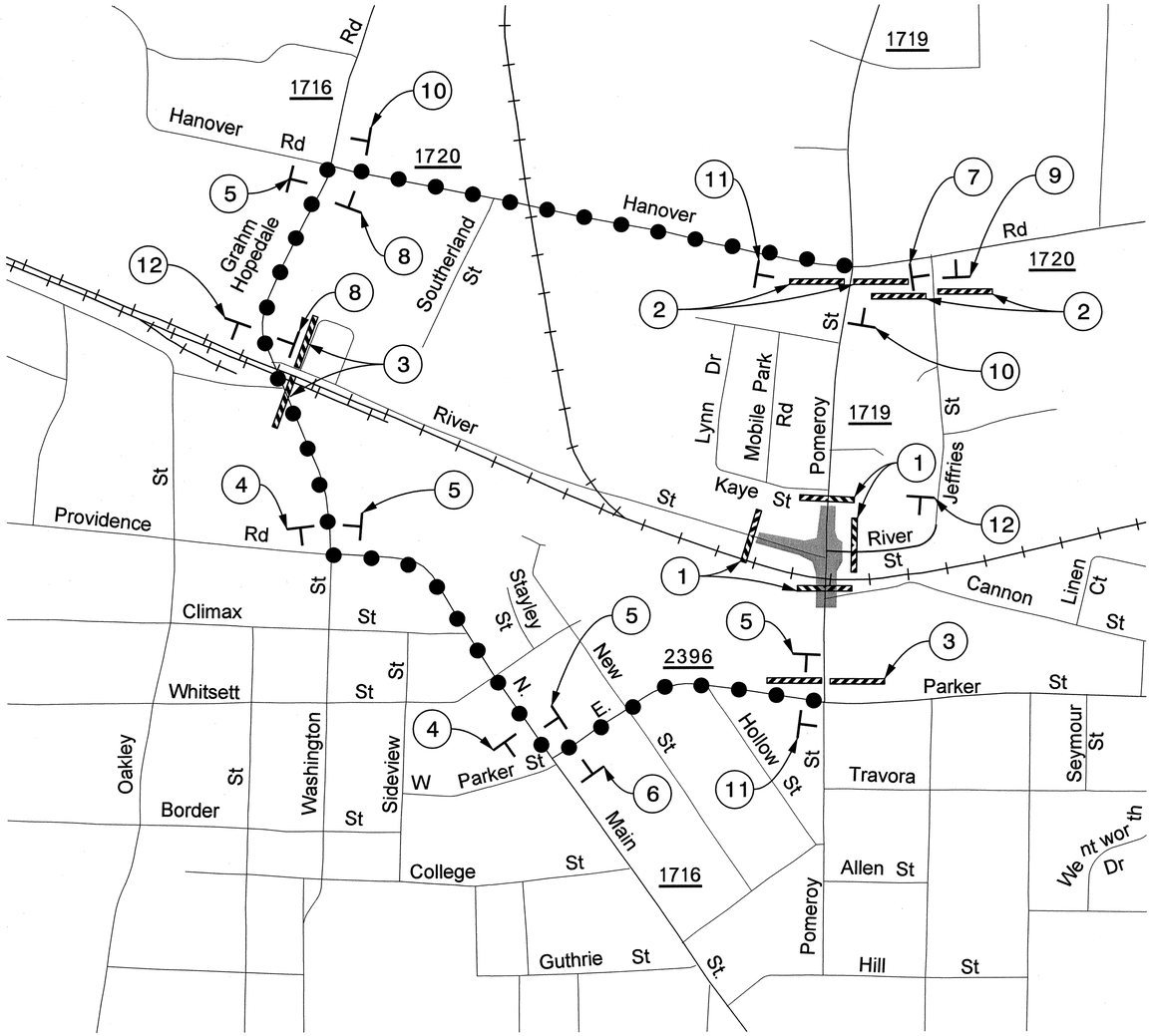
N.C.B.E.L.S. License Number: F-0116



DETOUR ROUTE

REFER TO RSD 1101.03, SHEET 1 OF 9, FOR ADDITIONAL SIGN AND BARRICADE PLACEMENT.

SEE SPECIAL SIGN DESIGN ON SHEET TMP-2.

RIVER ST. (EAST OF POMEROY ST.) SHALL REMAIN CLOSED DURING CLOSURE OF POMEROY ST.

OFF-SITE DETOUR SIGNS AND BARRICADES FOR CLOSURE OF RIVER ST. ON SHEET TMP-3 SHALL BE REMOVED OR RELOCATED AS SHOWN ON THIS SHEET DURING CLOSURE OF POMEROY ST.

(1)
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)

(2)
R11-4
60" x 30"
ROAD CLOSED TO THRU TRAFFIC
DETOUR
M4-10R
48" x 18"
TYPE III BARRICADE

(3)
R11-4
60" x 30"
ROAD CLOSED TO THRU TRAFFIC
DETOUR
M4-10L
48" x 18"
TYPE III BARRICADE

(4)
Pomeroy St SSD 48" X 12"
DETOUR M4-8 24" X 12"
M6-1 L 21" X 15"

(5)
Pomeroy St SSD 48" X 12"
DETOUR M4-8 24" X 12"
M6-1 21" X 15"

(6)
Pomeroy St SSD 48" X 12"
DETOUR M4-8 24" X 12"
M6-3 21" X 15"

(7)
River St SSD 36" X 12"
DETOUR M4-8 24" X 12"
M6-1 21" X 15"

(8)
River St SSD 36" X 12"
Pomeroy St SSD 48" X 12"
DETOUR M4-8 24" X 12"
M6-1 21" X 15"

(9)
River St SSD 36" X 12"
DETOUR M4-8 24" X 12"
M6-1 L 21" X 15"

(10)
River St SSD 36" X 12"
Pomeroy St SSD 48" X 12"
DETOUR M4-8 24" X 12"
M6-1 L 21" X 15"

(11)
Pomeroy St SSD 48" X 12"
END DETOUR M4-8 A 24" X 18"

(12)
River St SSD 36" X 12"
END DETOUR M4-8 A 24" X 18"

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
4/11/13

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

OFF-SITE DETOUR SIGNING (CLOSURE OF POMEROY ST.)

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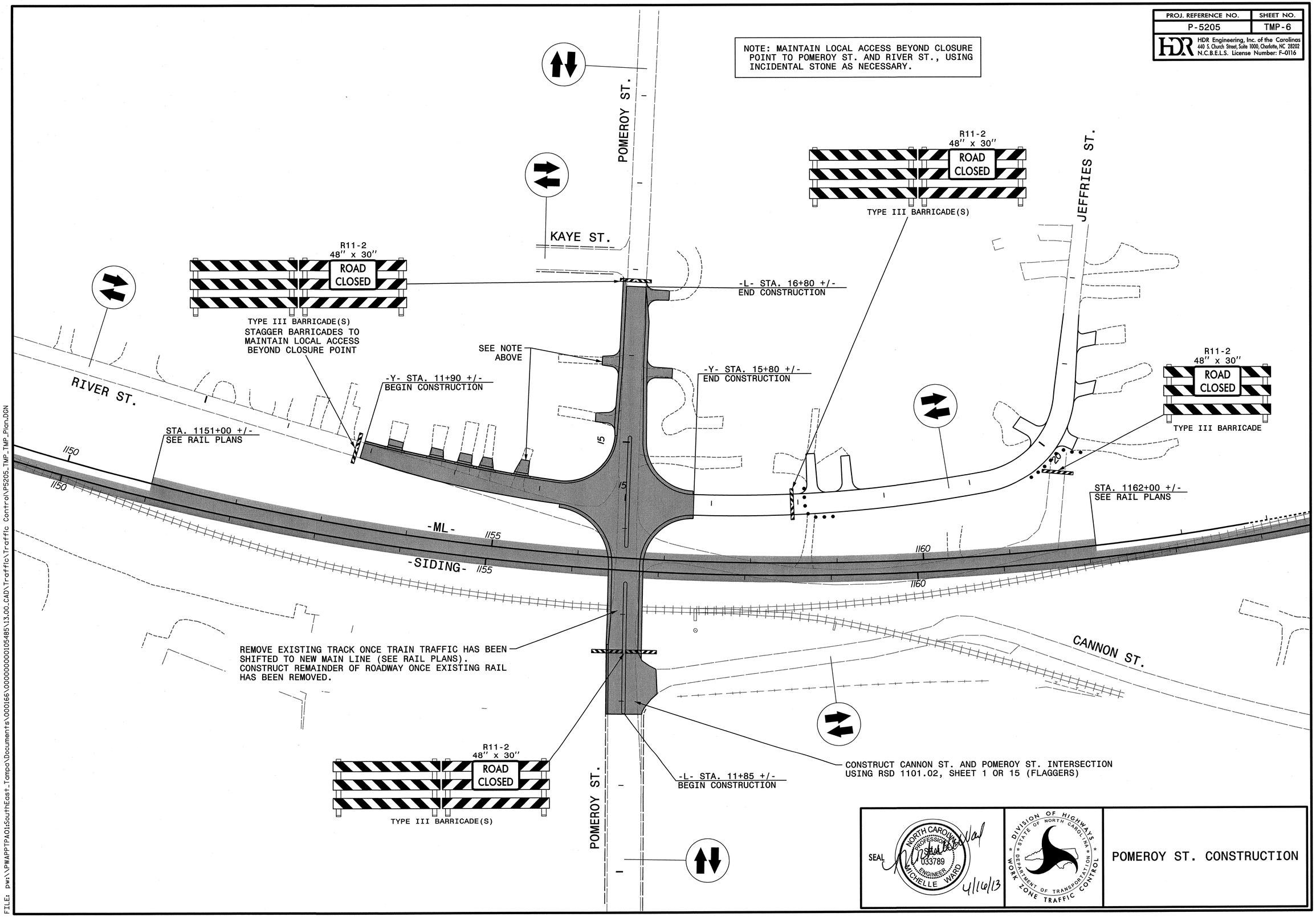
PROJ. REFERENCE NO.	SHEET NO.
P-5205	TMP-6

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

NOTE: MAINTAIN LOCAL ACCESS BEYOND CLOSURE POINT TO POMEROY ST. AND RIVER ST., USING INCIDENTAL STONE AS NECESSARY.



SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

4/16/13

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

POMEROY ST. CONSTRUCTION

0016DEL_P01

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STATE PROJECT REFERENCE NO.	SHEET NO.
P-5205	PMP-1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
ALAMANCE COUNTY

LOCATION: SR 1179 (POMEROY ST.) FROM SOUTH OF CANNON ST. TO SOUTH OF KAYE ST.

TIP PROJECT: P-5205

0016DEL_P01

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-PROJECT SERVICES UNIT-N.C. DEPARTMENT OF TRANSPORTATION-RALEIGH, N.C., DATED JULY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.08	PAVEMENT MARKINGS - ARROWS, SYMBOLS & WORD MESSAGES
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
-L- & -Y-	PAINT	PERMANENT RAISED

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

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

D) STOPBAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

E) ALL STOPBAR DIMENSIONS ARE TO THE FRONT OF THE STOPBAR.

INDEX OF SHEETS

SHEET NO.	TITLE
PMP-1	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, INDEX OF SHEETS, GENERAL NOTES, AND PAVEMENT MARKING SCHEDULE
PMP-2	PAVEMENT MARKING PLAN

PAVEMENT MARKING SCHEDULE

P1	PAINT 16" WHITE LINE, RR X
P2	PAINT 24" WHITE STOPBAR
P3	PAINT 24" WHITE TRANSVERSE BAND
P8	PAINT 4" 2'-6'/SP. WHITE MINI-SKIP
PA	PAINT 4" WHITE EDGELINE
PI	PAINT 4" YELLOW DOUBLE CENTER
QI	PAINT WHITE ALPHANUMERIC CHARACTER

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

APPROVED:

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

DATE: 4/16/13

PLANS PREPARED BY:

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

DOMINIC WAINWRIGHT, P.E. — PROJECT MANAGER
MICHELLE WARD, P.E. — PROJECT TRAFFIC ENGINEER
CHRIS HARNDEN — PROJECT TRAFFIC DESIGNER

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TIME: 3:13:08 PM

PROJ. REFERENCE NO.	SHEET NO.
P-5205	PMP-2

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

0016DEL_P01

REVISIONS

POMEROY ST.

KAYE ST.

JEFFRIES ST.

RIVER ST.

CANNON ST.

-L- STA. 16+80 +/-
END (PA)(PI)
TIE TO EXISTING

-L- STA. 16+87 +/-
END (PA)
TIE TO EXISTING

-Y- STA. 11+90 +/-
BEGIN (PA)(PA)(PI)
TIE TO EXISTING

-Y- STA. 21+58 +/-
END (PA)(PA)(PI)
TIE TO EXISTING

-L- STA. 15+07 +/-
END (P8)
BEGIN (PA)

-L- STA. 15+00 +/-
END (P8)

-L- STA. 13+57 +/-
BEGIN (P8)

-L- STA. 13+57 +/-
BEGIN (P8)

-L- STA. 12+65 +/-
BEGIN (PA)

-L- STA. 12+57 +/-
END (P8)
BEGIN (PA)

-L- STA. 11+85 +/-
BEGIN (P8)
TIE TO EXISTING

EXISTING RAILROAD MARKINGS

APPROVED: _____ DATE: _____

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD
4/16/13

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

PAVEMENT MARKING PLAN

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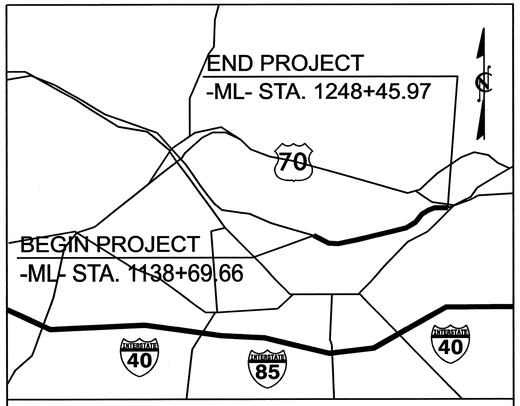
TIP PROJECT: P-5205

CONTRACT: C203129



VICINITY MAP

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5205	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50000.1.STR03T1B		PE/UTIL PE
50000.1.STR04T3		PE/UTIL PE
39364		ROW
50000.3.STR01T4A	FRA-FR-0006-10-01-00	CONST/UTIL CONST

LOCATION: NCRR/NS MAINLINE (MP H-23.4 TO MP H-25.5)

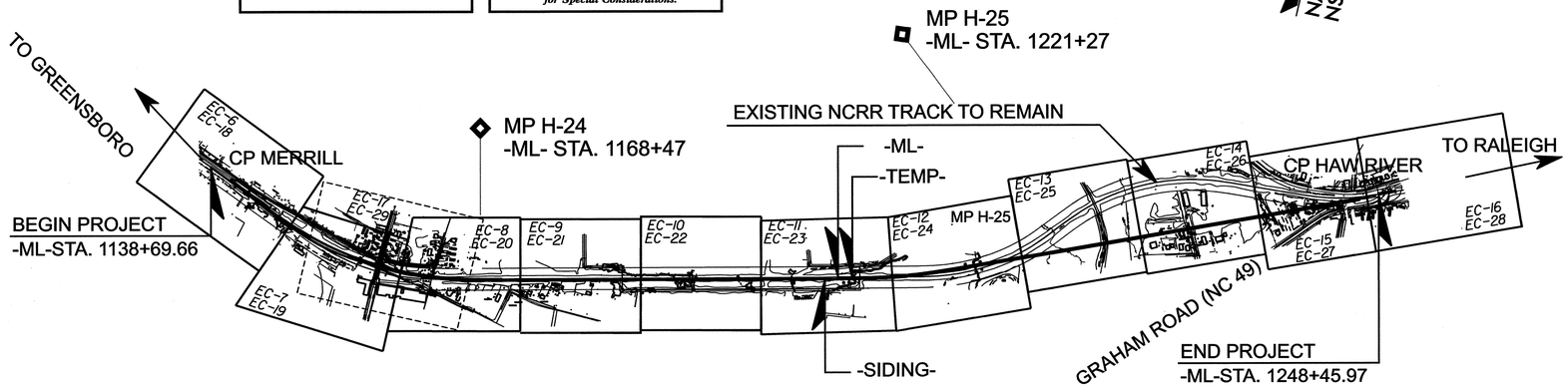
TYPE OF WORK: EROSION CONTROL

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

NAD 83/ NSRS 2007



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

*GENERAL NOTE:
EROSION CONTROL BASINS WILL BE KEPT 25 FT FROM ACTIVE TRACK CENTERS UNLESS APPROVAL IS RECEIVED FROM RAILROAD REPRESENTATIVES

WYATT D. YELVERTON, P.E.
LEVEL III-A: DESIGNER OF EROSION AND SEDIMENT CONTROL PLANS.
CERTIFICATION NUMBER: 370

2012 STANDARD SPECIFICATIONS

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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

Prepared In the Office of:
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

2012 STANDARD SPECIFICATIONS

R/W PLAN SET DATE: SEPTEMBER 16, 2009

LETTING DATE: AUGUST 20, 2013

EDGAR LEICHT, P.E.
RAIL PROJECT ENGINEER
EDGAR LEICHT, P.E.
RAIL PROJECT DESIGN ENGINEER
RONYELL THIGPEN, P.E.
ROADWAY PROJECT ENGINEER
MICHAEL DARBY, P.E.
HYDRAULICS PROJECT ENGINEER
JASON ORTHNER, P.E.
NCDOT PROJECT MANAGER

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2012 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

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SKIMMER BASIN WITH BAFFLES DETAIL

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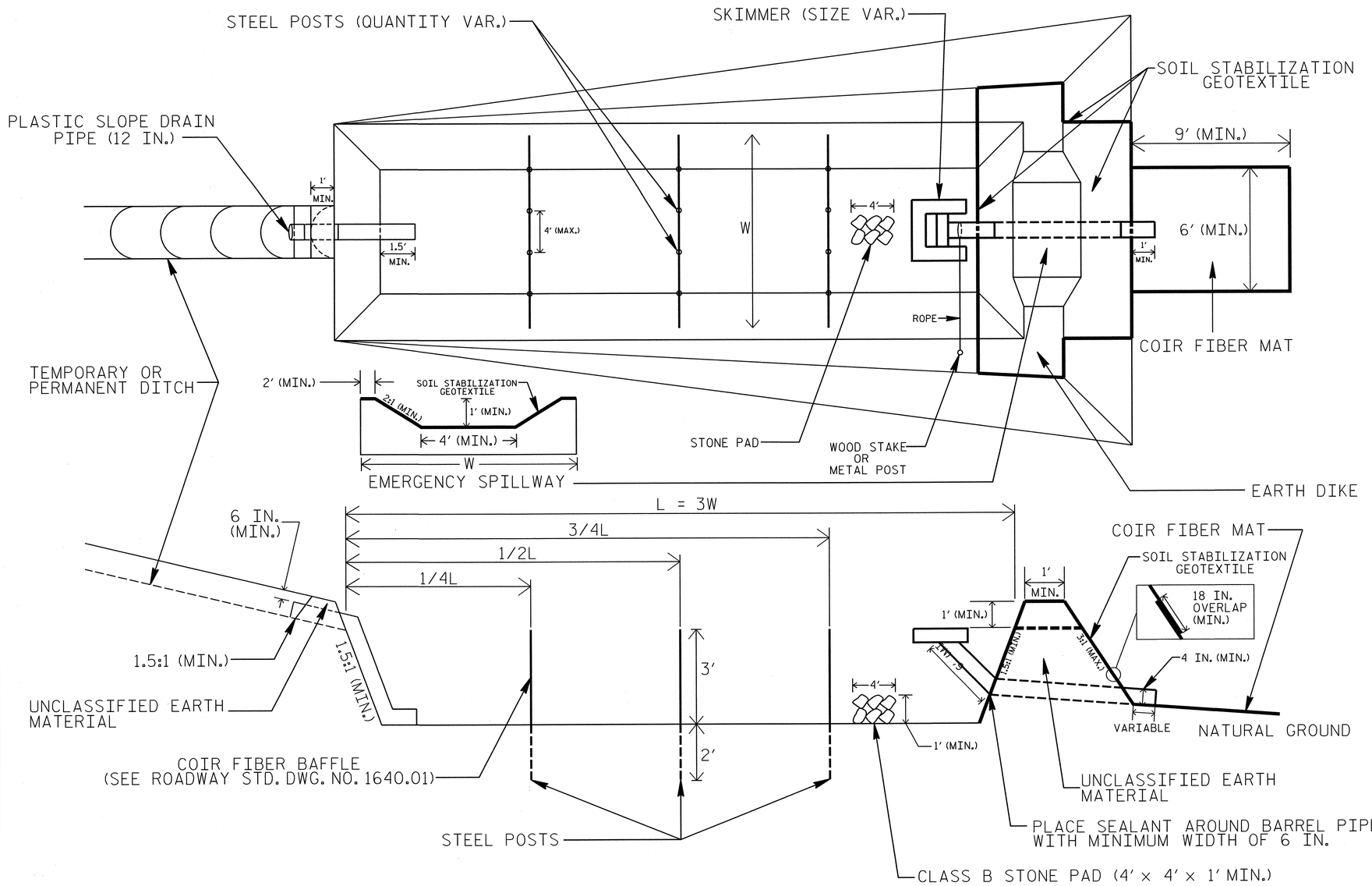
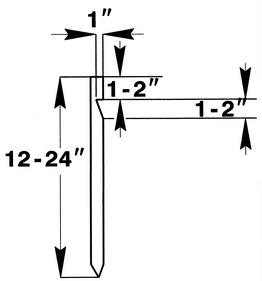
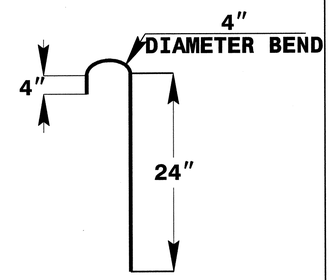
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



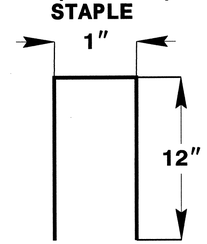
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

NOTES

1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE EMERGENCY SPILLWAY WEIR LENGTH (FT.) USING Q/0.8, WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE OR TARP AS DIRECTED.
6. SOIL STABILIZATION GEOTEXTILE FOR EMERGENCY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

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440 S. Church Street, Suite 1000, Charlotte, NC 28202
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PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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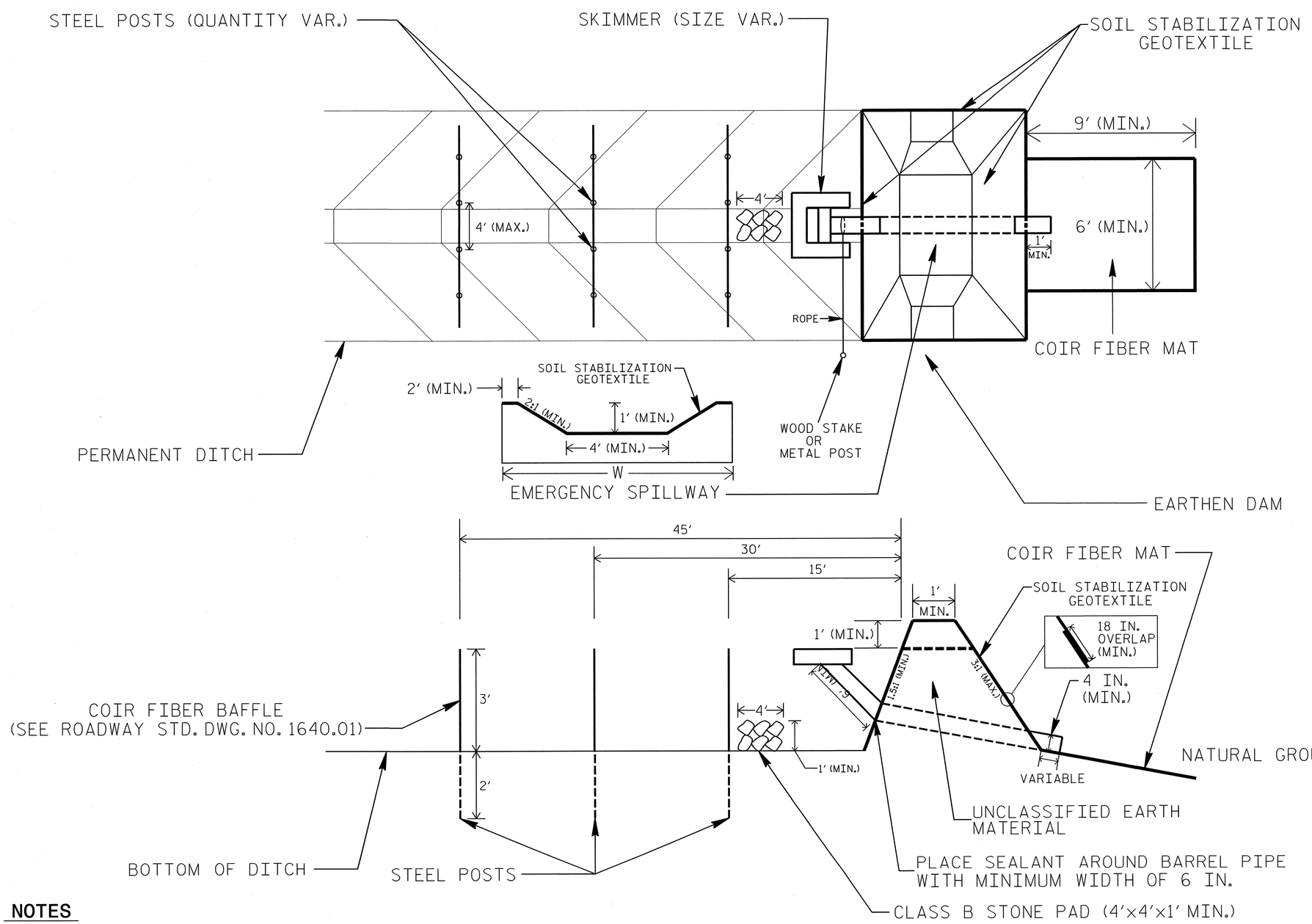
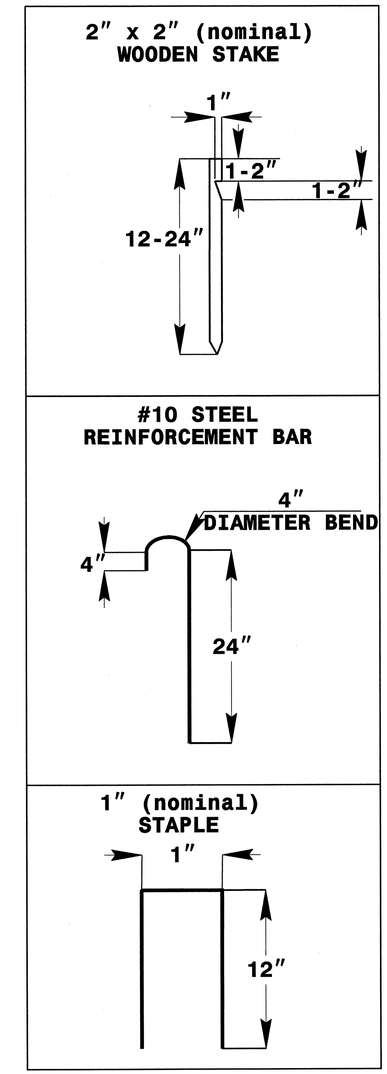
EARTHEN DAM WITH SKIMMER





COIR FIBER MAT ANCHOR OPTIONS

NOTES

1. LIMIT EARTHEN DAM HEIGHT TO 5 FT.
2. DETERMINE EMERGENCY SPILLWAY LENGTH (FT.) USING Q/0.8, WHERE Q IS FLOW RATE (CFS) INTO BASIN.
3. SOIL STABILIZATION GEOTEXTILE FOR EMERGENCY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

NOT TO SCALE

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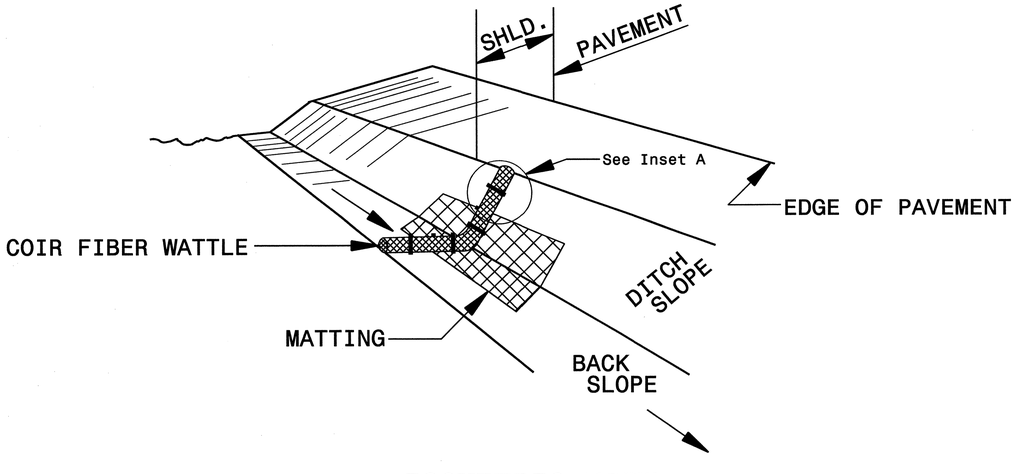
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

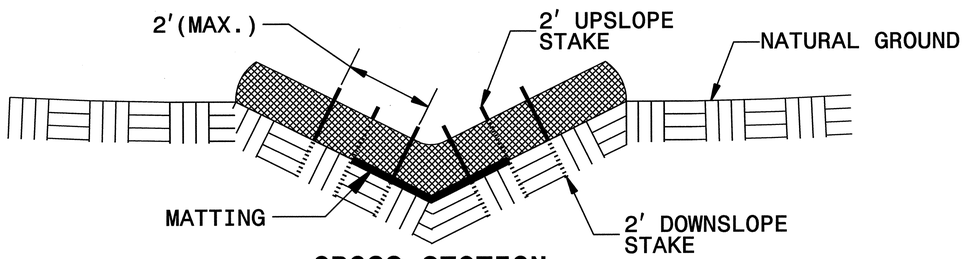
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DCN 0016DEL_P01

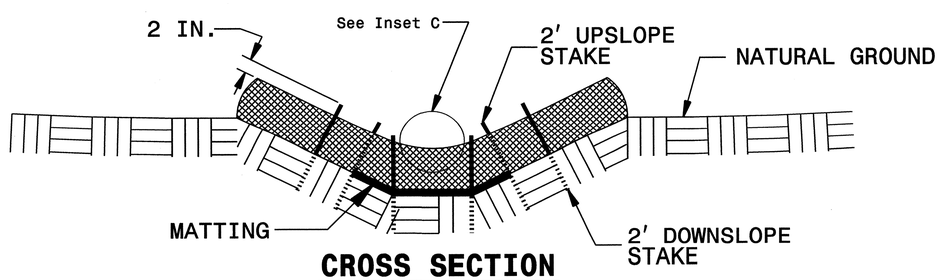
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

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

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

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

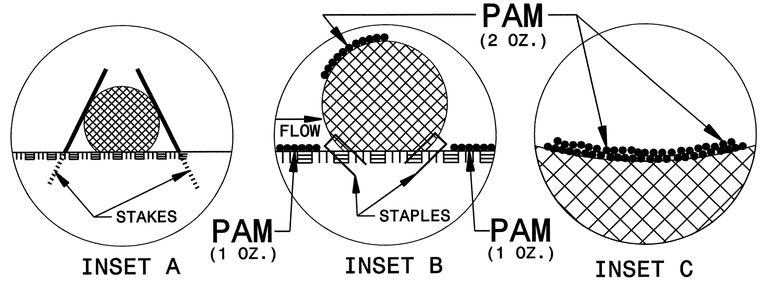
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

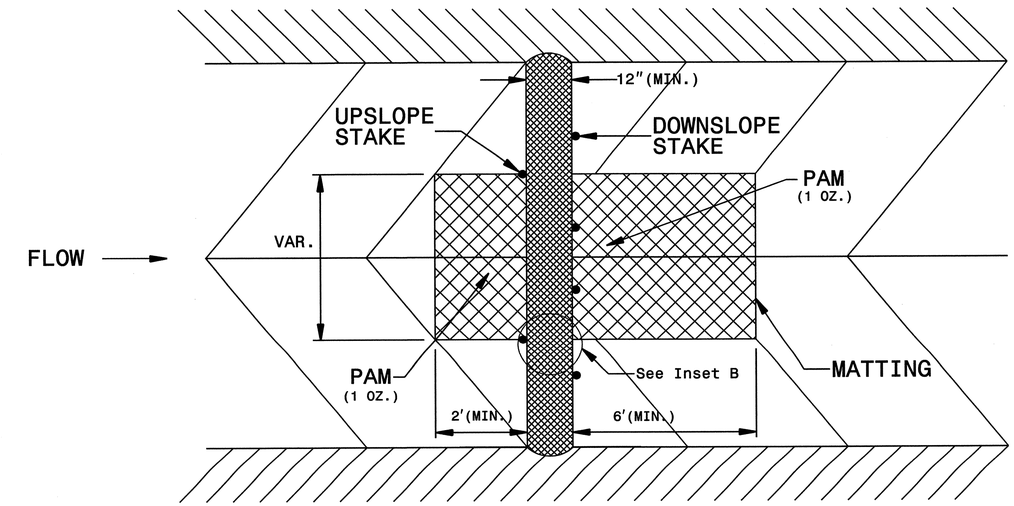
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

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

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





TOP VIEW

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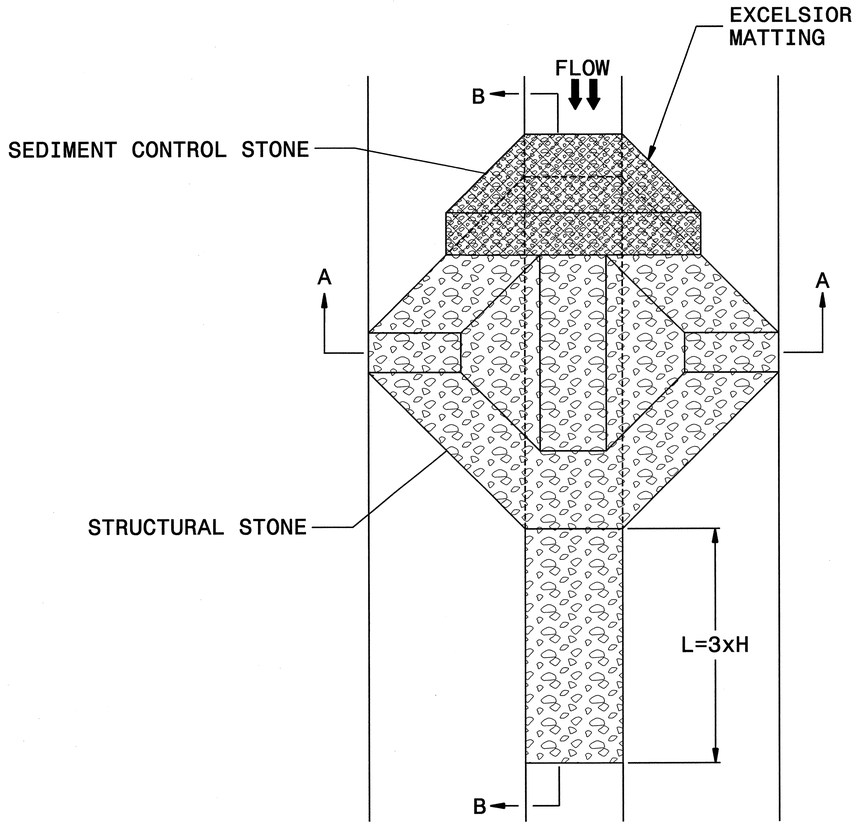
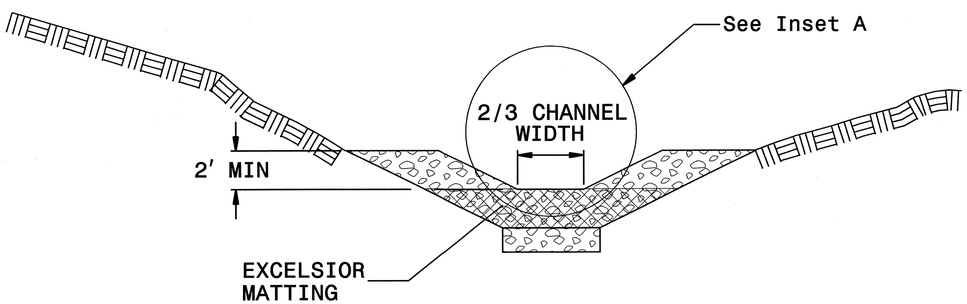
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN



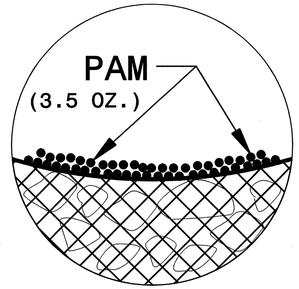
SECTION A-A

NOTES

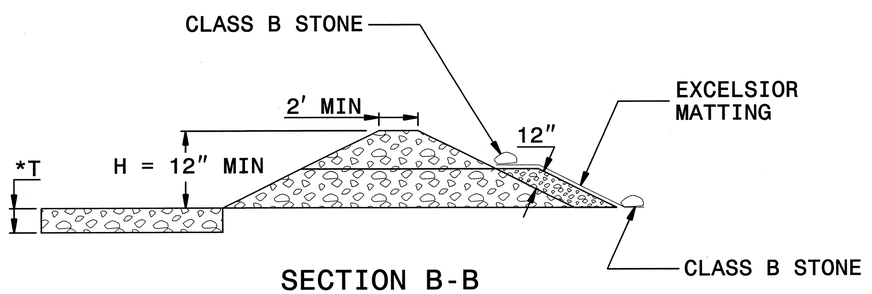
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

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



INSET A



SECTION B-B

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

NOT TO SCALE

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HDR HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL: SLOPES 2:1 OR STEEPER

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-ML-	1141+00	1145+50	LT	335
5	-ML-	1149+00	1153+50	LT	785
5-6	-ML-	1157+00	1166+50	LT	2360
4	-ML-	1142+00	1147+50	RT	1095
5	-ML-	1151+00	1156+00	RT	620
5-6	-ML-	1157+00	1160+00	RT	225
6-7	-ML-	1161+00	1177+50	RT	5220
7-10	-ML-	1179+00	1208+00	RT	7019
9-11	-ML-	1202+50	1217+50	LT	3081
10-11	-ML-	1212+00	1217+50	RT	1095
11-13	-ML-	1219+50	1244+00	LT	9130
11-13	-ML-	1219+00	1244+00	RT	12423
5-6	-Y-	15+00	19+00	LT	1095
5-6	-Y-	18+00	19+00	RT	125
			SUBTOTAL		44608

MATTING FOR EROSION CONTROL: PROPOSED DITCH LINE

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
5	-ML-	1149+00	1156+00		470
5-6	-ML-	1157+00	1165+00		620
10-11	-ML-	1214+00	1218+50		275
11	-ML-	1220+10	1225+00		335
11-13	-ML-	1225+43	1243+00		1280
5	-ML-	1150+00	1158+00		440
6-8	-ML-	1160+84	1184+00		1865
9-11	-ML-	1200+00	1219+84		1235
11	-ML-	1220+10	1225+35		390
11-13	-ML-	1225+43	1243+00		1300
5-6	-Y-	15+38	16+90		45
5-6	-Y-	11+50	13+50		60
5-6	-Y-	15+50	16+00		25
5-6	-Y-	17+50	19+14		95
5-6	-Y-	20+00	22+00		145
5-6	-Y-	18+00	18+50		15
5-6	-Y-	20+00	21+75		120
5-6	-Y-	19+14	20+00		15
			SUBTOTAL		8730
		MISC. MATTING INSTALLED AS DIRECTED BY ENGINEER			32515
				TOTAL	85853
				SAY	85900

5/13/2013
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11:02:38 AM

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-3A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

DCN 0016DEL_P01

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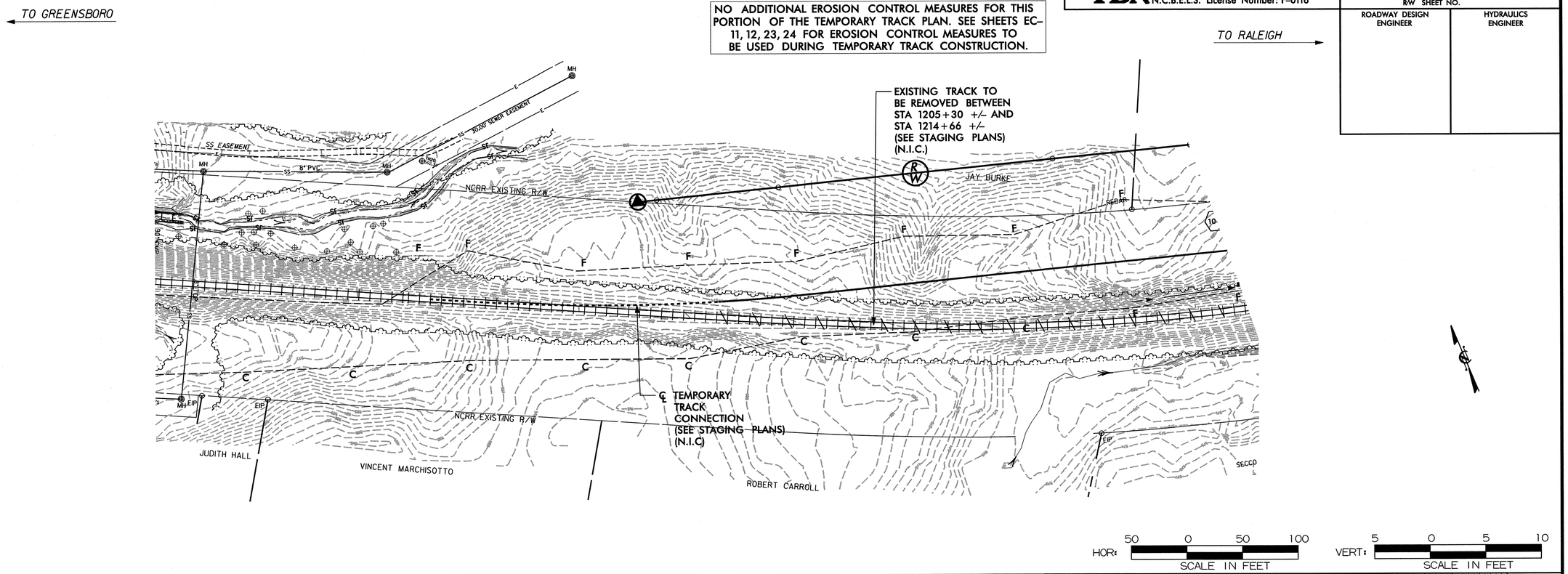
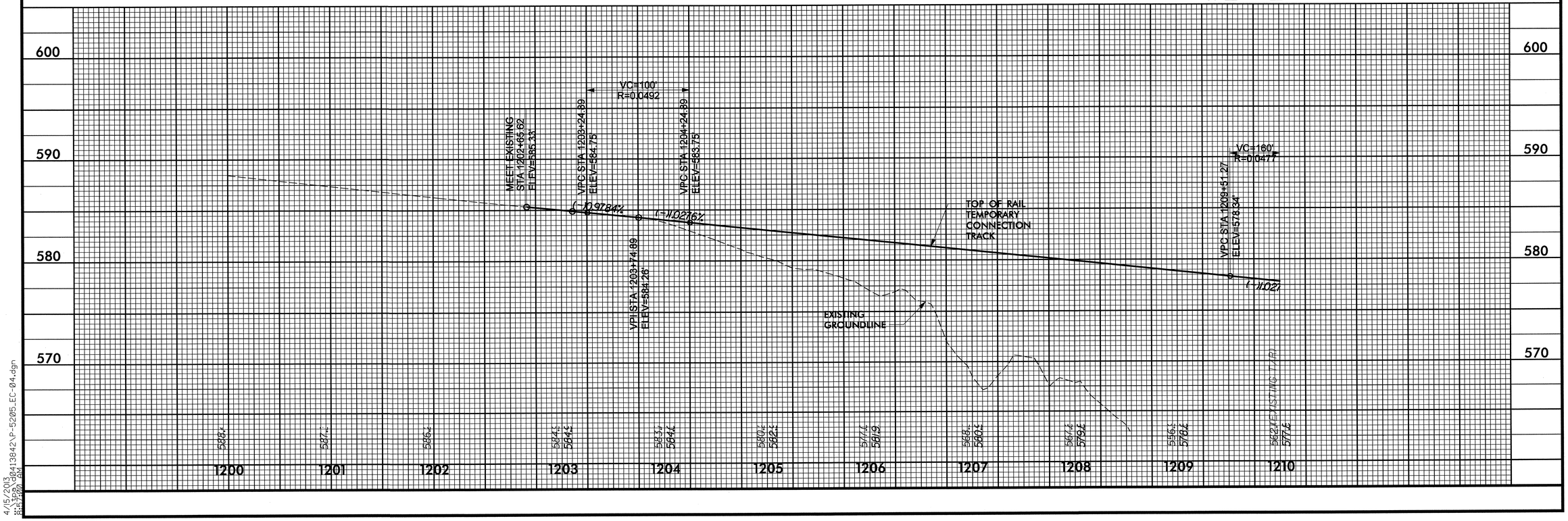
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-04/CONST.2-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NO ADDITIONAL EROSION CONTROL MEASURES FOR THIS PORTION OF THE TEMPORARY TRACK PLAN. SEE SHEETS EC-11, 12, 23, 24 FOR EROSION CONTROL MEASURES TO BE USED DURING TEMPORARY TRACK CONSTRUCTION.





4/15/2013

DCN 0016DEL_P01

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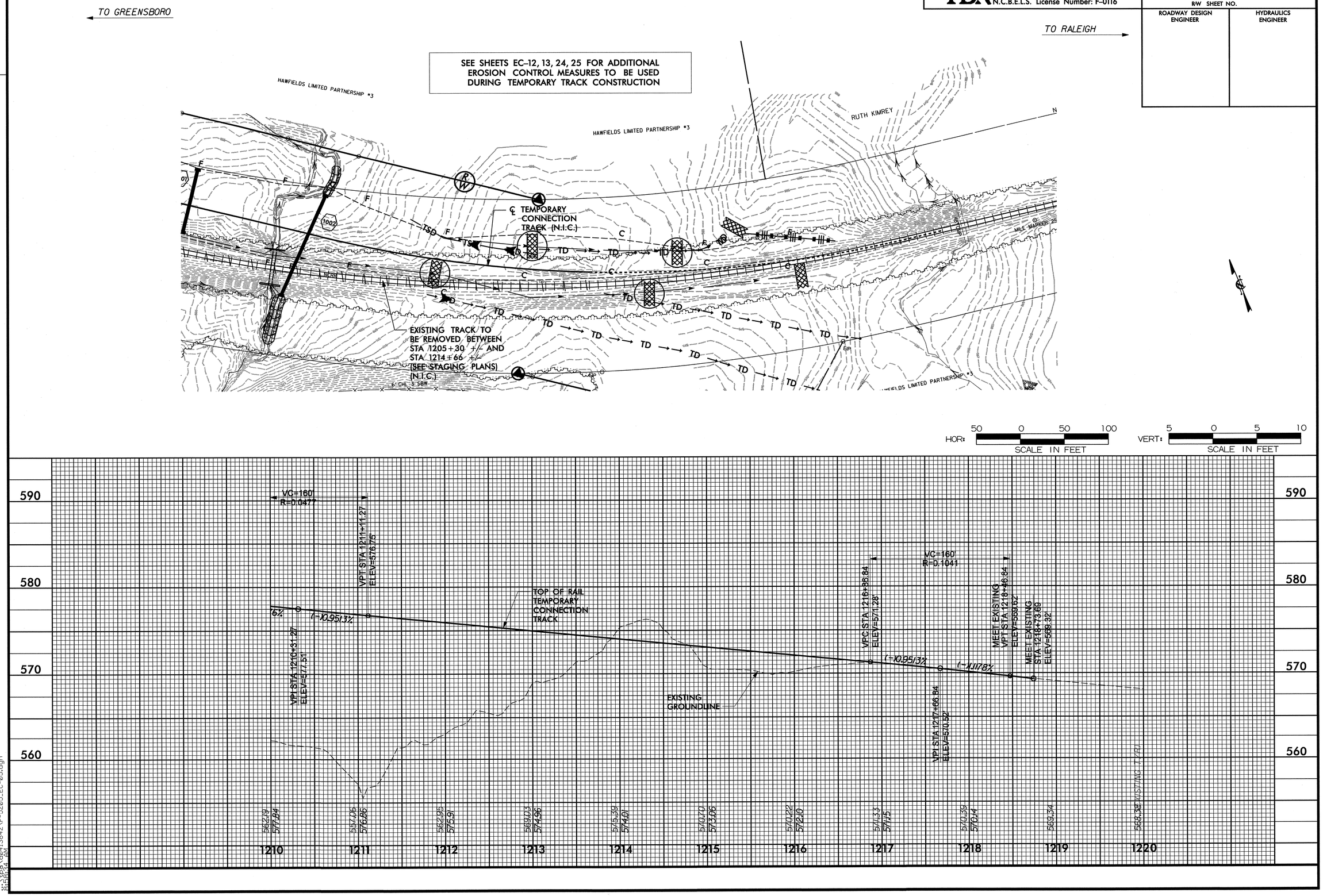
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-05/CONST.2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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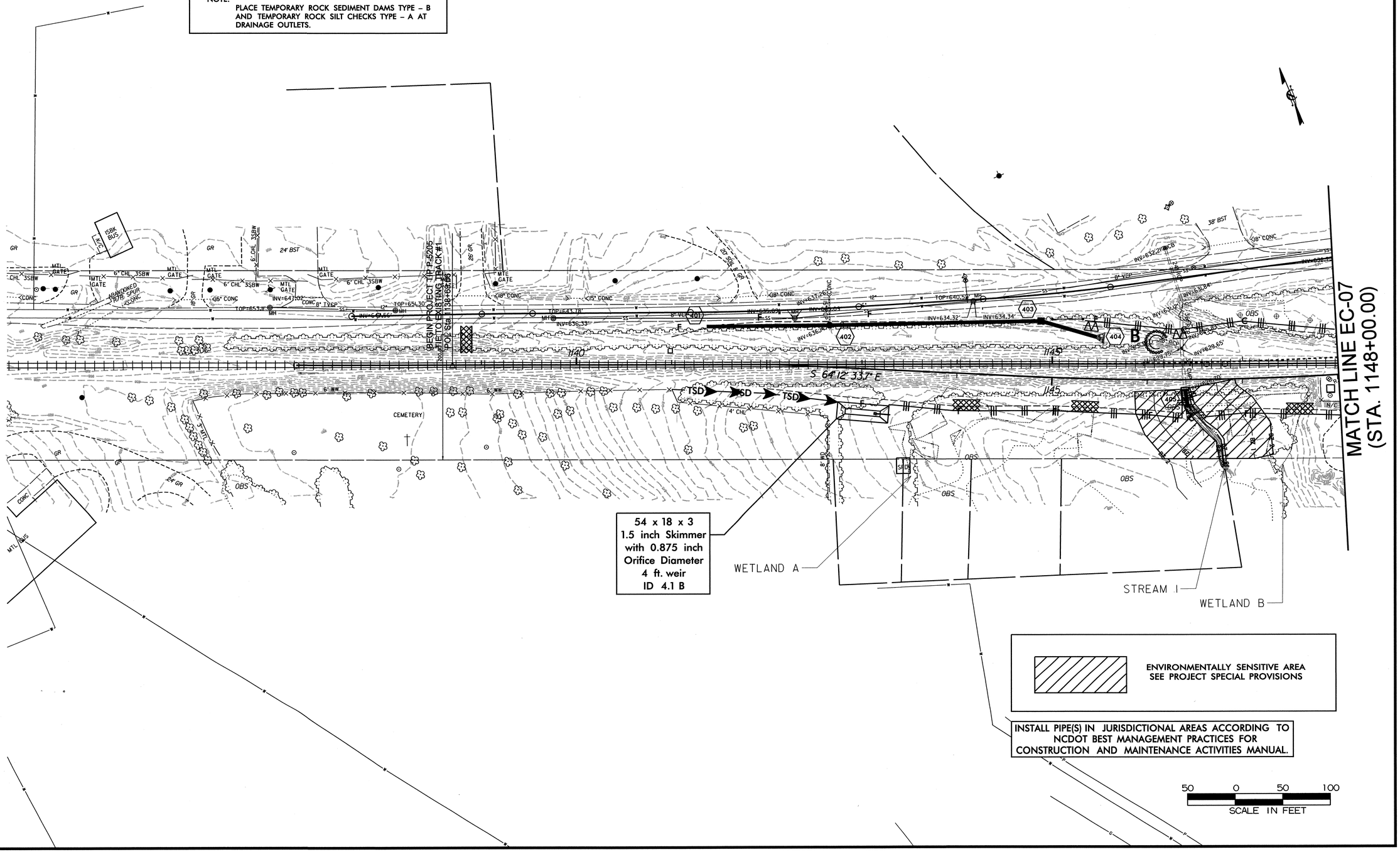
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-06/CONST.-04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

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



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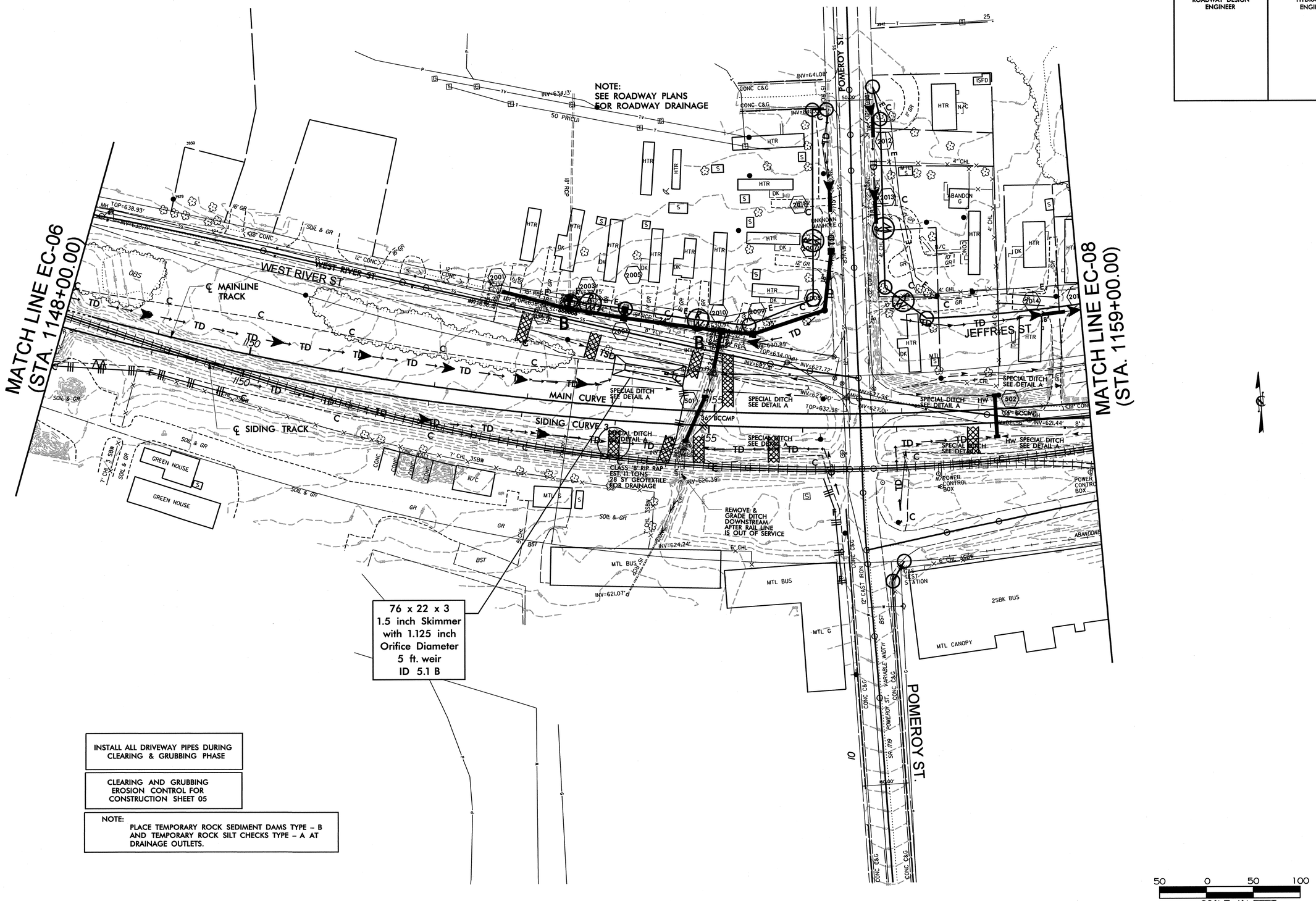
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-07/CONST.-05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



INSTALL ALL DRIVEWAY PIPES DURING CLEARING & GRUBBING PHASE

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 05

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

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CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 06

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

INSTALL ALL DRIVEWAY PIPES DURING CLEARING & GRUBBING PHASE

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-08/CONST.-06
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATCH LINE EC-07
(STA. 1159+00.00)

MATCH LINE EC-09
(STA. 1170+00.00)

JEFFRIES ST.

TURNER ST

ISBK BUS

ISFD

GAS TEST STATION

ABANDONED GF BUS

POWER PEDESTAL

(NCDOT STD. 866.03)

50 0 50 100
SCALE IN FEET

4/15/2013
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DCN 0016DEL_P01

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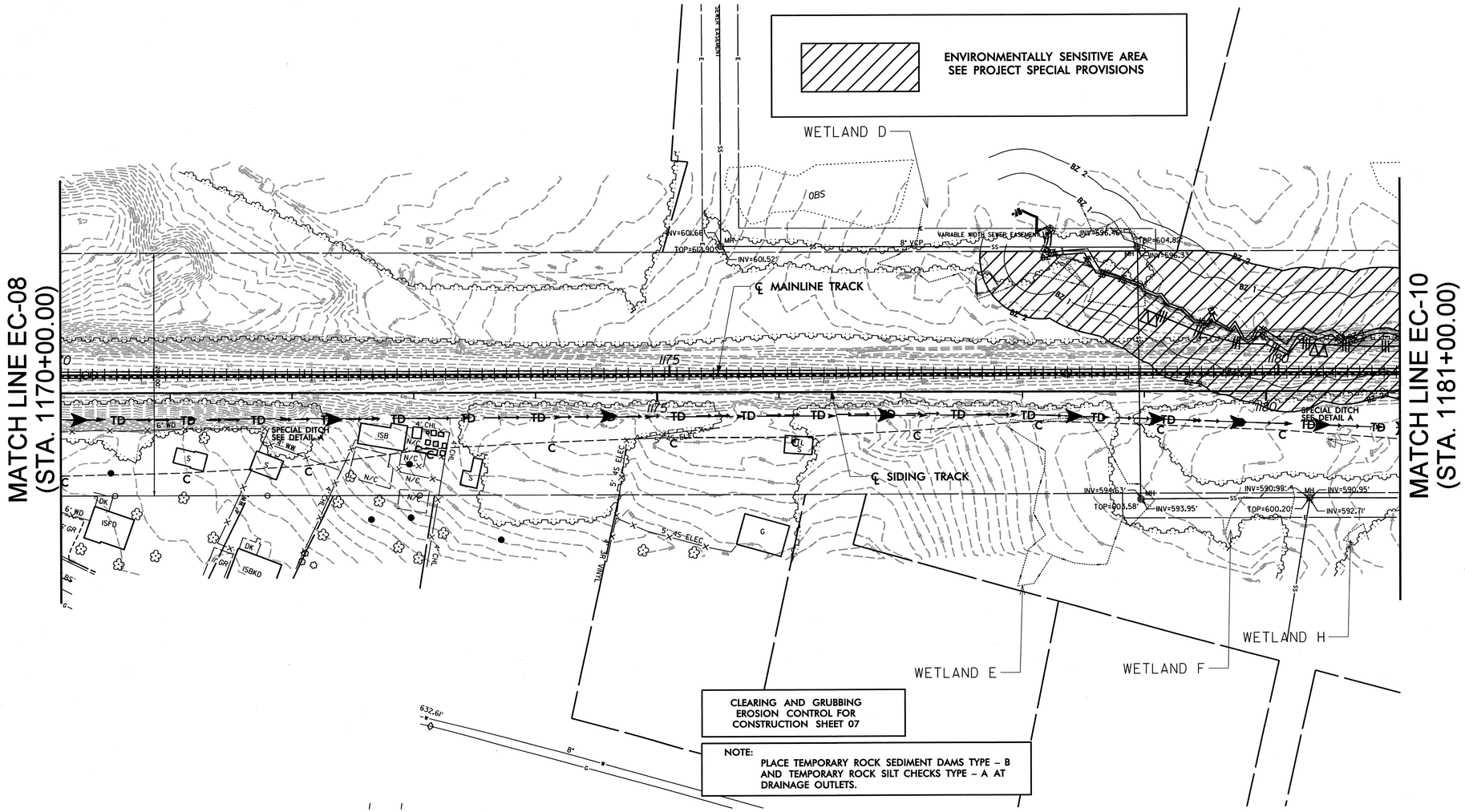
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-09/CONST.-07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 07

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

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SCALE IN FEET

4/15/2013
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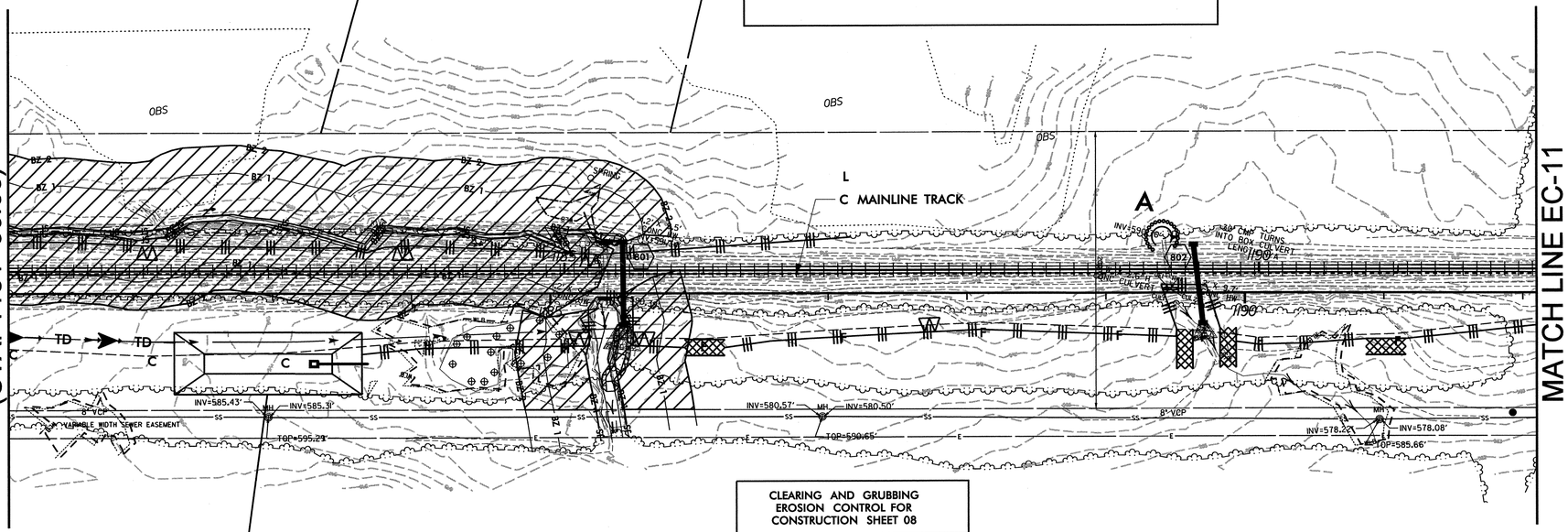
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-10/CONST.-08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

MATCH LINE EC-09
(STA. 1181+00.00)

MATCH LINE EC-11
(STA. 1192+00.00)



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 08

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

INSTALL PIPE(S) IN JURISDICTIONAL AREAS ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

135 x 45 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
22 ft. weir
ID 8.1 B

50 0 50 100
SCALE IN FEET

4/15/2013
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DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-11/CONST.-09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

MATCH LINE EC-10
(STA. 1192+00.00)

MATCH LINE EC-12
(STA. 1204+00.00)

p3414 3219-3220

p3414 3220-3221

OBS

RETAIN

INV=590.79'

MH TOP=599.49' INV=590.61'

INV=589.03'

MH TOP=595.41' INV=588.93'

8" PVC

SS EASEMENT

20.00' SEWER EASEMENT

30.00' SEWER EASEMENT

INSTALL
2 @ 60" SMOOTH STEEL
BY TRENCHLESS
CONSTRUCTION

6' BASE TAIL DITCH
61' LONG
@ 7.9% SLOPE
2:1 SIDE SLOPES
W/CLASS I RIP RAP
EST. 80 TONS
146 SY GEOTEXTILE
FOR DRAINAGE
EST. 23 CY DDE
SEE DETAIL E

INV=564.65'

INV=564.92'

MH TOP=581.48' INV=564.82'

INV=564.90'

MH TOP=580.48' INV=564.44'

INV=564.44'

2' BENCH
SEE DETAIL E OBS

HW=

ABANDON EXISTING
CULVERT CROSSING

℄ MAINLINE TRACK

MAIN CURVE 2

SIDING CURVE 2

TSD

TSDF

COLLAR & EXTEND
INS STD TA.200401
48" BCCP
INV=

HW=

CLASS 1" RIP RAP
EST. 26 TONS
50 SY GEOTEXTILE
FOR DRAINAGE

℄ SIDING TRACK

INV=569.95'

MH TOP=581.52'

INV=569.86'

8" VCP

VARIABLE WIDTH SEWER EASEMENT

INV=564.77'

MH TOP=573.24'

INV=564.69'

8" VCP

SPECIAL DITCH
SEE DETAIL A

2' BENCH
SEE DETAIL E

INV=562.74'

MH TOP=574.03'

INV=562.62'

INV=562.85'

5' LATERAL BASE DITCH
EST. 200 CY DDE
SEE DETAIL H

6' BASE HEAD DITCH
32' LONG
@ 1.6% SLOPE
2:1 SIDE SLOPES
W/CLASS I RIP RAP
EST. 40 TONS
57 SY GEOTEXTILE
FOR DRAINAGE
EST. 12 CY DDE
SEE DETAIL G

TOP=574.97'

INV=565.69'

MH

8" VCP

INV=576.45'

66 x 22 x 3
1.5 inch Skimmer
with 1.25 inch
Orifice Diameter
5 ft. weir
ID 9.1 B

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 09

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

INSTALL PIPE(S) IN JURISDICTIONAL AREAS ACCORDING TO
NCDOT BEST MANAGEMENT PRACTICES FOR
CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

50 0 50 100
SCALE IN FEET

4/15/2013
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10:03:21 AM

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
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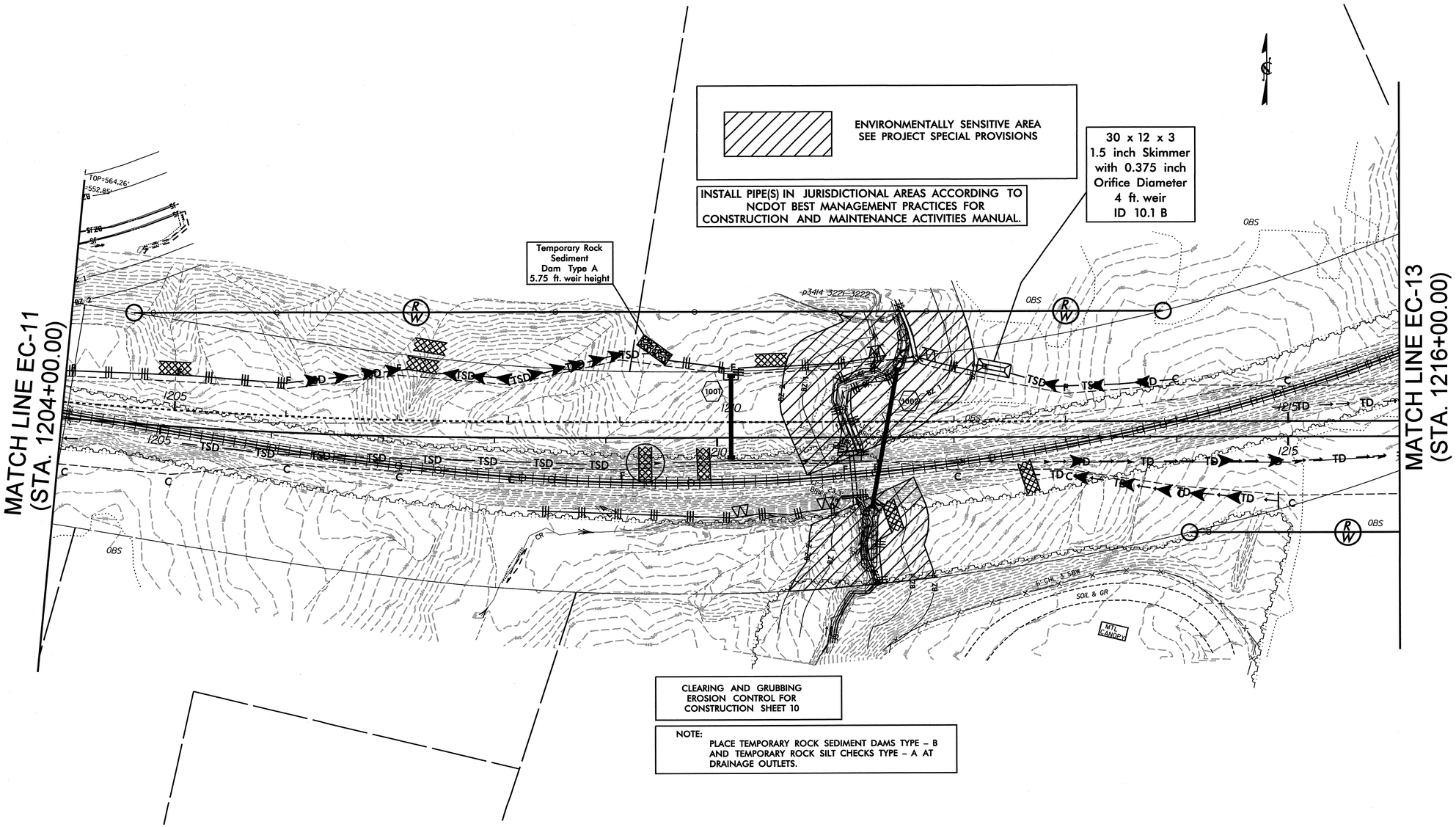
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-12/CONST.-10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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9:07:21 AM

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-13/CONST.-11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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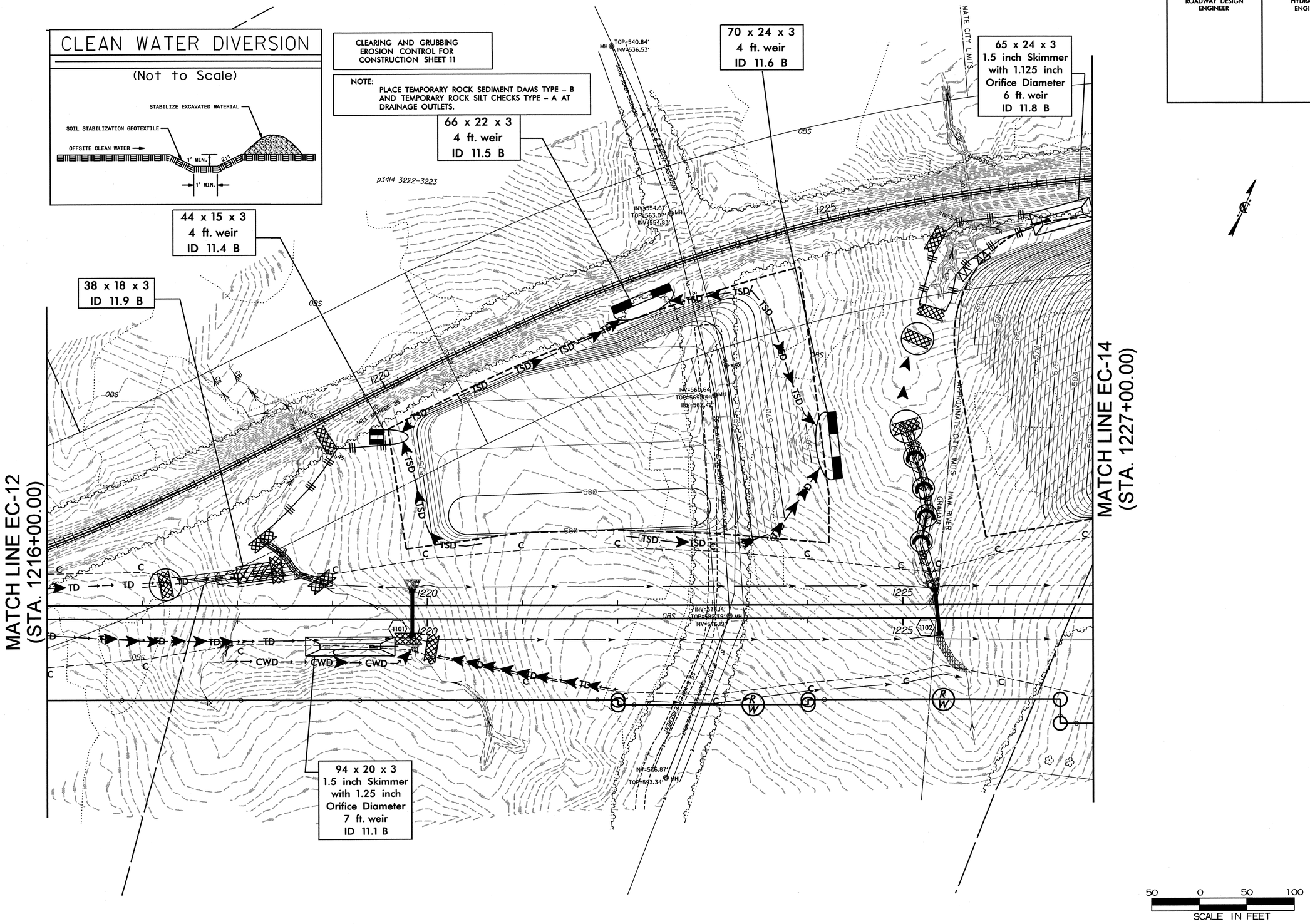
N.C.B.E.L.S. License Number: F-0116



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9:08:20 AM

HDR Engineering, Inc. of the Carolinas
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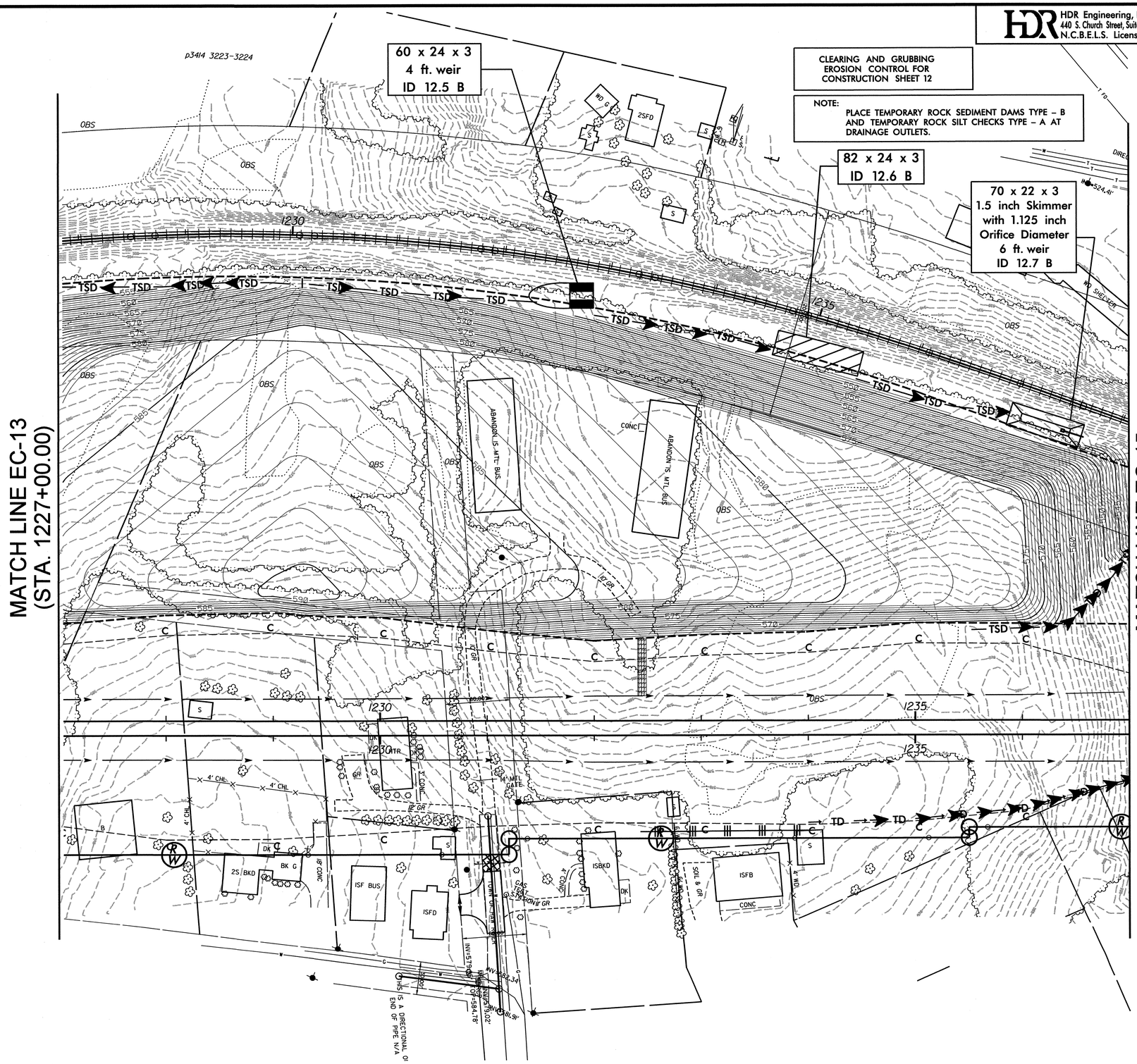
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-14/CONST.-12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 12

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



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DCN 0016DEL_P01

4/15/2013
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HDR Engineering, Inc. of the Carolinas
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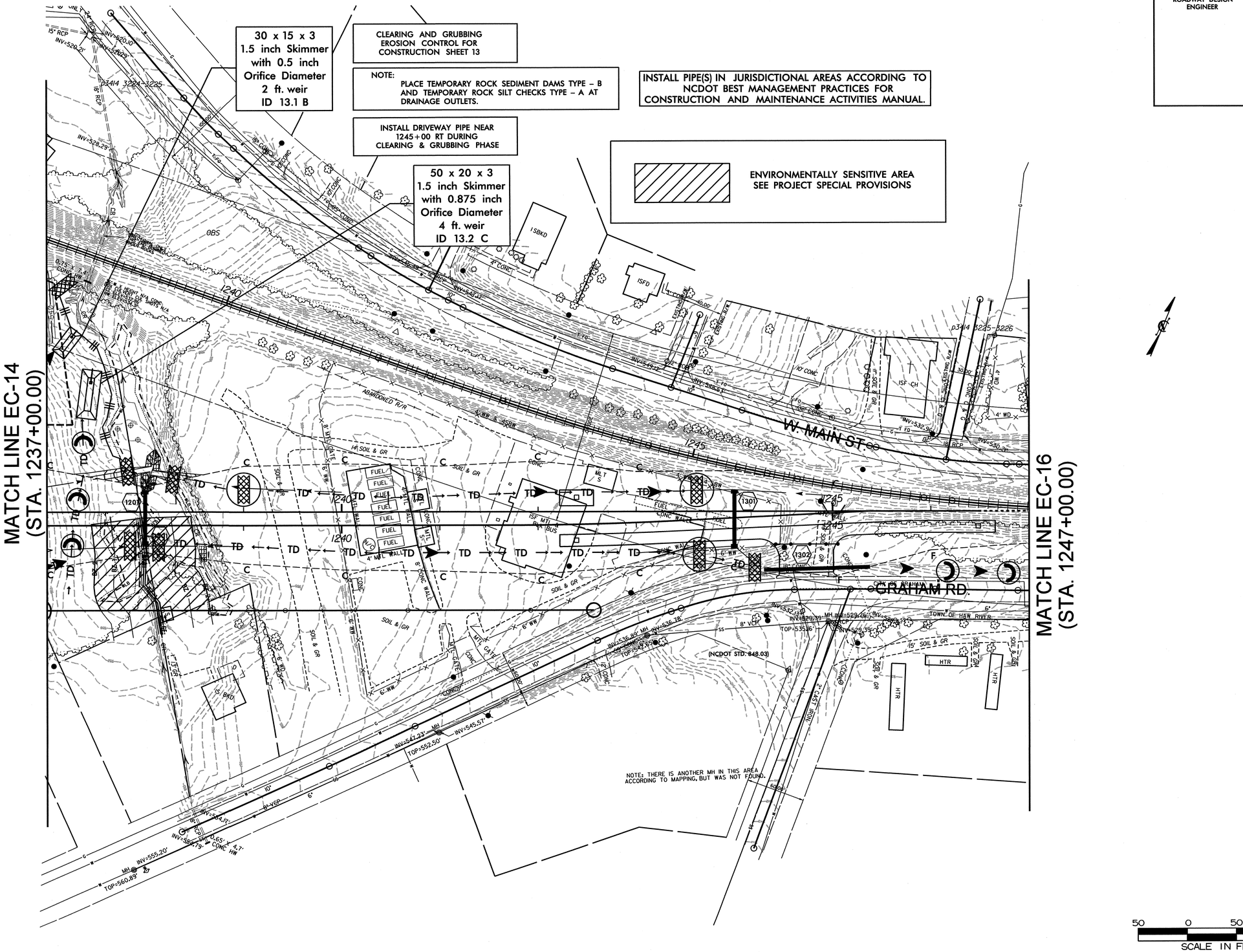
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-15/CONST.-13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DCN 0016DEL_P01



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DGN

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PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-16/CONST.-14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 14

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

50 0 50 100
SCALE IN FEET

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9:11:55 AM

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-17/RDY CONST.-04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

NAD 83/NSRS 2007

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

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET RDY 04

INSTALL ALL DRIVEWAY PIPES DURING CLEARING & GRUBBING PHASE

-Y-

PI Sta 15+62.72
Δ = 27° 53' 54.3" (LT)
D = 3° 49' 11.0"
L = 730.38'
T = 372.58'
R = 1,500.00'
DS = 40 MPH
SE = 3%

PI Sta 20+03.21
Δ = 73° 51' 52.5" (LT)
D = 52° 05' 13.5"
L = 141.81'
T = 82.69'
R = 110.00'
DS = 20 MPH
SE = 2%

-L- POT Sta. 19+24.39

END CONSTRUCTION
-L- STA. 17+15.00

END PAVING
-L- STA. 16+80.00

-Y- POT Sta. 10+00.00

-L- POC Sta.14+31.74 =
-Y- POC Sta.15+02.93

-Y- PC Sta. 11+90.14

BEGIN CONSTRUCTION
-Y- STA. 11+16.63

BEGIN PAVING
-Y- STA. 11+90.00

-L- POC Sta.13+65.30 =
Mainline Track Sta.1156+55.77

-L- POC Sta.13+50.80 =
Siding Track Sta.1156+62.20

-L- PT Sta. 15+83.31

-Y- PCC Sta. 19+20.52

-Y- PT Sta. 20+62.33

END CONSTRUCTION
-Y- STA. 22+00.33

END PAVING
-Y- STA. 21+58.00

-Y- POT Sta. 22+00.33

-L- PC Sta. 11+24.52

-L-

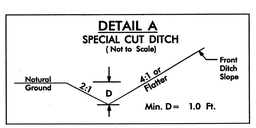
PI Sta 13+53.96
Δ = 2° 37' 43.3" (RT)
D = 0° 34' 22.6"
L = 458.79'
T = 229.44'
R = 10,000.00'
DS = 40 MPH
SE = NC

BEGIN CONSTRUCTION
BEGIN PAVING
-L- STA. 11+85.00

-L- POT Sta. 10+00.00

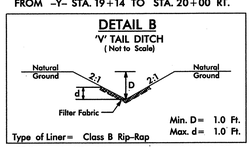
76 x 22 x 3
1.5 inch Skimmer
with 1.125 inch
Orifice Diameter
5 ft. weir
ID 5.1 B

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



FROM -L- STA. 12+50 TO STA. 13+25 RT
FROM -Y- STA. 11+50 TO STA. 13+50 RT.
FROM -Y- STA. 13+50 TO STA. 14+50 RT.
FROM -Y- STA. 15+50 TO STA. 19+14 LT.
FROM -Y- STA. 19+14 TO STA. 20+00 LT.
FROM -Y- STA. 15+50 TO STA. 19+14 RT.
FROM -Y- STA. 19+14 TO STA. 20+00 RT.

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



Type of Liner= Class B Rip-Rap

FROM -Y- STA. 19+50 TO STA. 20+00 RT

NOTES:
1. ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE SHOWN.
2. SEE TRACK PLANS FOR TRACK DRAINAGE.
3. SEE SHEET 22 FOR -L- PROFILE & -Y- PROFILE.

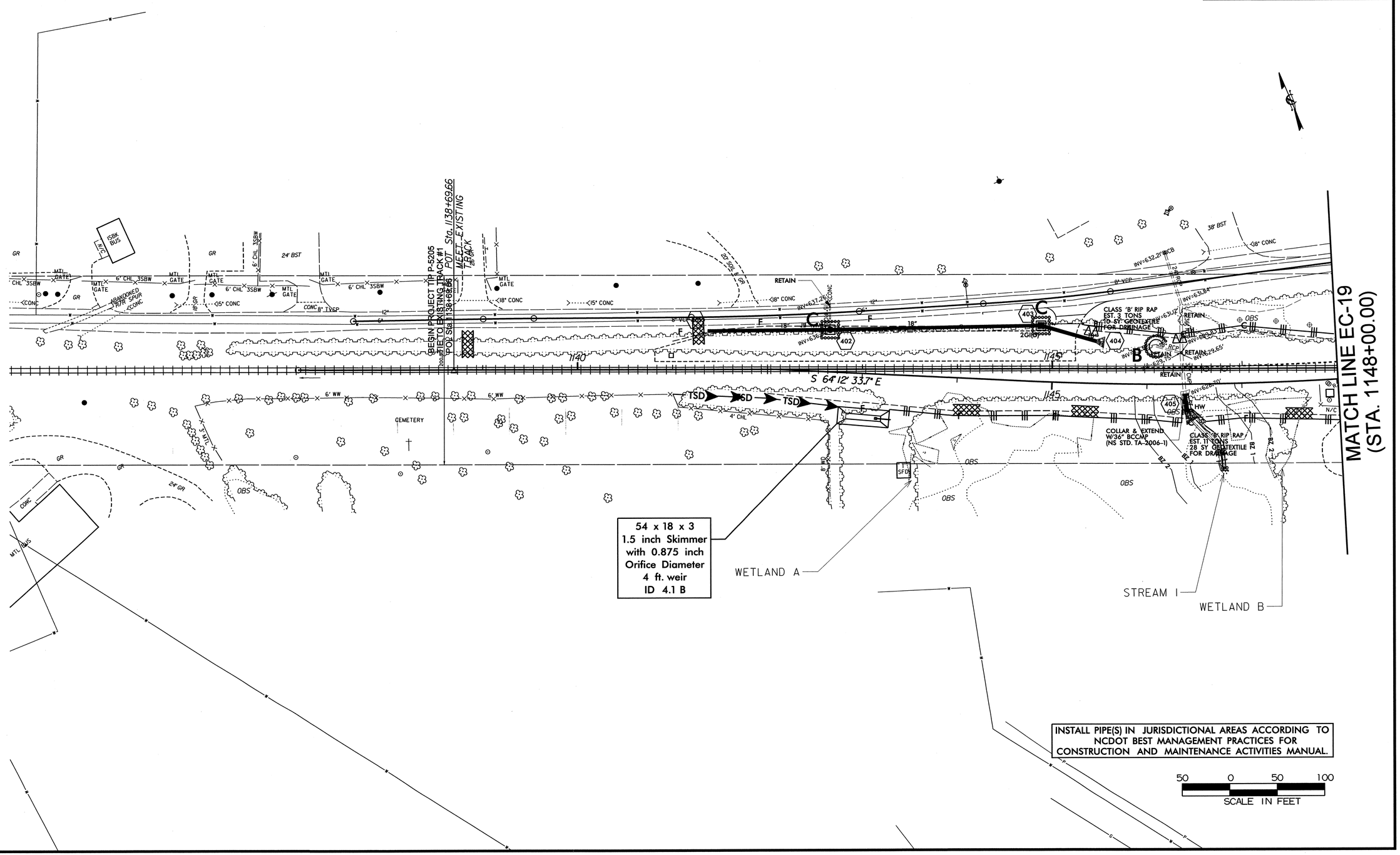
REVISIONS

PLOT DRIVER: NCDOT.pdf.color_eng.50.plt PENTABLE: NCDOT_EC_BW.tbl
USER: wyelver† TIME: 9:35:11 AM
FILE: North Carolina_Dept_of_Transportation\NCDOT_How_River_Sidlng\V3.00_CAD\BID PACKAGE - Track Roadbed\P-5205_EC-17.dgn
DATE: 4/15/2013

DCN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-18/CONST.-04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



6/21/2013
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440 S. Church Street, Suite 1000, Charlotte, NC 28202
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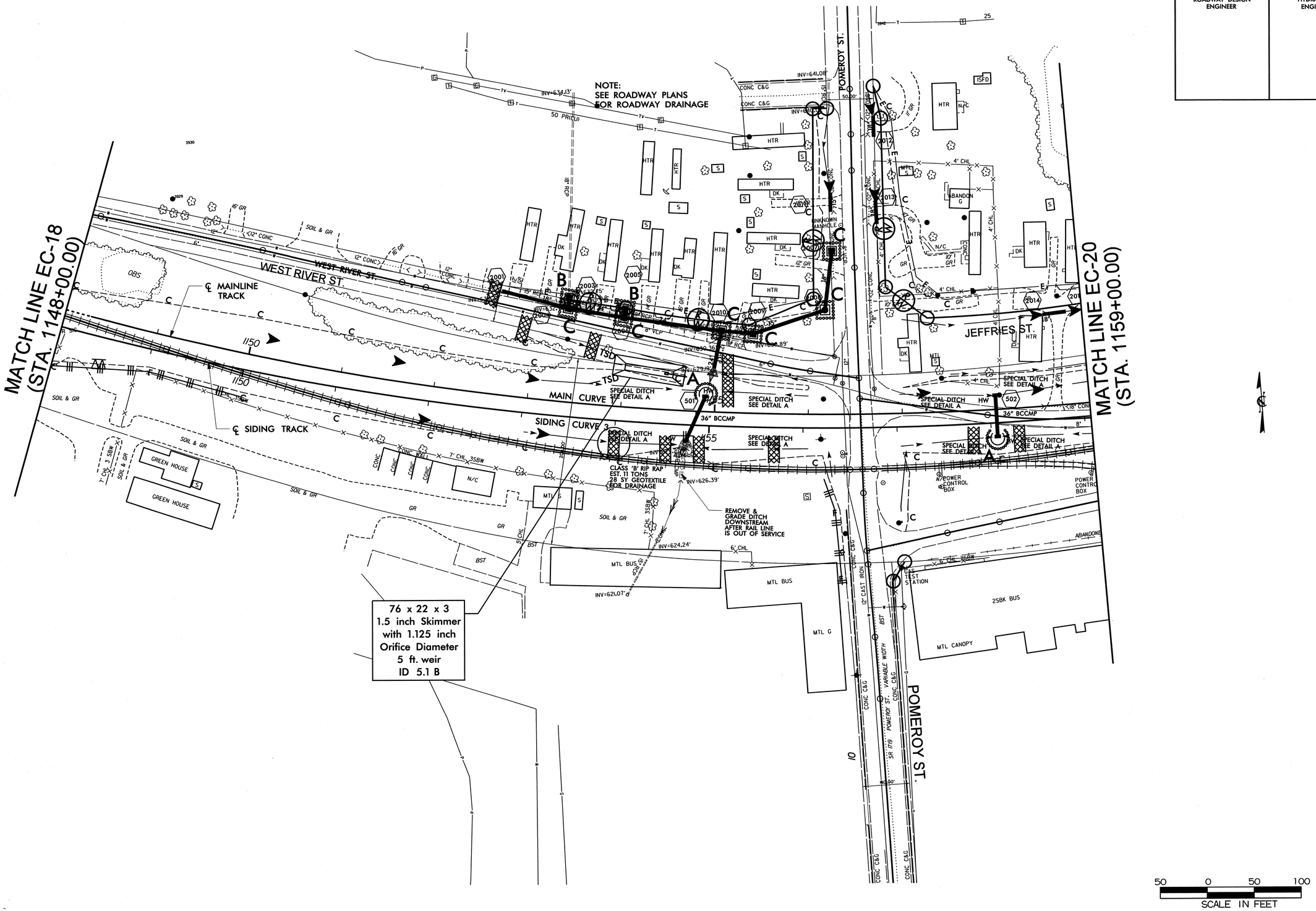
PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-19/CONST.-05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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4/15/2013
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9:16:25 AM

DGN 0016DEL_P01

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440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-20/CONST.-06
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

MATCH LINE EC-19
(STA. 1159+00.00)

MATCH LINE EC-21
(STA. 1170+00.00)

JEFFRIES ST.

55 x 18 x 3
ID 6.1 F

VAL MAP Sta.1168+94=
SIDING Sta.1168+47

MP H-24

MILE MARKER 24

ISBK BUS

ISFD

ABANDONED ISF BUS

GAS TEST STATION

ISBKD

POWER PEDESTAL

(NCDOT STD. 866.03)

(NCDOT STD. 866.03)

50 0 50 100
SCALE IN FEET

4/15/2013
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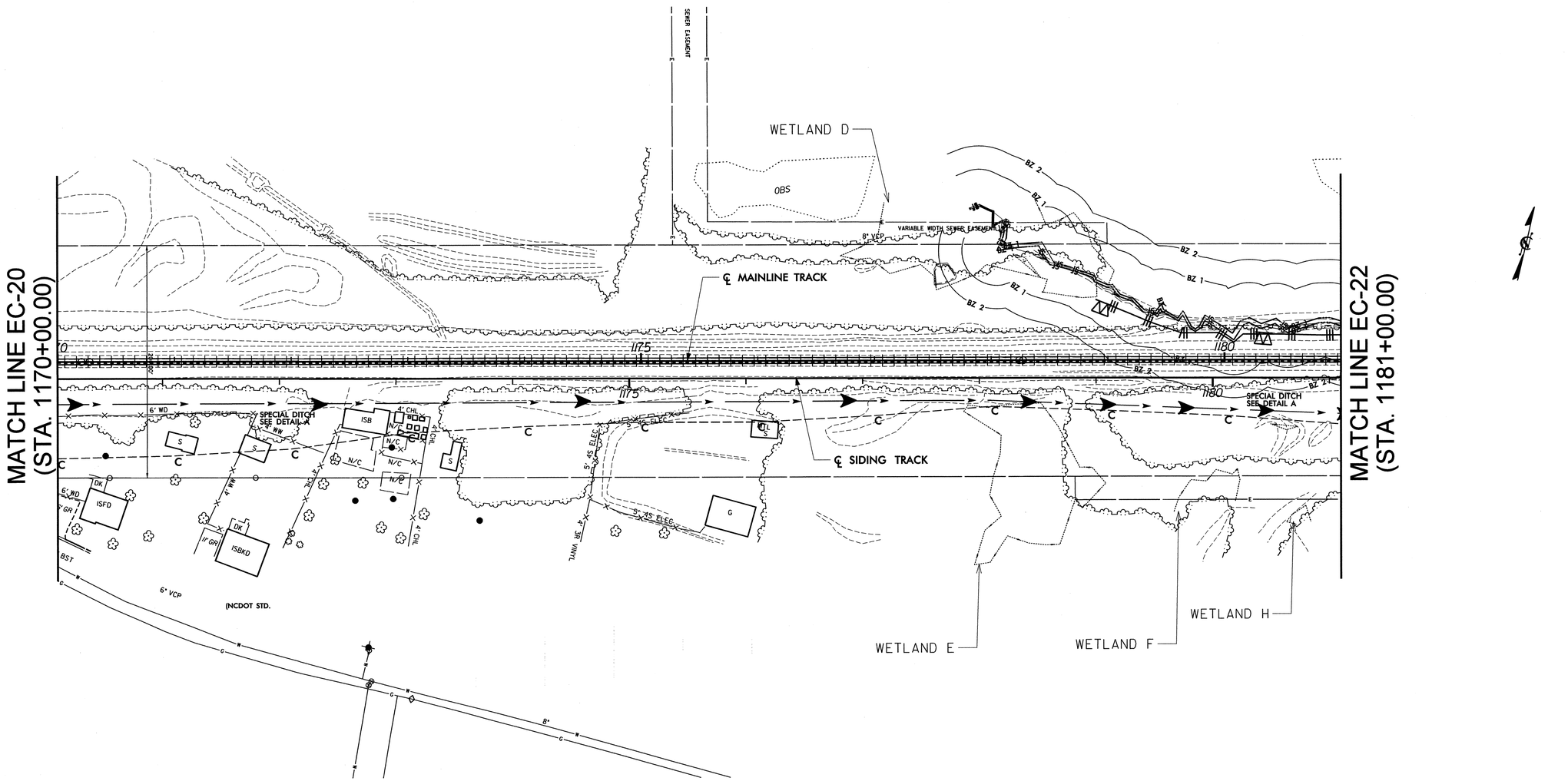
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-21/CONST.-07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DGN 0016DEL_P01



50 0 50 100
SCALE IN FEET

4/15/2013
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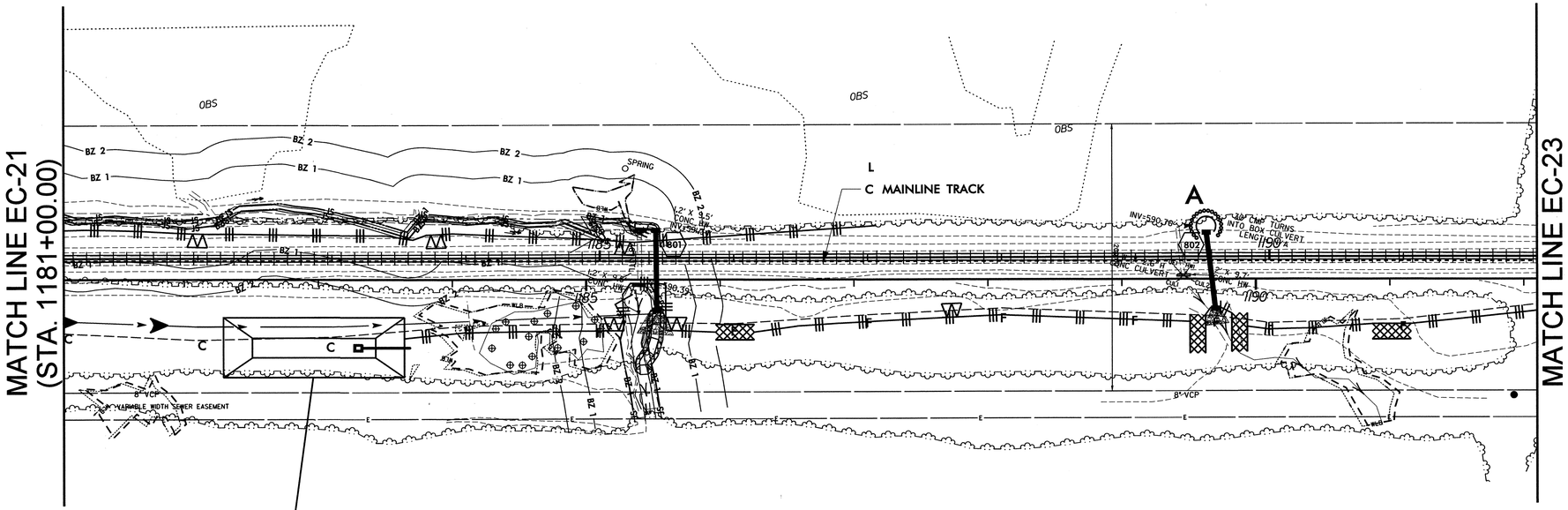
9:18:19 AM

HDR Engineering, Inc. of the Carolinas 440 S. Church Street, Suite 1000, Charlotte, NC 28202 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.	SHEET NO.
	P-5205	EC-22/CONST.-08
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DCN 0016DEL_P01

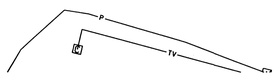
INSTALL PIPE(S) IN JURISDICTIONAL AREAS ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.



135 x 45 x 3
2.5 inch Skimmer
with 2.125 inch
Orifice Diameter
22 ft. weir
ID 8.1 B

Place Matting for Erosion Control on Slope as Work Allows.

STA. 1184+00 TO 1186+00 RT



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SCALE IN FEET

4/15/2013
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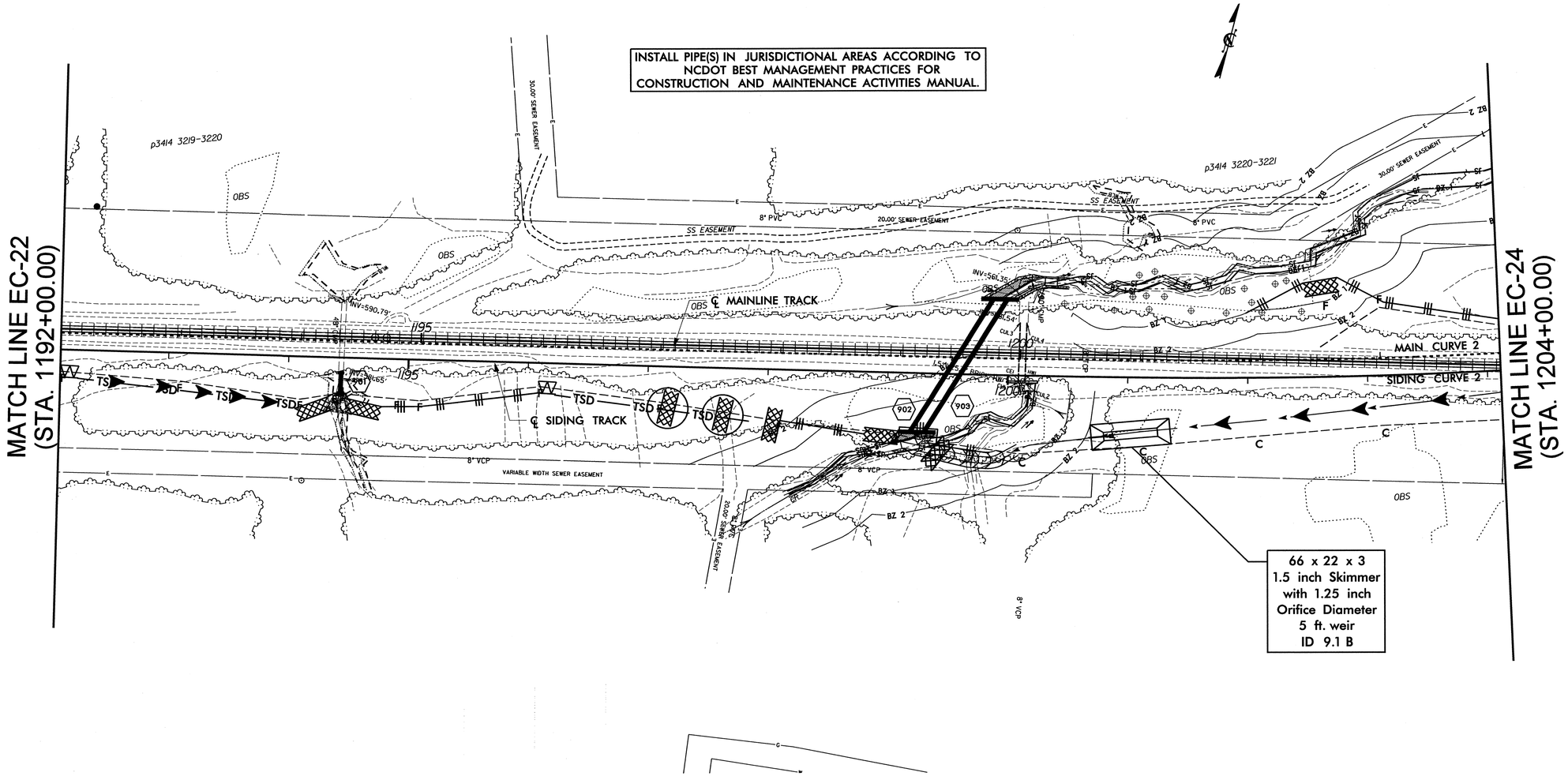
9:19:34 AM

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-23/CONST.-09
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DGN 0016DEL_P01



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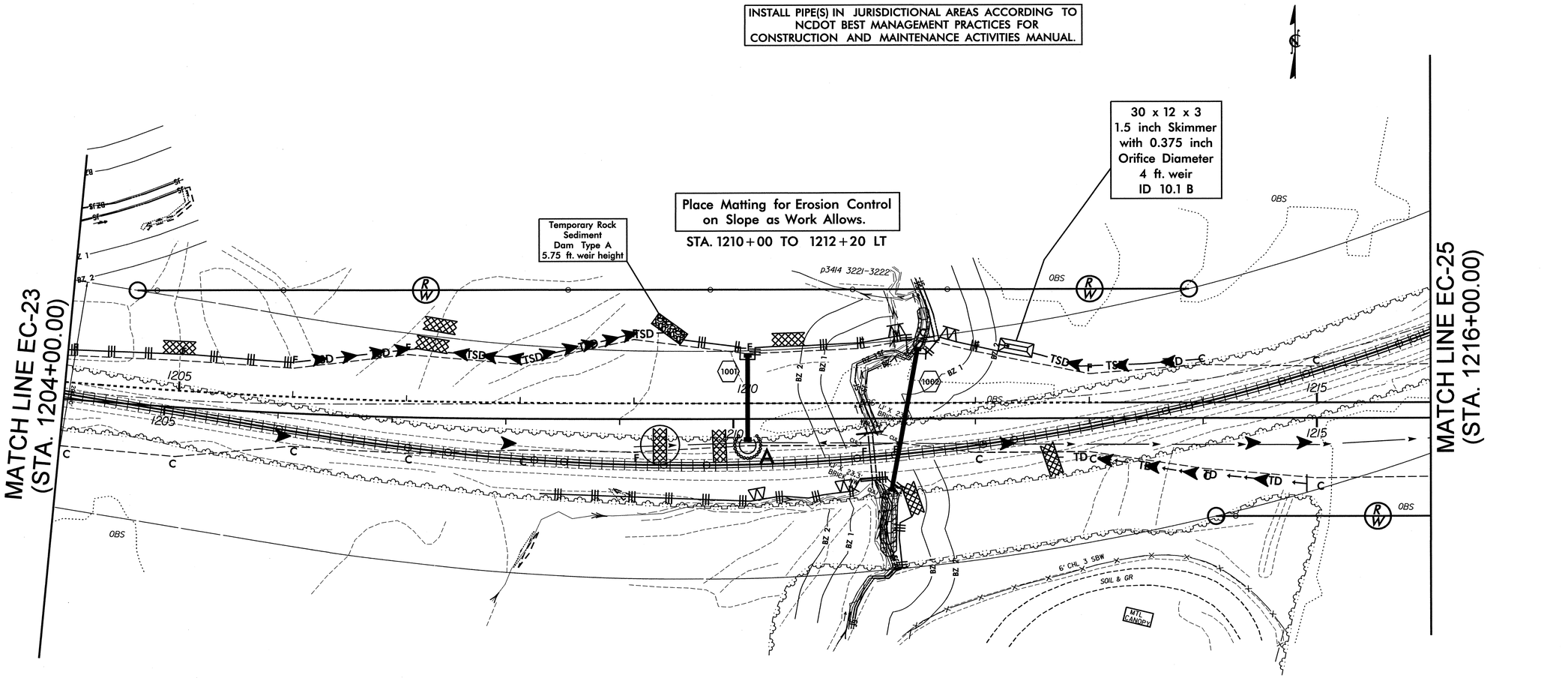
9:20:32 AM

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-24/CONST.-10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DCN 0016DEL_P01

INSTALL PIPE(S) IN JURISDICTIONAL AREAS ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.



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DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-25/CONST.-11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEAN WATER DIVERSION

(Not to Scale)

p3414 3222-3223

12 INCH SLOPE DRAIN PIPE

USE FOR ALL SLOPE DRAINS

MATCH LINE EC-24 (STA. 1216+00.00)

MATCH LINE EC-26 (STA. 1227+00.00)

38 x 18 x 3 ID 11.9 B

44 x 15 x 3 4 ft. weir ID 11.4 B

66 x 22 x 3 4 ft. weir ID 11.5 B

70 x 24 x 3 4 ft. weir ID 11.6 B

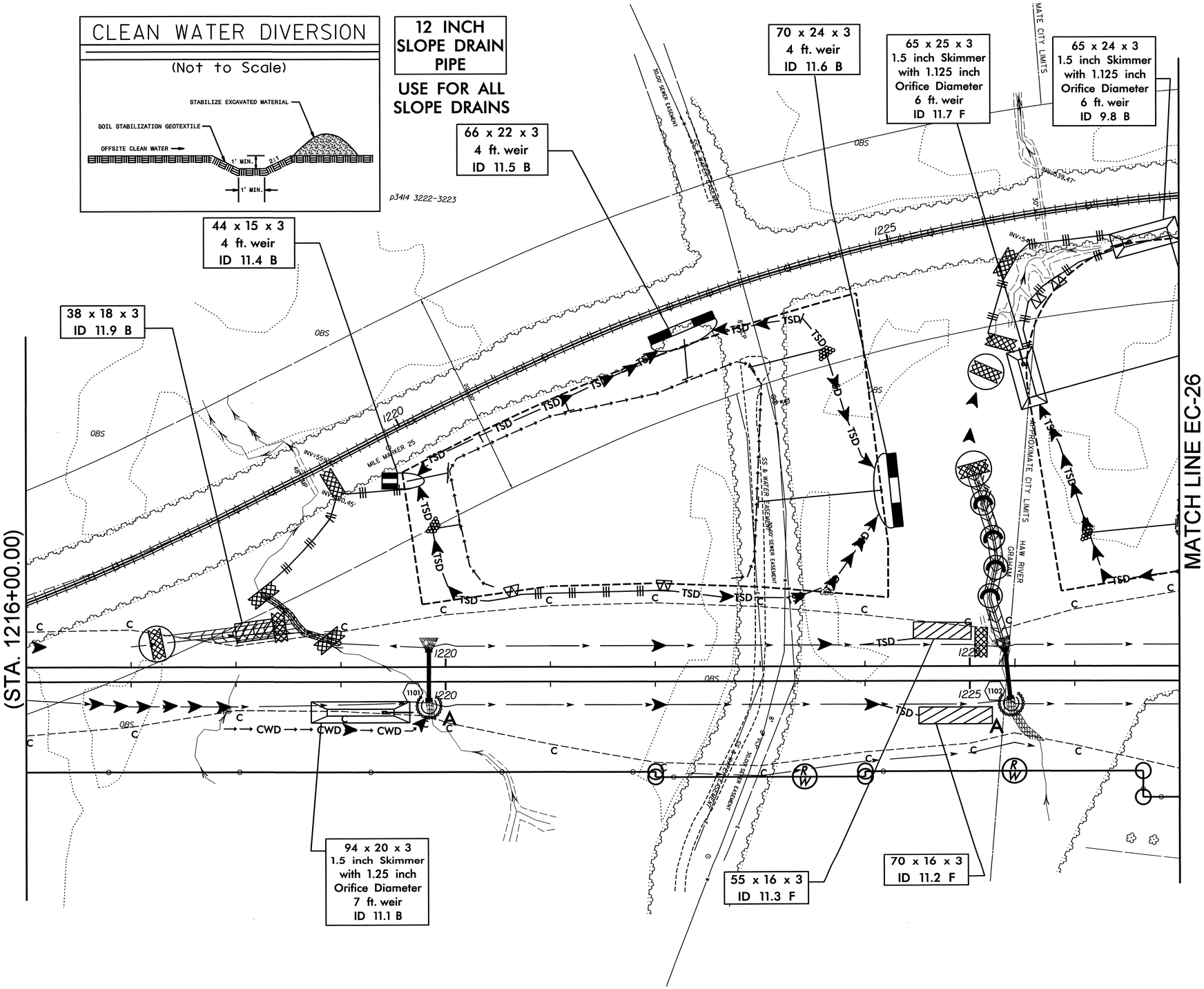
65 x 25 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 6 ft. weir ID 11.7 F

65 x 24 x 3 1.5 inch Skimmer with 1.125 inch Orifice Diameter 6 ft. weir ID 9.8 B

94 x 20 x 3 1.5 inch Skimmer with 1.25 inch Orifice Diameter 7 ft. weir ID 11.1 B

55 x 16 x 3 ID 11.3 F

70 x 16 x 3 ID 11.2 F



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12:54 PM

DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-26/CONST.-12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

p3414 3223-3224

60 x 24 x 3
4 ft. weir
ID 12.5 B

12 INCH
SLOPE DRAIN
PIPE

USE FOR ALL
SLOPE DRAINS

82 x 24 x 3
ID 12.6 B

70 x 22 x 3
1.5 inch Skimmer
with 1.125 inch
Orifice Diameter
6 ft. weir
ID 12.7 B

MATCH LINE EC-25
(STA. 1227+00.00)

MATCH LINE EC-27
(STA. 1237+00.00)

INSTALL RIP RAP DITCH
W/CLASS B RIP RAP
EST. 14 TONS
30 SY GEOTEXTILE
FOR DRAINAGE
PER NCDOT STD. 876.04

SPECIAL DITCH
SEE DETAIL A

80 x 16 x 3
ID 12.1 F

60 x 15 x 3
ID 12.2 F

1.5 inch Skimmer
with 1.0 inch
Orifice Diameter
14 ft. weir with
3.25 ft. weir height
ID 12.3 F
(See Earthen Dam
with Skimmer Detail)

1.5 inch Skimmer
with 0.875 inch
Orifice Diameter
11 ft. weir with
3.0 ft. weir height
ID 12.4 F
(See Earthen Dam
with Skimmer Detail)

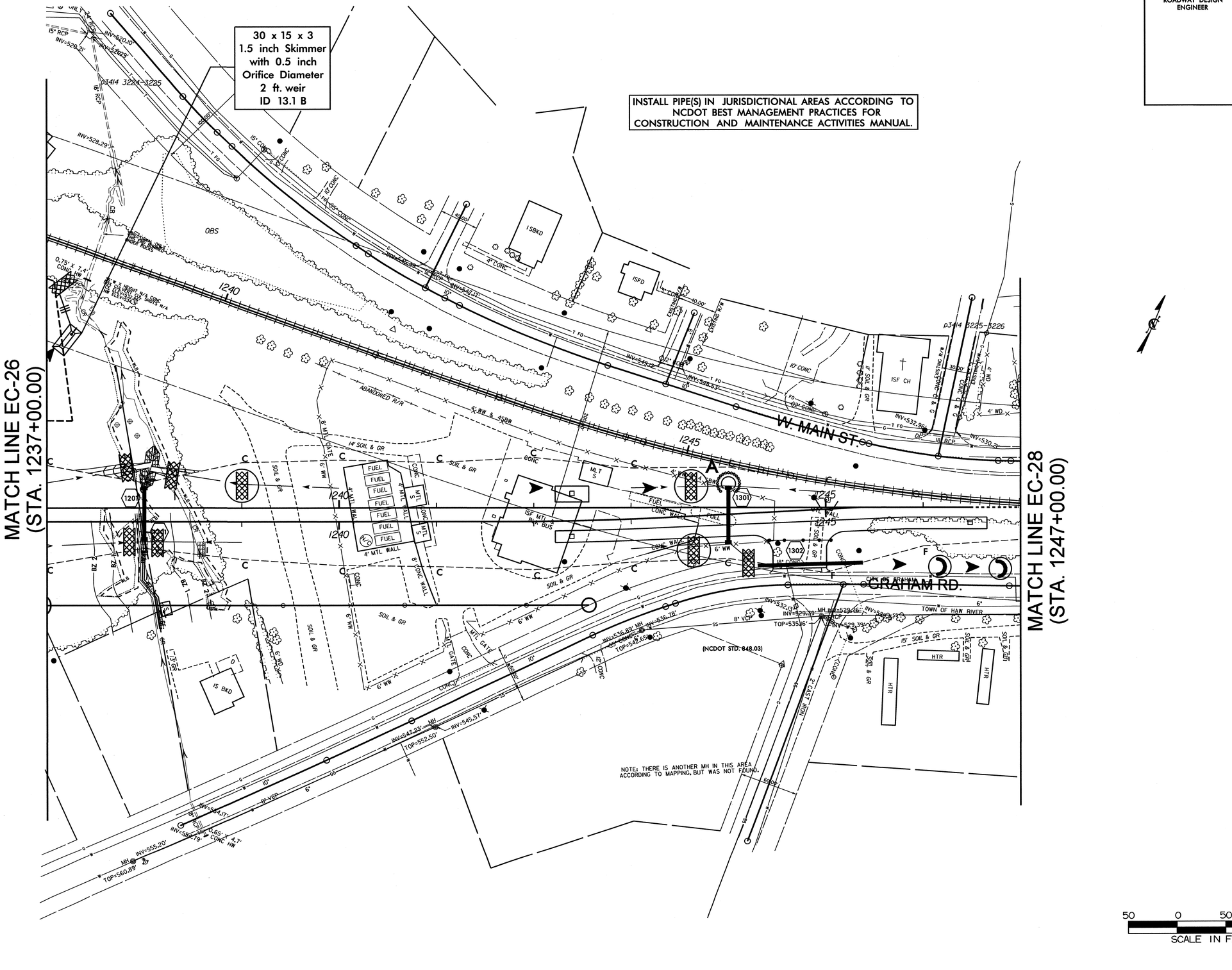
50 0 50 100
SCALE IN FEET

4/15/2013
S:\EAS\20413842\P-5205_EC-26.dgn

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-27/CONST.-13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DCN 0016DEL_P01



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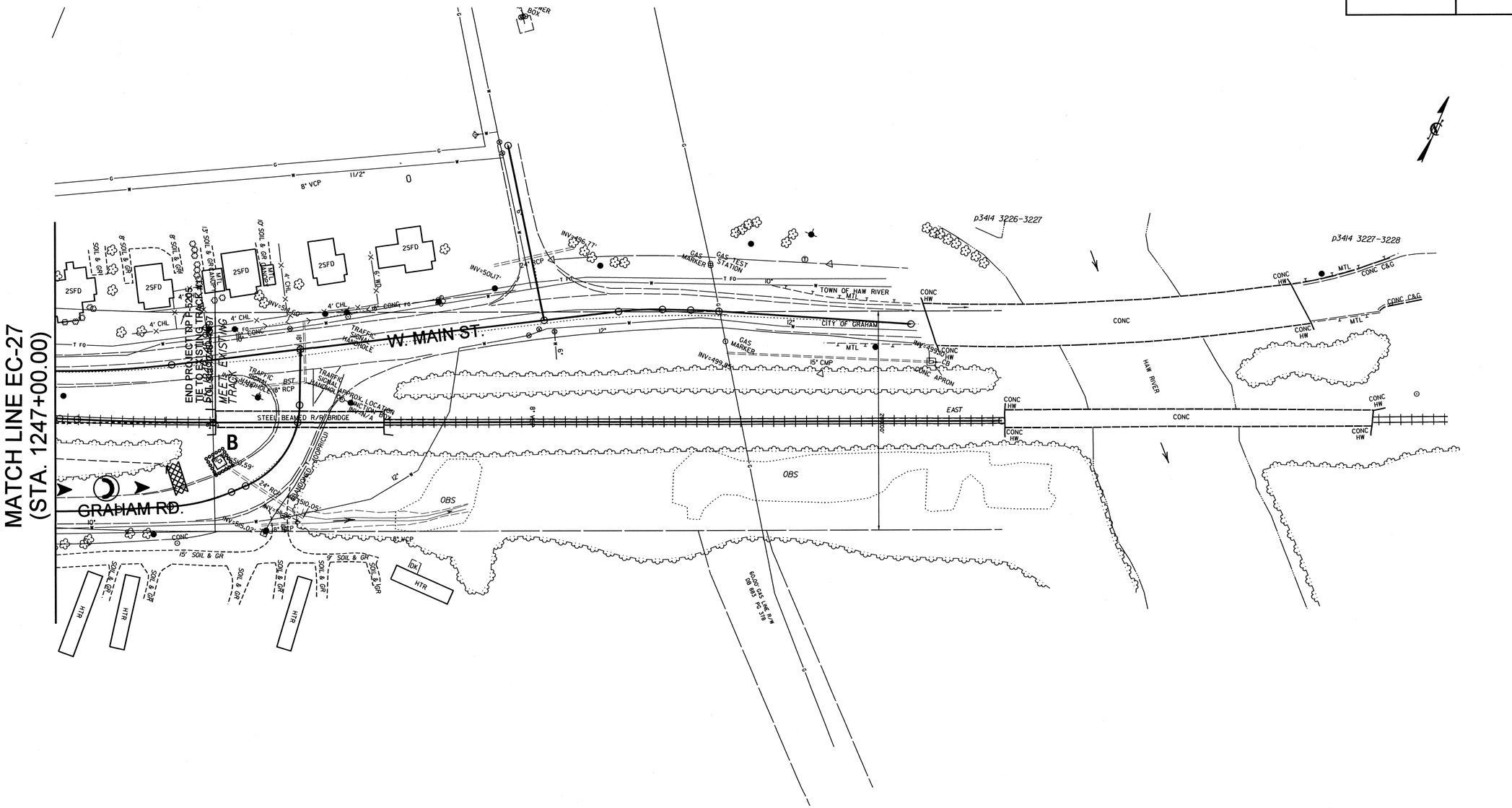
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-28/CONST.-14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



DCN 0016DEL_P01

4/15/2013
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9:27:05 AM

PROJECT REFERENCE NO.	SHEET NO.
P-5205	EC-29/RDY CONST.-04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612
N.C.B.E.L.S. License Number: F-0116

NAD 83/NSRS 2007

0016DEL_P01

REVISIONS

-Y-

PI Sta 15+62.72
Δ = 27° 53' 54.3" (LT)
D = 3° 49' 11.0"
L = 730.38'
T = 372.58'
R = 1,500.00'
DS = 40 MPH
SE = 3%

PI Sta 20+03.21
Δ = 73° 51' 52.5" (LT)
D = 52° 05' 13.5"
L = 141.81'
T = 82.69'
R = 110.00'
DS = 20 MPH
SE = 2%

-L- POT Sta. 19+24.39

END CONSTRUCTION
-L- STA. 17+15.00

END PAVING
-L- STA. 16+80.00

-Y- POT Sta. 10+00.00

-L- POC Sta.14+31.74 =
-Y- POC Sta.15+02.93

-Y- PC Sta. 11+90.14

-L- PT Sta. 15+83.31

-Y- PCC Sta. 19+20.52

55 x 18 x 3
ID 6.1 F

END CONSTRUCTION
-Y- STA. 22+00.33

END PAVING
-Y- STA. 21+58.00

-Y- POT Sta. 22+00.33

-Y- PT Sta. 20+62.33

BEGIN CONSTRUCTION
-Y- STA. 11+16.63

BEGIN PAVING
-Y- STA. 11+90.00

76 x 22 x 3
1.5 inch Skimmer
with 1.125 inch
Orifice Diameter
5 ft. weir
ID 5.1 B

-L- POC Sta.13+65.30 =
Mainline Track Sta.1156+55.77

-L- POC Sta.13+50.80 =
Siding Track Sta.1156+62.20

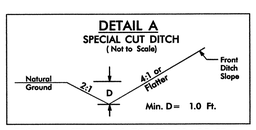
-L-
PI Sta 13+53.96
Δ = 2° 37' 43.3" (RT)
D = 0° 34' 22.6"
L = 458.79'
T = 229.44'
R = 10,000.00'
DS = 40 MPH
SE = NC

BEGIN CONSTRUCTION
BEGIN PAVING
-L- STA. 11+85.00

-L- POT Sta. 10+00.00

-L- PC Sta. 11+24.52

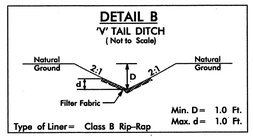
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



Min. D= 1.0 Ft.

FROM -L- STA. 12+50 TO STA. 13+25 RT
FROM -Y- STA. 11+50 TO STA. 13+50 RT.
FROM -Y- STA. 13+50 TO STA. 14+50 RT.
FROM -Y- STA. 15+50 TO STA. 19+14 LT.
FROM -Y- STA. 19+14 TO STA. 20+00 LT.
FROM -Y- STA. 15+50 TO STA. 19+14 RT.
FROM -Y- STA. 19+14 TO STA. 20+00 RT.

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



Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
Type of Liner= Class B Rip-Rap

FROM -Y- STA. 19+50 TO STA. 20+00 RT

NOTES:
1. ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE SHOWN.
2. SEE TRACK PLANS FOR TRACK DRAINAGE.
3. SEE SHEET 22 FOR -L- PROFILE & -Y- PROFILE.

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_EC_BW.tbl
USER: wyelver† DATE: 4/15/2013 TIME: 9:29:39 AM
FILE: North Carolina Dept_of_Transportation\NCDOT_Haw_River_Siding\13.00_CAD\BID PACKAGE - Track Roadbed\P-5205_EC-29.dgn

0016DEL_P01

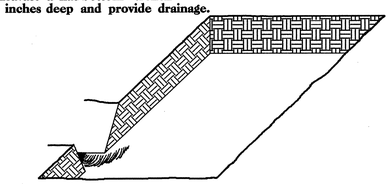
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5205	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

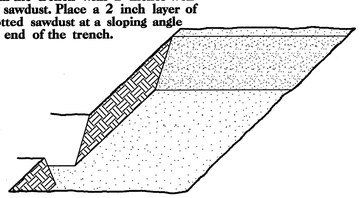
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

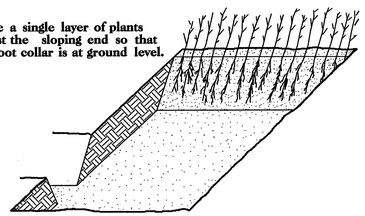
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



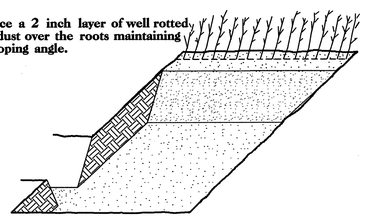
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

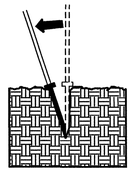


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

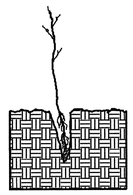


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

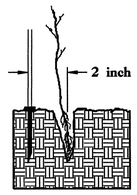
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



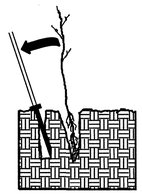
1. Insert planting bar as shown and pull handle toward planter.



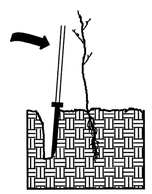
2. Remove planting bar and place seedling at correct depth.



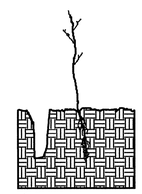
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

0016DEL_P01

T.I.P.: P-5205

CONTRACT: 70007950

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TIP NO.	SHEET NO.
P-5205	S-1

APPROVED: David Kerns

DATE: 4/16/2013

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030881 ENGINEER DAVID H. KERNS

SIGNING PLAN
ALAMANCE COUNTY

LOCATION: HAW RIVER PASSING SIDING AND MAINLINE FROM NCRR MP H-23.4 WEST OF POMEROY ST. (SR 1719) CROSSING TO MP H-25.5 AT THE NC 49 UNDERPASS

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

. SIGNS FURNISHED BY CONTRACTOR
. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	131.25	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	252	L.F.
4102000000	904	SIGN ERECTION, TYPE E	18	EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	7	EA.

PROJECT NOTES

1 DISPOSAL OF SIGN SYSTEM, U-CHANNEL

INDEX

SHEET NO.	DESCRIPTION
S-1	TITLE SHEET
S-2	E SIGN SHEET
S-3	SIGNING PLAN SHEET

PLAN PREPARED BY: HDR ENGINEERING OF THE CAROLINAS, INC

D. KERNS, PE SIGNING PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

4/16/2013
PW:\\PWAPPTPA01:SouthEast_Tampa\Documents\000166\0000000000105485\13.00_CAD\Traffic\Signing\P5205_sgn_tsh.dgn
10:23:45 AM

0016DEL_P01

TIP NO.	SHEET NO.
P-5205	S-2

APPROVED: David H. K

DATE: 4/16/2013

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030881 ENGINEER DAVID H. KERNS

(401) QUANTITY REQ'D 3

30 X 30
R1-1

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 5

24 X 24
R3-2

MOUNT BELOW SIGN 401 IN THREE INSTALLATIONS
ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 3

30 X 36
R3-5R

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 2

36" DIA.
W10-1

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 1

30 X 30
W1-1L

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D 1

30 X 30
W1-1R

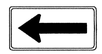
ONE "U" POST PER SIGN

(407) QUANTITY REQ'D 2

18 X 18
W13-1

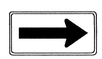
MOUNT BELOW SIGN 405 IN ONE INSTALLATION
MOUNT BELOW SIGN 406 IN ONE INSTALLATION

(408) QUANTITY REQ'D 1



48 X 24
W1-6L

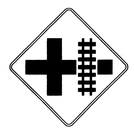
(409) QUANTITY REQ'D 1



48 X 24
W1-6R

TWO "U" POSTS PER SIGN

(410) QUANTITY REQ'D 1



36 X 36
W10-2R

ONE "U" POST PER SIGN

(411) QUANTITY REQ'D 2

24 X 30
R4-7

ONE "U" POST PER SIGN

TYPE "E" SIGNS

4/16/2013
P:\PWAPPTPA01\SouthEast_Tampa\Documents\000166\0000000000105485\13.00_CAD\Traffic\Signing\P5205_sgn_tsh.dgn
10:24:01 AM

PROJ. REFERENCE NO.	SHEET NO.
P-5205	S-3

NAD 83/NSRS 2007

NOTE: RAILROAD CROSSING GATES AND FLASHERS NOT IN CONTRACT

REVISIONS		
CADD FILE		

APPROVED: [signature] DATE: 4/16/2013

NORTH CAROLINA PROFESSIONAL SEAL 030881 ENGINEER DAVID H. KERNS

PROPOSED AND EXISTING SIGNS

SCALE:
DATE: 4/16/2013
DWG. BY:
DESIGN BY:
REVIEWED BY:

DIVISION OF HIGHWAYS TRAFFIC ENGINEERING BRANCH DEPARTMENT OF TRANSPORTATION SIGNING & DELINEATION

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000 Charlotte, N.C. 28202
N.C.B.E.L.S. License Number: F-0116

PLOT DRIVER: NCDOT_pdf_color_eng.50.pit
USER: dkerns
FILE: North Carolina.Dept.of.Transportation\NCDOT_How_River_Siding\13.00_CAD\Traffic\Signing\P5205_sgn_psh03.dgn
PENTABLE: NCDOT_Signing.tbl
DATE: 4/16/2013
TIME: 10:25:27 AM

0016DEL_P01

0016DEL_P01 09/08/99

TIP PROJECT: P-5205

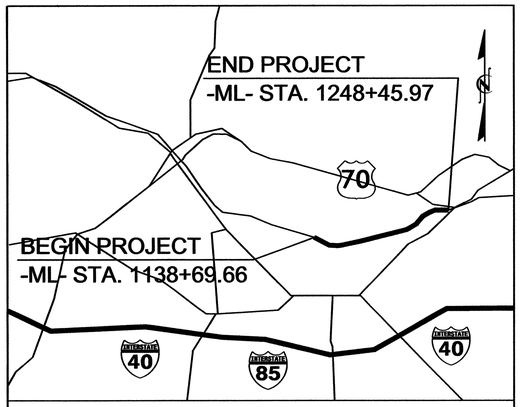
CONTRACT: 203129

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5205	UC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50000.1.STR03T1B		PE/UTIL PE
50000.1.STR04T3		PE/UTIL PE
39364		ROW
50000.3.STR01T4A		CONST/UTIL CONST



VICINITY MAP

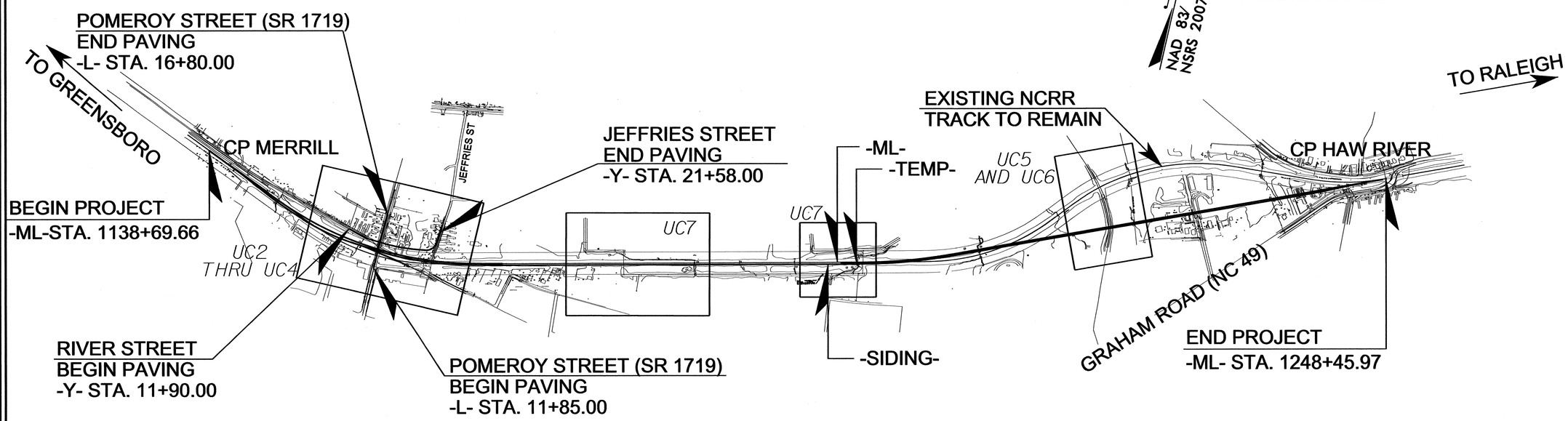
LOCATION: HAW RIVER PASSING SIDING AND MAINLINE FROM NCRR MP H-23.4 WEST OF POMEROY ST. (SR1719) CROSSING TO MP H-25.5 AT THE NC 49 UNDERPASS

TYPE OF WORK: WATER AND SEWER RELOCATION

UTILITY OWNER: CITY OF GRAHAM

LEGEND

WATER LINE	—W—
SEWER LINE	—SS—
MANHOLE	
VALVE	
FIRE HYDRANT	
PIPE ABANDONMENT	//////////



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA
-L-

ADT 2013	=	7,900
ADT 2035	=	12,300
DHV	=	10 %
D	=	55 %
T	=	1.1% *
V	=	40 MPH

PROJECT LENGTH

LENGTH RAILWAY TIP PROJECT P-5205	=	2.079 mi.
TOTAL LENGTH TIP PROJECT P-5205	=	2.079 mi.

Prepared in the Office of:
HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
June 3, 2011

LETTING DATE:
AUGUST 20, 2013

EDGAR LEICHT, P.E.
RAIL PROJECT ENGINEER
EDGAR LEICHT, P.E.
RAIL PROJECT DESIGN ENGINEER
RANDALL T. PLUMMER, P.E.
UTILITIES ENGINEER
MICHAEL DARBY, P.E.
HYDRAULICS PROJECT ENGINEER
JASON ORTHNER, P.E.
NCDOT PROJECT MANAGER

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER
05/09/13

SIGNATURE: Randall T. Plummer P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION

ENGINEERING AND SAFETY BRANCH
CAPITAL YARD
1556 MAIL SERVICE CENTER
RALEIGH, NC 27699-1556

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

0016DEL_P01

DGN

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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-2
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER 06/28/2013

HOR: 50 0 50 100 SCALE IN FEET

VERT: 5 0 5 10 SCALE IN FEET

GENERAL NOTES:

1. ALL GRAVITY SEWER PIPING SHALL BE DUCTILE IRON WITH PROTECTO 401 LINING, OR EQUAL.
2. PROVIDE BYPASS PUMPING AS NECESSARY TO MAINTAIN SERVICE.

KEY NOTES:

1. ABANDON EXISTING MANHOLE
2. ABANDON EXISTING 8-IN GRAVITY SEWER
3. PROVIDE INSIDE DROP FOR PROPOSED SEWER TIE-IN FROM THE NORTH

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

0016DEL_P01

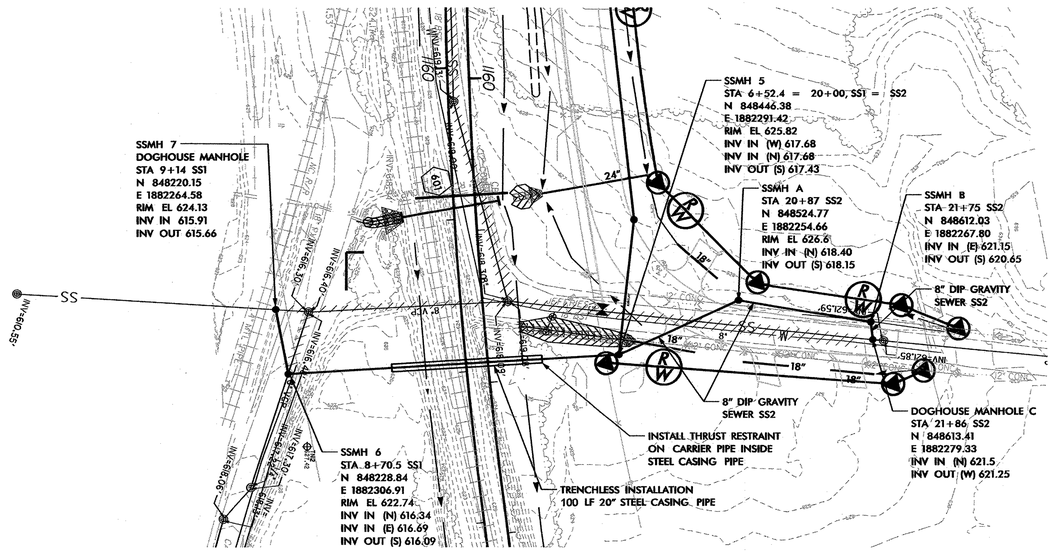
DGN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-3
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER 06/28/2013



HOR: 50 0 50 100 SCALE IN FEET

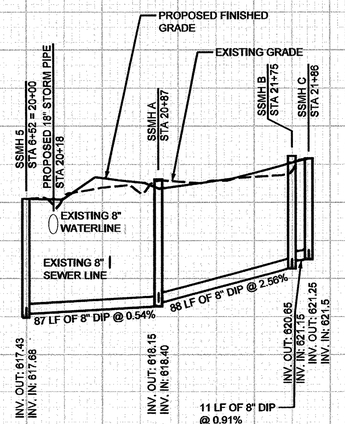
VERT: 5 0 5 10 SCALE IN FEET

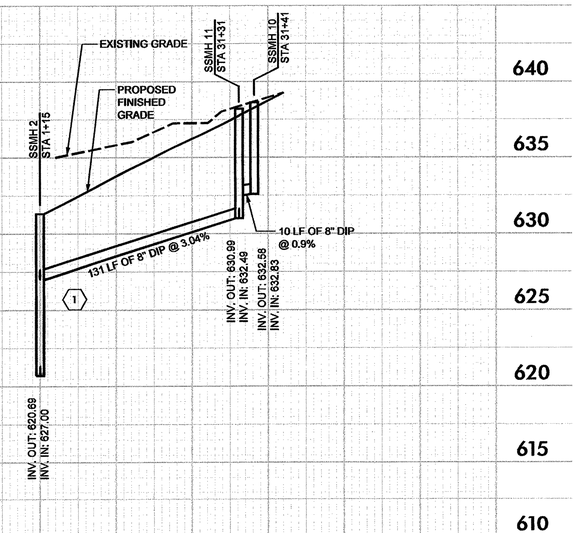
GENERAL NOTES:

1. ALL GRAVITY SEWER PIPING SHALL BE DUCTILE IRON WITH PROTECTO 401 LINING, OR EQUAL.
2. PROVIDE BYPASS PUMPING AS NECESSARY TO MAINTAIN SERVICE.

KEY NOTES:

(1) PROVIDE INSIDE DROP FOR GRAVITY SEWER ENTERING SSMH 2





0016DEL_P01

DGN

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-4
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER

06/28/2013

GENERAL NOTES:

1. THRUST RESTRAINT AT FITTINGS SHALL BE ACCOMPLISHED BY CONCRETE BLOCKING AND MECHANICAL JOINT RESTRAINT DEVICE MEETING ANSI/AWWA C110/A21.10.
2. WATER LINE TO BE TESTED AND DISINFECTED PER SECTION 1510.
3. ALL WORK SHALL BE IN ACCORDANCE WITH CITY OF GRAHAM STANDARDS.
4. ALL PIPING TO BE DUCTILE IRON. SEE PLANS FOR LOCATIONS WHERE THRUST RESTRAINT IS REQUIRED.

KEY NOTES

(1) INSTALL, TEST AND DISINFECT WATERLINE AND VALVES FROM VALVES AT TIE-IN POINTS. UPON APPROVAL OF ALL TESTS AND AT THE DIRECTION OF THE ENGINEER AND CITY OF GRAHAM CUT-IN BENDS ON THE EXISTING PIPE AND CONNECT NEW PIPE TO EXISTING PIPE SIMULTANEOUSLY.

COORDINATE WITH CITY OF GRAHAM FOR TEMPORARY SHUT DOWN OF EXISTING LINE TO MAKE THIS CONNECTION. THESE CONNECTIONS SHALL BE PERFORMED WITHIN A 6 HOUR PERIOD WHILE THE LINE IS SHUT DOWN.

(2) REMOVE EXISTING FIRE HYDRANT FOR CITY OF GRAHAM TO PICK UP. ABANDON EXISTING 8" GATE VALVE IN PLACE BY CLOSING VALVE, REMOVE VALVE BOX AND LID FOR CITY OF GRAHAM TO PICK UP.

(3) PROVIDE 6" DIP AND FITTINGS AS REQUIRED TO TIE-IN TO EXISTING 6" WATERLINE. PROVIDE THRUST RESTRAINT FOR TIE-IN.

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

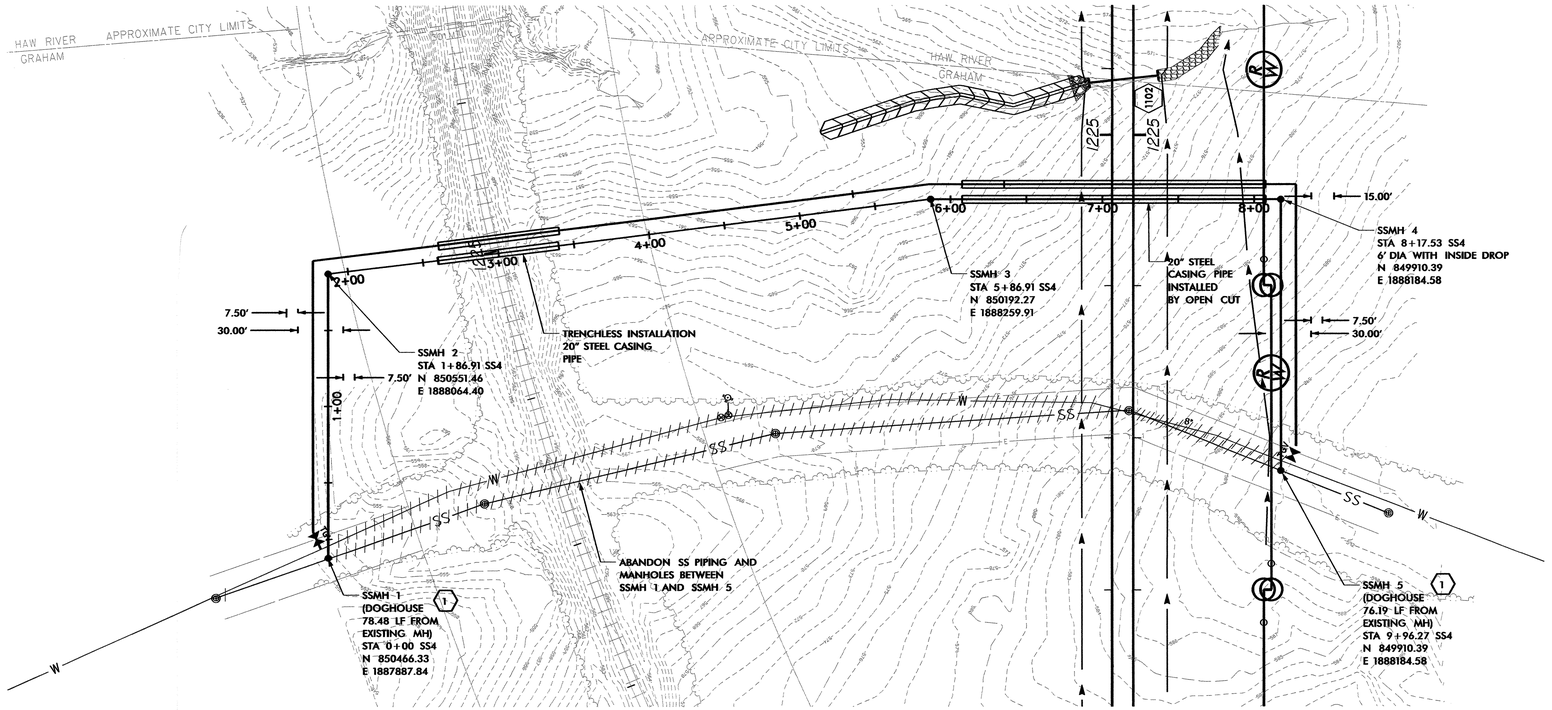
DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-5
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER 4/12/13



GENERAL NOTES:

1. SEWER LINE SHALL BE TESTED PER SECTION 1520.
2. ALL WORK SHALL BE IN ACCORDANCE WITH CITY OF GRAHAM STANDARDS.
3. ALL SANITARY SEWER PIPING SHALL BE CLASS 50 DUCTILE IRON WITH PROTECTO 401 LINING.

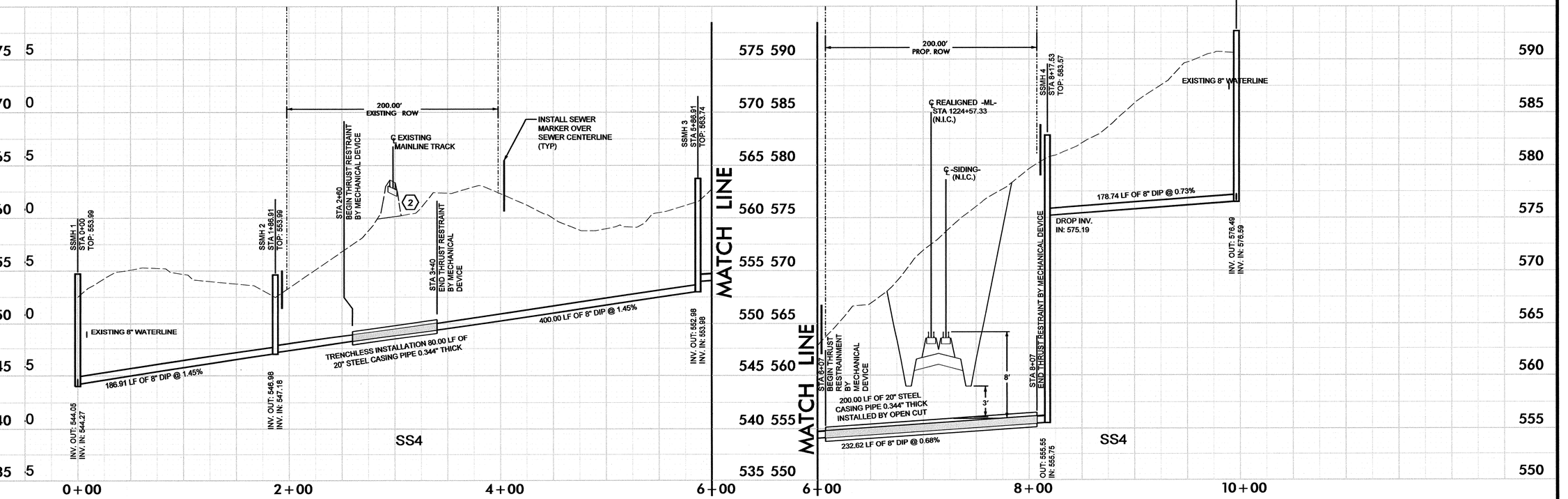
KEY NOTES

(1) FILL EXISTING INVERT WITH GROUT TO FORM NEW INVERT FOR 8" SEWER, AND PLUG THE INLET/OUTLET PIPES TO BE ABANDONED.

(2) WHEN EXISTING MAINLINE TRACK IS ABANDONED, NCDOT RAIL DIVISION SHALL REMOVE EXISTING TRACK AND FILL EMBANKMENT FOR MAINTENANCE OF WATER AND SEWER LINE.

VERT: 5 0 5 10 SCALE IN FEET

HOR: 50 0 50 100 SCALE IN FEET



DGN 0016DEL_P01

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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-6
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 30004 RANDALL T. PLUM
4/12/13

HAW RIVER APPROXIMATE CITY LIMITS
GRAHAM

℄ EXISTING MAINLINE TRACK

33
RUTH ISLEY KIMREY
DB 497 PG 660

TRENCHLESS INSTALLATION
20" STEEL CASING PIPE

END RJ
STA 3+55 W4
N 850360.88
E 1888174.26

STA 1224+67.33
-ML-

BEGIN THRUST RESTRAINT
STA 5+91.13

8" WATERLINE
11.25° BEND
STA 6+01.13 W4
N 850196.74
E 1888268.88

20" STEEL CASING PIPE
INSTALLED BY OPEN CUT

8" 90° BEND
STA 8+42.38 W4
N 849910.39
E 1888184.58

STA 1224+57.33
-ML-

10' MIN. BETWEEN
OUTSIDE WALL
OF PIPE (TYP)

HAWFIELDS LIMITED PARTNERSHIP #3
DB 1248 PG 473

8" 90° BEND
8" 11.25° BEND
STA 1+91.69 W4
N 850551.46
E 1888064.40

8" 45° BEND
STA 0+14.05 W4
N 850482.57
E 1887900.66

8" GATE BEND
STA 0+05 W4
N 850478.56
E 1887896.98

CUT-IN 8" 90° BEND
BEGIN THRUST RESTRAINT
STA 0+00 W4
N 850473.20
E 1887891.92

ABANDON WATERLINE BETWEEN
TIE-INS AT STA 0+00 AND 10+27
SEE KEY NOTE

8" 45° BEND
STA 10+14.93 W4
N 849907.45
E 1888203.37

8" GATE VALVE
STA 10+22.47 W4
N 849907.25
E 1888197.11

CUT-IN 8" 90° BEND
END RJ PIPE
STA 10+27.47 W4
N 849907.05
E 1888190.84

MH (TO BE ABANDONED)
TOP=563.07'
INV=556.67'
INV=554.83'

MH (TO BE ABANDONED)
TOP=569.75'
INV=560.64'
INV=562.42'

MH (TO BE ABANDONED)
INV=576.14'
TOP=582.79'
INV=576.19'

MH
TOP=593.34'
INV=576.87'

MH
INV=536.53'
TOP=540.84'

8" VCP
30.00' SEWER EASEMENT
GRAVEL ACCESS ROAD

℄ -SIDING-
℄ REALIGNED -ML-

N 67°12'16.2" E

-ML- STA 1221+27

7.50'
30.00'
PUE

VERT: 5 0 5 10
SCALE IN FEET

HOR: 50 0 50 100
SCALE IN FEET

GENERAL NOTES:

1. RESTRAINT AT FITTINGS SHALL BE ACCOMPLISHED BY CONCRETE BLOCKING AND MECHANICAL JOINT RESTRAINT DEVICE MEETING ANSI/AWWA C110/A21.10.
2. WATER LINE TO BE TESTED AND DISINFECTED PER SECTION 1510.
3. ALL WORK SHALL BE IN ACCORDANCE WITH CITY OF GRAHAM STANDARDS.

KEY NOTES

(1) INSTALL, TEST AND DISINFECT WATERLINE AND VALVES FROM STA 0+05 TO STA 10+22.47. UPON APPROVAL OF ALL TESTS AND AT THE DIRECTION OF THE ENGINEER AND CITY OF GRAHAM, CUT-IN 90° BENDS ON THE EXISTING PIPE AND CONNECT BOTH ENDS OF THE NEW PIPE TO EXISTING PIPE SIMULTANEOUSLY.

COORDINATE WITH CITY OF GRAHAM FOR TEMPORARY SHUT DOWN OF EXISTING LINE TO MAKE THIS CONNECTION. THESE CONNECTIONS SHALL BE PERFORMED WITHIN A 6 HOUR PERIOD WHILE THE LINE IS SHUT DOWN.

(2) REMOVE EXISTING FIRE HYDRANT FOR CITY OF GRAHAM TO PICK UP. ABANDON EXISTING 8" GATE VALVE IN PLACE BY CLOSING VALVE, REMOVE VALVE BOX AND LID FOR CITY OF GRAHAM TO PICK UP.

(3) WHEN EXISTING MAINLINE TRACK IS ABANDONED, NCDOT RAIL DIVISION SHALL REMOVE EXISTING TRACK AND FILL EMBANKMENT FOR MAINTENANCE ACCESS OF WATER AND SEWER LINE.

(4) ROTATE 11.25° BEND AS NECESSARY TO ALIGN PIPE WITH THE 20" STEEL CASING PIPE.

STA 0+00.00
8" 90° BEND
BEGIN THRUST RESTRAINT

STA 0+05
8" VALVE

STA 0+14.05
8" 45° BEND

STA 1+91.69
HORIZONTAL 60° BEND
11.25° BEND

STA 2+75
BEGIN THRUST
RESTRAINT

STA 3+55
END THRUST
RESTRAINT

STA 5+91.13
BEGIN THRUST RESTRAINT

℄ EXISTING TRACK

INSTALL WATER
MARKER OVER
WATER CENTERLINE
(TYP)

200.00'
EXISTING ROW

8" DIP WATERLINE

TRENCHLESS INSTALLATION 80.00 LF OF
20" STEEL CASING PIPE 0.344" THICK

MATCH LINE

W4

STA 8+01.13
11.25° BEND

200.00'
PROP. ROW

℄ REALIGNED -ML-
STA 1124+57.33
(N.I.C.)

℄ -SIDING-
(N.I.C.)

STA 8+42.38
HORIZONTAL 90° BEND AND 45°
BEND ROTATED DOWN

STA 10+22.47
8" GATE VALVE

STA 10+27.47
8" 90° BEND
END THRUST RESTRAINT

200.00 LF OF 20" STEEL
CASING PIPE 0.344" THICK
INSTALLED BY OPEN CUT

8.75'
3.6'

45° BEND ROTATED
VERTICALLY

575 570 565 560 555 550 545 540 535
590 585 580 575 570 565 560 555 550
0+00 2+00 4+00 6+00 6+00 8+00 10+00

SYSTIMEUSER

DGN 0016DEL_P01

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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-7
R/W SHEET NO.	

UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER 4/12/13

GENERAL NOTES:

1. CONNECT SPLIT CASING PIPE TO EXISTING CASING PIPE WITH RESTRAINED COUPLING TO PROVIDE WATER TIGHT SEAL.
2. INSTALL THRUST RESTRAINT DEVICES ON EXISTING JOINTS THAT WILL BE INSIDE SPLIT CASING PIPE.

HOR: 50 0 50 100 SCALE IN FEET

VERT: 5 0 5 10 SCALE IN FEET

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

DGN 0016DEL_P01

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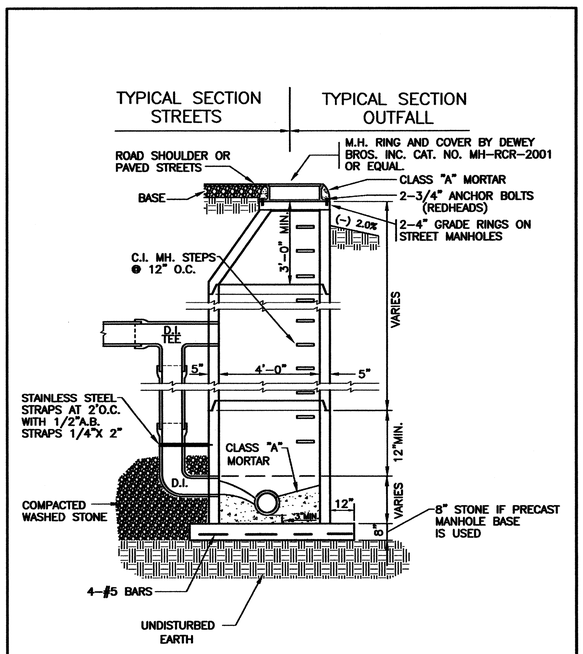
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-8
R/W SHEET NO.	

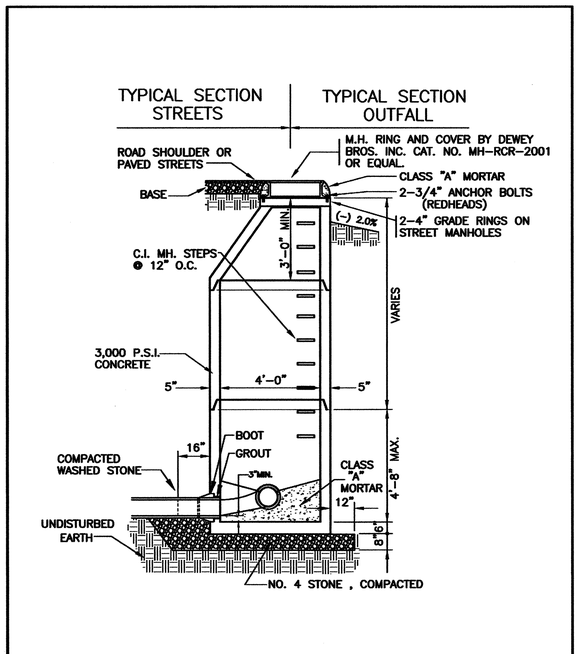
UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER MARSHALL T. PLUMMER
4/12/13



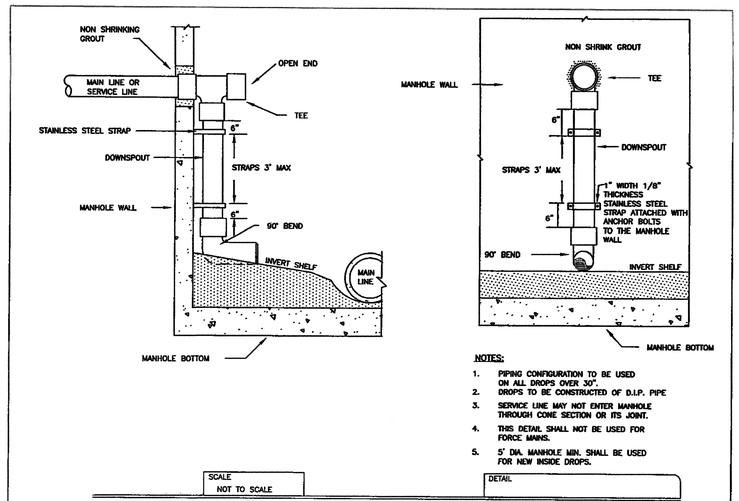
SS-1

CITY OF GRAHAM	STD. PRECAST DROP MANHOLE
	SCALE :N.T.S. DATE : 4/4/96 JOB NO. :DROPMH



SS-2

CITY OF GRAHAM	STD. PRECAST MANHOLE
	SCALE :N.T.S. DATE : 4/4/96 JOB NO. :PRECSTMH



NOTES:

1. PIPING CONFIGURATION TO BE USED ON ALL DROPS OVER 30".
2. DROPS TO BE CONSTRUCTED OF D.I.P. PIPE
3. SERVICE LINE MAY NOT ENTER MANHOLE THROUGH CONE SECTION OR ITS JOINT.
4. THIS DETAIL SHALL NOT BE USED FOR FORCE MAINS.
5. 5' DIA. MANHOLE MIN. SHALL BE USED FOR NEW INSIDE DROPS.

SCALE NOT TO SCALE | DETAIL

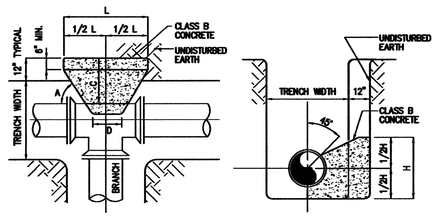
STANDARD INSIDE DROP FOR SANITARY SEWER SERVICE

CITY OF GRAHAM

THRUST BLOCK - TEES

SCALE :N.T.S. DATE : 4/4/96 JOB NO. :TB-TEES

W-2



PLAN – TEE SECTION

BUTTRESS DIMENSIONS				
B. D.	L	H	C	D
6"	1'-3"	1'-0"	SEE NOTE NO. 1	SEE NOTE NO. 2
8"	1'-6"	1'-4"		
12"	2'-3"	2'-0"		

B. D. = BRANCH DIAMETER

NOTES:

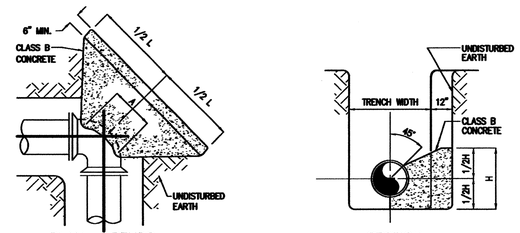
1. DIMENSION "C" SHOULD BE LARGE ENOUGH TO MAKE ANGLE "A" EQUAL TO OR GREATER THAN 45°.
2. DIMENSION "D" SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH EHT MECHANICAL JOINTS.
3. BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.

W-2

CITY OF GRAHAM

THRUST BLOCK - BENDS

SCALE :N.T.S. DATE : 4/4/96 JOB NO. :TB-BENDS



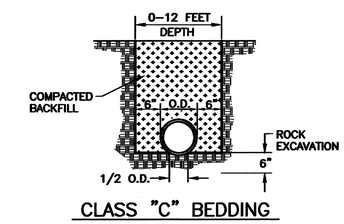
PLAN – BENDS SECTION

BUTTRESS DIMENSIONS						
PIPE SIZE	22 1/2° BENDS		45° BENDS		90° BENDS	
	L	H	L	H	L	H
6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-4"	1'-2"
8"	1'-0"	1'-0"	1'-4"	1'-2"	1'-10"	1'-6"
12"	1'-4"	1'-4"	1'-10"	1'-10"	2'-8"	2'-3"

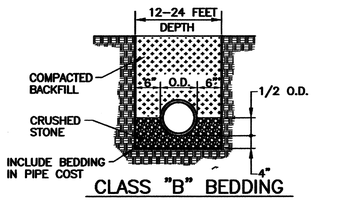
NOTES:

1. DIMENSION "A" SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH THE MECHANICAL JOINT BOLTS
2. THE SHAPE OF THE BACK OF THE BUTTRESS MAY VARY PROVIDED THE CONCRETE IS AGAINST FIRM, UNDISTURBED EARTH.
3. BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.

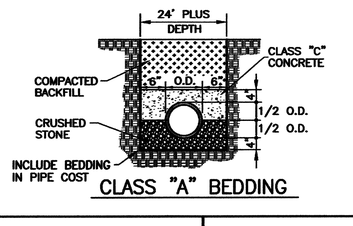
W-3



CLASS "C" BEDDING



CLASS "B" BEDDING



CLASS "A" BEDDING

SS-3

CITY OF GRAHAM	SANITARY SEWER BEDDING
	SCALE :N.T.S. DATE : 4/4/96 JOB NO. :SANIBED

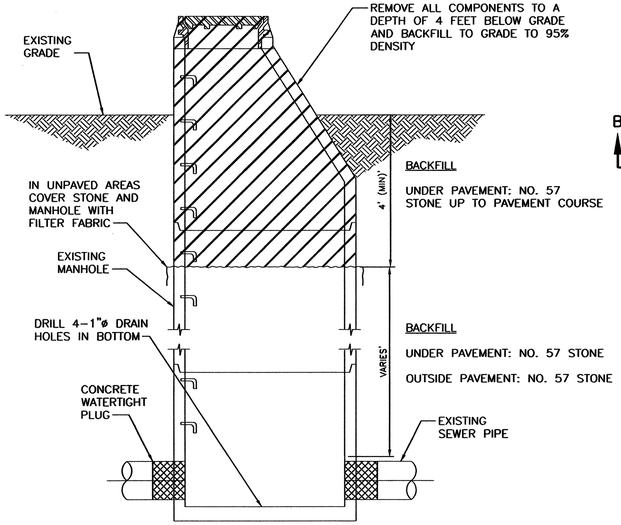
EXTERNAL DISCLAIMER

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UC-9
R/W SHEET NO.	

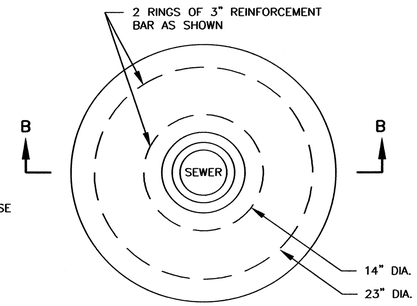
UTILITIES ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30004 ENGINEER RANDALL T. PLUMMER 2/12/13

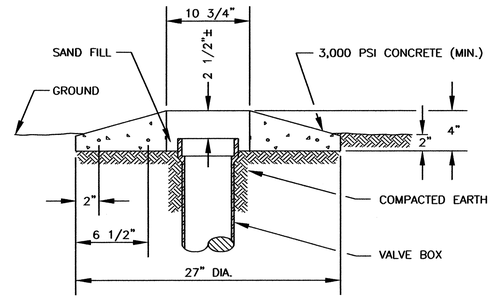


MANHOLE ABANDONMENT DETAIL 1

NTS



PLAN



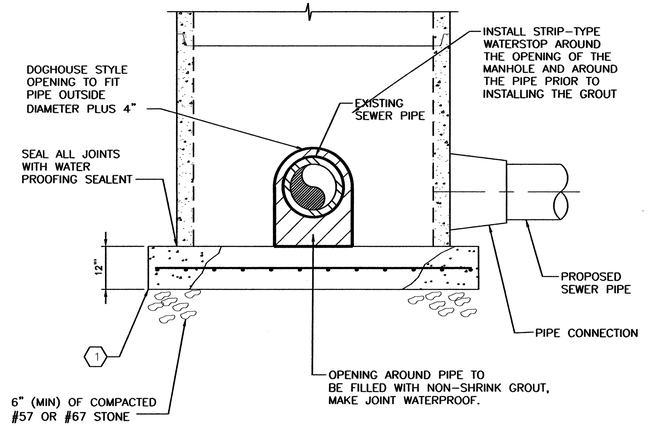
SECTION B–B

NOTES

1. TOTAL WEIGHT OF PROTECTIVE RING IS 115 LBS (MIN.).
2. TEXT TO READ "WATER" WHEN USED ON POTABLE WATER VALVE.

PROTECTIVE RING DETAIL 2

NTS

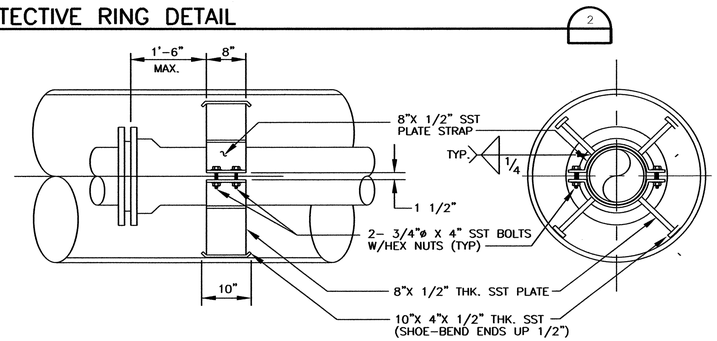


GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND SUPPORTING THE EXISTING SEWER PIPE AND MAINTAINING SEWER SERVICE DURING CONSTRUCTION OF THE MANHOLE AT NO ADDITIONAL COST.
2. CONTRACTOR TO RESHAPE INVERT.
3. FOR MANOLE WALL SECTIONS AND TOP REFER TO TOWN OF GRAHAM STANDARD MANHOLE DETAIL.
4. AFTER THE NEW SEWER SYSTEM IS PLACED INTO SERVICE, THE EXISTING SEWERS TO BE ABANDONED ENTERING AND EXITING THE MANHOLE SHALL BE PLUGGED.

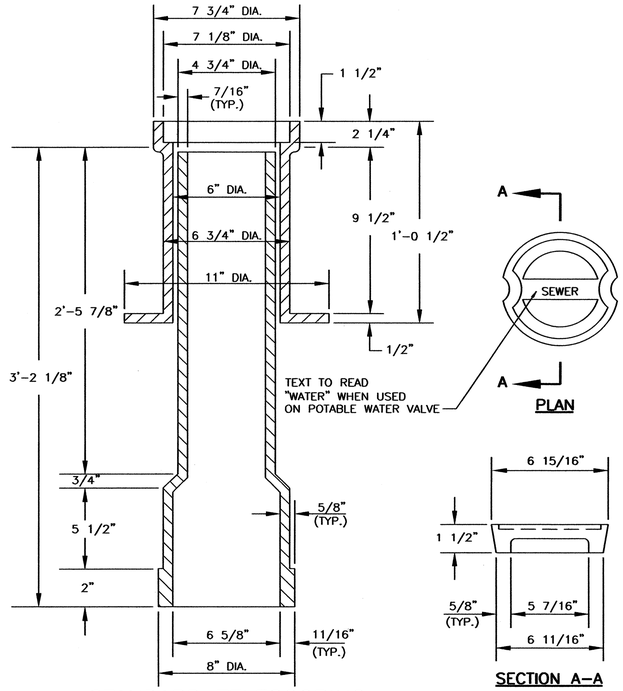
KEY NOTE

(1) POUR BASE SLAB UNDER EXISTING SEWER. REINFORCE WITH #5 REBAR @ 12" EACH WAY, CENTER IN SLAB. CONTRETE COMPRESSIVE STRENGTH SHALL BE 5,000 PSI.



CASING SECTION

END ELEVATION



PLAN

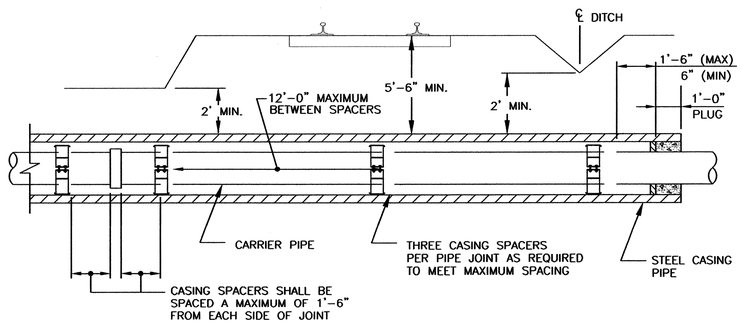
SECTION A–A

STANDARD TELESCOPING VALVE BOX DETAIL 5

NTS

CASING SPACER DETAIL 4

NTS



NOTES:

1. CASING SHALL BE PLUGGED ON BOTH ENDS BEFORE BACKFILLING. PLUGS SHALL CONSIST OF MINIMUM OF 1 LINEAR FOOT OF LOW STRENGTH GROUT (1,500 PSI MIN).
2. PROVIDE SIX-1/2" DIAMETER WEEP HOLES ON DOWNSLOPE SIDE OF CASING PLUGS.
3. THIS DETAIL DEPICTS THE MINIMUM DISTANCE THE STEEL CASING PIPE SHALL BE INSTALLED TO BOTTOM OF LOWEST RAIL, SEE APPROPRIATE SECTION DETAILS FOR CONSTRUCTION OF TRACK.

TYPICAL PIPE CROSSING 6

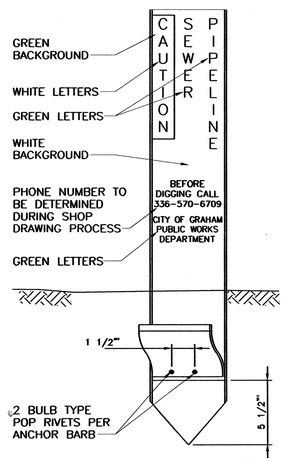
NTS

DOGHOUSE MANHOLE DETAIL 3

NTS

GENERAL NOTES

1. MARKER SHOWN IS STANDARD FOR SANITARY SEWER. FOR WATERLINE CHANGE THE WORD "SEWER" TO "WATER" AND LETTERING/BACKGROUND COLOR SHALL BE BLUE.
2. MARKERS SHALL BE CARSONITE TYPE CUM-375 OR APPROVED EQUAL. MARKERS SHALL BE PIGMENTED WITH U.V. RESISTANT RESINS OR COATED WITH CLEAR UV RESISTANT COATING.
3. DECALS SHALL BE AS SHOWN AND PROVIDED ON U.V. RESISTANT BACKING WITH TEXT CONFORMING TO THE FEDERAL OFFICE OF PIPELINE SAFETY STANDARDS AND DENOTING THE STANDARD NO-DIG SYMBOL.
4. MARKERS SHALL EXTEND 4-FEET ABOVE GRADE.
5. MARKERS SHALL BE INSTALLED WITH MANUFACTURER'S APPROVED MARKER DRIVER. BURIED DEPTH SHALL BE 24" MINIMUM FOR LOOSE, SANDY, OR MARSHY SOILS AND 18" MINIMUM FOR HARD OR ROCKY SURFACES.
6. MARKERS SHALL BE INSTALLED AT LOCATIONS INDICATED ON THE DRAWINGS, OR AS DIRECTED BY THE OWNER.



STANDARD LINE MARKER DETAIL 7

NTS

ENGINEERING SYSTEMS

0016DEL_P01

TIP PROJECT:P-5205

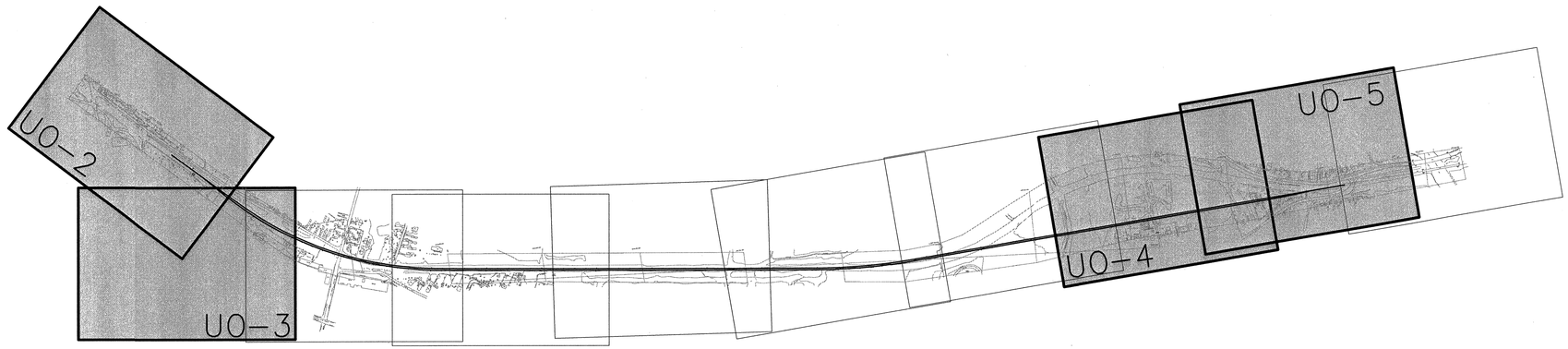
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
P-5205	UO-1

UTILITIES BY OTHERS PLANS
ALAMANCE COUNTY

LOCATION: HAW RIVER PASSING SIDING AND MAINLINE FROM NCRR MP H-23.4 WEST OF POMEROY ST. (SR1719) CROSSING TO MP H-25.5 AT THE NC 49 UNDERPASS

TYPE OF WORK: RAILROAD ROADBED FOR MAINLINE CURVE MODIFICATIONS AND SIDING TRACK; PAVING



UCC
Utility Coordination Consultants
P.O. Box 450
Mineral Springs, N.C. 28108
(704) 844-9093

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2 THRU UO-5	UTILITY BY OTHERS PLAN SHEETS

UTILITY OWNERS ON PROJECT

(1) DUKE ENERGY
(2) AT&T
(3) TWC

PID: "D735"
VRN: "03946, 03948, 03949"
FILE NUMBER: "TRK0067132"

ALL UTILITIES WORK, INCLUDING ABANDONMENT, REMOVAL, MODIFICATION AND INSTALLATION, SHALL BE SUBMITTED TO NCRR THROUGH NCRR'S OCCUPANCY AGREEMENT (REFERENCE HTTP://WWW.NCRR.COM /NCRR-CORRIDOR-FORMS.HTML) PROCESS FOR REVIEW AND APPROVAL. NO REVIEW OF UTILITIES, EXCEPT DRAINAGE PIPES, ARE INCLUDED IN THIS REVIEW.

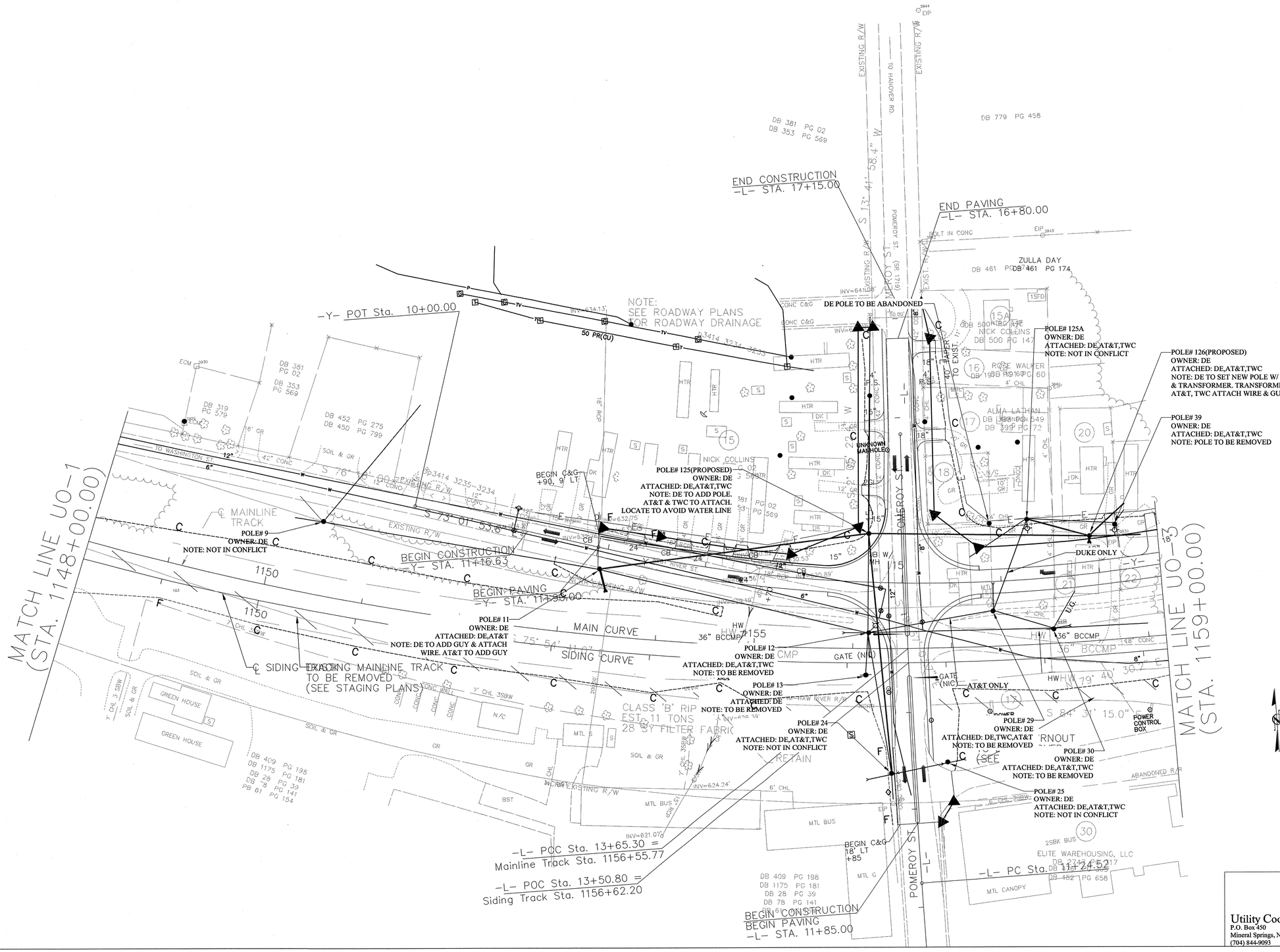
PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING
1591 MAIL SERVICES CENTER
RALEIGH NC 27699-1591
PHONE (919) 707-6690
FAX (919) 250-4151

Roger Worthington,P.E. UTILITIES SECTION ENGINEER
Xxxxx Xxxxx, P.E. UTILITIES SQUAD LEADER PROJECT ENGINEER
Xxxxx Xxxxx UTILITIES PROJECT DESIGNER

DCN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202

PROJECT REFERENCE NO.	SHEET NO.
P-5205	UO-2
R/W SHEET NO.	



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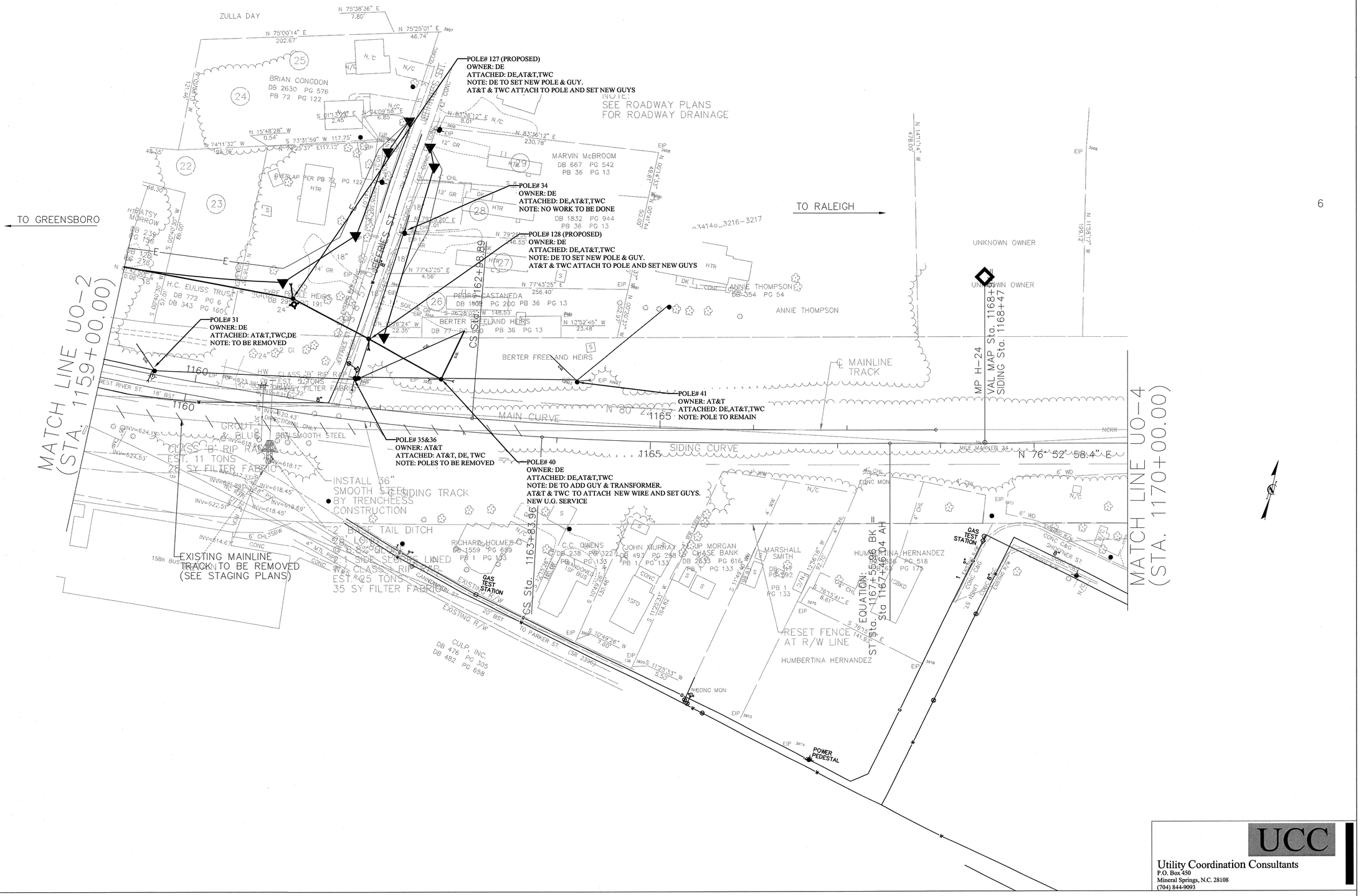
DGN 0016DEL_P01

HDR Engineering, Inc. of the Carolinas
440 S. Church Street, Suite 1000, Charlotte, NC 28202

PROJECT REFERENCE NO.	SHEET NO.
P-5205	U0-3
R/W SHEET NO.	



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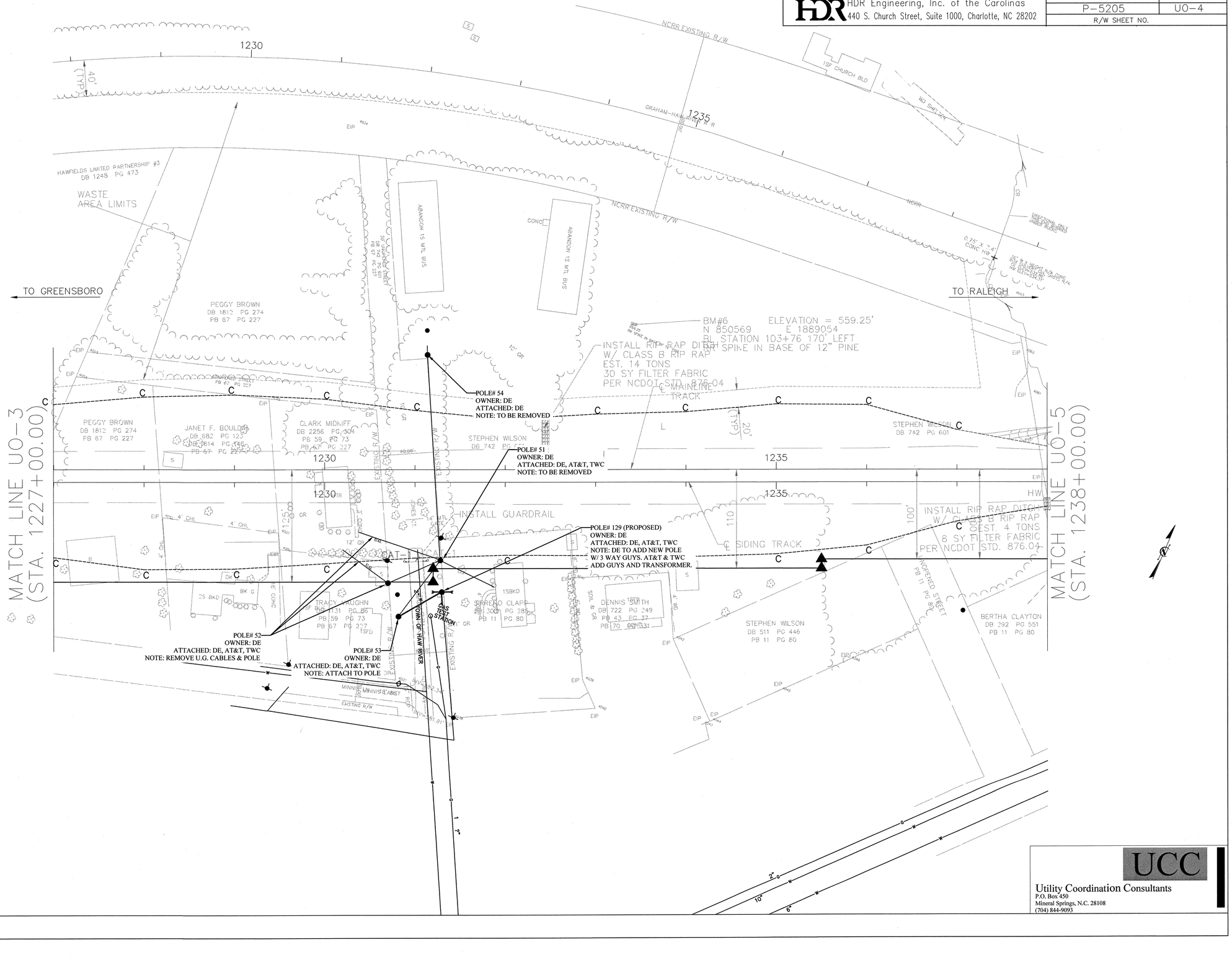
PROJECT REFERENCE NO.	SHEET NO.
P-5205	U0-4
R/W SHEET NO.	



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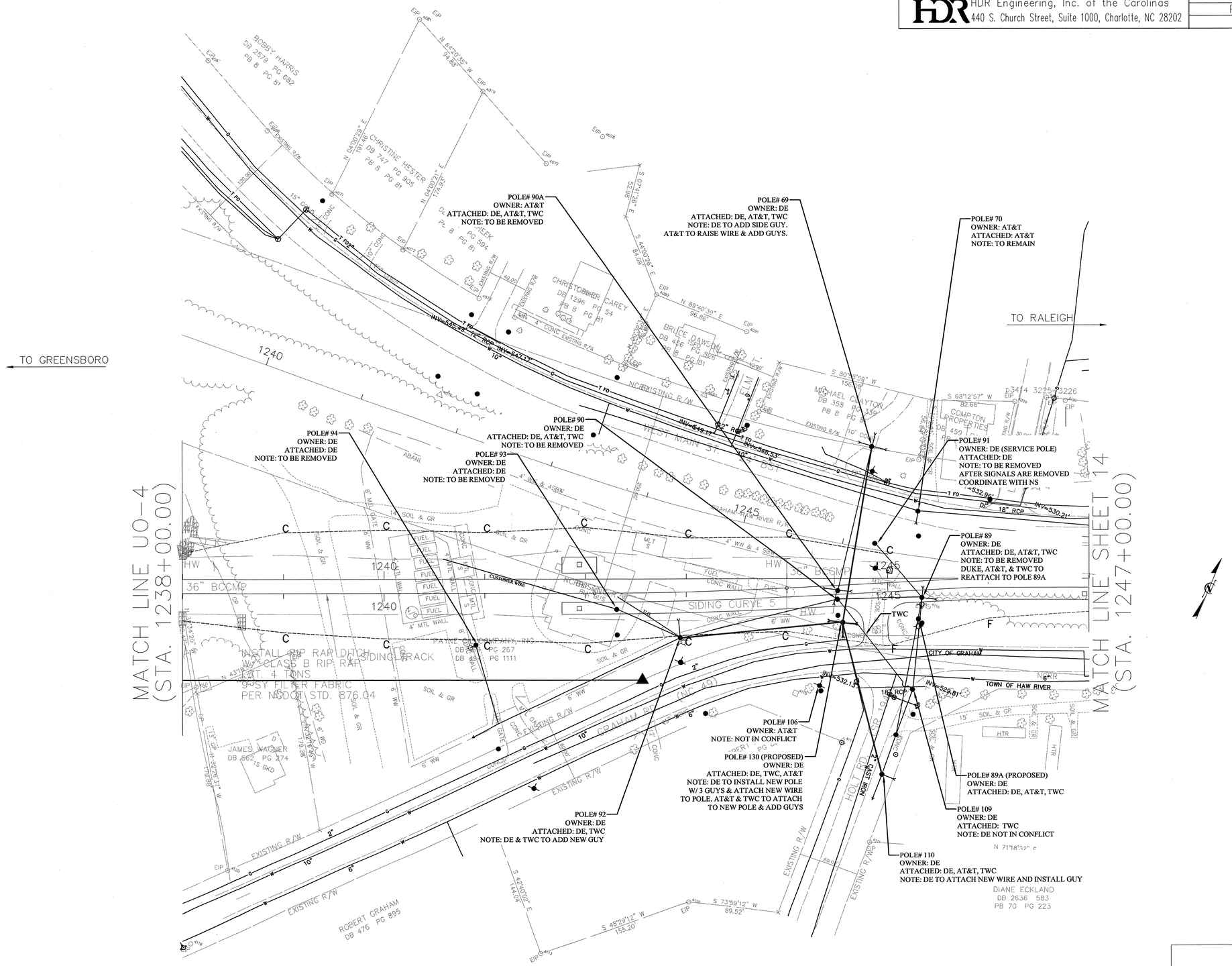
PROJECT REFERENCE NO.	SHEET NO.
P-5205	UO-5
R/W SHEET NO.	



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