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DKN

TIP PROJECT: P-5208G

CONTRACT: C203206

STATE OF NORTH CAROLINA
NCDOT RAIL DIVISION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208G	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50000.1.STR11T1B		PE, UTIL PE
50000.1.STR12T3		PE, UTIL PE
43219.2.STR09P5208		RIGHT OF WAY
50000.3.STR01T4A	FRA-FR-HSR-0006-10-01-00	CONST, UTIL CONST

CABARRUS AND MECKLENBURG COUNTIES

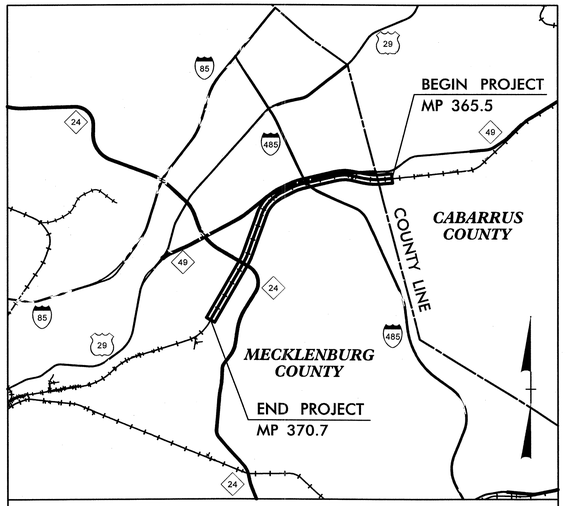
(PART 3 OF 3)

LOCATION: *NCRR/NS MAINLINE RAILROAD FROM MILLBROOK ROAD (SR 1182), MP 365.5 TO NORTH OF NEWELL-HICKORY GROVE ROAD (SR 2853), MP 370.7*

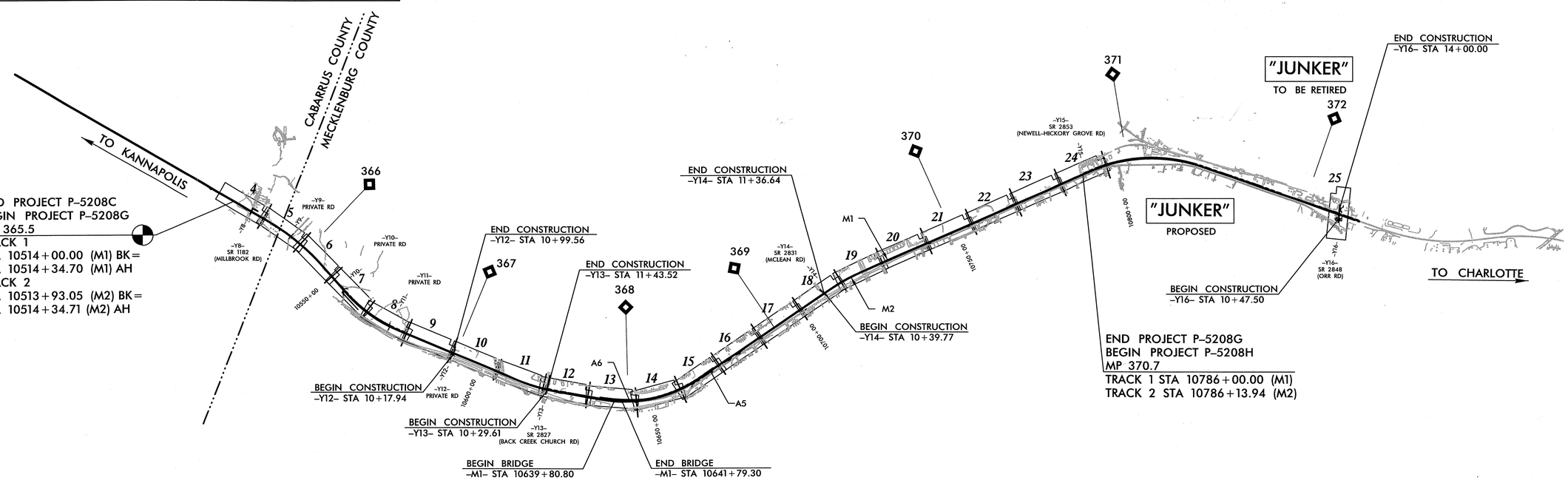
TYPE OF WORK: *RAILROAD ROADBED, GRADING, DRAINAGE, PAVING, STRUCTURES AND RETAINING WALLS*

NAD 83/ NSRS 2007

Part 3 0f 3



VICINITY MAP



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PROJECT LENGTH

LENGTH OF RAIL TIP PROJECT P-5208G	=	5.107 MILES
LENGTH OF STRUCTURE TIP PROJECT	=	0.038 MILES
TOTAL LENGTH OF TIP PROJECT	=	5.145 MILES

Prepared In the Office of:

AECOM

NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 – (919) 854-6259(FAX)

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 2012

LETTING DATE:
JULY 16, 2013

RILEY BIRMINGHAM, PE
RAIL PROJECT ENGINEER
CLAUDETTE ROQUE, PE
ROADWAY PROJECT ENGINEER
MARK KAMPRATH, PE
HYDRAULICS PROJECT ENGINEER
MARK PEARSON, PE
STRUCTURE PROJECT ENGINEER
BRAD SMYTHE, PE
NCDOT PROJECT MANAGER

RAIL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY W. BIRMINGHAM

Riley W. Birmingham P.E. 5/21/13
SIGNATURE:

ROADWAY ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 17306 ENGINEER CLAUDETTE M.K. ROQUE

Claudette M.K. Roque P.E. 5/22/13
SIGNATURE:

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH

John M. Kamprath P.E. 5/22/13.
SIGNATURE:

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
DESIGN AND CONSTRUCTION

3:02:14 PM
P:\60268940\400_Tech_Info_Disc_Files\450_NCDOTS+dTechDesFiles\Rail\Sheets\P-5208G_RR_TSH.dgn
birmingham

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	1-A
Location and Surveys	

SURVEY CONTROL SHEET

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "P3414-15"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 572927.0137(ft) EASTING: 1490817.4654(ft)
ELEVATION: 700.64(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998439800
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "P3414-15" TO -M1- STATION 10514+34.70 IS
N 87°17'45.6" E 9058.457'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

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

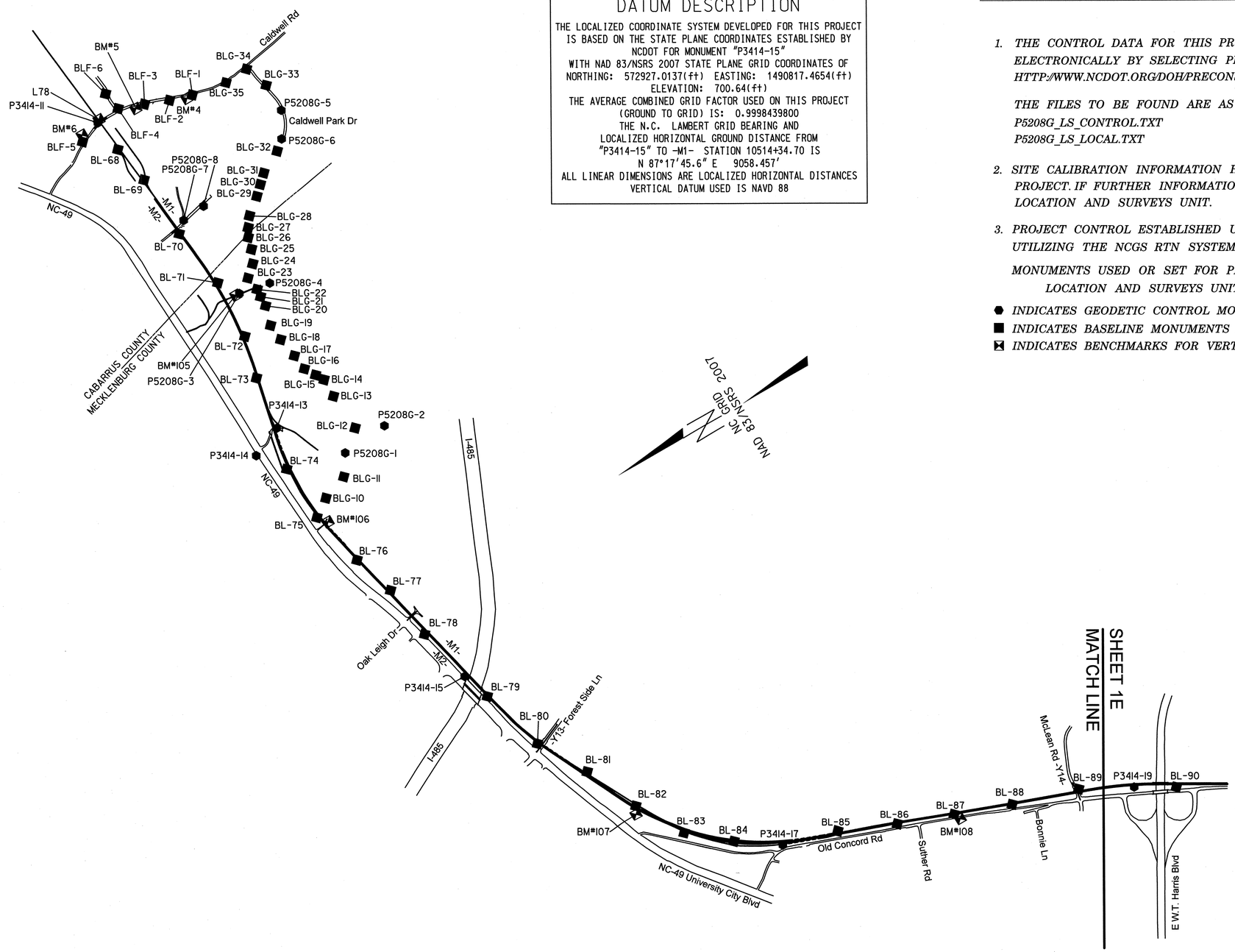
   THE FILES TO BE FOUND ARE AS FOLLOWS:
   P5208G_LS_CONTROL.TXT
   P5208G_LS_LOCAL.TXT

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

3. *PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM, UTILIZING THE NCGS RTN SYSTEM (VRS).*

   MONUMENTS USED OR SET FOR PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT:

- ⬢ *INDICATES GEODETIC CONTROL MONUMENTS FOR HORIZONTAL CONTROL*
- ■ *INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL*
- ⧗ *INDICATES BENCHMARKS FOR VERTICAL CONTROL*



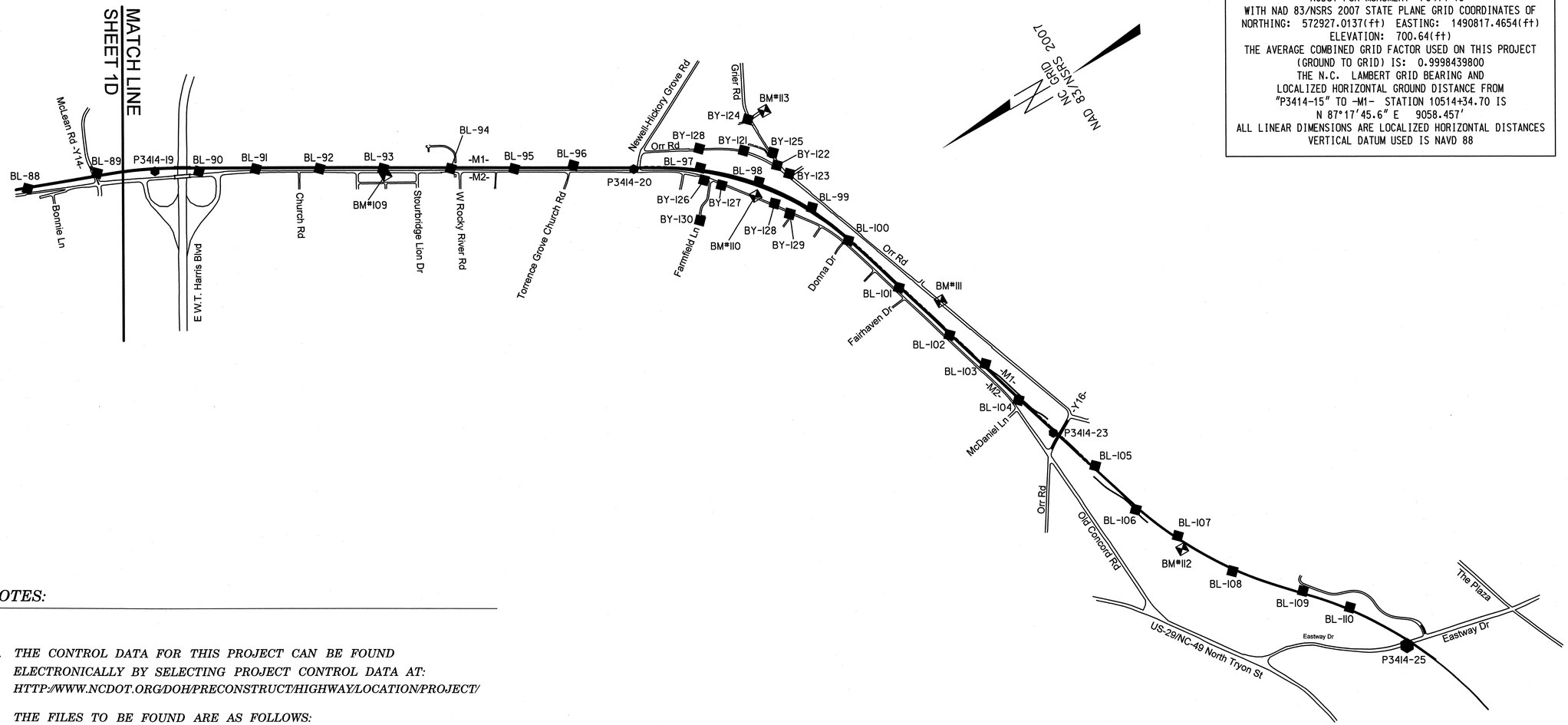
NOTE: DRAWING NOT TO SCALE

0041DEL_P10a1

9/28/12

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	1-B
Location and Surveys	

SURVEY CONTROL SHEET



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- ■ *INDICATES BASELINE MONUMENTS FOR HORIZONTAL PROJECT CONTROL*
- ⧗ *INDICATES BENCHMARKS FOR VERTICAL CONTROL*

NOTE: DRAWING NOT TO SCALE

12:08 AM
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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	1-C
Location and Surveys	

SURVEY CONTROL SHEET

****
BM4 ELEVATION = 610.31
N 572125 E 1500771
M1 STATION 10512+35
S 36°22'3.48" E DIST 1526.84
RR SPIKE IN 14" OAK
****
****
BM5 ELEVATION = 637.97
N 572892 E 1501035
M1 STATION 10512+35
S 68°25'35.28" E DIST 1257.45
RR SPIKE IN 9" OAK
****
****
BM6 ELEVATION = 669.30
N 573828 E 1501094
M1 STATION 10512+35
N 68°56'3.58" E DIST 1316.34
RR SPIKE IN 10" ELM
****
****
BM105 ELEVATION = 664.51
N 573014 E 1497744
M1 STATION 10533+59 176 LEFT
RR-SPIKE SET IN FIRST JOINT OF CONC.
C&G AT EOP ON EAST SIDE OF PRIVATE
DRIVE LEADING TO SEWER PLANT. 165 +/-
SOUTH OF TRACKS
****
****
BM106 ELEVATION = 691.17
N 573555 E 1493968
M1 STATION 10571+98 51 LEFT
RR-SPIKE SET IN NORTHERN MOST ROOT OF A
48" RED OAK. TREE BEING SW 50' FROM A
PRIVATE R/R CROSSING LEADING TO A 2
STORY FRAME FARM HOUSE LYING 75' SOUTH
OF TRACKS
****
****
BM107 ELEVATION = 729.21
N 571705 E 1487615
M1 STATION 10638+30 100 RIGHT
RR-SPIKE SET IN SOUTHWESTERN ROOT OF
24" FORKED ASHE LYING IN SW CORNER OF
PARKING LOT FOR BUCKWILD
****
****
BM108 ELEVATION = 747.49
N 567371 E 1485018
M1 STATION 10689+45 117 RIGHT
RR-SPIKE FOUND IN POWER POLE. #148486 &
056625 POLE LIES +/- 18' NORTH OF EOP
OF OLD CONCORD RD.
****
****
BM109 ELEVATION = 759.18
N 561813 E 1482323
M1 STATION 10751+63 119 RIGHT
RR-SPIKE SET IN SW ROOT OF A 60" WILLOW
OAK TREE. TREE IS 12' NW OF LIGHT POLE
& 10' NORTH OF CONC. SIDEWALK
****
****
BM110 ELEVATION = 776.25
N 557185 E 1479279
M1 STATION 10807+87 174 RIGHT
RR-SPIKE SET IN POWER POLE 12' SOUTH OF
EOP OF OLD CONCORD RD. POLE IS ACROSS
RD FROM BRANCH HILL FARMS 7217 OLD
CONCORD RD
****
****
BM111 ELEVATION = 768.10
N 555581 E 1476544
M1 STATION 10839+79 253 LEFT
RR-SPIKE SET BETWEEN EOP & C&G
SOUTHSIDE OF ORR RD. DIRECTLY UNDER A
HIGH TENSION POWERLINE
****
****
BM112 ELEVATION = 770.54
N 554327 E 1471529
M1 STATION 10512+35
S 56°07'11.25" W DIST 34132.34
#5 REBAR SET IN TOP OF BANK 85' NORTH
OF TRACKS. POINT IS 200' WEST OF STEIN
FABRIC CO. 300' EAST OF STORAGE BUILDING
****
****
BM113 ELEVATION = 804.33
N 556424 E 1480324
M1 STATION 10805+28 1087 LEFT
CHISELED SQUARE ON TOP BACK OF CURB
****
****
L78 ELEVATION = 644.64
N 573478 E 1501172
M1 STATION 10512+35
N 84°35'6.23" E DIST 1312.32
USCGS L78 1935
****

BL

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
P341411	P3414-11	573520.1777	1501138.6901	648.83	OUTSIDE PROJECT LIMITS	
BL68	BL-68	573459.3581	1500620.8578	651.17	OUTSIDE PROJECT LIMITS	
BL69	BL-69	573344.8679	1500009.1839	657.23	OUTSIDE PROJECT LIMITS	
BL70	BL-70	573293.4073	1499011.1322	654.09	10520+91.14	27.19 RT
BL71	BL-71	573157.7204	1498054.5231	664.68	10530+54.67	30.15 LT
BL72	BL-72	573217.8908	1497115.1322	673.06	10539+92.57	26.02 LT
BL73	BL-73	573391.5827	1496458.1881	678.06	10546+70.00	26.14 RT
P341413	P3414-13	573517.0917	1495622.0121	688.41	10555+13.59	32.88 LT
BL74	BL-74	573702.2178	1494992.9133	690.05	10561+63.06	47.30 RT
BL75	BL-75	573671.1494	1494112.6889	690.19	10570+35.72	40.01 RT
BL76	BL-76	573462.9844	1493227.3625	692.72	10579+42.00	23.91 RT
BL77	BL-77	573250.4812	1492554.1282	697.05	10586+46.20	26.23 LT
BL78	BL-78	573136.5919	1491697.7891	700.00	10595+05.55	62.12 RT
P341415	P3414-15	572927.0137	1490817.4654	700.64	10604+10.47	62.98 RT
BL79	BL-79	572780.4626	1490369.0049	707.60	10608+80.72	24.72 RT
BL80	BL-80	572475.7546	1489339.0620	713.21	10619+51.06	36.59 RT
BL81	BL-81	572028.0885	1488571.0706	715.45	10628+35.60	39.63 LT
BL82	BL-82	571638.8727	1487733.0143	721.71	10637+60.17	14.82 LT
BL83	BL-83	571205.1341	1486986.3357	726.04	10646+17.69	57.27 RT
BL84	BL-84	570599.7682	1486481.5880	730.27	10653+98.67	16.04 RT
P341417	P3414-17	569970.3231	1486048.3878	733.05	10661+55.26	59.76 RT
BL85	BL-85	569121.2539	1485806.6274	731.74	10670+30.59	24.90 LT
BL86	BL-86	568259.0206	1485437.8376	728.77	10679+66.99	26.27 RT
BL87	BL-87	567413.2248	1485130.2276	734.92	10688+66.99	25.59 RT
BL88	BL-88	566549.6535	1484814.8711	736.84	10697+86.34	26.10 RT
BL89	BL-89	565532.1285	1484503.5886	740.16	10708+48.93	29.95 LT
P341419	P3414-19	564767.3493	1484098.3476	746.59	10717+13.55	49.32 RT
BL90	BL-90	564198.5802	1483766.2571	741.15	10723+75.15	62.40 RT
BL91	BL-91	563445.5634	1483372.1772	748.22	10732+24.31	26.95 RT
BL92	BL-92	562620.0636	1482894.8638	753.85	10741+77.87	27.32 RT
BL93	BL-93	561795.8522	1482419.4826	756.94	10751+29.35	26.66 RT
BL94	BL-94	560920.1481	1481915.4659	759.54	10761+39.74	25.03 RT
BL95	BL-95	560098.3441	1481438.8177	766.49	10770+89.77	26.67 RT
BL96	BL-96	559309.7252	1481042.7146	773.31	10779+70.77	24.83 LT
BL97	BL-97	557685.4301	1480064.9284	783.82	10798+63.10	37.60 LT
BL98	BL-98	557032.8087	1479445.3543	788.25	10807+55.47	49.39 LT
BL99	BL-99	556545.0187	1478706.5784	785.81	10816+32.96	41.52 LT
BL100	BL-100	556319.0049	1478016.8249	777.22	10823+55.18	23.72 RT
BL101	BL-101	556018.9122	1477029.2367	770.42	10833+88.10	25.85 RT
BL102	BL-102	555719.7865	1476042.9376	764.94	10844+18.76	25.29 RT
BL103	BL-103	555472.3296	1475402.9360	762.10	10851+03.01	26.14 LT
BL104	BL-104	555314.4321	1474690.0481	762.20	10858+31.07	29.27 RT
P341423	P3414-23	555114.4441	1474002.6373	764.75	10865+46.86	38.06 RT
BL105	BL-105	554820.7271	1473262.7232	767.44	10873+40.19	29.28 LT
BL106	BL-106	554627.5193	1472388.2306	768.59	OUTSIDE PROJECT LIMITS	
BL107	BL-107	554283.8404	1471731.9959	759.22	OUTSIDE PROJECT LIMITS	
BL108	BL-108	553839.6463	1470869.6242	758.23	OUTSIDE PROJECT LIMITS	
BL109	BL-109	553076.4911	1470089.7245	761.21	OUTSIDE PROJECT LIMITS	
BL110	BL-110	552594.0702	1469525.6179	769.64	OUTSIDE PROJECT LIMITS	
P341425	P3414-25	552140.0827	1468608.2140	793.74	OUTSIDE PROJECT LIMITS	

BL1

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
EQ75	BL-75	573671.1494	1494112.6889	690.19	10570+35.72	40.01 RT
BLG10	BL-G10	573398.0936	1494301.2000	673.64	10568+76.95	253.79 LT
BLG11	BL-G11	572994.2484	1494441.2191	666.48	10567+56.82	668.01 LT
1	P5208G-1	572782.7490	1494757.7390	680.34	10563+63.90	885.10 LT
BLG12	BL-G12	572455.7883	1495011.3208	675.43	10559+78.76	1189.74 LT
BLG13	BL-G13	572496.2715	1495611.0366	679.49	10553+02.46	1031.80 LT
BLG14	BL-G14	572494.2410	1495906.4202	672.09	10550+13.69	969.62 LT
BLG15	BL-G15	572571.9256	1496035.4607	679.90	10549+04.60	865.75 LT
BLG16	BL-G16	572674.6537	1496206.7481	674.27	10547+59.72	728.27 LT
BLG17	BL-G17	572704.8268	1496464.0926	670.03	10545+21.44	643.64 LT
BLG18	BL-G18	572760.5864	1496789.2705	654.32	10542+35.67	527.28 LT
BLG19	BL-G19	572785.6526	1497059.7601	637.23	10539+90.37	461.79 LT
BLG20	BL-G20	572696.2458	1497365.7555	641.15	10536+98.01	516.96 LT
BLG21	BL-G21	572690.9597	1497530.7240	632.88	10535+44.99	509.59 LT
BLG22	BL-G22	572679.3552	1497656.2637	647.22	10534+28.44	514.13 LT
BLG23	BL-G23	572712.5581	1497879.9189	672.19	10532+23.76	474.55 LT
BLG24	BL-G24	572536.7479	1498033.7864	660.25	10530+84.18	650.69 LT
BLG25	BL-G25	572440.3200	1498236.8683	665.59	10529+06.26	753.21 LT
BLG26	BL-G26	572392.7282	1498419.9921	659.87	10527+48.16	811.70 LT
BLG27	BL-G27	572315.8039	1498552.7952	650.87	10526+35.53	899.27 LT
BLG28	BL-G28	572204.6489	1498701.2792	620.47	10525+08.32	1024.07 LT
BLG29	BL-G29	571954.4204	1498900.4331	606.73	10523+38.84	1293.33 LT
BLG30	BL-G30	571813.3951	1499034.9332	625.68	10522+19.54	1447.43 LT
BLG31	BL-G31	571677.2834	1499161.6212	645.29	10521+07.51	1595.84 LT
BLG32	BL-G32	571325.7264	1499348.4001	667.65	10519+57.84	1964.73 LT
6	P5208G-6	571170.4500	1499478.8570	675.81	10518+44.03	2132.59 LT
5	P5208G-5	570947.9730	1499869.5860	660.64	10514+78.23	2394.03 LT
BLG33	BL-G33	570953.5003	1500325.2135	648.60	OUTSIDE PROJECT LIMITS	
BLG34	BL-G34	571088.8002	1500700.1983	630.43	OUTSIDE PROJECT LIMITS	
BLG35	BL-G35	571473.2545	1500676.7101	608.81	OUTSIDE PROJECT LIMITS	
EQF1	BL-F1	572024.8982	1500775.0431	604.30	OUTSIDE PROJECT LIMITS	

BL2

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
BLF5	BL-F5	573874.1983	1500999.0037	672.99	OUTSIDE PROJECT LIMITS	
EQ11	P3414-11	573520.1777	1501138.6901	648.83	OUTSIDE PROJECT LIMITS	
BLF4	BL-F4	573131.3088	1501171.0561	639.84	OUTSIDE PROJECT LIMITS	
BLF3	BL-F3	572742.5686	1501025.1103	625.10	OUTSIDE PROJECT LIMITS	
BLF2	BL-F2	572373.7576	1500881.2505	615.35	OUTSIDE PROJECT LIMITS	
BLF1	BL-F1	572024.8982	1500775.0431	604.30	OUTSIDE PROJECT LIMITS	

BY1G

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
EQG27	BL-G27	572315.8039	1498552.7952	650.87	10526+35.53	899.27 LT
8	P5208G-8	572750.1980	1499190.8950	646.28	10519+68.15	531.61 LT
7	P5208G-7	573126.9750	1499158.1490	650.70	10519+62.01	153.47 LT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
EQF4	BL-F4	573131.3088	1501171.0561	639.84	OUTSIDE PROJECT LIMITS	
BLF6	BL-F6	573185.6688	1501467.8690	636.32	OUTSIDE PROJECT LIMITS	

BYS3-1

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
E97	BL-97	557685.4301	1480064.9284	783.82	10798+63.10	37.60 LT
BL126	BY-126	557729.8564	1479873.3360	775.53	10799+49.83	139.43 RT
BL127	BY-127	557540.7255	1479676.9626	760.05	10802+31.46	161.94 RT
BL128	BY-128	556996.0513	1479037.7898	786.07	10811+06.36	169.46 RT
BL129	BY-129	556875.7968	1478794.7907	782.59	10813+87.73	202.09 RT

BYS3-2

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
E126	BY-126	557729.8564	1479873.3360	775.53	10799+49.83	139.43 RT
BL130	BY-130	558084.9560	1479383.7016	742.98	10799+94.66	742.94 RT

BYS3-4

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
EE97	BL-97	557685.4301	1480064.9284	783.82	10798+63.10	37.60 LT
BL120	BY-120	557553.4894	1480319.0898	789.85	10798+12.81	319.14 LT
BL121	BY-121	556992.7141	1479958.8560	794.36	10804+19.32	423.28 LT
BL122	BY-122	556673.1069	1479520.8921	800.99	10809+13.78	377.29 LT
BL123	BY-123	556578.6938	1479320.2977	797.50	10811+14.68	334.45 LT

BYS3-5

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
BL124	BY-124	556700.7825	1480337.3918	800.01	10803+63.69	896.99 LT
BL125	BY-125	556632.6338	1479714.0219	808.82	10807+99.71	529.08 LT
E122	BY-122	556673.1069	1479520.8921	800.99	10809+13.78	377.29 LT

ADDITIONAL POINTS

POINT	DESC.	NORTH	EAST	ELEVATION	M1 STATION	OFFSET
2	P5208G-2	572042.1130	1494812.6370	662.30	10562+24.00	1621.92 LT
3	P5208G-3	572951.7770	1497740.7380	662.36	10533+59.68	238.50 LT
4	P5208G-4	572458.3860	1497643.0170	623.74	10534+31.02	735.48 LT
P341414	P3414-14	574005.9756	1495416.0977	688.57	10558+04.28	405.17 RT

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "P3414-15"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 572927.0137(ft) EASTING: 1490817.4654(ft)
ELEVATION: 700.64(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998439800
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"P3414-15" TO -M1- STATION 10514+34.70 IS
N 87°17'45.6" E 9058.457'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

SURVEY CONTROL SHEET

PERMANENT EASEMENT MARKER -E

ALIGN	STATION	OFFSET	NORTH	EAST
M1	10555+13.50	-87.16	573464.0575	1495610.4537
M1	10555+15.00	-103.00	573448.9064	1495605.5983
M1	10555+42.00	-103.00	573454.6394	1495579.3896
M1	10555+55.00	-87.34	573472.6843	1495570.0996

PERMANENT EASEMENT MARKER -E

ALIGN	STATION	OFFSET	NORTH	EAST
M2	10554+90.00	98.94	573655.4658	1495671.8380
M2	10555+30.00	135.00	573699.3241	1495640.2666
M2	10555+60.00	98.59	573670.1744	1495602.9713

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
Y16	10+47.50	26.34	555201.3237	1473812.1179
Y16	10+47.50	40.00	555193.5751	1473800.8682

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST
M2	10867+05.00	102.53	555144.5869	1473831.2830

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "P3414-15"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 572927.0137(ft) EASTING: 1490817.4654(ft)
ELEVATION: 700.64(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.9998439800
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"P3414-15" TO -M1G- STATION 10514+34.70 IS
N 87°17'45.6" E 9058.457'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

0041DEL_p10a1
1/3/13 TBL
3:10:11 PM
P:\60268940\400_Tech_Info_Disc_Files\450_NCDOTStdTechDesFiles\Rail\Sheets\p5208g_ls_1D.dgn

0041DEL_P10a1

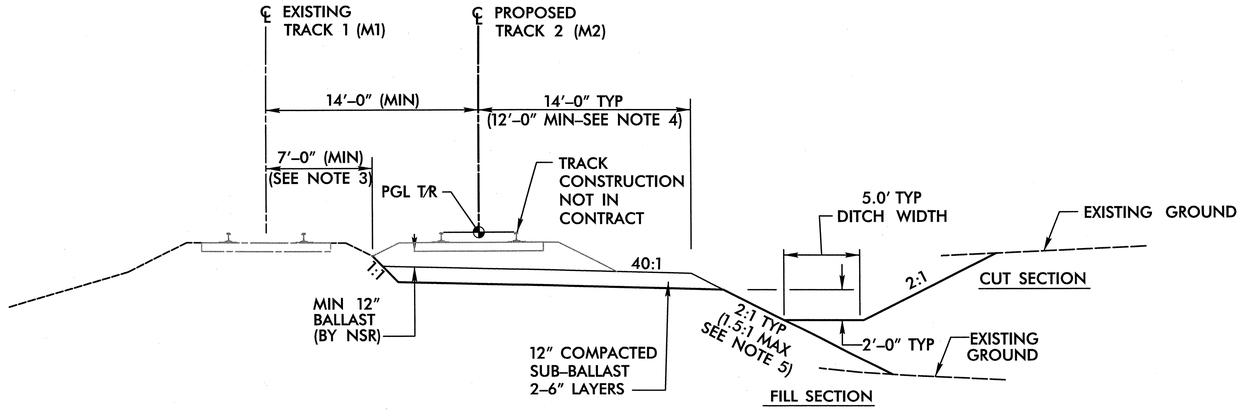
DGN

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036322 ENGINEER RICK K. BRAMHAM 4/17/13

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)



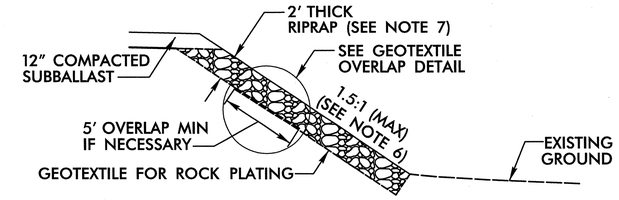
TYPICAL SECTION NO. 1

-M1- STA. 10514+35 TO STA. 10554+12
-M1- STA. 10576+40 TO STA. 10604+00
-M1- STA. 10607+70 TO STA. 10619+56
-M1- STA. 10620+78 TO STA. 10620+85
-M1- STA. 10670+54 TO STA. 10707+66*
-M1- STA. 10708+80 TO STA. 10720+14
-M1- STA. 10722+36 TO STA. 10786+00

* USE PARTIAL SECTION NO. 1 FOR THE FOLLOWING:
-M1- STA. 10689+50 TO STA. 10698+00

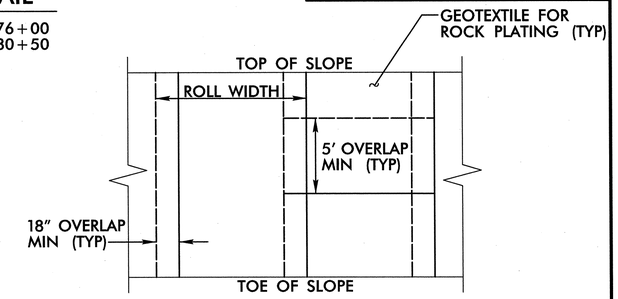
NOTES:

1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NSR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.
4. 12' ROADBED SHOULDER PROPOSED AS FOLLOWS:
   -STA 10674+00 TO STA 10681+00
   -STA 10705+00 TO STA 10706+00
5. ROCK PLATING IS REQUIRED ON SLOPES AS INDICATED ON ROCK PLATING DETAIL. (SEE ROCK PLATING DETAIL ON THIS SHEET).
6. 50' SLOPE TRANSITION WITH ROCK PLATING SHALL BE PROVIDED FROM 1.5:1 TO 2:1 SLOPE
7. USE CLASS I, II OR B RIPRAP.



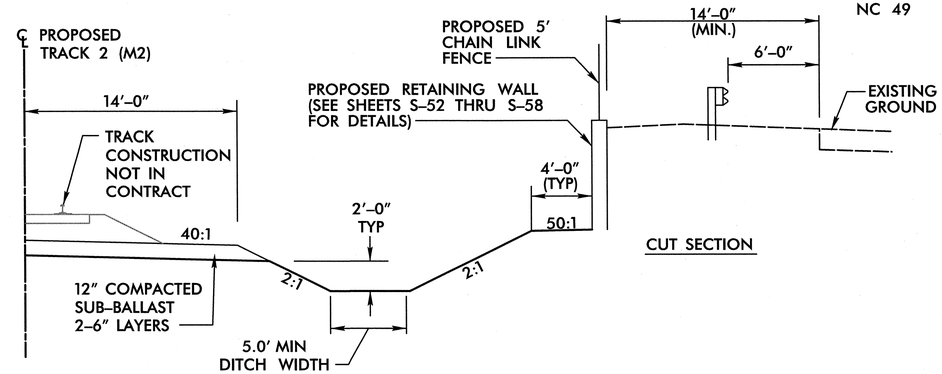
ROCK PLATING DETAIL

-M1- STA. 10673+50 TO STA. 10676+00
-M1- STA. 10677+50 TO STA. 10680+50



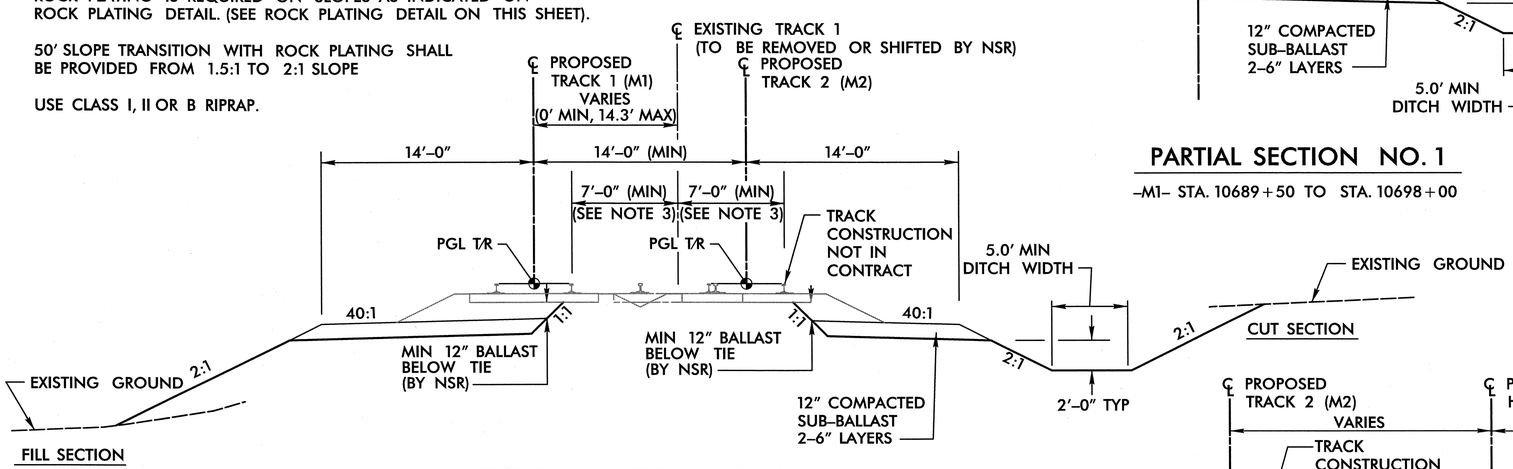
GEOTEXTILE OVERLAP DETAIL

(PLAN VIEW)



PARTIAL SECTION NO. 1

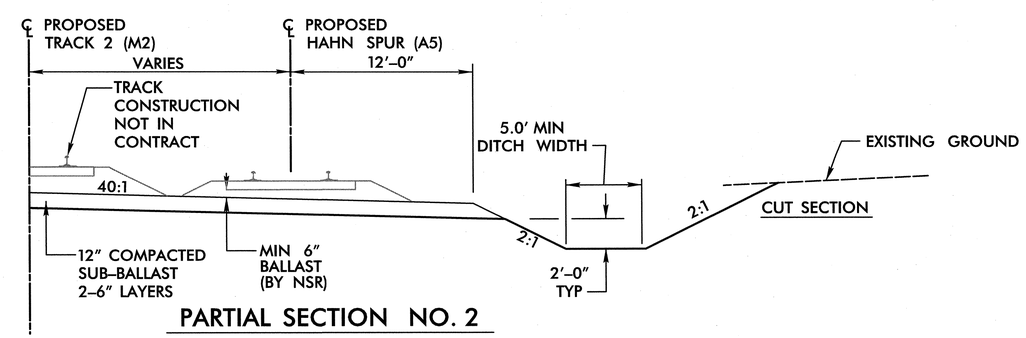
-M1- STA. 10689+50 TO STA. 10698+00



TYPICAL SECTION NO. 2

-M1- STA. 10554+12 TO STA. 10560+15
-M1- STA. 10570+20 TO STA. 10576+40
-M1- STA. 10664+50 TO STA. 10670+54**

**USE PARTIAL SECTION NO. 2 FOR THE FOLLOWING:
STA. 10664+50 TO STA. 10670+54



PARTIAL SECTION NO. 2

-M1- STA. 10664+50 TO STA. 10670+54

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DATE: 4/17/2013
TIME: 2:49:24 PM
DGN: R:\Rail\Sheets\P-5208G_RR-TS01.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-A
R/W SHEET NO.	

RAIL DESIGN ENGINEER

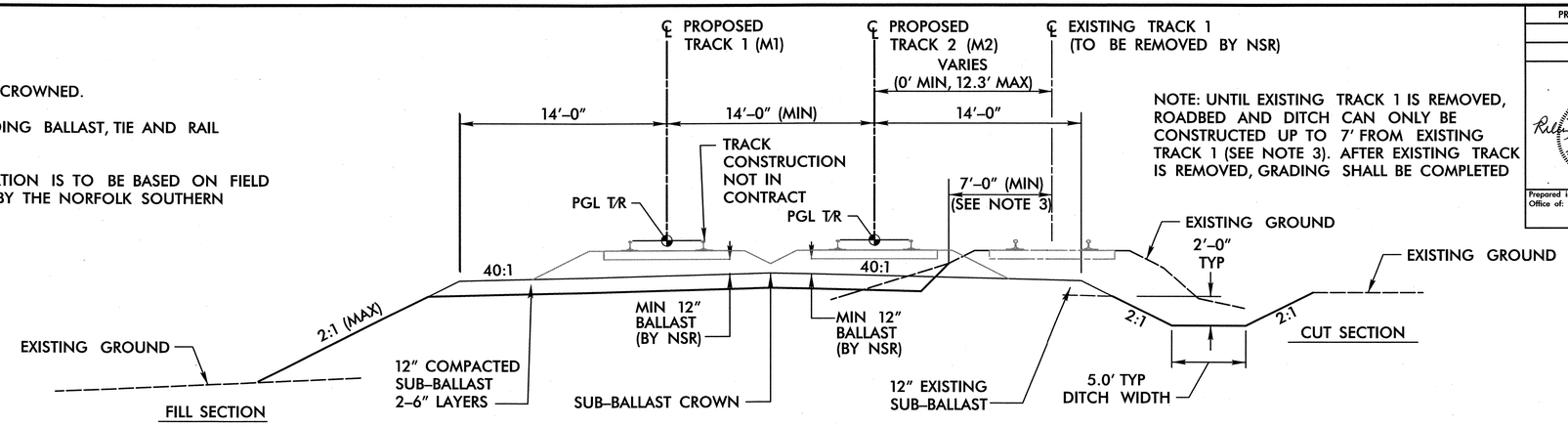
NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY M. BRIMMER

6/20/13

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-62590FAX)

NOTES:

1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NSR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.

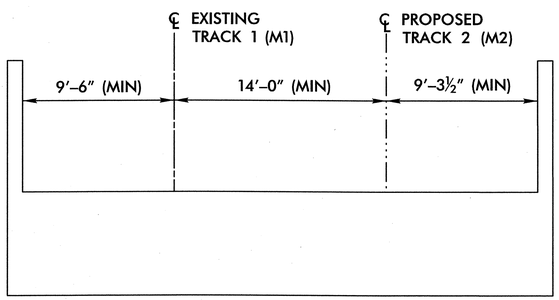


NOTE: UNTIL EXISTING TRACK 1 IS REMOVED, ROADBED AND DITCH CAN ONLY BE CONSTRUCTED UP TO 7' FROM EXISTING TRACK 1 (SEE NOTE 3). AFTER EXISTING TRACK IS REMOVED, GRADING SHALL BE COMPLETED

TYPICAL SECTION NO. 3

-M1- STA. 10560+15 TO STA. 10570+20 **

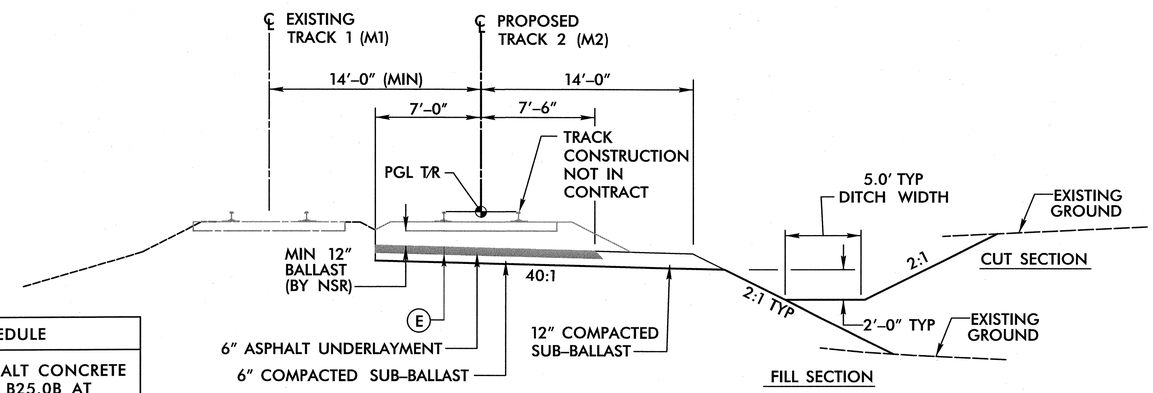
** TEMPORARY DITCH TO BE CONSTRUCTED BETWEEN STA 10563+00 - STA 10568+00 (SEE TEMPORARY DITCH DETAIL 1 - SHEET 2-H)



TYPICAL SECTION NO. 4

-M1- STA. 10604+00 TO STA. 10607+70 (EXISTING BRIDGE OVER INTERSTATE 485)
-M1- STA. 10720+14 TO STA. 10722+36 (EXISTING BRIDGE OVER HARRIS BLVD)

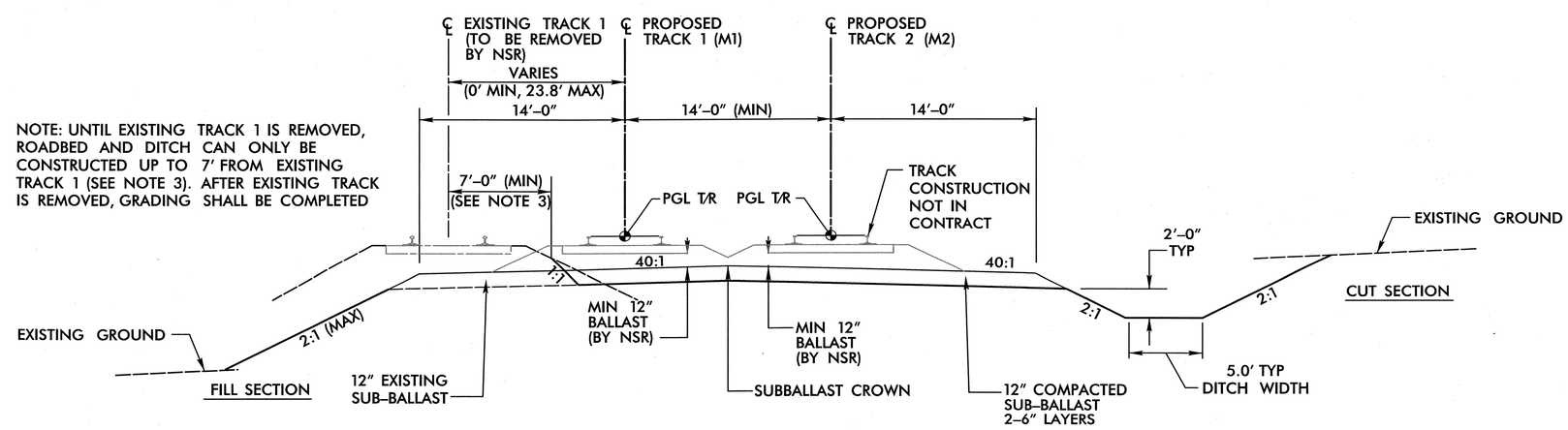
PAVEMENT SCHEDULE	
E	PROPOSED 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AVERAGE RATE OF 342 LBS PER SY IN EACH OF THE TWO LAYERS.



TYPICAL SECTION NO. 5

-M1- STA. 10619+56 TO STA. 10620+78
-M1- STA. 10707+66 TO STA. 10708+80

NOTE: UNTIL EXISTING TRACK 1 IS REMOVED, ROADBED AND DITCH CAN ONLY BE CONSTRUCTED UP TO 7' FROM EXISTING TRACK 1 (SEE NOTE 3). AFTER EXISTING TRACK IS REMOVED, GRADING SHALL BE COMPLETED



TYPICAL SECTION NO. 6

-M1- STA. 10620+85 TO STA. 10631+00

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0001ADD_P10a1

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DATE: 6/20/2013
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DGN: R:\Rail\Sheets\P-5208G_RR-TS02.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-B
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER 036222 RILEY W. BEMINGHAM 4/17/13

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

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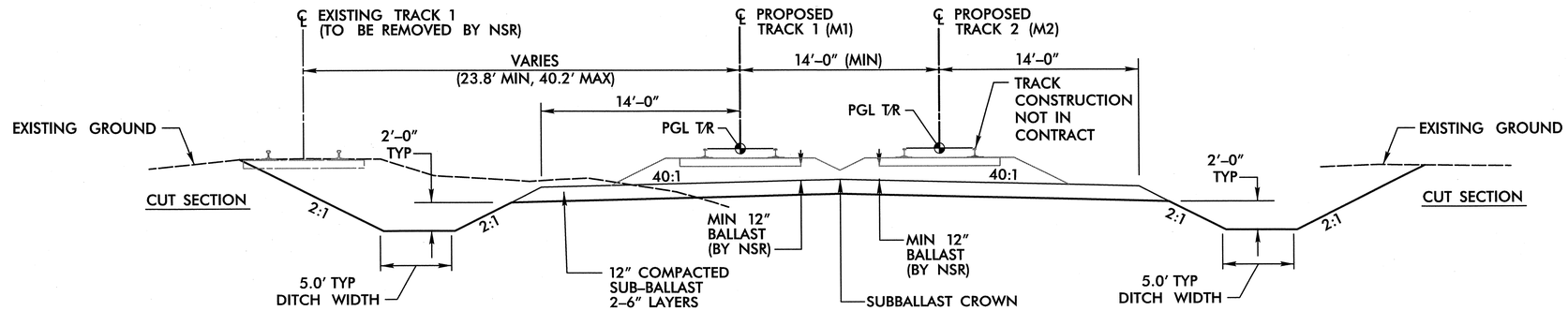


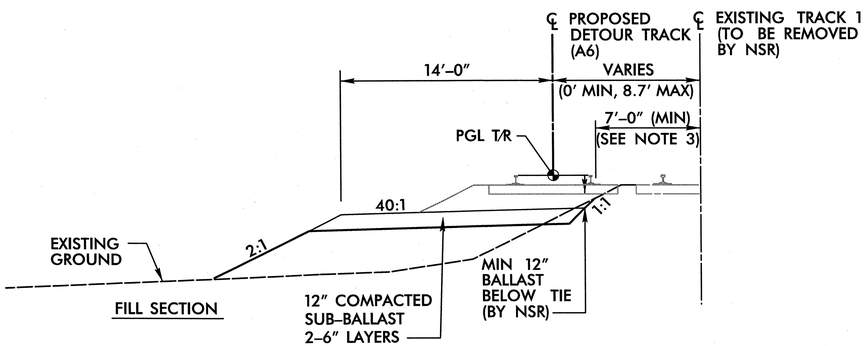
NOTE: UNTIL EXISTING TRACK 1 IS REMOVED, DITCH CAN ONLY BE EXCAVATED UP TO 7' FROM EXISTING TRACK 1 (SEE NOTE 3). AFTER EXISTING TRACK IS REMOVED, GRADING SHALL BE COMPLETED

TYPICAL SECTION NO. 7

-M1- STA. 10631+00 TO STA. 10639+54*

*TEMPORARY DITCH TO BE CONSTRUCTED BETWEEN STA 10631+00 - STA 10634+00 (SEE TEMPORARY DITCH DETAIL 2 - SHEET 2-H)

USE PARTIAL SECTION NO. 7 FOR THE FOLLOWING: STA. 10635+65 TO STA. 10639+70

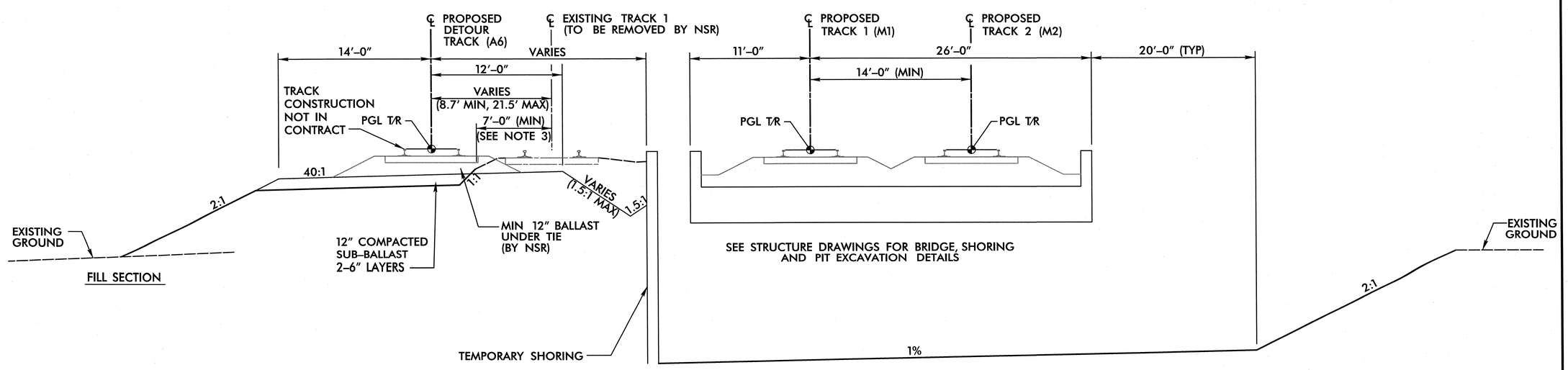


PARTIAL SECTION NO. 7

-M1- STA. 10635+65 TO STA. 10639+54

NOTES:

1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NSR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.



TYPICAL SECTION NO. 8

-M1- STA. STA. 10639+54 TO STA. 10642+16

USER: westml
DATE: 4/17/2013
TIME: 1:21:59 AM
DGN: R:\Rail\Sheets\P-5208G_RR-TS03.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-C
R/W SHEET NO.	

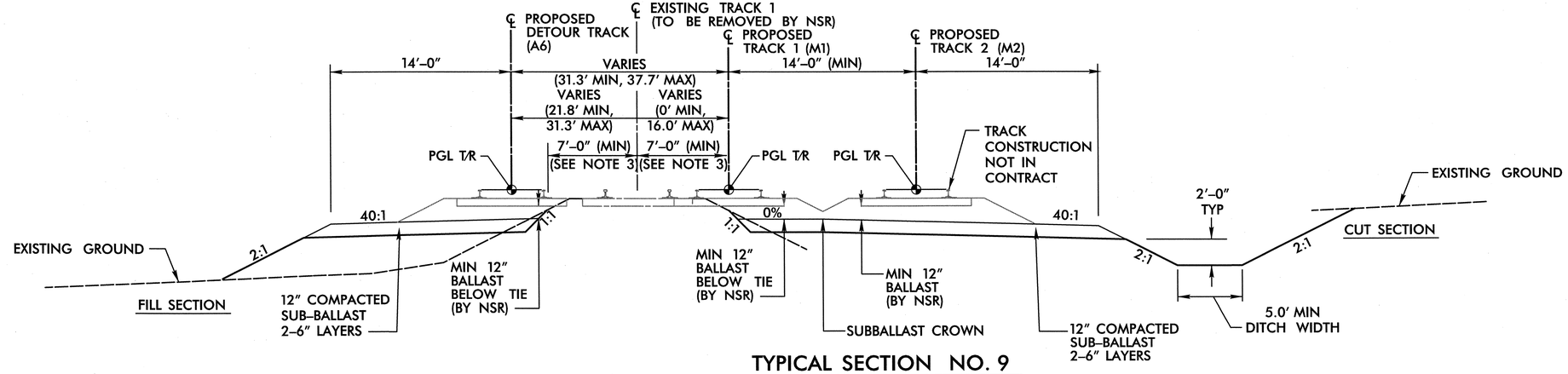
RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. H. BRAMBLEY 2/17/13

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27610
(919) 854-6200 - (919) 854-6259(FAX)

0041DEL_P10a1

DGN

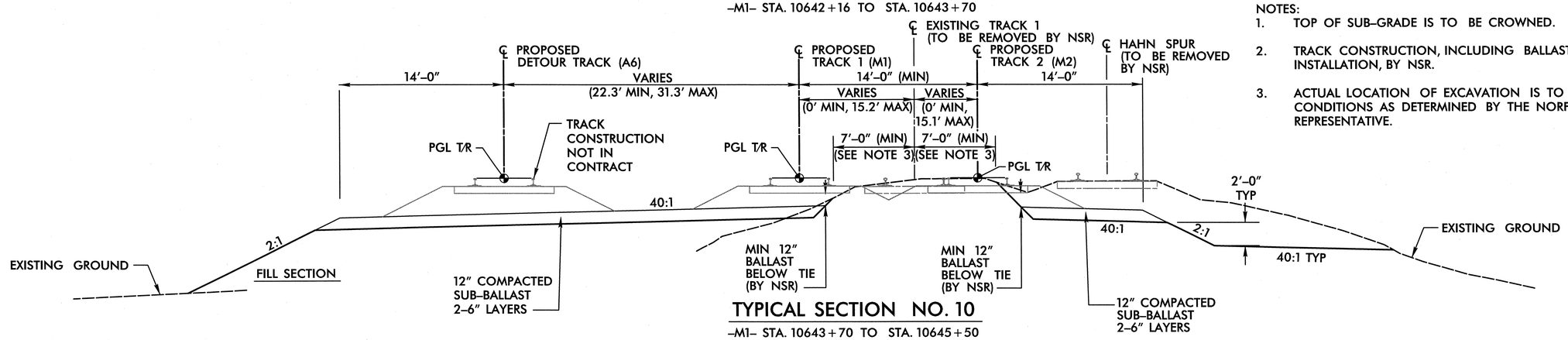


TYPICAL SECTION NO. 9

-M1- STA. 10642+16 TO STA. 10643+70

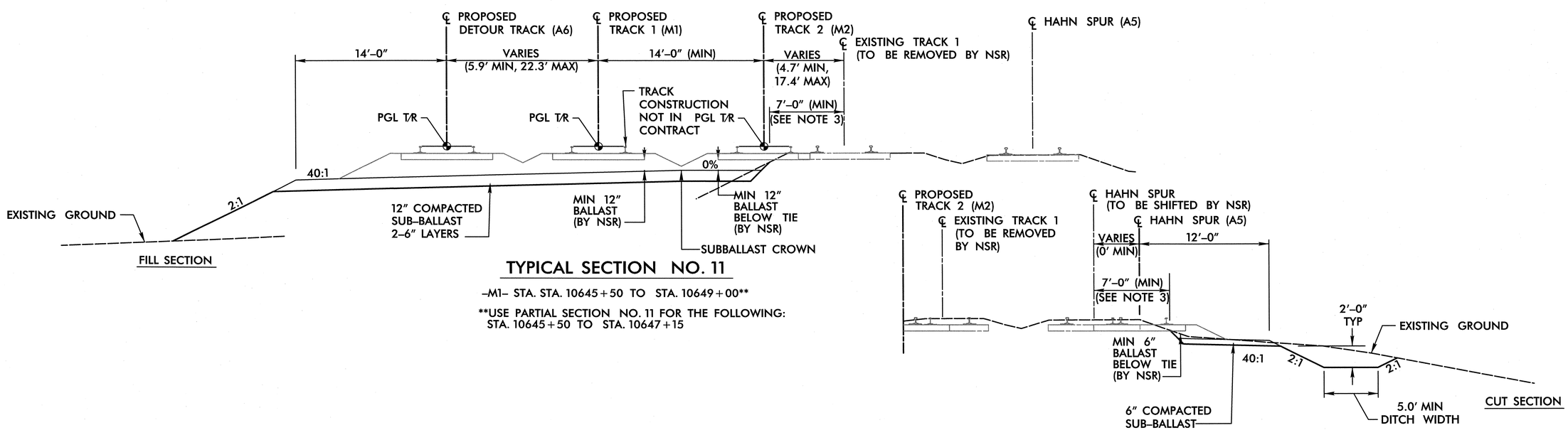
NOTES:

1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NSR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.



TYPICAL SECTION NO. 10

-M1- STA. 10643+70 TO STA. 10645+50



TYPICAL SECTION NO. 11

-M1- STA. STA. 10645+50 TO STA. 10649+00**

**USE PARTIAL SECTION NO. 11 FOR THE FOLLOWING: STA. 10645+50 TO STA. 10647+15

PARTIAL SECTION NO. 11

-M1- STA. STA. 10645+50 TO STA. 10647+15

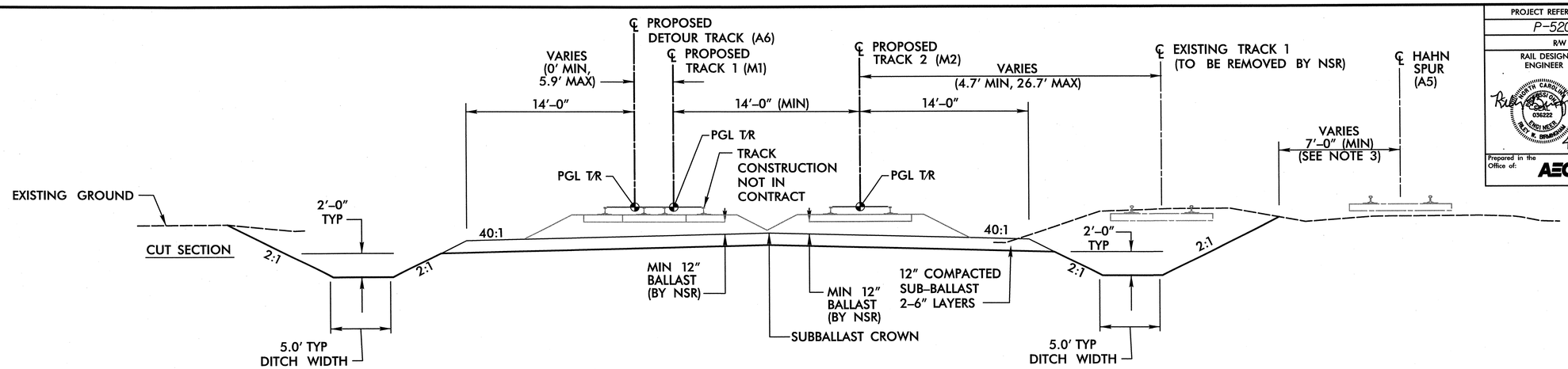
USER: westrd
DATE: 1/17/2013
TIME: 10:02:20 AM
DGN: R:\Rail\Sheets\P-5208G_RR-TS04.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-D
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER REY W. BRUNSWIG 4/17/13

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)



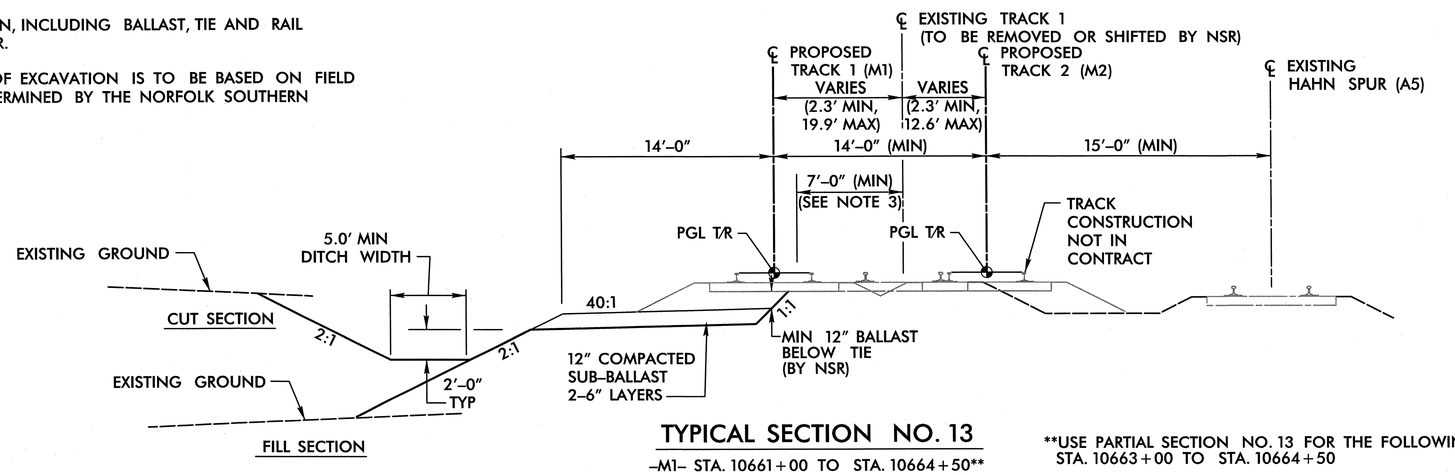
TYPICAL SECTION NO. 12

-M1- STA. STA. 10649+00 TO STA. 10661+00**

** TEMPORARY DITCH TO BE CONSTRUCTED BETWEEN STA 10649+00 - STA 10660+00 (SEE TEMPORARY DITCH DETAIL 3 - SHEET 2-H)

NOTES:

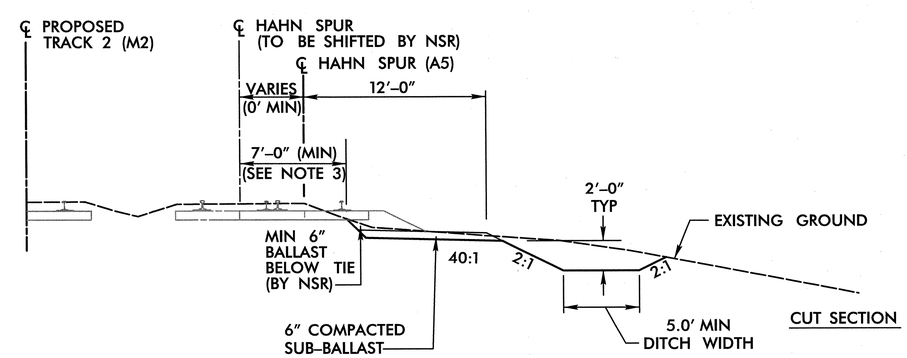
1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NSR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.



TYPICAL SECTION NO. 13

-M1- STA. 10661+00 TO STA. 10664+50**

**USE PARTIAL SECTION NO. 13 FOR THE FOLLOWING: STA. 10663+00 TO STA. 10664+50



PARTIAL SECTION NO. 13

-M1- STA. STA. 10663+00 TO STA. 10664+50

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DATE: 4/17/2013
TIME: 11:21:21 AM
DGN: R:\Rail\Sheets\P-5208G_RR-TS05.dgn

0041DEL_P10a1

DGN

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-E
R/W SHEET NO.	

ROADWAY ENGINEER

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 17306 ENGINEER CLAUDETTE M. LEGGETTE

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLAY S. STEPHENSON

4/17/13 4/24/13

Prepared in the Office of: AECOM

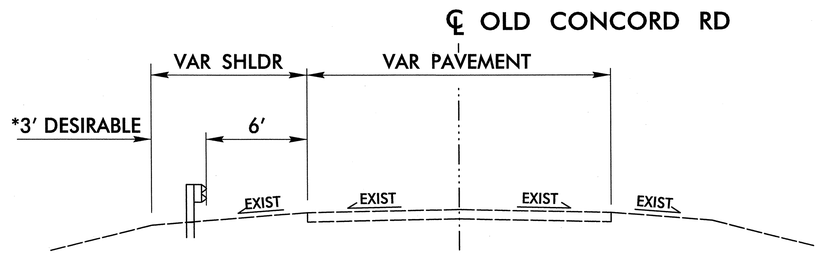
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 • (919) 854-6259(FAX)

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

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. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E4	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.
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	6" MONOLITHIC CONCRETE ISLAND (KEYED-IN).
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILL EXISTING PAVEMENT 1½".
V2	MILL EXISTING PAVEMENT VAR. DEPTH.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 1 ON THIS SHEET)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 2 ON THIS SHEET)

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



TYPICAL SECTION NO. 14

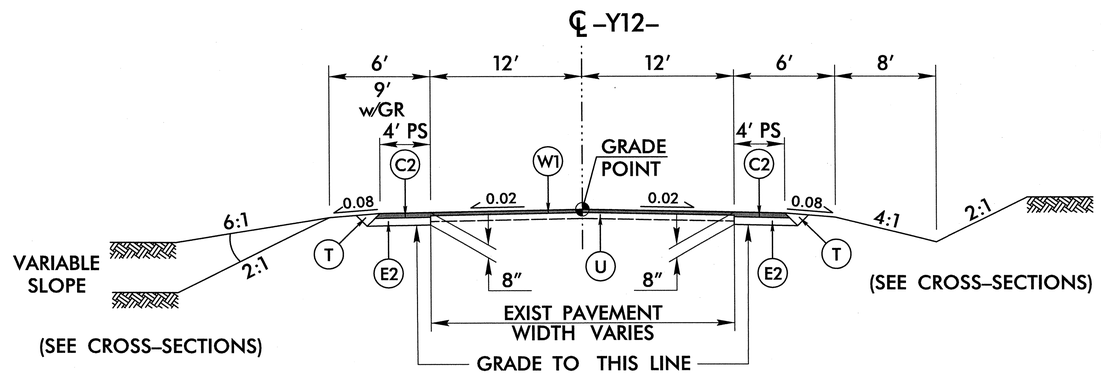
USE FOR GUARDRAIL ALONG OLD CONCORD RD

USE TYPICAL SECTION NO. 14

–M1– STA 10663+50.00 TO STA 10669+50.00 RT
–M1– STA 10674+07.50 TO STA 10679+20.00 RT
–M1– STA 10686+00.00 TO STA 10701+50.00 RT
–M1– STA 10753+53.50 TO STA 10757+03.50 RT

* NOTE: EXTRA LENGTH GUARDRAIL POSTS MAY BE REQUIRED IF 3' CANNOT BE OBTAINED AT THE DISCRETION OF THE ENGINEER

NOTE: ANY SHOULDER RECONSTRUCTION NECESSARY FOR GUARDRAIL INSTALLATION WILL BE AT THE DISCRETION OF THE ENGINEER

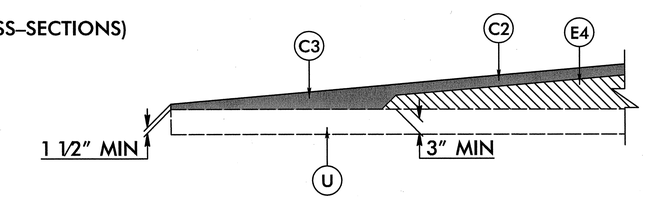


TYPICAL SECTION NO. 15

–Y12– (PRIVATE RD)

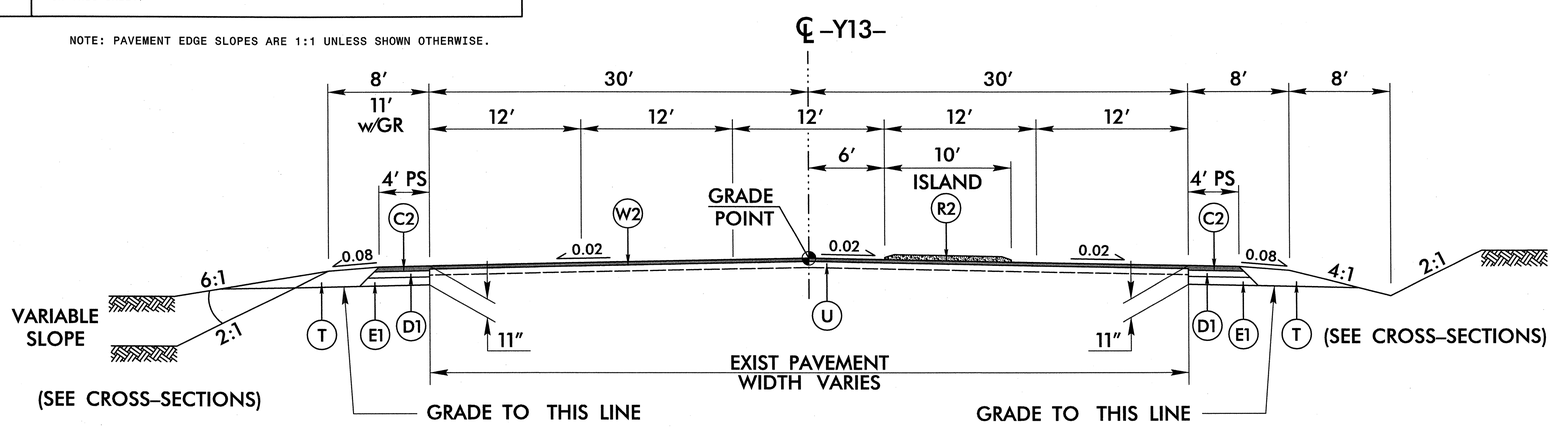
USE TYPICAL SECTION NO. 15

–Y12– STA 10+17.94 TO STA 10+99.56



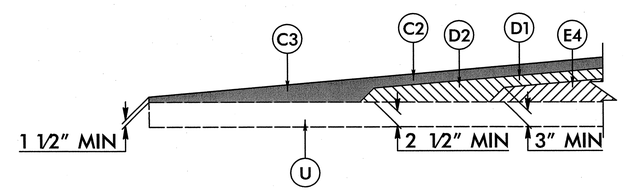
WEDGING DETAIL 1 FOR RESURFACING

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 15



TYPICAL SECTION NO. 16

–Y13– (BACK CREEK CHURCH RD)



WEDGING DETAIL 2 FOR RESURFACING

USE IN CONJUNCTION WITH TYPICAL SECTION NOs. 16–18

USE TYPICAL SECTION NO. 16

–Y13– STA 10+29.61 TO STA 11+43.52

USER: westtrd
DATE: 4/17/2013
TIME: 11:39:22 AM
DGN: R:\Roadway\Proj\p5208g_rdy_typdgn

0041DEL_P10a1

DGN

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-F
R/W SHEET NO.	

ROADWAY ENGINEER

PAVEMENT DESIGN ENGINEER

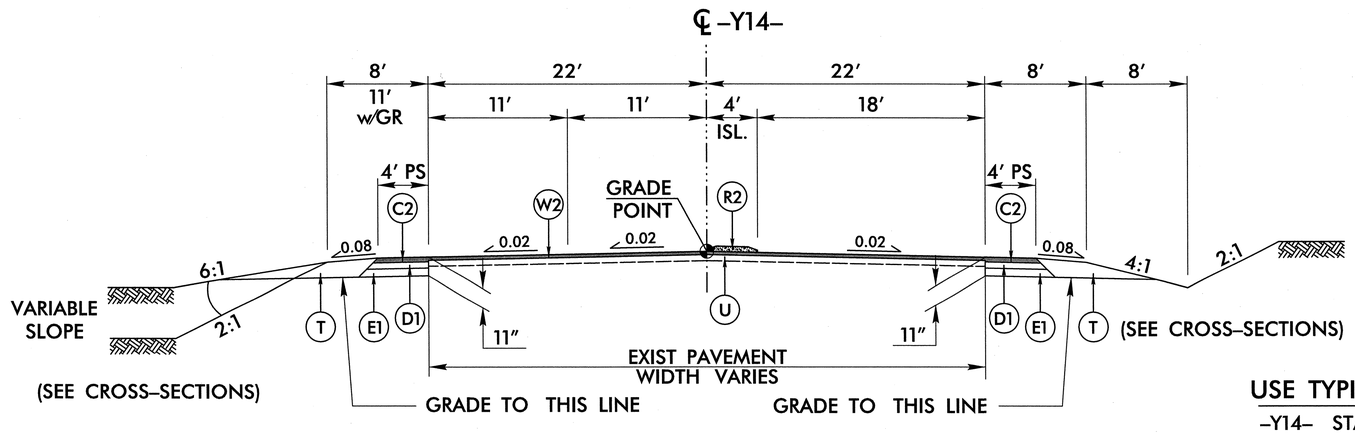
Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27610 (919) 854-6200 - (919) 854-6259(FAX)

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

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. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E4	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.
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	6" MONOLITHIC CONCRETE ISLAND (KEYED-IN).
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILL EXISTING PAVEMENT 1½".
V2	MILL EXISTING PAVEMENT VAR. DEPTH.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 1 ON SHEET 2-F)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL 2 ON SHEET 2-F)

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



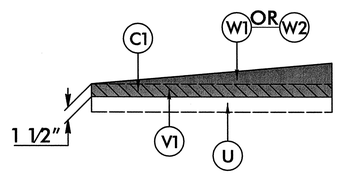
TYPICAL SECTION NO. 17

-Y14- (McLEAN RD)

USE TYPICAL SECTION NO. 17

-Y14- STA 10+39.77 TO STA 11+36.64

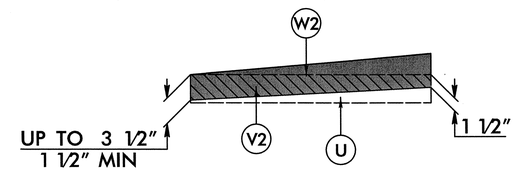
NOTE: PAVED SHOULDER TO BE CONSTRUCTED AROUND RADIUS OF NC 49 (SEE PLANS)



1 1/2" MILLING DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NOs. 15-17

-Y12- STA 10+17.94 TO STA 10+45.00
-Y13- STA 10+29.61 TO STA 10+40.00
-Y14- STA 10+39.77 TO STA 10+55.00
AND OTHER AREAS AS DIRECTED BY ENGINEER

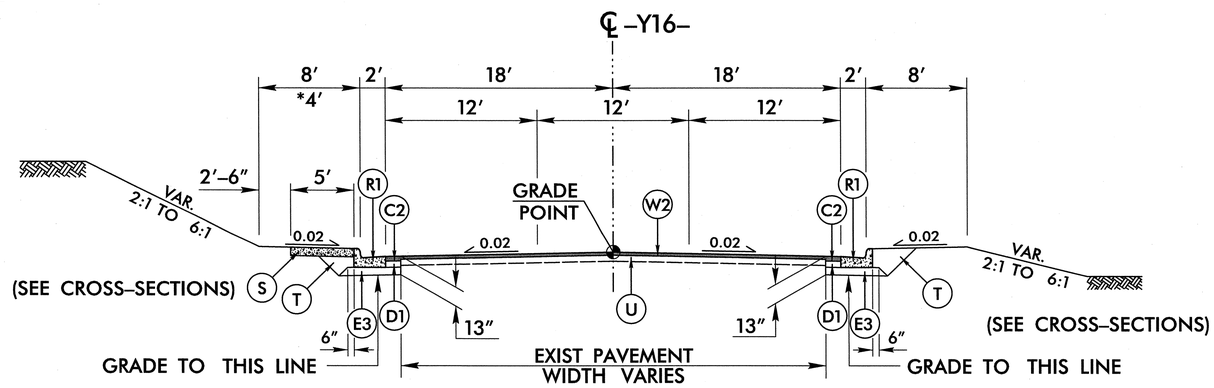


VAR. DEPTH MILLING DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 18

-Y16- STA 10+47.50 TO STA 11+00.00
-Y16- STA 13+55.00 TO STA 14+00.00
AND OTHER AREAS AS DIRECTED BY ENGINEER

NOTE: VAR. DEPTH MILLING REQUIRED DUE TO SOME UNDERCUTTING OF EXIST PAVEMENT



TYPICAL SECTION NO. 18

-Y16- (ORR RD)

USE TYPICAL SECTION NO. 18

-Y16- STA 10+47.50 TO STA 12+04.17 RT
-Y16- STA 10+47.50 TO STA 12+12.70 LT
-Y16- STA 12+49.26 TO STA 14+00.00 RT
*-Y16- STA 12+57.80 TO STA 14+00.00 LT

NOTE: SIDEWALK TO BE REPLACED
STA. 10+47.50 TO STA. 11+61.88 LT
STA. 12+73.47 TO STA. 14+00.00 RT

USER: wadtel
DATE: 4/17/2013
TIME: 10:01:22 AM
DGN: R:\Roadway\Proj\p5208g_rdy_typ.dgn

0041DEL_P10a1

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-G
R/W SHEET NO.	

HYDRAULICS ENGINEER

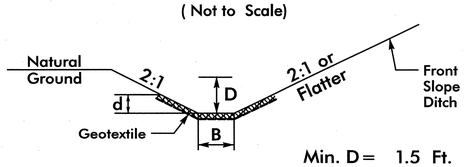
NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER RYAN M. KAMPHAUS

5/29/13

Prepared in the Office of: AECOM

NC FIRM LICENSE No: F-0342 701 Corporate Center Drive Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259 FAX

DETAIL 1
SPECIAL CUT BASE DITCH
(Not to Scale)

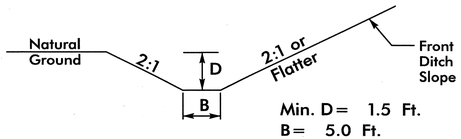


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.

Type of Liner = CLASS B RIP RAP

FROM STA 10520+00 TO STA 10521+00 –M1– RT
FROM STA 10529+00 TO STA 10531+00 –M1– RT
FROM STA 10679+50 TO STA 10687+00 –M1– RT

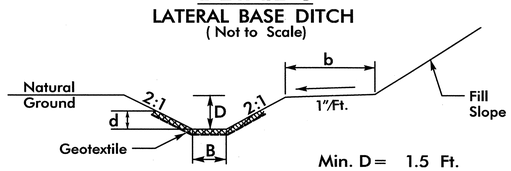
DETAIL 2
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 5.0 Ft.

FROM STA 10544+00 TO STA 10546+25 –M1– RT
FROM STA 10554+75 TO STA 10556+00 –M1– LT
FROM STA 10562+00 TO STA 10565+50 –M1– RT
FROM STA 10568+50 TO STA 10572+00 –M1– RT
FROM STA 10575+65 TO STA 10577+00 –M1– RT
FROM STA 10612+00 TO STA 10619+00 –M1– RT
FROM STA 10648+00 TO STA 10662+00 –M1– LT
FROM STA 10652+00 TO STA 10659+00 –M1– RT
FROM STA 10665+00 TO STA 10668+00 –M1– LT
FROM STA 10695+00 TO STA 10703+50 –M1– RT
FROM STA 10708+75 TO STA 10712+00 –M1– RT
FROM STA 10715+00 TO STA 10718+00 –M1– RT
FROM STA 10748+00 TO STA 10749+00 –M1– RT
FROM STA 10750+00 TO STA 10758+00 –M1– RT
FROM STA 10775+45 TO STA 10780+00 –M1– RT

DETAIL 3
LATERAL BASE DITCH
(Not to Scale)



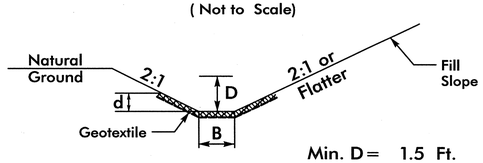
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.
b = 5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

FROM STA 10526+30 TO STA 10529+00 –M1– RT
FROM STA 10644+40 TO STA 10645+00 –M1– LT

DETAIL 4
SPECIAL LATERAL BASE DITCH
(Not to Scale)

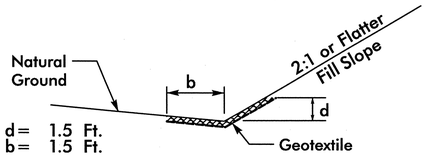


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.

Type of Liner = CLASS B RIP RAP

FROM STA 10645+00 TO STA 10648+00 –M1– LT

DETAIL 5
TOE PROTECTION
(Not to Scale)

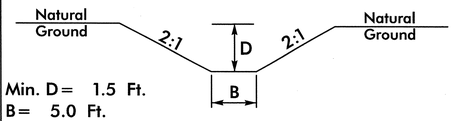


d = 1.5 Ft.
b = 1.5 Ft.

Type of Liner = CLASS B RIP RAP

FROM STA 10574+00 TO STA 10575+65 –M1– RT
FROM STA 10577+00 TO STA 10579+00 –M1– RT
FROM STA 10596+00 TO STA 10598+00 –M1– RT

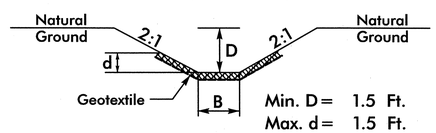
DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 5.0 Ft.

FROM STA 10519+68 TO STA 10520+44 –M1– LT
FROM STA 10565+50 TO STA 10566+03 –M1– RT
FROM STA 10568+05 TO STA 10568+50 –M1– RT
STA 10576+18 –M1– LT
STA 10576+18 –M1– RT
FROM STA 10642+00 TO STA 10645+00 –M1– RT
FROM STA 10664+50 TO STA 10665+00 –M1– LT
FROM STA 10671+00 TO STA 10671+95 –M1– LT

DETAIL 7
STANDARD BASE DITCH
(Not to Scale)



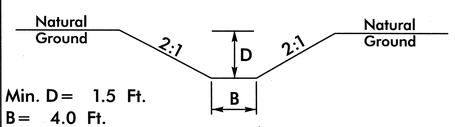
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

FROM STA 10519+35 TO STA 10520+00 –M1– RT
FROM STA 10670+00 TO STA 10673+00 –M1– RT

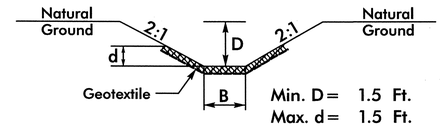
DETAIL 8
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 4.0 Ft.

STA 10566+59 –M1– LT
STA 10566+62 –M1– RT
STA 10624+33 –M1– LT
FROM STA 10705+10 TO STA 10705+63 –M1– LT

DETAIL 9
STANDARD BASE DITCH
(Not to Scale)



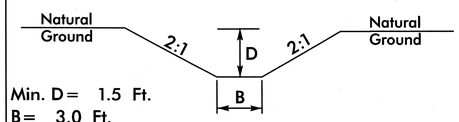
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 4.0 Ft.

*When B is < 6.0'

Type of Liner = CLASS B RIP RAP

STA 10534+00 –M1– RT

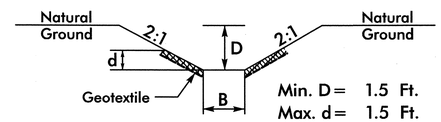
DETAIL 10
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 3.0 Ft.

STA 10555+28 –M1– RT
STA 10555+28 –M1– LT
STA 10614+09 –M1– LT

DETAIL 11
STANDARD BASE DITCH
(Not to Scale)



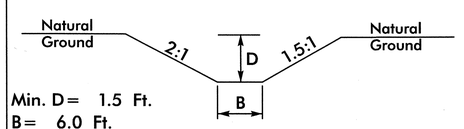
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 7.0 Ft.

When B is > _6.0'
Std. No. 876.01

Type of Liner = CLASS I RIP RAP

STA 10676+26 –M1– LT

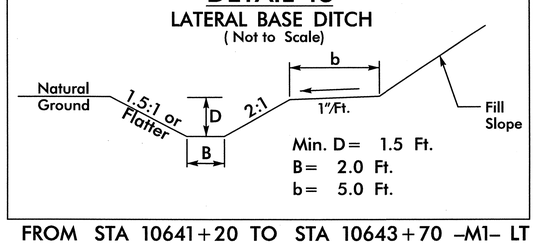
DETAIL 12
STANDARD BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 6.0 Ft.

FROM STA 10515+75 TO STA 10516+25 –M1– RT

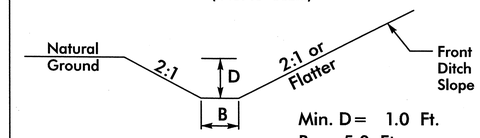
DETAIL 13
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1.5 Ft.
B = 2.0 Ft.
b = 5.0 Ft.

FROM STA 10641+20 TO STA 10643+70 –M1– LT

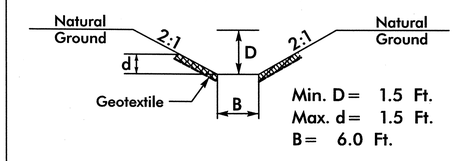
DETAIL 14
SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 1.0 Ft.
B = 5.0 Ft.

FROM STA 10663+00 TO STA 10665+00 –M1– RT
FROM STA 10762+00 TO STA 10767+00 –M1– RT

DETAIL 15
STANDARD BASE DITCH
(Not to Scale)

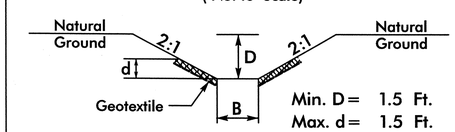


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 6.0 Ft.

Type of Liner = CLASS I RIP RAP

STA 10516+00 –M1– LT

DETAIL 16
STANDARD BASE DITCH
(Not to Scale)

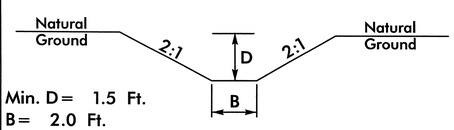


Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 5.0 Ft.

Type of Liner = CLASS I RIP RAP

STA 10534+10 –M1– LT

DETAIL 17
STANDARD BASE DITCH
(Not to Scale)



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

STA 10641+20 –M1– LT

USER: westml
DATE: 5/29/2013
TIME: 4:25:35 PM
DGN: R:\Hydr\Sheets\P-5208G_RR_HYD_DET02.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-H
R/W SHEET NO.	

RAIL DESIGN ENGINEER

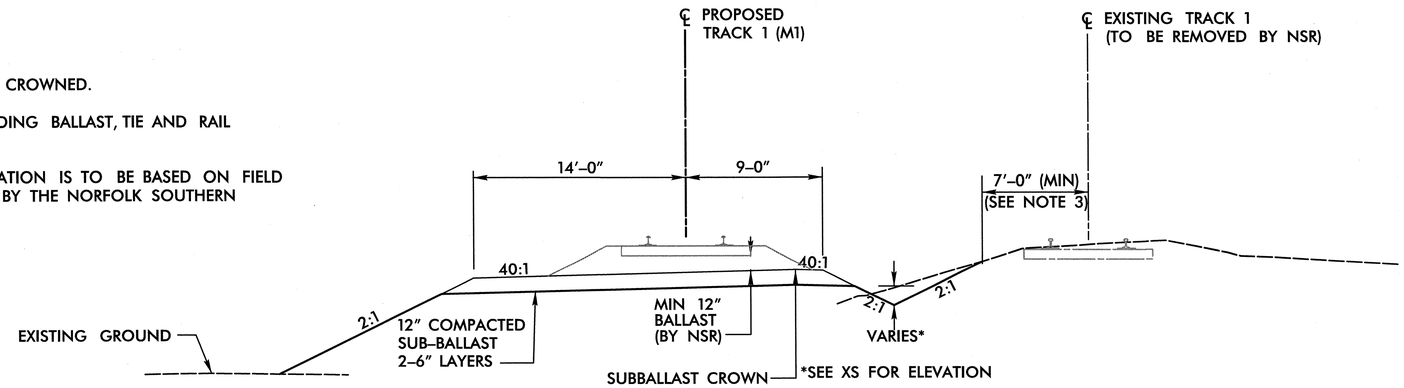
NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER REY W. BRAMHAM 4/17/13

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

DCN 0041DEL_P10a1

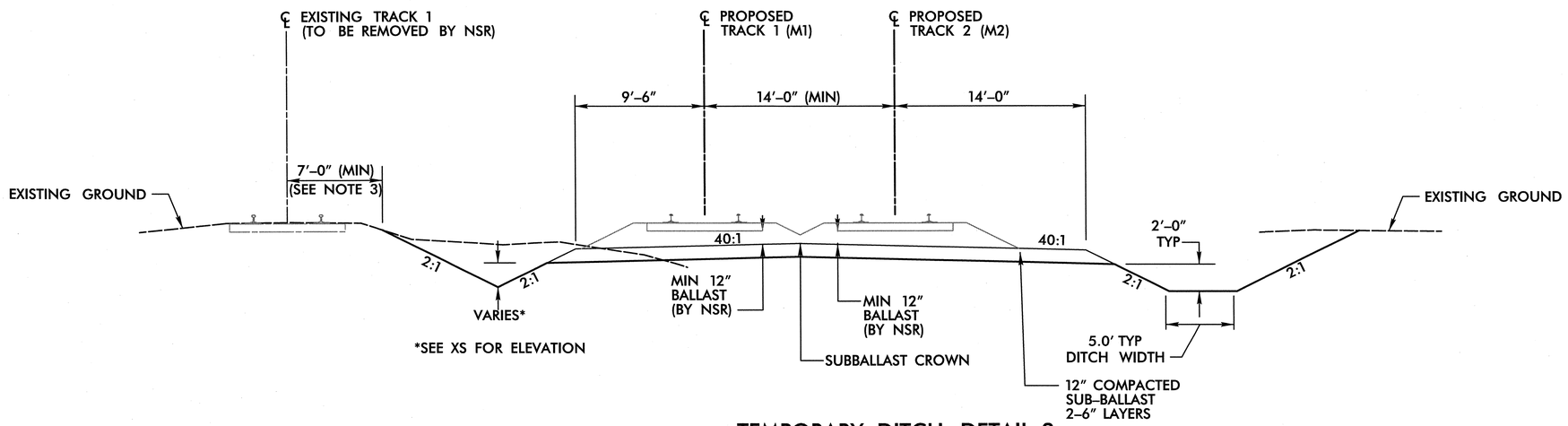
NOTES:

1. TOP OF SUB-GRADE IS TO BE CROWNED.
2. TRACK CONSTRUCTION, INCLUDING BALLAST, TIE AND RAIL INSTALLATION, BY NCR.
3. ACTUAL LOCATION OF EXCAVATION IS TO BE BASED ON FIELD CONDITIONS AS DETERMINED BY THE NORFOLK SOUTHERN REPRESENTATIVE.



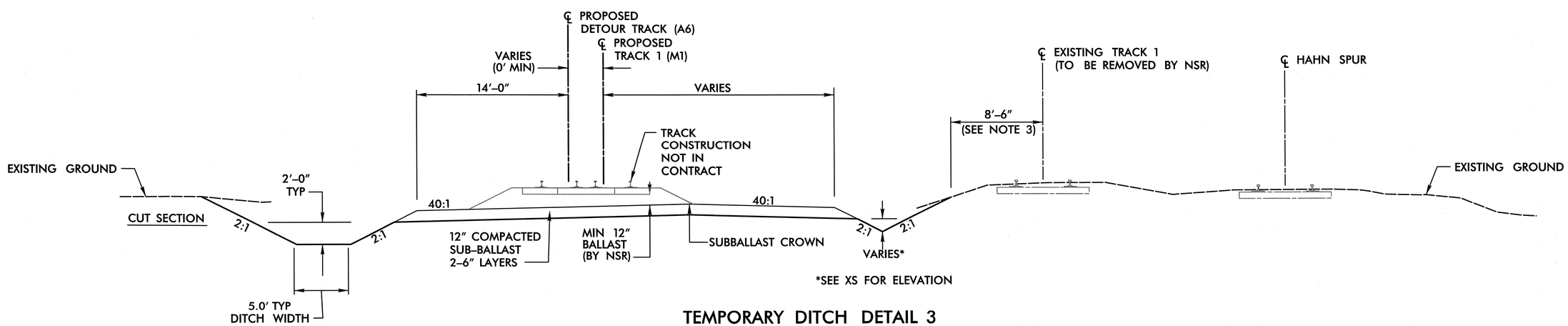
TEMPORARY DITCH DETAIL 1

-M1- STA. 10563+00 TO STA. 10568+00



TEMPORARY DITCH DETAIL 2

-M1- STA. 10631+00 TO STA. 10634+00



TEMPORARY DITCH DETAIL 3

-M1- STA. STA. 10649+00 TO STA. 10660+00

USER: westml
DATE: 4/17/2013
TIME: 11:21:36 AM
DGN: R:\Rail\Sheets\P-5208G_RR-TD01.dgn

PROJECT REFERENCE NO. P-5208G | SHEET NO. 2-1

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

DCN 0041DEL_P10a1

HORIZONTAL CURVE GEOMETRY

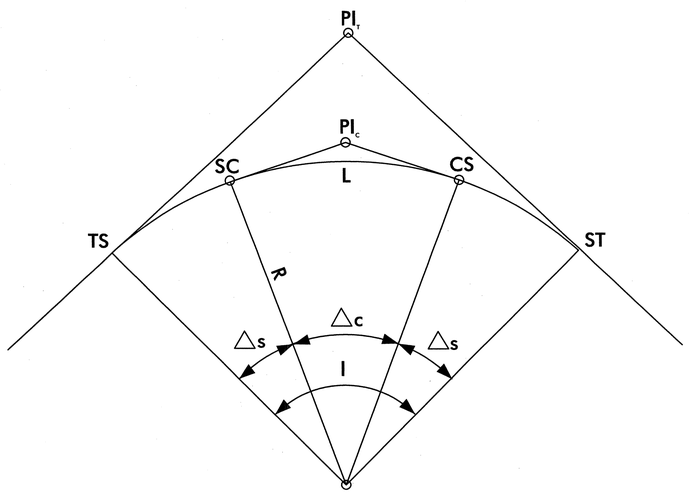


FIGURE A

CIRCULAR CURVE WITH SPIRAL TRANSITION CURVES

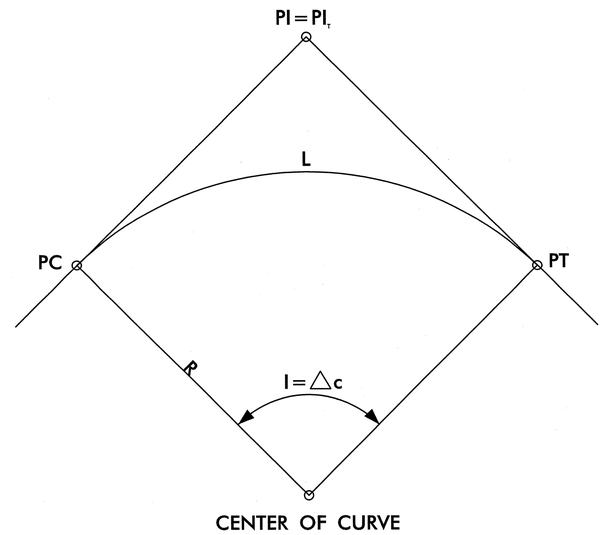


FIGURE B

SIMPLE CIRCULAR CURVE

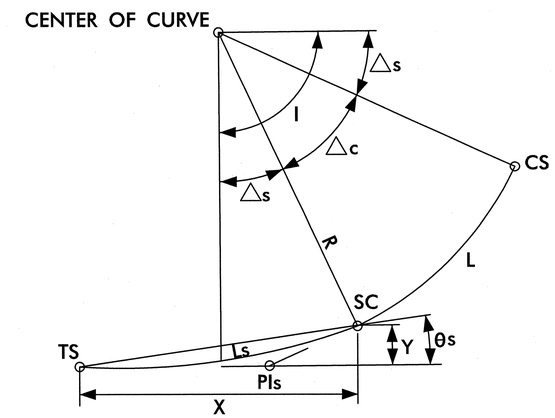


FIGURE C

SPIRAL TRANSITION CURVE

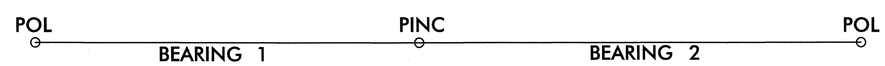


FIGURE D

DEFLECTION BETWEEN TANGENTS

R	RADIUS OF CURVATURE
Dc	DEGREE OF CURVATURE (CHORD DEFINED)
L	LENGTH OF CURVE (CHORD DEFINED)
I	TOTAL INTERSECTION ANGLE
△c	CURVE ANGLE
△s	SPIRAL ANGLE
θs	SPIRAL DEFLECTION
Ls	LENGTH OF SPIRAL
X	SPIRAL TANGENT LENGTH TO OFFSET
Y	SPIRAL TANGENT OFFSET

PI	POINT OF INTERSECTION (CIRCULAR CURVE)
PI_T	POINT OF INTERSECTION (TANGENT)
PIs	POINT OF INTERSECTION (SPIRAL)
PC	TANGENT TO CIRCULAR CURVE
PT	CIRCULAR CURVE TO TANGENT
TS	TANGENT TO SPIRAL
SC	SPIRAL TO CIRCULAR CURVE
CS	CIRCULAR CURVE TO SPIRAL
ST	SPIRAL TO TANGENT
PINC	POINT OF INTERSECTION NO CURVE

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-J
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. E. W. BRAMMER

4/17/13

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259 FAX

TRACK GEOMETRY DATA

PROPOSED TRACK 1 (M1)

FEATURE NO.	DESC	STATION	NORTHING	EASTING	BEARING	DISTANCE	R(ft)	Dc	L(ft)	I	DELTA(CURVE)	DELTA(SPIRAL)	THETA	Ls(ft)	X(ft)	Y(ft)	Eq(in)	V(MPH) FREIGHT PLAN7-2	V(MPH) INTERMODAL PLAN7-2	V(MPH) PASSENGER PLAN7-2	V(MPH) PASSENGER FUTURE 4"CD	V(MPH) PASSENGER FUTURE 5"CD
	POL	10514+34.70	573,333.8091	1,499,666.8947																		
					S 84°06' 08.77" W	964.5215																
	TS	10523+99.22	573,234.7043	1,498,707.4782																		
												1° 53' 27.51" (RT)	0° 37' 49.15"	372.00	371.9595	4.0921						
	SC	10527+71.22	573,200.5559	1,498,337.0670																		
M1C3658	PI	10531+00.07	573,177.5788	1,498,009.0212			5,635.7244	1° 01' 00.00"	656.9454		6° 40' 44.20" (RT)						2.5	50	60	80 Eu=2.05"	90 Eu=3.26"	90 Eu=3.26"
	CS	10534+28.17	573,192.9112	1,497,680.5294																		
												0° 35' 01.78" (RT)	0° 17' 02.99"	62.0000								
	SC	10534+90.17	573,196.1257	1,497,618.6131																		
	PI	10539+41.60	573,221.7676	1,497,167.9039			6,611.1145	0° 52' 00.00"	901.4680	18° 26' 38.84" (RT)	7° 48' 45.80" (RT)											
M1C3660	CS	10543+91.63	573,308.4389	1,496,724.8640													2.0	50	60	80 Eu=1.88"	90 Eu=2.91"	90 Eu=2.91"
												1° 28' 39.55" (RT)	0° 29' 33.17"	341.0000	340.9773	2.9313						
	ST	10547+32.63	573,379.6491	1,496,391.3925																		
					N 77° 27' 12.39" W	678.9403																
	TS	10554+11.58	573,527.1372	1,495,728.6654																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	SC	10559+07.58	573,624.3646	1,495,242.3829																		
M1C3665	PI	10565+31.46	573,720.0977	1,494,625.8831			3,819.8277	1° 30' 00.00"	1,236.8206	25° 59' 31.54" (LT)	18° 33' 08.31" (LT)						4.0	50	60	80 Eu=2.72"	85 Eu=3.59"	90 Eu=4.51"
	CS	10571+44.40	573,614.7038	1,494,010.9611																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	ST	10576+40.40	573,509.8588	1,493,526.2639																		
					S 76° 33' 16.06" W	3,259.7729																
	TS	10609+00.17	572,751.8932	1,490,355.8369																		
												2° 08' 57.49" (LT)	0° 42' 59.13"	403.0000	402.9433	5.0387						
	SC	10613+03.17	572,653.2998	1,489,965.1093																		
M1C3675	PI	10616+94.70	572,548.0440	1,489,587.9942			5,371.5569	1° 04' 00.00"	781.6634	12° 38' 10.85" (LT)	8° 20' 15.87" (LT)						2.5	50	60	80 Eu=2.28"	90 Eu=3.55"	90 Eu=3.55"
	CS	10620+84.83	572,389.2160	1,489,230.1280																		
												2° 08' 57.49" (LT)	0° 42' 59.13"	403.0000	402.9433	5.0387						
	ST	10624+87.83	572,216.5854	1,488,866.0025																		
					S 63° 55' 05.21" W	864.7610																
	TS	10633+52.59	571,836.3887	1,488,089.3031																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	SC	10638+48.59	571,608.7735	1,487,648.7181																		
M1C3682	PI	10651+06.30	570,983.6899	1,486,557.3392			3,819.8277	1° 30' 00.00"	2,429.9432	43° 53' 20.16" (LT)	36° 26' 56.93" (LT)						4.0	50	60	80 Eu=2.72"	85 Eu=3.59"	90 Eu=4.51"
	CS	10662+78.54	569,832.4842	1,486,050.8189																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	ST	10667+74.54	569,370.3549	1,485,870.9293																		
					S 20° 01' 45.04" W	4,090.9293																
	TS	10708+65.47	565,526.8519	1,484,469.7915								1° 53' 27.51" (RT)	0° 37' 49.15"	372.0000	371.9595	4.0921						
	SC	10712+37.47	565,178.7907	1,484,338.5513																		
M1C3695	PI	10715+42.87	564,895.4640	1,484,224.5389			5,635.7244	1° 01' 00.00"	610.2072	9° 59' 8.59" (RT)	6° 12' 13.58" (RT)						2.5	50	60	80 Eu=2.05"	90 Eu=3.26"	90 Eu=3.26"
	CS	10718+47.67	564,626.1172	1,484,080.5765																		
												1° 53' 27.51" (RT)	0° 37' 49.15"	372.0000	371.9595	4.0921						
	ST	10722+19.67	564,301.9922	1,483,898.0564																		
					S 30° 00' 53.65"	6,819.8398																

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-K
R/W SHEET NO.	

RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. E. W. BRANDENBURG

4/17/13

Prepared in the Office of: AECOM NC FIRM LICENSE No F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

TRACK GEOMETRY DATA

PROPOSED TRACK 2 (M2)

FEATURE NO.	DESC	STATION	NORTHING	EASTING	BEARING	DISTANCE	R(ft)	Dc	L(ft)	I	DELTA(CURVE)	DELTA(SPIRAL)	THETA	Ls(ft)	X(ft)	Y(ft)	Ea(in)	V(MPH) FREIGHT PLAN7-2	V(MPH) INTERMODAL PLAN7-2	V(MPH) PASSENGER PLAN7-2	V(MPH) PASSENGER FUTURE 4"CD	V(MPH) PASSENGER FUTURE 5"CD
	POL	10514+34.71	573,348.4215	1,499,665.3767																		
					S 84°06' 08.77" W	960.2962																
	TS	10523+95.01	573,249.7508	1,498,710.1632																		
												1° 53' 27.51" (RT)	0° 37' 49.15"	372.0000	371.9595	4.0921						
	SC	10527+67.01	573,215.6024	1,498,339.7519																		
M2C3658	PI	10530+74.58	573,194.1119	1,498,032.9304			5,635.7244	1° 01' 00.00"	614.5287		6° 14' 51.75" (RT)						2.5	50	60	80 Eu=2.05"	90 Eu=3.26"	90 Eu=3.26"
	CS	10533+81.53	573,206.1395	1,497,725.5925																		
												0° 35' 01.78" (RT)	0° 17' 02.99"	62.0000								
	SC	10534+43.53	573,208.8879	1,497,663.6537																		
	PI	10539+19.97	573,232.3691	1,497,187.7929			6,611.1145	0° 52' 00.00"	951.2260	18° 26' 38.83" (RT)	8° 14' 38.25" (RT)											
M2C3660	CS	10543+94.76	573,323.8405	1,496,720.2163													2.0	50	60	80 Eu=1.88"	90 Eu=2.91"	90 Eu=2.91"
												1° 28' 39.55" (RT)	0° 29' 33.17"	341.0000	340.9773	2.9313						
	ST	10547+35.76	573,395.0506	1,496,386.7448																		
					N 77° 27' 12.39" W	674.4311																
	TS	10554+10.19	573,541.5593	1,495,728.4192																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	SC	10559+06.19	573,638.7867	1,495,242.1367																		
M2C3665	PI	10565+30.08	573,734.5197	1,494,625.6368			3,819.8277	1° 30' 00.00"	1,236.8206	25° 59' 31.54" (LT)	18° 33' 08.31" (LT)						4.0	50	60	80 Eu=2.72"	85 Eu=3.59"	90 Eu=4.51"
	CS	10571+43.01	573,629.1259	1,494,010.7149																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	ST	10576+39.01	573,524.2809	1,493,526.0177																		
					S 76° 33' 16.06" W	3,273.2102																
	TS	10609+12.22	572,763.1908	1,490,342.5217																		
												2° 10' 58.38" (LT)	0° 43' 39.43"	403.0000	402.9415	5.1174						
	SC	10613+15.22	572,664.5213	1,489,951.8142																		
M2C3675	PI	10616+97.61	572,561.5066	1,489,583.5625			5,288.9200	1° 05' 00.00"	763.4380	12° 38' 10.83" (LT)	8° 16' 14.08" (LT)						2.5	50	60	80 Eu=2.35"	90 Eu=3.64"	90 Eu=3.64"
	CS	10620+78.66	572,406.5911	1,489,233.9593																		
												2° 10' 58.38" (LT)	0° 43' 39.43"	403.0000	402.9415	5.1174						
	ST	10624+81.66	572,234.0320	1,488,869.8008																		
					S 63° 55' 05.21" W	882.5274																
	TS	10633+64.19	571,846.0242	1,488,077.1441																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	SC	10638+60.19	571,618.4089	1,487,636.5591																		
M2C3682	PI	10651+17.90	570,993.3253	1,486,545.1803			3,819.8277	1° 30' 00.00"	2,429.9432	43° 53' 20.17" (LT)	36° 26' 56.93" (LT)						4.0	50	60	80 Eu=2.72"	85 Eu=3.59"	90 Eu=4.51"
	CS	10662+90.13	569,842.1197	1,486,038.6600																		
												3° 43' 11.62" (LT)	1° 14' 23.71"	496.0000	495.7910	10.7309						
	ST	10667+86.13	569,379.9903	1,485,858.7703																		
					S 20° 01' 45.04" W	253.6503																
	PI/TO	10670+39.63	569,141.8218	1,485,771.9467																		
8 NO. 10 LH	PS	10670+70.88	569,112.4619	1,485,761.2436																		
					S 20° 01' 45.04" W	4,096.2670																
	TS	10708+82.40	565,531.4724	1,484,455.8044								1° 53' 27.51" (RT)	0° 37' 49.15"	372.0000	371.9595	4.0921						
	SC	10712+54.40	565,183.4112	1,484,324.5642																		
M2C3695	PI	10715+59.80	564,900.0845	1,484,210.5518			5,635.7244	1° 01' 00.00"	610.2072	9° 59' 8.59" (RT)	6° 12' 13.58" (RT)						2.5	50	60	80 Eu=2.05"	90 Eu=3.26"	90 Eu=3.26"
	CS	10718+64.61	564,630.7377	1,484,066.5894																		
												1° 53' 27.51" (RT)	0° 37' 49.15"	372.0000	371.9595	4.0921						
	ST	10722+36.61	564,306.6127	1,483,884.0693																		
					S 30° 00' 53.65" W	6,811.7598																

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-L
R/W SHEET NO.	

RAIL DESIGN ENGINEER

4/17/13

Prepared in the Office of: AECOM

NC FIRM LICENSE Nos F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

TRACK GEOMETRY DATA

PROPOSED HAHN SPUR (A5)

FEATURE NO.	DESC	STATION	NORTHING	EASTING	BEARING	DISTANCE	R(ft)	Dc	L(ft)	I	DELTA(CURVE)	DELTA(SPIRAL)	THETA	Ls(ft)	X(ft)	Y(ft)	Ea(in)	V(MPH) FREIGHT PLAN7-2	V(MPH) INTERMODAL PLAN7-2	V(MPH) PASSENGER PLAN7-2	V(MPH) PASSENGER FUTURE 4"CD	V(MPH) PASSENGER FUTURE 5"CD
	POB	10645+49.74	571,224.5442	1,487,042.3763																		
					S 50° 02' 20.82" W	165.0000																
	PC	10647+14.74	571,118.5706	1,486,915.9066	**TIE TO EXISTING ALIGNMENT**																	
	POL	10662+62.11	569,875.2837	1,486,027.8308	**TIE TO EXISTING ALIGNMENT**																	
					S 20° 41' 28.25" W	557.2391																
A5C3685	PC	10668+19.35	569,353.9874	1,485,830.9410																		
	PI	10668+62.00	569,314.0858	1,485,815.8705			764.4894	7° 30' 00.00"	85.1563		6° 23' 12.21" (LT)						0	10				
	PT	10669+04.50	569,272.7555	1,485,805.3321																		
					S 14° 18' 16.04" W	135.1229																
8 NO. 10 LH	PI/TO	10670+39.63	569,141.8218	1,485,771.9467																		
					S 20° 01' 45.04" W	31.2500																
	PS	10670+70.88	569,112.4619	1,485,761.2436																		

TRACK GEOMETRY DATA

PROPOSED MALLARD CREEK CHURCH ROAD DETOUR TRACK (A6)

FEATURE NO.	DESC	STATION	NORTHING	EASTING	BEARING	DISTANCE	R(ft)	Dc	L(ft)	I	DELTA(CURVE)	DELTA(SPIRAL)	THETA	Ls(ft)	X(ft)	Y(ft)	Ea(in)	V(MPH) FREIGHT PLAN7-2	V(MPH) INTERMODAL PLAN7-2	V(MPH) PASSENGER PLAN7-2	V(MPH) PASSENGER FUTURE 4"CD	V(MPH) PASSENGER FUTURE 5"CD
A6C3678	TS	10635+64.70	571,712.2576	1,487,924.5424								0° 55' 47.96" (LT)	0° 18' 35.98"	186.0000	185.9951	1.0063	2.0	50	60	70 Eu=1.43"		
	SC	10637+50.70	571,624.0399	1,487,760.7962																		
	PI	10641+15.28	571,447.6586	1,487,441.7217			5,729.6507	1° 00' 00.00"	728.1698		7° 16' 54.11" (LT)											
	CS	10644+78.87	571,232.2582	1,487,147.5771								2° 47' 23.62" (LT)	1° 14' 23.84"	186.0000								
A6C3680	SC	10646+64.87	571,119.1551	1,486,999.9387													4.0	50	60	70 Eu=2.86"		
	PI	10649+43.76	570,943.6271	1,486,783.2184			2,864.9344	2° 00' 00.00"	555.9915	41° 49' 57.56" (LT)	11° 07' 11.39" (LT)											
	CS	10652+20.87	570,729.5981	1,486,604.4200																		
A6C3682												1° 37' 38.76" (LT)	0° 46' 29.89"	93.0000			4.0	50	60	70 Eu=1.15"		
	SC	10653+13.87	570,657.3494	1,486,545.8661																		
	PI	10658+34.62	570,248.3815	1,486,223.4881			3,819.8277	1° 30' 00.00"	1,035.0922		15° 31' 34.98" (LT)											
	CS	10663+48.96	569,768.0432	1,486,022.3480								2° 33' 26.74" (LT)	0° 51' 08.86"	341.0000	340.9321	5.0728						
	ST	10666+89.96	569,449.7554	1,485,900.0643																		

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-M
R/W SHEET NO.	

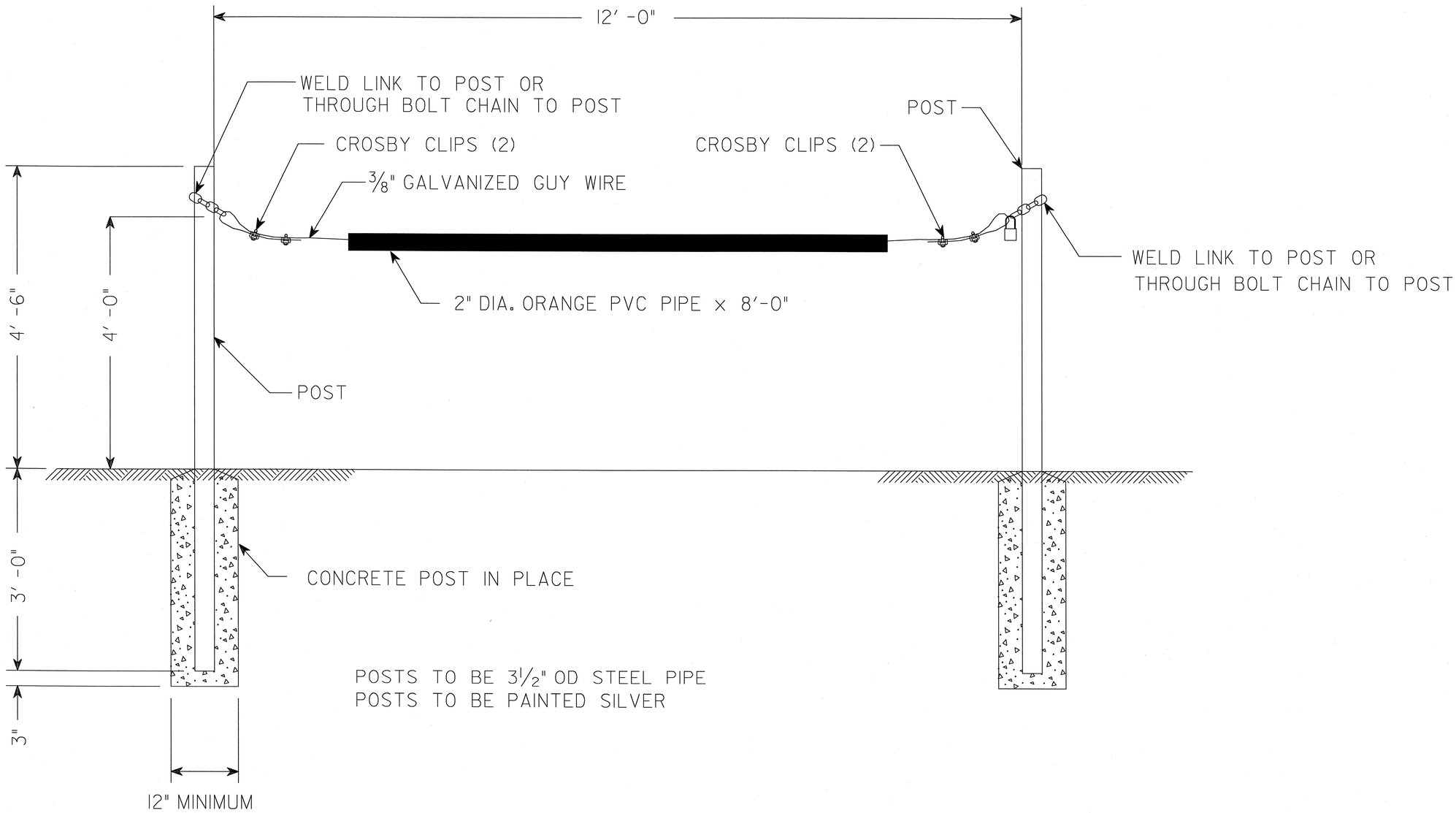
RAIL DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036222 RILEY W. BRIMINGHAM

5/1/13

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

RIGHT OF WAY GATE DETAIL



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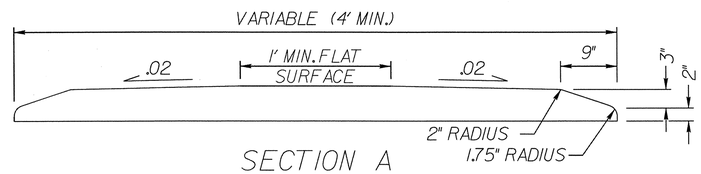
PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-N

Prepared in the Office of: AECOM
NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

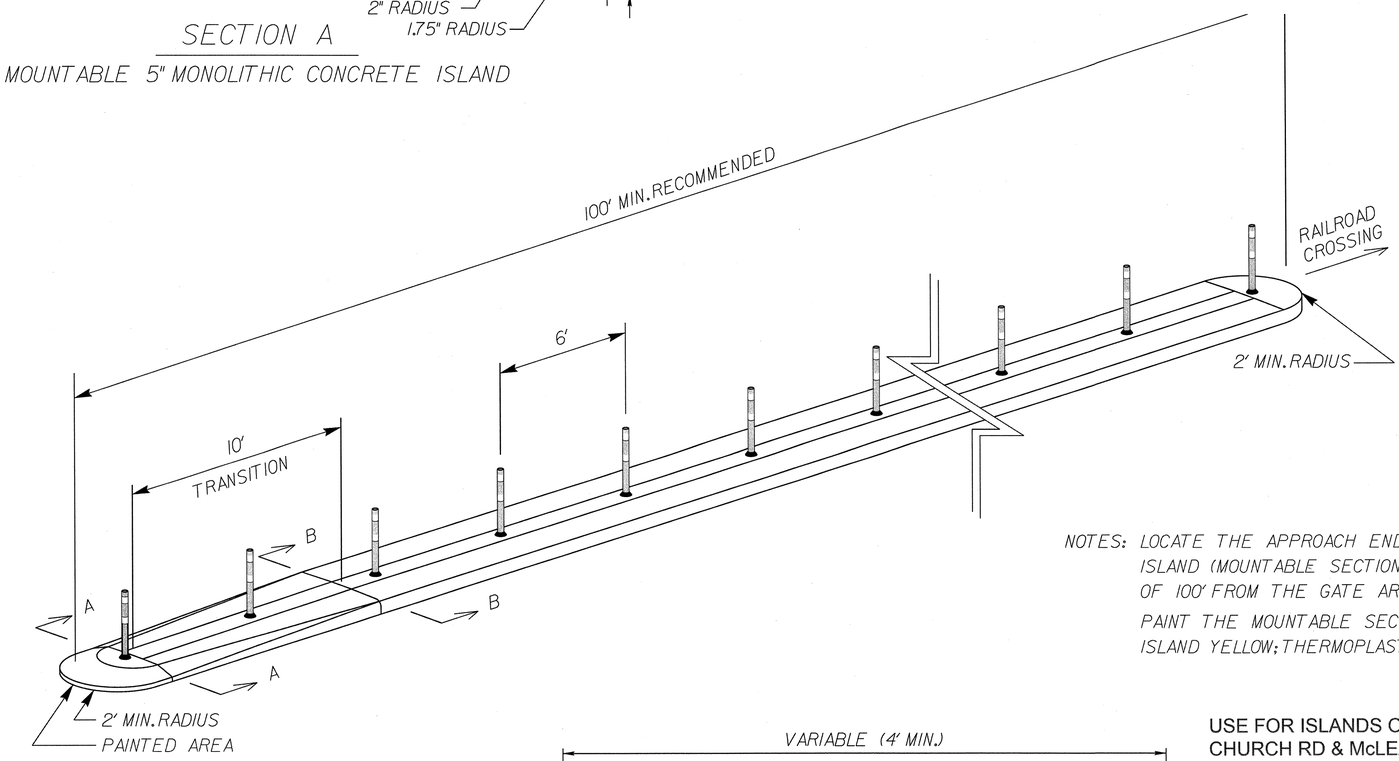
0041DEL_P10a1

5/14/99



SECTION A

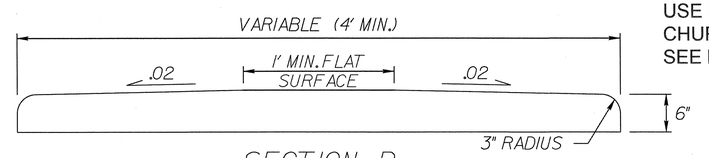
MOUNTABLE 5" MONOLITHIC CONCRETE ISLAND



NOTES: LOCATE THE APPROACH END OF THE ISLAND (MOUNTABLE SECTION) A MINIMUM OF 100' FROM THE GATE ARM.

PAINT THE MOUNTABLE SECTION OF THE ISLAND YELLOW; THERMOPLASTIC PREFERRED.

USE FOR ISLANDS ON BACK CREEK CHURCH RD & McLEAN RD
SEE PLAN SHEETS 12 & 18



SECTION B

NON-MOUNTABLE 6" MONOLITHIC CONCRETE ISLAND

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: /epicward/stds/stdstodetails/30001/0300d01.dgn

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN S. HOWARD
4/26/13

USER: wwatsl
DATE: 4/17/2013
TIME: 11:51:55 AM
DGN: R:\Roadway\Proj\p5208g_rdy_uat2.dgn

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$$$$USER$$$$
$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$

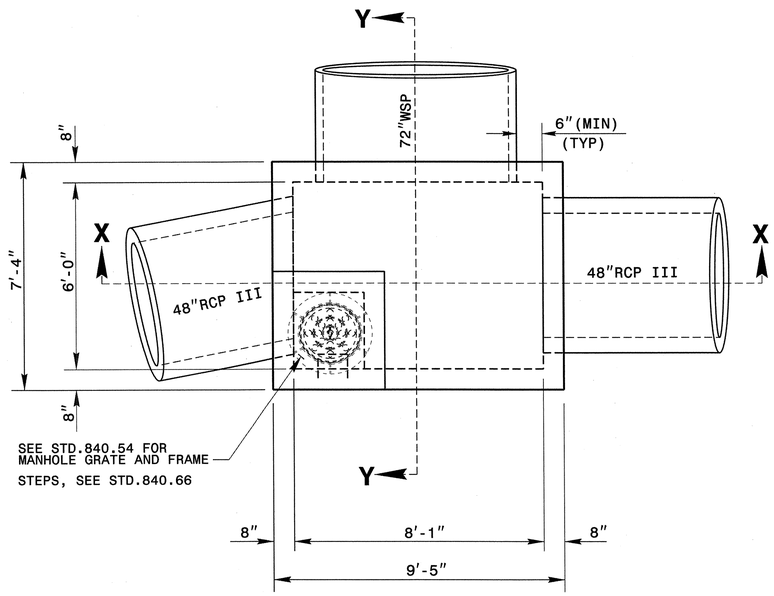
PROJECT REFERENCE NO.	SHEET NO.
P-5208G	2-0

Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

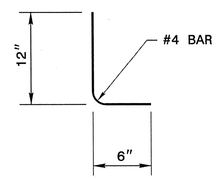
DCN 0041DEL_P10a1

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	



PLAN VIEW



DOWEL "C"

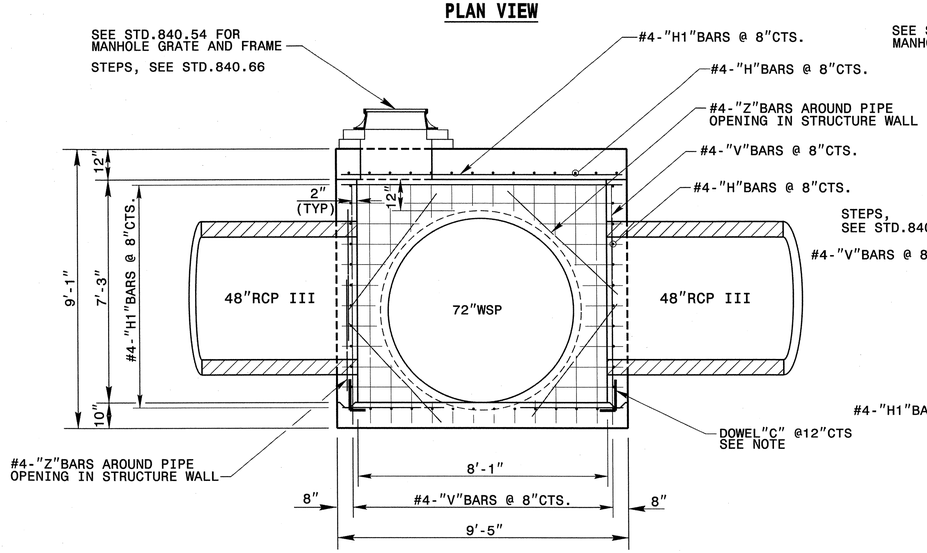
GENERAL NOTES:

- THE BASE SLAB TO BE CONSTRUCTED BY FORMING.
- SEE STD. DWG. 840.00 FOR CONSTRUCTION OF BASE SLAB
- CLASS 'B' CONCRETE TO BE USED THROUGHOUT.
- CONSTRUCTION OPTIONS: MONOLITHIC POUR; 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
- ALL EXPOSED CORNERS TO BE CHAMFERED 1".
- MAINTAIN 2" MINIMUM CONCRETE COVERAGE ON ALL STEEL.
- JUNCTION BOXES OVER 3'-6" IN DEPTH WITH MANHOLES REQUIRE STEPS TO BE PLACED ON 12" CTRS. REFERENCE STD. NO. 840.66.

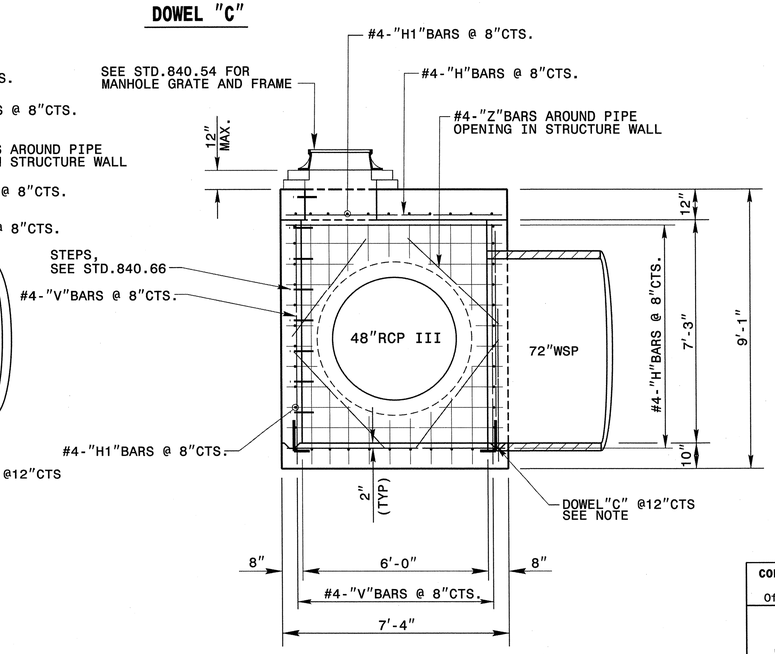
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
H	46	#4	7'-0"	215
H1	40	#4	9'-1"	243
V	46	#4	7'-9"	239
Z	12	#4	4'-0"	32
TOTAL REINF. STEEL (LBS.)				729
TOTAL CONC. (CU. YDS.)				10.2
CONCRETE PIPE DEDUCTION				
2-48" RCP				-1.0
1-72" RCP				-0.8
TOTAL CONC. (CU. YDS.)				8.4

* 0.30 CU. YD. PER FOOT OF RISER HEIGHT



SECTION X-X



SECTION Y-Y

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

STRUCTURE NO. G1603

CONTRACT STANDARDS AND DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-707-6900 FAX 919-250-4119

72"WELDED STEEL PIPE
JUNCTION BOX WITH MANHOLE

ORIGINAL BY: DATE:
MODIFIED BY: nbritt DATE: 03/15/13
CHECKED BY: DATE:
FILE SPEC.: detail/nbritt/english/hydro/p5208g 72 wsp jb.dgn

USER: westml
DATE: 4/17/2013
TIME: 11:23:06 AM
DGN: R:\Roll\Sheets\P-5208G_RR-DT20.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	3-A

Prepared in the Office of: AECOM NC FIRM LICENSE Nos F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27607 (919) 854-6200 - (919) 854-6259(FAX)

COMPUTED BY: DGL DATE: 10/17/2012

CHECKED BY: FFF DATE: 12/11/2012

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

| STATION | LOCATION (LT, RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 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 (SEE PROJECT SPECIAL PROVISIONS) SIZE 8" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS III SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 15" WELDED STEEL PIPE 0.312" THICK, GRADE B (IN SOIL) | 18" WELDED STEEL PIPE 0.312" THICK, GRADE B (NOT IN SOIL) | 18" WELDED STEEL PIPE 0.312" THICK, GRADE B (OPEN CUT) | 24" WELDED STEEL PIPE 0.375" THICK, GRADE B (IN SOIL) | 24" WELDED STEEL PIPE 0.375" THICK, GRADE B (NOT IN SOIL) | 24" WELDED STEEL PIPE 0.375" THICK, GRADE B (OPEN CUT) | 30" WELDED STEEL PIPE 0.469" THICK, GRADE B (IN SOIL) | 30" WELDED STEEL PIPE 0.469" THICK, GRADE B (NOT IN SOIL) | 30" WELDED STEEL PIPE 0.469" THICK, GRADE B (OPEN CUT) | 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) | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B (IN SOIL) | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B (NOT IN SOIL) | 42" WELDED STEEL PIPE 0.625" THICK, GRADE B (OPEN CUT) | 48" WELDED STEEL PIPE 0.688" 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) | ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS | STD. 838.11 AND CLASS B CONCRETE NOT ALLOWED IN RR ROW. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0') | LIN. FT. A 5.0' THRU 10.0' | LIN. FT. B 10.0' AND ABOVE | *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') | 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 | J.B. STD. 840.31 OR 840.32 | T.B.J.B. STD. 840.34 | M.H. STD. 840.51, STD. 840.52, OR STD. 840.53 | M.H. FRAME AND COVER STD. 840.54 | | | REMOVE CB | REMOVE JB | | FLOWABLE FILL | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

0041DEL_P10a1

DGN

COMPUTED BY: DGL DATE: 10/17/2012

CHECKED BY: JMK DATE: 12/11/2012

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

USR4LPC049

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

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE 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 (SEE PROJECT SPECIAL PROVISIONS) SIZE 8"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																				.064	.064	.064	.064	.079	.079	.109	.109																
10+85 -Y16-	RT	G2505		766.25	762.90																																						
		G2505	G2504		762.90	762.50																								12													
10+98 -Y16-	RT	G2504		765.50	762.50																																						
		G2504	G2503		762.50	762.30																								40													
10+98 -Y16-	LT	G2503		765.50	762.30																																						
		G2503	G2502		762.30	762.08																								44													
10+52 -Y16-	LT	G2502		765.37	762.08																																						
		G2502	G2501		762.08	762.04																								8													
10+43 -Y16-	LT	G2501		765.73	762.04																																						
11+44 -Y16-	RT																																										
11+44 -Y16-	LT																																										
SHEET TOTALS																														104													
SHEET 3-A TOTALS										80	124	28				96					40	40																					
SHEET 3-C TOTALS																																											
PROJECT TOTALS										80	124	28				96					40	40								104													

STATION	18" WELDED STEEL PIPE 0.312" THICK, GRADE B (IN SOIL)	18" WELDED STEEL PIPE 0.312" THICK, GRADE B (NOT IN SOIL)	18" WELDED STEEL PIPE 0.312" THICK, GRADE B (OPEN CUT)	24" WELDED STEEL PIPE 0.375" THICK, GRADE B (IN SOIL)	24" WELDED STEEL PIPE 0.375" THICK, GRADE B (NOT IN SOIL)	24" WELDED STEEL PIPE 0.375" THICK, GRADE B (OPEN CUT)	30" WELDED STEEL PIPE 0.469" THICK, GRADE B (IN SOIL)	30" WELDED STEEL PIPE 0.469" THICK, GRADE B (NOT IN SOIL)	30" WELDED STEEL PIPE 0.469" THICK, GRADE B (OPEN CUT)	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)	42" WELDED STEEL PIPE 0.625" THICK, GRADE B (IN SOIL)	42" WELDED STEEL PIPE 0.625" THICK, GRADE B (NOT IN SOIL)	42" WELDED STEEL PIPE 0.625" THICK, GRADE B (OPEN CUT)	48" WELDED STEEL PIPE 0.688" 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)	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS	STD. 838.11 AND CLASS B CONCRETE NOT ALLOWED IN RR ROW.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. "A" + (1.3 X COL. "B")	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	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			REMOVE CB	REMOVE JB		FLOWABLE FILL	PIPE REMOVAL LIN. FT.	REMARKS
10+85 -Y16-																											1									1			1							
10+98 -Y16-																											1			1	1													
10+98 -Y16-																											1			1	1													
10+52 -Y16-																											1			1			1											
10+43 -Y16-																											1								1		1							
11+44 -Y16-																																								1				
11+44 -Y16-																																								1				
SHEET TOTALS																											5			3	2		1			1	1		2			2			5.2	78	
SHEET 3-A TOTALS	30	30	74	17	18	38				79	81	252	37	38	51	56	56	90		1	1.3													1		1				1		61.5	557	
SHEET 3-C TOTALS																																						1					155.1		
PROJECT TOTALS	30	30	74	17	18	38				79	81	252	37	38	51	56	56	90	73.9	6	1.3		3	2		1			2	1		4			2	1		221.8	635	

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

USER: westful
DATE: 4/24/2013
TIME: 1:07 PM
DGN: R:\Roll\Sheets\P-5208G_RR-DSUM.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	3-C

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)

DGN 0041DEL_P10a1

COMPUTED BY: DGL DATE: 10/17/2012

CHECKED BY: FFF DATE: 12/11/2012

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

USR4L3PC049

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 | LOCATION (LT, RT, OR CL)* | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 54" | 60" | 66" | 72" | 78" | 84" | C.S. PIPE SIZE 54" THICKNESS OR GAUGE .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 | REINFORCED ENDWALLS WITH R.C. - C.Y. | REINFORCED ENDWALLS WITH C.S. - C.Y. | MASONRY DRAINAGE STRUCTURES CUBIC YARDS | | FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | 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) | 72" WELDED STEEL PIPE 1.0" THICK, GRADE B (IN SOIL) | 72" WELDED STEEL PIPE 1.0" THICK, GRADE B (NOT IN SOIL) | 72" WELDED STEEL PIPE 1.0" THICK, GRADE B (OPEN CUT) | | J.B. SEE DETAIL SHEET 2-O | M.H. FRAME AND COVER STD. 840.54 | REINF. CONC. FLARED END SECTIONS NO. & SIZE | CORR. STEEL FLARED END SECTIONS NO. & SIZE | CORR. STEEL ELBOWS NO. & SIZE | | FLOWABLE FILL | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	3-D

Prepared in the Office of: AECOM
NC FIRM LICENSE Nos F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

DGN 0041DEL_P10a1 0001ADD_P10a1

COMPUTED BY:	mkw, cmkr	DATE:	3/7/2013
CHECKED BY:	rwb	DATE:	3/7/2013

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK
(IN CUBIC YARDS)

LINE	Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
M1						
Segment 1	10514+00.00	10544+00.00	5842	1644	0	4198
Segment 2	10544+00.00	10574+00.00	17867	5194	0	12674
Segment 3	10574+00.00	10604+00.00	5172	4618	0	554
Segment 4	10607+67.00	10638+00.00	14124	741	51	13434
Segment 5	10638+00.00	10668+00.00	16007	11326	0	4681
Segment 6	10668+00.00	10698+00.00	18668	1970	0	16698
Segment 7	10698+00.00	10731+00.00	7446	499	0	6948
Segment 8	10731+00.00	10761+00.00	5185	7	0	5177
Segment 9	10761+00.00	10786+00.00	4712	87	0	4624
Subtotal			95023	26086	51	68988
ADJUSTMENTS DUE TO						
Earth Waste to Replace Borrow					-51	-51
PROJECT TOTAL			95023	26086	0	68937
Est. 5% to Replace Topsoil in Borrow Pits					0	
GRAND TOTAL			95023		0	
SAY			95100		0	
Est. Drainage Ditch Excav.	4645 CY					
Shoulder Borrow	100 CY					
Estimate Undercut	200 CY					
Select Granular Material	200 CY					

"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

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

LINE	Station	Station	LOC LT/RT/CL	YD^2
Y12	10+17.94	10+37.84	LT	14
Y12	10+17.94	10+35.85	RT	13
Y13	10+29.61	11+29.11	LT	54
Y13	10+29.61	11+29.11	RT	74
Y14	10+39.77	11+21.43	LT	51
Y14	10+39.77	11+21.43	RT	53
Y16	10+47.50	12+18.46	LT	28
Y16	10+47.50	12+18.46	RT	20
Y16	12+43.06	14+00.00	LT	22
Y16	12+43.06	14+00.00	RT	29
WITHIN ROADBED LIMITS:				
Y12	10+85.48	10+99.56	CL	43
Y13	11+29.11	11+43.52	CL	117
Y14	11+21.43	11+36.64	CL	88
Y16	12+18.46	12+30.55	CL	61
Y16	12+31.87	12+35.69	CL	20
Y16	12+36.88	12+43.06	CL	31
M1	10519+86.00		LT	130
M1	10519+92.00		RT	300
M1	10533+39.00		LT	103
M1	10533+30.00		RT	117
M1	10554+95.00		LT	153
M1	10554+98.00		RT	1256
M1	10571+45.00		LT	76
M1	10571+83.00		RT	109
M1	10741+53.00		RT	116
M1	10748+25.00		RT	73
			TOTAL:	3151.00
			SAY:	3160

CHAIN LINK FENCE

LINE	BEGIN STATION	END STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E LINE POSTS	F TERMINAL POSTS
M1	10689+51.00	10697+99.00	RT.	848.00	2		3	70.83	5
					0		0		0
									0
									0
									0
		TOTAL		848.00				70.83	5
		SAY		850.00				71.00	5.00

Note: See Structure Plans for attachment of Chain Link Fence to Retaining Wall

PARCEL INDEX

PARCEL NO.	PLAN SHEET NO.	PROPERTY OWNER NAME
1G	4	LIPPERT COMPONENTS MFG INC/DE
2G	7	DUKE ENERGY
3G	7	FORTY NINE DEV CO
4G	OMITTED	OMITTED
5G	OMITTED	OMITTED
6G	RR10(P5208H)	AMANDA & ASSOCIATES, LLC
7G	RR10(P5208H)	CITY OF CHARLOTTE
8G	RR10(P5208H)	ROYAL REALTY II, LLC
9G	13,14	VILLAGES AT BACK CREEK HOME OWNERS ASSOC. INC.
10G	RR6(P5208H)	JUDY K. WATSON
11G	OMITTED	OMITTED
12G	12	TSG PROPERTIES LLC
13G	OMITTED	OMITTED
14G	RR7(P5208H)	KENNETH W MARTIN AND JOAN C MARTIN
15G	RR7(P5208H)	WALTER SURMA AND TERESA & MARKC SMITH & WF
16G	RR7(P5208H)	TED HILDRETH AND SHIRLEY HILDRETH
17G	RR7(P5208H)	GERMAN AUTOMOTIVE INC AND % 911 SHOP
18G	RR7(P5208H)	RAYMOND BENNETT MULLIS
19G	RR8(P5208H)	ALAN R KESSEL
20G	RR8(P5208H)	ROMER1800 LLC AND C/O RON HUNTE
21G	14	REDUS NC HOUSING, LLC

GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST FROM E.O.L.	TOTAL SHLDR WIDTH	FLARE LENGTH APPR. END	FLARE LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS III	ANCHORS B-77	ANCHORS GRAU 350	ANCHORS M-350	ANCHORS AT-1	ANCHORS CAT-1	ANCHORS TES	IMP. ATTEN. TYPE 350 EA	IMP. ATTEN. TYPE 350 G	IMP. ATTEN. TYPE 350 NG	REMOVE EXISTING GRDRAIL	REMARKS
M1	10519+85.00		LT	25.00																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10519+98.00		RT	25.00																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10533+30.00		RT	12.50																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10533+45.00		LT	12.50																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10555+34.00		LT	25.00																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10555+92.00		RT	25.00																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10571+43.00		LT	12.50																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10571+83.00		RT	12.50																	2					INSTALL OM-4 PER STANDARD 1264.01-1264.02
M1	10662+00.00	10669+50.00	RT	750.00			10663+00.00	10668+50.00	6	9	50	50	1	1			2									along Old Concord Rd
M1	10674+89.00	10678+89.00	RT	400.00			10675+89.00	10677+12.00	6	9	50	50	1	1			2									USE STD 862.01 (SHEET 10 OF 12) TO SPAN CREEK IF NECESSARY
M1	10686+00.00	10701+50.00	RT	1550.00			10687+00.00	10700+50.00	6	9	50	50	1	1			2									along Old Concord Rd
M1	10753+53.50	10757+03.50	RT	350.00			10754+91.00		6	9	50	50	1	1			2									along Old Concord Rd
			SUBTOTAL	3200.00													8				16					
	DEDUCT ANCHORS:																									
		GRAU 350	50.00	-400.00																						
	ADDITIONAL POSTS = 10		TOTAL	2800.00													8				16					
	EXTRA LENGTH POSTS = 40		SAY	3000.00																						

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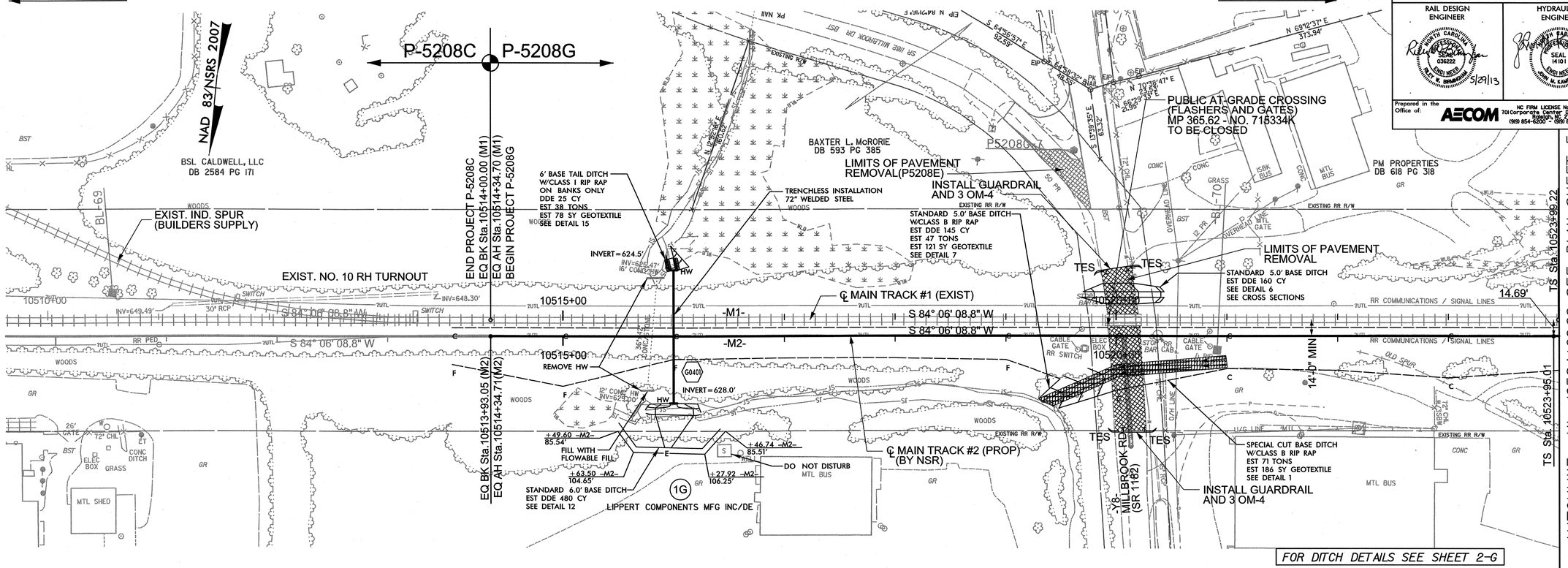
0041DEL_P10a1

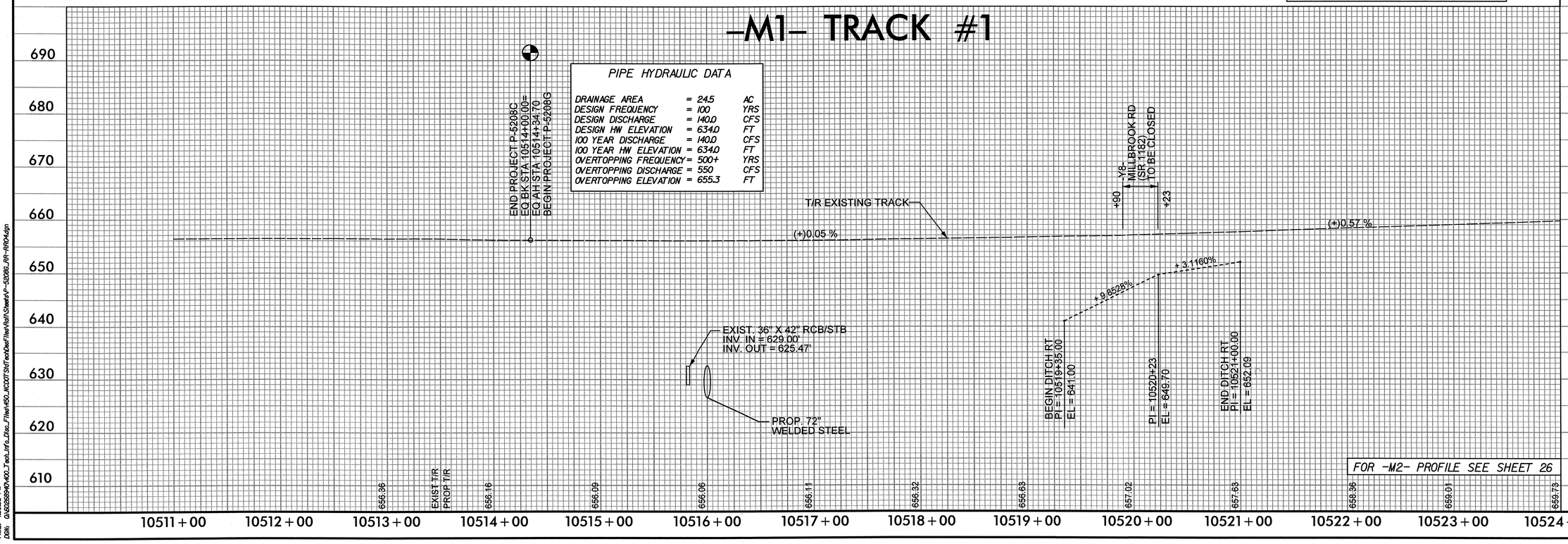
PROJECT REFERENCE NO.	SHEET NO.
P-5208G	4
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. L. BRANCHEAU 5/29/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN W. KAMPSTEIN 6/3/13

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)





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0041DEL_P10a1

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	5
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036222 — 5/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14101 — 5/1/13

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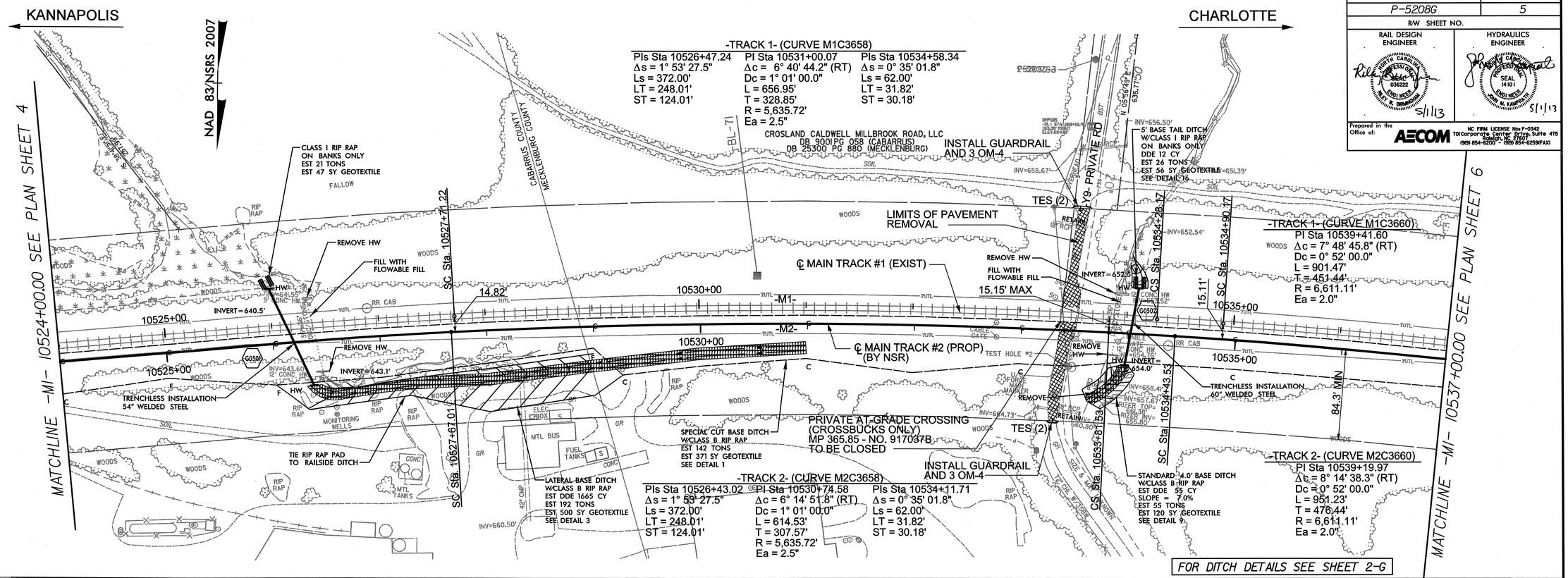

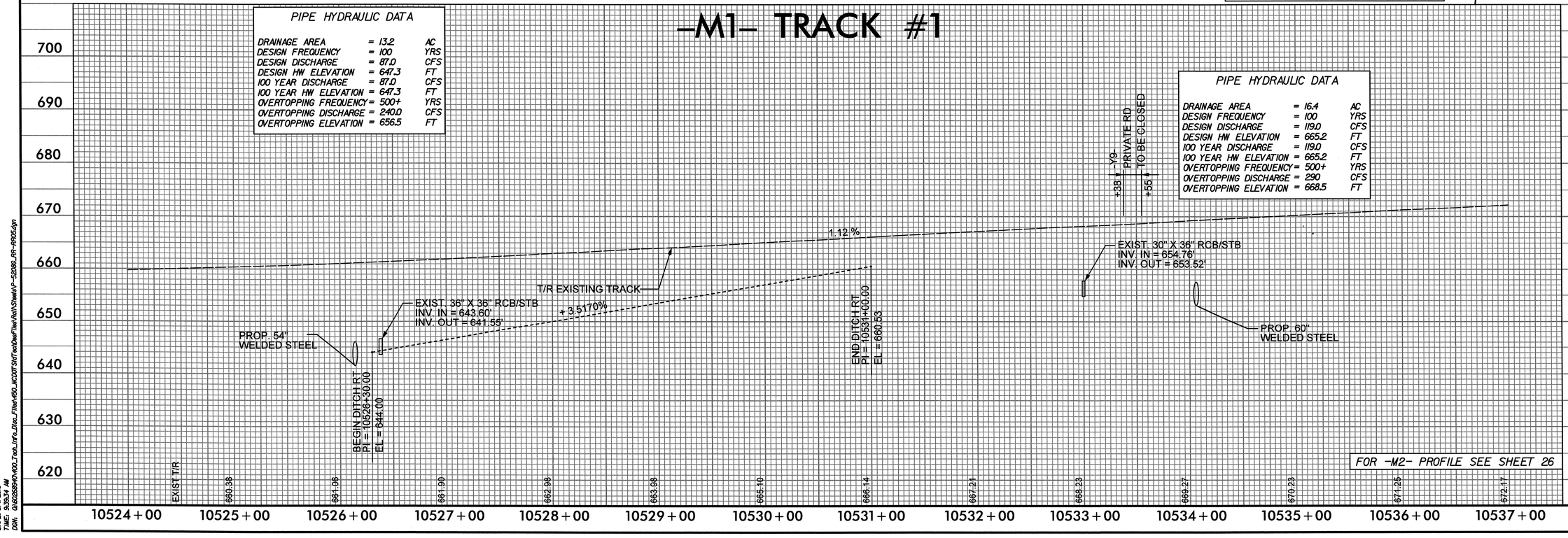

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	6
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. BRENNAN 5/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER J.M. KAMPATH 5/1/13

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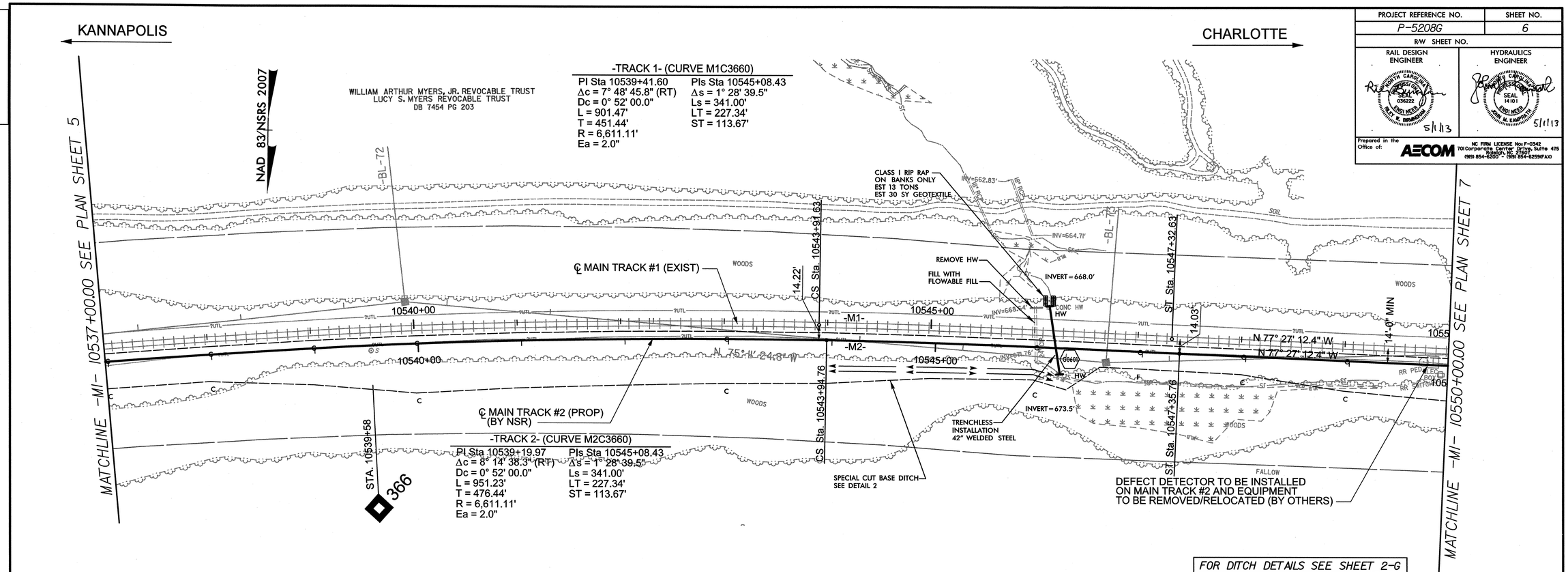

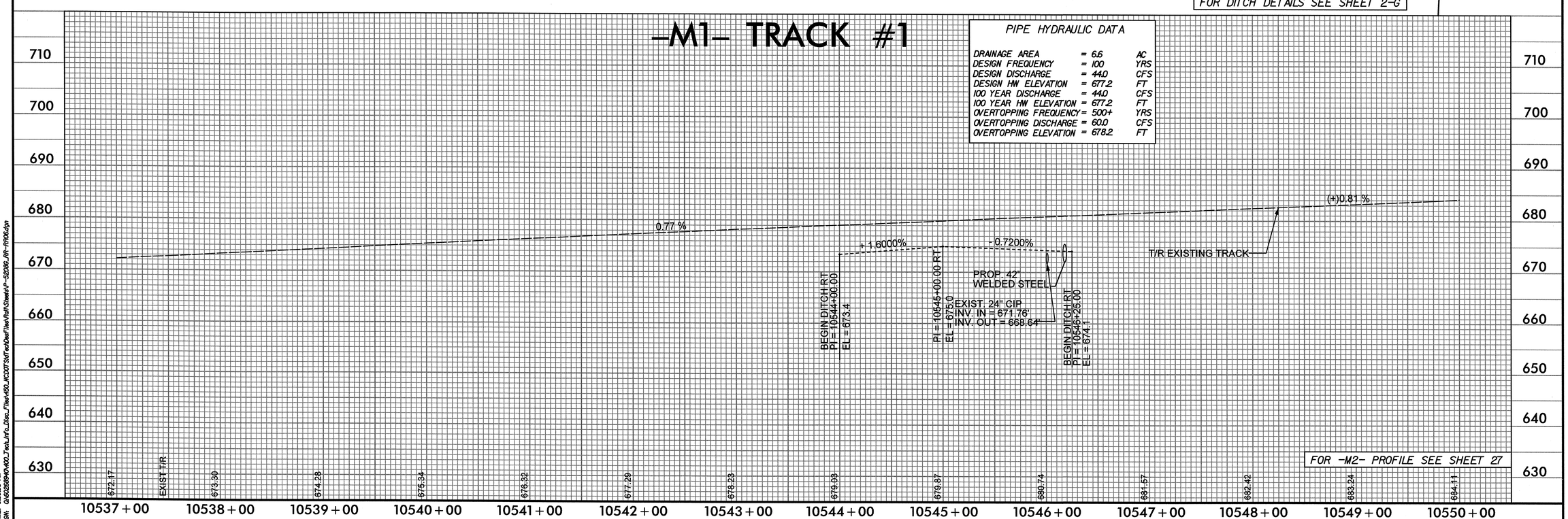

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	7
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

5/1/13 5/1/13

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0041DEL_P10a1

KANNAPOLIS

CHARLOTTE

WILLIAM ARTHUR MYERS, JR. REVOCABLE TRUST
LUCY S. MYERS REVOCABLE TRUST
DB 7454 PG 203

DUKE ENERGY
DB 2488 PG 379

NAD 83/NSRS 2007

-TRACK 1- (CURVE M1C3665)

PIs Sta 10557+42.31	PI Sta 10565+31.46
Δs = 3° 43' 11.6"	Δc = 18° 33' 08.3" (LT)
Ls = 496.00'	Dc = 1° 30' 00.0"
LT = 330.74'	L = 1,236.82'
ST = 165.40'	T = 623.89'
	R = 3,819.83'
	Ea = 4.0"

-TRACK 2- (CURVE M2C3665)

PIs Sta 10557+40.93	PI Sta 10565+30.08
Δs = 3° 43' 11.6"	Δc = 18° 33' 08.3" (LT)
Ls = 496.00'	Dc = 1° 30' 00.0"
LT = 330.74'	L = 1,236.82'
ST = 165.40'	T = 623.89'
	R = 3,819.83'
	Ea = 4.0"

MATCHLINE -M1- 10550+00.00 SEE PLAN SHEET 6

MATCHLINE -M1- 10564+00.00 SEE PLAN SHEET 8

INSTALL GUARDRAIL AND 3 OM-4

SPECIAL CUT BASE DITCH SEE DETAIL 2

℄ MAIN TRACK #1 (SHIFTED) (BY NSR)

℄ MAIN TRACK #1 (PROP) (BY NSR)

℄ MAIN TRACK #1 (EXIST)

EXIST. IND. SPUR (DUKE ENERGY)

EXIST. NO. 10 LH TURNOUT

-Y10- PRIVATE RD

STANDARD 3.0' BASE DITCH
EST DDE 45 CY
SLOPE = 4.0%
SEE DETAIL 10

BEGIN TRACK SHIFT TS Sta. 10554+11.58

END TRACK SHIFT SC Sta. 10559+07.58

℄ MAIN TRACK #2 (PROP) (BY NSR)

FILL WITH FLOWABLE FILL

TRENCHLESS INSTALLATION 36" WELDED STEEL

LIMITS OF PAVEMENT REMOVAL

EXIST. MAIN TRACK (TO BE REMOVED) (BY NSR)

REMOVE EXISTING MAST SIGNALS AND ASSOCIATED EQUIPMENT (BY NSR)

FORTY NINE DEV CO

PRIVATE AT-GRADE CROSSING (CROSSBUCKS ONLY) MP 366.29 - NO. 715335S TO BE CLOSED

CLASS B RIP RAP
EST 22 TONS
EST 56 SY GEOTEXTILE

STANDARD 3.0' BASE DITCH
EST DDE 120 CY
SLOPE = 0.4%
SEE DETAIL 10

FOR DITCH DETAILS SEE SHEET 2-G

-M1- TRACK #1

PIPE HYDRAULIC DATA

DRAINAGE AREA	= 4.3	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 31.0	CFS
DESIGN HW ELEVATION	= 685.0	FT
100 YEAR DISCHARGE	= 31.0	CFS
100 YEAR HW ELEVATION	= 685.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 82	CFS
OVERTOPPING ELEVATION	= 688.5	FT

T/R PROPOSED TRACK

T/R EXISTING TRACK

BEGIN GRADE STA 10554+11.58 EL = 688.13

+95' -Y10- PRIVATE RD

+10' TO BE CLOSED

VPI STA 10559+35.00 EL = 692.89

+0.9082% -0.0039%

(+)0.93 %

-2.0755% +1.8574%

EXIST. 20" CIP
INV. IN = 683.04
INV. OUT = 682.74

BEGIN DITCH LT PI = 10554+75.00 EL = 684.00

PI = 10555+32.00 LT EL = 682.90

VPC STA 10555+80.00 EL = 689.66

END DITCH LT PI = 10556+00.00 EL = 684.08

PROP. 36" WELDED STEEL

L = 710'
r = 0.13

BEGIN DITCH RT PI = 10562+00.00 EL = 687.07

VPT STA 10562+90.00 EL = 692.87

-0.4000%

FOR -M2- PROFILE SEE SHEET 27

730 720 710 700 690 680 670 660 650

684.11 EXIST T/R PROP T/R 685.08 686.01 686.87 687.88 688.74 688.94 689.71 689.84 690.58 690.66 691.32 691.35 691.91 691.91 692.27 692.34 692.49 692.56 692.72 692.82 692.77 692.87 692.81 692.87

10550+00 10551+00 10552+00 10553+00 10554+00 10555+00 10556+00 10557+00 10558+00 10559+00 10560+00 10561+00 10562+00 10563+00 10564+00

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	8
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. BRENNAN 5/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER J. M. KAMPSTRA 5/1/13

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)

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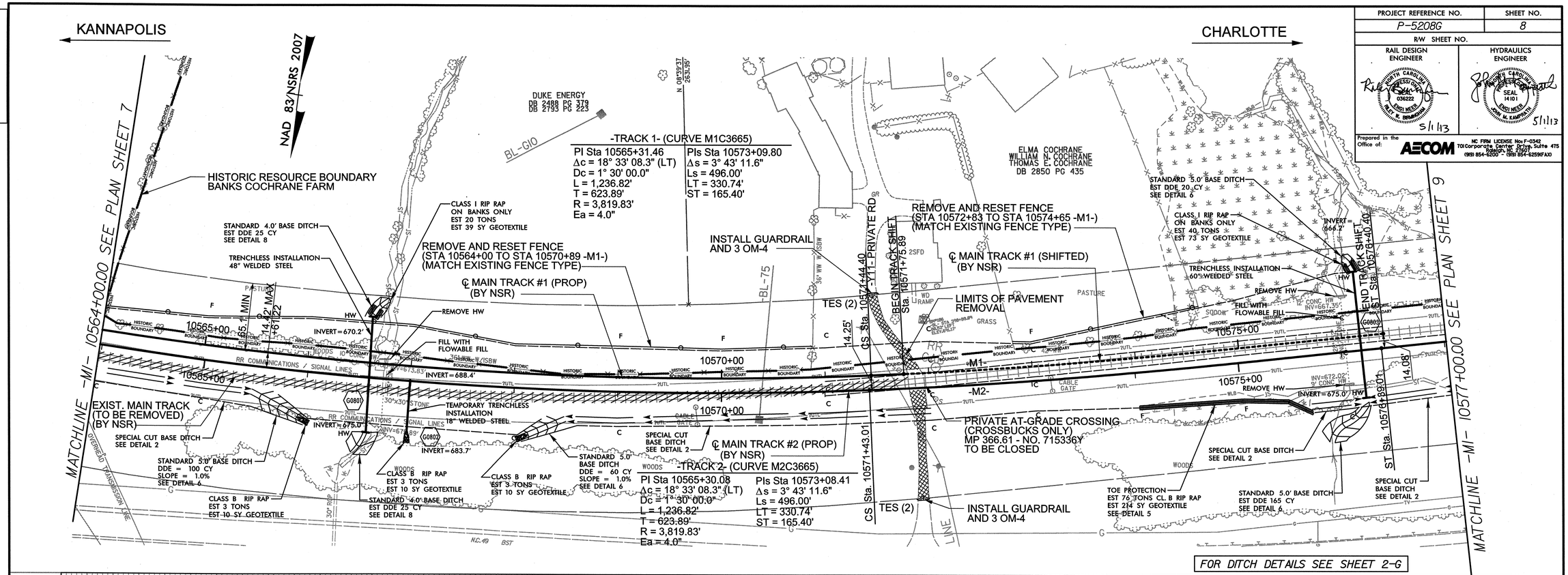

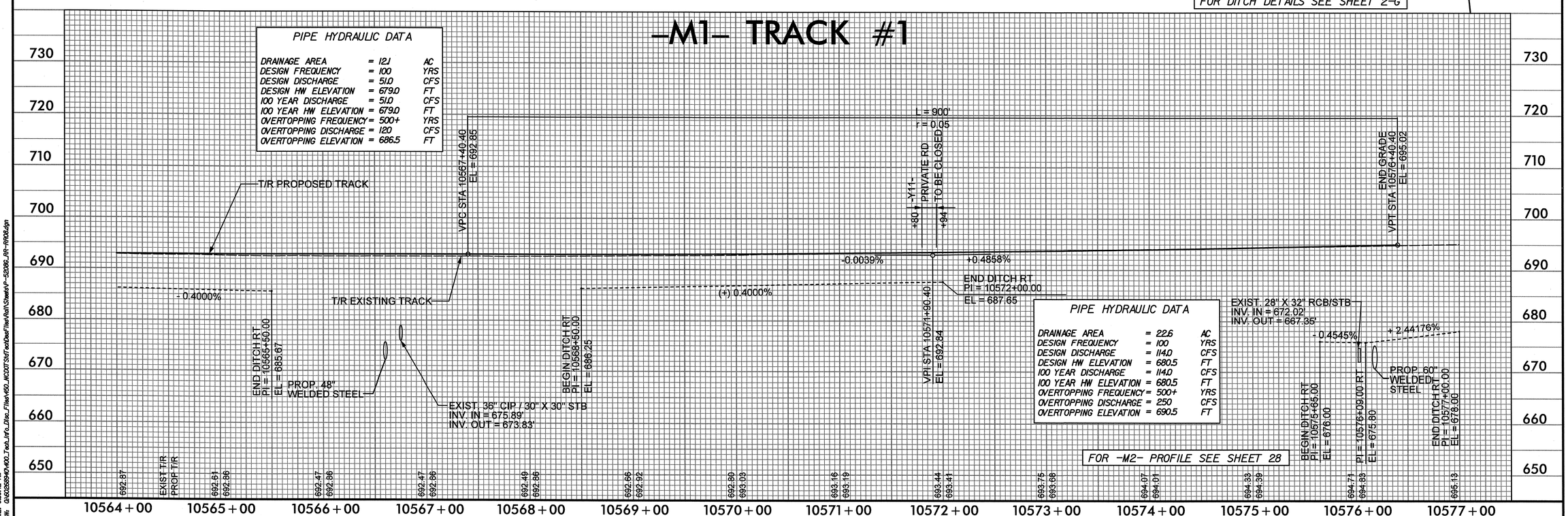

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	9
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. E. M. BERNHARDT — 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPE — 4/17/13

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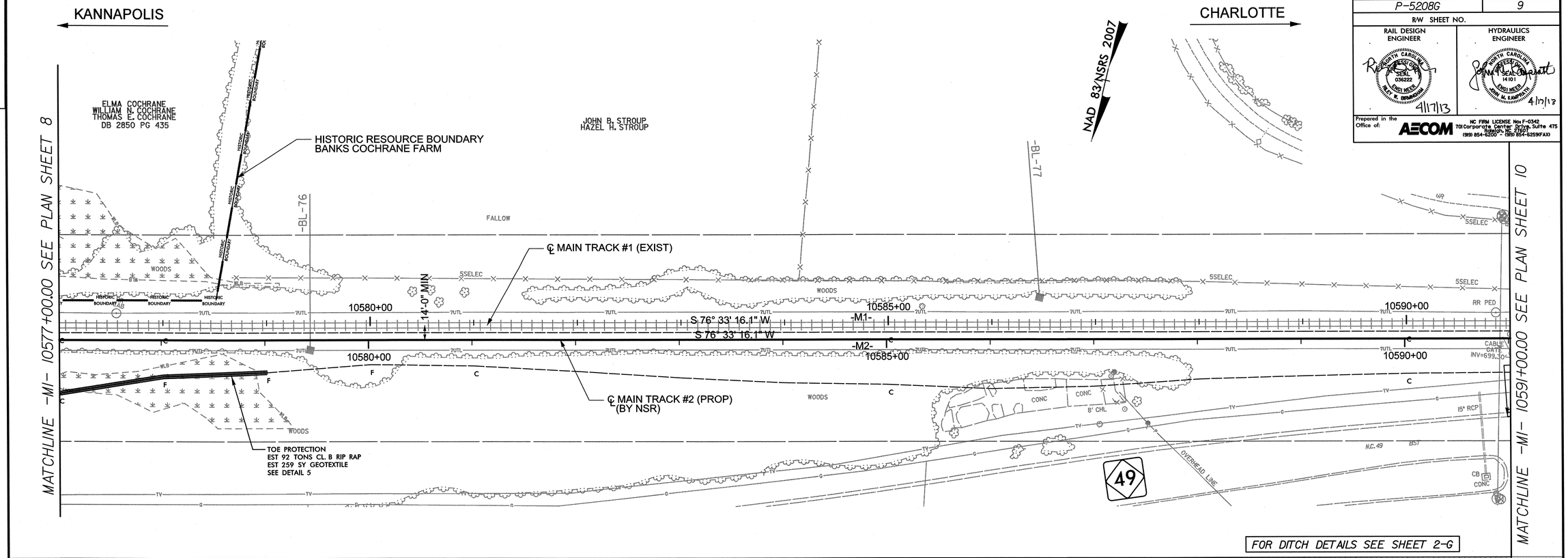

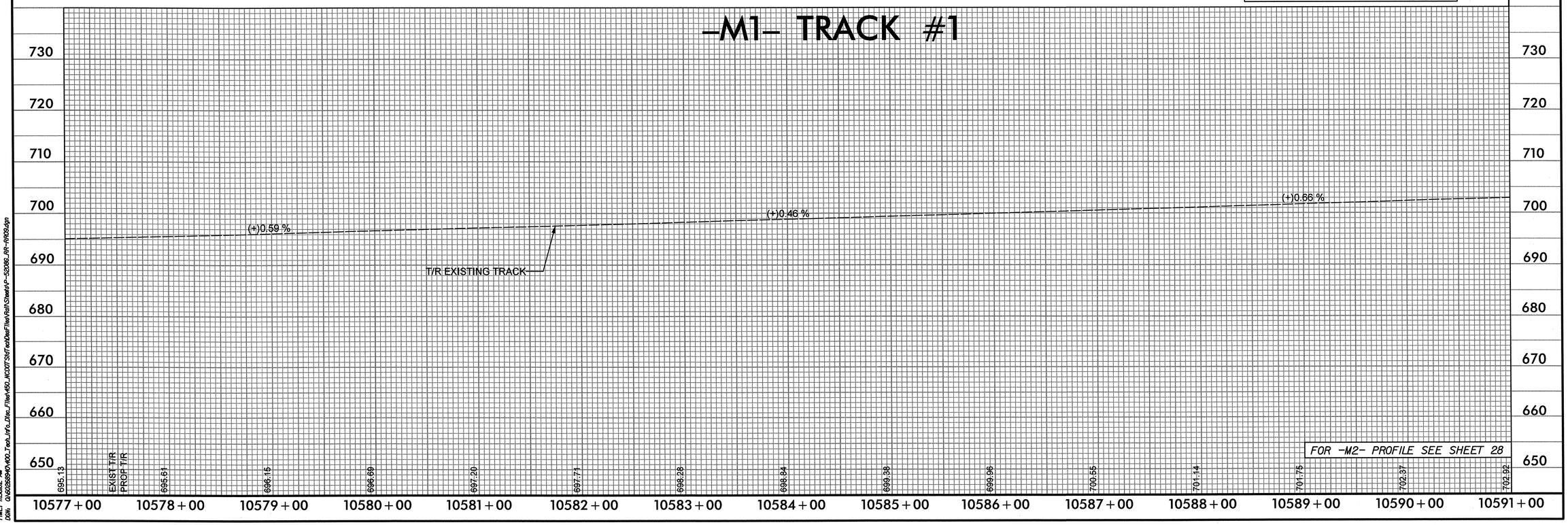

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — RAIL DESIGN ENGINEER — HYDRAULICS ENGINEER

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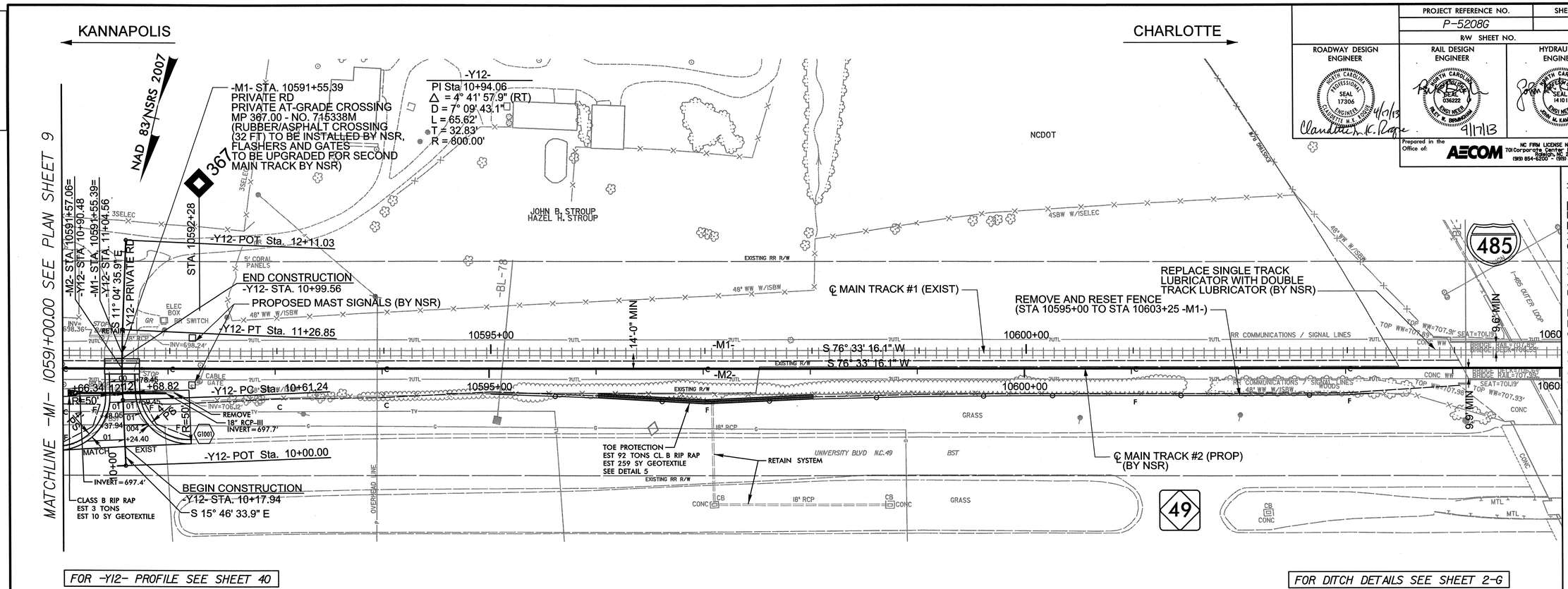
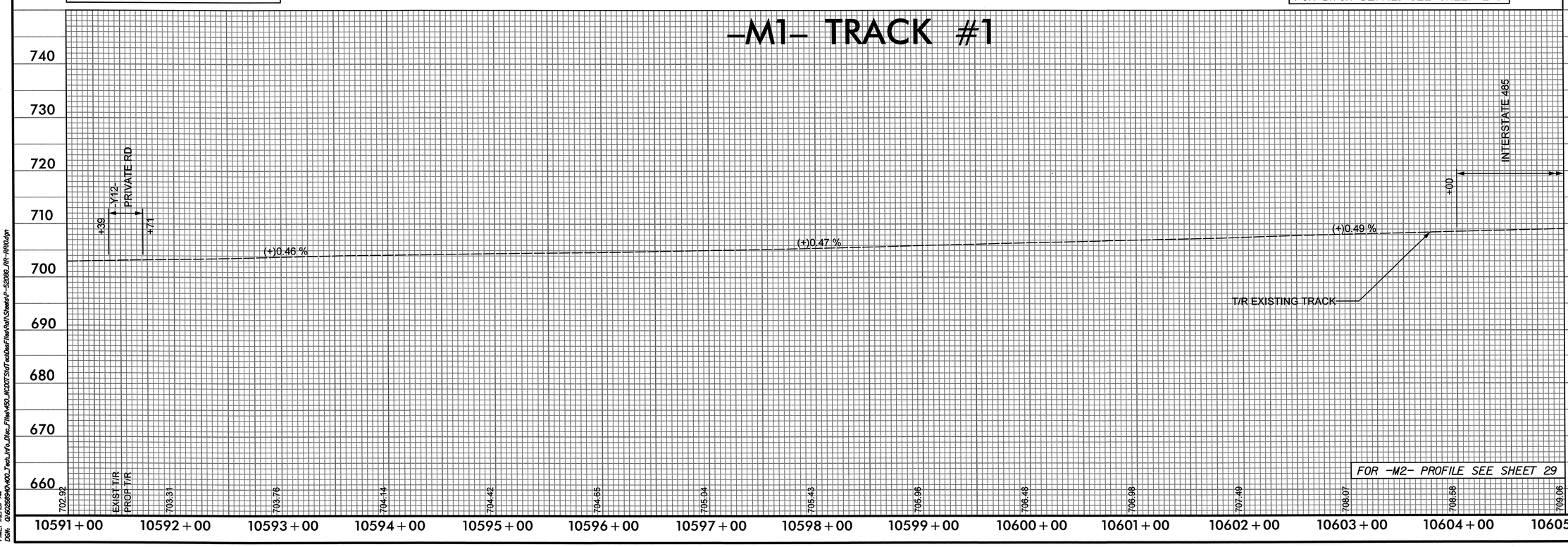


FOR -Y12- PROFILE SEE SHEET 40

FOR DITCH DETAILS SEE SHEET 2-G



FOR -M2- PROFILE SEE SHEET 29

0041DEL_P10a1

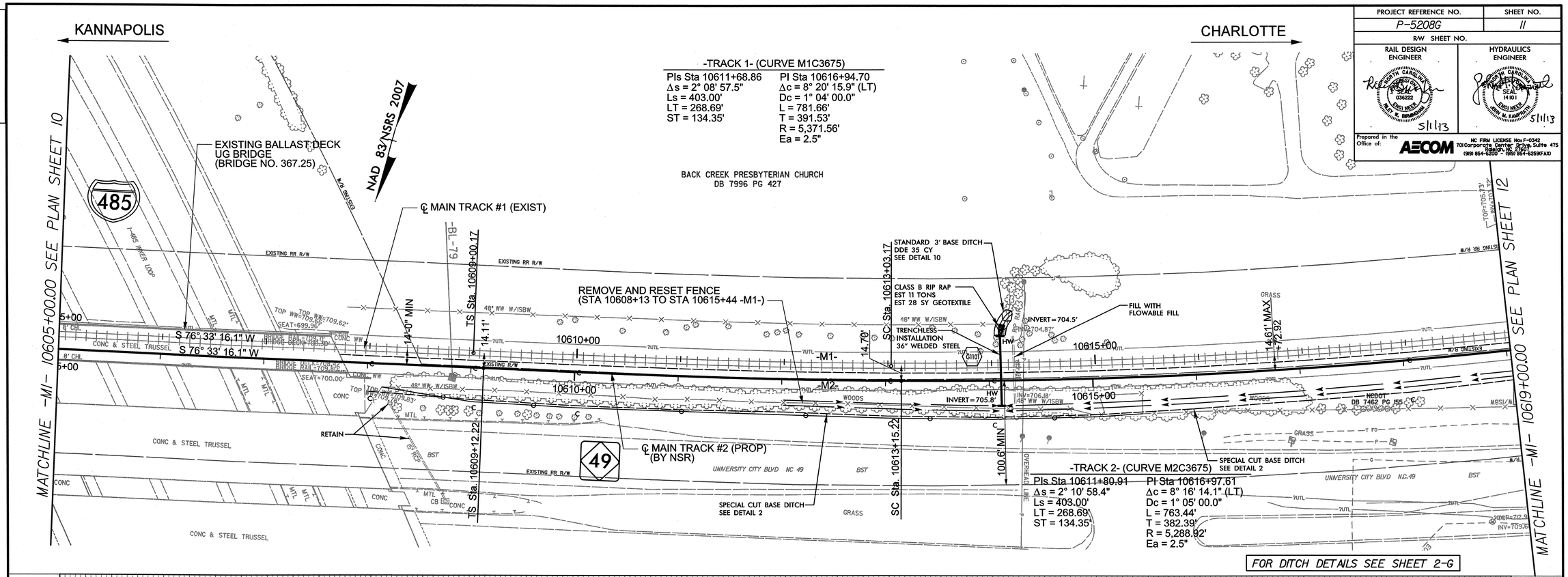
0041DEL_P10a1

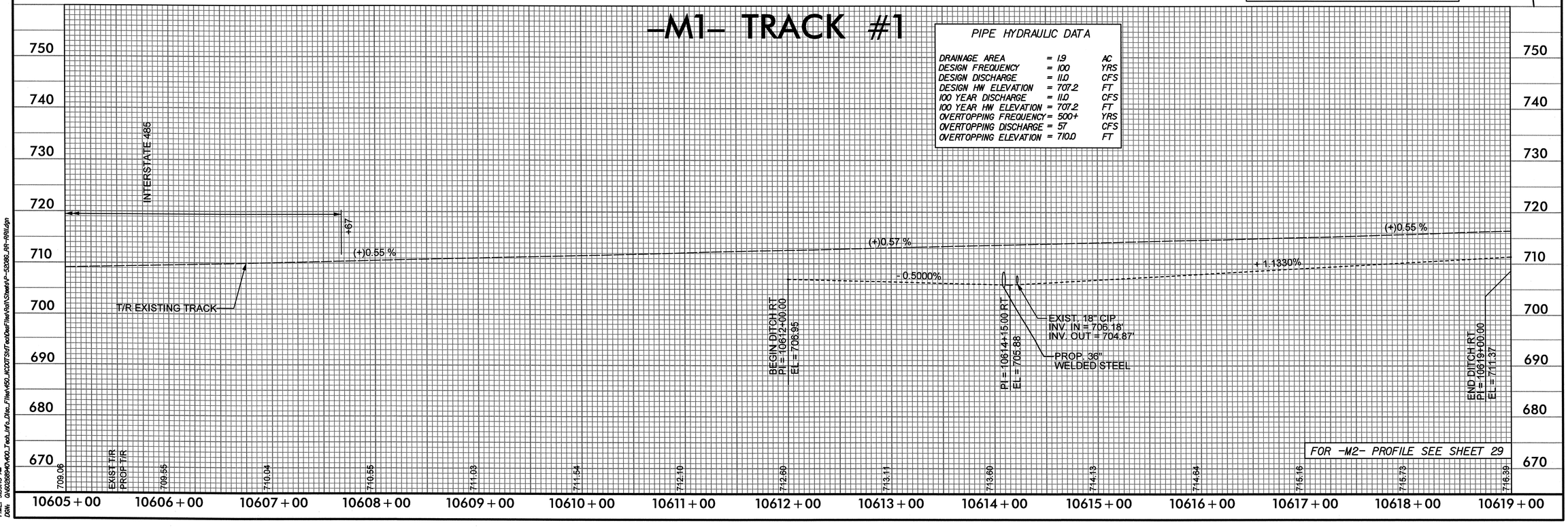
PROJECT REFERENCE NO.	SHEET NO.
P-5208G	11
R/W SHEET NO.	

RAIL DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER — 5/1/13

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER — 5/1/13

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27610, (919) 854-6200 - (919) 854-6259 FAX





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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
17306	036222	14101
6/5/13	6/4/13	6/5/13

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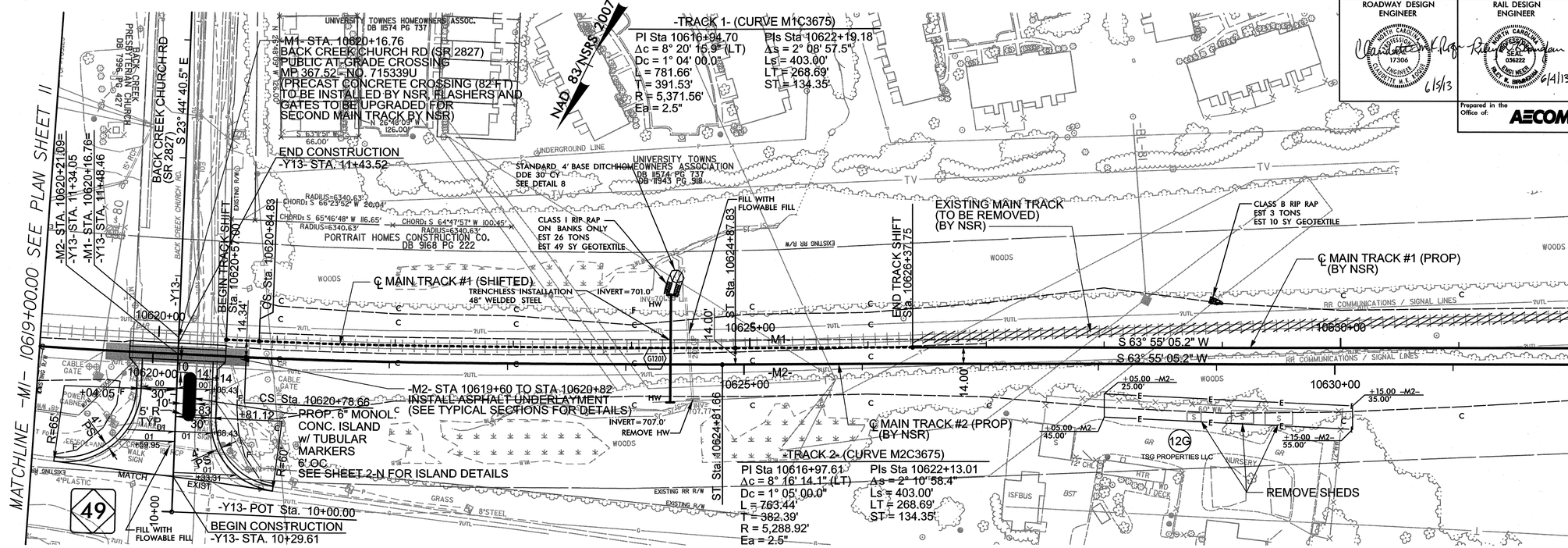

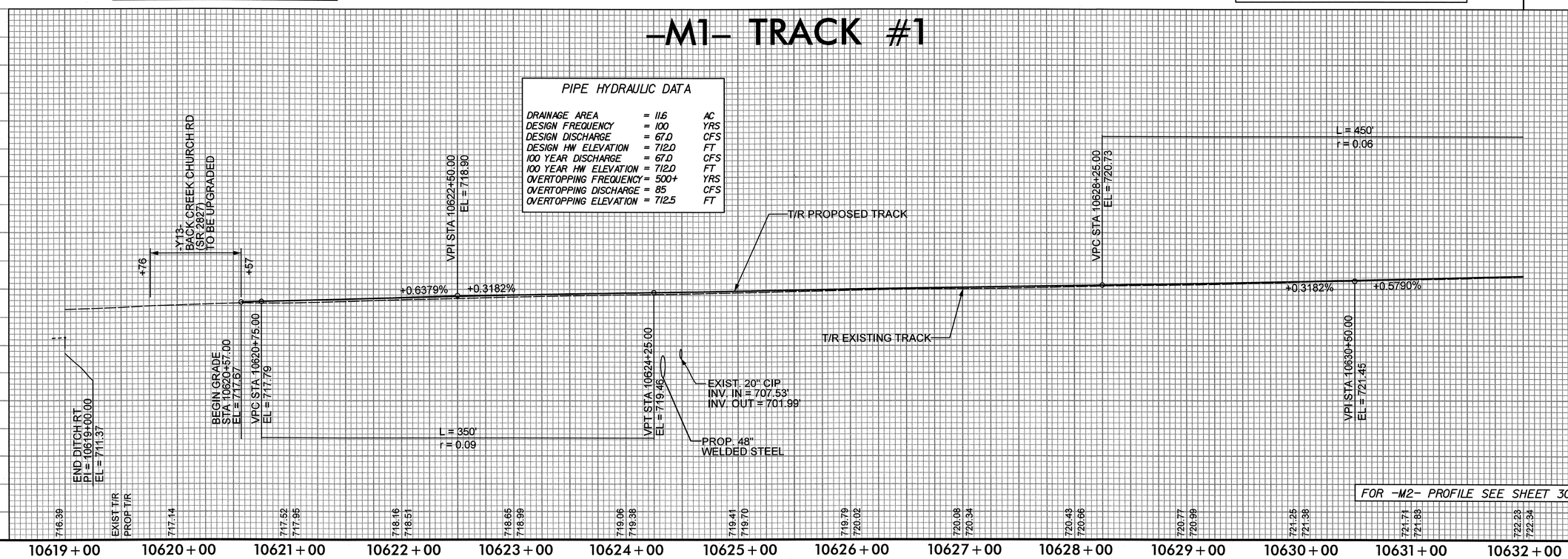

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	13
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 RILEY W. BRUNNIGAN, ENGINEER 6/20/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 JOHN M. KAUFFMANN, ENGINEER 6/21/13

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27610, (919) 854-6200 FAX (919) 854-6259

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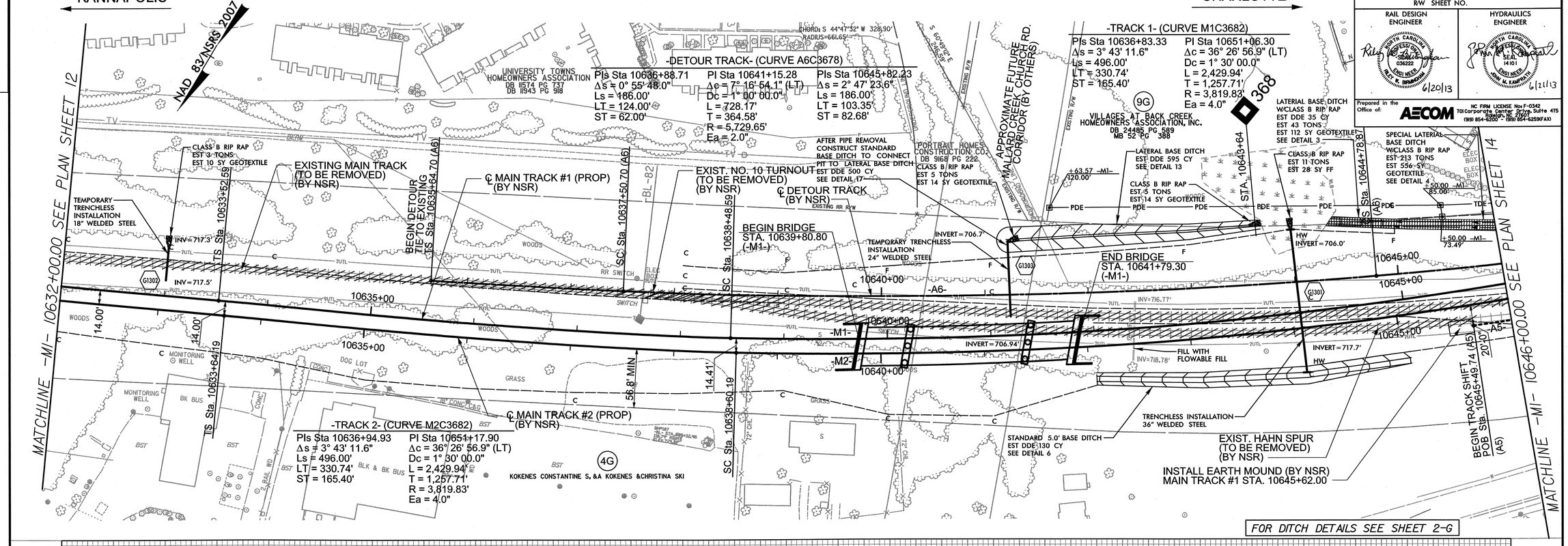

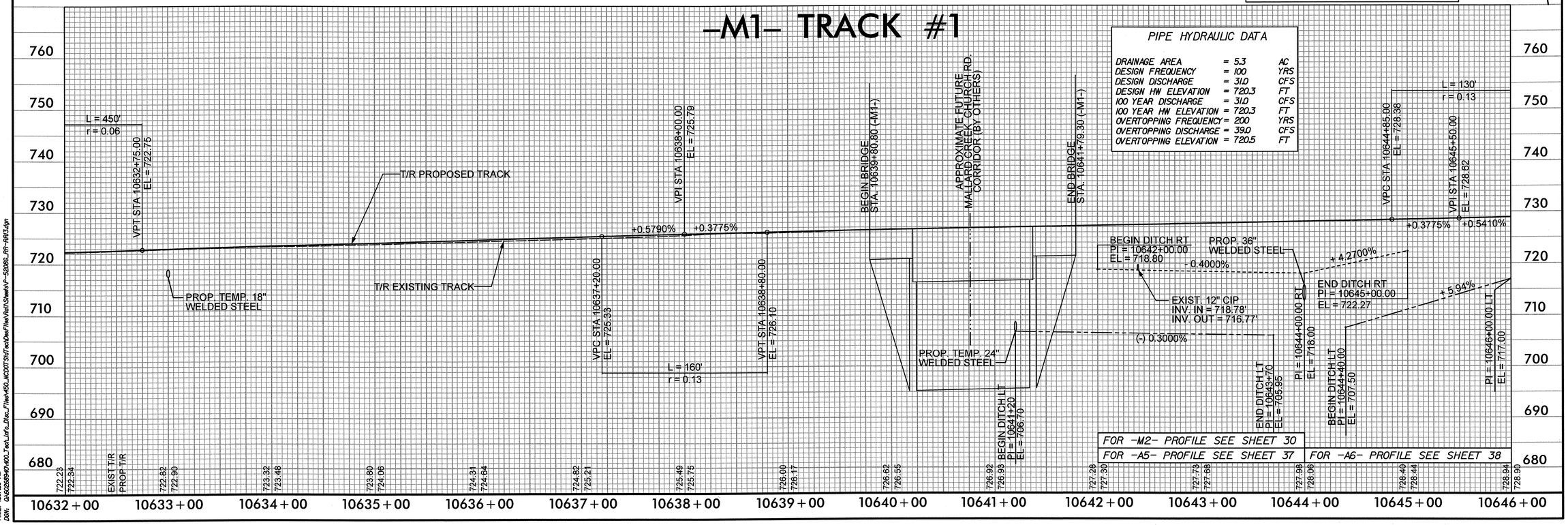

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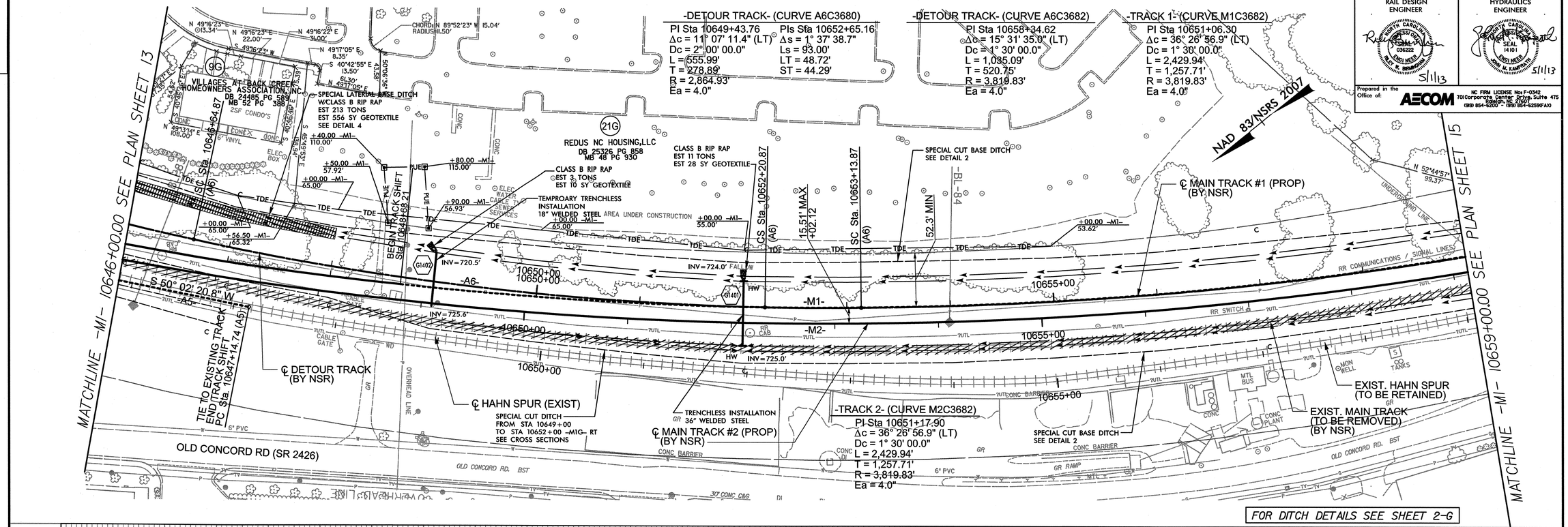
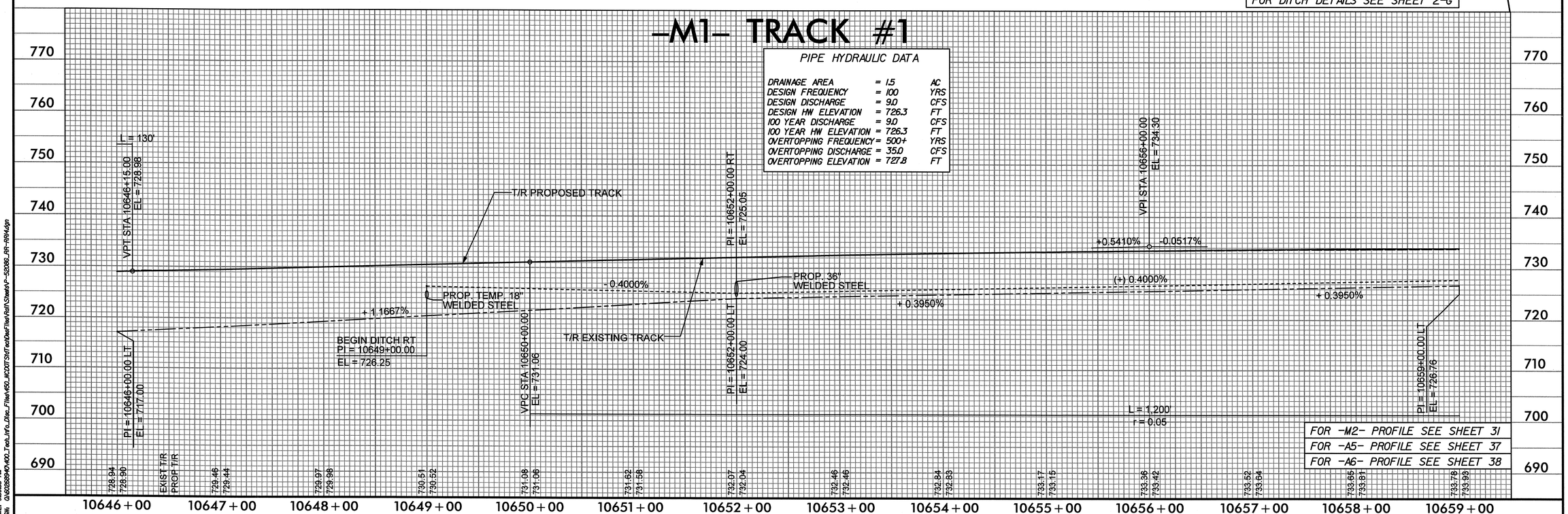
PROJECT REFERENCE NO.	SHEET NO.
P-5208G	14
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. SHERMAN 5/1/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER M. KAMPFER 5/1/13

Prepared in the Office of: AECOM — NC FIRM LICENSE No: F-0342, 701 Corporate Center Drive, Suite 475, Raleigh, NC 27607, (919) 854-6200 - (919) 854-6259(FAX)





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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	15
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

5/1/13 5/1/13

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KANNAPOLIS

CHARLOTTE

NAD 83/NSRS 2007

-DETOUR TRACK- (CURVE A8C3682)
PI Sta 10658+34.62
Δc = 15° 31' 35.0" (LT)
Dc = 1° 30' 00.0"
L = 1,035.09'
T = 520.75'
R = 3,819.83'
Ea = 4.0"
PIs Sta 10664+62.65
Δs = 2° 33' 26.7"
Ls = 341.00'
LT = 227.36'
ST = 113.69'

-TRACK 1- (CURVE M1C3682)
PI Sta 10651+06.30
Δc = 36° 26' 56.9" (LT)
Dc = 1° 30' 00.0"
L = 2,429.94'
T = 1,257.71'
R = 3,819.83'
Ea = 4.0"
PIs Sta 10664+43.94
Δs = 3° 43' 11.6"
Ls = 496.00'
LT = 330.74'
ST = 165.40'

-TRACK 2- (CURVE M2C3682)
PI Sta 10651+17.90
Δc = 36° 26' 56.9" (LT)
Dc = 1° 30' 00.0"
L = 2,429.94'
T = 1,257.71'
R = 3,819.83'
Ea = 4.0"
PIs Sta 10664+55.53
Δs = 3° 43' 11.6"
Ls = 496.00'
LT = 330.74'
ST = 165.40'

-HAHN SPUR- (CURVE A5C3685)
PI Sta 10668+62.00
Δc = 6° 23' 12.2" (LT)
Dc = 7° 30' 00.0"
L = 85.16'
T = 42.65'
R = 764.49'
Ea = 0.0"

MATCHLINE -M1- 10659+00.00 SEE PLAN SHEET 14

MATCHLINE -M1- 10672+00.00 SEE PLAN SHEET 16

℄ DETOUR TRACK (BY NSR)
℄ MAIN TRACK #1 (SHIFTED) (BY NSR)
℄ MAIN TRACK #2 (PROP) (BY NSR)
℄ MAIN TRACK #1 (PROP) (BY NSR)
℄ MAIN TRACK #1 (EXIST)
℄ HAHN SPUR (SHIFTED) (BY NSR)
℄ HAHN SPUR (PROP) (BY NSR)

REMOVE NO. 10 LH TURNOUT AND CONSTRUCT TRACK (BY NSR)

SPECIAL CUT BASE DITCH SEE DETAIL 2

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE

STANDARD BASE DITCH
EST DDE = 15 CY
SLOPE = 1.0%
SEE DETAIL 6

CLASS B RIP RAP
EST 3 TONS
EST 10 SY GEOTEXTILE
STANDARD 5.0' BASE DITCH
DDE 35 CY
SLOPE = 0.5%
SEE DETAIL 6

STANDARD 5.0' BASE DITCH W/CLASS B RIP RAP
EST DDE 85 CY
EST 213 TONS
EST 556 SY GEOTEXTILE
SEE DETAIL 7

END DETOUR TIE TO EXISTING ST Sta. 10666+89.96 (A6)
CS Sta. 10662+78.54
CS Sta. 10663+48.96 (A6)
END TRACK SHIFT POL Sta. 10668+96.43
TIE TO EXISTING TRACK POL Sta. 10669+97.43
TIE TO EXISTING TRACK BEGIN TRACK SHIFT POL Sta. 10662+62.11 (A5)
END TRACK SHIFT POL Sta. 10667+24.83 (A6)
ST Sta. 10667+74.54
ST Sta. 10667+86.13
PC Sta. 10668+19.35 (A5)
PT Sta. 10669+04.50 (A5)
PI NO. 10 LH TURNOUT Sta. 10670+39.63
PS NO. 10 LH TURNOUT Sta. 10670+70.88

15.01'
14.72
14.72

S 20° 01' 45.0" W
S 20° 01' 45.0" W
S 20° 41' 28.2" W
S 14° 18' 16.0" W
14.00' RT
14.00', 22.00' RT
64.78' RT
64.75' RT

PROPOSED GUARDRAIL
REMOVE +/- 8' OF 15" RCP
RETAIN
INSTALL RIGHT OF WAY GATE (SEE SHEET 2-M FOR DETAIL)
GRAU 350
ACCESS DRIVE
END GUARDRAIL STA. 10669+50.00 (-M1-)
OLD CONCORD RD (SR 2426)
EXIST. MAIN TRACK (TO BE REMOVED) (BY NSR)
EXIST. HAHN SPUR (TO BE RETAINED)
SPECIAL CUT DITCH FROM STA 10659+00 TO STA 10660+00 -MIG- RT SEE CROSS SECTIONS
BEGIN GUARDRAIL STA. 10662+00.00 (-M1-)
FOR DITCH DETAILS SEE SHEET 2-G

-M1- TRACK #1

T/R PROPOSED TRACK
T/R EXISTING TRACK

VPI STA 10667+60.00 EL = 733.71
END GRADE STA. 10669+97.43 EL = 732.81
-0.0517% -0.3780% (-)0.36 %
(+) 0.4000% + 0.3463% -0.62500% (+) 0.4000% 4.2857% 3.8500%
PI = 10659+00.00 LT EL = 726.76
END DITCH RT STA. 10660+00.00 EL = 728.25
L = 1,200' r = 0.05
VPT STA 10662+00.00 EL = 733.98
END DITCH LT PI = 10662+00.00 EL = 727.96
BEGIN DITCH RT STA. 10663+00.00 EL = 728.99
END DITCH RT STA. 10665+00.00 EL = 727.74
BEGIN DITCH LT PI = 10665+00 EL = 727.54
VPC STA 10666+30.00 EL = 733.77
r = 260' T = 0.13
END DITCH LT PI = 10668+00 EL = 728.74
VPT STA 10668+90.00 EL = 733.21
BEGIN DITCH RT PI = 10670+30.00 EL = 724.70
PI = 10671+00.00 RT EL = 721.70

770 760 750 740 730 720 710 700 690

733.78 733.93 EXIST T/R PROF T/R 733.83 734.00 733.96 734.02 734.00 733.99 734.02 733.94 733.93 733.89 733.77 733.84 733.57 733.79 733.37 733.71 733.16 733.50 732.96 733.18 732.63 732.26 731.97

10659+00 10660+00 10661+00 10662+00 10663+00 10664+00 10665+00 10666+00 10667+00 10668+00 10669+00 10670+00 10671+00 10672+00

FOR -M2- PROFILE SEE SHEET 31
FOR -A5- PROFILE SEE SHEET 37
FOR -A6- PROFILE SEE SHEET 39

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	16
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY W. ERRINGHAM 6/20/13	NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER KRIM M. KAMPRATH 6/21/13

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0041DEL_P10a1
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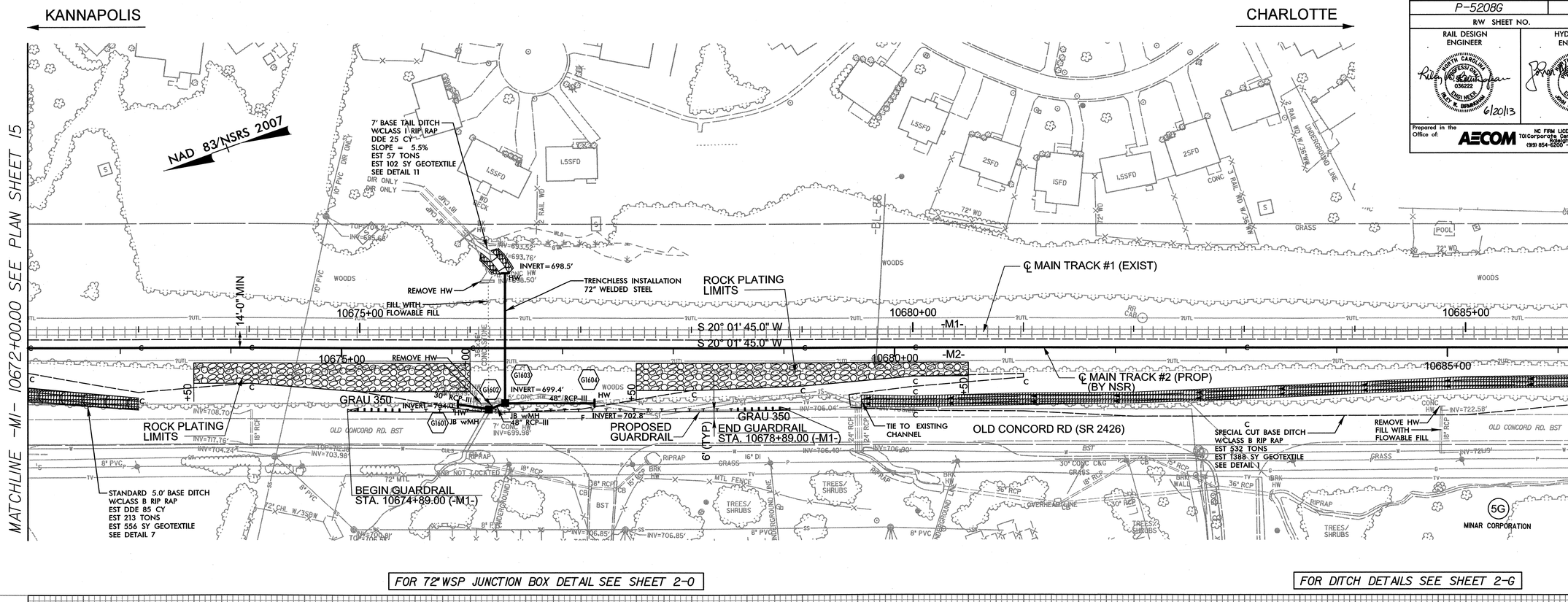
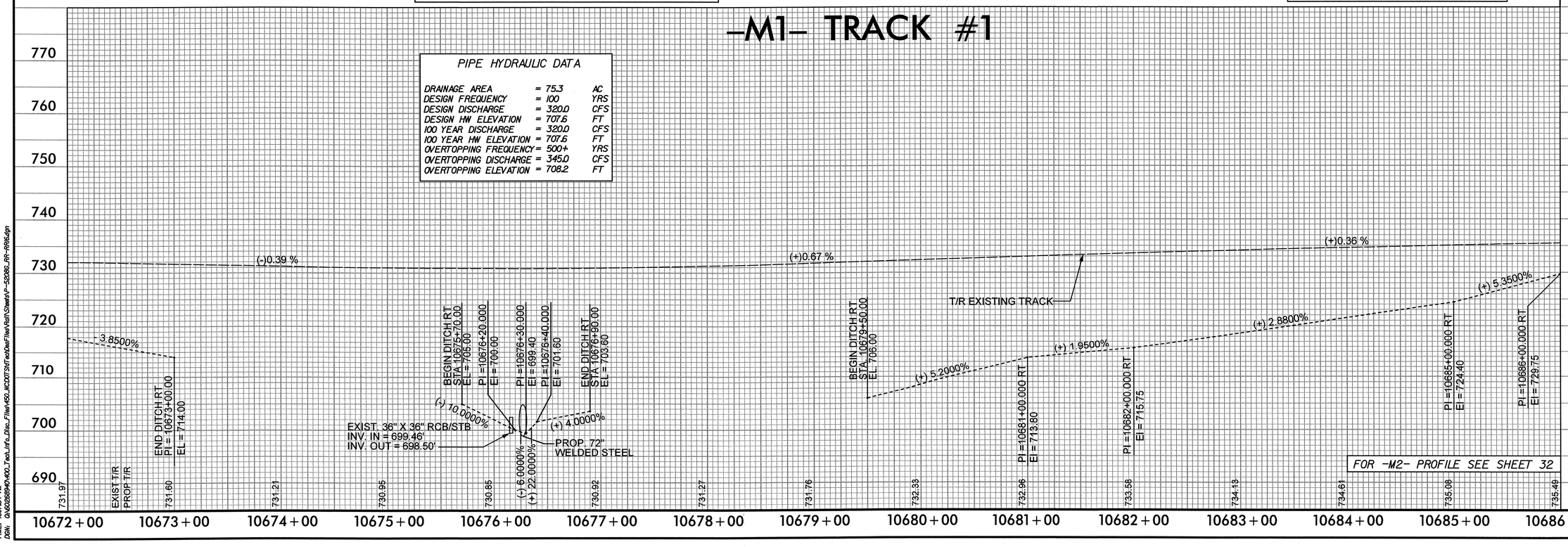


FOR 72" WSP JUNCTION BOX DETAIL SEE SHEET 2-0

FOR DITCH DETAILS SEE SHEET 2-G

-M1- TRACK #1



PIPE HYDRAULIC DATA

DRAINAGE AREA	= 75.3	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 320.0	CFS
DESIGN HW ELEVATION	= 707.6	FT
100 YEAR DISCHARGE	= 320.0	CFS
100 YEAR HW ELEVATION	= 707.6	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 345.0	CFS
OVERTOPPING ELEVATION	= 708.2	FT

FOR -M2- PROFILE SEE SHEET 32

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DATE: 6/20/2013
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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	17
R/W SHEET NO.	

RAIL DESIGN ENGINEER: R. Lewis Brinkley, SEAL 036222, 4/24/13

HYDRAULICS ENGINEER: J. Brian Mann, SEAL 14101, 4/24/13

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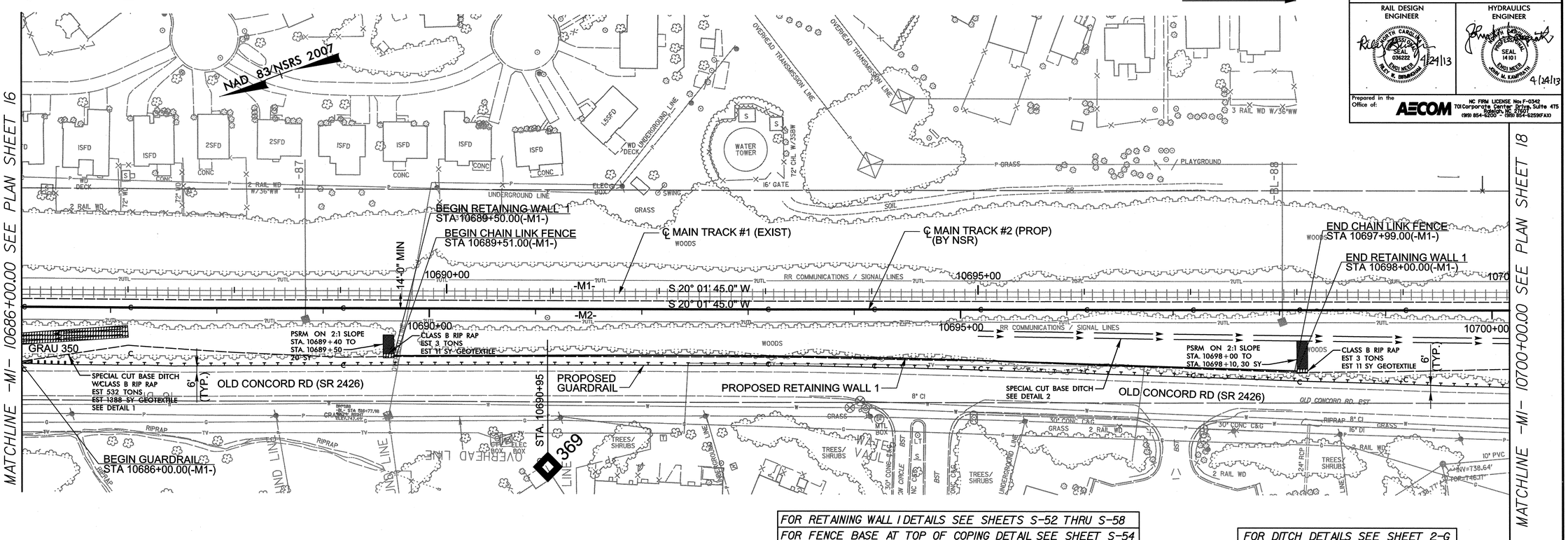
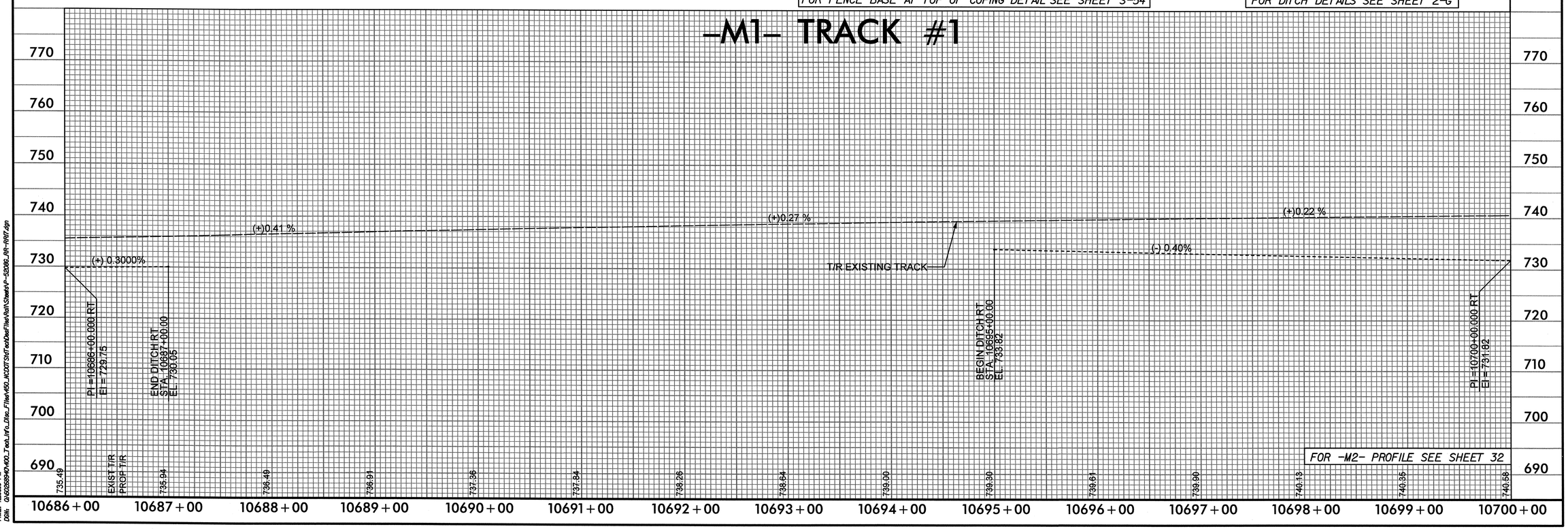
0041DEL_P10a1





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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
5/1/13	5/1/13	5/1/13

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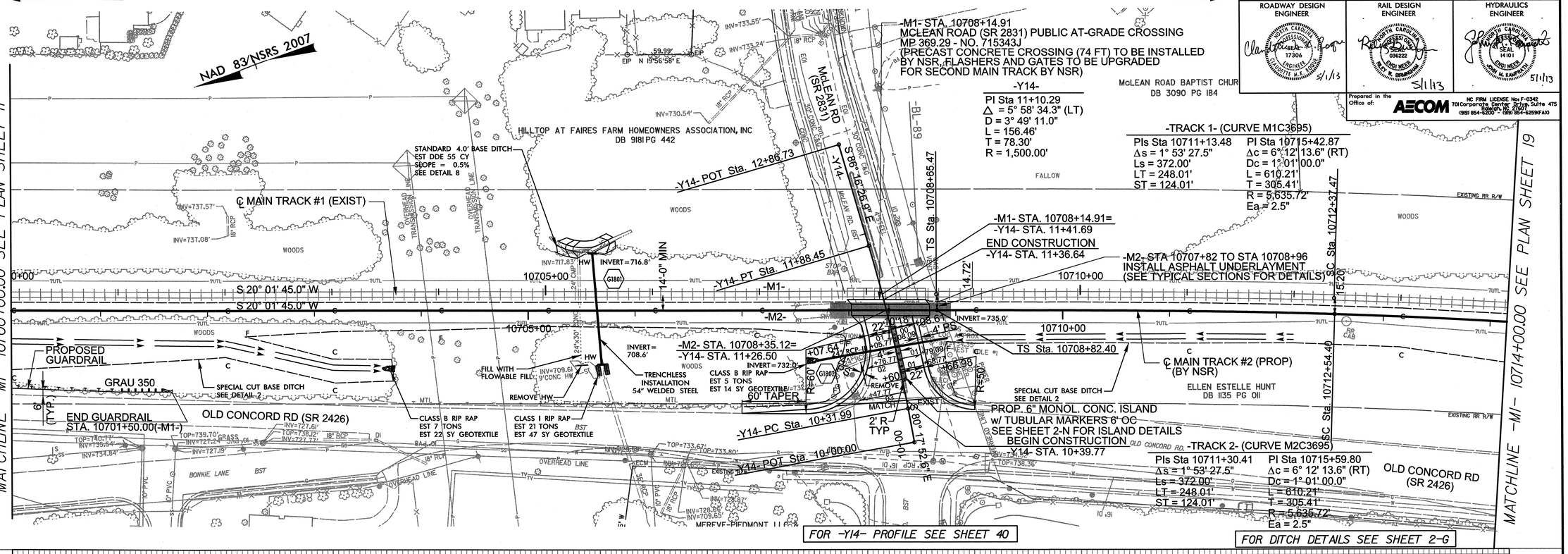

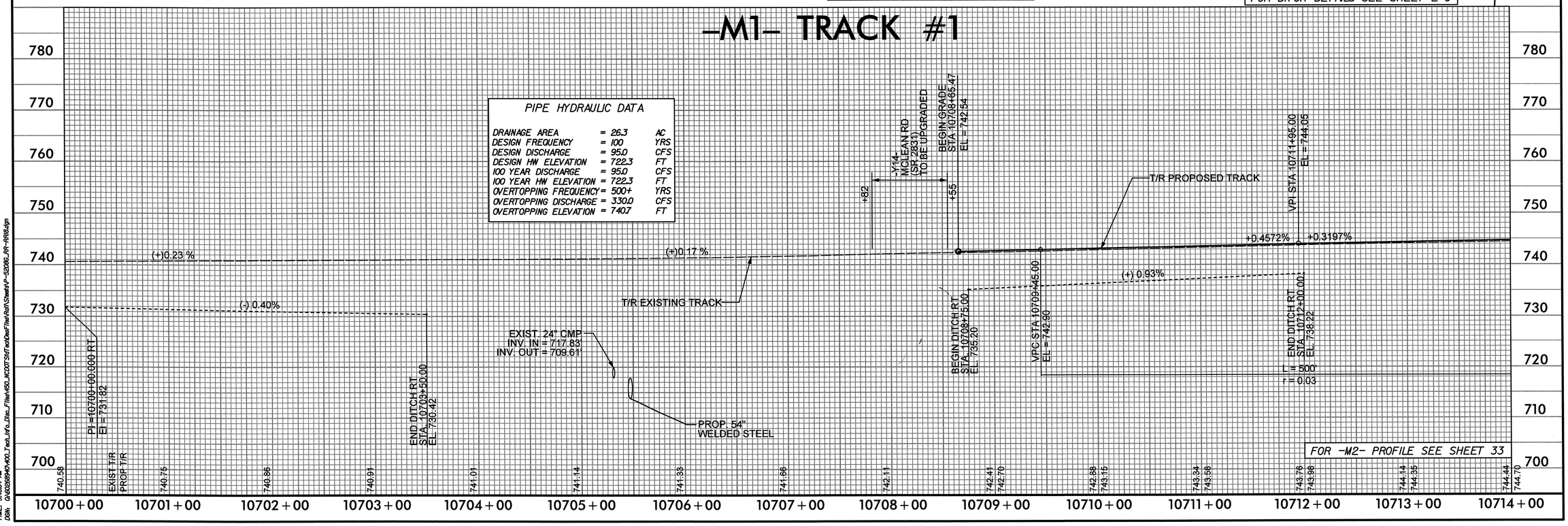

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	19
R/W SHEET NO.	

RAIL DESIGN ENGINEER: R. M. BRINKMAN, SEAL 036222, 5/1/13

HYDRAULICS ENGINEER: R. M. KAUFFMAN, SEAL 14101, 5/1/13

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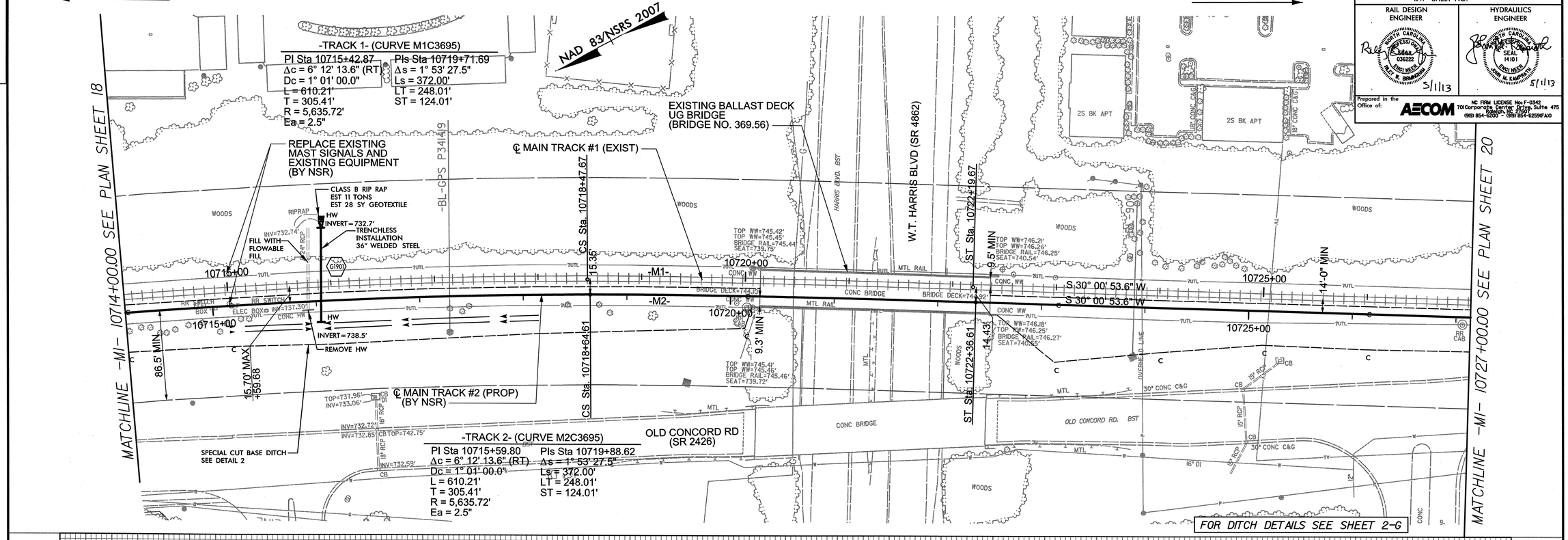

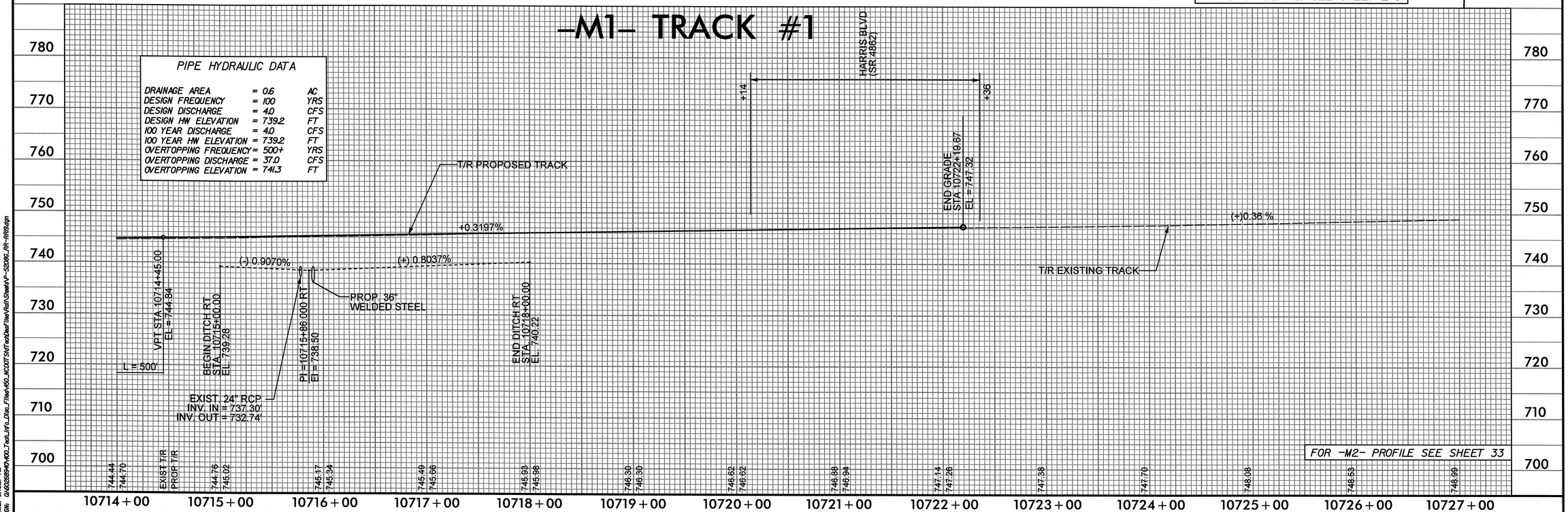

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	20
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036222 ENGINEER BLEY W. BRINKHAM 4/17/13	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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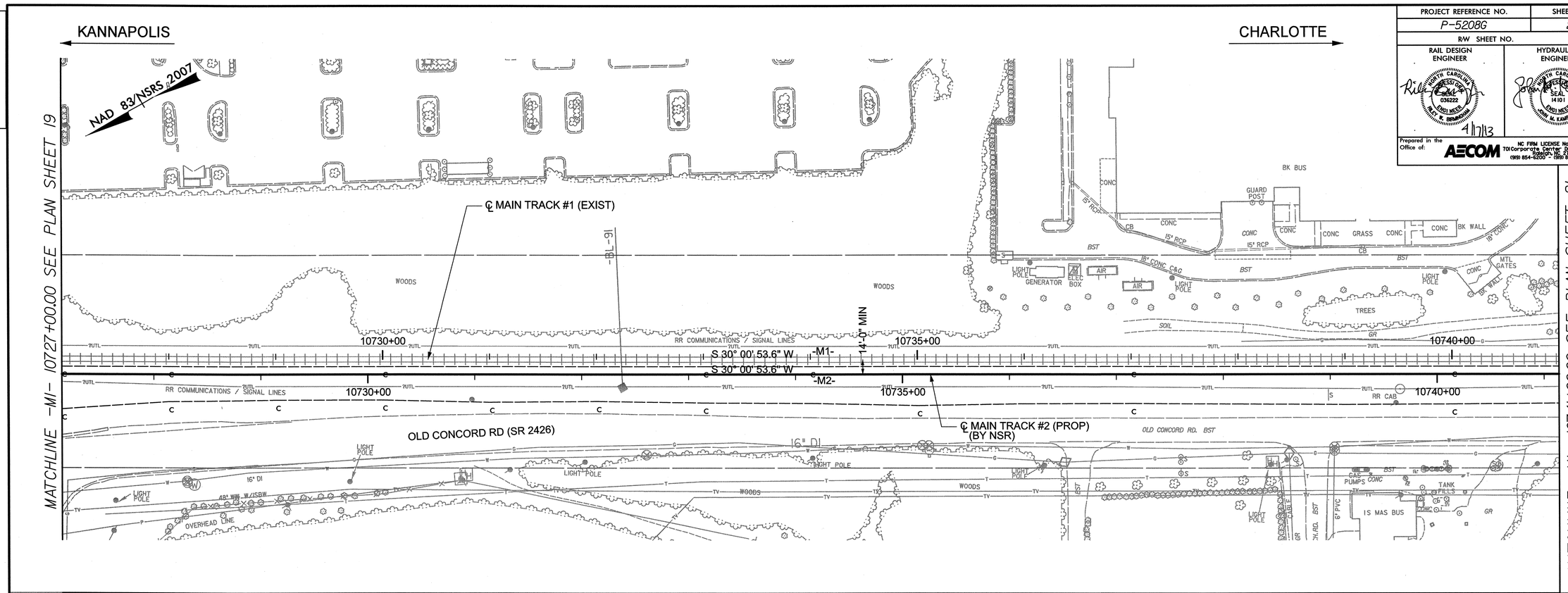

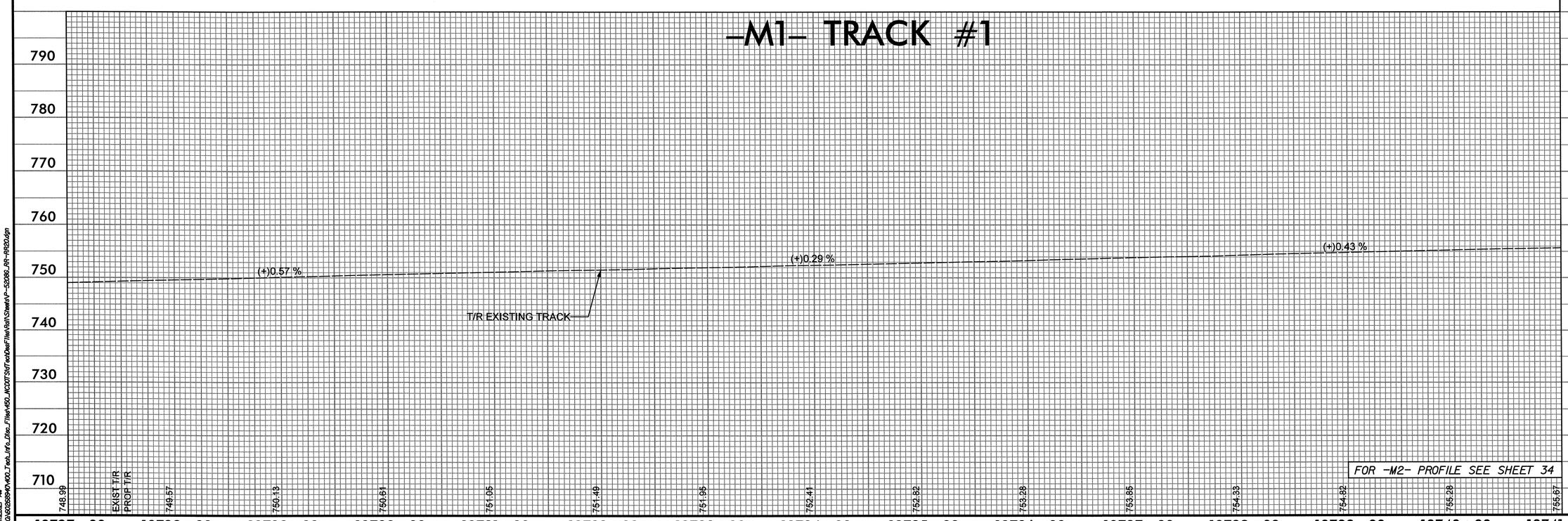

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	21
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

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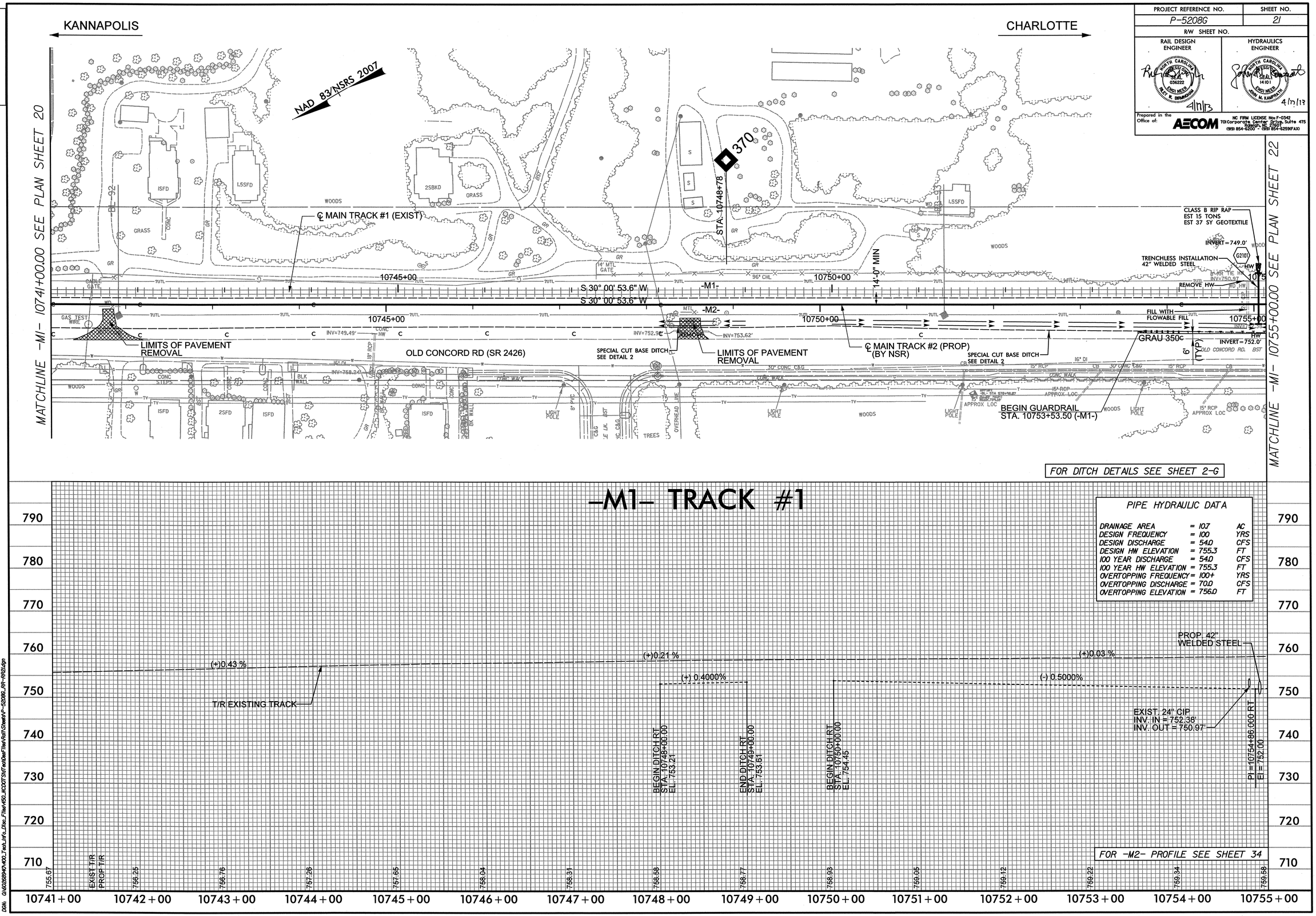
DCN 0041DEL_P10a1



FOR DITCH DETAILS SEE SHEET 2-G

-M1- TRACK #1

FOR -M2- PROFILE SEE SHEET 34

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0041DEL_P10a1

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	22
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEERING R. W. BRINKLEY 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEERING JOHN W. KAMPRATH 4/17/13

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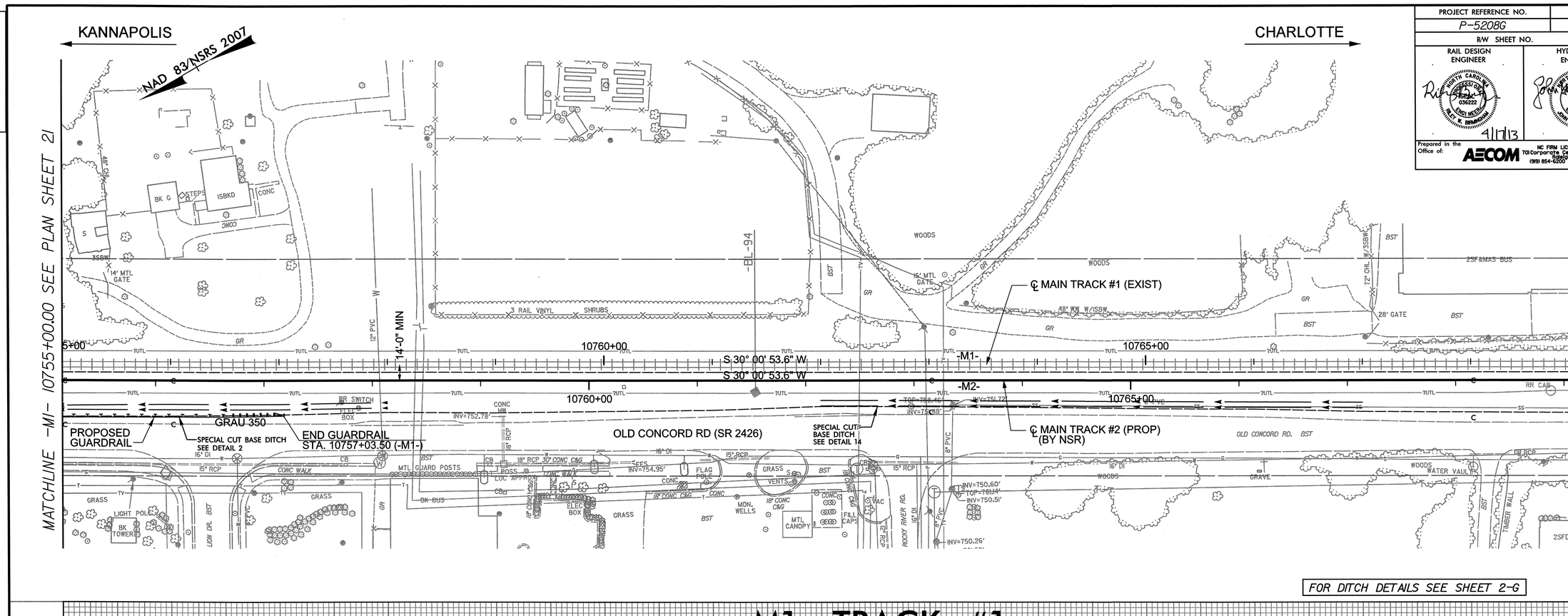

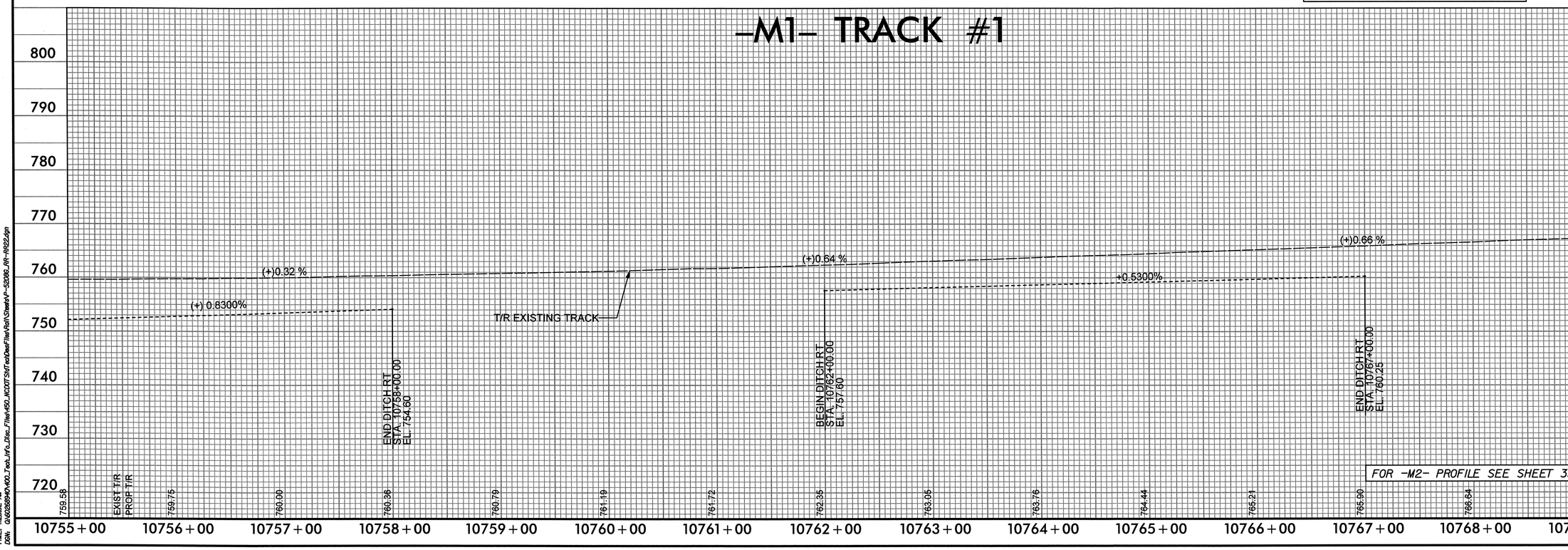

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	23
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
4/17/13	4/17/13

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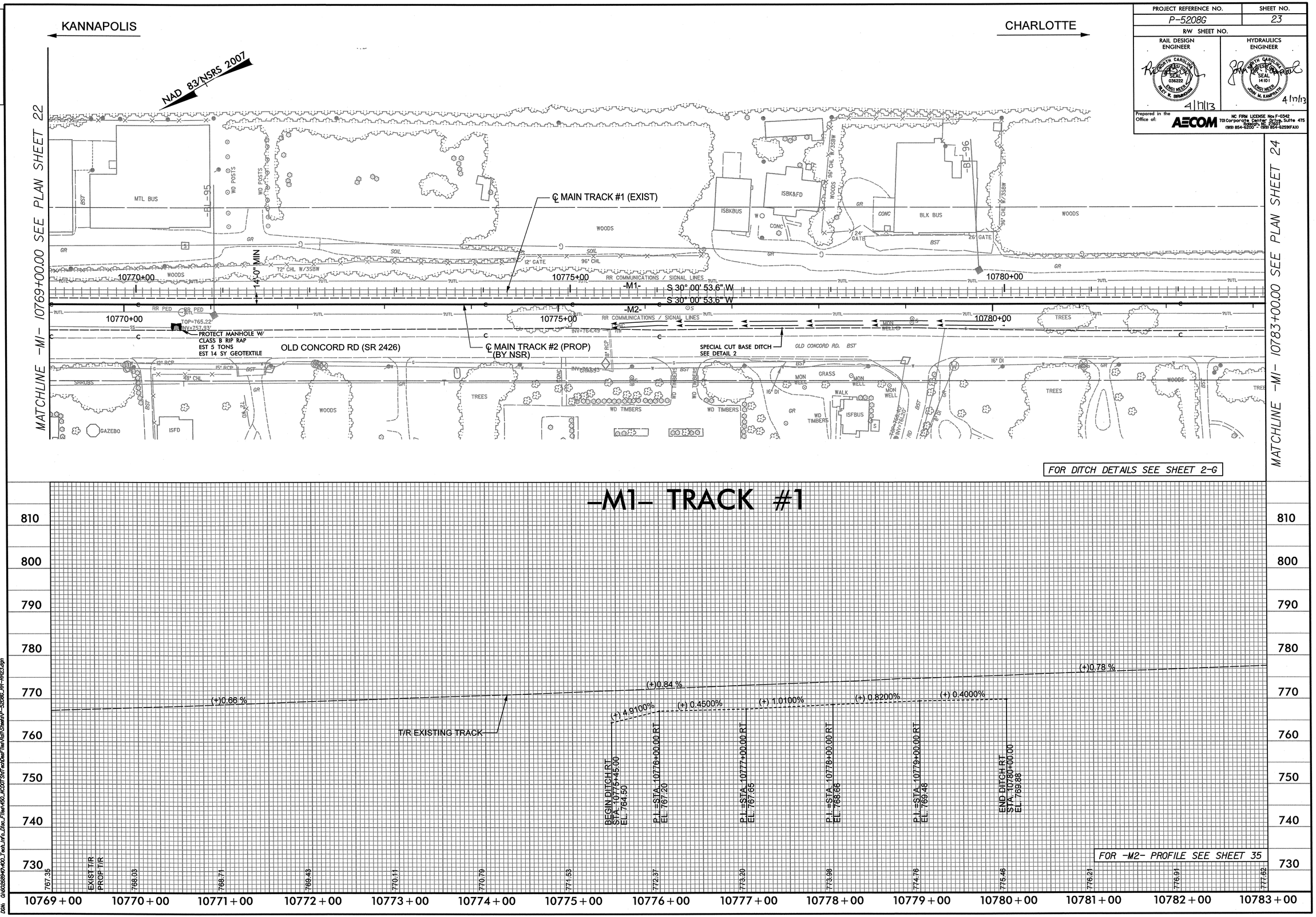

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	24
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. W. BRAMHAM — 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER J. M. KAMPHUIS — 4/17/13

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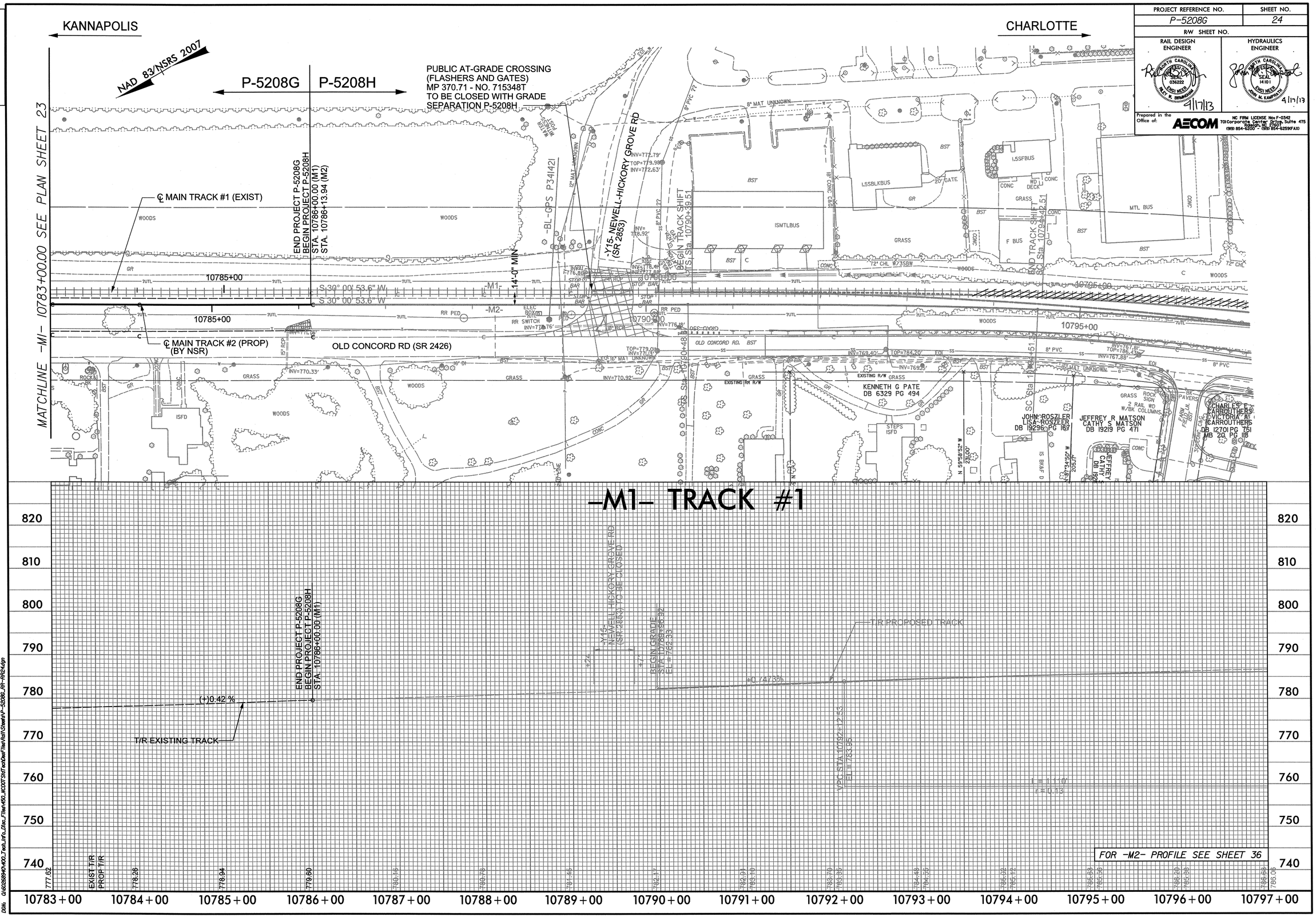
DGN 0041DEL_P10a1



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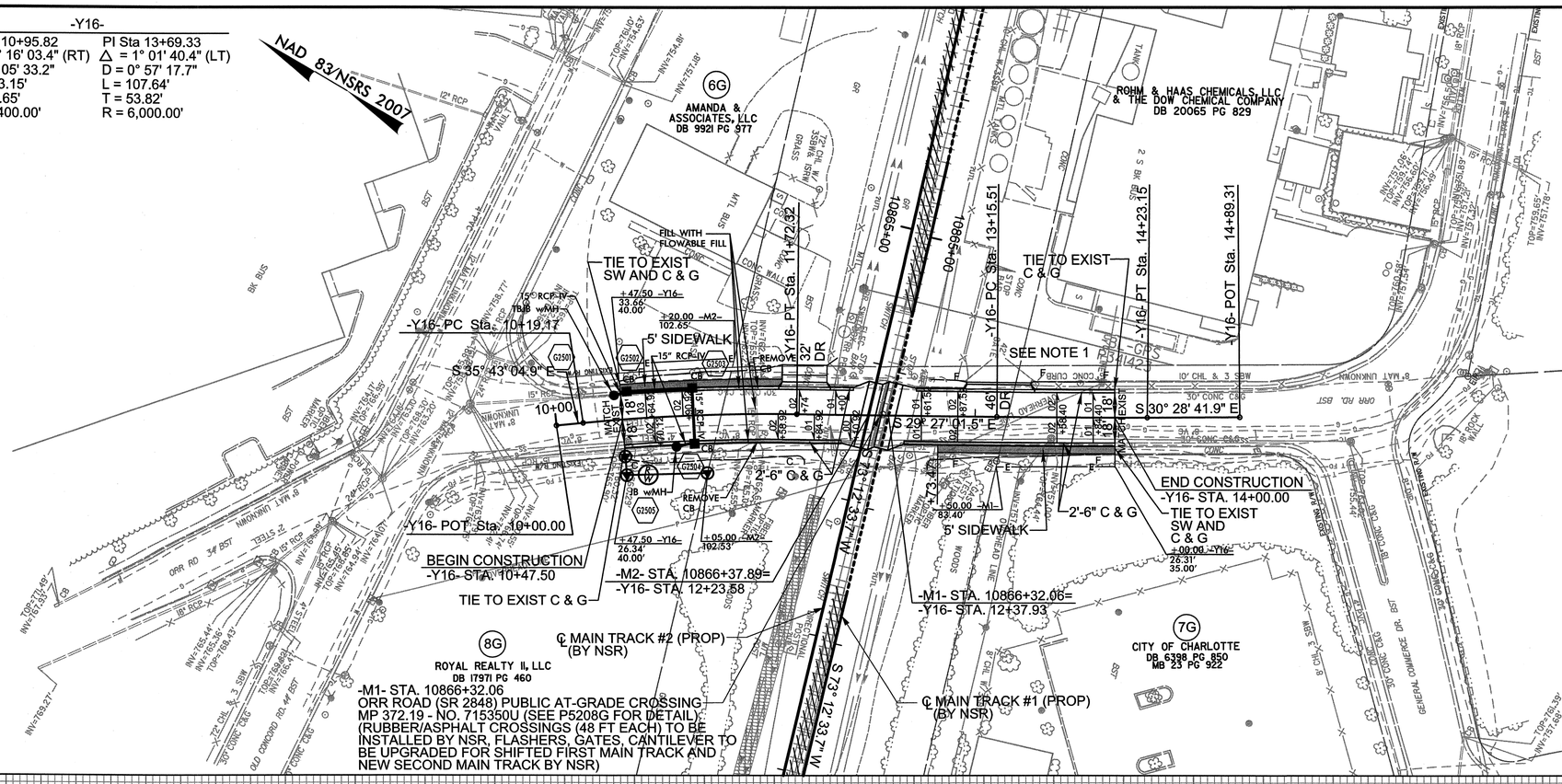
0041DEL_P10a1

-Y16-	
PI Sta 10+95.82	PI Sta 13+69.33
Δ = 6° 16' 03.4" (RT)	Δ = 1° 01' 40.4" (LT)
D = 4° 05' 33.2"	D = 0° 57' 17.7"
L = 153.15'	L = 107.64'
T = 76.65'	T = 53.82'
R = 1,400.00'	R = 6,000.00'



-M1- STA. 10866+32.06
ORR ROAD (SR 2848) PUBLIC AT-GRADE CROSSING
MP 372.19 - NO. 715350U (SEE P5208G FOR DETAIL)
(RUBBER/ASPHALT CROSSINGS (48 FT EACH) TO BE INSTALLED BY NSR, FLASHERS, GATES, CANTILEVER TO BE UPGRADED FOR SHIFTED FIRST MAIN TRACK AND NEW SECOND MAIN TRACK BY NSR)

NOTE
1. DO NOT DISTURB GATE AND ELECTRIC OPERATOR. TIE TO EXISTING 6" CONC CURB. RESET FENCE STA 13+45 +/- TO 14+00.
2. SEE P5208H FOR RAILROAD ROADBED GRADING.
3. FOR EROSION CONTROL SEE SHEETS EC-25 AND EC-47.

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
5/1/13	5/1/13

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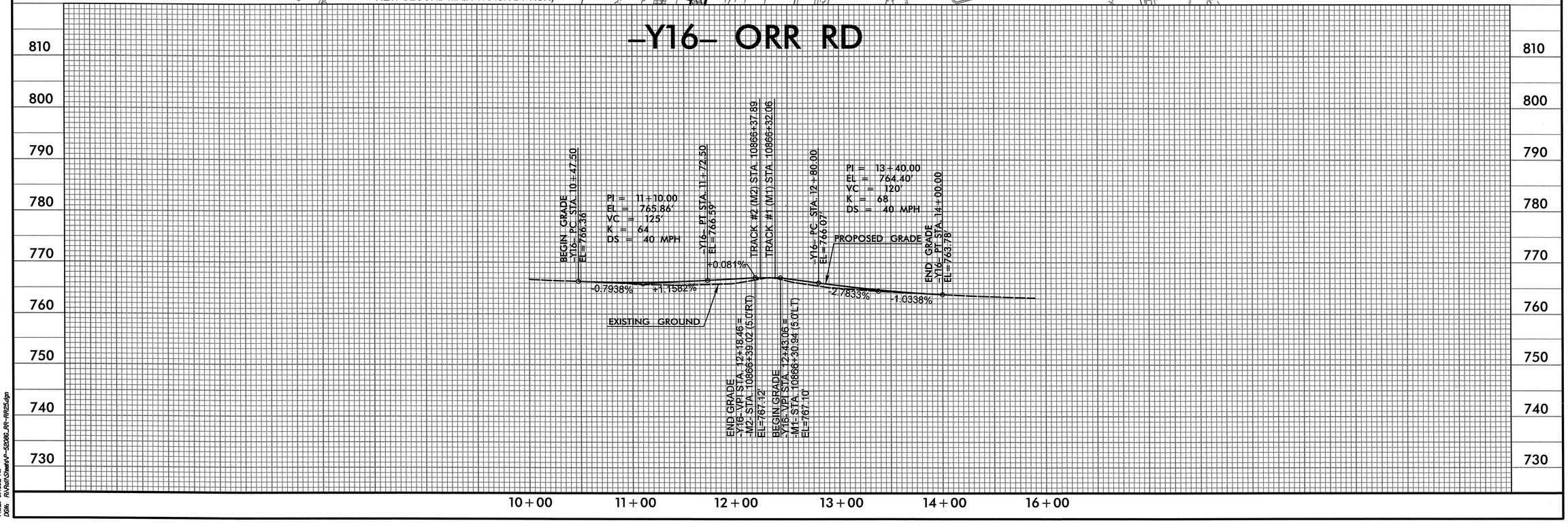
Raleigh, NC 27610
(919) 854-6200 - (919) 854-6259(FAX)

-Y16- ORR RD



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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	26
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEERING R. K. BRAMHAM 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEERING JOHN M. KAMPA, III 4/17/13

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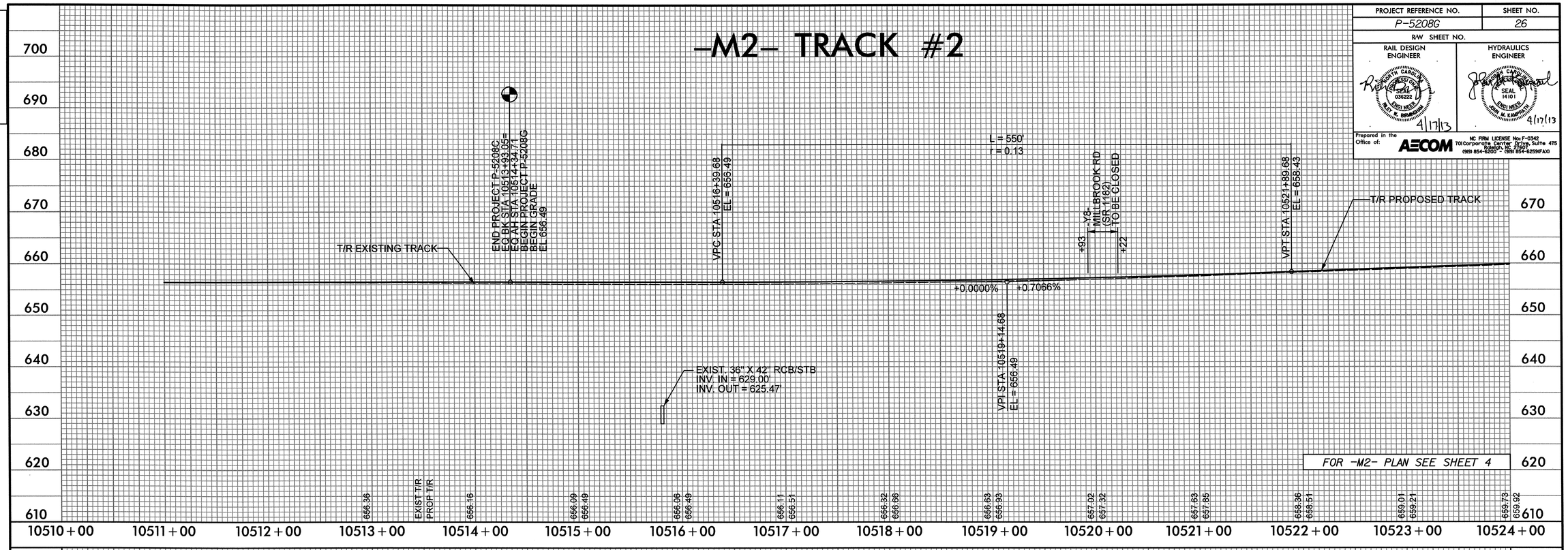
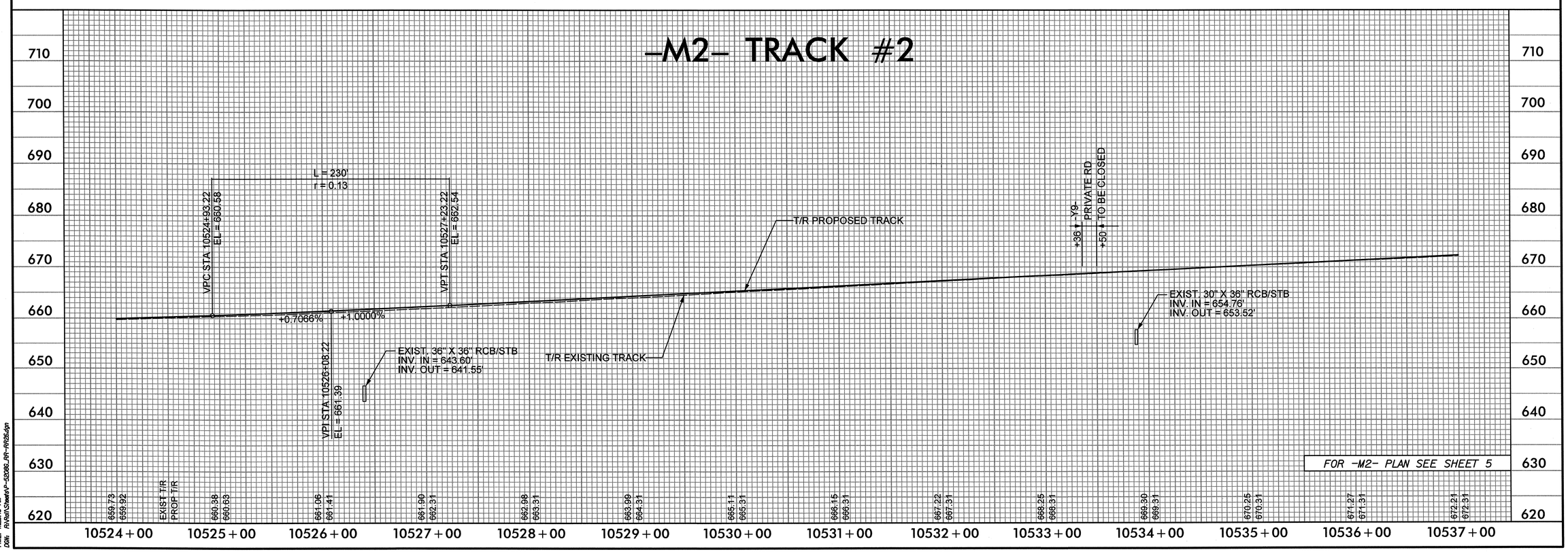
0041DEL_P10a1

DGN

-M2- TRACK #2



-M2- TRACK #2



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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	27
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

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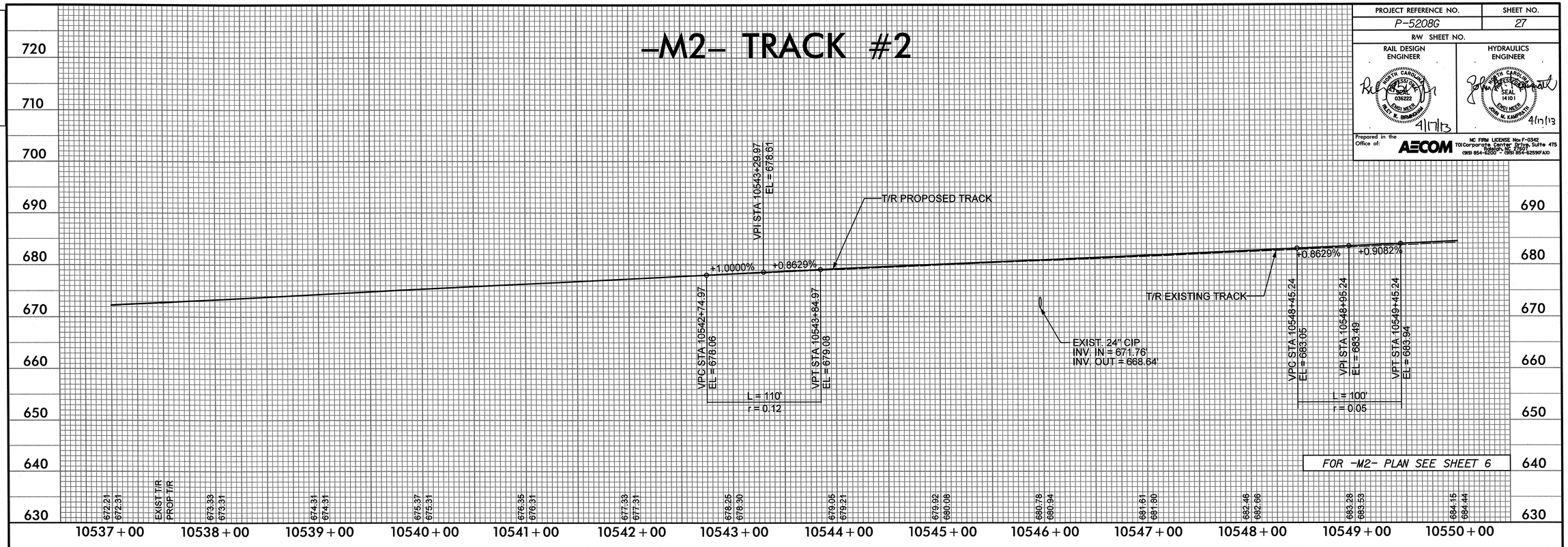

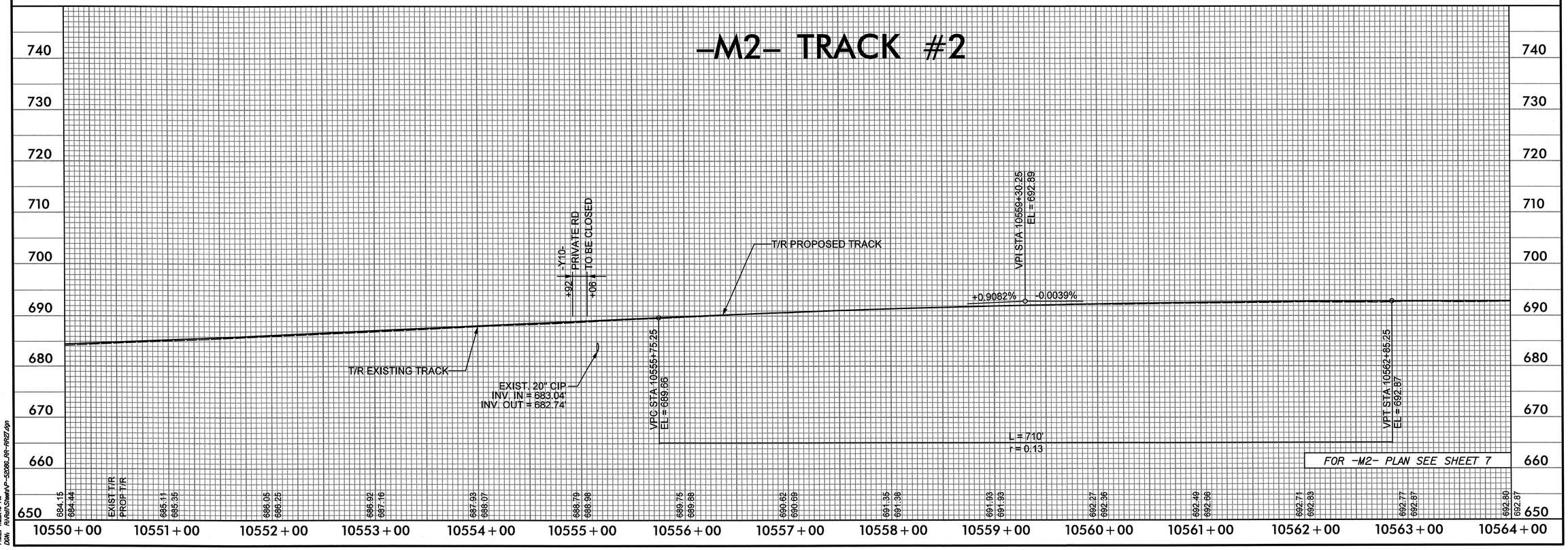

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PROJECT REFERENCE NO.	SHEET NO.
P-5208G	28
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

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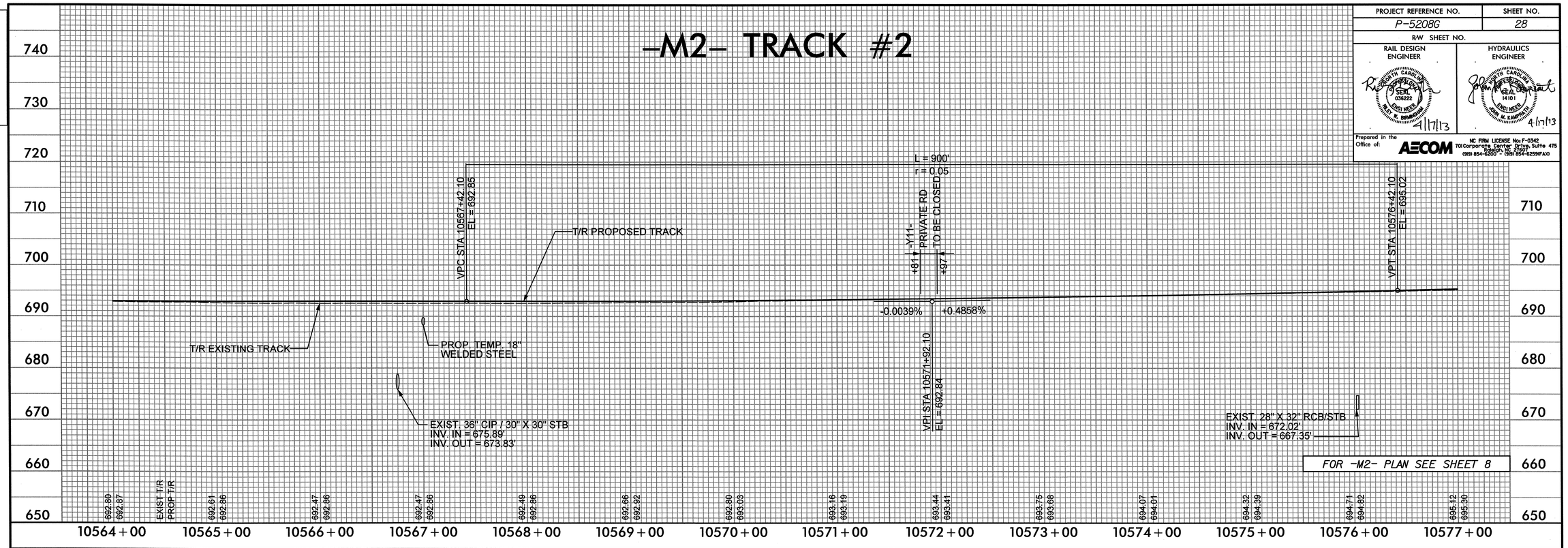
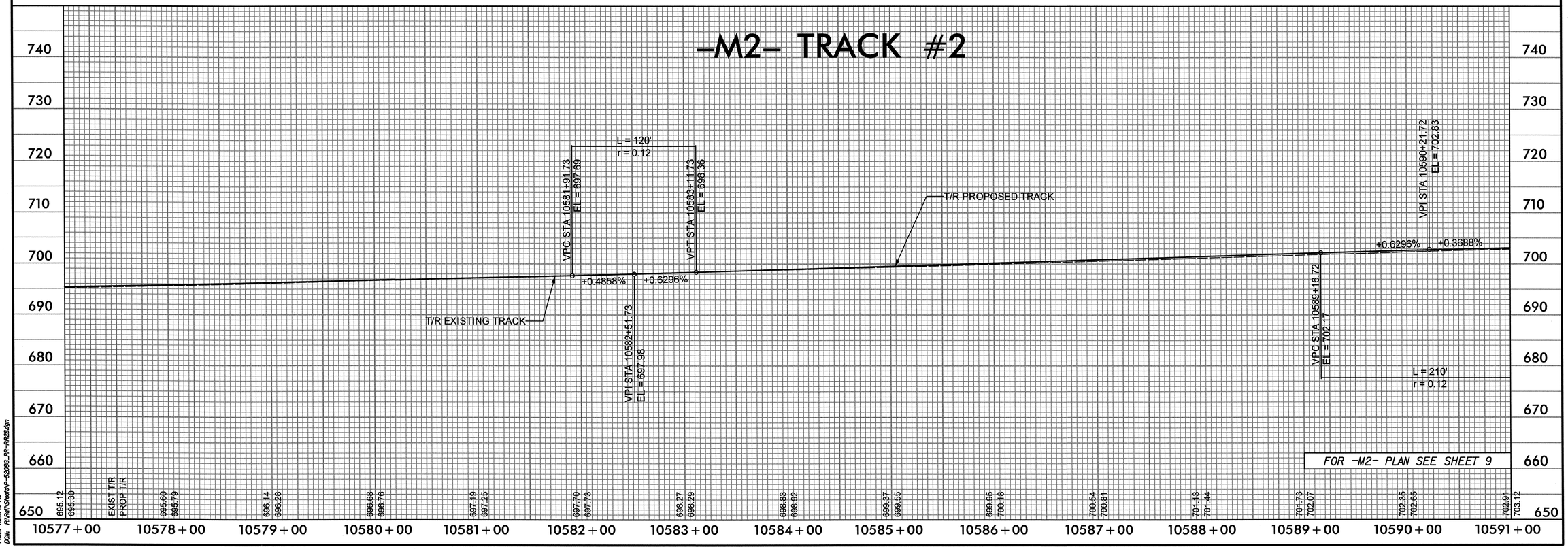
DCN 0041DEL_P10a1





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0041DEL_P10a1

DGN

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	29
R/W SHEET NO.	

RAIL DESIGN ENGINEER

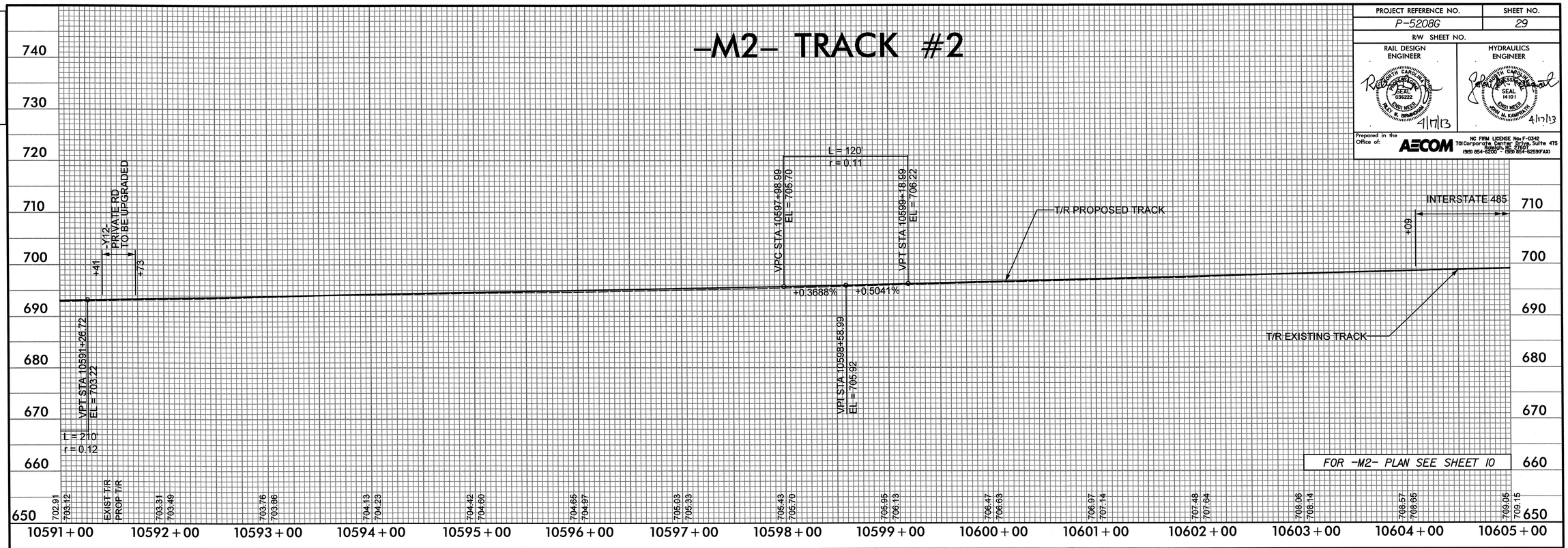
REGISTERED PROFESSIONAL ENGINEER SEAL 036222 ENDI NEETS BRIAN M. BRUNNING
4/17/13

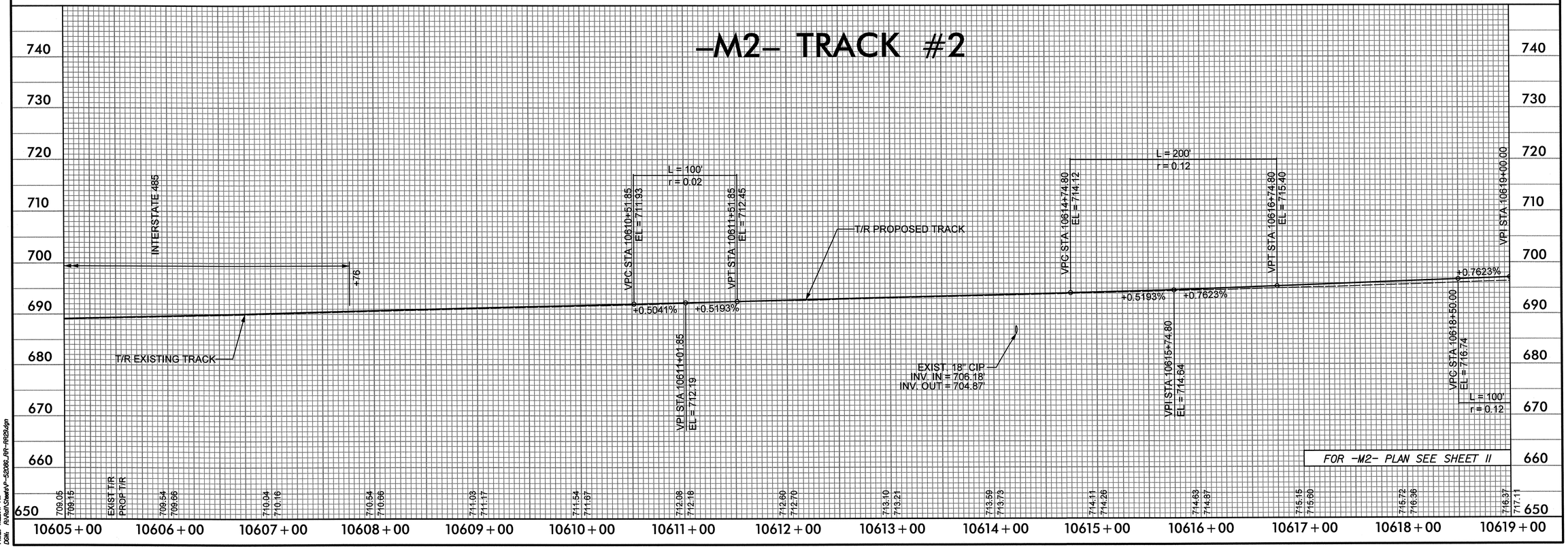
HYDRAULICS ENGINEER

REGISTERED PROFESSIONAL ENGINEER SEAL 14101 ENDI NEETS JOHN M. KAMPSTRA
4/17/13

Prepared in the Office of: AECOM

NC FIRM LICENSE No: F-0342
701 Corporate Center Drive, Suite 475
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)





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TIME: 11:28:47 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR29.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	30
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY W. BIRMINGHAM 4/17/13	NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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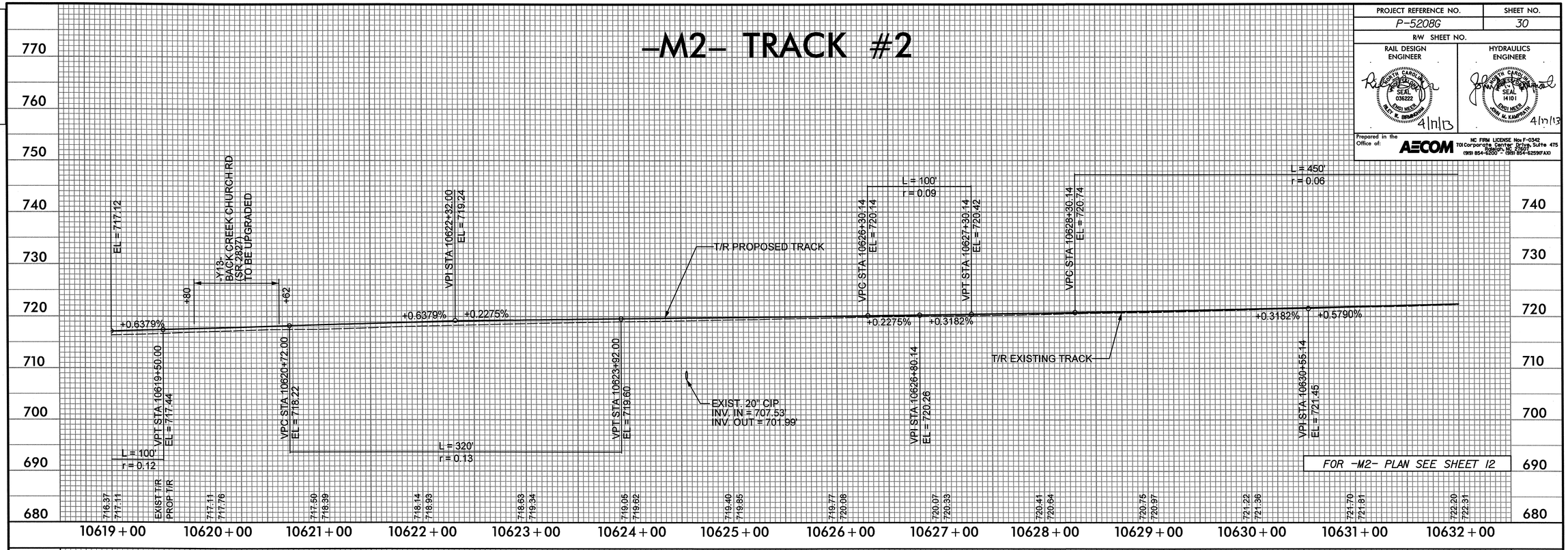
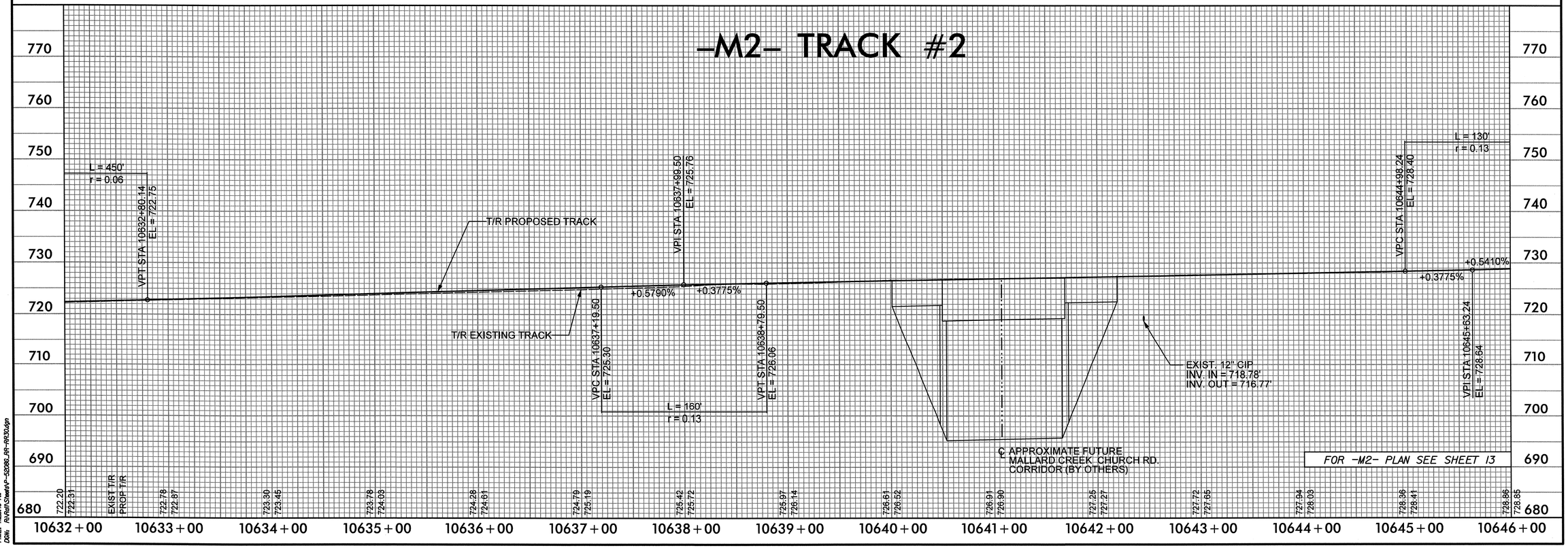
DCN 0041DEL_P10a1

-M2- TRACK #2



-M2- TRACK #2



USER: westmi
DATE: 4/17/2013
TIME: 11:28:46 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR30.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	31
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY W. BRMINGHAM 4/17/13

NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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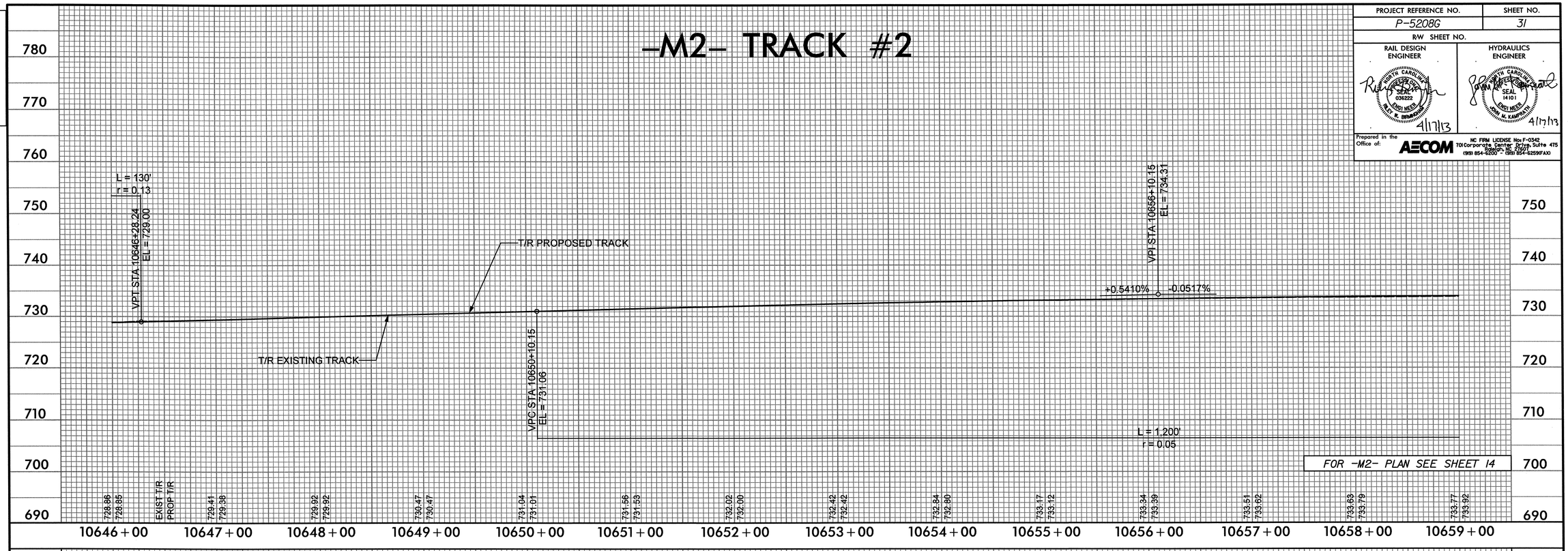
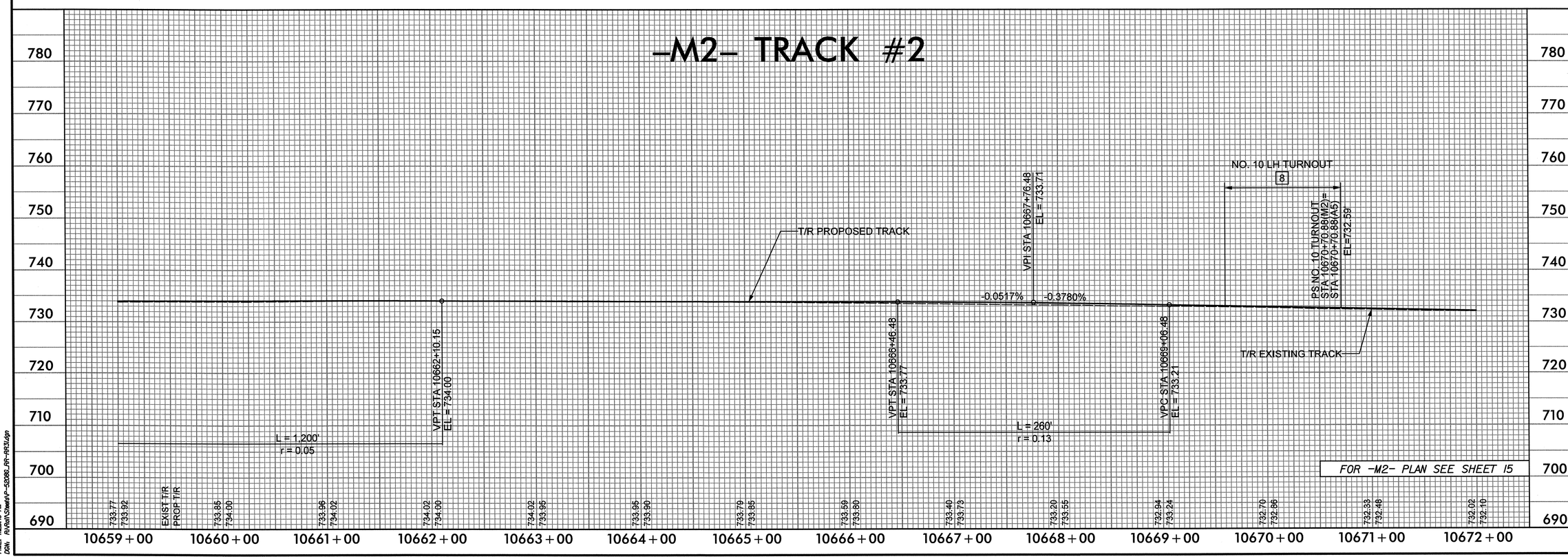
DCN 0041DEL_P10a1

-M2- TRACK #2



-M2- TRACK #2



USER: westml
DATE: 4/17/2013
TIME: 11:28:49 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR31.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	32
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

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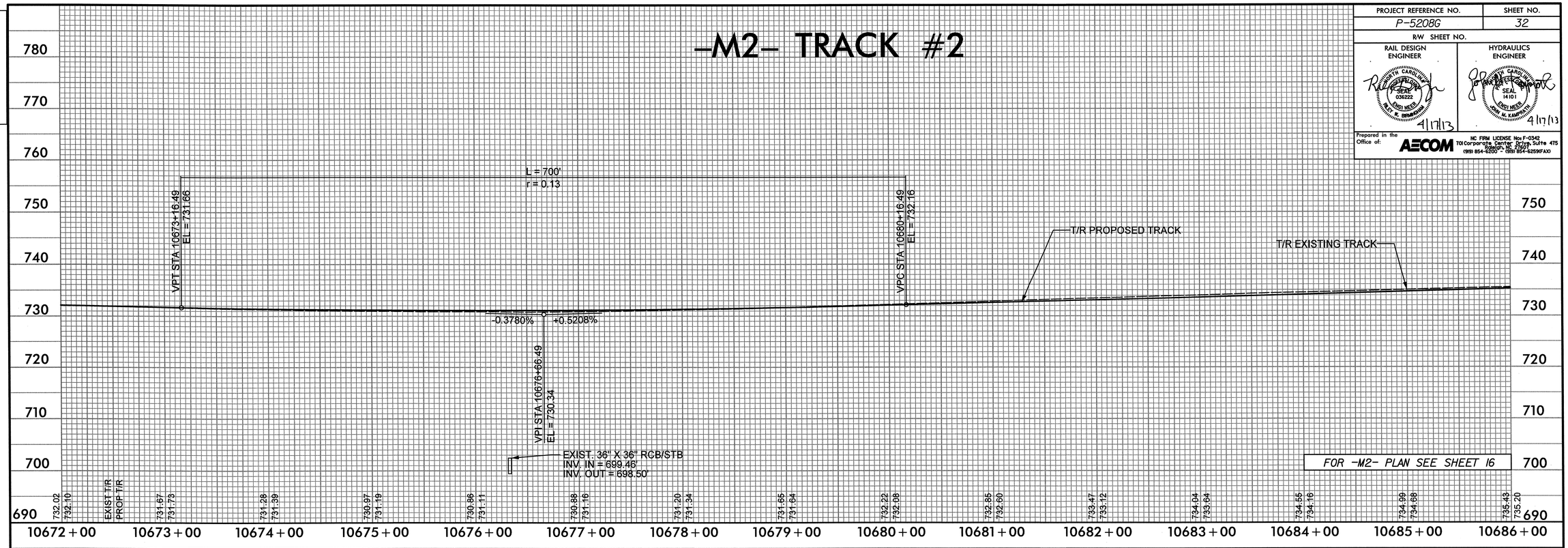
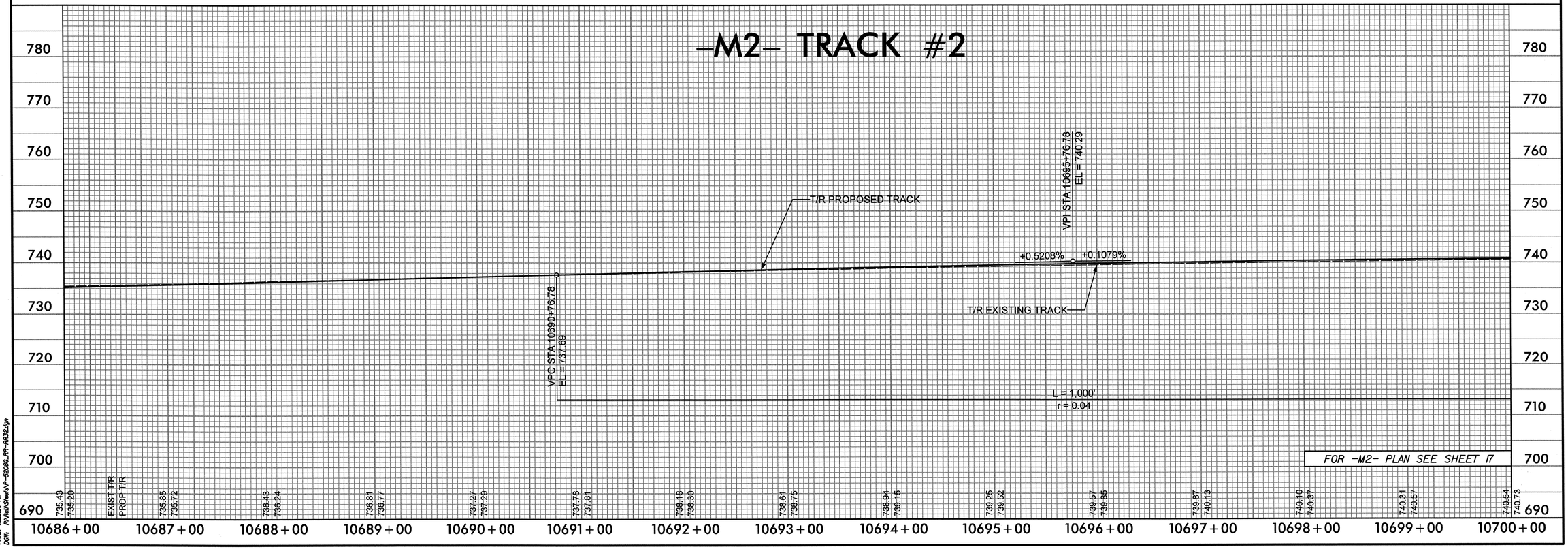
DCN 0041DEL_P10a1





USER: westml
DATE: 4/17/2013
TIME: 11:28:50 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR32.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	33
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY W. BRIMMIGAN 4/17/13

NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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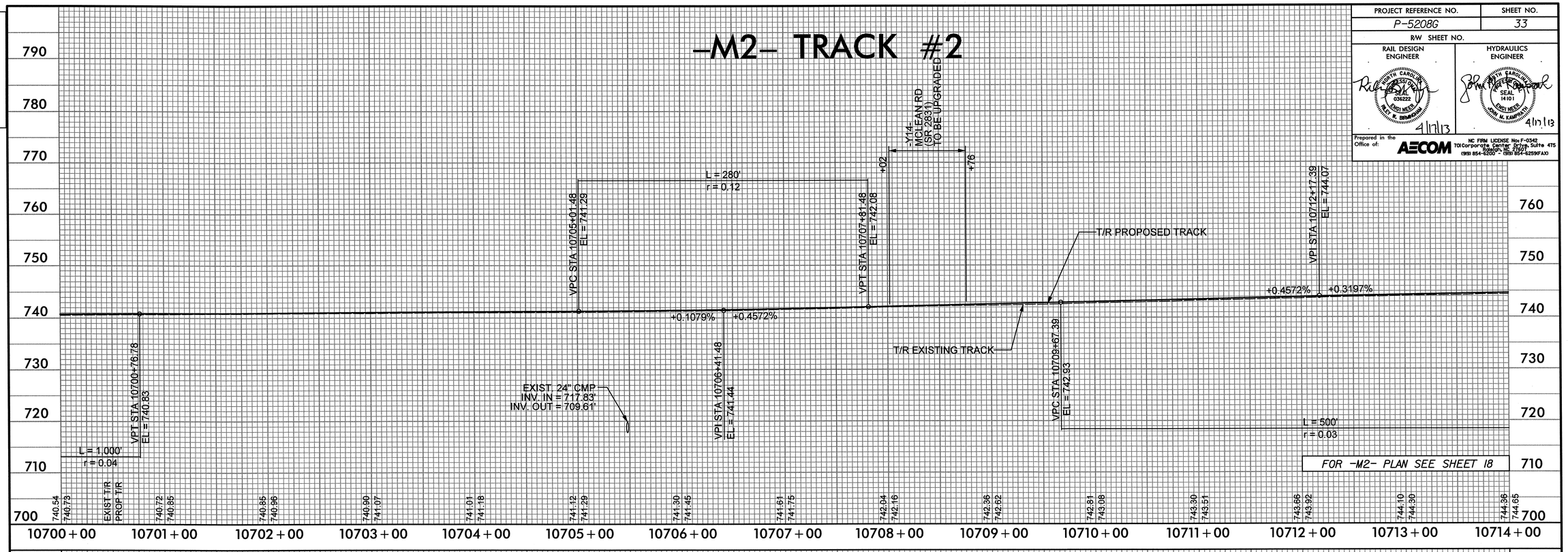
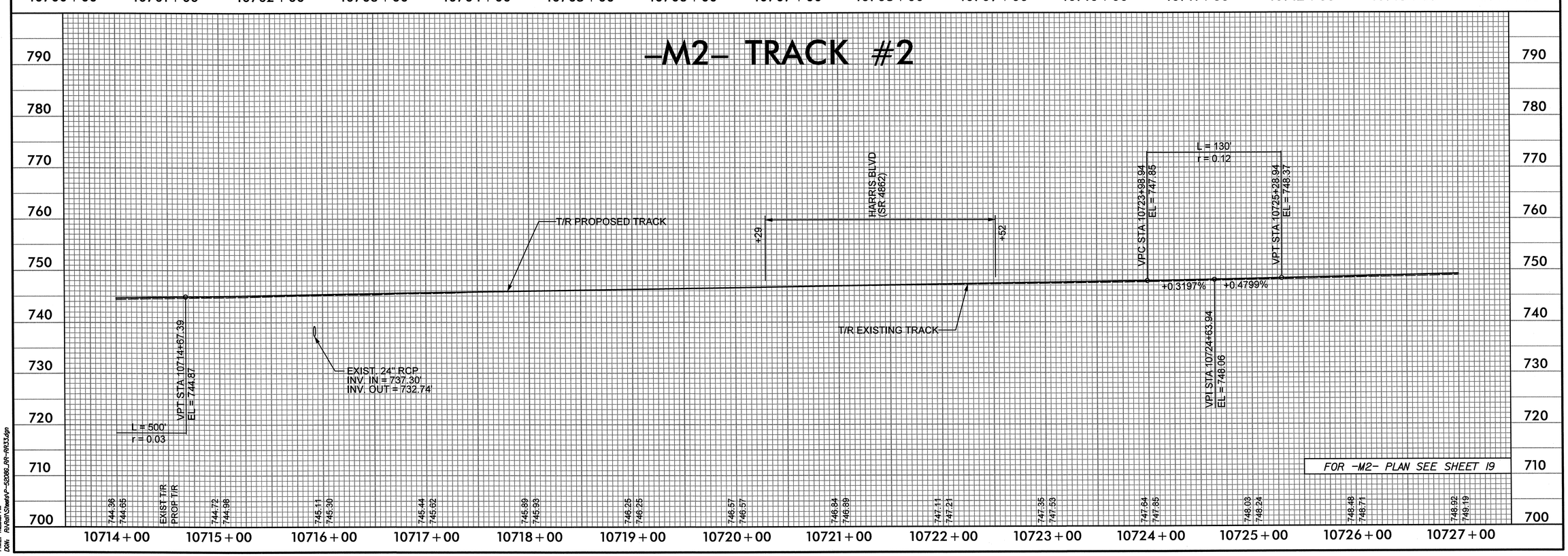
DCN 0041DEL_P10a1





USER: westmi
DATE: 4/17/2013
TIME: 11:28:51 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR33.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	34
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER RILEY M. BRIMMINGHAM 4/17/13	NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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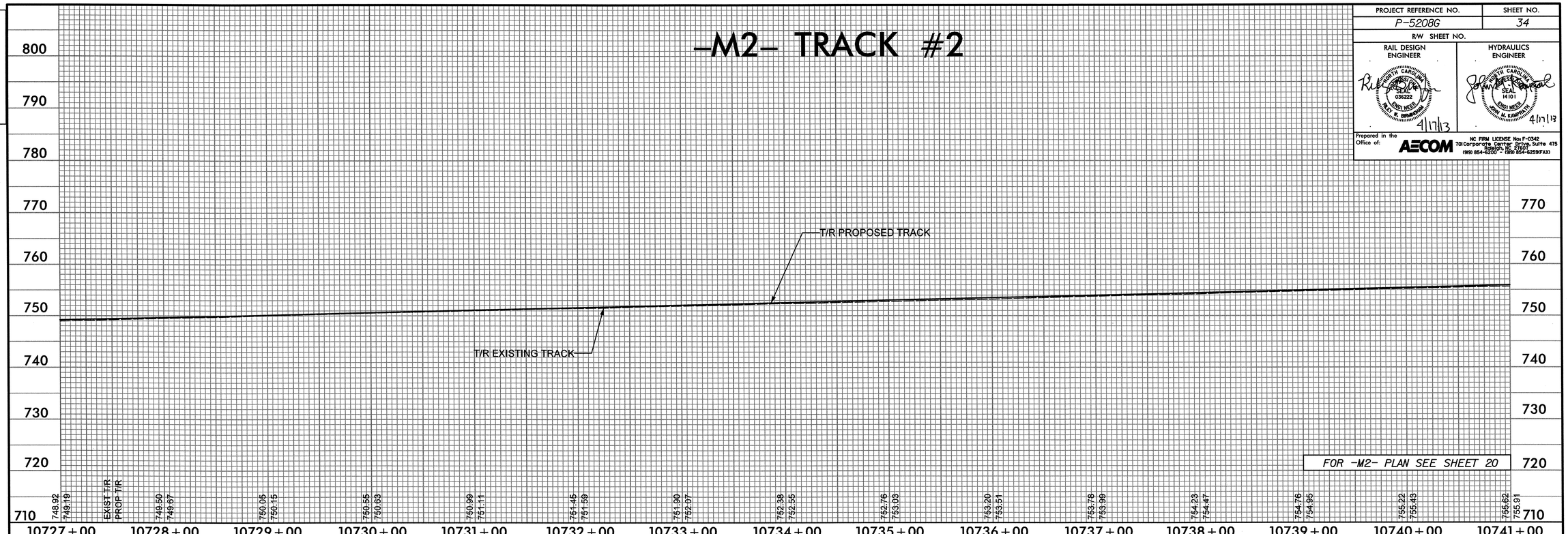

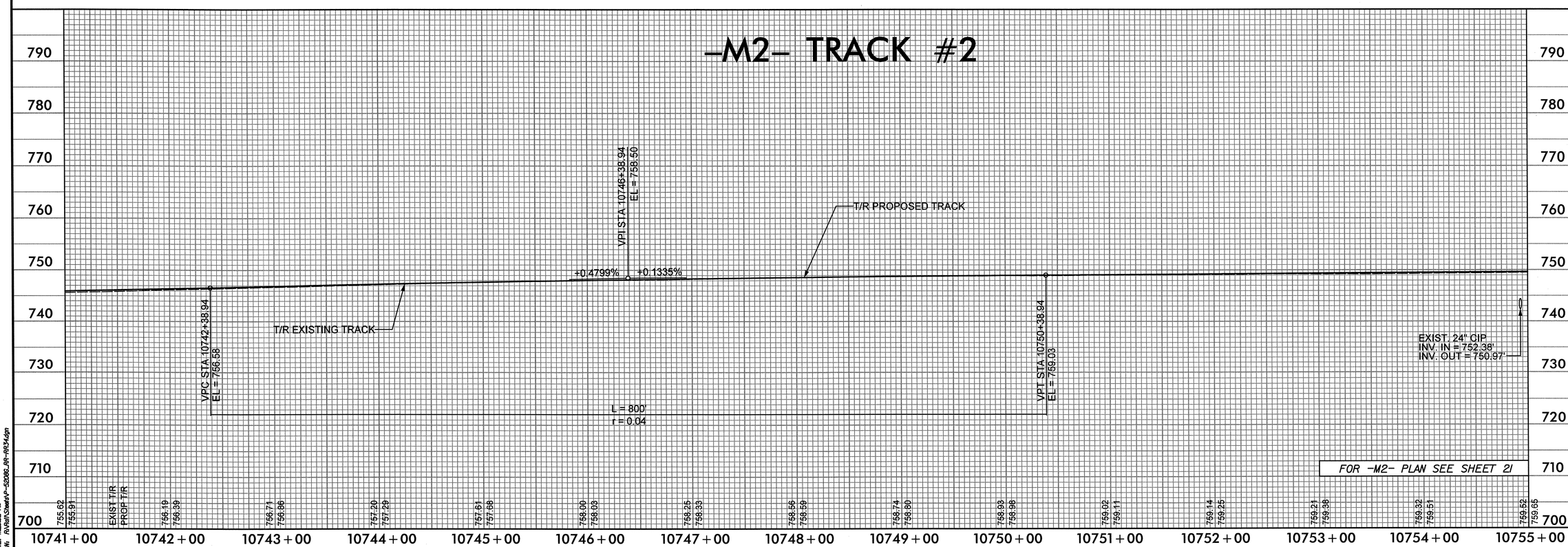

DCN 0041DEL_P10a1

USER: westml
DATE: 4/17/2013
TIME: 11:28:52 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR34.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	35
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER BILEY W. BIRMINGHAM 4/17/13

NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMPRATH 4/17/13

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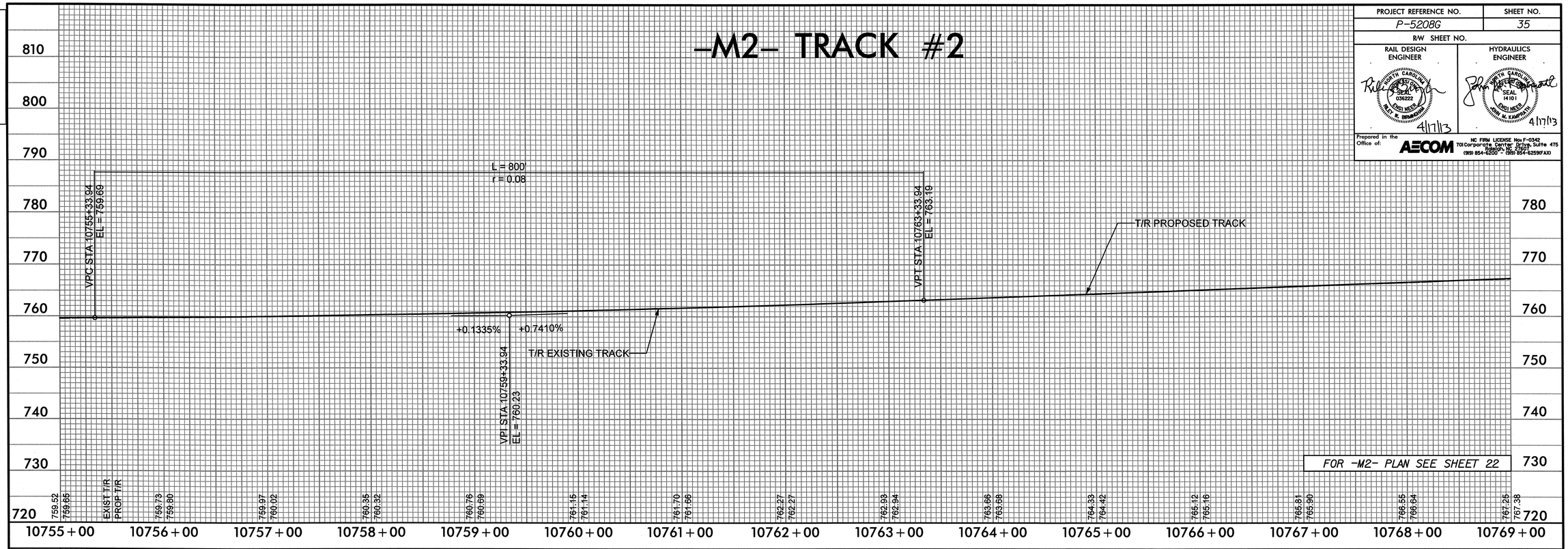
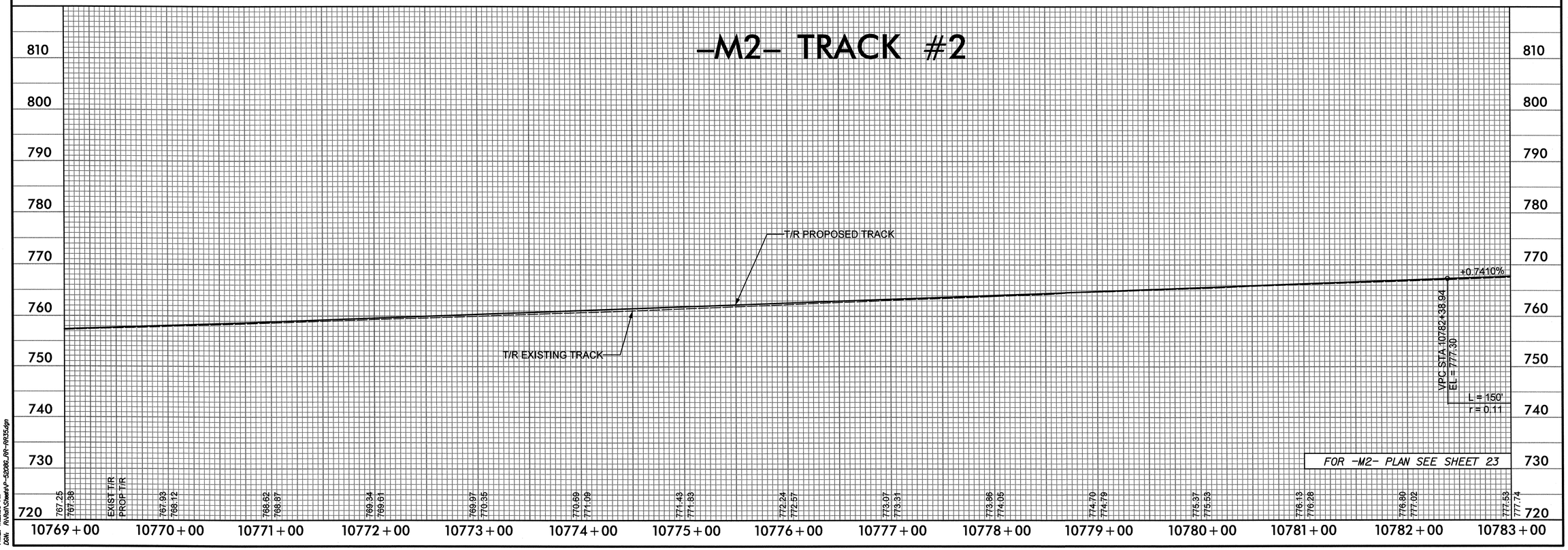
DGN 0041DEL_P10a1

-M2- TRACK #2



-M2- TRACK #2



USER: westmi
DATE: 4/17/2013
TIME: 11:28:53 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR35.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	36
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER
4/17/13	4/17/13

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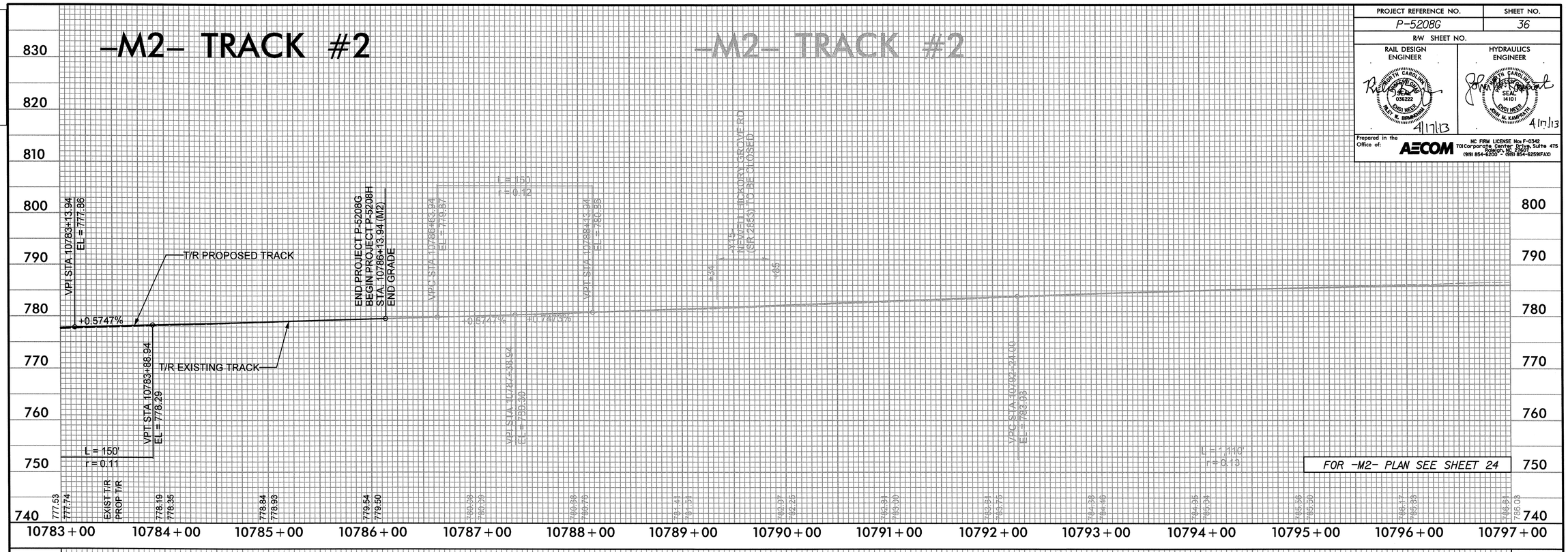

DCN 0041DEL_P10a1

USER: westml
DATE: 4/17/2013
TIME: 11:28:53 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR36.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	37
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 CIVIL ENGINEER RALPH W. BRAMBLETT 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 CIVIL ENGINEER JOHN M. KAMPSCHUT 4/17/13

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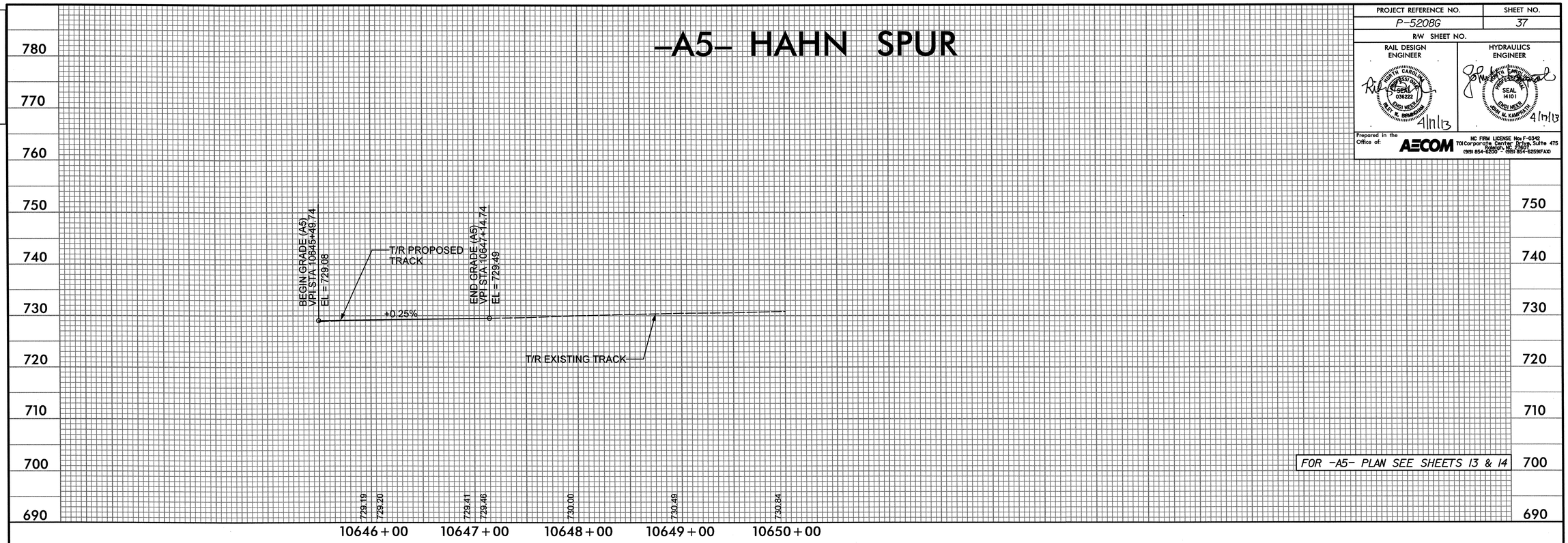
0041DEL_P10a1

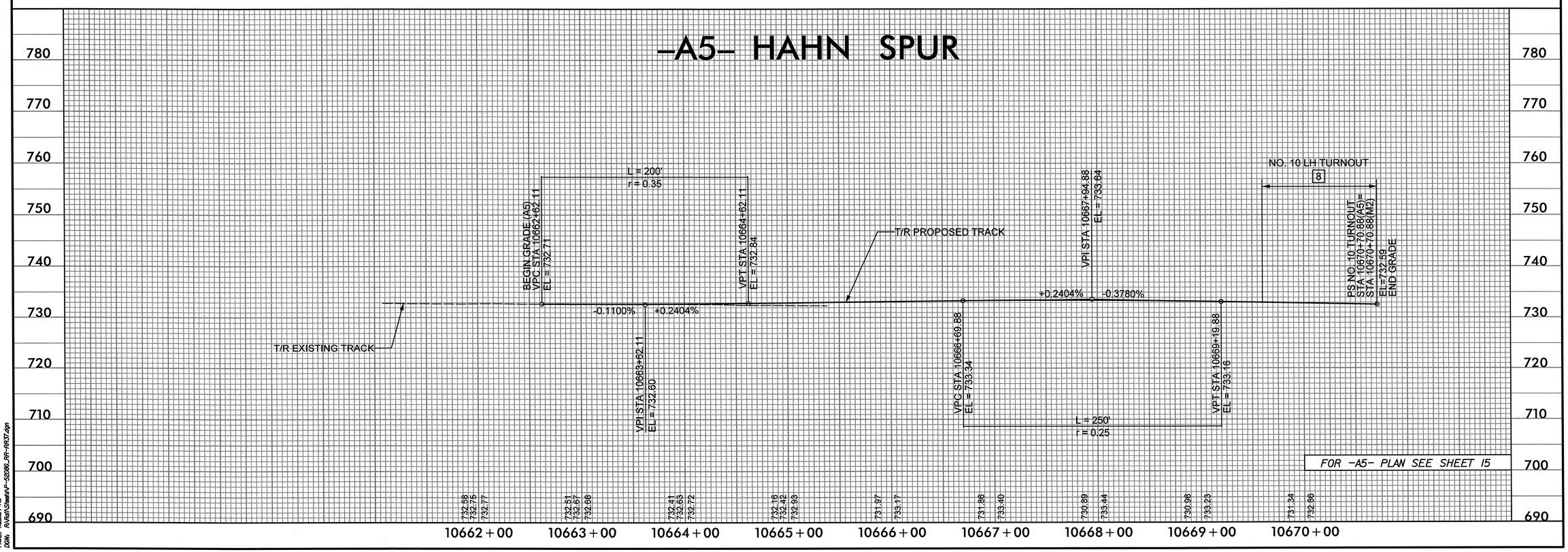
DGN

-A5- HAHN SPUR



FOR -A5- PLAN SEE SHEETS 13 & 14

-A5- HAHN SPUR



FOR -A5- PLAN SEE SHEET 15

USER: wadtrd
DATE: 4/17/2013
TIME: 10:56:44 AM
FILE: R:\Rail\Sheets\P-5208G_RR-R37.dgn
DGN: R:\Rail\Sheets\P-5208G_RR-R37.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	38
R/W SHEET NO.	
RAIL DESIGN ENGINEER	HYDRAULICS ENGINEER

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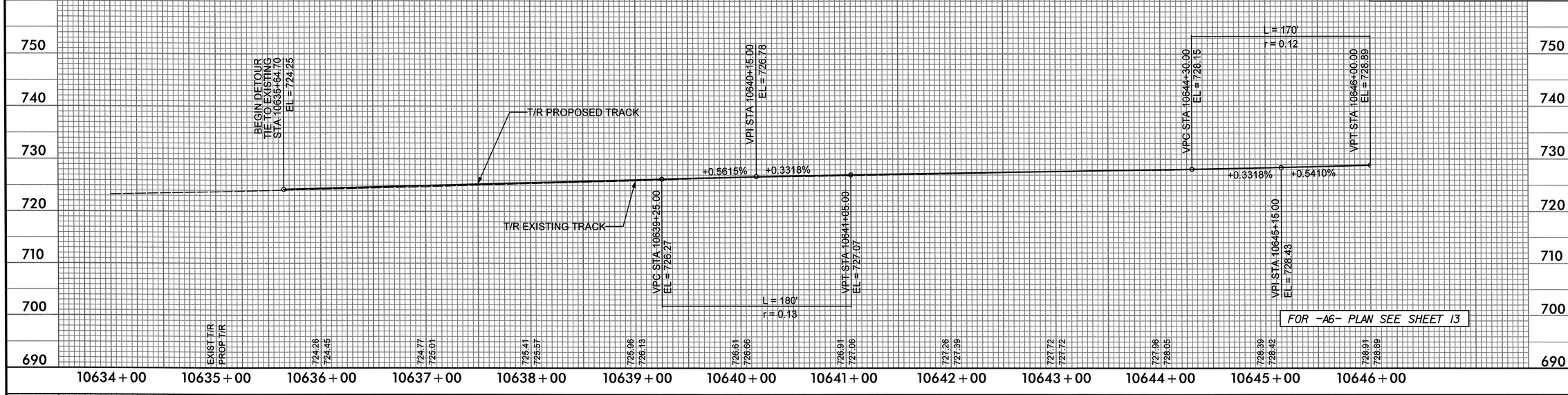
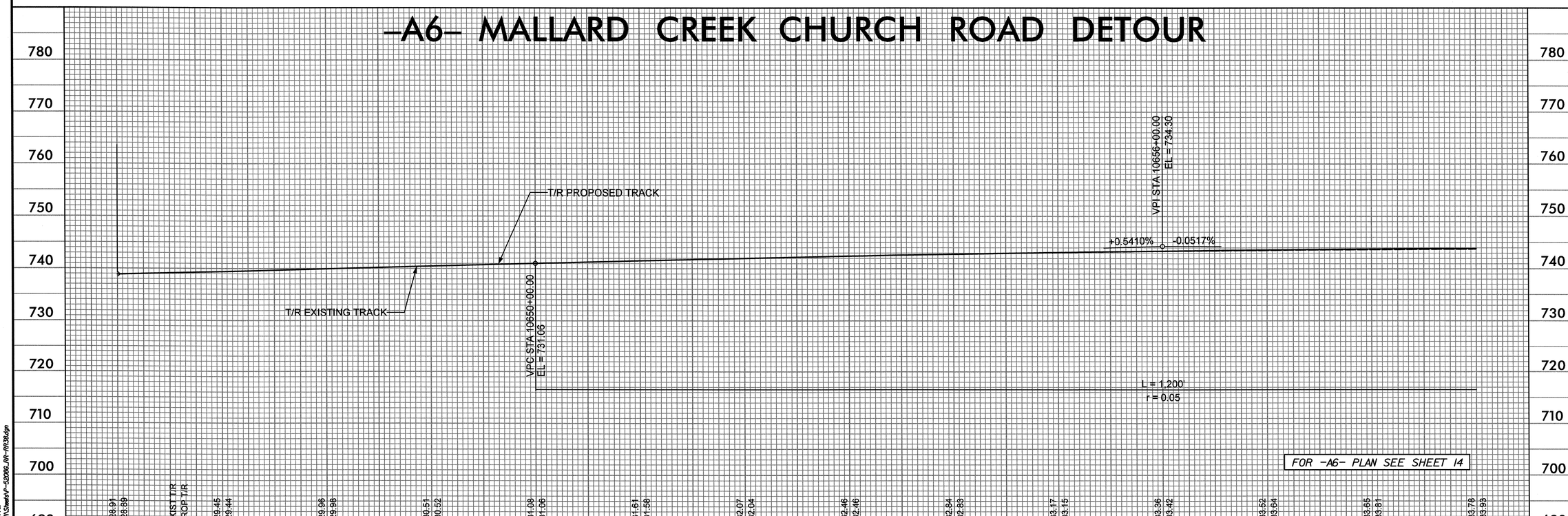
0041DEL_P10a1

-A6- MALLARD CREEK CHURCH ROAD DETOUR



-A6- MALLARD CREEK CHURCH ROAD DETOUR



USER: westrel
DATE: 4/17/2013
TIME: 11:29:01 AM
DGN: R:\Rail\Sheets\P-5208G_RR-RR38.dgn

0041DEL_P10a1

DGN

-A6- MALLARD CREEK CHURCH ROAD DETOUR

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	39
R/W SHEET NO.	

RAIL DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 036222 ENGINEER R. W. BRINKLEY — 4/17/13

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 14101 ENGINEER JOHN M. KAMINSKY — 4/17/13

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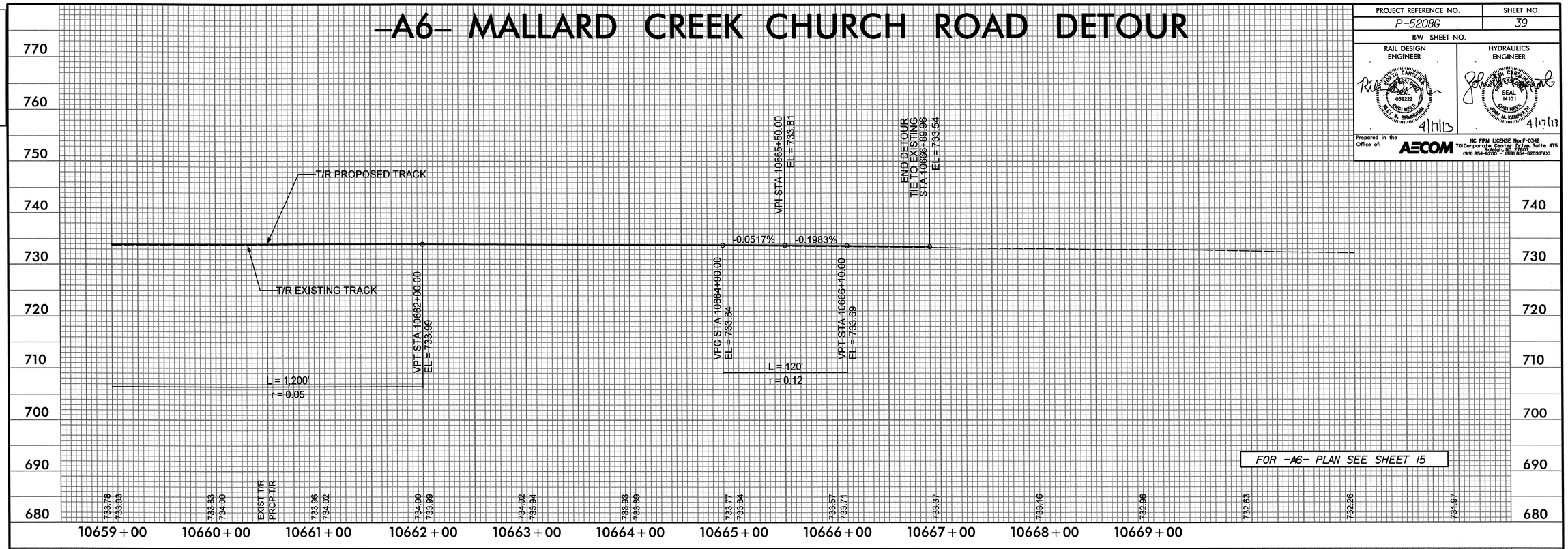
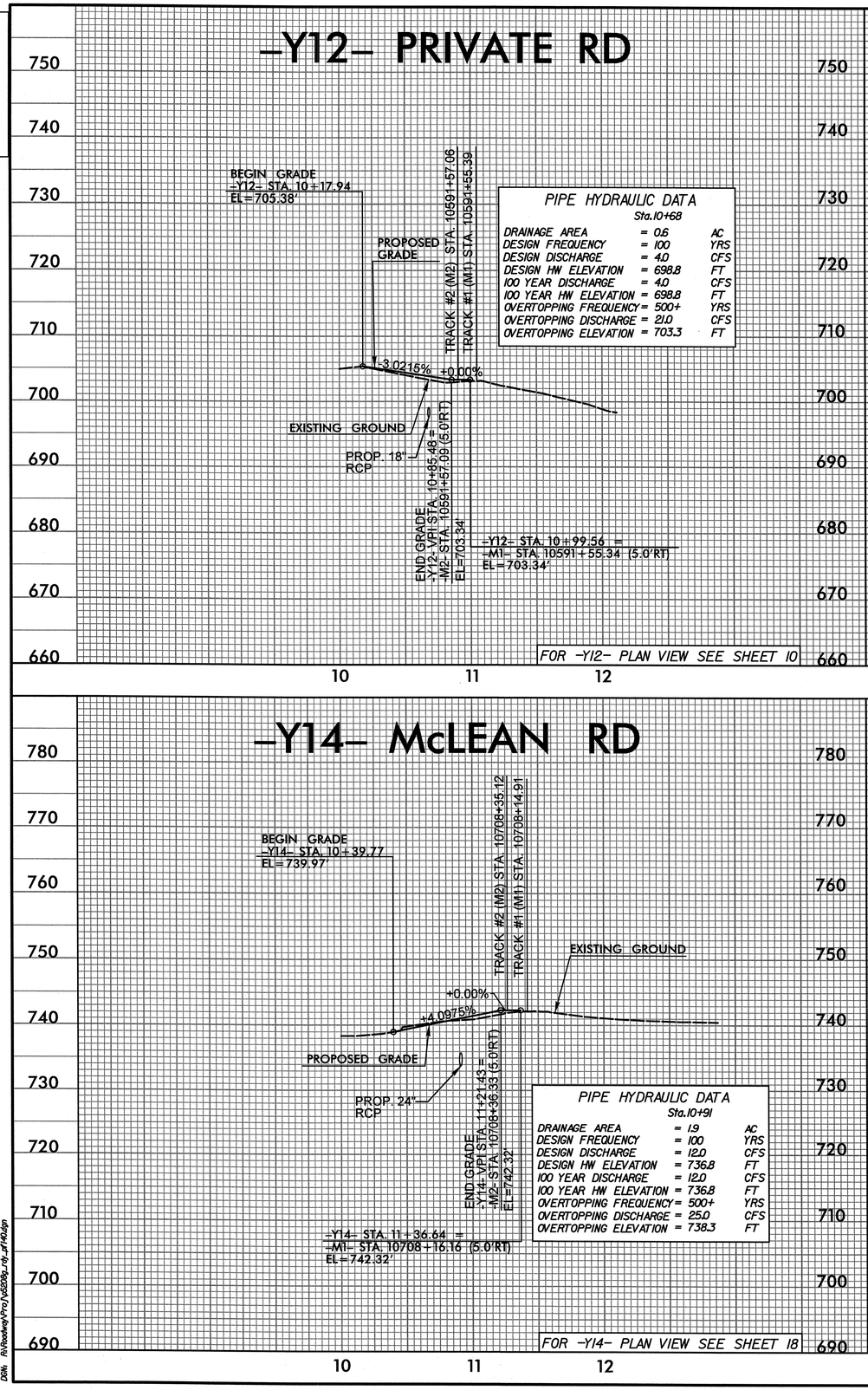


USER: weathal
DATE: 4/17/2013
TIME: 11:29:02 AM
DGN: R:\Roll\Sheets\P-5208G_RR-RR39.dgn

PROJECT REFERENCE NO.	SHEET NO.
P-5208G	40
R/W SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER



PIPE HYDRAULIC DATA
Sta.10+68

DRAINAGE AREA	= 0.6	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 4.0	CFS
DESIGN HW ELEVATION	= 698.8	FT
100 YEAR DISCHARGE	= 4.0	CFS
100 YEAR HW ELEVATION	= 698.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 21.0	CFS
OVERTOPPING ELEVATION	= 703.3	FT

PIPE HYDRAULIC DATA
Sta.10+91

DRAINAGE AREA	= 1.9	AC
DESIGN FREQUENCY	= 100	YRS
DESIGN DISCHARGE	= 12.0	CFS
DESIGN HW ELEVATION	= 736.8	FT
100 YEAR DISCHARGE	= 12.0	CFS
100 YEAR HW ELEVATION	= 736.8	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 25.0	CFS
OVERTOPPING ELEVATION	= 738.3	FT

DCN 0041DEL_P10a1

USER: westml
DATE: 4/24/2013
TIME: 10:00:59 AM
DGN: R:\Roadway\Proj\p5208g_rdy_pf140.dgn