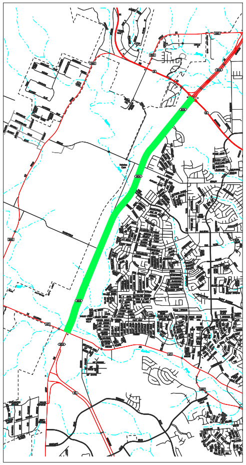
TEXAS DEPARTMENT OF TRANSPORTATION
SCHEMATIC LAYOUT
LOOP 1604 - BEXAR COUNTY
OFFICE OF THE DISTRICT ENGINEER
SAN ANTONIO, TEXAS

CONTROL: 2452 SECTION: 01 JOB: 055

LIMITS: FM 471 TO SH 16
LENGTH = 4.731 MILES

DESIGN SPEED: MAINLANES = 60 MPH
FRONTAGE ROADS = 45 MPH
RAMPS = 40 MPH
FUNCTIONAL CLASS: URBAN FREEWAY



LOCATION MAP
Not To Scale

CORRECT:
______________ , 2012
TRANSPORTATION PLANNING DIRECTOR

CORRECT:
______________ , 2012
DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED: BY DESIGN DIVISION
LETTER DATED

RECOMMENDED FOR APPROVAL:
______________ , 2012
DISTRICT ENGINEER

APPROVED: BY F.H.W.A.
LETTER DATED

Scale: 1" = 200' Horizontal
1" =20' Vertical

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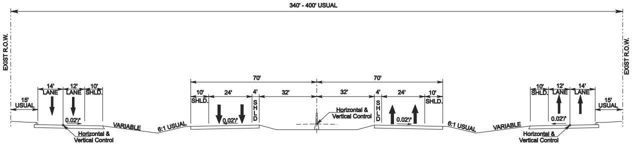
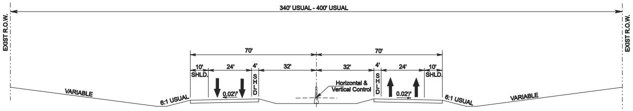
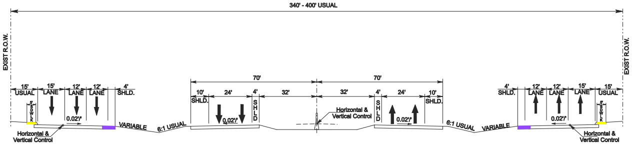


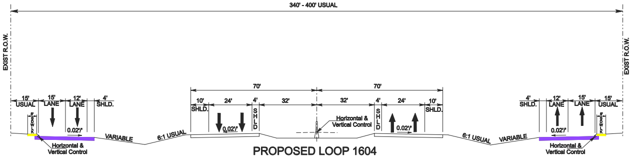
EXISTING LOOP 1604
SH 16 TO 1.2 MILES SOUTH OF SH 16



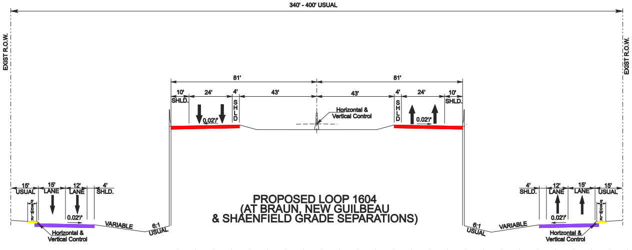
EXISTING LOOP 1604
1.2 MILES SOUTH OF SH 16 TO FM 471



PROPOSED LOOP 1604
SH 16 TO 1.2 MILES SOUTH OF SH 16



PROPOSED LOOP 1604
1.2 MILES SOUTH OF SH 16
TO FM 471



PROPOSED LOOP 1604
(AT BRAUN, NEW GUILBEAU
& SHAENFIELD GRADE SEPARATIONS)

LEGEND

- 🟥 MAIN LANES CONSTRUCTION
- 🟪 FRONTAGE ROAD CONSTRUCTION
- 🟨 SIDEWALKS
- EXISTING RIGHT OF WAY LINE
- CONTROL OF ACCESS LINE

LEGEND

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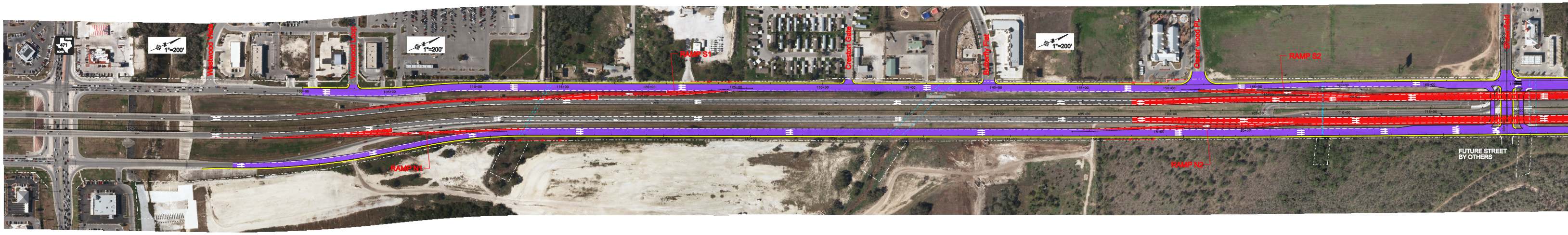


LOOP 1604 CENTERLINE

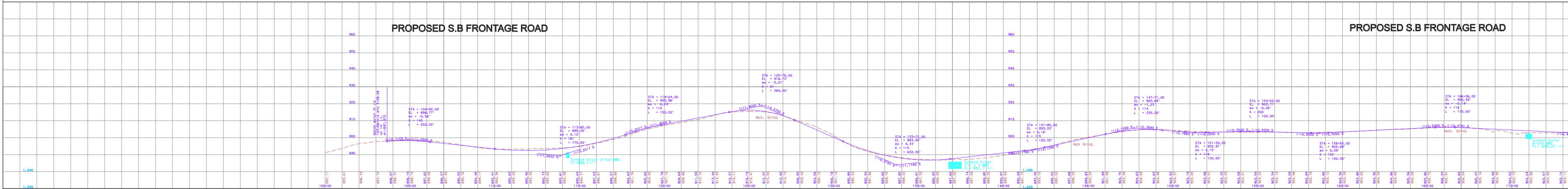
P.I. Station	649+04.25	X	2,063,307.1520	Y	13,730,801.7060
Delta =	6° 42' 06.63" (LT)				
Degree =	0° 44' 59.99"				
Tangent =	447.3013				
Length =	893.5824				
Radius =	7,639.4683				
External =	13.0838				
Long Chord =	893.0731				
Mid. Ord. =	13.0615				
P.C. Station	644+56.95	X	2,063,121.9711	Y	13,730,394.5371
P.T. Station	653+50.53	X	2,063,443.5499	Y	13,731,227.7037

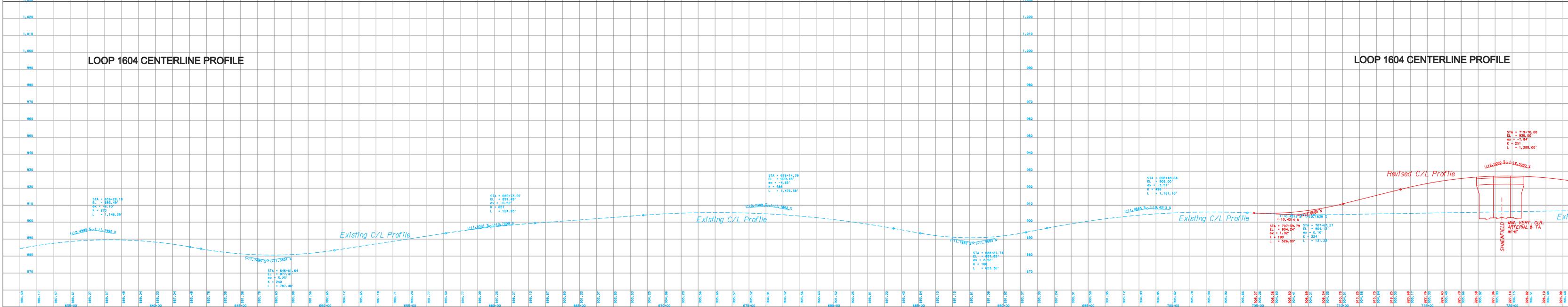
LOOP 1604 CENTERLINE

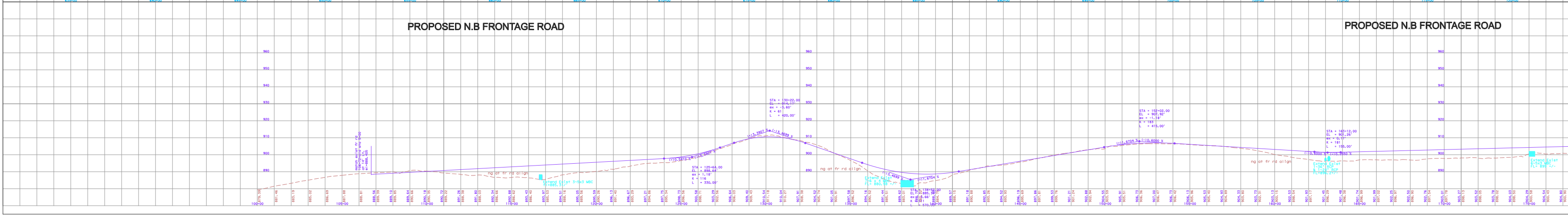
P.I. Station	659+49.16	X	2,063,626.0920	Y	13,731,797.8190
Delta =	5° 49' 52.88" (RT)				
Degree =	0° 44' 59.99"				
Tangent =	389.0946				
Length =	777.5173				
Radius =	7,639.4683				
External =	9.9023				
Long Chord =	777.1818				
Mid. Ord. =	9.8895				
P.C. Station	655+60.06	X	2,063,507.4434	Y	13,731,427.2558
P.T. Station	663+37.58	X	2,063,781.7761	Y	13,732,154.4099

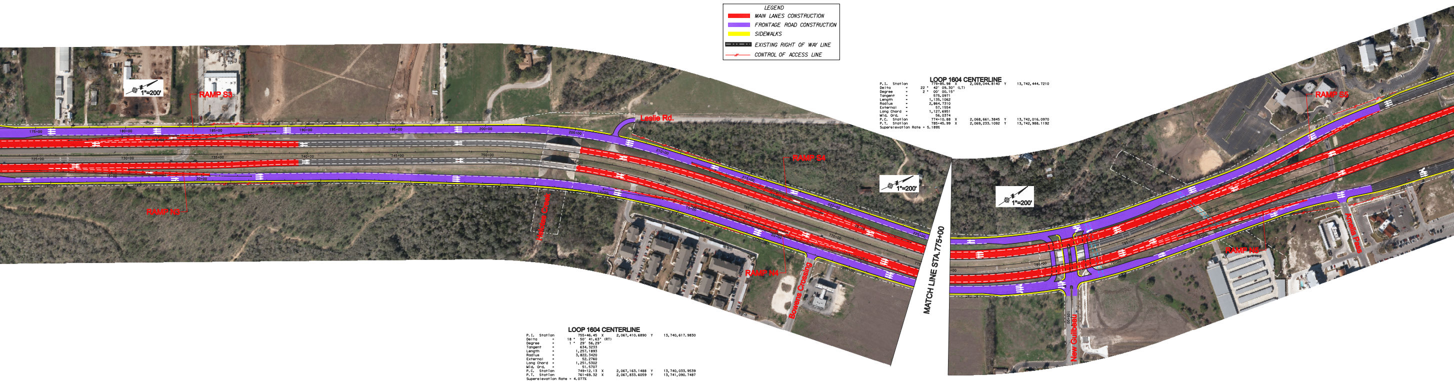
LOOP 1604 CENTERLINE

P.I. Station	699+03.16	X	2,065,208.4340	Y	13,735,422.1360
Delta =	0° 37' 00.72" (LT)				
Degree =	0° 15' 00.00"				
Tangent =	123.3750				
Length =	246.7476				
Radius =	22,918.3720				
External =	0.3321				
Long Chord =	246.7464				
Mid. Ord. =	0.3321				
P.C. Station	697+79.79	X	2,065,159.0693	Y	13,735,309.0673
P.T. Station	700+26.53	X	2,065,256.5785	Y	13,735,535.7296









LEGEND

- 🟥 MAIN LANES CONSTRUCTION
- 🟪 FRONTAGE ROAD CONSTRUCTION
- 🟨 SIDEWALKS
- EXISTING RIGHT OF WAY LINE
- CONTROL OF ACCESS LINE

LOOP 1604 CENTERLINE

P.I. Station	779+85.98	X	2,069,044.8140	Y	13,742,444.7210
Delta =	22 ° 42' 09.30" (LT)				
Degree =	2 ° 00' 00.15"				
Tangent =	575.0971				
Length =	1,135.1062				
Radius =	2,864.7310				
External =	57.1554				
Long Chord =	1,127.6951				
Mid. Ord. =	56.0374				
P.C. Station	774+10.88	X	2,068,661.3845	Y	13,742,016.0970
P.T. Station	785+45.99	X	2,069,233.1092	Y	13,742,988.1192

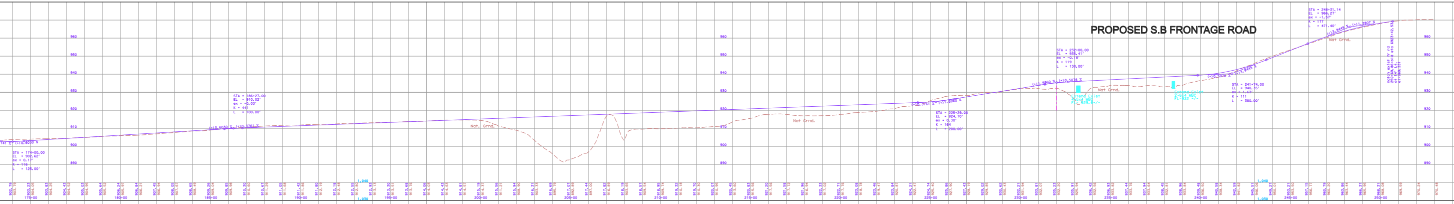
Superelevation Rate = 5.189%

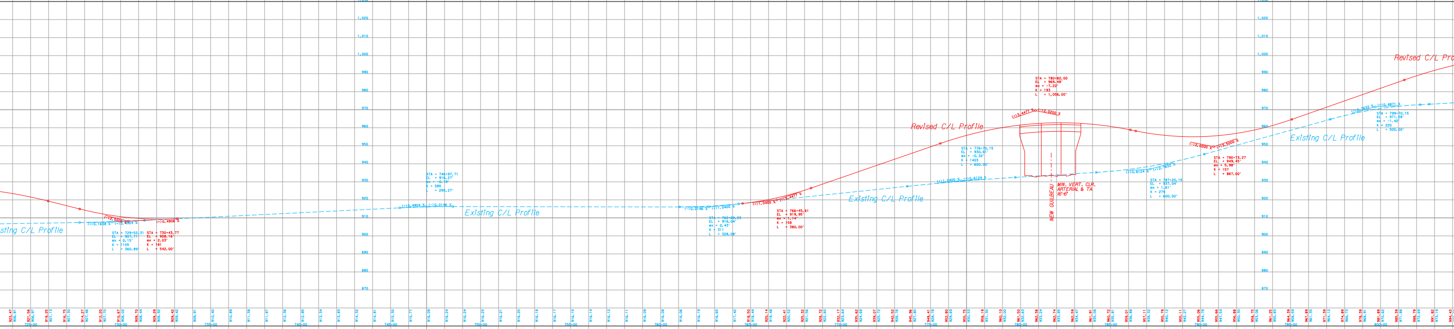
LOOP 1604 CENTERLINE

P.I. Station	755+46.45	X	2,067,410.6890	Y	13,740,617.9830
Delta =	18 ° 50' 41.63" (RT)				
Degree =	1 ° 29' 56.29"				
Tangent =	634.3233				
Length =	1,257.1893				
Radius =	3,822.3420				
External =	52.2760				
Long Chord =	1,251.5302				
Mid. Ord. =	51.5707				
P.C. Station	749+12.13	X	2,067,163.1488	Y	13,740,033.9539
P.T. Station	761+69.32	X	2,067,833.6059	Y	13,741,090.7487

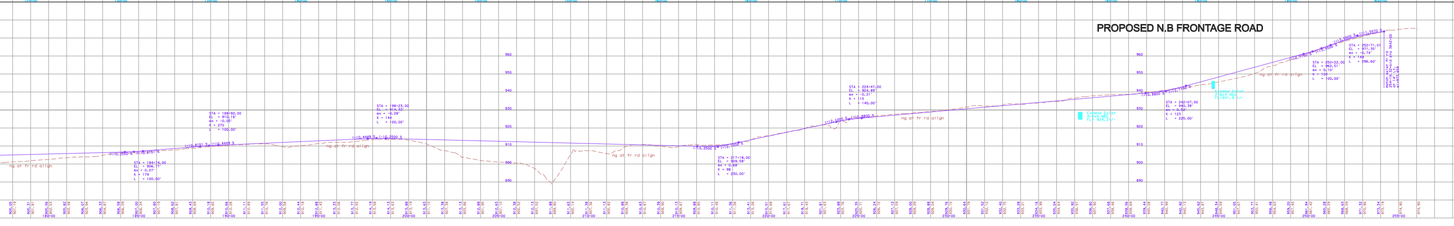
Superelevation Rate = 4.077%

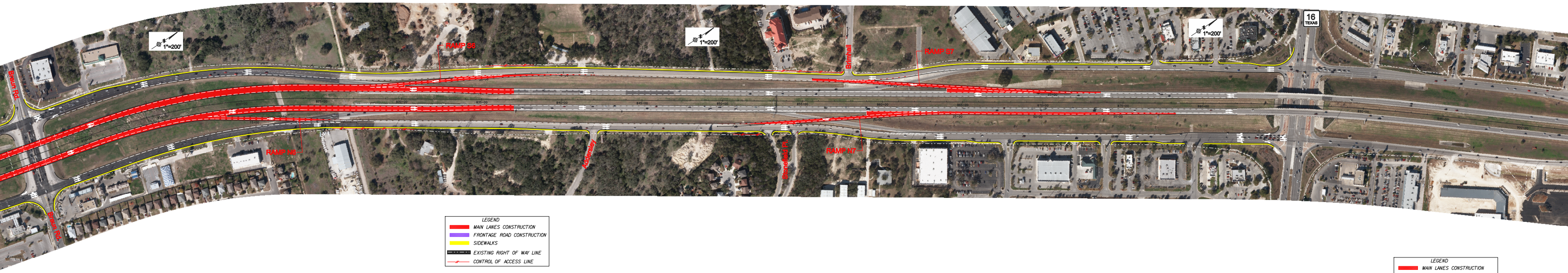
PROPOSED S.B FRONTAGE ROAD





PROPOSED N.B FRONTAGE ROAD





LEGEND
🟥	MAIN LANES CONSTRUCTION
🟪	FRONTAGE ROAD CONSTRUCTION
🟨	SIDEWALKS
▬	EXISTING RIGHT OF WAY LINE
─	CONTROL OF ACCESS LINE

LEGEND
MAIN LANES CONSTRUCTION
FRONTAGE ROAD CONSTRUCTION
SIDEWALKS
EXISTING RIGHT OF WAY LINE
CONTROL OF ACCESS LINE

LOOP 1604 CENTERLINE

```
P.I.  Station         817+20.90  X      2,070,272.6210  Y      13,745,988.0300
Delta        =      20 °  12' 29.63" (RT)
Degree       =       1 °  30' 00.43"
Tangent      =          680.6241
Length       =        1,347.1076
Radius       =        3,819.4130
External     =           60.1701
Long Chord   =        1,340.1361
Mid. Ord.    =           59.2369
P.C.  Station         810+40.28  X      2,070,049.7747  Y      13,745,344.9214
P.T.  Station         823+87.38  X      2,070,703.9006  Y      13,746,514.5726
Superelevation Rate = 4.08%
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LOOP 1604 CENTERLINE

```
P.I.  Station         888+06.84  X      2,074,771.6090  Y      13,751,480.7750
Delta        =       5 °  56' 17.21" (RT)
Degree       =       0 °  29' 59.96"
Tangent      =          594.3580
Length       =        1,187.6517
Radius       =       11,459.4370
External     =           15.4032
Long Chord   =        1,187.1203
Mid. Ord.    =           15.3825
P.C.  Station         882+12.48  X      2,074,394.9922  Y      13,751,020.9694
P.T.  Station         894+00.13  X      2,075,193.7738  Y      13,751,899.1508
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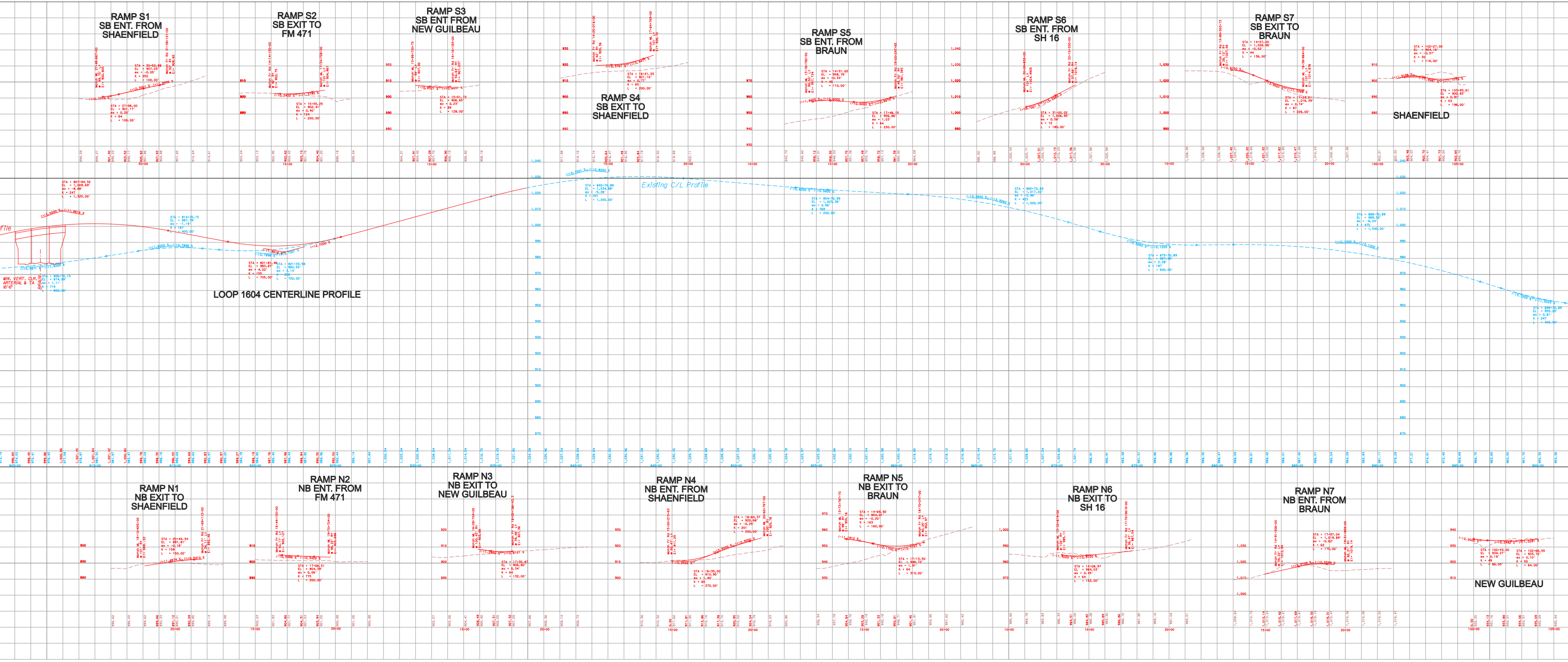

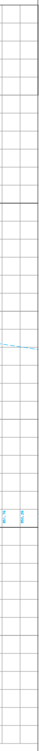

PROPOSED NB FRONTAGE ROAD

```
POT Station 100+00                X   2,063,389.0844 Y   13,730,418.5669

P.I.  Station         104+23.76  X     2,063,564.5190  Y     13,730,804.3099
Delta        =     12 °  14' 59.35" (LT)
Degree       =      1 °  27' 03.22"
Tangent      =         423.7629
Length       =         844.2949
Radius       =       3,949.0000
External     =          22.6717
Long Chord   =         842.6878
Mid. Ord.    =          22.5423
P.C.  Station         100+00.00  X     2,063,389.0844  Y     13,730,418.5669
P.T.  Station         108+44.29  X     2,063,654.1143  Y     13,731,218.4931
Superelevation Rate = 2.431%

P.I.  Station         114+14.37  X     2,063,774.6448  Y     13,731,775.6835
Delta        =     11 °  22' 46.44" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =         285.4280
Length       =         568.9783
Radius       =       2,864.7890
External     =          14.1839
Long Chord   =         568.0436
Mid. Ord.    =          14.1141
P.C.  Station         111+28.94  X     2,063,714.2973  Y     13,731,496.7080
P.T.  Station         116+97.92  X     2,063,888.8500  Y     13,732,037.2678
Superelevation Rate = 3.262%

P.I.  Station         157+93.71  X     2,065,527.6515  Y     13,735,790.9041
Delta        =      0 °  36' 57.54" (LT)
Degree       =      0 °  30' 00.00"
Tangent      =          61.5989
Length       =         123.1966
Radius       =      11,459.1560
External     =           0.1656
Long Chord   =         123.1960
Mid. Ord.    =           0.1656
P.C.  Station         157+32.11  X     2,065,503.0046  Y     13,735,734.4510
P.T.  Station         158+55.31  X     2,065,551.6901  Y     13,735,847.6189

P.I.  Station         197+12.86  X     2,067,057.0742  Y     13,739,399.3135
Delta        =      2 °  12' 42.74" (RT)
Degree       =      1 °  00' 00.00"
Tangent      =         110.6073
Length       =         221.1871
Radius       =       5,729.5780
External     =           1.0675
Long Chord   =         221.1734
Mid. Ord.    =           1.0673
P.C.  Station         196+02.25  X     2,067,013.9104  Y     13,739,297.4760
P.T.  Station         198+23.44  X     2,067,104.1362  Y     13,739,499.4091

P.I.  Station         210+86.15  X     2,067,641.4029  Y     13,740,642.1161
Delta        =     16 °  24' 08.15" (RT)
Degree       =      1 °  30' 28.02"
Tangent      =         547.6650
Length       =       1,087.8394
Radius       =       3,800.0000
External     =          39.2626
Long Chord   =       1,084.1286
Mid. Ord.    =          38.8610
P.C.  Station         205+38.48  X     2,067,408.3784  Y     13,740,146.4987
P.T.  Station         216+26.32  X     2,068,004.8960  Y     13,741,051.7620
Superelevation Rate = 2.52%

P.I.  Station         228+20.57  X     2,068,797.5351  Y     13,741,945.0422
Delta        =      3 °  02' 11.89" (LT)
Degree       =      0 °  42' 49.21"
Tangent      =         212.7980
Length       =         425.4964
Radius       =       8,028.3360
External     =           2.8197
Long Chord   =         425.4466
Mid. Ord.    =           2.8187
P.C.  Station         226+07.77  X     2,068,656.2980  Y     13,741,785.8723
P.T.  Station         230+33.27  X     2,068,930.1419  Y     13,742,111.4706

P.I.  Station         235+23.86  X     2,069,235.8593  Y     13,742,495.1618
Delta        =     19 °  26' 06.74" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =         490.5933
Length       =         971.7603
Radius       =       2,864.7890
External     =          41.7033
Long Chord   =         967.1082
Mid. Ord.    =          41.1050
P.C.  Station         230+33.27  X     2,068,930.1421  Y     13,742,111.4709
P.T.  Station         240+05.03  X     2,069,396.4867  Y     13,742,958.7139
Superelevation Rate = 3.262%

P.I.  Station         249+27.70  X     2,069,698.5844  Y     13,743,830.5329
Delta        =      8 °  12' 02.90" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =         136.9139
Length       =         273.3602
Radius       =       1,909.8593
External     =           4.9012
Long Chord   =         273.1269
Mid. Ord.    =           4.8887
P.C.  Station         247+90.79  X     2,069,653.7568  Y     13,743,701.1655
P.T.  Station         250+64.15  X     2,069,761.4069  Y     13,743,952.1830
Superelevation Rate = 4.535%

P.I.  Station         253+76.39  X     2,069,904.6759  Y     13,744,229.6102
Delta        =      5 °  51' 49.27" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          97.8135
Length       =         195.4562
Radius       =       1,909.8593
External     =           2.5031
Long Chord   =         195.3709
Mid. Ord.    =           2.4998
P.C.  Station         252+78.57  X     2,069,859.7945  Y     13,744,142.7014
P.T.  Station         254+74.03  X     2,069,940.4437  Y     13,744,320.6495
Superelevation Rate = 4.535%

POT Station 256+05.75             X   2,069,988.6103 Y   13,744,443.2469
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PROPOSED SB FRONTAGE ROAD

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POT Station 100+00                X   2,063,129.0944 Y   13,730,970.7304

P.I.  Station         105+07.77  X     2,063,339.3113  Y     13,731,432.9470
Delta        =      6 °  54' 19.16" (LT)
Degree       =      2 °  00' 27.22"
Tangent      =         172.1914
Length       =         343.9658
Radius       =       2,854.0000
External     =           5.1897
Long Chord   =         343.7577
Mid. Ord.    =           5.1803
P.C.  Station         103+35.58  X     2,063,268.0247  Y     13,731,276.2049
P.T.  Station         106+79.55  X     2,063,391.2358  Y     13,731,597.1229
Superelevation Rate = 3.275%

P.I.  Station         108+41.87  X     2,063,440.1837  Y     13,731,751.8874
Delta        =      6 °  02' 05.38" (RT)
Degree       =      2 °  00' 27.22"
Tangent      =         150.4416
Length       =         300.6050
Radius       =       2,854.0000
External     =           3.9623
Long Chord   =         300.4661
Mid. Ord.    =           3.9568
P.C.  Station         106+91.43  X     2,063,394.8179  Y     13,731,608.4489
P.T.  Station         109+92.03  X     2,063,500.3783  Y     13,731,889.7616
Superelevation Rate = 3.275%

P.I.  Station         141+21.99  X     2,064,752.7352  Y     13,734,758.2556
Delta        =      0 °  07' 02.03" (RT)
Degree       =      0 °  30' 00.00"
Tangent      =          11.7230
Length       =          23.4460
Radius       =      11,459.1560
External     =           0.0060
Long Chord   =          23.4460
Mid. Ord.    =           0.0060
P.C.  Station         141+10.27  X     2,064,748.0446  Y     13,734,747.5118
P.T.  Station         141+33.72  X     2,064,757.4477  Y     13,734,768.9896

P.I.  Station         151+46.46  X     2,065,164.5654  Y     13,735,696.3043
Delta        =      1 °  29' 50.50" (LT)
Degree       =      0 °  30' 00.00"
Tangent      =         149.7446
Length       =         299.4722
Radius       =      11,459.1560
External     =           0.9784
Long Chord   =         299.4637
Mid. Ord.    =           0.9783
P.C.  Station         149+96.72  X     2,065,104.3691  Y     13,735,559.1917
P.T.  Station         152+96.19  X     2,065,221.1583  Y     13,735,834.9430

P.I.  Station         158+99.07  X     2,065,449.0023  Y     13,736,393.1047
Delta        =      0 °  56' 59.10" (RT)
Degree       =      0 °  30' 00.00"
Tangent      =          94.9772
Length       =         189.9500
Radius       =      11,459.1560
External     =           0.3936
Long Chord   =         189.9478
Mid. Ord.    =           0.3936
P.C.  Station         158+04.09  X     2,065,413.1076  Y     13,736,305.1716
P.T.  Station         159+94.04  X     2,065,486.3495  Y     13,736,480.4308

P.I.  Station         205+71.81  X     2,067,286.4381  Y     13,740,689.4304
Delta        =     17 °  50' 34.73" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =         449.7149
Length       =         892.1491
Radius       =       2,864.7890
External     =          35.0833
Long Chord   =         888.5484
Mid. Ord.    =          34.6589
P.C.  Station         201+22.10  X     2,067,109.5995  Y     13,740,275.9432
P.T.  Station         210+14.25  X     2,067,581.4671  Y     13,741,028.8437
Superelevation Rate = 3.262%

P.I.  Station         219+14.67  X     2,068,172.1791  Y     13,741,708.4227
Delta        =      1 °  10' 00.55" (RT)
Degree       =      0 °  30' 00.00"
Tangent      =         116.6860
Length       =         233.3640
Radius       =      11,459.1560
External     =           0.5941
Long Chord   =         233.3600
Mid. Ord.    =           0.5940
P.C.  Station         217+97.99  X     2,068,095.6289  Y     13,741,620.3563
P.T.  Station         220+31.35  X     2,068,250.5067  Y     13,741,794.9121

P.I.  Station         226+85.99  X     2,068,689.9455  Y     13,742,280.1402
Delta        =      9 °  26' 51.89" (LT)
Degree       =      2 °  09' 59.76"
Tangent      =         218.5270
Length       =         436.0633
Radius       =       2,644.5020
External     =           9.0136
Long Chord   =         435.5695
Mid. Ord.    =           8.9830
P.C.  Station         224+67.46  X     2,068,543.2552  Y     13,742,118.1648
P.T.  Station         229+03.53  X     2,068,808.0581  Y     13,742,463.9974
Superelevation Rate = 3.527%

P.I.  Station         232+26.68  X     2,068,982.7232  Y     13,742,735.8856
Delta        =     13 °  36' 19.31" (LT)
Degree       =      2 °  07' 19.44"
Tangent      =         322.0837
Length       =         641.1376
Radius       =       2,700.0000
External     =          19.1429
Long Chord   =         639.6324
Mid. Ord.    =          19.0081
P.C.  Station         229+04.60  X     2,068,808.6388  Y     13,742,464.9013
P.T.  Station         235+45.74  X     2,069,088.1781  Y     13,743,040.2163
Superelevation Rate = 3.46%

P.I.  Station         242+91.07  X     2,069,332.2119  Y     13,743,744.4697
Delta        =      8 °  10' 17.30" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =         204.6338
Length       =         408.5736
Radius       =       2,864.7890
External     =           7.2993
Long Chord   =         408.2274
Mid. Ord.    =           7.2807
P.C.  Station         240+86.44  X     2,069,265.2118  Y     13,743,551.1151
P.T.  Station         244+95.01  X     2,069,371.0491  Y     13,743,945.3842
Superelevation Rate = 3.262%

Curve CPF30
P.I.  Station         248+42.12  X     2,069,436.9261  Y     13,744,286.1829
Delta        =      8 °  10' 10.56" (RT)
Degree       =      1 °  47' 25.78"
Tangent      =         228.5256
Length       =         456.2766
Radius       =       3,200.0000
External     =           8.1496
Long Chord   =         455.8901
Mid. Ord.    =           8.1289
P.C.  Station         246+13.59  X     2,069,393.5546  Y     13,744,061.8107
P.T.  Station         250+69.87  X     2,069,511.7417  Y     13,744,502.1147
Superelevation Rate = 2.94%

POT Station 257+12.41             X   2,069,722.0977 Y   13,745,109.2419
```

PROPOSED NEW GUILBEAU CENTERLINE

```
POT Station 100+00                X   2,068,950.3917 Y   13,742,713.6408

P.I.  Station         101+56.52  X     2,069,092.6834  Y     13,742,648.4378
Delta        =     13 °  56' 00.46" (RT)
Degree       =      5 °  43' 46.48"
Tangent      =         122.1952
Length       =         243.1848
Radius       =       1,000.0000
External     =           7.4382
Long Chord   =         242.5860
Mid. Ord.    =           7.3833
P.C.  Station         100+34.32  X     2,068,981.5959  Y     13,742,699.3420
P.T.  Station         102+77.51  X     2,069,188.2448  Y     13,742,572.2822
Superelevation Rate = 5.1%

POT Station 105+46.45             X   2,069,398.5680 Y   13,742,404.6697
```

PROPOSED SHAENFIELD CENTERLINE

```
POT Station 100+00                X   2,065,636.1252 Y   13,737,455.3317

POT Station 105+49.66             X   2,066,141.3182 Y   13,737,238.7448
```

RAMP N1 PROPOSED NB EXIT TO SHAENFIELD

```
POT Sta. 10+00                    X   2,063,273.5522 Y   13,730,592.1351

P.I.  Station          18+09.56  X     2,063,585.3189  Y     13,731,339.2564
Delta        =      1 °  10' 38.38" (LT)
Degree       =      1 °  00' 00.00"
Tangent      =          58.8685
Length       =         117.7328
Radius       =       5,729.5780
External     =           0.3024
Long Chord   =         117.7307
Mid. Ord.    =           0.3024
P.C.  Station          17+50.69  X     2,063,562.6483  Y     13,731,284.9284
P.T.  Station          18+68.43  X     2,063,606.8684  Y     13,731,394.0388

POT Sta. 24+64.62                 X   2,063,825.1144 Y   13,731,948.8554
```

RAMP N2 PROPOSED NB ENTRANCE FROM FM 471

```
P.I.  Station          10+61.98  X     2,065,154.5882  Y     13,734,998.8928
Delta        =      2 °  28' 44.43" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =          61.9849
Length       =         123.9504
Radius       =       2,864.7890
External     =           0.6705
Long Chord   =         123.9407
Mid. Ord.    =           0.6703
P.C.  Station          10+00.00  X     2,065,129.7869  Y     13,734,942.0860
P.T.  Station          11+23.95  X     2,065,176.9093  Y     13,735,056.7192
Superelevation Rate = 2.708%

P.I.  Station          16+86.19  X     2,065,379.3759  Y     13,735,581.2436
Delta        =      2 °  28' 44.43" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          41.3232
Length       =          82.6336
Radius       =       1,909.8593
External     =           0.4470
Long Chord   =          82.6271
Mid. Ord.    =           0.4469
P.C.  Station          16+44.87  X     2,065,364.4953  Y     13,735,542.6927
P.T.  Station          17+27.51  X     2,065,395.9102  Y     13,735,619.1149
Superelevation Rate = 3.835%

P.I.  Station          20+10.58  X     2,065,509.1736  Y     13,735,878.5421
Delta        =      3 °  43' 35.79" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          62.1320
Length       =         124.2203
Radius       =       1,909.8593
External     =           1.0104
Long Chord   =         124.1984
Mid. Ord.    =           1.0098
P.C.  Station          19+48.45  X     2,065,484.3134  Y     13,735,821.6004
P.T.  Station          20+72.67  X     2,065,530.2803  Y     13,735,936.9792
Superelevation Rate = 2.708%

P.I.  Station          23+01.46  X     2,065,608.0043  Y     13,736,152.1703
Delta        =      3 °  06' 38.25" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =          77.7847
Length       =         155.5313
Radius       =       2,864.7890
External     =           1.0558
Long Chord   =         155.5122
Mid. Ord.    =           1.0554
P.C.  Station          22+23.68  X     2,065,581.5803  Y     13,736,079.0113
P.T.  Station          23+79.21  X     2,065,638.3592  Y     13,736,223.7876
Superelevation Rate = 2.708%
```

RAMP N3 PROPOSED NB EXIT TO NEW GUILBEAU

```
P.I.  Station          11+15.16  X     2,066,308.9996  Y     13,737,806.0482
Delta        =      2 °  18' 10.55" (RT)
Degree       =      1 °  00' 00.00"
Tangent      =         115.1621
Length       =         230.2932
Radius       =       5,729.5780
External     =           1.1572
Long Chord   =         230.2777
Mid. Ord.    =           1.1570
P.C.  Station          10+00.00  X     2,066,264.0584  Y     13,737,700.0171
P.T.  Station          12+30.29  X     2,066,358.1652  Y     13,737,910.1878

P.I.  Station          21+60.35  X     2,066,755.2303  Y     13,738,751.2274
Delta        =      2 °  18' 10.55" (LT)
Degree       =      1 °  00' 00.00"
Tangent      =         115.1621
Length       =         230.2932
Radius       =       5,729.5780
External     =           1.1572
Long Chord   =         230.2777
Mid. Ord.    =           1.1570
P.C.  Station          20+45.19  X     2,066,706.0647  Y     13,738,647.0878
P.T.  Station          22+75.48  X     2,066,800.1715  Y     13,738,857.2584
```

RAMP N4 PROPOSED NB ENTRANCE FROM SHAENFIELD

```
POT Sta. 10+00                    X   2,067,645.7539 Y   13,740,622.7530 Sta     10+00.00

P.I.  Station          14+79.48  X     2,067,908.1361  Y     13,741,024.0769
Delta        =      8 °  38' 17.72" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =         144.2442
Length       =         287.9418
Radius       =       1,909.8593
External     =           5.4394
Long Chord   =         287.6692
Mid. Ord.    =           5.4239
P.C.  Station          13+35.24  X     2,067,829.2031  Y     13,740,903.3459
P.T.  Station          16+23.18  X     2,068,004.3069  Y     13,741,131.5831
Superelevation Rate = 3.835%

P.I.  Station          21+54.66  X     2,068,358.6567  Y     13,741,527.6991
Delta        =      3 °  05' 59.60" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          51.6774
Length       =         103.3296
Radius       =       1,909.8593
External     =           0.6990
Long Chord   =         103.3170
Mid. Ord.    =           0.6988
P.C.  Station          21+02.99  X     2,068,324.2022  Y     13,741,489.1836
P.T.  Station          22+06.31  X     2,068,390.9779  Y     13,741,568.0215
Superelevation Rate = 3.835%

P.I.  Station          24+69.01  X     2,068,555.2787  Y     13,741,772.9948
Delta        =      3 °  05' 59.41" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          51.6765
Length       =         103.3279
Radius       =       1,909.8593
External     =           0.6990
Long Chord   =         103.3152
Mid. Ord.    =           0.6987
P.C.  Station          24+17.33  X     2,068,522.9580  Y     13,741,732.6731
P.T.  Station          25+20.66  X     2,068,589.7326  Y     13,741,811.5097
Superelevation Rate = 3.835%
```

RAMP N5 PROPOSED NB EXIT TO BRAUN

```
POT Station 10+00                 X   2,069,259.5028 Y   13,742,822.1667

P.I.  Station          19+63.36  X     2,069,620.2754  Y     13,743,715.4228
Delta        =      3 °  22' 17.66" (RT)
Degree       =      0 °  48' 19.18"
Tangent      =         209.3893
Length       =         418.6578
Radius       =       7,114.5800
External     =           3.0806
Long Chord   =         418.5974
Mid. Ord.    =           3.0793
P.C.  Station          17+53.97  X     2,069,541.8603  Y     13,743,521.2709
P.T.  Station          21+72.63  X     2,069,709.9730  Y     13,743,904.6270

POT Station 21+72.65              X   2,069,709.9628 Y   13,743,904.6056
```

RAMP N6 PROPOSED NB EXIT TO SH 16

```
P.I.  Station          11+28.97  X     2,070,375.3653  Y     13,745,907.4472
Delta        =     12 °  51' 09.66" (RT)
Degree       =      5 °  00' 14.39"
Tangent      =         128.9654
Length       =         256.8483
Radius       =       1,145.0000
External     =           7.2400
Long Chord   =         256.3101
Mid. Ord.    =           7.1945
P.C.  Station          10+00.00  X     2,070,316.9421  Y     13,745,792.4741
P.T.  Station          12+56.85  X     2,070,457.8998  Y     13,746,006.5437
Superelevation Rate = 5.565%

P.I.  Station          17+69.65  X     2,070,786.0829  Y     13,746,400.5821
Delta        =      2 °  11' 49.00" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =          54.9303
Length       =         109.8472
Radius       =       2,864.7890
External     =           0.5266
Long Chord   =         109.8404
Mid. Ord.    =           0.5265
P.C.  Station          17+14.72  X     2,070,750.9289  Y     13,746,358.3739
P.T.  Station          18+24.57  X     2,070,822.8291  Y     13,746,441.4117
Superelevation Rate = 2.708%

P.I.  Station          20+73.89  X     2,070,989.6113  Y     13,746,626.7276
Delta        =      2 °  40' 04.51" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =          66.7101
Length       =         133.3960
Radius       =       2,864.7890
External     =           0.7766
Long Chord   =         133.3840
Mid. Ord.    =           0.7764
P.C.  Station          20+07.18  X     2,070,944.9850  Y     13,746,577.1421
P.T.  Station          21+40.57  X     2,071,031.8813  Y     13,746,678.3366
Superelevation Rate = 2.708%
```

RAMP N7 PROPOSED NB ENTRANCE FROM BRAUN

```
P.I.  Station          11+03.66  X     2,072,531.3326  Y     13,748,491.9211
Delta        =      4 °  08' 40.95" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =         103.6629
Length       =         207.2354
Radius       =       2,864.7890
External     =           1.8749
Long Chord   =         207.1902
Mid. Ord.    =           1.8737
P.C.  Station          10+00.00  X     2,072,465.6463  Y     13,748,411.7257
P.T.  Station          12+07.24  X     2,072,591.0510  Y     13,748,576.6543
Superelevation Rate = 2.708%

P.I.  Station          23+31.92  X     2,073,238.9640  Y     13,749,495.9656
Delta        =      4 °  08' 40.95" (RT)
Degree       =      1 °  00' 00.00"
Tangent      =         207.3258
Length       =         414.4708
Radius       =       5,729.5780
External     =           3.7498
Long Chord   =         414.3804
Mid. Ord.    =           3.7474
P.C.  Station          21+24.60  X     2,073,119.5273  Y     13,749,326.4992
P.T.  Station          25+39.07  X     2,073,370.3367  Y     13,749,656.3564

POT Station 32+60.89              X   2,073,827.7211 Y   13,750,214.7700

POT Station 38+61.01              X   2,074,198.6296 Y   13,750,686.5442
```

RAMP S1 PROPOSED SB ENTRANCE FROM SHAENFIELD

```
P.I.  Station          11+33.97  X     2,063,305.4378  Y     13,731,003.3364
Delta        =      4 °  02' 48.92" (LT)
Degree       =      1 °  30' 39.47"
Tangent      =         133.9742
Length       =         267.8369
Radius       =       3,792.0000
External     =           2.3660
Long Chord   =         267.7813
Mid. Ord.    =           2.3645
P.C.  Station          10+00.00  X     2,063,258.0648  Y     13,730,878.0173
P.T.  Station          12+67.84  X     2,063,343.8484  Y     13,731,131.6863
Superelevation Rate = 2.125%

POT Sta. 15+99.28                 X   2,063,438.8725 Y   13,731,449.2111 Sta     15+99.28

P.I.  Station          19+44.01  X     2,063,543.9949  Y     13,731,777.5294
Delta        =      5 °  07' 09.64" (RT)
Degree       =      0 °  44' 34.78"
Tangent      =         344.7370
Length       =         689.0153
Radius       =       7,711.4683
External     =           7.7018
Long Chord   =         688.7861
Mid. Ord.    =           7.6941
P.C.  Station          15+99.28  X     2,063,438.8725  Y     13,731,449.2111
P.T.  Station          22+88.29  X     2,063,677.9941  Y     13,732,095.1578


P.I.  Station          23+52.33  X     2,063,702.8864  Y     13,732,154.1620
Delta        =      3 °  50' 27.47" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          64.0400
Length       =         128.0321
Radius       =       1,909.8593
External     =           1.0734
Long Chord   =         128.0081
Mid. Ord.    =           1.0728
P.C.  Station          22+88.29  X     2,063,677.9941  Y     13,732,095.1578
P.T.  Station          24+16.32  X     2,063,723.7703  Y     13,732,214.7012
Superelevation Rate = 3.835%

P.I.  Station          27+02.49  X     2,063,817.0910  Y     13,732,485.2233
Delta        =      4 °  33' 10.71" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          75.9229
Length       =         151.7658
Radius       =       1,909.8593
External     =           1.5085
Long Chord   =         151.7259
Mid. Ord.    =           1.5073
P.C.  Station          26+26.57  X     2,063,792.3320  Y     13,732,413.4509
P.T.  Station          27+78.33  X     2,063,847.4692  Y     13,732,554.8038
Superelevation Rate = 3.835%

P.I.  Station          32+03.10  X     2,064,017.4274  Y     13,732,944.0890
Delta        =      4 °  18' 09.95" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          71.7465
Length       =         143.4255
Radius       =       1,909.8593
External     =           1.3472
Long Chord   =         143.3918
Mid. Ord.    =           1.3462
P.C.  Station          31+31.35  X     2,063,988.7202  Y     13,732,878.3360
P.T.  Station          32+74.78  X     2,064,041.1203  Y     13,733,011.8105
Superelevation Rate = 3.835%

P.I.  Station          35+62.90  X     2,064,136.2683  Y     13,733,283.7714
Delta        =      4 °  18' 09.95" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          71.7465
Length       =         143.4255
Radius       =       1,909.8593
External     =           1.3472
Long Chord   =         143.3918
Mid. Ord.    =           1.3462
P.C.  Station          34+91.16  X     2,064,112.5753  Y     13,733,216.0499
P.T.  Station          36+34.58  X     2,064,164.9754  Y     13,733,349.5244
Superelevation Rate = 3.835%
```

RAMP S2 PROPOSED SB EXIT TO FM 471

```
P.I.  Station          10+47.19  X     2,065,176.8443  Y     13,735,663.5245
Delta        =      1 °  53' 15.21" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =          47.1932
Length       =          94.3779
Radius       =       2,864.7890
External     =           0.3887
Long Chord   =          94.3736
Mid. Ord.    =           0.3886
P.C.  Station          10+00.00  X     2,065,158.1649  Y     13,735,620.1854
P.T.  Station          10+94.38  X     2,065,196.9411  Y     13,735,706.2248
Superelevation Rate = 2.708%

P.I.  Station          13+27.28  X     2,065,296.1189  Y     13,735,916.9514
Delta        =      0 °  38' 06.14" (LT)
Degree       =      1 °  00' 00.00"
Tangent      =          31.7523
Length       =          63.5039
Radius       =       5,729.5780
External     =           0.0880
Long Chord   =          63.5036
Mid. Ord.    =           0.0880
P.C.  Station          12+95.52  X     2,065,282.5975  Y     13,735,888.2220
P.T.  Station          13+59.03  X     2,065,309.3210  Y     13,735,945.8289

P.I.  Station          18+26.83  X     2,065,503.8244  Y     13,736,371.2722
Delta        =      1 °  29' 36.44" (RT)
Degree       =      1 °  00' 00.00"
Tangent      =          74.6770
Length       =         149.3455
Radius       =       5,729.5780
External     =           0.4866
Long Chord   =         149.3413
Mid. Ord.    =           0.4866
P.C.  Station          17+52.15  X     2,065,472.7747  Y     13,736,303.3563
P.T.  Station          19+01.49  X     2,065,536.6336  Y     13,736,438.3558

P.I.  Station          21+12.68  X     2,065,629.4190  Y     13,736,628.0703
Delta        =      3 °  05' 33.57" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =          77.3352
Length       =         154.6329
Radius       =       2,864.7890
External     =           1.0436
Long Chord   =         154.6141
Mid. Ord.    =           1.0433
P.C.  Station          20+35.35  X     2,065,595.4419  Y     13,736,558.5988
P.T.  Station          21+89.98  X     2,065,659.5985  Y     13,736,699.2737
Superelevation Rate = 2.708%
```

RAMP S3 PROPOSED SB ENTRANCE FROM NEW GUILBEAU

```
P.I.  Station          10+51.59  X     2,066,234.2820  Y     13,738,055.1405
Delta        =      3 °  05' 41.67" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          51.5943
Length       =         103.1636
Radius       =       1,909.8593
External     =           0.6968
Long Chord   =         103.1511
Mid. Ord.    =           0.6965
P.C.  Station          10+00.00  X     2,066,214.1477  Y     13,738,007.6370
P.T.  Station          11+03.16  X     2,066,251.8223  Y     13,738,103.6618
Superelevation Rate = 3.835%

P.I.  Station          13+47.92  X     2,066,335.0306  Y     13,738,333.8395
Delta        =      3 °  05' 41.65" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          51.5943
Length       =         103.1634
Radius       =       1,909.8593
External     =           0.6968
Long Chord   =         103.1509
Mid. Ord.    =           0.6965
P.C.  Station          12+96.33  X     2,066,317.4904  Y     13,738,285.3183
P.T.  Station          13+99.49  X     2,066,355.1649  Y     13,738,381.3429
Superelevation Rate = 3.835%

P.I.  Station          17+24.25  X     2,066,481.9001  Y     13,738,680.3529
Delta        =      3 °  51' 54.25" (LT)
Degree       =      3 °  00' 00.00"
Tangent      =          64.4423
Length       =         128.8357
Radius       =       1,909.8593
External     =           1.0869
Long Chord   =         128.8113
Mid. Ord.    =           1.0863
P.C.  Station          16+59.81  X     2,066,456.7520  Y     13,738,621.0201
P.T.  Station          17+88.64  X     2,066,502.9916  Y     13,738,741.2458
Superelevation Rate = 3.835%

P.I.  Station          20+82.22  X     2,066,599.0784  Y     13,739,018.6564
Delta        =      4 °  03' 02.44" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =          67.5394
Length       =         135.0226
Radius       =       1,909.8593
External     =           1.1938
Long Chord   =         134.9945
Mid. Ord.    =           1.1931
P.C.  Station          20+14.68  X     2,066,576.9732  Y     13,738,954.8369
P.T.  Station          21+49.70  X     2,066,625.6365  Y     13,739,080.7550
Superelevation Rate = 3.835%
```

RAMP S4 PROPOSED SB EXIT TO SHAENFIELD

```
P.I.  Station          10+68.32  X     2,067,750.9105  Y     13,741,185.6706
Delta        =      2 °  43' 55.85" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =          68.3175
Length       =         136.6091
Radius       =       2,864.7890
External     =           0.8145
Long Chord   =         136.5961
Mid. Ord.    =           0.8142
P.C.  Station          10+00.00  X     2,067,706.0918  Y     13,741,134.1093
P.T.  Station          11+36.61  X     2,067,798.1361  Y     13,741,235.0368
Superelevation Rate = 2.708%

P.I.  Station          18+93.22  X     2,068,321.1529  Y     13,741,781.7616
Delta        =      0 °  59' 04.50" (RT)
Degree       =      2 °  00' 00.00"
Tangent      =          24.6152
Length       =          49.2292
Radius       =       2,864.7890
External     =           0.1057
Long Chord   =          49.2286
Mid. Ord.    =           0.1057
P.C.  Station          18+68.60  X     2,068,304.1372  Y     13,741,763.9746
P.T.  Station          19+17.83  X     2,068,338.4716  Y     13,741,799.2535
Superelevation Rate = 2.708%

P.I.  Station          21+76.62  X     2,068,520.5518  Y     13,741,983.1543
Delta        =      2 °  54' 01.70" (LT)
Degree       =      1 °  13' 28.64"
Tangent      =         118.4486
Length       =         236.8466
Radius       =       4,678.6540
External     =           1.4991
Long Chord   =         236.8213
Mid. Ord.    =           1.4987
P.C.  Station          20+58.17  X     2,068,437.2137  Y     13,741,898.9828
P.T.  Station          22+95.02  X     2,068,599.5240  Y     13,742,071.4349
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RAMP S5 PROPOSED SB ENTRANCE FROM BRAUN

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POT Sta. 10+00                    X   2,069,262.3006 Y   13,743,325.8635

P.I.  Station          12+98.56  X     2,069,360.0546  Y     13,743,607.9700
Delta        =      8 °4  11' 10.05" (LT)
Degree       =      1 °  25' 56.62"
Tangent      =         286.2367
Length       =         571.4993
Radius       =       4,000.0000
External     =          10.2284
Long Chord   =         571.0133
Mid. Ord.    =          10.2023
P.C.  Station          10+12.33  X     2,069,266.3365  Y     13,743,337.5104
P.T.  Station          15+83.83  X     2,069,414.3072  Y     13,743,889.0182
Superelevation Rate = 2.000%

P.I.  Station          21+71.45  X     2,069,525.6847  Y     13,744,465.9940
Delta        =      8 °  11' 03.31" (RT)
Degree       =      3 °  00' 00.00"
Tangent      =         136.6366
Length       =         272.8084
Radius       =       1,909.8593
External     =           4.8814
Long Chord   =         272.5765
Mid. Ord.    =           4.8690
P.C.  Station          20+34.82  X     2,069,499.7870  Y     13,744,331.8341
P.T.  Station          23+07.62  X     2,069,570.4173  Y     13,744,595.1007
Superelevation Rate = 3.835%
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RAMP S6 PROPOSED SB ENTRANCE FROM SH16

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POT Station 10+00                 X   2,069,982.6882 Y   13,745,368.1678

P.I.  Station          14+55.10  X     2,070,131.6961  Y     13,745,798.1874
Delta        =     11 °  36' 31.10" (RT)
Degree       =      1 °  43' 42.17"
Tangent      =         336.9779
Length       =         671.6487
Radius       =       3,315.0000
External     =          17.0833
Long Chord   =         670.5005
Mid. Ord.    =          16.9957
P.C.  Station          11+18.13  X     2,070,021.3646  Y     13,745,479.7835
P.T.  Station          17+89.78  X     2,070,303.8418  Y     13,746,087.8768
Superelevation Rate = 2.411%

P.I.  Station          20+83.26  X     2,070,453.7702  Y     13,746,340.1788
Delta        =      8 °  35' 58.53" (RT)
Degree       =      1 °  28' 05.57"
Tangent      =         293.4099
Length       =         585.7178
Radius       =       3,902.4130
External     =          11.0147
Long Chord   =         585.1682
Mid. Ord.    =          10.9837
P.C.  Station          17+89.85  X     2,070,303.8813  Y     13,746,087.9434
P.T.  Station          23+75.57  X     2,070,639.6904  Y     13,746,567.1658
Superelevation Rate = 2.059%

P.I.  Station          28+10.10  X     2,070,915.0321  Y     13,746,903.3263
Delta        =      4 °  55' 41.34" (LT)
Degree       =      2 °  00' 00.00"
Tangent      =         123.2798
Length       =         246.4075
Radius       =       2,864.7890
External     =           2.6513
Long Chord   =         246.3315
Mid. Ord.    =           2.6489
P.C.  Station          26+86.82  X     2,070,836.9155  Y     13,746,807.9549
P.T.  Station          29+33.23  X     2,070,984.6669  Y     13,747,005.0558
Superelevation Rate = 2.708%

P.I.  Station          38+87.20  X     2,071,523.5208  Y     13,747,792.2675
Delta        =      5 °  58' 19.81" (RT)
Degree       =      1 ° 00' 00.00"
Tangent      =         298.8791
Length       =         597.2168
Radius       =       5,729.5780
External     =           7.7901
Long Chord   =         596.9465
Mid. Ord.    =           7.7795
P.C.  Station          35+88.32  X     2,071,354.6984  Y     13,747,545.6348
P.T.  Station          41+85.54  X     2,071,717.0879  Y     13,748,019.9964
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RAMP S7 PROPOSED SB EXIT TO BRAUN

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POT Sta. 10+00                    X   2,072,606.9648 Y   13,749,060.0798 Sta

P.I.  Station          10+82.25  X     2,072,660.4409  Y     13,749,122.5767
Delta        =      1 °  38' 41.81" (RT)
Degree       =      1 °  00' 00.00"
Tangent      =          82.2531
Length       =         164.4948
Radius       =       5,729.5780
External     =           0.5904
Long Chord   =         164.4892
Mid. Ord.    =           0.5903
P.C.  Station          10+00.00  X     2,072,606.9648  Y     13,749,060.0798
P.T.  Station          11+64.49  X     2,072,715.6891  Y     13,749,183.5129

P.I.  Station          26+55.29  X     2,073,717.0313  Y     13,750,287.9463
Delta        =      2 °  52' 37.49" (LT)
Degree       =      1 °  00' 00.00"
Tangent      =         143.8842
Length       =         287.7080
Radius       =       5,729.5780
External     =           1.8064
Long Chord   =         287.6777
Mid. Ord.    =           1.8058
P.C.  Station          25+11.40  X     2,073,620.3864  Y     13,750,181.3516
P.T.  Station          27+99.11  X     2,073,808.2039  Y     13,750,399.2577
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