Northwest Corridor Managed Lanes

Conceptual Design Calculations

Note 1: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior to the completion of all work under that contract and directed that the work with respect to this document be discontinued.

(a) This document was not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. This document is a work-in-progress and is presented only as such.

(b) Any user is cautioned that the use of this document and any related information or calculations, without access to pertinent factors and without proper regard for their purpose, could lead to erroneous conclusions.

(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.

(d) GTP has no responsibility for the use of this information not under its direct control.

Prepared by: PBSJ

Prepared for: GTP Georgia Transportation Partners

November 30, 2009

Conceptual Design Calculations

Version Control

Date	Version	Author	Status
11/30/2009	C	M. Moseley	Printed per GDOT's Termination for Convenience Direction.

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I-75 Managed Lanes

(KC 50)

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: I-75 Outside-Rev_HOV(KC50)
Description: Outside Reversible HOV
Style: Prop Main CL

COMP: PCT / JHD
CHECK: MRM
11/12/09
REV C.

	STATION	NORTHING	EASTING
Element: Linear			
POB ( )	192+72.42	1412287.4498	2203879.9886
PC ( )	194+16.04	1412412.1234	2203951.2882
Tangent Direction:	N 29^45'53" E		
Tangent Length:	143.6215		
Element: Circular KC 50			
PC ( )	194+16.04	1412412.1234	2203951.2882
PI ( )	197+29.62	1412684.3288	2204106.9597
CC ( )		1410799.3409	2206771.3802
PCC ( )	200+41.26	1412921.7343	2204311.8208
Radius:	3248.6900		
Delta:	11^01'36" Right		
Degree of Curvature(Arc):	1^45'49"		
Length:	625.2136		
Tangent:	313.5752		
Chord:	624.2492		
Middle Ordinate:	15.0288		
External:	15.0986		
Tangent Direction:	N 29^45'53" E		
Radial Direction:	S 60^14'07" E		
Chord Direction:	N 35^16'41" E		
Radial Direction:	S 49^12'31" E		
Tangent Direction:	N 40^47'29" E		
Element: Circular KC 51			
PCC ( )	200+41.26	1412921.7343	2204311.8208
PI ( )	204+15.78	1413205.2840	2204556.5003
CC ( )		1410374.6975	2207263.4829
PT ( )	207+88.01	1413437.0680	2204850.6852
Radius:	3898.6800		
Delta:	10^58'28" Right		
Degree of Curvature(Arc):	1^28'11"		
Length:	746.7573		
Tangent:	374.5244		
Chord:	745.6163		
Middle Ordinate:	17.8657		
External:	17.9479		
Tangent Direction:	N 40^47'29" E		
Radial Direction:	S 49^12'31" E		
Chord Direction:	N 46^16'43" E		
Radial Direction:	S 38^14'03" E		
Tangent Direction:	N 51^45'57" E		
Element: Linear			
PT ( )	207+88.01	1413437.0680	2204850.6852
PI ( )	210+69.14	1413611.0524	2205071.5096
Tangent Direction:	N 51^45'57" E		
Tangent Length:	281.1299		
Element: Linear			
PI ( )	210+69.14	1413611.0524	2205071.5096
PI ( )	215+39.30	1413904.9776	2205438.4670
Tangent Direction:	N 51^18'22" E		
Tangent Length:	470.1592		
Element: Linear			
PI ( )	215+39.30	1413904.9776	2205438.4670
PI ( )	223+39.36	1414397.6916	2206068.8027
Tangent Direction:	N 51^59'11" E		
Tangent Length:	800.0564		
Element: Linear			
PI ( )	223+39.36	1414397.6916	2206068.8027
PC ( )	225+39.36	1414522.7238	2206224.9019
Tangent Direction:	N 51^18'22" E		
Tangent Length:	200.0000		

Kc52

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Element: Circular
              PC (        )          225+39.36  1414522.7238  2206224.9019
              PI (        )          228+79.58  1414735.4162  2206490.4423
              CC (        )                     1414980.8749  2205857.9324
              PT (        )          231+56.03  1415071.5525  2206437.8863
                     Radius:           587.0000
                      Delta:          60^11'33" Left
  Degree of Curvature(Arc):            9^45'39"
                     Length:           616.6764
                    Tangent:           340.2202
                      Chord:           588.7065
            Middle Ordinate:            79.1367
                   External:            91.4680
         Tangent Direction:       N 51^18'22" E
          Radial Direction:       S 38^41'38" E
           Chord Direction:       N 21^12'35" E
          Radial Direction:       N 81^06'49" E
         Tangent Direction:       N  8^53'11" W

Element: Linear
              PT (        )          231+56.03  1415071.5525  2206437.8863
              PC (        )          242+21.63  1416124.3571  2206273.2770
         Tangent Direction:       N  8^53'11" W
            Tangent Length:          1065.5955

Element: Circular
              PC (        )          242+21.63  1416124.3571  2206273.2770
              PI (        )          244+87.76  1416387.2904  2206232.1665
              CC (        )                     1415997.3776  2205461.1439
              PT (        )          247+36.38  1416576.2387  2206044.7565
                     Radius:           822.0000
                      Delta:          35^52'46" Left
  Degree of Curvature(Arc):            6^58'13"
                     Length:           514.7474
                    Tangent:           266.1277
                      Chord:           506.3779
            Middle Ordinate:            39.9646
                   External:            42.0069
         Tangent Direction:       N  8^53'11" W
          Radial Direction:       N 81^06'49" E
           Chord Direction:       N 26^49'34" W
          Radial Direction:       N 45^14'03" E
         Tangent Direction:       N 44^45'57" W

Element: Linear
              PT (        )          247+36.38  1416576.2387  2206044.7565
              PC (        )          255+55.85  1417158.0604  2205467.6718
         Tangent Direction:       N 44^45'57" W
            Tangent Length:           819.4774

Element: Circular
              PC (        )          255+55.85  1417158.0604  2205467.6718
              PI (        )          258+15.02  1417342.0668  2205285.1634
              CC (        )                     1416158.0812  2204459.4845
              PT (        )          260+68.55  1417449.7373  2205049.4205
                     Radius:          1420.0000
         Design Speed(mph):            45.0000
            Superelevation:            -5.6000%
                      Delta:          20^41'12" Left
  Degree of Curvature(Arc):            4^02'06"
                     Length:           512.6916
                    Tangent:           259.1673
                      Chord:           509.9114
            Middle Ordinate:            23.0757
                   External:            23.4569
         Tangent Direction:       N 44^45'57" W
          Radial Direction:       N 45^14'03" E
           Chord Direction:       N 55^06'33" W
          Radial Direction:       N 24^32'51" E
         Tangent Direction:       N 65^27'09" W

Element: Linear
              PT (        )          260+68.55  1417449.7373  2205049.4205
              PC (        )          262+16.32  1417511.1304  2204915.0013
         Tangent Direction:       N 65^27'09" W
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          Tangent Length:          147.7755

Element: Circular
             PC (        )         262+16.32  1417511.1304  2204915.0013
             PI (        )         265+49.32  1417649.4752  2204612.0973
             CC (        )                    1418813.7019  2205509.9227
             PT (        )         268+70.70  1417907.2745  2204401.3139
                   Radius:         1432.0000
        Design Speed(mph):           45.0000
           Superelevation:           5.6000%
                   Delta:          26^10'56" Right
  Degree of Curvature(Arc):         4^00'04"
                  Length:           654.3735
                 Tangent:           333.0017
                   Chord:           648.6948
           Middle Ordinate:          37.2159
                  External:          38.2089
        Tangent Direction:      N 65^27'09" W
         Radial Direction:      N 24^32'51" E
          Chord Direction:      N 52^21'41" W
         Radial Direction:      N 50^43'47" E
        Tangent Direction:      N 39^16'13" W

Element: Linear
             PT (        )         268+70.70  1417907.2745  2204401.3139
             PI (        )         276+59.15  1418517.6714  2203902.2375
        Tangent Direction:      N 39^16'13" W
          Tangent Length:          788.4552

Element: Linear
             PI (        )         276+59.15  1418517.6714  2203902.2375
             PC (        )         280+81.69  1418847.4021  2203638.0137
        Tangent Direction:      N 38^42'23" W
          Tangent Length:          422.5359

Element: Circular
             PC (        )         280+81.69  1418847.4021  2203638.0137
             PI (        )         285+14.33  1419185.0172  2203367.4719
             CC (        )                    1420902.2324  2206202.2813
             PT (        )         289+42.02  1419581.1527  2203193.5367
                   Radius:         3286.0000
        Design Speed(mph):           55.0000
           Superelevation:           4.0000%
                   Delta:          15^00'04" Right
  Degree of Curvature(Arc):         1^44'37"
                  Length:           860.3303
                 Tangent:           432.6393
                   Chord:           857.8751
           Middle Ordinate:          28.1159
                  External:          28.3586
        Tangent Direction:      N 38^42'23" W
         Radial Direction:      N 51^17'37" E
          Chord Direction:      N 31^12'21" W
         Radial Direction:      N 66^17'41" E
        Tangent Direction:      N 23^42'19" W

Element: Linear
             PT (        )         289+42.02  1419581.1527  2203193.5367
             PC (        )         300+27.56  1420575.1064  2202757.1115
        Tangent Direction:      N 23^42'19" W
          Tangent Length:         1085.5464

Element: Circular
             PC (        )         300+27.56  1420575.1064  2202757.1115
             PI (        )         301+45.50  1420683.0936  2202709.6964
             CC (        )                    1415388.8836  2190945.5454
             PT (        )         302+63.43  1420790.1959  2202660.3149
                   Radius:        12900.0000
        Design Speed(mph):           60.0000
           Superelevation:                NC
                   Delta:           1^02'51" Left
  Degree of Curvature(Arc):         0^26'39"
                  Length:           235.8699
                 Tangent:           117.9382
                   Chord:           235.8666
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          Middle Ordinate:            0.5391
                 External:            0.5391
        Tangent Direction:      N 23^42'19" W
         Radial Direction:      N 66^17'41" E
          Chord Direction:      N 24^13'45" W
         Radial Direction:      N 65^14'49" E
        Tangent Direction:      N 24^45'11" W

Element: Linear
             PT (        )          302+63.43  1420790.1959  2202660.3149
             PC (        )          354+61.91  1425511.0485  2200483.6781
        Tangent Direction:      N 24^45'11" W
           Tangent Length:          5198.4802

Element: Circular
             PC (        )          354+61.91  1425511.0485  2200483.6781
             PI (        )          356+41.65  1425674.2751  2200408.4194
             CC (        )                     1420109.7362  2188768.9085
             PT (        )          358+21.37  1425835.3416  2200328.6422
                   Radius:         12900.0000
        Design Speed(mph):            60.0000
           Superelevation:                 NC
                    Delta:           1^35'48" Left
  Degree of Curvature(Arc):          0^26'39"
                   Length:           359.4587
                  Tangent:           179.7410
                    Chord:           359.4470
          Middle Ordinate:             1.2520
                 External:             1.2521
        Tangent Direction:      N 24^45'11" W
         Radial Direction:      N 65^14'49" E
          Chord Direction:      N 25^33'04" W
         Radial Direction:      N 63^39'02" E
        Tangent Direction:      N 26^20'58" W

Element: Linear
             PT (        )          358+21.37  1425835.3416  2200328.6422
             PC (        )          369+17.55  1426817.6268  2199842.1105
        Tangent Direction:      N 26^20'58" W
           Tangent Length:          1096.1740

Element: Circular
             PC (        )          369+17.55  1426817.6268  2199842.1105
             PI (        )          372+13.24  1427082.6034  2199710.8660
             CC (        )                     1432543.2322  2211401.8441
             PT (        )          375+08.84  1427353.3153  2199591.9008
                   Radius:         12900.0000
        Design Speed(mph):            60.0000
           Superelevation:                 NC
                    Delta:           2^37'35" Right
  Degree of Curvature(Arc):          0^26'39"
                   Length:           591.2937
                  Tangent:           295.6986
                    Chord:           591.2419
          Middle Ordinate:             3.3877
                 External:             3.3886
        Tangent Direction:      N 26^20'58" W
         Radial Direction:      N 63^39'02" E
          Chord Direction:      N 25^02'11" W
         Radial Direction:      N 66^16'36" E
        Tangent Direction:      N 23^43'24" W

Element: Linear
             PT (        )          375+08.84  1427353.3153  2199591.9008
             PC (        )          395+92.35  1429260.7652  2198753.6659
        Tangent Direction:      N 23^43'24" W
           Tangent Length:          2083.5074

Element: Circular
             PC (        )          395+92.35  1429260.7652  2198753.6659
             PI (        )          410+25.86  1430573.1464  2198176.9358
             CC (        )                     1427104.3346  2193846.5886
             PT (        )          423+93.81  1431422.4204  2197022.0783
                   Radius:          5360.0000
        Design Speed(mph):            65.0000
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          Superelevation:          3.4000%
                   Delta:        29^56'47" Left
 Degree of Curvature(Arc):        1^04'08"
                  Length:        2801.4621
                 Tangent:        1433.5139
                   Chord:        2769.6838
        Middle Ordinate:          181.9876
                External:         188.3837
       Tangent Direction:     N 23^43'24" W
        Radial Direction:     N 66^16'36" E
         Chord Direction:     N 38^41'47" W
        Radial Direction:     N 36^19'50" E
       Tangent Direction:     N 53^40'10" W

Element: Linear
            PT (        )        423+93.81  1431422.4204  2197022.0783
            PC (        )        446+60.24  1432765.1487  2195196.2133
       Tangent Direction:     N 53^40'10" W
          Tangent Length:        2266.4294

Element: Circular
            PC (        )        446+60.24  1432765.1487  2195196.2133
            PI (        )        448+34.11  1432868.1581  2195056.1393
            CC (        )                   1431274.7646  2194100.1954
            PT (        )        450+06.96  1432943.2644  2194899.3250
                 Radius:         1850.0000
       Design Speed(mph):          55.0000
          Superelevation:          6.2000%
                   Delta:        10^44'18" Left
 Degree of Curvature(Arc):        3^05'49"
                  Length:         346.7266
                 Tangent:         173.8726
                   Chord:         346.2194
        Middle Ordinate:            8.1170
                External:           8.1528
       Tangent Direction:     N 53^40'10" W
        Radial Direction:     N 36^19'50" E
         Chord Direction:     N 59^02'19" W
        Radial Direction:     N 25^35'32" E
       Tangent Direction:     N 64^24'28" W

Element: Linear
            PT (        )        450+06.96  1432943.2644  2194899.3250
            PC (        )        455+99.68  1433199.2927  2194364.7645
       Tangent Direction:     N 64^24'28" W
          Tangent Length:         592.7102

Element: Circular
            PC (        )        455+99.68  1433199.2927  2194364.7645
            PI (        )        459+15.44  1433335.6917  2194079.9776
            CC (        )                   1434867.7926  2195163.8942
            PT (        )        462+25.18  1433558.8335  2193856.5587
                 Radius:         1850.0000
       Design Speed(mph):          55.0000
          Superelevation:          6.2000%
                   Delta:        19^22'20" Right
 Degree of Curvature(Arc):        3^05'49"
                  Length:         625.5045
                 Tangent:         315.7661
                   Chord:         622.5293
        Middle Ordinate:           26.3733
                External:          26.7547
       Tangent Direction:     N 64^24'28" W
        Radial Direction:     N 25^35'32" E
         Chord Direction:     N 54^43'18" W
        Radial Direction:     N 44^57'52" E
       Tangent Direction:     N 45^02'08" W

Element: Linear
            PT (        )        462+25.18  1433558.8335  2193856.5587
            PC (        )        471+80.51  1434233.9323  2193180.6214
       Tangent Direction:     N 45^02'08" W
          Tangent Length:         955.3270

Element: Circular
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            PC (        )          471+80.51  1434233.9323  2193180.6214
            PI (        )          477+02.79  1434603.0132  2192811.0821
            CC (        )                     1428848.5442  2187801.9136
            PT (        )          482+23.44  1434918.1577  2192394.5919
                   Radius:         7611.3667
        Design Speed(mph):           55.0000
           Superelevation:           2.0000%
                    Delta:          7^51'03" Left
  gree of Curvature(Arc):           0^45'10"
                   Length:         1042.9322
                  Tangent:          522.2835
                    Chord:         1042.1165
          Middle Ordinate:           17.8562
                 External:           17.8982
        Tangent Direction:      N 45^02'08" W
         Radial Direction:      N 44^57'52" E
          Chord Direction:      N 48^57'40" W
         Radial Direction:      N 37^06'49" E
        Tangent Direction:      N 52^53'11" W

Element: Linear
            PT (        )          482+23.44  1434918.1577  2192394.5919
            PC (        )          496+55.45  1435782.2294  2191252.6480
        Tangent Direction:      N 52^53'11" W
           Tangent Length:         1432.0111

Element: Circular
            PC (        )          496+55.45  1435782.2294  2191252.6480
            PI (        )          507+03.14  1436414.4047  2190417.1748
            CC (        )                     1437491.9422  2192546.3319
            PT (        )          516+04.50  1437461.9957  2190402.5411
                   Radius:         2144.0000
        Design Speed(mph):           55.0000
           Superelevation:           5.6000%
                    Delta:         52^05'10" Right
  Degree of Curvature(Arc):          2^40'21"
                   Length:         1949.0540
                  Tangent:         1047.6932
                    Chord:         1882.6303
          Middle Ordinate:          217.6922
                 External:          242.2936
        Tangent Direction:      N 52^53'11" W
         Radial Direction:      N 37^06'49" E
          Chord Direction:      N 26^50'36" W
         Radial Direction:      N 89^11'59" E
        Tangent Direction:      N  0^48'01" W

Element: Linear
            PT (        )          516+04.50  1437461.9957  2190402.5411
            PC (        )          528+84.40  1438741.7684  2190384.6640
        Tangent Direction:      N  0^48'01" W
           Tangent Length:         1279.8975

Element: Circular
            PC (        )          528+84.40  1438741.7684  2190384.6640
            PI (        )          533+77.80  1439235.1164  2190377.7724
            CC (        )                     1438686.2332  2186409.0518
           PCC (        )          538+66.17  1439711.8160  2190250.5041
                   Radius:         3976.0000
        Design Speed(mph):           65.0000
           Superelevation:          -4.6000%
                    Delta:         14^08'52" Left
  Degree of Curvature(Arc):          1^26'28"
                   Length:          981.7733
                  Tangent:          493.3961
                    Chord:          979.2810
          Middle Ordinate:           30.2646
                 External:           30.4967
        Tangent Direction:      N  0^48'01" W
         Radial Direction:      N 89^11'59" E
          Chord Direction:      N  7^52'27" W
         Radial Direction:      N 75^03'07" E
        Tangent Direction:      N 14^56'53" W

Element: Circular
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            PCC (        )          538+66.17  1439711.8160  2190250.5041
             PI (        )          544+88.85  1440313.4202  2190089.8891
             CC (        )                     1438944.1765  2187375.2119
             PT (        )          550+93.82  1440800.1667  2189701.5559
                     Radius:         2976.0000
        Design Speed(mph):             65.0000
           Superelevation:             -5.6000%
                    Delta:          23^38'07" Left
   gree of Curvature(Arc):           1^55'31"
                   Length:          1227.6410
                  Tangent:           622.6756
                    Chord:          1218.9551
          Middle Ordinate:             63.0783
                 External:             64.4442
        Tangent Direction:      N 14^56'53" W
         Radial Direction:      N 75^03'07" E
          Chord Direction:      N 26^45'57" W
         Radial Direction:      N 51^25'00" E
        Tangent Direction:      N 38^35'00" W

Element: Linear
             PT (        )          550+93.82  1440800.1667  2189701.5559
             PC (        )          589+44.53  1443810.2798  2187300.0450
        Tangent Direction:      N 38^35'00" W
           Tangent Length:          3850.7188

Element: Circular
             PC (        )          589+44.53  1443810.2798  2187300.0450
             PI (        )          591+26.17  1443952.2674  2187186.7653
             CC (        )                     1459401.5952  2206842.5854
             PT (        )          593+07.81  1444095.8860  2187075.5607
                     Radius:        25000.0000
                    Delta:            0^49'57" Right
  Degree of Curvature(Arc):           0^13'45"
                   Length:           363.2719
                  Tangent:           181.6391
                    Chord:           363.2687
          Middle Ordinate:             0.6598
                 External:             0.6598
        Tangent Direction:      N 38^35'00" W
         Radial Direction:      N 51^25'00" E
          Chord Direction:      N 38^10'01" W
         Radial Direction:      N 52^14'57" E
        Tangent Direction:      N 37^45'03" W

Element: Linear
             PT (        )          593+07.81  1444095.8860  2187075.5607
             PC (        )          605+46.76  1445075.5019  2186317.0390
        Tangent Direction:      N 37^45'03" W
           Tangent Length:          1238.9521

Element: Circular
             PC (        )          605+46.76  1445075.5019  2186317.0390
             PI (        )          608+36.32  1445304.4545  2186139.7599
             CC (        )                     1437177.7559  2176117.2543
             PT (        )          611+25.79  1445525.2218  2185952.3859
                     Radius:        12900.0000
                    Delta:            2^34'18" Left
  Degree of Curvature(Arc):           0^26'39"
                   Length:           579.0304
                  Tangent:           289.5638
                    Chord:           578.9817
          Middle Ordinate:             3.2487
                 External:             3.2495
        Tangent Direction:      N 37^45'03" W
         Radial Direction:      N 52^14'57" E
          Chord Direction:      N 39^02'12" W
         Radial Direction:      N 49^40'39" E
        Tangent Direction:      N 40^19'21" W

Element: Linear
             PT (        )          611+25.79  1445525.2218  2185952.3859
             PC (        )          624+26.51  1446516.9084  2185110.7022
        Tangent Direction:      N 40^19'21" W
           Tangent Length:          1300.7205
```

```
Element: Circular
              PC (        )          624+26.51  1446516.9084  2185110.7022
              PI (        )          626+38.31  1446678.3845  2184973.6510
              CC (        )                     1452670.7378  2192361.2527
              PT (        )          628+50.03  1446845.8021  2184843.9245
                     Radius:         9510.0000
                      Delta:          2^33'06" Right
  Degree of Curvature(Arc):           0^36'09"
                     Length:          423.5222
                    Tangent:          211.7961
                      Chord:          423.4872
           Middle Ordinate:             2.3576
                   External:            2.3582
         Tangent Direction:      N 40^19'21" W
          Radial Direction:      N 49^40'39" E
           Chord Direction:      N 39^02'48" W
          Radial Direction:      N 52^13'45" E
         Tangent Direction:      N 37^46'15" W

Element: Linear
              PT (        )          628+50.03  1446845.8021  2184843.9245
              PC (        )          632+50.31  1447162.2046  2184598.7544
         Tangent Direction:      N 37^46'15" W
            Tangent Length:           400.2736

Element: Circular
              PC (        )          632+50.31  1447162.2046  2184598.7544
              PI (        )          634+00.32  1447280.7844  2184506.8707
              CC (        )                     1441337.2689  2177081.4262
              PT (        )          635+50.31  1447396.4071  2184411.2928
                     Radius:         9510.0000
                      Delta:          1^48'27" Left
  Degree of Curvature(Arc):           0^36'09"
                     Length:          300.0001
                    Tangent:          150.0125
                      Chord:          299.9877
           Middle Ordinate:             1.1829
                   External:            1.1831
         Tangent Direction:      N 37^46'15" W
          Radial Direction:      N 52^13'45" E
           Chord Direction:      N 38^40'29" W
          Radial Direction:      N 50^25'18" E
         Tangent Direction:      N 39^34'42" W

Element: Linear
              PT (        )          635+50.31  1447396.4071  2184411.2928
              PC (        )          643+30.19  1447997.5031  2183914.4046
         Tangent Direction:      N 39^34'42" W
            Tangent Length:           779.8810

Element: Circular
              PC (        )          643+30.19  1447997.5031  2183914.4046
              PI (        )          645+14.10  1448139.2521  2183797.2297
              CC (        )                     1446404.6698  2181987.5206
              PT (        )          646+97.34  1448262.3282  2183660.5732
                     Radius:         2500.0000
         Design Speed(mph):            60.0000
            Superelevation:           -5.8000%
                      Delta:          8^24'53" Left
  Degree of Curvature(Arc):           2^17'31"
                     Length:          367.1578
                    Tangent:          183.9096
                      Chord:          366.8279
           Middle Ordinate:             6.7372
                   External:            6.7554
         Tangent Direction:      N 39^34'42" W
          Radial Direction:      N 50^25'18" E
           Chord Direction:      N 43^47'09" W
          Radial Direction:      N 42^00'25" E
         Tangent Direction:      N 47^59'35" W

Element: Linear
              PT (        )          646+97.34  1448262.3282  2183660.5732
              PC (        )          651+47.01  1448563.2572  2183326.4395
```

```
        Tangent Direction:      N 47^59'35" W
           Tangent Length:           449.6705

Element: Circular
             PC (        )          651+47.01  1448563.2572  2183326.4395
             PI (        )          655+39.76  1448826.0908  2183034.6046
             CC (        )                     1452287.4909  2186680.5753
             PT (        )          659+30.90  1449131.1742  2182787.2723
                     Radius:          5012.0000
        Design Speed(mph):              60.0000
           Superelevation:              3.4000%
                    Delta:            8^57'40" Right
  Degree of Curvature(Arc):           1^08'35"
                   Length:            783.8894
                  Tangent:            392.7456
                    Chord:            783.0907
          Middle Ordinate:             15.3175
                 External:             15.3644
        Tangent Direction:      N 47^59'35" W
         Radial Direction:      N 42^00'25" E
          Chord Direction:      N 43^30'45" W
         Radial Direction:      N 50^58'05" E
        Tangent Direction:      N 39^01'55" W

Element: Linear
             PT (        )          659+30.90  1449131.1742  2182787.2723
             PC (        )          676+19.34  1450442.7456  2181723.9759
        Tangent Direction:      N 39^01'55" W
           Tangent Length:          1688.4368

Element: Circular
             PC (        )          676+19.34  1450442.7456  2181723.9759
             PI (        )          685+26.42  1451147.3630  2181152.7397
             CC (        )                     1447168.0355  2177684.6352
             PT (        )          694+15.43  1451616.9591  2180376.6752
                     Radius:          5200.0000
        Design Speed(mph):              55.0000
           Superelevation:              2.8000%
                    Delta:          19^47'24" Left
  Degree of Curvature(Arc):           1^06'07"
                   Length:          1796.0905
                  Tangent:           907.0813
                    Chord:          1787.1756
          Middle Ordinate:             77.3541
                 External:             78.5222
        Tangent Direction:      N 39^01'55" W
         Radial Direction:      N 50^58'05" E
          Chord Direction:      N 48^55'37" W
         Radial Direction:      N 31^10'41" E
        Tangent Direction:      N 58^49'19" W

Element: Linear
             PT (        )          694+15.43  1451616.9591  2180376.6752
             PC (        )          701+26.31  1451984.9800  2179768.4758
        Tangent Direction:      N 58^49'19" W
           Tangent Length:           710.8768

Element: Circular
             PC (        )          701+26.31  1451984.9800  2179768.4758
             PI (        )          703+38.81  1452094.9939  2179586.6645
             CC (        )                     1453627.6595  2180762.4598
             PT (        )          705+49.60  1452242.1036  2179433.3116
                     Radius:          1920.0000
        Design Speed(mph):              55.0000
           Superelevation:              6.0000%
                    Delta:          12^37'54" Right
  Degree of Curvature(Arc):           2^59'03"
                   Length:            423.2873
                  Tangent:            212.5050
                    Chord:            422.4306
          Middle Ordinate:             11.6530
                 External:             11.7242
        Tangent Direction:      N 58^49'19" W
         Radial Direction:      N 31^10'41" E
          Chord Direction:      N 52^30'22" W
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          Radial Direction:      N 43^48'35" E
        Tangent Direction:       N 46^11'25" W

Element: Linear
              PT (        )          705+49.60  1452242.1036  2179433.3116
              PC (        )          709+59.32  1452525.7400  2179137.6379
        Tangent Direction:       N 46^11'25" W
           Tangent Length:            409.7225

Element: Circular
              PC (        )          709+59.32  1452525.7400  2179137.6379
              PI (        )          712+09.57  1452698.9785  2178957.0474
              CC (        )                     1449220.6120  2175967.0657
              PT (        )          714+59.32  1452851.5097  2178758.6569
                     Radius:          4580.0000
        Design Speed(mph):              55.0000
           Superelevation:              3.0000%
                    Delta:             6^15'18" Left
  Degree of Curvature(Arc):            1^15'04"
                   Length:             500.0006
                  Tangent:             250.2489
                    Chord:             499.7524
          Middle Ordinate:               6.8215
                 External:               6.8316
        Tangent Direction:       N 46^11'25" W
          Radial Direction:      N 43^48'35" E
           Chord Direction:      N 49^19'04" W
          Radial Direction:      N 37^33'17" E
        Tangent Direction:       N 52^26'43" W

Element: Linear
              PT (        )          714+59.32  1452851.5097  2178758.6569
              PC (        )          721+47.21  1453270.7922  2178213.3150
        Tangent Direction:       N 52^26'43" W
           Tangent Length:            687.8922

Element: Circular
              PC (        )          721+47.21  1453270.7922  2178213.3150
              PI (        )          731+83.22  1453902.2584  2177391.9952
              CC (        )                     1456640.0750  2180803.7654
              PT (        )          741+79.59  1454840.8493  2176953.4035
                     Radius:          4250.0000
        Design Speed(mph):              55.0000
           Superelevation:              3.2000%
                    Delta:            27^23'57" Right
  Degree of Curvature(Arc):            1^20'53"
                   Length:            2032.3816
                  Tangent:            1036.0095
                    Chord:            2013.0714
          Middle Ordinate:             120.9098
                 External:             124.4503
        Tangent Direction:       N 52^26'43" W
          Radial Direction:      N 37^33'17" E
           Chord Direction:      N 38^44'45" W
          Radial Direction:      N 64^57'14" E
        Tangent Direction:       N 25^02'46" W

Element: Linear
              PT (        )          741+79.59  1454840.8493  2176953.4035
              PC (        )          763+10.00  1456770.9303  2176051.5009
        Tangent Direction:       N 25^02'46" W
           Tangent Length:           2130.4086

Element: Circular
              PC (        )          763+10.00  1456770.9303  2176051.5009
              PI (        )          765+03.98  1456946.6712  2175969.3794
              CC (        )                     1452655.9955  2167245.4967
              PT (        )          766+97.91  1457118.9958  2175880.3116
                     Radius:          9720.0000
        Design Speed(mph):              65.0000
           Superelevation:             -2.0000%
                    Delta:             2^17'12" Left
  Degree of Curvature(Arc):            0^35'22"
                   Length:             387.9115
                  Tangent:             193.9815
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                 Chord:          387.8858
   Middle Ordinate:                1.9351
          External:                1.9354
  Tangent Direction:      N 25^02'46" W
   Radial Direction:      N 64^57'14" E
    Chord Direction:      N 26^11'22" W
   Radial Direction:      N 62^40'02" E
  Tangent Direction:      N 27^19'58" W

Element: Linear
       PT (        )          766+97.91  1457118.9958  2175880.3116
       PC (        )          776+21.29  1457939.2858  2175456.3355
  Tangent Direction:      N 27^19'58" W
     Tangent Length:           923.3805

Element: Circular
       PC (        )          776+21.29  1457939.2858  2175456.3355
       PI (        )          782+19.33  1458470.5577  2175181.7417
       CC (        )                     1459867.7427  2179187.4284
       PT (        )          788+09.39  1459057.3595  2175066.3509
             Radius:          4200.0000
              Delta:          16^12'28" Right
 Degree of Curvature(Arc):     1^21'51"
             Length:          1188.0928
            Tangent:           598.0397
              Chord:          1184.1355
   Middle Ordinate:                41.9409
          External:                42.3639
  Tangent Direction:      N 27^19'58" W
   Radial Direction:      N 62^40'02" E
    Chord Direction:      N 19^13'44" W
   Radial Direction:      N 78^52'30" E
  Tangent Direction:      N 11^07'30" W

Element: Linear
       PT (        )          788+09.39  1459057.3595  2175066.3509
      POE (        )          790+23.65  1459267.5981  2175025.0089
  Tangent Direction:      N 11^07'30" W
     Tangent Length:           214.2648
```

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: I-75 Outside-Rev_HOV(KC50)
Description: Outside Reversible HOV
Style: Prop Main CL
Vertical Alignment Name: I-75 Outside-Rev_HOV(KC50)
Description:
Style: Prop Main CL

ADMIN C: 10-19-09

10/16/09
Comp: PCT

	STATION	ELEVATION
Element: Linear		
POB	192+84.70	950.57
PVC	193+94.70	951.17
Tangent Grade:	0.5395	
Tangent Length:	110.0000	
Element: Parabola		
PVC	193+94.70	951.17
PVI	196+94.70	952.79
PVT	199+94.70	946.72
VHIGH	195+21.07	951.51
Length:	600.0000	
Stopping Sight Distance:	721.2538	
Entrance Grade:	0.5395	
Exit Grade:	-2.0222	
r = (g2 - g1) / L:	-0.4270	
K = 1 / (g2 - g1):	234.2141	
Middle Ordinate:	-1.9213	
Element: Linear		
PVT	199+94.70	946.72
PVC	205+22.42	936.05
Tangent Grade:	-2.0222	
Tangent Length:	527.7200	
Element: Parabola		
PVC	205+22.42	936.05
PVI	207+22.42	932.00
PVT	209+22.42	928.83
Length:	400.0000	
Entrance Grade:	-2.0222	
Exit Grade:	-1.5861	
r = (g2 - g1) / L:	0.1090	
K = 1 / (g2 - g1):	917.1950	
Middle Ordinate:	0.2181	
Element: Linear		
PVT	209+22.42	928.83
PVC	210+22.42	927.25
Tangent Grade:	-1.5861	
Tangent Length:	100.0000	
Element: Parabola		
PVC	210+22.42	927.25
PVI	212+22.42	924.07
PVT	214+22.42	919.78
Length:	400.0000	
Stopping Sight Distance:	2120.2517	
Entrance Grade:	-1.5861	
Exit Grade:	-2.1481	
r = (g2 - g1) / L:	-0.1405	
K = 1 / (g2 - g1):	711.7644	
Middle Ordinate:	-0.2810	
Element: Linear		
PVT	214+22.42	919.78
PVC	214+59.00	918.99
Tangent Grade:	-2.1481	
Tangent Length:	36.5800	
Element: Parabola		
PVC	214+59.00	918.99

PVI	218+05.00	911.56
PVT	221+51.00	934.40
VLOW	216+28.92	917.17
Length:	692.0000	
Headlight Sight Distance:	363.8279	
Entrance Grade:	-2.1481	
Exit Grade:	6.6000	
r = (g2 - g1) / L:	1.2642	
K = l / (g2 - g1):	79.1030	
Middle Ordinate:	7.5671	

Element: Linear

PVT	221+51.00	934.40
PVC	229+60.09	987.80
Tangent Grade:	6.6000	
Tangent Length:	809.0931	

Element: Parabola

PVC	229+60.09	987.80
PVI	234+60.09	1020.80
PVT	239+60.09	1010.80
VHIGH	237+27.53	1013.12
Length:	1000.0000	
Stopping Sight Distance:	500.9642	
Entrance Grade:	6.6000	
Exit Grade:	-2.0000	
r = (g2 - g1) / L:	-0.8600	
K = l / (g2 - g1):	116.2790	
Middle Ordinate:	-10.7500	

Element: Linear

PVT	239+60.09	1010.80
PVC	259+50.00	971.00
Tangent Grade:	-2.0000	
Tangent Length:	1989.9069	

Element: Parabola

PVC	259+50.00	971.00
PVI	262+50.00	965.00
PVT	265+50.00	971.00
VLOW	262+49.99	968.00
Length:	600.0000	
Headlight Sight Distance:	622.2068	
Entrance Grade:	-2.0000	
Exit Grade:	2.0001	
r = (g2 - g1) / L:	0.6667	
K = l / (g2 - g1):	149.9960	
Middle Ordinate:	3.0001	

Element: Linear

PVT	265+50.00	971.00
PVC	286+67.03	1013.34
Tangent Grade:	2.0001	
Tangent Length:	2117.0296	

Element: Parabola

PVC	286+67.03	1013.34
PVI	289+17.03	1018.34
PVT	291+67.03	1014.30
VHIGH	289+43.60	1016.11
Length:	500.0000	
Stopping Sight Distance:	548.4504	
Entrance Grade:	2.0001	
Exit Grade:	-1.6157	
r = (g2 - g1) / L:	-0.7232	
K = l / (g2 - g1):	138.2803	
Middle Ordinate:	-2.2599	

Element: Linear

PVT	291+67.03	1014.30
PVC	299+50.00	1001.65
Tangent Grade:	-1.6157	

```
            Tangent Length:          782.9704

Element: Parabola
                       PVC        299+50.00          1001.65
                       PVI        302+00.00           997.61
                       PVT        304+50.00           992.76
                   Length:         500.0000
   Stopping Sight Distance:       3577.4784
            Entrance Grade:         -1.6157
                Exit Grade:         -1.9401
       r = ( g2 - g1 ) / L:         -0.0649
       K = 1 / ( g2 - g1 ):        1541.7123
           Middle Ordinate:         -0.2027

Element: Linear
                       PVT        304+50.00           992.76
                       PVC        323+00.00           956.87
             Tangent Grade:         -1.9401
            Tangent Length:       1850.0000

Element: Parabola
                       PVC        323+00.00           956.87
                       PVI        327+00.00           949.11
                       PVT        331+00.00           957.11
                      VLOW        326+93.91           953.05
                   Length:         800.0000
  Headlight Sight Distance:        810.9488
            Entrance Grade:         -1.9401
                Exit Grade:          2.0000
       r = ( g2 - g1 ) / L:          0.4925
       K = 1 / ( g2 - g1 ):        203.0429
           Middle Ordinate:          3.9401

Element: Linear
                       PVT        331+00.00           957.11
                       PVC        336+00.00           967.11
             Tangent Grade:          2.0000
            Tangent Length:        500.0000

Element: Parabola
                       PVC        336+00.00           967.11
                       PVI        341+00.00           977.11
                       PVT        346+00.00           966.11
                     VHIGH        340+76.19           971.87
                   Length:        1000.0000
   Stopping Sight Distance:        716.8550
            Entrance Grade:          2.0000
                Exit Grade:         -2.2000
       r = ( g2 - g1 ) / L:         -0.4200
       K = 1 / ( g2 - g1 ):        238.0952
           Middle Ordinate:         -5.2500

Element: Linear
                       PVT        346+00.00           966.11
                       PVC        348+50.00           960.61
             Tangent Grade:         -2.2000
            Tangent Length:        250.0000

Element: Parabola
                       PVC        348+50.00           960.61
                       PVI        354+50.00           947.41
                       PVT        360+50.00           976.65
                      VLOW        352+23.24           956.50
                   Length:        1200.0000
  Headlight Sight Distance:        691.8782
            Entrance Grade:         -2.2000
                Exit Grade:          4.8732
       r = ( g2 - g1 ) / L:          0.5894
       K = 1 / ( g2 - g1 ):        169.6555
           Middle Ordinate:         10.6097

Element: Linear
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```
                    PVT          360+50.00            976.65
                    PVC          364+50.00            996.14
         Tangent Grade:             4.8732
        Tangent Length:           400.0000

Element: Parabola
                    PVC          364+50.00            996.14
                    PVI          373+50.00           1040.00
                    PVT          382+50.00           1003.04
                  VHIGH          374+26.86           1019.94
                 Length:         1800.0000
   Stopping Sight Distance:       657.7603
        Entrance Grade:             4.8732
            Exit Grade:            -4.1063
     r = ( g2 - g1 ) / L:          -0.4989
     K = 1 / ( g2 - g1 ):         200.4580
        Middle Ordinate:          -20.2037

Element: Linear
                    PVT          382+50.00           1003.04
                    PVC          389+20.00            975.53
         Tangent Grade:            -4.1063
        Tangent Length:           670.0000

Element: Parabola
                    PVC          389+20.00            975.53
                    PVI          394+20.00            955.00
                    PVT          399+20.00            957.50
                   VLOW          398+11.43            957.23
                 Length:         1000.0000
  Headlight Sight Distance:        860.7020
        Entrance Grade:            -4.1063
            Exit Grade:             0.5001
     r = ( g2 - g1 ) / L:           0.4606
     K = 1 / ( g2 - g1 ):         217.0893
        Middle Ordinate:            5.7580

Element: Linear
                    PVT          399+20.00            957.50
                    PVC          431+35.00            973.58
         Tangent Grade:             0.5001
        Tangent Length:          3215.0000

Element: Parabola
                    PVC          431+35.00            973.58
                    PVI          436+35.00            976.08
                    PVT          441+35.00            998.64
                 Length:         1000.0000
  Headlight Sight Distance:        974.7701
        Entrance Grade:             0.5001
            Exit Grade:             4.5117
     r = ( g2 - g1 ) / L:           0.4012
     K = 1 / ( g2 - g1 ):         249.2793
        Middle Ordinate:            5.0145

Element: Linear
                    PVT          441+35.00            998.64
                    PVC          455+35.00           1061.80
         Tangent Grade:             4.5117
        Tangent Length:          1400.0000

Element: Parabola
                    PVC          455+35.00           1061.80
                    PVI          461+60.00           1090.00
                    PVT          467+85.00           1080.40
                  VHIGH          464+67.63           1082.84
                 Length:         1250.0000
   Stopping Sight Distance:       667.9467
        Entrance Grade:             4.5117
            Exit Grade:            -1.5353
     r = ( g2 - g1 ) / L:          -0.4838
     K = 1 / ( g2 - g1 ):         206.7148
```

```
          Middle Ordinate:            -9.4484

Element: Linear
                       PVT         467+85.00           1080.40
                       PVC         471+90.00           1074.19
            Tangent Grade:            -1.5353
           Tangent Length:           405.0000

Element: Parabola
                       PVC         471+90.00           1074.19
                       PVI         476+90.00           1066.51
                       PVT         481+90.00           1072.61
                      VLOW         477+47.40           1069.91
                   Length:         1000.0000
  Headlight Sight Distance:        1570.3181
           Entrance Grade:            -1.5353
               Exit Grade:             1.2191
       r = ( g2 - g1 ) / L:            0.2754
       K = 1 / ( g2 - g1 ):          363.0589
          Middle Ordinate:             3.4430

Element: Linear
                       PVT         481+90.00           1072.61
                       PVC         510+50.00           1107.47
            Tangent Grade:             1.2191
           Tangent Length:         2860.0000

Element: Parabola
                       PVC         510+50.00           1107.47
                       PVI         513+00.00           1110.52
                       PVT         515+50.00           1115.52
                   Length:           500.0000
           Entrance Grade:             1.2191
               Exit Grade:             2.0000
       r = ( g2 - g1 ) / L:            0.1562
       K = 1 / ( g2 - g1 ):          640.2706
          Middle Ordinate:             0.4881

Element: Linear
                       PVT         515+50.00           1115.52
                       PVC         527+04.56           1138.61
            Tangent Grade:             2.0000
           Tangent Length:         1154.5621

Element: Parabola
                       PVC         527+04.56           1138.61
                       PVI         533+54.56           1151.61
                       PVT         540+04.56           1112.61
                     VHIGH         530+29.56           1141.86
                   Length:         1300.0000
  Stopping Sight Distance:          592.2194
           Entrance Grade:             2.0000
               Exit Grade:            -6.0000
       r = ( g2 - g1 ) / L:           -0.6154
       K = 1 / ( g2 - g1 ):          162.5000
          Middle Ordinate:           -13.0000

Element: Linear
                       PVT         540+04.56           1112.61
                       PVC         547+57.67           1067.42
            Tangent Grade:            -6.0000
           Tangent Length:           753.1085

Element: Parabola
                       PVC         547+57.67           1067.42
                       PVI         554+07.67           1028.42
                       PVT         560+57.67           1060.92
                      VLOW         554+66.76           1046.15
                   Length:         1300.0000
  Headlight Sight Distance:          506.8957
           Entrance Grade:            -6.0000
               Exit Grade:             5.0000
```

```
      r = ( g2 - g1 ) / L:            0.8462
      K = 1 / ( g2 - g1 ):          118.1818
          Middle Ordinate:           17.8750

Element: Linear
                       PVT        560+57.67          1060.92
                       PVC        565+07.22          1083.40
            Tangent Grade:            5.0000
           Tangent Length:          449.5517

Element: Parabola
                       PVC        565+07.22          1083.40
                       PVI        570+22.22          1109.15
                       PVT        575+37.22          1088.55
                     VHIGH        570+79.44          1097.71
                   Length:        1030.0000
   Stopping Sight Distance:         496.9965
           Entrance Grade:            5.0000
               Exit Grade:           -4.0000
      r = ( g2 - g1 ) / L:           -0.8738
      K = 1 / ( g2 - g1 ):          114.4444
          Middle Ordinate:          -11.5875

Element: Linear
                       PVT        575+37.22          1088.55
                       PVC        586+75.00          1043.04
            Tangent Grade:           -4.0000
           Tangent Length:        1137.7778

Element: Parabola
                       PVC        586+75.00          1043.04
                       PVI        592+00.00          1022.04
                       PVT        597+25.00          1030.23
                      VLOW        594+30.40          1027.93
                   Length:        1050.0000
  Headlight Sight Distance:         760.3231
           Entrance Grade:           -4.0000
               Exit Grade:            1.5600
      r = ( g2 - g1 ) / L:            0.5295
      K = 1 / ( g2 - g1 ):          188.8489
          Middle Ordinate:            7.2975

Element: Linear
                       PVT        597+25.00          1030.23
                       PVC        605+00.00          1042.32
            Tangent Grade:            1.5600
           Tangent Length:         775.0000

Element: Parabola
                       PVC        605+00.00          1042.32
                       PVI        608+00.00          1047.00
                       PVT        611+00.00          1058.51
                   Length:         600.0000
  Headlight Sight Distance:       1676.5823
           Entrance Grade:            1.5600
               Exit Grade:            3.8367
      r = ( g2 - g1 ) / L:            0.3794
      K = 1 / ( g2 - g1 ):          263.5432
          Middle Ordinate:            1.7075

Element: Linear
                       PVT        611+00.00          1058.51
                       PVC        617+00.00          1081.53
            Tangent Grade:            3.8367
           Tangent Length:         600.0000

Element: Parabola
                       PVC        617+00.00          1081.53
                       PVI        620+00.00          1093.04
                       PVT        623+00.00          1101.27
                   Length:         600.0000
   Stopping Sight Distance:       1286.1280
```

```
          Entrance Grade:          3.8367
              Exit Grade:          2.7423
     r = ( g2 - g1 ) / L:         -0.1824
     K = l / ( g2 - g1 ):        548.2803
         Middle Ordinate:         -0.8207

Element: Linear
                     PVT      623+00.00          1101.27
                     PVC      647+75.31          1169.15
          Tangent Grade:          2.7423
         Tangent Length:      2475.3100

Element: Parabola
                     PVC      647+75.31          1169.15
                     PVI      652+75.31          1182.86
                     PVT      657+75.31          1175.36
                   VHIGH      654+21.71          1178.01
                  Length:     1000.0000
  Stopping Sight Distance:      713.2587
          Entrance Grade:          2.7423
              Exit Grade:         -1.5001
     r = ( g2 - g1 ) / L:         -0.4242
     K = l / ( g2 - g1 ):        235.7123
         Middle Ordinate:         -5.3031

Element: Linear
                     PVT      657+75.31          1175.36
                     PVC      689+00.31          1128.48
          Tangent Grade:         -1.5001
         Tangent Length:      3125.0000

Element: Parabola
                     PVC      689+00.31          1128.48
                     PVI      693+00.31          1122.48
                     PVT      697+00.31          1135.91
                    VLOW      691+47.39          1126.63
                  Length:      800.0000
 Headlight Sight Distance:     674.1889
          Entrance Grade:         -1.5001
              Exit Grade:          3.3570
     r = ( g2 - g1 ) / L:          0.6071
     K = l / ( g2 - g1 ):        164.7053
         Middle Ordinate:          4.8572

Element: Linear
                     PVT      697+00.31          1135.91
                     PVC      700+50.31          1147.66
          Tangent Grade:          3.3570
         Tangent Length:      350.0000

Element: Parabola
                     PVC      700+50.31          1147.66
                     PVI      706+50.31          1167.80
                     PVT      712+50.31          1131.89
                   VHIGH      704+81.53          1154.90
                  Length:     1200.0000
  Stopping Sight Distance:      526.5362
          Entrance Grade:          3.3570
              Exit Grade:         -5.9849
     r = ( g2 - g1 ) / L:         -0.7785
     K = l / ( g2 - g1 ):        128.4531
         Middle Ordinate:        -14.0129

Element: Linear
                     PVT      712+50.31          1131.89
                     PVC      723+70.31          1064.86
          Tangent Grade:         -5.9849
         Tangent Length:      1120.0000

Element: Parabola
                     PVC      723+70.31          1064.86
                     PVI      725+70.31          1052.89
```

```
                        PVT          727+70.31            1046.75
                     Length:          400.0000
  Headlight Sight Distance:          673.1399
           Entrance Grade:           -5.9849
               Exit Grade:           -3.0724
       r = ( g2 - g1 ) / L:           0.7281
       K = 1 / ( g2 - g1 ):         137.3416
           Middle Ordinate:           1.4562

Element: Linear
                        PVT          727+70.31            1046.75
                        PVC          730+50.31            1038.14
            Tangent Grade:           -3.0724
           Tangent Length:          280.0000

Element: Parabola
                        PVC          730+50.31            1038.14
                        PVI          735+50.31            1022.78
                        PVT          740+50.31            1035.22
                       VLOW          736+02.88            1029.65
                     Length:         1000.0000
  Headlight Sight Distance:          728.2467
           Entrance Grade:           -3.0724
               Exit Grade:            2.4878
       r = ( g2 - g1 ) / L:           0.5560
       K = 1 / ( g2 - g1 ):         179.8467
           Middle Ordinate:           6.9504

Element: Linear
                        PVT          740+50.31            1035.22
                        PVC          755+29.19            1072.01
            Tangent Grade:            2.4878
           Tangent Length:         1478.8848

Element: Parabola
                        PVC          755+29.19            1072.01
                        PVI          761+29.19            1086.94
                        PVT          767+29.19            1075.06
                      VHIGH          761+97.39            1080.32
                     Length:         1200.0000
   Stopping Sight Distance:          761.3733
           Entrance Grade:            2.4878
               Exit Grade:           -1.9800
       r = ( g2 - g1 ) / L:          -0.3723
       K = 1 / ( g2 - g1 ):         268.5860
           Middle Ordinate:          -6.7018

Element: Linear
                        PVT          767+29.19            1075.06
                        PVC          779+00.00            1051.88
            Tangent Grade:           -1.9800
           Tangent Length:         1170.8052

Element: Parabola
                        PVC          779+00.00            1051.88
                        PVI          782+00.00            1045.94
                        PVT          785+00.00            1042.17
                     Length:          600.0000
           Entrance Grade:           -1.9800
               Exit Grade:           -1.2556
       r = ( g2 - g1 ) / L:           0.1207
       K = 1 / ( g2 - g1 ):         828.2209
           Middle Ordinate:           0.5433

   ment: Linear
                        PVT          785+00.00            1042.17
                        PVI          787+70.00            1038.78
            Tangent Grade:           -1.2556
           Tangent Length:          270.0000

Element: Linear
                        PVI          787+70.00            1038.78
```

POE	789+45.00	1034.61
Tangent Grade:	-2.3829	
Tangent Length:	175.0000	

Subject:	KCSD SG Ds = 55 V = 213 W = 48 bw = 0.625		
Comp by: PCT/JHD Check by:		Date: Job Number:	Sheet Number:

CKC 110

PC = 194+16

PT = 200+41

R = 3249 Q

e = 0.042

L = 48(213)(0.042)(0.625) = 268 $\frac{L}{3}$ = 89

LR = 48(213)(0.022)(0.625) = 141

L2 = 128

	STA	LT	RT
BEG PRO	192+84.70	+0.042	-0.042
EFSE	199+52	+0.042	-0.042
KC 111	199+78	+0.038	-0.038

} L = 26

CKC 111

PC = 200+41

PT = 207+88

R = 3899 Q

e = 0.038 (MATCH EX)

L = 48(213)(0.038)(0.625) = 243 $\frac{L}{3}$ = 81

LR = 48(213)(0.018)(0.625) = 115

L2 = 128

	STA	LT	RT
KC 111	199+78	+0.038	-0.038
DFSE	201+22	+0.038	-0.038
EFSE	207+07	+0.038	-0.038
RC	208+22	+0.02	-0.02
	210+67	+0.02	-0.02
	211+95	0	0
NC	213+23	-0.02	+0.02

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC51B (NEW)* KC160

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	587.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	
Min. Runoff Length - pg. 181 AASHTO (L1) =	178.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	16	ft.
Rate of SE @ Full Super (SE) =	0.080	
PC Station =	225+39.36	
PT Station =	231+56.03	

CALCULATED:

		EFSE	BFSE
Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		1/2	1/2
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/2	1/2
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	60.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	238.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	223+60.00	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	224+20.00	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	224+80.00	*0.02*
PC Station =		225+39.36	*0.040*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	226+58.00	*0.080*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	230+37.00	*0.080*
PT Station =		231+56.03	*0.040*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	232+15.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	232+75.00	*0*
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	233+35.00	*-0.02*

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC53A (NEW)* (KC161)

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	822.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	164.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.074	
PC Station =	242+21.63	
PT Station =	247+36.38	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	67.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	247.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	239+90.00	*-0.02*
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	240+57.00	*0*
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	241+24.00	*0.02*
PC Station =		242+21.63	*0.049*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	243+04.00	*0.074*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	246+54.00	*0.074*
PT Station =		247+36.38	*0.049*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	248+34.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	249+01.00	~~*0*~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	249+68.00	~~*-0.02*~~

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC54*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1420.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	124.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.056	
PC Station =	255+55.85	
PT Station =	260+68.54	

CALCULATED:

		BFSE	EFSE
Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	1/2
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	1/2
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	67.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	187.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~253+64.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~254+31.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	254+98.00	0.02	
PC Station =		255+55.85	0.037	
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	256+18.00	0.056	
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	259+75.00	0.056	259+65.50
PT Station =		260+68.54	0.028	
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	260+95.00	0.02	260+75.50
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~261+62.00~~	~~0~~	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~262+29.00~~	~~-0.02~~	
Station at FLAT (btwn rev curves)		261+42.50	0	

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC55*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1432.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	124.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.056	
PC Station =	262+16.32	
PT Station =	268+70.69	

CALCULATED:

		BFSE	EFSE	
Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		1/2	2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/2	1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	67.00	ft.	
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	187.00	ft.	
*(L2) must be greater than AASHTO min. (L1)				
Station at FLAT (btwn rev curves)		261+42.50	0	
Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~260+56.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~261+23.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	~~261+90.00~~	0.02	262+09.50
PC Station =		262+16.32	0.028	
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	~~263+10.00~~	0.056	263+29.50
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	268+08.00	0.056	
PT Station =		268+70.69	0.037	
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	269+28.00	0.02	
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~269+95.00~~	~~0~~	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~270+62.00~~	~~-0.02~~	

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC56*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	3286.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	102.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.040	
PC Station =	280+81.68	
PT Station =	289+42.01	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	154.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~279+02.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~279+79.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	280+56.00	0.02
PC Station =		280+81.68	0.027
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	281+33.00	0.040
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	288+91.00	0.040
PT Station =		289+42.01	0.027
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	289+68.00	0.02
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	290+45.00	0
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	291+22.00	-0.02

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC60*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	5360.00	ft.
Design Speed =	65	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.43	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	95.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.034	
PC Station =	395+92.34	
PT Station =	423+93.81	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	85.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	143.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~394+12.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~394+97.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	395+82.00	*0.02*
PC Station =		395+92.34	*0.022*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	396+40.00	*0.034*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	423+46.00	*0.034*
PT Station =		423+93.81	*0.022*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	424+04.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~424+89.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~425+74.00~~	~~-0.02~~

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC61*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1850.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	158.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.062	
PC Station =	446+60.24	
PT Station =	450+06.96	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	238.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~444+25.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~445+02.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	445+79.00	0.02
PC Station =		446+60.24	0.041
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	447+40.00	0.062
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	449+28.00	0.062
PT Station =		450+06.96	0.041
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	450+89.00	0.02
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~451+66.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~452+43.00~~	~~-0.02~~

Station at FLAT (btwn rev curves)	453+03.50	0

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC62*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1850.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	158.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.062	
PC Station =	455+99.67	
PT Station =	462+25.18	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	238.00	ft.
*(L2) must be greater than AASHTO min. (L1)			
	Station at FLAT (btwn rev curves)	453+03.50	0
Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~453+64.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~454+41.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	455+18.00	*0.02*
PC Station =		455+99.67	*0.041*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	456+79.00	*0.062*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	461+46.00	*0.062*
PT Station =		462+25.18	*0.041*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	463+07.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	463+84.00	*0*
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	464+61.00	*-0.02*

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC64*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	2144.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	143.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.056	
PC Station =	496+55.45	
PT Station =	516+04.50	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	215.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	494+35.00	-0.02
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	495+12.00	0
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	495+89.00	0.02
PC Station =		496+55.45	0.037
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	497+27.00	0.056
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	515+33.00	0.056
PT Station =		516+04.50	0.037
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	516+71.00	0.02
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	517+48.00	0
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	518+25.00	-0.02

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC65*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	3976.00	ft.
Design Speed =	65	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.43	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	128.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.046	
PC Station =	528+84.40	
PT Station =	538+66.17	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	84.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	193.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~526+72.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~527+56.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	528+40.00	*0.02*
PC Station =		528+84.40	*0.031*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	529+49.00	*0.046*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	538+02.00	*0.046*
PT Station =		~~538+66.17~~	~~0.031~~
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	~~539+11.00~~	~~0.02~~
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~539+95.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~540+79.00~~	~~-0.02~~

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC66*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	2976.00	ft.
Design Speed =	65	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.43	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	156.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.056	
PC Station =	538+66.17	
PT Station =	550+93.81	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	84.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	235.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~530+26.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~537+10.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	~~537+94.00~~	~~0.02~~
PC Station =		~~538+66.17~~	~~0.037~~
		539+03	0.046
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	539+45.00	0.056
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	550+15.00	0.056
PT Station =		550+93.81	0.037
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	551+66.00	0.02
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~552+50.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~553+34.00~~	~~-0.02~~

Subject:	KC 50 SE NON CURVES DS = 65 MPH		
Comp by: PCT Check by:	Date: 8/20/09 Job Number:	Sheet Number:	

CURVE KC 150

PC = 624+27

PT = 628+50

R = 9570

e = 0.02

W = 24 V = 233 bw = 0.75

L = 24 (0.02)(233)(0.75) = 84 $\frac{1}{3}$ = 28

	STA	LT	RT
*NC	622+87	-0.02	+0.02
	623+71	0	0
BRC	624+55	+0.02	-0.02
ERC	628+22	+0.02	-0.02
	629+06	0	0
*NC	629+90	-0.02	+0.02

CURVE KC 151 = NC

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC69*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	2500.00	ft.
Design Speed =	60	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.45	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	155.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.058	
PC Station =	643+29.88	643+30.19
PT Station =	646+97.04	646+97.34

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3		
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3		
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	80.00		ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	232.00		ft.
*(L2) must be greater than AASHTO min. (L1)				
Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~640+95.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~641+75.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	642+55.00	0.02	642+56
PC Station =		643+29.88	0.039	643+30.19
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	644+07.00	0.058	644+08
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	646+20.00	0.058	646+20
PT Station =		646+97.04	0.039	646+97.34
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	647+72.00	0.02	647+72
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~648+52.00~~	~~0~~	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~649+32.00~~	~~-0.02~~	

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC70*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	5012.00	ft.
Design Speed =	60	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.45	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	85.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.032	CHECK 0.034
PC Station =	651+46.71	651+47.01
PT Station =	659+30.60	659+30.90

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =	2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =	1/3	
Tangent Runout (NC to Flat) =(CWO) = (NC/ SE) *L1 =	80.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =** [((w*n)*(SE*100)) / G]*b =	128.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	649+81.00	-0.02	649+76
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	650+61.00	0	650+56
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	651+41.00	0.02	651+36
PC Station =		651+46.71	0.021	651+47.01
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	651+89.00	0.034 ~~0.032~~	651+92
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	658+88.00	0.034 ~~0.032~~	658+86
PT Station =		659+30.60	0.021	659+30.90
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	659+36.00	0.02	659+42
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	660+16.00	0	660+22
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	660+96.00	-0.02	661+02

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC71*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	5200.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	71.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.028	
PC Station =	676+19.04	676+19.34
PT Station =	694+15.13	694+15.43

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	78.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	108.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~674+69.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~675+47.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	676+25.00	0.02	676+25
PC Station =		676+19.04	0.018	676+19.34
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	676+55.00	0.028	676+55
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	693+79.00	0.028	693+79
PT Station =		694+15.13	0.018	694+15.43
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	694+09.00	0.02	
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~694+87.00~~	~~0~~	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~695+65.00~~	~~-0.02~~	

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC76*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1920.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	153.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.060	
PC Station =	701+26.00	701+26.31
PT Station =	705+49.29	705+49.60

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =	2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =	1/3	
Tangent Runout (NC to Flat) =(CWO) = (NC/ SE) *L1 =	77.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =** [((w*n)*(SE*100)) / G]*b =	230.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	698+96.00	-0.02	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	699+73.00	0	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	700+50.00	0.02	
PC Station =		701+26.00	0.040	701+26.31
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	702+03.00	0.060	
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	704+73.00	0.060	
PT Station =		705+49.29	0.040	705+49.60
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	706+26.00	0.02	
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~707+03.00~~	~~0~~	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~707+80.00~~	~~-0.02~~	

Station at FLAT (btwn rev curves)	707+93	0

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC77*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	4580.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	77.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.030	
PC Station =	709+59.01	709+59.32
PT Station =	714+59.01	714+59.32

CALCULATED:

	Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =	2/3		
	Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =	1/3		
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00		ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	115.00		ft.
	*(L2) must be greater than AASHTO min. (L1)			
	Station at FLAT (btwn rev curves)	707+93	0	
Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~708+05.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~708+82.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	709+59.00	0.02	709+60
PC Station =		709+59.01	0.020	709+59.32
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	709+97.00	0.030	709+98
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	714+21.00	0.030	714+21
PT Station =		714+59.01	0.020	714+59.01
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	714+59.00	0.02	714+59
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	715+43.00	0	
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	716+20.00	-0.02	

***Sta. Eq 714+59.01BK = 714+65.95 AH**

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC78*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	4250.00	ft.
Design Speed =	55	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.47	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	2	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	0.75	
Min. Runoff Length - pg. 181 AASHTO (L1) =	82.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.032	
PC Station =	721+46.91	721+47.21
PT Station =	741+79.29	741+79.59

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3		
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3		
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	77.00		ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	123.00		ft.
*(L2) must be greater than AASHTO min. (L1)				
Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~719+88.00~~	~~-0.02~~	
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~720+65.00~~	~~0~~	
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	721+42.00	0.02	721+42
PC Station =		721+46.91	0.021	721+47.21
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	721+88.00	0.032	721+88
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	741+38.00	0.032	741+39
PT Station =		741+79.29	0.021	741+79.59
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	741+84.00	0.02	741+85
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	742+61.00	0	742+62
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	743+38.00	-0.02	743+39

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov (KC50)*

CURVE NO.: *KC80*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	4200.00	ft.
Design Speed =	65	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.43	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	
Min. Runoff Length - pg. 181 AASHTO (L1) =	117.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	12	ft.
Rate of SE @ Full Super (SE) =	0.042	
PC Station =	~~776+21.68~~	~~776+21.99~~ NEW 776+21.29
PT Station =	~~788+13.74~~	~~788+14.04~~ 788+09.39

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =	2/3		
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =	1/3		
Tangent Runout (NC to Flat) =(CWO) = (NC/ SE) *L1 =	57.00	ft.	
***Superelevation Runoff (Flat to FS) = (L2) =** [((w*n)*(SE*100)) / G]*b =	118.00	ft.	
*(L2) must be greater than AASHTO min. (L1)			

NEW					
774+86 →	**Station at End Normal Crown (ENC) =**	PC Station - (FRT)*(L)+(CWO) =	774+86.00	-0.02	774+86
775+43 →	**Station at FLAT or Begin SuperElevation (F) =**	PC Station - (FRT)*(L) =	775+43.00	0	775+43
776+00 →	**Station at Reverse Crown (RC) =**	ENC + (2*CWO) =	776+00.00	0.02	776+00
	PC Station =		776+21.68	0.028	776+21.99
776+61 →	**Station at Begin Full SuperElevation (BFSE) =**	PC Station + (FRC)*(L) =	776+61.00	0.042	776+61
787+70 →	**Station at End Full SuperElevation (EFSE) =**	PT Station - (FRC)*(L) =	787+74.00	0.042	787+75
	PT Station =		788+13.74	0.028	788+14.04
788+31 →	**Station at Reverse Crown End of Curve (RCend) =**	EFSE + (TL-CWO) =	788+35.00	0.02	788+36
788+88 →	**Station at FLAT or End SuperElevation (Fend) =**	PT Station + (FRT)*(TL) =	788+92.00	0	788+93
789+45 →	**Begin Normal Crown (BNC) =**	EFSE + (TL+CWO) =	789+49.00	-0.02	789+50

I-285 EB

(KC 1)

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285E (KC1)
Description: I-285 EB
Style: Prop Main CL

Comp: PLT
CHECK: MRM
11/12/09
REV. C

	STATION	NORTHING	EASTING
Element: Circular			
PC ( )	1200+00.00	1412308.5465	2203910.4852
PI ( )	1206+82.46	1412900.9731	2204249.2881
CC ( )		1410571.0034	2206948.7321
PT ( )	1213+48.01	1413322.7140	2204785.8430
Radius:	3500.0000		
Delta:	22^04'02" Right		
Degree of Curvature(Arc):	1^38'13"		
Length:	1348.0129		
Tangent:	682.4636		
Chord:	1339.6966		
Middle Ordinate:	64.6975		
External:	65.9160		
Tangent Direction:	N 29^45'53" E		
Radial Direction:	S 60^14'07" E		
Chord Direction:	N 40^47'54" E		
Radial Direction:	S 38^10'05" E		
Tangent Direction:	N 51^49'55" E		
Element: Linear			
PT ( )	1213+48.01	1413322.7140	2204785.8430
PC ( )	1235+61.93	1414690.8443	2206526.4309
Tangent Direction:	N 51^49'55" E		
Tangent Length:	2213.9166		
Element: Circular			
PC ( )	1235+61.93	1414690.8443	2206526.4309
PI ( )	1236+68.64	1414756.7905	2206610.3302
CC ( )		1406800.5109	2212728.3609
PT ( )	1237+75.35	1414820.9378	2206695.6129
Radius:	10036.0000		
Delta:	1^13'06" Right		
Degree of Curvature(Arc):	0^34'15"		
Length:	213.4211		
Tangent:	106.7146		
Chord:	213.4171		
Middle Ordinate:	0.5673		
External:	0.5673		
Tangent Direction:	N 51^49'55" E		
Radial Direction:	S 38^10'05" E		
Chord Direction:	N 52^26'29" E		
Radial Direction:	S 36^56'58" E		
Tangent Direction:	N 53^03'02" E		
Element: Linear			
PT ( )	1237+75.35	1414820.9378	2206695.6129
POE ( )	1240+60.44	1414992.3086	2206923.4472
Tangent Direction:	N 53^03'02" E		
Tangent Length:	285.0902		

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285E (KC1)
Description: I-285 EB
Style: Prop Main CL
Vertical Alignment Name: I-285E
Description: I-285 EB
Style: Prop Main CL

Comp: PCT

	STATION	ELEVATION
Element: Linear		
POB	1201+00.00	952.75
PVC	1203+00.00	952.23
Tangent Grade:	-0.2593	
Tangent Length:	200.0000	
Element: Parabola		
PVC	1203+00.00	952.23
PVI	1205+00.00	951.71
PVT	1207+00.00	947.48
Length:	400.0000	
Stopping Sight Distance:	781.6361	
Entrance Grade:	-0.2593	
Exit Grade:	-2.1147	
r = (g2 - g1) / L:	-0.4638	
K = 1 / (g2 - g1):	215.5904	
Middle Ordinate:	-0.9277	
Element: Linear		
PVT	1207+00.00	947.48
PVC	1219+75.00	920.52
Tangent Grade:	-2.1147	
Tangent Length:	1275.0000	
Element: Parabola		
PVC	1219+75.00	920.52
PVI	1224+00.00	911.53
PVT	1228+25.00	922.85
VLOW	1223+51.26	916.54
Length:	850.0000	
Headlight Sight Distance:	721.3896	
Entrance Grade:	-2.1147	
Exit Grade:	2.6626	
r = (g2 - g1) / L:	0.5620	
K = 1 / (g2 - g1):	177.9238	
Middle Ordinate:	5.0759	
Element: Linear		
PVT	1228+25.00	922.85
PVC	1229+00.00	924.84
Tangent Grade:	2.6626	
Tangent Length:	75.0000	
Element: Parabola		
PVC	1229+00.00	924.84
PVI	1233+00.00	935.50
PVT	1237+00.00	936.47
Length:	800.0000	
Stopping Sight Distance:	846.0483	
Entrance Grade:	2.6626	
Exit Grade:	0.2433	
r = (g2 - g1) / L:	-0.3024	
K = 1 / (g2 - g1):	330.6663	
Middle Ordinate:	-2.4194	
Element: Linear		
PVT	1237+00.00	936.47
POE	1237+13.05	936.50
Tangent Grade:	0.2433	
Tangent Length:	13.0544	

Subject:	KC6 SE / KC1 SE emax = 0.08		
Comp by: PCT Check by:	Date: 6/09/09 Job Number:	Sheet Number:	

KC6: CURVE #15 DS = 45 V = 185 W = 24 bw = 0.75

PC = 500+00 L = 24(185)(0.078)(0.75) = 260 $\frac{1}{3}$ = 87

PT = 505+60 LRC = 24(185)(0.058)(0.75) = 193

R = 750

e = 0.078

	STA	LT	RT	
BEG PRO	501+53.62	+0.07	−0.07	MATCH EXIST SE
	501+80	+0.078	−0.078	27
* EFSE	503+67	+0.078	−0.078	193
* RC	505+60	+0.02	−0.02	MATCH THRU LANE

(KC6 – SEE NEW 9/17/09 – PCT)

I: CURVE KC 1 DS = 55 V = 213 W = 48 bw = 0.625

PC = 200+00 L = 48(213)(0.038)(0.625) = 243 $\frac{1}{3}$ = 81

PT = 213+48.01 LRC = 48(213)(0.018)(0.625) = 115

R = 3500 L2 = 48(213)(0.02)(0.625) = 128

e = 0.038

	STA	LT	RT	
BEG PRO	201+00	+0.036	−0.036	MATCH EXIST SE
	201+13	+0.038	−0.038	13
EFSE	212+68	+0.038	−0.038	
RC	213+83	+0.02	−0.02	
END PRO	237+13.05	+0.02	−0.02	MATCH EXIST SE

* REVISE ALIGN STA. PC = 1200+00 7/27/09 (PCT)

XL = 200

I-285 WB

(KC 2)

Project Name: I285 ALT5
Description: ALTERNATIVE 5 — UPDATED IN C3 CALC 9/18/09 — 9/10/09
Horizontal Alignment Name: 5M2W (KC2)
Description: I-285 WB
Style: Prop Main CL

	STATION	NORTHING	EASTING
Element: Linear			
POB (KC10004)	307+53.30	1413749.7185238	2205222.8286502
PC ( )	314+61.36	1414198.6100352	2205770.4128726
Tangent Direction:	N 50^39'22" E		
Tangent Length:	708.0622		
Element: Circular			
PC ( )	314+61.36	1414198.6100352	2205770.4128726
PI (KC10005)	319+36.46	1414499.8095815	2206137.8337641
CC (CKC3)		1406843.9934441	2211799.4853383
PT ( )	324+10.77	1414762.8896841	2206533.4448581
Radius:	9510.0000		
Delta:	5^43'12" Right		
Degree of Curvature(Arc):	0^36'09"		
Length:	949.4091		
Tangent:	475.0992		
Chord:	949.0149		
Middle Ordinate:	11.8453		
External:	11.8601		
Tangent Direction:	N 50^39'22" E		
Radial Direction:	S 39^20'38" E		
Chord Direction:	N 53^30'58" E		
Radial Direction:	S 33^37'26" E		
Tangent Direction:	N 56^22'34" E		
Element: Linear			
PT ( )	324+10.77	1414762.8896841	2206533.4448581
POE (KC10006)	331+66.69	1415181.4720000	2207162.8950000
Tangent Direction:	N 56^22'34" E		
Tangent Length:	755.9224		

COMP: PCT
CHECK: MRM 11/13/09
REV. C

OLD KC2
DEL PT- KC 10004 TO 10012, 10082
DEL C- KC3 TO KC9, KC42

```
        Project Name: I285 ALT5
         Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W (KC2)
         Description: I-285 WB
               Style: Prop Main CL
  Vertical Alignment Name: 5M2W (KC2)
         Description: I-285WB RELOCATION
               Style: Prop Main CL
                                    STATION          ELEVATION

Element: Parabola
                     PVC          310+18.49            917.11
                     PVI          312+98.49            914.19
                     PVT          315+78.49            921.39
                    VLOW          311+80.16            916.27
                 Length:           560.0000
  Headlight Sight Distance:        649.9023
          Entrance Grade:           -1.0437
              Exit Grade:            2.5716
      r = ( g2 - g1 ) / L:           0.6456
      K = 1 / ( g2 - g1 ):         154.8948
         Middle Ordinate:            2.5308

Element: Linear
                     PVT          315+78.49            921.39
                     PVC          316+30.00            922.71
           Tangent Grade:            2.5716
          Tangent Length:           51.5100

Element: Parabola
                     PVC          316+30.00            922.71
                     PVI          320+30.00            933.00
                     PVT          324+30.00            936.16
                 Length:           800.0000
   Stopping Sight Distance:       1006.0410
          Entrance Grade:            2.5716
              Exit Grade:            0.7910
      r = ( g2 - g1 ) / L:          -0.2226
      K = 1 / ( g2 - g1 ):         449.2728
         Middle Ordinate:           -1.7807

Element: Linear
                     PVT          324+30.00            936.16
                     PVC          324+87.25            936.62
           Tangent Grade:            0.7910
          Tangent Length:           57.2512

Element: Parabola
                     PVC          324+87.25            936.62
                     PVI          326+37.25            937.80
                     PVT          327+87.25            936.05
                   VHIGH          326+08.45            937.10
                 Length:           300.0000
   Stopping Sight Distance:        701.2125
          Entrance Grade:            0.7910
              Exit Grade:           -1.1668
      r = ( g2 - g1 ) / L:          -0.6526
      K = 1 / ( g2 - g1 ):         153.2352
         Middle Ordinate:           -0.7342

Element: Linear
                     PVT          327+87.25            936.05
                     PVC          329+35.96            934.32
           Tangent Grade:           -1.1668
          Tangent Length:          148.7091

Element: Parabola
                     PVC          329+35.96            934.32
                     PVI          330+35.96            933.15
                     PVT          331+35.96            931.36
                 Length:           200.0000
   Stopping Sight Distance:       1820.9864
          Entrance Grade:           -1.1668
              Exit Grade:           -1.7939
      r = ( g2 - g1 ) / L:          -0.3135
```

K = 1 / (g2 - g1):	318.9521
Middle Ordinate:	-0.1568

Element: Linear

PVT	331+35.96	931.36
POE	331+66.63	930.81
Tangent Grade:	-1.7939	
Tangent Length:	30.6716	

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W (KC2)
Description: I-285 WB
Style: Prop Main CL
Vertical Alignment Name: 5M2W (KC2)
Description: I-285WB RELOCATION
Style: Prop Main CL

ADDED TO O: 10-19-09
C: 10-19-09

10/16/09

Comp: PCT

	STATION	ELEVATION
Element: Parabola		
PVC	310+18.49	917.34
PVI	312+98.49	914.16
PVT	315+78.49	921.37
VLOW	311+89.97	916.36
Length:	560.0000	
Headlight Sight Distance:	631.2555	
Entrance Grade:	-1.1374	
Exit Grade:	2.5770	
r = (g2 - g1) / L:	0.6633	
K = 1 / (g2 - g1):	150.7653	
Middle Ordinate:	2.6001	
Element: Linear		
PVT	315+78.49	921.37
PVC	317+00.00	924.50
Tangent Grade:	2.5770	
Tangent Length:	121.5100	
Element: Parabola		
PVC	317+00.00	924.50
PVI	319+00.00	929.66
PVRC	321+00.00	932.34
Length:	400.0000	
Stopping Sight Distance:	1073.9344	
Entrance Grade:	2.5770	
Exit Grade:	1.3422	
r = (g2 - g1) / L:	-0.3087	
K = 1 / (g2 - g1):	323.9343	
Middle Ordinate:	-0.6174	
Element: Parabola		
PVRC	321+00.00	932.34
PVI	322+00.00	933.68
PVT	323+00.00	935.68
Length:	200.0000	
Entrance Grade:	1.3422	
Exit Grade:	2.0000	
r = (g2 - g1) / L:	0.3289	
K = 1 / (g2 - g1):	304.0271	
Middle Ordinate:	0.1645	
Element: Linear		
PVT	323+00.00	935.68
PVC	323+61.24	936.91
Tangent Grade:	2.0000	
Tangent Length:	61.2357	
Element: Parabola		
PVC	323+61.24	936.91
PVI	325+81.24	941.31
PVT	328+01.24	937.36
VHIGH	325+93.19	939.23
Length:	440.0000	
Stopping Sight Distance:	504.4462	
Entrance Grade:	2.0000	
Exit Grade:	-1.7939	
r = (g2 - g1) / L:	-0.8622	
K = 1 / (g2 - g1):	115.9767	
Middle Ordinate:	-2.0866	
Element: Linear		

PVT	328+01.24	937.36
POE	331+66.63	930.81
Tangent Grade:	-1.7939	
Tangent Length:	365.3962	

PBS&J

Subject:	KC2 SE 5M 2W - UPDATED C:CAICE 9/18/09		
Comp by: PCT	Date: 9/4/09	Sheet Number:	
Check by:	Job Number:		

CURVE 7

PC = 314+61

PT = 324+11

R = 9510

e = 0.02

DS = 55 V = 213

L = 48(0.02)(213)(0.625) = 128 $\frac{1}{3}$ = 43

	STA	LT	RT
NC	310+18.49	-0.02	+0.02
NC	312+48	-0.02	+0.02
FLAT	313+76	0	0
RC/BPSE	315+04	+0.02	-0.02
RC/EPSE	323+68	+0.02	-0.02
	331+39	+0.02	-0.02
MATCH	331+66.63	+0.027	-0.027

} L = 24(0.007)(213)(0.75) = 27

- DEL KC2SE 1-34
- ADD KC2SE 1-7

CD from US41 TO I-285 RAMP Y (KC 3, 5, 107)

PRINTED 07-07-09

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: CD1 (KC3)
             Description: FROM US 41 TO I-75
                   Style: Default
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )              100+00.00  1412990.0233  2204702.2875
             PC (        )              103+88.17  1413285.8288  2204953.6351
        Tangent Direction:          N 40^21'17" E
           Tangent Length:                 388.17

Element: Circular
             PC (  KC10   )              103+88.17  1413285.8288  2204953.6351
             PI (        )              104+87.26  1413361.3429  2205017.8000
             CC (        )                         1412689.4644  2205655.4831
             PT (        )              105+85.60  1413421.4794  2205096.5599
                 Radius:                    921.00
                  Delta:                 12^16'55" Right
  Degree of Curvature(Arc):               6^13'16"
                 Length:                    197.43
                Tangent:                     99.09
                  Chord:                    197.05
          Middle Ordinate:                    5.29
                 External:                    5.32
        Tangent Direction:          N 40^21'17" E
         Radial Direction:          S 49^38'43" E
          Chord Direction:          N 46^29'45" E
         Radial Direction:          S 37^21'48" E
        Tangent Direction:          N 52^38'12" E

Element: Linear
             PT (        )              105+85.60  1413421.4794  2205096.5599
             PC (        )              113+61.05  1413892.0747  2205712.8930
        Tangent Direction:          N 52^38'12" E
           Tangent Length:                 775.45

Element: Circular
             PC (  KC11   )              113+61.05  1413892.0747  2205712.8930
             PI (        )              114+94.57  1413973.1012  2205819.0125
             CC (        )                         1411404.3365  2207612.3820
             PT (        )              116+27.92  1414044.7964  2205931.6467
                 Radius:                   3130.00
                  Delta:                  4^53'07" Right
  Degree of Curvature(Arc):               1^49'50"
                 Length:                    266.87
                Tangent:                    133.52
                  Chord:                    266.79
          Middle Ordinate:                    2.84
                 External:                    2.85
        Tangent Direction:          N 52^38'12" E
         Radial Direction:          S 37^21'48" E
          Chord Direction:          N 55^04'46" E
         Radial Direction:          S 32^28'41" E
        Tangent Direction:          N 57^31'19" E

Element: Linear
             PT (        )              116+27.92  1414044.7964  2205931.6467
            POE (        )              121+00.00  1414298.2911  2206329.8906
        Tangent Direction:          N 57^31'19" E
           Tangent Length:                 472.08
```

Comp: PCT
CHECK: MRM
11/14/09
REV. C

Project Name: I-75 CUMBERLAND
Description: INTERCHANGE AT I-285
Horizontal Alignment Name: CD1 (KC3)
Description: FROM US 41 TO I-75
Style: Prop Main CL
Vertical Alignment Name: CD1
Description: FROM US 41 TO I-75
Style: Prop Main CL

Comp: PCT

	STATION	ELEVATION
Element: Parabola		
PVC	102+00.00	916.94
PVI	102+75.00	917.69
PVT	103+50.00	919.15
Length:	150.00	
Entrance Grade:	1.0000	
Exit Grade:	1.9569	
r = (g2 - g1) / L:	0.6379	
K = l / (g2 - g1):	156.7562	
Middle Ordinate:	0.18	
Element: Linear		
PVT	103+50.00	919.15
PVC	103+75.00	919.64
Tangent Grade:	1.9569	
Tangent Length:	25.00	
Element: Parabola		
PVC	103+75.00	919.64
PVI	106+50.00	925.02
PVT	109+25.00	918.87
VHIGH	106+31.63	922.15
Length:	550.00	
Stopping Sight Distance:	532.01	
Entrance Grade:	1.9569	
Exit Grade:	-2.2371	
r = (g2 - g1) / L:	-0.7625	
K = l / (g2 - g1):	131.1398	
Middle Ordinate:	-2.88	
Element: Linear		
PVT	109+25.00	918.87
PVC	110+80.00	915.41
Tangent Grade:	-2.2371	
Tangent Length:	155.00	
Element: Parabola		
PVC	110+80.00	915.41
PVI	112+00.00	912.72
PVT	113+20.00	913.59
VLOW	112+61.22	913.38
Length:	240.00	
Headlight Sight Distance:	458.07	
Entrance Grade:	-2.2371	
Exit Grade:	0.7257	
r = (g2 - g1) / L:	1.2345	
K = l / (g2 - g1):	81.0052	
Middle Ordinate:	0.89	
Element: Linear		
PVT	113+20.00	913.59
PVC	114+07.00	914.22
Tangent Grade:	0.7257	
Tangent Length:	87.00	
ment: Parabola		
PVC	114+07.00	914.22
PVI	115+50.00	915.26
PVT	116+93.00	909.62
VHIGH	114+51.43	914.38
Length:	286.00	
Stopping Sight Distance:	374.04	

Entrance Grade:	0.7257
Exit Grade:	-3.9452
r = (g2 - g1) / L:	-1.6332
K = l / (g2 - g1):	61.2305
Middle Ordinate:	-1.67

Element: Linear

PVT	116+93.00	909.62
PVC	119+00.00	901.45
Tangent Grade:	-3.9452	
Tangent Length:	207.00	

Element: Parabola

PVC	119+00.00	901.45
PVI	119+95.00	897.70
PVT	120+90.00	895.60
Length:	190.00	
Entrance Grade:	-3.9452	
Exit Grade:	-2.2158	
r = (g2 - g1) / L:	0.9102	
K = l / (g2 - g1):	109.8625	
Middle Ordinate:	0.41	

Subject:	KC 3 SE / KC 5 SE $e_{max}=0.08$		
Comp by: PCT	Date: 6/10/09	Sheet Number:	
Check by:	Job Number:		

KC 3:

CURVE KC10 — DS=45 — V=185 — W=24 — bw=0.75

PC = 103+88.17 — L = 24(185)(0.072)(0.75) = 240 — $\frac{1}{3}$ = 80

PT = 105+85.60 — L_{RC} = 24(185)(0.052)(0.75) = 173

R = 921 — L_2 = 24(185)(0.02)(0.75) = 67

e = 0.072

	STA	LT	RT	
	102+00	+0.01	−0.01	MATCH EX SE
	102+33	+0.02	−0.02	33
TRC	102+95	+0.02	−0.02	
BFSE	104+68	+0.072	−0.072	
EFSE	105+06	+0.072	−0.072	
RC	106+79	+0.02	−0.02	

CURVE KC 11 — DS=45 — V=185 — W=24 — bw=0.75

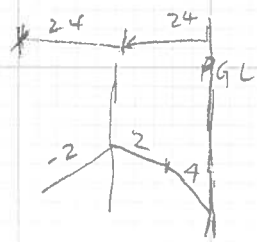
PC = 113+61.05 — L = 24(185)(0.03)(0.75) = 100 — $\frac{1}{3}$ = 33

PT = 116+27.92 — L_{RC} = 24(185)(0.01)(0.75) = 33

R = 3130

e = 0.03

	STA	LT	RT	
RC	113+61	+0.02	−0.02	
	110+94	+0.02	−0.02	
BFSE	113+94	+0.03	−0.03	PROJECT TO KC5
EFSE	115+95	+0.03	−0.03	
RC	116+28	+0.02	−0.02	



KC5: — DS=45 — V=185 — W=24 — bw=0.75

	STA	LT	RT	
	213+57.89	+0.02	−0.02	
	213+91.87	+0.02	−0.03	(SEE KC3)
	215+95	+0.02	−0.03	
	216+27.92	+0.02	−0.02	
FLAT	216+95	0	−0.02	
RC	217+62	−0.02	−0.02	
	220+00	−0.02	−0.02	(MATCH EX)

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285E EX1 (KC5)
Description: I-285 EB TO I-75
Style: Prop Main CL

PRINTED 11-3-09
- ALIGN EXTENDED BY JEK
COMP: PCT/JEK
CHECK: MRM
11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Linear			
POB ( )	207+31.16	1413566.3629	2205173.4965
PC ( )	213+05.26	1413888.7924	2205648.5089
Tangent Direction:	N 55^49'55" E		
Tangent Length:	574.1059		
Element: Circular			
PC (KC14)	213+05.26	1413888.7924	2205648.5089
PI ( )	214+26.20	1413956.7119	2205748.5698
CC ( )		1407104.1521	2210253.7947
PT ( )	215+47.11	1414021.6510	2205850.5902
Radius:	8200.0000		
Delta:	1^41'24" Right		
Degree of Curvature(Arc):	0^41'55"		
Length:	241.8523		
Tangent:	120.9349		
Chord:	241.8436		
Middle Ordinate:	0.8916		
External:	0.8917		
Tangent Direction:	N 55^49'55" E		
Radial Direction:	S 34^10'05" E		
Chord Direction:	N 56^40'37" E		
Radial Direction:	S 32^28'41" E		
Tangent Direction:	N 57^31'19" E		
Element: Linear			
PT ( )	215+47.11	1414021.6510	2205850.5902
POE ( )	231+85.88	1414901.6288	2207233.0483
Tangent Direction:	N 57^31'19" E		
Tangent Length:	1638.7651		

* SE SEE KC3 (CD FROM US41) - CALC.

Comp: PCT


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285E EX1
             Description: I-285 EB TO I-75
                   Style: Prop Main CL
  Vertical Alignment Name: I-285E EX1
             Description: EB EXIT RAMP TO I-75
                   Style: Prop Main CL
                                     STATION          ELEVATION

Element: Parabola
                     PVC          213+57.89             914.87
                     PVI          214+67.89             915.02
                     PVT          215+77.89             911.20
                   VHIGH          213+66.02             914.88
                 Length:             220.00
   Stopping Sight Distance:          409.78
          Entrance Grade:            0.1330
              Exit Grade:           -3.4668
      r = ( g2 - g1 ) / L:          -1.6363
      K = 1 / ( g2 - g1 ):          61.1137
         Middle Ordinate:             -0.99

Element: Linear
                     PVT          215+77.89             911.20
                     PVC          218+00.00             903.50
           Tangent Grade:           -3.4668
          Tangent Length:            222.11

Element: Parabola
                     PVC          218+00.00             903.50
                     PVI          219+00.00             900.04
                     PVT          220+00.00             898.23
                 Length:             200.00
          Entrance Grade:           -3.4668
              Exit Grade:           -1.8102
      r = ( g2 - g1 ) / L:           0.8283
      K = 1 / ( g2 - g1 ):         120.7284
         Middle Ordinate:              0.41
```

PRINTED 11-3-09
- ALIGN EXTENDED BY JEK

COMP: PCT/JEK

CHECK: MRM
11/14/09
REV. C

```
          Project Name: I285 ALT5
           Description: ALTERNATIVE 5
Horizontal Alignment Name: 5CCP2E (KC107)
           Description: CD FROM US41 TO I285E
                 Style: Prop Main CL
                                    STATION      NORTHING       EASTING

Element: Linear
          POB (        )          2251+03.89  1415076.2387  2207534.2853
           PC (        )          2261+47.90  1415641.9070  2208411.7696
     Tangent Direction:       N 57^11'32" E
        Tangent Length:            1044.0112

Element: Circular
           PC ( KC 217  )          2261+47.90  1415641.9070  2208411.7696
           PI (        )          2269+69.34  1416086.9804  2209102.1829
           CC (        )                      1421661.5195  2204531.2400
           PT (        )          2277+83.63  1416676.8124  2209673.8988
               Radius:             7162.0000
                Delta:             13^05'09" Left
  Degree of Curvature(Arc):         0^48'00"
               Length:             1635.7290
              Tangent:              821.4383
                Chord:             1632.1762
       Middle Ordinate:               46.6473
             External:                46.9531
     Tangent Direction:       N 57^11'32" E
      Radial Direction:       S 32^48'28" E
       Chord Direction:       N 50^38'58" E
      Radial Direction:       S 45^53'37" E
     Tangent Direction:       N 44^06'23" E

Element: Linear
           PT (        )          2277+83.63  1416676.8124  2209673.8988
          POE (        )          2287+42.41  1417365.2655  2210341.2068
     Tangent Direction:       N 44^06'23" E
        Tangent Length:             958.7845
```

ADDED TO C: CALCS - 9/18/09

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5CCP2E (KC107)
Description: CD FROM US41 TO I285E
Style: Prop Main CL

Comp: PCT

	STATION	NORTHING	EASTING
Element: Linear			
POB (KC12030)	2253+32.62	1415200.1698773	2207726.5316213
PC ( )	2261+47.90	1415641.9070076	2208411.7696169
Tangent Direction:	N 57^11'32" E		
Tangent Length:	815.2808		
Element: Circular			
PC ( )	2261+47.90	1415641.9070076	2208411.7696169
PI (KC12031)	2269+69.34	1416086.9803764	2209102.1829017
CC (CKC217)		1421661.5194532	2204531.2400133
PT ( )	2277+83.63	1416676.8123568	2209673.8987773
Radius:	7162.0000		
Delta:	13^05'09" Left		
Degree of Curvature(Arc):	0^48'00"		
Length:	1635.7290		
Tangent:	821.4383		
Chord:	1632.1762		
Middle Ordinate:	46.6473		
External:	46.9531		
Tangent Direction:	N 57^11'32" E		
Radial Direction:	S 32^48'28" E		
Chord Direction:	N 50^38'58" E		
Radial Direction:	S 45^53'37" E		
Tangent Direction:	N 44^06'23" E		
Element: Linear			
PT ( )	2277+83.63	1416676.8123568	2209673.8987773
POE (KC12032)	2287+42.41	1417365.2654922	2210341.2067569
Tangent Direction:	N 44^06'23" E		
Tangent Length:	958.7845		

0.02 MATCH EX

SE

CURVE KCC217 DS = 45 (KC107 SG1-705)

L = 24(185)(0.02)(0.75) = 67 $\frac{1}{3}$ = 22

STA	LT	RT	
2253+33	-0.02	-0.02	(MATCH EX)
2260+36	-0.02	-0.02	
2261+03	-0.02	0	
2261+70	-0.02	+0.02	
2272+31	-0.02	+0.02	
2272+81	0	0	
2273+51	+0.02	-0.02	(MATCH KC100)
2287+42	+0.02	-0.02	

SEE LAST PAGE (10-22-09)

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5CCP2E (KC107)
Description: CD FROM US41 TO I285E
Style: Prop Main CL
Vertical Alignment Name: 5CCP2E
Description: KC107
Style: Prop Main CL

COMP: PCT

	STATION	ELEVATION
Element: Linear		
POB	2255+00.00	859.56
PVC	2256+25.00	858.46
Tangent Grade:	-0.8850	
Tangent Length:	125.0000	
Element: Parabola		
PVC	2256+25.00	858.46
PVI	2257+75.00	857.13
PVT	2259+25.00	858.52
VLOW	2257+71.81	857.81
Length:	300.0000	
Headlight Sight Distance:	8048.8314	
Entrance Grade:	-0.8850	
Exit Grade:	0.9235	
r = (g2 - g1) / L:	0.6029	
K = l / (g2 - g1):	165.8785	
Middle Ordinate:	0.6782	
Element: Linear		
PVT	2259+25.00	858.52
PVC	2260+00.00	859.21
Tangent Grade:	0.9235	
Tangent Length:	75.0000	
Element: Parabola		
PVC	2260+00.00	859.21
PVI	2261+00.00	860.13
PVT	2262+00.00	860.73
Length:	200.0000	
Stopping Sight Distance:	3397.8731	
Entrance Grade:	0.9235	
Exit Grade:	0.5963	
r = (g2 - g1) / L:	-0.1636	
K = l / (g2 - g1):	611.1981	
Middle Ordinate:	-0.0818	
Element: Linear		
PVT	2262+00.00	860.73
PVC	2266+00.00	863.11
Tangent Grade:	0.5963	
Tangent Length:	400.0000	
Element: Parabola		
PVC	2266+00.00	863.11
PVI	2267+00.00	863.71
PVT	2268+00.00	863.42
VHIGH	2267+34.28	863.51
Length:	200.0000	
Stopping Sight Distance:	1315.0607	
Entrance Grade:	0.5963	
Exit Grade:	-0.2918	
r = (g2 - g1) / L:	-0.4441	
K = l / (g2 - g1):	225.1884	
Middle Ordinate:	-0.2220	
Element: Linear		
PVT	2268+00.00	863.42
PVC	2270+50.41	862.69
Tangent Grade:	-0.2918	
Tangent Length:	250.4100	
Element: Parabola		
PVC	2270+50.41	862.69
PVI	2271+50.41	862.39

PVT	2272+50.41	863.25
VLOW	2271+01.19	862.61
Length:	200.0000	
Entrance Grade:	-0.2918	
Exit Grade:	0.8575	
r = (g2 - g1) / L:	0.5747	
K = 1 / (g2 - g1):	174.0117	
Middle Ordinate:	0.2873	

Element: Linear

PVT	2272+50.41	863.25
POE	2273+50.41	864.11
Tangent Grade:	0.8575	
Tangent Length:	100.0000	

(10-22-09)

SE
L2 = 45

(KC107 SE 1-9)

STA	LT	RT	
2253+33	+0.02	-0.02	
2254+42	+0.02	-0.02	
2254+87	0	-0.02	EX FLAT
2255+32	-0.02	0	EX FLAT
2255+77	-0.02	+0.02	

2272+31	-0.02	+0.02	
2272+91	0	0	
2273+51	+0.02	-0.02	(MATCH KC100)
2274+42	+0.02	-0.02	

Ramp AA
(KC 6)

PRINTED 07-07-09

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285W ENT1 (KC6)
Description: I-75 SB TO I-285
Style: Default

COMP: PCT
CHECK: MRM 11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Circular			
PC (KC15)	500+00.00	1415275.1994	2206693.1917
PI ( )	502+93.81	1414984.1572	2206652.9563
CC ( )		1415377.9069	2205950.2575
PT ( )	505+60.06	1414797.8898	2206425.7364
Radius:	750.00		
Delta:	42^47'07" Right		
Degree of Curvature(Arc):	7^38'22"		
Length:	560.06		
Tangent:	293.81		
Chord:	547.14		
Middle Ordinate:	51.67		
External:	55.50		
Tangent Direction:	S 7^52'16" W		
Radial Direction:	N 82^07'44" W		
Chord Direction:	S 29^15'49" W		
Radial Direction:	N 39^20'38" W		
Tangent Direction:	S 50^39'22" W		
Element: Linear			
PT ( )	505+60.06	1414797.8898	2206425.7364
POE ( )	517+21.78	1414061.3913	2205527.3122
Tangent Direction:	S 50^39'22" W		
Tangent Length:	1161.72		

- 9/21/09 - ADDED TO C:CALC -S

COMP: PCT

```
            Project Name: I285 ALT5
             Description: ALTERNATIVE 5
Horizontal Alignment Name: I-285W ENT1 (KC6)
             Description: I-75 SB TO I-285 WB
                   Style: Prop Main CL
  Vertical Alignment Name: I-285W ENT1
             Description: I-75 SB TO I-285 WB
                   Style: Prop Main CL
                                     STATION          ELEVATION

Element: Linear
                     POB          501+53.62            948.01
                     PVC          503+13.73            942.18
          Tangent Grade:            -3.6400
         Tangent Length:           160.1105

Element: Parabola
                     PVC          503+13.73            942.18
                     PVI          504+53.73            937.08
                    PVRC          505+93.73            936.32
                  Length:          280.0000
  Headlight Sight Distance:        471.4693
          Entrance Grade:           -3.6400
              Exit Grade:           -0.5475
      r = ( g2 - g1 ) / L:           1.1045
      K = 1 / ( g2 - g1 ):          90.5414
         Middle Ordinate:            1.0824

Element: Parabola
                    PVRC          505+93.73            936.32
                     PVI          506+68.73            935.91
                     PVT          507+43.73            934.72
                  Length:          150.0000
   Stopping Sight Distance:       1117.6326
          Entrance Grade:           -0.5475
              Exit Grade:           -1.5825
      r = ( g2 - g1 ) / L:          -0.6900
      K = 1 / ( g2 - g1 ):         144.9241
         Middle Ordinate:           -0.1941
```

PBSJ

Subject:	KC 6 SE $e_{max} = 0.08$		
Comp by: PCT	Date: 9/17/09	Sheet Number:	
Check by:	Job Number:		

Curve KC 15

PC = 500+00

PT = 505+60

R = 750

e = 0.078

DS = 45 V = 185 W = 24 b_w = 0.75

L = 24(185)(0.078)(0.75) = 260 $\frac{L}{2}$ = 130

L_R = 24(185)(0.058)(0.75) = 193

L_2 = 24(185)(0.02)(0.75) = 67

	STA	LT	RT	
BEG PRO	501+53.62	+0.07	−0.07	MATCH EX SE
	501+80	+0.078	−0.078	
ET-SE	504+30	+0.078	−0.078	
RC	506+23	+0.02	−0.02	
FLAT	506+90	0	0	
RC	507+57	−0.02	+0.02	MATCH KC2

Ramp AC
(KC 103)

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 10R2W7N (KC103)
Description: RAMP FROM I285W TO I75N
Style: Prop Main CL

9/10/09

Comp: PCT
CHECK: MJZM
11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Linear			
POB (KC12017)	50+00.00	1417633.3948	2232103.6900
PC ( )	51+00.00	1417561.3901	3862210299.6100852
Tangent Direction:	S 43^56'30" W		
Tangent Length:	100.0000		
Element: Circular KC210			
PC ( )	51+00.00	1417561.3901	3862210299.6100852
PI (KC1201B)	54+78.75	1417288.6717	9662210036.7852336
CC (CKC210)		1424306.3456	7902203300.7548389
PCC ( )	58+57.12	1417037.2318	5302209753.5359591
Radius:	9720.0000		
Delta:	4^27'47" Right		
Degree of Curvature(Arc):	0^35'22"		
Length:	757.1186		
Tangent:	378.7508		
Chord:	756.9272		
Middle Ordinate:	7.3708		
External:	7.3764		
Tangent Direction:	S 43^56'30" W		
Radial Direction:	N 46^03'30" W		
Chord Direction:	S 46^10'23" W		
Radial Direction:	N 41^35'43" W		
Tangent Direction:	S 48^24'17" W		
Element: Circular KC 211			
PCC ( )	58+57.12	1417037.2318	0822209753.5359087
PI (KC12019)	62+14.47	1416799.9957	4572209486.2874219
CC (CKC211)		1420671.7887	6602206527.1453990
PCC ( )	65+70.55	1416604.4013	3332209187.2129681
Radius:	4860.0000		
Delta:	8^24'39" Right		
Degree of Curvature(Arc):	1^10'44"		
Length:	713.4264		
Tangent:	357.3551		
Chord:	712.7860		
Middle Ordinate:	13.0851		
External:	13.1204		
Tangent Direction:	S 48^24'17" W		
Radial Direction:	N 41^35'43" W		
Chord Direction:	S 52^36'36" W		
Radial Direction:	N 33^11'05" W		
Tangent Direction:	S 56^48'55" W		
Element: Circular KC 212			
PCC ( )	65+70.55	1416604.4013	3332209187.2129681
PI (KC12020)	69+47.83	1416397.8965	4512208871.4559589
CC (CKC212)		1418638.0950	4962207857.1791836
PT ( )	73+19.15	1416296.8562	4892208507.9486344
Radius:	2430.0000		
Delta:	17^39'03" Right		
Degree of Curvature(Arc):	2^21'28"		
Length:	748.6001		
Tangent:	377.2886		
Chord:	745.6434		
Middle Ordinate:	28.7703		
External:	29.1150		
Tangent Direction:	S 56^48'55" W		
Radial Direction:	N 33^11'05" W		
Chord Direction:	S 65^38'27" W		
Radial Direction:	N 15^32'02" W		
Tangent Direction:	S 74^27'58" W		
Element: Linear			
PT ( )	73+19.15	1416296.8562	4892208507.9486344

POE (1CC/2021) 73+36.12 1416292.30946162208491.5908982
Tangent Direction: S 74^27'58" W
Tangent Length: 16.9779

Project Name: I285 ALT5
Description: ALTERNATIVE 5 KC103

9/11/09
COMP: PCT

Horizontal Alignment Name: 10R2W7N
Description: RAMP FROM I285W TO I75N
Style: Prop Main CL
Vertical Alignment Name: 10R2W7N
Description: I285W OFF RAMP TO I75 N
Style: Prop Main CL

	STATION	ELEVATION
Element: Linear		
POB	51+00.00	878.15
PVC	54+00.00	874.79
Tangent Grade:	-1.1200	
Tangent Length:	300.0000	
Element: Parabola		
PVC	54+00.00	874.79
PVI	55+00.00	873.67
PVRC	56+00.00	872.04
Length:	200.0000	
Stopping Sight Distance:	2226.7434	
Entrance Grade:	-1.1200	
Exit Grade:	-1.6274	
r = (g2 - g1) / L:	-0.2537	
K = l / (g2 - g1):	394.1515	
Middle Ordinate:	-0.1269	
Element: Parabola		
PVRC	56+00.00	872.04
PVI	57+00.00	870.42
PVT	58+00.00	869.50
Length:	200.0000	
Entrance Grade:	-1.6274	
Exit Grade:	-0.9149	
r = (g2 - g1) / L:	0.3563	
K = l / (g2 - g1):	280.6921	
Middle Ordinate:	0.1781	
Element: Linear		
PVT	58+00.00	869.50
PVC	61+00.00	866.76
Tangent Grade:	-0.9149	
Tangent Length:	300.0000	
Element: Parabola		
PVC	61+00.00	866.76
PVI	62+00.00	865.84
PVT	63+00.00	864.23
Length:	200.0000	
Stopping Sight Distance:	1652.9454	
Entrance Grade:	-0.9149	
Exit Grade:	-1.6098	
r = (g2 - g1) / L:	-0.3475	
K = l / (g2 - g1):	287.8089	
Middle Ordinate:	-0.1737	
Element: Linear		
PVT	63+00.00	864.23
PVC	65+00.00	861.01
Tangent Grade:	-1.6098	
Tangent Length:	200.0000	
Element: Parabola		
PVC	65+00.00	861.01
PVI	66+00.00	859.40
PVT	67+00.00	858.90
Length:	200.0000	
Entrance Grade:	-1.6098	
Exit Grade:	-0.5000	
r = (g2 - g1) / L:	0.5549	
K = l / (g2 - g1):	180.2126	

Middle Ordinate:	0.2775	

Element: Linear

PVT	67+00.00	858.90
PVC	68+65.00	858.08
Tangent Grade:	-0.5000	
Tangent Length:	165.0000	

Element: Parabola

PVC	68+65.00	858.08
PVI	70+50.00	857.15
PVT	72+35.00	862.16
VLOW	69+22.67	857.93
Length:	370.0000	
Headlight Sight Distance:	544.1798	
Entrance Grade:	-0.5000	
Exit Grade:	2.7082	
r = (g2 - g1) / L:	0.8671	
K = l / (g2 - g1):	115.3301	
Middle Ordinate:	1.4838	

Element: Linear

PVT	72+35.00	862.16
POE	73+36.12	864.90
Tangent Grade:	2.7082	
Tangent Length:	101.1230	

PBSJ

Subject:	10R 2W 7N / 10R 2W 7S (KC103) (KC104)		
Comp by: PCT	Date: 9/10/09	Sheet Number:	
Check by:	Job Number:		

CURVE 1 = NC

CURVE 2 DS=55 V=213

PC = 58+57

PT = 65+71 L = 36 (0.03)(213)(0.67) = 154 $\frac{1}{3}$ = 52

R = 4860 L_R = 36 (0.01)(213)(0.67) = 52

e = 0.03

	STA	LT	RT
MATCH	51+00	+0.02	-0.02
NC/RC	~~58+57~~	+0.02	-0.02
BFSE	59+09	+0.03	-0.03
EFSE	65+19	+0.03	-0.03
*	66+32	+0.052	-0.052

EXSE 56+44 +0.02 -0.02

57+00 +0.03 -0.03

} ROTATE TO MATCH CURVE 3

L = 36(0.022)(213)(0.67) = 113

CURVE 3 BEG

PC = 65+71 L = 36 (0.052)(213)(0.67) = 267 $\frac{1}{3}$ = 89

PT = 73+19 L_R = 36 (0.032)(213)(0.67) = 164

R = 2430 L_2 = 36 (0.02)(213)(0.67) = 103

e = 0.052

L = 24 (0.052)(213)(0.75) = 200

$\frac{1}{2}$ = 100

	STA	LT	RT
*	66+32	+0.052	-0.052
BFSE	66+60	+0.052	-0.052
EFSE	72+19	+0.052	-0.052
MATCH	73+34	+0.022	-0.022

(USE $\frac{1}{2}$ TRANSITION TO GET BACK TO EXIST)

L = 24 (0.03)(213)(0.75) = 115

(KC104) CURVE 1

PC = 169+55 R = 4012

PT = 172+09 e = 0.034

L = 24 (0.034)(213)(0.75) = 130 $\frac{1}{3}$ = 43

	STA	LT	RT
MATCH	169+56	+0.052	-0.052
*BFSE	170+25	+0.034	-0.034
EFSE	171+66	+0.034	-0.034
	172+12	+0.022	-0.022
MATCH EX	173+35	+0.022	-0.022

} L = 24 (0.018)(213)(0.75) = 69

} L = 24 (0.012)(213)(0.75) = 46

Ramp AD
(KC 104)

9/10/09
Comp: PCT
CHECK: MRM
11/14/09
REV: C

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 10R2W7S (KC104)
Description: RAMP FROM I285W TO I75S
Style: Prop Main CL

	STATION	NORTHING	EASTING
Element: Circular			
PC (KC12022)	169+55.38	1416398.1880952	2208859.6425703
PI (KC12023)	170+82.23	1416339.3238802	2208747.2804979
CC (CKC213)		1419952.1084959	2206997.8156171
PT ( )	172+08.99	1416287.6750957	2208631.4244053
Radius:	4012.0755		
Delta:	3^37'18" Right		
Degree of Curvature(Arc):	1^25'41"		
Length:	253.6101		
Tangent:	126.8473		
Chord:	253.5678		
Middle Ordinate:	2.0037		
External:	2.0047		
Tangent Direction:	S 62^21'03" W		
Radial Direction:	N 27^38'57" W		
Chord Direction:	S 64^09'42" W		
Radial Direction:	N 24^01'39" W		
Tangent Direction:	S 65^58'21" W		
Element: Linear			
PT ( )	172+08.99	1416287.6750957	2208631.4244053
POE (KC12024)	173+35.15	1416236.3044350	2208516.1921870
Tangent Direction:	S 65^58'21" W		
Tangent Length:	126.1642		

9/10/09

Comp: PCT

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 10R2W7S (1CC104)
Description: RAMP FROM I285W TO I75S
Style: Prop Main CL
Vertical Alignment Name: 10R2W7S
Description: I285W OFF RAMP TO I75S
Style: Prop Main CL

		STATION	ELEVATION
Element: Parabola			
	PVC	169+55.38	859.23
	PVI	171+05.38	860.37
	PVT	172+55.38	864.26
	Length:	300.0000	
	Headlight Sight Distance:	5439.2539	
	Entrance Grade:	0.7584	
	Exit Grade:	2.5959	
	r = (g2 - g1) / L:	0.6125	
	K = l / (g2 - g1):	163.2705	
	Middle Ordinate:	0.6890	
Element: Linear			
	PVT	172+55.38	864.26
	POE	173+35.15	866.33
	Tangent Grade:	2.5959	
	Tangent Length:	79.7742	

Ramp AB
(KC 106)

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5R7N2E (KC106)
Description: RAMP FROM I75N TO I285E
Style: Prop Main CL

ALIGN -ADDED TO C:CALCS 9/18/09

COMP: PCT
CHECK: MRM 11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Circular KC 214			
PC (KC12025)	155+37.74	1415151.6024084	2208057.6425020
PI (KC12026)	157+53.18	1415355.7394737	2208126.5279324
CC (CKC214)		1414874.5001095	2208878.8154222
PCC ( )	159+60.07	1415503.8590383	2208282.9815630
Radius:	866.6664		
Delta:	27^55'14" Right		
Degree of Curvature(Arc):	6^36'40"		
Length:	422.3319		
Tangent:	215.4464		
Chord:	418.1655		
Middle Ordinate:	25.5986		
External:	26.3777		
Tangent Direction:	N 18^38'49" E		
Radial Direction:	S 71^21'11" E		
Chord Direction:	N 32^36'26" E		
Radial Direction:	S 43^25'57" E		
Tangent Direction:	N 46^34'03" E		
Element: Circular KC215			
PCC ( )	159+60.07	1415503.8590383	2208282.9815630
PI (KC12027)	160+88.00	1415591.8108611	2208375.8820657
CC (CKC215)		1414170.5890662	2209545.2301090
PT ( )	162+15.51	1415666.0289593	2208480.0823557
Radius:	1835.9957		
Delta:	7^58'18" Right		
Degree of Curvature(Arc):	3^07'14"		
Length:	255.4467		
Tangent:	127.9298		
Chord:	255.2407		
Middle Ordinate:	4.4408		
External:	4.4516		
Tangent Direction:	N 46^34'03" E		
Radial Direction:	S 43^25'57" E		
Chord Direction:	N 50^33'12" E		
Radial Direction:	S 35^27'39" E		
Tangent Direction:	N 54^32'21" E		
Element: Linear			
PT ( )	162+15.51	1415666.0289593	2208480.0823557
PC ( )	164+84.02	1415821.8024942	2208698.7843693
Tangent Direction:	N 54^32'21" E		
Tangent Length:	268.5069		
Element: Circular KC 216			
PC ( )	164+84.02	1415821.8024942	2208698.7843693
PI (KC12028)	166+49.80	1415917.9769704	2208833.8108460
CC (CKC216)		1421665.1090953	2204536.8084004
PT (KC12029)	168+15.51	1416020.2858151	2208964.2507924
Radius:	7174.0000		
Delta:	2^38'51" Left		
Degree of Curvature(Arc):	0^47'55"		
Length:	331.4930		
Tangent:	165.7760		
Chord:	331.4635		
Middle Ordinate:	1.9146		
External:	1.9151		
Tangent Direction:	N 54^32'21" E		
Radial Direction:	S 35^27'39" E		
Chord Direction:	N 53^12'55" E		
Radial Direction:	S 38^06'30" E		
Tangent Direction:	N 51^53'30" E		

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5R7N2E (KC106)
Description: RAMP FROM I75N TO I285E
Style: Prop Main CL
Vertical Alignment Name: 5R7N2E
Description: KC106
Style: Prop Main CL

PROFILE NOT ADDED TO C!
– WORK OFF ICC107

COMP: PCT

		STATION	ELEVATION
Element: Linear			
	POB	155+37.74	867.49
	PVI	155+40.00	867.40
	Tangent Grade:	-4.3487	
	Tangent Length:	2.2640	
Element: Linear			
	PVI	155+40.00	867.40
	PVI	155+50.00	866.96
	Tangent Grade:	-4.3416	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	155+50.00	866.96
	PVI	155+60.00	866.49
	Tangent Grade:	-4.7233	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	155+60.00	866.49
	PVI	155+70.00	866.06
	Tangent Grade:	-4.2798	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	155+70.00	866.06
	PVI	155+80.00	865.68
	Tangent Grade:	-3.7735	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	155+80.00	865.68
	PVI	155+90.00	865.29
	Tangent Grade:	-3.9761	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	155+90.00	865.29
	PVI	156+00.00	864.91
	Tangent Grade:	-3.7480	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	156+00.00	864.91
	PVI	156+10.00	864.53
	Tangent Grade:	-3.8284	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	156+10.00	864.53
	PVI	156+20.00	864.17
	Tangent Grade:	-3.5626	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	156+20.00	864.17
	PVI	156+30.00	863.83
	Tangent Grade:	-3.4548	
	Tangent Length:	10.0000	
Element: Linear			
	PVI	156+30.00	863.83
	PVI	156+40.00	863.49
	Tangent Grade:	-3.3817	
	Tangent Length:	10.0000	

Element: Linear

PVI	156+40.00	863.49
PVI	156+50.00	863.17
Tangent Grade:	-3.2300	
Tangent Length:	10.0000	

Element: Linear

PVI	156+50.00	863.17
PVI	156+60.00	862.86
Tangent Grade:	-3.1005	
Tangent Length:	10.0000	

Element: Linear

PVI	156+60.00	862.86
PVI	156+70.00	862.54
Tangent Grade:	-3.1495	
Tangent Length:	10.0000	

Element: Linear

PVI	156+70.00	862.54
PVI	156+80.00	862.28
Tangent Grade:	-2.5990	
Tangent Length:	10.0000	

Element: Linear

PVI	156+80.00	862.28
PVI	156+90.00	862.02
Tangent Grade:	-2.6446	
Tangent Length:	10.0000	

Element: Linear

PVI	156+90.00	862.02
PVI	157+00.00	861.77
Tangent Grade:	-2.5027	
Tangent Length:	10.0000	

Element: Linear

PVI	157+00.00	861.77
PVI	157+10.00	861.52
Tangent Grade:	-2.4848	
Tangent Length:	10.0000	

Element: Linear

PVI	157+10.00	861.52
PVI	157+20.00	861.25
Tangent Grade:	-2.6901	
Tangent Length:	10.0000	

Element: Linear

PVI	157+20.00	861.25
PVI	157+30.00	860.99
Tangent Grade:	-2.5560	
Tangent Length:	10.0000	

Element: Linear

PVI	157+30.00	860.99
PVI	157+40.00	860.75
Tangent Grade:	-2.4101	
Tangent Length:	10.0000	

Element: Linear

PVI	157+40.00	860.75
PVI	157+50.00	860.51
Tangent Grade:	-2.4491	
Tangent Length:	10.0000	

Element: Linear

PVI	157+50.00	860.51
PVI	157+60.00	860.30
Tangent Grade:	-2.0849	
Tangent Length:	10.0000	

Element: Linear

PVI	157+60.00	860.30

PVI	157+70.00	860.11
Tangent Grade:	-1.8473	
Tangent Length:	10.0000	

Element: Linear

PVI	157+70.00	860.11
PVI	157+80.00	859.89
Tangent Grade:	-2.2281	
Tangent Length:	10.0000	

Element: Linear

PVI	157+80.00	859.89
PVI	157+90.00	859.57
Tangent Grade:	-3.2312	
Tangent Length:	10.0000	

Element: Linear

PVI	157+90.00	859.57
PVI	158+00.00	859.52
Tangent Grade:	-0.4812	
Tangent Length:	10.0000	

Element: Linear

PVI	158+00.00	859.52
PVI	158+10.00	859.46
Tangent Grade:	-0.5639	
Tangent Length:	10.0000	

Element: Linear

PVI	158+10.00	859.46
PVI	158+20.00	859.33
Tangent Grade:	-1.3828	
Tangent Length:	10.0000	

Element: Linear

PVI	158+20.00	859.33
PVI	158+30.00	859.18
Tangent Grade:	-1.4029	
Tangent Length:	10.0000	

Element: Linear

PVI	158+30.00	859.18
PVI	158+40.00	859.03
Tangent Grade:	-1.5328	
Tangent Length:	10.0000	

Element: Linear

PVI	158+40.00	859.03
PVI	158+50.00	858.94
Tangent Grade:	-0.8998	
Tangent Length:	10.0000	

Element: Linear

PVI	158+50.00	858.94
PVI	158+60.00	858.84
Tangent Grade:	-1.0381	
Tangent Length:	10.0000	

Element: Linear

PVI	158+60.00	858.84
PVI	158+70.00	858.76
Tangent Grade:	-0.7596	
Tangent Length:	10.0000	

Element: Linear

PVI	158+70.00	858.76
PVI	158+80.00	858.68
Tangent Grade:	-0.8139	
Tangent Length:	10.0000	

Element: Linear

PVI	158+80.00	858.68
PVI	158+90.00	858.62
Tangent Grade:	-0.6060	
Tangent Length:	10.0000	

Element: Linear

PVI	158+90.00	858.62
PVI	159+00.00	858.53
Tangent Grade:	-0.8778	
Tangent Length:	10.0000	

Element: Linear

PVI	159+00.00	858.53
PVI	159+10.00	858.44
Tangent Grade:	-0.8936	
Tangent Length:	10.0000	

Element: Linear

PVI	159+10.00	858.44
PVI	159+20.00	858.37
Tangent Grade:	-0.6950	
Tangent Length:	10.0000	

Element: Linear

PVI	159+20.00	858.37
PVI	159+30.00	858.30
Tangent Grade:	-0.7659	
Tangent Length:	10.0000	

Element: Linear

PVI	159+30.00	858.30
PVI	159+40.00	858.26
Tangent Grade:	-0.3303	
Tangent Length:	10.0000	

Element: Linear

PVI	159+40.00	858.26
PVI	159+50.00	858.22
Tangent Grade:	-0.4185	
Tangent Length:	10.0000	

Element: Linear

PVI	159+50.00	858.22
PVI	159+60.00	858.16
Tangent Grade:	-0.5802	
Tangent Length:	10.0000	

Element: Linear

PVI	159+60.00	858.16
PVI	159+70.00	858.13
Tangent Grade:	-0.3323	
Tangent Length:	10.0000	

Element: Linear

PVI	159+70.00	858.13
PVI	159+80.00	858.13
Tangent Grade:	0.0425	
Tangent Length:	10.0000	

Element: Linear

PVI	159+80.00	858.13
PVI	159+90.00	858.21
Tangent Grade:	0.7869	
Tangent Length:	10.0000	

Element: Linear

PVI	159+90.00	858.21
PVI	160+00.00	858.23
Tangent Grade:	0.1585	
Tangent Length:	10.0000	

Element: Linear

PVI	160+00.00	858.23
PVI	160+10.00	858.23
Tangent Grade:	-0.0412	
Tangent Length:	10.0000	

Element: Linear

PVI	160+10.00	858.23

PVI	160+20.00	858.25
Tangent Grade:	0.2595	
Tangent Length:	10.0000	

Element: Linear

PVI	160+20.00	858.25
PVI	160+30.00	858.31
Tangent Grade:	0.5805	
Tangent Length:	10.0000	

Element: Linear

PVI	160+30.00	858.31
PVI	160+40.00	858.38
Tangent Grade:	0.7330	
Tangent Length:	10.0000	

Element: Linear

PVI	160+40.00	858.38
PVI	160+50.00	858.45
Tangent Grade:	0.6454	
Tangent Length:	10.0000	

Element: Linear

PVI	160+50.00	858.45
PVI	160+60.00	858.53
Tangent Grade:	0.7988	
Tangent Length:	10.0000	

Element: Linear

PVI	160+60.00	858.53
PVI	160+70.00	858.56
Tangent Grade:	0.3746	
Tangent Length:	10.0000	

Element: Linear

PVI	160+70.00	858.56
PVI	160+80.00	858.64
Tangent Grade:	0.7965	
Tangent Length:	10.0000	

Element: Linear

PVI	160+80.00	858.64
PVI	160+90.00	858.76
Tangent Grade:	1.1462	
Tangent Length:	10.0000	

Element: Linear

PVI	160+90.00	858.76
PVI	161+00.00	858.85
Tangent Grade:	0.9258	
Tangent Length:	10.0000	

Element: Linear

PVI	161+00.00	858.85
PVI	161+10.00	858.94
Tangent Grade:	0.8862	
Tangent Length:	10.0000	

Element: Linear

PVI	161+10.00	858.94
PVI	161+20.00	859.05
Tangent Grade:	1.1076	
Tangent Length:	10.0000	

Element: Linear

PVI	161+20.00	859.05
PVI	161+30.00	859.13
Tangent Grade:	0.7756	
Tangent Length:	10.0000	

Element: Linear

PVI	161+30.00	859.13
PVI	161+40.00	859.24
Tangent Grade:	1.0925	
Tangent Length:	10.0000	

Element: Linear

PVI	161+40.00	859.24
PVI	161+50.00	859.36
Tangent Grade:	1.1872	
Tangent Length:	10.0000	

Element: Linear

PVI	161+50.00	859.36
PVI	161+60.00	859.51
Tangent Grade:	1.5537	
Tangent Length:	10.0000	

Element: Linear

PVI	161+60.00	859.51
PVI	161+70.00	859.58
Tangent Grade:	0.7301	
Tangent Length:	10.0000	

Element: Linear

PVI	161+70.00	859.58
PVI	161+80.00	859.72
Tangent Grade:	1.3226	
Tangent Length:	10.0000	

Element: Linear

PVI	161+80.00	859.72
PVI	161+90.00	859.84
Tangent Grade:	1.2234	
Tangent Length:	10.0000	

Element: Linear

PVI	161+90.00	859.84
PVI	162+00.00	859.94
Tangent Grade:	0.9634	
Tangent Length:	10.0000	

Element: Linear

PVI	162+00.00	859.94
PVI	162+10.00	860.09
Tangent Grade:	1.5030	
Tangent Length:	10.0000	

Element: Linear

PVI	162+10.00	860.09
PVI	162+20.00	860.23
Tangent Grade:	1.4318	
Tangent Length:	10.0000	

Element: Linear

PVI	162+20.00	860.23
PVI	162+30.00	860.36
Tangent Grade:	1.3257	
Tangent Length:	10.0000	

Element: Linear

PVI	162+30.00	860.36
PVI	162+40.00	860.51
Tangent Grade:	1.4554	
Tangent Length:	10.0000	

Element: Linear

PVI	162+40.00	860.51
PVI	162+50.00	860.66
Tangent Grade:	1.5479	
Tangent Length:	10.0000	

Element: Linear

PVI	162+50.00	860.66
PVI	165+40.00	861.01
Tangent Grade:	0.1187	
Tangent Length:	290.0000	

Element: Linear

PVI	165+40.00	861.01

PVI	165+50.00	863.03
Tangent Grade:	20.2851	
Tangent Length:	10.0000	

Element: Linear

PVI	165+50.00	863.03
PVI	165+60.00	863.05
Tangent Grade:	0.1406	
Tangent Length:	10.0000	

Element: Linear

PVI	165+60.00	863.05
PVI	165+70.00	863.07
Tangent Grade:	0.2005	
Tangent Length:	10.0000	

Element: Linear

PVI	165+70.00	863.07
PVI	165+80.00	863.06
Tangent Grade:	-0.0787	
Tangent Length:	10.0000	

Element: Linear

PVI	165+80.00	863.06
PVI	165+90.00	863.04
Tangent Grade:	-0.1946	
Tangent Length:	10.0000	

Element: Linear

PVI	165+90.00	863.04
PVI	166+00.00	863.08
Tangent Grade:	0.3714	
Tangent Length:	10.0000	

Element: Linear

PVI	166+00.00	863.08
PVI	166+10.00	863.15
Tangent Grade:	0.7281	
Tangent Length:	10.0000	

Element: Linear

PVI	166+10.00	863.15
PVI	166+20.00	863.20
Tangent Grade:	0.5314	
Tangent Length:	10.0000	

Element: Linear

PVI	166+20.00	863.20
PVI	166+30.00	863.24
Tangent Grade:	0.3349	
Tangent Length:	10.0000	

Element: Linear

PVI	166+30.00	863.24
PVI	166+40.00	863.27
Tangent Grade:	0.2972	
Tangent Length:	10.0000	

Element: Linear

PVI	166+40.00	863.27
PVI	166+50.00	863.27
Tangent Grade:	0.0380	
Tangent Length:	10.0000	

Element: Linear

PVI	166+50.00	863.27
PVI	166+60.00	863.28
Tangent Grade:	0.1061	
Tangent Length:	10.0000	

Element: Linear

PVI	166+60.00	863.28
PVI	166+70.00	863.30
Tangent Grade:	0.1740	
Tangent Length:	10.0000	

Element: Linear

PVI	166+70.00	863.30
PVI	166+80.00	863.28
Tangent Grade:	-0.1525	
Tangent Length:	10.0000	

Element: Linear

PVI	166+80.00	863.28
PVI	166+90.00	863.28
Tangent Grade:	-0.0276	
Tangent Length:	10.0000	

Element: Linear

PVI	166+90.00	863.28
PVI	167+00.00	863.28
Tangent Grade:	0.0075	
Tangent Length:	10.0000	

Element: Linear

PVI	167+00.00	863.28
PVI	167+10.00	863.30
Tangent Grade:	0.1880	
Tangent Length:	10.0000	

Element: Linear

PVI	167+10.00	863.30
PVI	167+20.00	863.32
Tangent Grade:	0.1671	
Tangent Length:	10.0000	

Element: Linear

PVI	167+20.00	863.32
PVI	167+30.00	863.30
Tangent Grade:	-0.2193	
Tangent Length:	10.0000	

Element: Linear

PVI	167+30.00	863.30
PVI	167+40.00	863.29
Tangent Grade:	-0.0367	
Tangent Length:	10.0000	

Element: Linear

PVI	167+40.00	863.29
PVI	167+50.00	863.29
Tangent Grade:	-0.0002	
Tangent Length:	10.0000	

Element: Linear

PVI	167+50.00	863.29
PVI	167+60.00	863.28
Tangent Grade:	-0.1471	
Tangent Length:	10.0000	

Element: Linear

PVI	167+60.00	863.28
PVI	167+70.00	863.27
Tangent Grade:	-0.0541	
Tangent Length:	10.0000	

Element: Linear

PVI	167+70.00	863.27
PVI	167+80.00	863.26
Tangent Grade:	-0.1439	
Tangent Length:	10.0000	

Element: Linear

PVI	167+80.00	863.26
PVI	167+90.00	863.23
Tangent Grade:	-0.2831	
Tangent Length:	10.0000	

Element: Linear

PVI	167+90.00	863.23

PVI	168+00.00	863.21
Tangent Grade:	-0.2320	
Tangent Length:	10.0000	

Element: Linear

PVI	168+00.00	863.21
PVI	168+10.00	863.18
Tangent Grade:	-0.2313	
Tangent Length:	10.0000	

Element: Linear

PVI	168+10.00	863.18
POE	168+15.51	863.16
Tangent Grade:	-0.3322	
Tangent Length:	5.5145	

Ramp B
(KC 100)

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 6M7S2E (KC100)
Description: HOV TO I285EB
Style: Prop Main CL

-UPDATED IN C:CALCE - 9/10/09

9/10/09

COMP: PCT
CHECK: MRM 11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Linear			
POB (KC12000)	1234+94.32	1415408.2534853	2206401.4364529
PC ( )	1235+98.34	1415306.1035650	2206421.0455962
Tangent Direction:	S 10^52'00" E		
Tangent Length:	104.0150		
Element: Circular (KC 200)			
PC ( )	1235+98.34	1415306.1035650	2206421.0455962
PI (KC12001)	1246+02.13	1414320.3100902	2206610.2828019
CC (CKC 200)		1415431.6593666	2207075.1034994
PT ( )	1249+10.36	1414877.8315441	2207445.0098970
Radius:	66.0000		
Delta:	112^52'22" Left		
Degree of Curvature(Arc):	8^36'11"		
Length:	1312.0207		
Tangent:	1003.7926		
Chord:	1109.9188		
Middle Ordinate:	297.7935		
External:	538.6392		
Tangent Direction:	S 10^52'00" E		
Radial Direction:	S 79^08'00" W		
Chord Direction:	S 67^18'11" E		
Radial Direction:	S 33^44'21" E		
Tangent Direction:	N 56^15'39" E		
Element: Linear			
PT ( )	1249+10.36	1414877.8315441	2207445.0098970
PC ( )	1251+68.47	1415021.1911771	2207659.6494758
Tangent Direction:	N 56^15'39" E		
Tangent Length:	258.1126		
Element: Circular			
PC ( )	1251+68.47	1415021.1911771	2207659.6494758
PI (KC12002)	1253+20.26	1415105.5006067	2207785.8784572
CC (CKC201)		1416060.6578109	2206965.3807115
PT ( )	1254+70.58	1415217.5716188	2207888.2597245
Radius:	1250.0000		
Delta:	13^50'52" Left		
Degree of Curvature(Arc):	4^35'01"		
Length:	302.1115		
Tangent:	151.7954		
Chord:	301.3767		
Middle Ordinate:	9.1160		
External:	9.1830		
Tangent Direction:	N 56^15'39" E		
Radial Direction:	S 33^44'21" E		
Chord Direction:	N 49^20'13" E		
Radial Direction:	S 47^35'13" E		
Tangent Direction:	N 42^24'47" E		
Element: Linear			
PT ( )	1254+70.58	1415217.5716188	2207888.2597245
PC ( )	1258+68.89	1415511.6449585	2208156.9072597
Tangent Direction:	N 42^24'47" E		
Tangent Length:	398.3097		
Element: Circular			
PC ( )	1258+68.89	1415511.6449585	2208156.9072597
PI (KC12003)	1260+22.55	1415625.0947280	2208260.5480759
CC (CKC202)		1414668.5587663	2209079.7862727
PT ( )	1261+74.68	1415710.0648182	2208388.5806998
Radius:	1250.0000		
Delta:	14^00'59" Right		
Degree of Curvature(Arc):	4^35'01"		
Length:	305.7915		
Tangent:	153.6628		
Chord:	305.0295		
Middle Ordinate:	9.3392		

```
                External:              9.4095
      Tangent Direction:      N 42^24'47" E
       Radial Direction:      S 47^35'13" E
        Chord Direction:      N 49^25'16" E
       Radial Direction:      S 33^34'14" E
      Tangent Direction:      N 56^25'46" E

Element: Linear
            PT (        )        1261+74.681415710.06481822208388.5806998
            PC (        )        1265+77.681415932.90654632208724.3578079
      Tangent Direction:      N 56^25'46" E
         Tangent Length:           402.9947

Element: Circular
            PC (        )        1265+77.681415932.90654632208724.3578079
            PI (ICC12004 )       1272+90.171416326.89244282209318.0143287
            CC ( CICC203 )                 1421432.05849992205074.7923830
            PT (        )        1279+97.171416838.49987992209813.9082504
                  Radius:          6600.0000
                   Delta:          12^19'22" Left
  Degree of Curvature(Arc):         0^52'05"
                  Length:          1419.4981
                 Tangent:           712.4977
                   Chord:          1416.7637
          Middle Ordinate:            38.1256
                 External:            38.3472
      Tangent Direction:      N 56^25'46" E
       Radial Direction:      S 33^34'14" E
        Chord Direction:      N 50^16'04" E
       Radial Direction:      S 45^53'37" E
      Tangent Direction:      N 44^06'23" E

Element: Linear
            PT (        )        1279+97.171416838.49987992209813.9082504
           POE (KC12005 )        1287+42.411417373.61741692210332.5901826
      Tangent Direction:      N 44^06'23" E
         Tangent Length:           745.2394
```

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 6M7S2E (KC100)
Description: HOV TO I285EB
Style: Prop Main CL
Vertical Alignment Name: 6M7S2E (KC100)
Description: I-75 HOV TO I-285EB
Style: Prop Main CL

- UPDATED IN C-CALC - 9/18/09

- SEE NEW

	STATION	ELEVATION
Element: Parabola		
PVC	1236+97.65	999.14
PVI	1238+97.65	992.14
PVT	1240+97.65	982.61
Length:	400.0000	
Stopping Sight Distance:	1052.8441	
Entrance Grade:	-3.5000	
Exit Grade:	-4.7654	
r = (g2 - g1) / L:	-0.3163	
K = 1 / (g2 - g1):	316.1169	
Middle Ordinate:	-0.6327	
Element: Linear		
PVT	1240+97.65	982.61
PVC	1243+79.28	969.19
Tangent Grade:	-4.7654	
Tangent Length:	281.6283	
Element: Parabola		
PVC	1243+79.28	969.19
PVI	1245+79.28	959.66
PVT	1247+79.28	955.16
Length:	400.0000	
Headlight Sight Distance:	918.6210	
Entrance Grade:	-4.7654	
Exit Grade:	-2.2500	
r = (g2 - g1) / L:	0.6288	
K = 1 / (g2 - g1):	159.0233	
Middle Ordinate:	1.2577	
Element: Linear		
PVT	1247+79.28	955.16
PVC	1253+72.30	941.82
Tangent Grade:	-2.2500	
Tangent Length:	593.0191	
Element: Parabola		
PVC	1253+72.30	941.82
PVI	1255+72.30	937.32
PVT	1257+72.30	926.78
Length:	400.0000	
Stopping Sight Distance:	557.6891	
Entrance Grade:	-2.2500	
Exit Grade:	-5.2670	
r = (g2 - g1) / L:	-0.7543	
K = 1 / (g2 - g1):	132.5818	
Middle Ordinate:	-1.5085	
Element: Linear		
PVT	1257+72.30	926.78
PVC	1266+92.02	878.34
Tangent Grade:	-5.2670	
Tangent Length:	919.7258	
Element: Parabola		
PVC	1266+92.02	878.34
PVI	1270+22.02	860.96
PVT	1273+52.02	863.79
VLOW	1272+59.61	863.39
Length:	660.0000	
Headlight Sight Distance:	469.0686	
Entrance Grade:	-5.2670	
Exit Grade:	0.8575	
r = (g2 - g1) / L:	0.9280	
K = 1 / (g2 - g1):	107.7636	

Middle Ordinate:	5.0527	

Element: Linear

PVT	1273+52.02	863.79
POE	1284+72.79	873.40
Tangent Grade:	0.8575	
Tangent Length:	1120.7668	

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 6M7S2E (KC100)
Description: HOV TO I285EB
Style: Prop Main CL
Vertical Alignment Name: 6M7S2E (KC100)
Description: I-75 HOV TO I-285EB
Style: Prop Main CL

ADDED TO D: 10-19-09
C: 10-19-09

10/16/09

COMP: PCT

	STATION	ELEVATION
Element: Parabola		
PVC	1236+97.65	1004.73
PVI	1238+97.65	997.21
PVT	1240+97.65	986.19
Length:	400.0000	
Stopping Sight Distance:	816.9528	
Entrance Grade:	-3.7600	
Exit Grade:	-5.5092	
r = (g2 - g1) / L:	-0.4373	
K = l / (g2 - g1):	228.6810	
Middle Ordinate:	-0.8746	
Element: Linear		
PVT	1240+97.65	986.19
PVC	1243+79.28	970.68
Tangent Grade:	-5.5092	
Tangent Length:	281.6283	
Element: Parabola		
PVC	1243+79.28	970.68
PVI	1245+79.28	959.66
PVT	1247+79.28	955.16
Length:	400.0000	
Headlight Sight Distance:	564.4407	
Entrance Grade:	-5.5092	
Exit Grade:	-2.2500	
r = (g2 - g1) / L:	0.8148	
K = l / (g2 - g1):	122.7309	
Middle Ordinate:	1.6296	
Element: Linear		
PVT	1247+79.28	955.16
PVC	1253+72.30	941.82
Tangent Grade:	-2.2500	
Tangent Length:	593.0191	
Element: Parabola		
PVC	1253+72.30	941.82
PVI	1255+72.30	937.32
PVT	1257+72.30	926.78
Length:	400.0000	
Stopping Sight Distance:	557.6891	
Entrance Grade:	-2.2500	
Exit Grade:	-5.2670	
r = (g2 - g1) / L:	-0.7543	
K = l / (g2 - g1):	132.5818	
Middle Ordinate:	-1.5085	
Element: Linear		
PVT	1257+72.30	926.78
PVC	1266+92.02	878.34
Tangent Grade:	-5.2670	
Tangent Length:	919.7258	
ement: Parabola		
PVC	1266+92.02	878.34
PVI	1270+22.02	860.96
PVT	1273+52.02	863.79
VLOW	1272+59.61	863.39
Length:	660.0000	
Headlight Sight Distance:	469.0686	
Entrance Grade:	-5.2670	

Exit Grade:	0.8575
r = (g2 - g1) / L:	0.9280
K = 1 / (g2 - g1):	107.7636
Middle Ordinate:	5.0527

Element: Linear

PVT	1273+52.02	863.79
POE	1284+72.79	873.40
Tangent Grade:	0.8575	
Tangent Length:	1120.7668	

PBSJ

Subject:	KC100 6M 7S 2E SE	C: CALCS (KC100SE7017 - 9/18/09)
Comp by: PLT	Date: 9/4/09	Sheet Number:
Check by:	Job Number:	

CURVE 200

PC = 1235+98

PT = 1249+10

R = 666

e = 0.08

Ds = 45

W = 16 V = 185

L = 16(0.08)(185) = 238 $\frac{1}{3}$ = 79

L_R = 16(0.06)(185) = 178

L_2 = 16(0.02)(185) = 60

KC50 SE AT GRADE

230+37	−0.08
232+15	−0.02
232+75	0.00
233+35	+0.02

(232+90.65 ≐ 0.006)

~~PROF = 999.92 − (30.5 × 0.006) = 999.14~~

PROF = 1004.91 − (30.5 × 0.006) = 1004.73

GRADE = −3.76

	STA	LT	RT
MATCH	1236+98	−0.006	+0.006
RC	1237+39	−0.02	+0.02
* BFSE	1239+17	−0.08	+0.08
EFSE	1248+31	−0.08	+0.08
RC	1250+09	−0.02	+0.02

} L = 16(0.04)(185) = 41

CURVE 201

PC = 1251+68

PT = 1254+71

R = 1250

e = 0.06 NC

L = 16(0.06)(185) = 178 $\frac{1}{3}$ = 60

L_R = 16(0.04)(185) = 118

L_2 = 60

	STA	LT	RT
RC	1251+10	−0.02	+0.02
BFSE	1252+28	−0.06	+0.06
EFSE	1254+11	−0.06	+0.06
RC	1255+29	−0.02	+0.02
NC	1256+33	−0.02	+0.02
FLAT	1256+90	0	0
RC	1257+75	+0.02	−0.02

CURVE 202

PC = 1258+68 L = 178

PT = 1261+75

R = 1250

e = 0.06

	STA	LT	RT
RC	1258+10	+0.02	−0.02
BFSE	1259+28	+0.06	−0.06
EFSE	1261+15	+0.06	−0.06
RC	1262+33	+0.02	−0.02
* MATCH	1264+73	+0.02	−0.02

CURVE 203

PC = 1265+77 L = 60 $\frac{1}{3}$ = 20

PT = 1279+97

R = 6600

e = 0.02 → NC (PER MCM) TO MATCH EXIST

	STA	LT	RT
NC	1264+77	+0.02	−0.02
FLAT	1265+37	0	0
RC	1265+97	−0.02	+0.02
RC	1279+77	−0.02	+0.02
	1280+37	0	0
	1280+97	+0.02	−0.02
MATCH	1284+73	+0.02	+0.02

Ramp C
(KC 102)

9/10/09

COMP: PCT
CHECK: MRM 11/14/09
REV. C

```
          Project Name: I285 ALT5
           Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W7N (KC102)
           Description: I-285WB TO HOV I-75N
                 Style: Prop Main CL
                                        STATION      NORTHING       EASTING
```

KC 206

```
Element: Circular
          PC ( KC12011 )          1208+12.94 1416399.9516887 2209088.8892446
          PI ( KC12012 )          1210+10.05 1416280.6966255 2208931.9528590
          CC ( CKC206 )                      1418629.3193592 2207394.8054835
          PT (         )           1212+06.50 1416184.6037905 2208759.8570534
                Radius:            2800.0000
                 Delta:              8^03'12" Right
  Degree of Curvature(Arc):          2^02'47"
                Length:              393.5629
               Tangent:              197.1061
                 Chord:              393.2390
        Middle Ordinate:                6.9120
               External:                6.9291
      Tangent Direction:        S 52^46'08" W
       Radial Direction:        N 37^13'52" W
        Chord Direction:        S 56^47'45" W
       Radial Direction:        N 29^10'39" W
      Tangent Direction:        S 60^49'21" W

Element: Linear
          PT (         )           1212+06.50 1416184.6037905 2208759.8570534
          PC (         )           1217+15.84 1415936.2900330 2208315.1438115
      Tangent Direction:        S 60^49'21" W
         Tangent Length:              509.3423

Element: Circular
          PC (         )           1217+15.84 1415936.2900330 2208315.1438115
          PI ( KC12013 )          1218+58.02 1415866.9777034 2208191.0100901
          CC ( CKC207 )                      1418669.1327937 2206789.2111638
          PT (         )           1220+00.00 1415809.2046162 2208061.1037770
                Radius:            3130.0000
                 Delta:              5^12'05" Right
  Degree of Curvature(Arc):          1^49'50"
                Length:              284.1522
               Tangent:              142.1738
                 Chord:              284.0546
        Middle Ordinate:                3.2240
               External:                3.2273
      Tangent Direction:        S 60^49'21" W
       Radial Direction:        N 29^10'39" W
        Chord Direction:        S 63^25'23" W
       Radial Direction:        N 23^58'34" W
      Tangent Direction:        S 66^01'26" W

Element: Linear
          PT (         )           1220+00.00 1415809.2046162 2208061.1037770
          PC (         )           1228+49.61 1415463.9602260 2207284.8006919
      Tangent Direction:        S 66^01'26" W
         Tangent Length:              849.6118

Element: Circular
          PC (         )           1228+49.61 1415463.9602260 2207284.8006919
          PI ( KC12014 )          1234+88.74 1415204.2467314 2206700.8190462
          CC ( CKC208 )                      1416012.1892696 2207040.9874114
          PT (         )           1238+29.97 1415803.4508687 2206478.4678295
                Radius:             600.0000
                 Delta:             93^37'02" Right
  Degree of Curvature(Arc):          9^32'57"
                Length:              980.3584
               Tangent:              639.1288
                 Chord:              874.8866
        Middle Ordinate:              189.3379
               External:              276.6331
      Tangent Direction:        S 66^01'26" W
       Radial Direction:        N 23^58'34" W
```

```
          Chord Direction:      N 67^10'03" W
         Radial Direction:      N 69^38'28" E
        Tangent Direction:      N 20^21'32" W

Element: Linear
             PT (        )         1238+29.97 1415803.4508687 2206478.4678295
             PC (        )         1242+53.31 1416200.3478913 2206331.1882458
        Tangent Direction:      N 20^21'32" W
           Tangent Length:            423.3421

Element: Circular   KC 209
             PC (        )         1242+53.31 1416200.3478913 2206331.1882458
             PI ( KC/2015 )        1244+98.56 1416430.2801233 2206245.8655513
             CC ( CKC209 )                    1415805.8323136 2205268.0262361
             PT (        )         1247+36.37 1416604.4072166 2206073.1561164
                     Radius:          1134.0000
                      Delta:          24^24'25" Left
  Degree of Curvature(Arc):           5^03'09"
                     Length:          483.0652
                    Tangent:          245.2525
                      Chord:          479.4210
           Middle Ordinate:            25.6251
                   External:           26.2176
        Tangent Direction:      N 20^21'32" W
         Radial Direction:      N 69^38'28" E
          Chord Direction:      N 32^33'44" W
         Radial Direction:      N 45^14'03" E
        Tangent Direction:      N 44^45'57" W

Element: Linear
             PT (        )         1247+36.37 1416604.4072166 2206073.1561164
            POE ( KC/2016 )        1250+57.87 1416832.6686826 2205846.7530447
        Tangent Direction:      N 44^45'57" W
           Tangent Length:            321.4991
```

9/10/09
(ADDED TO C:CALCE 9/18/09)
COMP:PCT

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W7N (KC102)
Description: I-285WB TO HOV I-75N
Style: Prop Main CL
Vertical Alignment Name: 5M2W7N (KC102)
Description: FORMERLY HOV_ES2
Style: Prop Main CL

	STATION	ELEVATION
Element: Parabola		
PVC	1210+01.06	868.89
PVI	1211+01.06	870.72
PVT	1212+01.06	873.88
Length:	200.0000	
Entrance Grade:	1.8306	
Exit Grade:	3.1603	
r = (g2 - g1) / L:	0.6649	
K = 1 / (g2 - g1):	150.4038	
Middle Ordinate:	0.3324	
Element: Linear		
PVT	1212+01.06	873.88
PVC	1216+97.16	889.56
Tangent Grade:	3.1603	
Tangent Length:	496.1012	
Element: Parabola		
PVC	1216+97.16	889.56
PVI	1218+97.16	895.88
PVT	1220+97.16	907.87
Length:	400.0000	
Headlight Sight Distance:	706.9535	
Entrance Grade:	3.1603	
Exit Grade:	5.9953	
r = (g2 - g1) / L:	0.7087	
K = 1 / (g2 - g1):	141.0978	
Middle Ordinate:	1.4175	
Element: Linear		
PVT	1220+97.16	907.87
PVC	1236+00.00	997.97
Tangent Grade:	5.9953	
Tangent Length:	1502.8388	
Element: Parabola		
PVC	1236+00.00	997.97
PVI	1239+00.00	1015.96
PVT	1242+00.00	1009.96
VHIGH	1240+49.91	1011.46
Length:	600.0000	
Stopping Sight Distance:	402.4531	
Entrance Grade:	5.9953	
Exit Grade:	-2.0000	
r = (g2 - g1) / L:	-1.3325	
K = 1 / (g2 - g1):	75.0444	
Middle Ordinate:	-5.9964	
Element: Linear		
PVT	1242+00.00	1009.96
POE	1243+68.78	1006.58
Tangent Grade:	-2.0000	
Tangent Length:	168.7800	

PBSJ

Subject: 5M2W7N (KC102) (NEW)

Comp by: PCT | Date: 9/10/09 | Sheet Number:

Check by: | Job Number:

ADD C: CALCS 9/18/09 (KC102SE1-17)

CURVE 1

PC = 1208+13 | DS = 45 | V = 185

PT = 1212+07 | L = 16 (0.034) (185) = 101 | $\frac{1}{3}$ = 34

R = 2800 | L_R = 16 (0.014) (185) = 41

e = 0.046 | L_2 = 16 (0.02) (185) = 59

	STA	LT	RT	
MATCH	1210+01.	+0.026	-0.026	(MATCH MAIN)
* BFSE	1210+35	+0.034	-0.034	
EFSE	1211+73	+0.034	-0.034	
RC	1212+14	+0.02	-0.02	

1208+12.94 | 866.13 - (12 x 0.02) = 865.89

1209+00 | 867.30 - (12.86 x 0.02) = 867.04

1210+01.06 | 869.21 - (16 x 0.02) = 868.89

1212+91.21 | 877.46 - (16 + 20.52) x 0.02 = 876.13

1213+72.40 | 879.64 - (16 + 26.36) x 0.02 = 878.79

1211+00 | 871.07

1212+00 | 874.76 - (12.93 x 0.02) - (16 x 0.025) = 874.10

06104-01

PBSJ

Subject:	KC102 (5m 2W 7N) I285 WB TO HOV NB		
Comp by: PCT	Date: 9/3/09	Sheet Number:	
Check by:	Job Number:		

CURVE 1 → (SEE NEW)

PC = 1207+21

PT = 1211+02

R = 2500 e = 0.05 Q

Ds = 55 V = 213

L = 16(0.05)(213) = 170 ½ = 85

L_R = 16(0.03)(213) = 102

L_2 = 16(0.02)(213) = 68

	STA	LT	RT
RC	1207+04	+0.02	-0.02
BFSE	1208+06	+0.05	-0.05
EFSE	1210+17	+0.05	-0.05
RC	1211+19	+0.02	-0.02

CURVE 207

PC = 1217+16

PT = 1220+00

R = 3130 e = 0.03 Q

Ds = 45 V = 185

L = 16(0.03)(185) = 90 ⅓ = 30

L_R = 16(0.01)(185) = 30

L_2 = 16(0.02)(185) = 60

	STA	LT	RT
RC	1217+16	+0.02	-0.02
BFSE	1217+46	+0.03	-0.03
EFSE	1219+70	+0.03	-0.03
RC	1220+00	+0.02	-0.02

(SEE KC 99 SE)

CURVE 209

L = 16(0.074)(185) = 219 ⅓ = 73

L_R = 16(0.054)(185) = 160

(0.074 TO MATCH KC 50)

CURVE 208

PC = 1228+49

PT = 1238+30

R = 600 e = 0.08 Q

Ds = 45 V = 185

L = 16(0.08)(185) = 237 ⅓ = 79

L_R = 16(0.06)(185) = 178

L_2 = 16(0.02)(185) = 60

	STA	LT	RT
RC	1227+50	+0.02	-0.02
BFSE	1229+28	+0.08	-0.08
EFSE	1237+51	+0.08	-0.08
RC	1239+29	+0.02	-0.02

	STA	LT	RT
NC	1240+52	+0.02	-0.02
FLAT	1241+12	0	0
RC	1241+72	-0.02	+0.02
BFSE	1243+32	-0.074	+0.074
END	1243+68.52	-0.074	+0.074

06104-01

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W7N (KC99)
Description: I-285WB HOV TO I-75 HOV
Style: Prop Main CL

ADDED TO C:CALCE 10/16/09

10/16/09

TIE FROM I-285 MAINLINE TO I-75 ML

-2.8% + 3.32%

COMP: PCT

	STATION	NORTHING	EASTING
Element: Linear			
POB (12100)	1206+49.69	1416616.2638	1092209147.5359018
PC ( )	1218+23.08	1415924.9126	8642208199.4383149
Tangent Direction:	S 53^54'02" W		
Tangent Length:	1173.3948		
Element: Circular			
PC ( )	1218+23.08	1415924.9126	8642208199.4383149
PI (12101)	1220+58.83	1415786.0125	0522208008.9548948
CC (KC219)		1417718.6624	1232206891.4391097
PT ( )	1222+92.82	1415690.2149	5222207793.5482503
Radius:	2220.0000		
Delta:	12^07'24" Right		
Degree of Curvature(Arc):	2^34'51"		
Length:	469.7359		
Tangent:	235.7482		
Chord:	468.8601		
Middle Ordinate:	12.4125		
External:	12.4823		
Tangent Direction:	S 53^54'02" W		
Radial Direction:	N 36^05'58" W		
Chord Direction:	S 59^57'44" W		
Radial Direction:	N 23^58'34" W		
Tangent Direction:	S 66^01'26" W		
Element: Linear			
PT ( )	1222+92.82	1415690.2149	5222207793.5482503
PC ( )	1228+49.61	1415463.9602	2722207284.8006923
Tangent Direction:	S 66^01'26" W		
Tangent Length:	556.7902		
Element: Circular			
PC ( )	1228+49.61	1415463.9602	2722207284.8006923
PI (12102)	1234+88.74	1415204.2467	3142206700.8190462
CC (KC220)		1416012.1892	7042207040.9874111
PT ( )	1238+29.97	1415803.4508	6952206478.4678292
Radius:	600.0000		
Delta:	93^37'02" Right		
Degree of Curvature(Arc):	9^32'57"		
Length:	980.3584		
Tangent:	639.1288		
Chord:	874.8866		
Middle Ordinate:	189.3379		
External:	276.6331		
Tangent Direction:	S 66^01'26" W		
Radial Direction:	N 23^58'34" W		
Chord Direction:	N 67^10'03" W		
Radial Direction:	N 69^38'28" E		
Tangent Direction:	N 20^21'32" W		
Element: Linear			
PT ( )	1238+29.97	1415803.4508	6952206478.4678292
PC ( )	1242+53.31	1416200.3478	9132206331.1882458
Tangent Direction:	N 20^21'32" W		
Tangent Length:	423.3421		
Element: Circular			
PC ( )	1242+53.31	1416200.3478	9132206331.1882458
PI (12103)	1244+98.56	1416430.2801	2332206245.8655513
CC (KC221)		1415805.8323	1362205268.0262361
PT ( )	1247+36.37	1416604.4072	1662206073.1561164
Radius:	1134.0000		
Delta:	24^24'25" Left		
Degree of Curvature(Arc):	5^03'09"		
Length:	483.0652		

```
                Tangent:          245.2525
                  Chord:          479.4210
     Middle Ordinate:              25.6251
               External:           26.2176
     Tangent Direction:      N 20^21'32" W
      Radial Direction:      N 69^38'28" E
       Chord Direction:      N 32^33'44" W
      Radial Direction:      N 45^14'03" E
     Tangent Direction:      N 44^45'57" W

Element: Linear
          PT (         )         1247+36.37 1416604.40721662 206073.1561164
         POE ( 12104   )         1250+57.87 1416832.66868262 205846.7530447
     Tangent Direction:      N 44^45'57" W
        Tangent Length:          321.4991
```

COMP: PCT

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W7N (KC99)
Description: I-285WB HOV TO I-75 HOV
Style: Prop Main CL
Vertical Alignment Name: 5M2W7N (KC99)
Description: I-285HOV TO I-75 HOV
Style: Prop Main CL

	STATION	ELEVATION
Element: Parabola		
PVC	1208+02.75	902.20 ~~903.17~~
PVI	1209+~~52.75~~ 02.75	902.04 905.90
PVT	1211+02.75	901.61
VHIGH	1209+19.44	904.23
Length:	~~300.0000~~ 200	
Stopping Sight Distance:	380.8711	
Entrance Grade:	1.8182	
Exit Grade:	-2.8561	
r = (g2 - g1) / L:	-1.5581	
K = 1 / (g2 - g1):	64.1814	
Middle Ordinate:	-1.7528	
Element: Linear		
PVT	1211+02.75	901.61
PVC	1212+29.84	897.98
Tangent Grade:	-2.8561	
Tangent Length:	127.0900	
Element: Parabola		
PVC	1212+29.84	897.98
PVI	~~1214+74.84~~ 1215+81	~~890.99~~ 881.07
PVT	~~1217+19.84~~ 1218+74	~~899.12~~ 894.82
VLOW	1214+56.44	894.75
Length:	~~490.0000~~ 506	
adlight Sight Distance:	364.7018	
Entrance Grade:	-2.8561	
Exit Grade:	3.3200	
r = (g2 - g1) / L:	1.2604	
K = 1 / (g2 - g1):	79.3384	
Middle Ordinate:	3.7828	

2140+35.50 ~~902.42~~ ~~-15193~~
0.034 ~~903.15~~ 901.4
-0.1598

```
            Project Name: I285 ALT5
             Description: ALTERNATIVE 5
Horizontal Alignment Name: 5M2W7N (KC99)
             Description: I-285WB HOV TO I-75 HOV
                   Style: Prop Main CL
  Vertical Alignment Name: 5M2W7N (KC99)
             Description: I-285HOV TO I-75 HOV
                   Style: Prop Main CL
                                  STATION          ELEVATION

Element: Parabola
                     PVC        1208+02.75            903.17
                     PVI        1209+52.75            905.90
                     PVT        1211+02.75            901.59
                   VHIGH        1209+19.11            904.23
                 Length:          300.0000
   Stopping Sight Distance:       380.2178
          Entrance Grade:          1.8182
              Exit Grade:         -2.8693
      r = ( g2 - g1 ) / L:        -1.5625
      K = 1 / ( g2 - g1 ):        63.9998
          Middle Ordinate:        -1.7578

Element: Linear
                     PVT        1211+02.75            901.59
                     PVC        1213+55.16            894.35
            Tangent Grade:         -2.8693
           Tangent Length:        252.4100

Element: Parabola
                     PVC        1213+55.16            894.35
                     PVI        1216+90.16            884.74
                     PVT        1220+25.16            903.13
                    VLOW        1215+85.14            891.05
                 Length:          670.0000
   adlight Sight Distance:        367.7123
          Entrance Grade:         -2.8693
              Exit Grade:          5.4900
      r = ( g2 - g1 ) / L:         1.2477
      K = 1 / ( g2 - g1 ):        80.1499
          Middle Ordinate:         7.0009
```

Subject: KC99 (TIE)		
Comp by: PCT	Date: 10/16/09	Sheet Number:
Check by:	Job Number:	

CURVE 1

PC = 1218+23

PT = 1222+93

R = 2220

e = 0.04

DS = 45 Δ = 185

L = 16(0.04)(185) = 120 $\frac{1}{3}$ = 40

LR = 16(0.02)(185) = 60

	STA	LT	RT
RC	1218+03	+0.02	-0.02
BFSE	1218+63	+0.04	-0.04
EFSE	1222+53	+0.04	-0.04
	1223+13	+0.02	-0.02

KC 102 SET

	STA	LT	RT
	1217+16	+0.02	-0.02
RC	1217+56	+0.02	-0.02
BFSE	1218+16	+0.04	-0.04
*EFSE	1222+53	+0.04	-0.04
⟷	1223+13	+0.02	-0.02

CUT XSC FROM KC102

STA. 1217+00

1218+00

1219+00

1220+00

1221+00

1222+00

1223+00

1224+00

1220+25.16 /

1220+25.81 903.77 − (16.12 × 0.04) = 903.13

PBSJ

Subject: KC 99
KC102 TIE INTO MANAGED LANE

Comp by: PLT | Date: 9/11/09 | Sheet Number:
Check by: | Job Number:

CURVE 1

PC = 1208+69
PT = 1212+17

R = 2236
e = 0.04

DS = 45 V = 185
L = 16(0.04)(185) = 118 $\frac{1}{3}$ = 39
LR = 16(0.02)(185) = 59

- ELE FOR MANAGED LANE
@ BEG = 903.74
GR = +0.64572

@ GONE = 906.52
GR = +2.76378

0.035 SE

	STA	LT	RT
BEG	1208+68.64	+0.035	-0.035
	1209+73	0	0
	1210+82	-0.02	+0.02
* BFSE	1210+91	-0.04	+0.04
EFSE	1211+78	-0.04	+0.04
RC	1212+37	-0.02	+0.02

} L = 16(0.035)(185) = 104

CURVE 2

PC = 1214+22
PT = 1221+71

R = 2220
e = 0.04

	STA	LT	RT
NC/RC	1212+84	-0.02	+0.02
FLAT	1213+43	0	0
RC	1214+02	+0.02	-0.02
BFSE	1214+61	+0.04	-0.04
EFSE	1221+32	+0.04	-0.04
RC	1221+91	+0.02	-0.02

I-75 NB Akers Mill to Windy Hill (KC 11)

Comp: PCT
CHECK: MRM
11/14/09
REV. C

I-75N(KC11_101209).txt

```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N (KC 11)
             Description: I-75 NB AT I-285
                   Style: Prop Main CL
                                          STATION       NORTHING        EASTING

Element: Linear                                  1415D
             POB (KC10041 )              99+96.00 1413096.27466392208798.7563153
              PC (        )             104+63.27 1413477.55556472208528.6436529
         Tangent Direction:          N 35^18'54" W
            Tangent Length:             467.2644

Element: Circular
              PC (        )             104+63.27 1413477.55556472208528.6436529
              PI (KC10042 )             105+71.80 1413566.11915842208465.9021203
              CC (CKC22 )                         1419095.26390372216458.3899930
              PT (        )             106+80.33 1413656.06194712208405.1542411
                     Radius:             9718.0000
                      Delta:             1^16'47" Right
  Degree of Curvature(Arc):              0^35'23"
                     Length:              217.0625
                    Tangent:              108.5358
                      Chord:              217.0580
            Middle Ordinate:                0.6060
                   External:                0.6061
         Tangent Direction:          N 35^18'54" W
          Radial Direction:          N 54^41'06" E
           Chord Direction:          N 34^40'31" W
          Radial Direction:          N 55^57'53" E
         Tangent Direction:          N 34^02'07" W

Element: Linear
              PT (        )             106+80.33 1413656.06194712208405.1542411
              PC (        )             120+20.44 1414766.60243382207655.0887800
         Tangent Direction:          N 34^02'07" W
            Tangent Length:            1340.1113

Element: Circular
              PC (        )             120+20.44 1414766.60243382207655.0887800
              PI (KC10043 )             121+69.67 1414890.26916752207571.5635535
              CC (CKC23 )                         1421195.36078672217173.4532424
              PT (        )             123+18.89 1415016.06418332207491.2794427
                     Radius:            11486.0000
                      Delta:              1^29'19" Right
  Degree of Curvature(Arc):              0^29'56"
                     Length:              298.4454
                    Tangent:              149.2311
                      Chord:              298.4370
            Middle Ordinate:                0.9693
                   External:                0.9694
         Tangent Direction:          N 34^02'07" W
          Radial Direction:          N 55^57'53" E
           Chord Direction:          N 33^17'27" W
          Radial Direction:          N 57^27'12" E
         Tangent Direction:          N 32^32'48" W

Element: Linear
              PT (        )             123+18.89 1415016.06418332207491.2794427
              PI (KC10044 )             129+12.33 1415516.31208332207172.0143465
         Tangent Direction:          N 32^32'48" W
            Tangent Length:             593.4460
```

```
Element: Linear
              PI (          )          129+12.33 1415516.31208332207172.0143465
              PC (          )          129+78.14 1415571.65808792207136.4076581
         Tangent Direction:            N 32^45'18" W
            Tangent Length:                65.8105

Element: Circular
              PC (          )          129+78.14 1415571.65808792207136.4076581
              PI (KC10045   )          130+74.57 1415652.75335062207084.2352605
              CC ( CKC24    )                    1420829.57308752215309.1583491
              PT (          )          131+70.99 1415734.86791982207033.6823353
                     Radius:                 9718.0000
                      Delta:                  1^08'13" Right
  Degree of Curvature(Arc):                   0^35'23"
                     Length:                  192.8501
                    Tangent:                   96.4282
                      Chord:                  192.8469
            Middle Ordinate:                    0.4784
                   External:                    0.4784
         Tangent Direction:            N 32^45'18" W
          Radial Direction:            N 57^14'42" E
           Chord Direction:            N 32^11'12" W
          Radial Direction:            N 58^22'55" E
         Tangent Direction:            N 31^37'05" W

Element: Linear
              PT (          )          131+70.99 1415734.86791982207033.6823353
              PC (          )          137+10.51 1416194.30426532206750.8354368
         Tangent Direction:            N 31^37'05" W
            Tangent Length:                539.5221

Element: Circular
              PC (          )          137+10.51 1416194.30426532206750.8354368
              PI (KC10046   )          138+27.01 1416293.50922632206689.7610012
              CC ( CKC25    )                    1413946.03887012203098.9133453
              PT (          )          139+43.45 1416389.25213572206623.3907802
                     Radius:                 4288.5000
                      Delta:                  3^06'44" Left
  Degree of Curvature(Arc):                   1^20'10"
                     Length:                  232.9381
                    Tangent:                  116.4977
                      Chord:                  232.9095
            Middle Ordinate:                    1.5815
                   External:                    1.5820
         Tangent Direction:            N 31^37'05" W
          Radial Direction:            N 58^22'55" E
           Chord Direction:            N 33^10'27" W
          Radial Direction:            N 55^16'11" E
         Tangent Direction:            N 34^43'49" W

Element: Linear
              PT (          )          139+43.45 1416389.25213572206623.3907802
              PC (          )          142+13.18 1416610.92803422206469.7221851
         Tangent Direction:            N 34^43'49" W
            Tangent Length:                269.7299

Element: Circular
              PC (          )          142+13.18 1416610.92803422206469.7221851
              PI (KC10047   )          145+74.10 1416907.54460662206264.1037472
              CC ( CKC26    )                    1415116.00169422204313.2038712
              PT (          )          149+30.51 1417137.63350702205986.0400299
                     Radius:                 2624.0000
                      Delta:                 15^39'47" Left
```

```
  Degree of Curvature(Arc):          2^11'01"
                    Length:          717.3309
                   Tangent:          360.9160
                     Chord:          715.0994
            Middle Ordinate:          24.4742
                  External:           24.7047
         Tangent Direction:      N 34^43'49" W
          Radial Direction:      N 55^16'11" E
           Chord Direction:      N 42^33'42" W
          Radial Direction:      N 39^36'24" E
         Tangent Direction:      N 50^23'36" W

Element: Linear
              PT (        )          149+30.51 1417137.63350702205986.0400299
              PI (        )          153+54.21 1417407.74647582205659.6070028
         Tangent Direction:      N 50^23'36" W
            Tangent Length:          423.6975

Element: Linear
              PI (KC10048 )          153+54.21 1417407.74647582205659.6070028
              PC (        )          167+35.16 1418279.27497422204588.4050657
         Tangent Direction:      N 50^52'06" W
            Tangent Length:          1380.9546

Element: Circular
              PC (        )          167+35.16 1418279.27497422204588.4050657
              PI (KC10049 )          176+53.63 1418858.92470452203875.9534188
              CC ( CKC47  )                    1422423.19047162207959.8893075
             PCC (        )          185+54.31 1419643.23674162203398.0038528
                  Radius:             5342.1851
                   Delta:             19^30'38" Right
  Degree of Curvature(Arc):           1^04'21"
                    Length:          1819.1486
                   Tangent:           918.4667
                     Chord:          1810.3720
            Middle Ordinate:            77.2464
                  External:            78.3797
         Tangent Direction:      N 50^52'06" W
          Radial Direction:      N 39^07'54" E
           Chord Direction:      N 41^06'46" W
          Radial Direction:      N 58^38'33" E
         Tangent Direction:      N 31^21'27" W

Element: Circular
             PCC (        )          185+54.31 1419643.23674162203398.0038528
              PI (KC10082 )          185+91.46 1419674.96083222203378.6716042
              CC (CKC48   )                    1421096.65151902205783.0477696
              PT (        )          186+28.61 1419707.18789502203360.1899864
                  Radius:             2793.0000
                   Delta:             1^31'27" Right
  Degree of Curvature(Arc):           2^03'05"
                    Length:            74.2965
                   Tangent:            37.1504
                     Chord:            74.2943
            Middle Ordinate:            0.2470
                  External:             0.2471
         Tangent Direction:      N 31^21'27" W
          Radial Direction:      N 58^38'33" E
           Chord Direction:      N 30^35'44" W
          Radial Direction:      N 60^10'00" E
         Tangent Direction:      N 29^50'00" W

Element: Linear
```

```
                PT (        )        186+28.61 1419707.18789502203360.1899864
               POE (KC10083 )        186+35.86 1419713.48132782203356.5808204
Tangent Direction:          N 29^50'00" W
   Tangent Length:                   7.2549
```

Comp: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N (KC 11)
             Description: I-75 NB AT I-285
                   Style: Prop Main CL
                                    STATION       NORTHING        EASTING

Element: Linear                                 14150
             POB (KC10041 )          99+96.00 1413096.27466392208798.7563153
              PC (        )         104+63.27 1413477.55556472208528.6436529
         Tangent Direction:      N 35^18'54" W
            Tangent Length:          467.2644

Element: Circular
              PC (        )         104+63.27 1413477.55556472208528.6436529
              PI (KC10042 )         105+71.80 1413566.11915842208465.9021203
              CC (CKC22 )                     1419095.26390372216458.3899930
              PT (        )         106+80.33 1413656.06194712208405.1542411
                     Radius:          9718.0000
                      Delta:           1^16'47" Right
  Degree of Curvature(Arc):           0^35'23"
                     Length:           217.0625
                    Tangent:           108.5358
                      Chord:           217.0580
            Middle Ordinate:             0.6060
                   External:             0.6061
         Tangent Direction:       N 35^18'54" W
          Radial Direction:       N 54^41'06" E
           Chord Direction:       N 34^40'31" W
          Radial Direction:       N 55^57'53" E
         Tangent Direction:       N 34^02'07" W

Element: Linear
              PT (        )         106+80.33 1413656.06194712208405.1542411
              PC (        )         120+20.44 1414766.60243382207655.0887800
         Tangent Direction:      N 34^02'07" W
            Tangent Length:         1340.1113

Element: Circular
              PC (        )         120+20.44 1414766.60243382207655.0887800
              PI (KC10043 )         121+69.67 1414890.26916752207571.5635535
              CC (CKC23 )                     1421195.36078672217173.4532424
              PT (        )         123+18.89 1415016.06418332207491.2794427
                     Radius:         11486.0000
                      Delta:           1^29'19" Right
  Degree of Curvature(Arc):           0^29'56"
                     Length:           298.4454
                    Tangent:           149.2311
                      Chord:           298.4370
            Middle Ordinate:             0.9693
                   External:             0.9694
         Tangent Direction:       N 34^02'07" W
          Radial Direction:       N 55^57'53" E
           Chord Direction:       N 33^17'27" W
          Radial Direction:       N 57^27'12" E
         Tangent Direction:       N 32^32'48" W

Element: Linear
              PT (        )         123+18.89 1415016.06418332207491.2794427
              PI (KC10044 )         129+12.33 1415516.31208332207172.0143465
         Tangent Direction:      N 32^32'48" W
            Tangent Length:          593.4460
```

```
Element: Linear
              PI (          )        129+12.33 1415516.31208332207172.0143465
              PC (          )        129+78.14 1415571.65808792207136.4076581
         Tangent Direction:          N 32^45'18" W
            Tangent Length:                65.8105

Element: Circular
              PC (          )        129+78.14 1415571.65808792207136.4076581
              PI (KC100 45  )        130+74.57 1415652.75335062207084.2352605
              CC ( CKC 24   )                  1420829.57308752215309.1583491
              PT (          )        131+70.99 1415734.86791982207033.6823353
                     Radius:                   9718.0000
                      Delta:                    1^08'13" Right
  Degree of Curvature(Arc):                     0^35'23"
                     Length:                    192.8501
                    Tangent:                     96.4282
                      Chord:                    192.8469
            Middle Ordinate:                      0.4784
                   External:                      0.4784
         Tangent Direction:          N 32^45'18" W
          Radial Direction:          N 57^14'42" E
           Chord Direction:          N 32^11'12" W
          Radial Direction:          N 58^22'55" E
         Tangent Direction:          N 31^37'05" W

Element: Linear
              PT (          )        131+70.99 1415734.86791982207033.6823353
              PC (          )        137+10.51 1416194.30426532206750.8354368
         Tangent Direction:          N 31^37'05" W
            Tangent Length:                539.5221

Element: Circular
              PC (          )        137+10.51 1416194.30426532206750.8354368
              PI (KC10046   )        138+27.01 1416293.50922632206689.7610012
              CC ( CKC25    )                  1413946.03887012203098.9133453
              PT (          )        139+43.45 1416389.25213572206623.3907802
                     Radius:                   4288.5000
                      Delta:                    3^06'44" Left
  Degree of Curvature(Arc):                     1^20'10"
                     Length:                    232.9381
                    Tangent:                    116.4977
                      Chord:                    232.9095
            Middle Ordinate:                      1.5815
                   External:                      1.5820
         Tangent Direction:          N 31^37'05" W
          Radial Direction:          N 58^22'55" E
           Chord Direction:          N 33^10'27" W
          Radial Direction:          N 55^16'11" E
         Tangent Direction:          N 34^43'49" W

Element: Linear
              PT (          )        139+43.45 1416389.25213572206623.3907802
              PC (          )        142+13.18 1416610.92803422206469.7221851
         Tangent Direction:          N 34^43'49" W
            Tangent Length:                269.7299

Element: Circular
              PC (          )        142+13.18 1416610.92803422206469.7221851
              PI (KC10047   )        145+74.10 1416907.54460662206264.1037472
              CC ( CKC26    )                  1415116.00169422204313.2038712
              PT (          )        149+30.51 1417137.63350702205986.0400299
                     Radius:                   2624.0000
                      Delta:                    15^39'47" Left
```

```
  Degree of Curvature(Arc):          2^11'01"
                    Length:          717.3309
                   Tangent:          360.9160
                     Chord:          715.0994
            Middle Ordinate:          24.4742
                  External:           24.7047
          Tangent Direction:     N 34^43'49" W
           Radial Direction:     N 55^16'11" E
            Chord Direction:     N 42^33'42" W
           Radial Direction:     N 39^36'24" E
          Tangent Direction:     N 50^23'36" W

Element: Linear
               PT (        )        149+30.51 1417137.6335070 2205986.0400299
               PI (        )        153+54.21 1417407.7464758 2205659.6070028
          Tangent Direction:     N 50^23'36" W
             Tangent Length:         423.6975

Element: Linear
               PI (KC10048 )        153+54.21 1417407.7464758 2205659.6070028
               PC (        )        167+35.16 1418279.2749742 2204588.4050657
          Tangent Direction:     N 50^52'06" W
             Tangent Length:        1380.9546

Element: Circular
               PC (        )        167+35.16 1418279.2749742 2204588.4050657
               PI (KC10049 )        176+53.63 1418858.9247045 2203875.9534188
               CC ( CKC47  )                  1422423.1904716 2207959.8893075
              PCC (        )        185+54.31 1419643.2367416 2203398.0038528
                   Radius:           5342.1851
                    Delta:           19^30'38" Right
  Degree of Curvature(Arc):           1^04'21"
                    Length:          1819.1486
                   Tangent:           918.4667
                     Chord:          1810.3720
            Middle Ordinate:           77.2464
                  External:            78.3797
          Tangent Direction:     N 50^52'06" W
           Radial Direction:     N 39^07'54" E
            Chord Direction:     N 41^06'46" W
           Radial Direction:     N 58^38'33" E
          Tangent Direction:     N 31^21'27" W

Element: Circular
              PCC (        )        185+54.31 1419643.2367416 2203398.0038528
               PI (KC10082 )        185+91.46 1419674.9608322 2203378.6716042
               CC ( CKC48  )                  1421096.6515190 2205783.0477696
               PT (        )        186+28.61 1419707.1878950 2203360.1899864
                   Radius:           2793.0000
                    Delta:           1^31'27" Right
  Degree of Curvature(Arc):          2^03'05"
                    Length:           74.2965
                   Tangent:           37.1504
                     Chord:           74.2943
            Middle Ordinate:           0.2470
                  External:            0.2471
          Tangent Direction:     N 31^21'27" W
           Radial Direction:     N 58^38'33" E
            Chord Direction:     N 30^35'44" W
           Radial Direction:     N 60^10'00" E
          Tangent Direction:     N 29^50'00" W

Element: Linear
```

```
     PT (        )          186+28.611419707.18789502203360.1899864
    POE (KC10083 )          186+35.861419713.48132782203356.5808204
Tangent Direction:      N 29^50'00" W
   Tangent Length:              7.2549
```

C:

10/13/09

COMP: PCT


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N (KC 11)
             Description: I-75 NB AT I-285
                   Style: Prop Main CL
  Vertical Alignment Name: KC11
             Description: I-75 NB AT I-285
                   Style: Prop Main CL
                                  STATION          ELEVATION

Element: Linear
                     POB          99+96.00            929.72
                     PVC         100+14.66            930.15
           Tangent Grade:            2.3015
          Tangent Length:           18.6548

Element: Parabola
                     PVC         100+14.66            930.15
                     PVI         108+74.66            949.94
                     PVT         117+34.66            913.56
                   VHIGH         106+20.61            937.12
                  Length:        1720.0000
   Stopping Sight Distance:       753.8336
          Entrance Grade:           2.3015
              Exit Grade:          -4.2312
      r = ( g2 - g1 ) / L:         -0.3798
      K = 1 / ( g2 - g1 ):        263.2929
         Middle Ordinate:         -14.0452

Element: Linear
                     PVT         117+34.66            913.56
                     PVC         120+56.83            899.92
           Tangent Grade:           -4.2312
          Tangent Length:          322.1738

Element: Parabola
                     PVC         120+56.83            899.92
                     PVI         121+56.83            895.69
                     PVT         122+56.83            892.69
                  Length:          200.0000
          Entrance Grade:           -4.2312
              Exit Grade:           -3.0000
      r = ( g2 - g1 ) / L:           0.6156
      K = 1 / ( g2 - g1 ):         162.4434
         Middle Ordinate:            0.3078

Element: Linear
                     PVT         122+56.83            892.69
                     PVI         122+76.83            892.09
           Tangent Grade:           -3.0000
          Tangent Length:           20.0000

Element: Linear
                     PVI         122+76.83            892.09
                     PVI         124+45.94            889.06
           Tangent Grade:           -1.7910
          Tangent Length:          169.1100

Element: Linear
                     PVI         124+45.94            889.06
                     PVC         124+65.94            888.87
           Tangent Grade:           -0.9792
          Tangent Length:           20.0000
```

```
Element: Parabola
                          PVC          124+65.94            888.87
                          PVI          126+55.94            887.01
                          PVT          128+45.94            890.87
                         VLOW          125+89.49            888.26
                      Length:           380.0000
  Headlight Sight Distance:            612.0474
            Entrance Grade:             -0.9792
                Exit Grade:              2.0325
       r = ( g2 - g1 ) / L:              0.7926
       K = l / ( g2 - g1 ):            126.1743
           Middle Ordinate:              1.4306

Element: Linear
                          PVT          128+45.94            890.87
                          PVC          134+00.00            902.13
             Tangent Grade:               2.0325
            Tangent Length:            554.0600

Element: Parabola
                          PVC          134+00.00            902.13
                          PVI          136+00.00            906.20
                         PVRC          138+00.00            911.40
                      Length:           400.0000
            Entrance Grade:              2.0325
                Exit Grade:              2.6020
       r = ( g2 - g1 ) / L:              0.1424
       K = l / ( g2 - g1 ):            702.3797
           Middle Ordinate:              0.2847

Element: Parabola
                         PVRC          138+00.00            911.40
                          PVI          140+00.00            916.60
                          PVT          142+00.00            920.20
                      Length:           400.0000
   Stopping Sight Distance:           1542.6037
            Entrance Grade:              2.6020
                Exit Grade:              1.7982
       r = ( g2 - g1 ) / L:             -0.2009
       K = l / ( g2 - g1 ):            497.6522
           Middle Ordinate:             -0.4019

Element: Linear
                          PVT          142+00.00            920.20
                          PVC          145+15.00            925.86
             Tangent Grade:               1.7982
            Tangent Length:            315.0000

Element: Parabola
                          PVC          145+15.00            925.86
                          PVI          149+85.00            934.32
                          PVT          154+55.00            928.39
                        VHIGH          150+67.65            930.83
                      Length:           940.0000
   Stopping Sight Distance:            814.4401
            Entrance Grade:              1.7982
                Exit Grade:             -1.2604
       r = ( g2 - g1 ) / L:             -0.3254
       K = l / ( g2 - g1 ):            307.3310
           Middle Ordinate:             -3.5938

Element: Linear
```

```
                    PVT        154+55.00          928.39
                    PVC        167+15.00          912.51
          Tangent Grade:         -1.2604
         Tangent Length:       1260.0000

Element: Parabola
                    PVC        167+15.00          912.51
                    PVI        170+15.00          908.73
                    PVT        173+15.00          917.81
                   VLOW        168+91.44          911.40
                 Length:        600.0000
  Headlight Sight Distance:     585.5960
         Entrance Grade:         -1.2604
             Exit Grade:          3.0256
     r = ( g2 - g1 ) / L:         0.7143
     K = 1 / ( g2 - g1 ):       139.9921
        Middle Ordinate:          3.2145

Element: Linear
                    PVT        173+15.00          917.81
                    PVC        183+20.08          948.22
          Tangent Grade:          3.0256
         Tangent Length:       1005.0796

Element: Parabola
                    PVC        183+20.08          948.22
                    PVI        184+20.08          951.24
                    PVT        185+20.08          953.31
                 Length:        200.0000
   Stopping Sight Distance:    1230.7168
         Entrance Grade:          3.0256
             Exit Grade:          2.0712
     r = ( g2 - g1 ) / L:        -0.4772
     K = 1 / ( g2 - g1 ):       209.5569
        Middle Ordinate:         -0.2386

Element: Linear
                    PVT        185+20.08          953.31
                    POE        186+28.61          955.56
          Tangent Grade:          2.0712
         Tangent Length:        108.5304
```

(I-13 NB AT I-285)

PBSJ

Subject:	KC 11 SE DS = 55 V = 213		
Comp by: PCT Check by:	Date: REV 10/14/09 Job Number:	Sheet Number: KC11SE1-30.	

CURVE KC25

PC = 137+11

PT = 139+43

R = 4287 4288.50

e = 0.032

w = 48 b_w = 0.625

L = 48(0.032)(213)(0.625) = 204 $\frac{1}{3}$ = 68

L_R = 48(0.012)(213)(0.625) = 77

L_2 = 48(0.02)(213)(0.625) = 128

	STA	LT	RT
NC	134+46	-0.02	-0.02
RLAT	135+74	-0.02	0
RC	137+02	-0.02	+0.02
BFSE	137+79	-0.032	+0.032
EFSE	139+52	-0.032	+0.032

EXISTG (113+00)

EXIST 7 (114+00 TO 138+00)

EXIST 3 (139+00 TO END)

BEGIN NC

	99+96	+0.02	-0.02
	106+12	+0.02	-0.02
	107+40	0	-0.02
	108+68	-0.02	-0.02
	119+57	-0.02	-0.02
	120+85	0	-0.02
	122+13	+0.02	-0.02
EXBR	122+77	+0.01	-0.01
EXSR	124+46	+0.01	-0.01
	125+10	+0.02	-0.02
	126+38	0	-0.02
	127+66	-0.02	-0.02

CURVE 26

PC = 142+13

PT = 149+30

R = 2622

e = 0.048

L = 48(0.048)(213)(0.625) = 306 $\frac{1}{3}$ = 102

LR = 48(0.028)(213)(0.625) = 179

	STA	LT	RT
	139+52	-0.032	+0.032
	142+13	-0.032	+0.032
BFSE	143+15	-0.048	+0.048
EFSE	148+28	-0.048	+0.048
RC	150+07	-0.02	+0.02
RLAT	151+35	-0.02	0
NC	152+63	-0.02	-0.02
NC	158+19	-0.02	-0.02
	159+22	0	-0.02
	160+25	+0.02	-0.02

L = 48(0.016)(213)(0.625) = 102

ROTATE LT LANE FOR RAMP

L = 36(0.02)(213)(0.67) = 103

6104-01

PBSJ

Subject:	KEC15E DS = 55 V = 213	
Comp by: Check by:	Date: Job Number:	Sheet Number:

CURVE 47

PC = ~~166+53~~ 167+35 $\quad L = 36(0.026)(213)(0.67) = 134 \quad \frac{1}{3} = 45$

PT = ~~184+83~~ 185+54 $\quad L_R = 36(0.006)(213)(0.67) = 31$

R = ~~5799~~ 5586 $\quad L_2 = 36(0.02)(213)(0.67) = 103$

e = 0.026 $\quad L_1 = 51$

$bw = \frac{1 + 0.5(7-1)}{7} = 0.57$

	STA	LT	RT
RC	166+67	+0.02	-0.02
BPSE	166+98	+0.026	-0.026
~~EPSE~~	~~183+95~~	~~+0.026~~	~~-0.026~~
*EPSE	181+89	+0.026	-0.026
MATCH	184+83	+0.055	-0.055

$L = 84(0.026)(213)(0.57) = 265$

$\frac{1}{3} = 88$

$L_R = 84(0.006)(213)0.57) = 62$

$L = 84(0.029)(213)(0.57) = 296$

CURVE 47 REVISION

PC = 167+35

PT = 185+54

R = 5586

e = 0.026

	STA	LT	RT
RC	167+49	+0.02	-0.02
BPSE	167+80	+0.026	-0.026
*EPSE	182+07	+0.026	-0.026
MATCH	185+54	+0.06	-0.06
END	186+29	+0.06	-0.06

$L = 84(0.034)(213)(0.57) = 347$

I-75 SB Akers Mill to Windy Hill (KC 12)

Project Name: I-75 PBSJ
Description:
Horizontal Alignment Name: I-75S (KC12)
Description: I-75 SB AT I-285
Style: Prop Main CL

Comp: PCT
Check: MRM
11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Linear			
POB (10051)	304+22.43	1413369.9150000	2208454.2690000
PC ( )	304+54.85	1413396.4036962	2208435.5747116
Tangent Direction:	N 35^12'45" W		
Tangent Length:	32.4211		
Element: Circular			
PC ( )	304+54.85	1413396.4036962	2208435.5747116
PI (10052)	307+37.09	1413627.0050403	2208272.8287617
CC ( )		1417115.5303184	2213705.3562221
PT ( )	310+18.98	1413870.9409691	2208130.8481761
Radius:	6450.0000		
Delta:	5^00'40" Right		
Degree of Curvature(Arc):	0^53'18"		
Length:	564.1336		
Tangent:	282.2467		
Chord:	563.9538		
Middle Ordinate:	6.1666		
External:	6.1725		
Tangent Direction:	N 35^12'45" W		
Radial Direction:	N 54^47'15" E		
Chord Direction:	N 32^42'24" W		
Radial Direction:	N 59^47'56" E		
Tangent Direction:	N 30^12'04" W		
Element: Linear			
PT ( )	310+18.98	1413870.9409691	2208130.8481761
PC ( )	318+31.82	1414573.4472522	2207721.9610806
Tangent Direction:	N 30^12'04" W		
Tangent Length:	812.8368		
Element: Circular			
PC ( )	318+31.82	1414573.4472522	2207721.9610806
PI (10053)	319+34.35	1414662.0602022	2207670.3847565
CC ( )		1411964.6968080	2203239.8837587
PT ( )	320+36.85	1414748.5653229	2207615.3462590
Radius:	8186.0000		
Delta:	2^15'55" Left		
Degree of Curvature(Arc):	1^06'17"		
Length:	205.0330		
Tangent:	102.5299		
Chord:	205.0197		
Middle Ordinate:	1.0132		
External:	1.0134		
Tangent Direction:	N 30^12'04" W		
Radial Direction:	N 59^47'56" E		
Chord Direction:	N 31^20'02" W		
Radial Direction:	N 57^32'01" E		
Tangent Direction:	N 32^27'59" W		
Element: Linear			
PT ( )	320+36.85	1414748.5653229	2207615.3462590
PI ( )	329+22.50	1415495.7945558	2207139.9249898
Tangent Direction:	N 32^27'59" W		
Tangent Length:	885.6506		
Element: Linear			
PI (10054)	329+22.50	1415495.7945558	2207139.9249898
PC ( )	329+88.22	1415551.0721510	2207104.3796071
Tangent Direction:	N 32^44'33" W		
Tangent Length:	65.7198		
Element: Circular			
PC ( )	329+88.22	1415551.0721510	2207104.3796071
PI (10055)	331+07.85	1415651.6916808	2207039.6778110

CKC27

CKC28

```
            CC (          )                    1422145.2405599 2217359.1509420
            PT (          )          332+27.471415753.5614203 2206976.9628339
                   Radius:           12191.9396
                    Delta:            1^07'28" Right
  Degree of Curvature(Arc):           0^28'12"
                   Length:            239.2463
                  Tangent:            119.6270
                    Chord:            239.2424
           Middle Ordinate:             0.5868
                  External:             0.5869
         Tangent Direction:       N 32^44'33" W
          Radial Direction:       N 57^15'27" E
           Chord Direction:       N 32^10'49" W
          Radial Direction:       N 58^22'55" E
         Tangent Direction:       N 31^37'05" W

Element: Linear
            PT (          )          332+27.471415753.5614203 2206976.9628339
            PC (          )          337+21.331416174.1204866 2206718.0503019
         Tangent Direction:       N 31^37'05" W
            Tangent Length:           493.8680

Element: Circular
            PC (          )          337+21.331416174.1204866 2206718.0503019
            PI ( 10056    )          338+46.341416280.5731777 2206652.5138814
            CC (          )                    1413946.0388892 2203098.9133336
            PT (          )          339+71.281416382.9898059 2206580.8338137
                   Radius:           4250.0000
                    Delta:            3^22'11" Left
  Degree of Curvature(Arc):           1^20'53"
                   Length:            249.9455
                  Tangent:            125.0088
                    Chord:            249.9095
           Middle Ordinate:             1.8373
                  External:             1.8381
         Tangent Direction:       N 31^37'05" W
          Radial Direction:       N 58^22'55" E
           Chord Direction:       N 33^18'10" W
          Radial Direction:       N 55^00'44" E
         Tangent Direction:       N 34^59'16" W

Element: Linear
            PT (          )          339+71.281416382.9898059 2206580.8338137
            PC (          )          342+00.301416570.6204773 2206449.5135439
         Tangent Direction:       N 34^59'16" W
            Tangent Length:           229.0203

Element: Circular
            PC (          )          342+00.301416570.6204773 2206449.5135439
            PI ( 10057    )          346+43.601416933.8072100 2206195.3238672
            CC (          )                    1414920.3746565 2204091.6389223
           PCC (          )          350+79.991417203.6680781 2205843.6249813
                   Radius:           2878.0000
                    Delta:            17^30'47" Left
  Degree of Curvature(Arc):           1^59'27"
                   Length:            879.6911
                  Tangent:            443.3024
                    Chord:            876.2706
           Middle Ordinate:            33.5455
                  External:            33.9411
         Tangent Direction:       N 34^59'16" W
          Radial Direction:       N 55^00'44" E
           Chord Direction:       N 43^44'39" W
          Radial Direction:       N 37^29'57" E
         Tangent Direction:       N 52^30'03" W

Element: Circular
           PCC (          )          350+79.991417203.6680781 2205843.6249813
            PI ( 10084    )          353+28.961417355.2263471 2205646.1051456
            CC (          )                    1409492.1975924 2199926.5629614
            PT (          )          355+77.811417496.4740607 2205441.0854447
                   Radius:           5720.0000
```

CCC29

CCC30

CCC31

CCC32

```
                  Delta:          2^56'04" Left
Degree of Curvature(Arc):         0^35'22"
                 Length:          497.8229
                Tangent:          248.9658
                  Chord:          497.7684
     Middle Ordinate:               3.1869
               External:            3.1880
     Tangent Direction:       N 52^30'03" W
      Radial Direction:       N 37^29'57" E
       Chord Direction:       N 53^58'05" W
      Radial Direction:       N 34^33'53" E
     Tangent Direction:       N 55^26'07" W

Element: Linear
          PT (        )          355+77.811417496.47406072205441.0854447
          PC (        )          361+97.031417847.77657972204931.1732095
     Tangent Direction:       N 55^26'07" W
        Tangent Length:          619.2124

Element: Circular
          PC (        )          361+97.031417847.77657972204931.1732095
          PI ( 10058  )          369+17.641418256.60843572204337.7576935
          CC (        )                   1421141.71751312207200.5240256
          PT (        )          376+22.961418846.82770122203924.3248939
                Radius:          4000.0000
                 Delta:          20^25'30" Right
Degree of Curvature(Arc):         1^25'57"
                 Length:          1425.9342
                Tangent:          720.6146
                  Chord:          1418.3958
     Middle Ordinate:               63.3722
               External:          64.3924
     Tangent Direction:       N 55^26'07" W
      Radial Direction:       N 34^33'53" E
       Chord Direction:       N 45^13'22" W
      Radial Direction:       N 54^59'23" E
     Tangent Direction:       N 35^00'37" W

Element: Linear
          PT (        )          376+22.961418846.82770122203924.3248939
          PC (        )          382+12.301419329.52817282203586.2061318
     Tangent Direction:       N 35^00'37" W
        Tangent Length:          589.3420

Element: Circular
          PC (        )          382+12.301419329.52817282203586.2061318
          PI ( 10059  )          384+32.681419510.02922992203459.7699720
          CC (        )                   1422655.39723282208334.2377235
          PT (        )          386+52.851419699.60862962203347.4027821
                Radius:          5797.0000
                 Delta:          4^21'15" Right
Degree of Curvature(Arc):         0^59'18"
                 Length:          440.5451
                Tangent:          220.3786
                  Chord:          440.4391
     Middle Ordinate:               4.1844
               External:          4.1874
     Tangent Direction:       N 35^00'37" W
      Radial Direction:       N 54^59'23" E
       Chord Direction:       N 32^49'59" W
      Radial Direction:       N 59^20'38" E
     Tangent Direction:       N 30^39'22" W

Element: Linear
          PT (        )          386+52.851419699.60862962203347.4027821
         POE ( 10060  )          386+60.101419705.84900002203343.7040000
     Tangent Direction:       N 30^39'22" W
        Tangent Length:          7.2542
```

CICC31

CICC32

C:

10/13/09

COMP: PCT


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S (KC12)
             Description: I-75 SB AT I-285
                   Style: Prop Main CL
  Vertical Alignment Name: KC12
             Description: I-75 SB AT I-285
                   Style: Prop Main CL
                                    STATION          ELEVATION

Element: Linear
                      POB          304+22.43          936.80
                      PVC          304+54.05          936.98
           Tangent Grade:             0.5620
          Tangent Length:            31.6233

Element: Parabola
                      PVC          304+54.05          936.98
                      PVI          311+04.05          940.63
                      PVT          317+54.05          913.12
                    VHIGH          306+06.40          937.41
                  Length:          1300.0000
   Stopping Sight Distance:         764.9006
          Entrance Grade:             0.5620
              Exit Grade:            -4.2336
      r = ( g2 - g1 ) / L:           -0.3689
      K = 1 / ( g2 - g1 ):          271.0804
         Middle Ordinate:            -7.7929

Element: Linear
                      PVT          317+54.05          913.12
                      PVC          320+66.96          899.87
           Tangent Grade:            -4.2336
          Tangent Length:           312.9116

Element: Parabola
                      PVC          320+66.96          899.87
                      PVI          321+66.96          895.63
                      PVT          322+66.96          892.63
                  Length:           200.0000
          Entrance Grade:            -4.2336
              Exit Grade:            -3.0000
      r = ( g2 - g1 ) / L:            0.6168
      K = 1 / ( g2 - g1 ):          162.1262
         Middle Ordinate:             0.3084

Element: Linear
                      PVT          322+66.96          892.63
                      PVI          322+86.96          892.03
           Tangent Grade:            -3.0000
          Tangent Length:            20.0000

Element: Linear
                      PVI          322+86.96          892.03
                      PVI          324+56.20          889.01
           Tangent Grade:            -1.7875
          Tangent Length:           169.2400

Element: Linear
                      PVI          324+56.20          889.01
                      PVC          324+76.20          888.83
           Tangent Grade:            -0.9169
          Tangent Length:            20.0000
```

```
Element: Parabola
                        PVC          324+76.20            888.83
                        PVI          326+66.20            887.08
                        PVT          328+56.20            890.95
                       VLOW          325+94.22            888.28
                     Length:          380.0000
  Headlight Sight Distance:          632.9281
            Entrance Grade:           -0.9169
                Exit Grade:            2.0353
       r = ( g2 - g1 ) / L:            0.7769
       K = 1 / ( g2 - g1 ):          128.7164
           Middle Ordinate:            1.4023

Element: Linear
                        PVT          328+56.20            890.95
                        PVC          345+00.00            924.41
             Tangent Grade:            2.0353
            Tangent Length:         1643.8000

Element: Parabola
                        PVC          345+00.00            924.41
                        PVI          350+00.00            934.58
                        PVT          355+00.00            927.66
                      VHIGH          350+95.10            930.46
                     Length:         1000.0000
   Stopping Sight Distance:          794.3867
            Entrance Grade:            2.0353
                Exit Grade:           -1.3848
       r = ( g2 - g1 ) / L:           -0.3420
       K = 1 / ( g2 - g1 ):          292.3829
           Middle Ordinate:           -4.2752

Element: Linear
                        PVT          355+00.00            927.66
                        PVC          360+80.00            919.63
             Tangent Grade:           -1.3848
            Tangent Length:          580.0000

Element: Parabola
                        PVC          360+80.00            919.63
                        PVI          361+80.00            918.24
                        PVT          362+80.00            917.61
                     Length:          200.0000
            Entrance Grade:           -1.3848
                Exit Grade:           -0.6340
       r = ( g2 - g1 ) / L:            0.3754
       K = 1 / ( g2 - g1 ):          266.3622
           Middle Ordinate:            0.1877

Element: Linear
                        PVT          362+80.00            917.61
                        PVC          368+65.00            913.90
             Tangent Grade:           -0.6340
            Tangent Length:          585.0000

Element: Parabola
                        PVC          368+65.00            913.90
                        PVI          371+15.00            912.32
                        PVT          373+65.00            919.53
                       VLOW          369+55.02            913.62
                     Length:          500.0000
  Headlight Sight Distance:          609.9032
```

```
            Entrance Grade:          -0.6340
                Exit Grade:           2.8873
      r = ( g2 - g1 ) / L:            0.7043
      K = 1 / ( g2 - g1 ):          141.9926
          Middle Ordinate:            2.2008

Element: Linear
                       PVT        373+65.00          919.53
                       PVC        382+00.00          943.64
             Tangent Grade:          2.8873
            Tangent Length:        835.0000

Element: Parabola
                       PVC        382+00.00          943.64
                       PVI        383+00.00          946.53
                       PVT        384+00.00          948.54
                   Length:         200.0000
   Stopping Sight Distance:       1333.9821
            Entrance Grade:          2.8873
                Exit Grade:          2.0128
      r = ( g2 - g1 ) / L:          -0.4373
      K = 1 / ( g2 - g1 ):         228.6951
          Middle Ordinate:          -0.2186

Element: Linear
                       PVT        384+00.00          948.54
                       POE        386+52.85          953.63
             Tangent Grade:          2.0128
            Tangent Length:        252.8500
```

(I-75 SB AT I-285)

PBSJ

Subject:	KC12 SB DS = 55 V = 43		
Comp by: PCT	Date: REV 10/14/09	Sheet Number:	
Check by:	Job Number:		

CURVE 27

PC = 304 + 54
PT = 310 + 19

R = 6450
e = 0.022

w = 48 bw = 0.625
L = 48 (0.022) (213) (0.625) = 141 $\frac{1}{3}$ = 47

L_R = 48 (0.002) (213) (0.625) = 13
L_2 = 128

	STA	LT	RT		(10/14/09)	(9/25/09)	EXTEND 0.04 TO MATCH EX
MATCH EX	304+22	+0.04	−0.04	→	304+22	+0.04	−0.04
					305+50	+0.04	−0.04
*	305+37	+0.022	−0.022	→	306+14	+0.03	−0.03
					309+21	+0.03	−0.03
EFSE	309+72	+0.022	−0.022	→	309+72	+0.022	−0.022
RC	309+85	+0.02	−0.02		309+85	+0.02	−0.02
FLAT	311+13	0	0		311+13	0	−0.02
NC	312+41	−0.02	+0.02		312+41	−0.02	−0.02

CURVE 28

PC = 318 + 31
PT = 320 + 37

R = 5186
e = 0.028

w = 48 bw = 0.625
L = 48 (0.028) (213) (0.625) = 180 $\frac{1}{3}$ = 60

L_R = 48 (0.008) (213) (0.625) = 51
L_2 = 128

		LT	RT				
					315+84	−0.02	−0.02
		−0.02	+0.02		317+12	−0.02	0
RC	318+40	−0.02	+0.02	⟷	318+40	−0.02	+0.02
BFSE	318+91	−0.028	+0.028				
EFSE	319+77	−0.028	+0.028				
RC	320+28	−0.02	+0.02				
	322+23	−0.02	+0.02				
MATCH OFFRIDE	322+87	−0.01	+0.01				
EX DN	324+56	−0.01	+0.01				
	325+20	−0.02	+0.02				
	326+48	−0.02	0				
	327+76	−0.02	−0.02				

PBSJ

Subject:	KC12 SE DS = 55 V = 213	
Comp by:	Date:	Sheet Number:
Check by:	Job Number:	

CURVE 30

PC = 337+21

PT = 339+72

R = 4250

e = 0.032

W = 48 bw = 0.625

L = 48 (0.032)(213)(0.625) = 204 $\frac{1}{3}$ = 68

LR = 48 (0.012)(213)(0.625) = 77

L2 = 128

	STA	LT	RT
NC/RC	337+12	-0.02	+0.02
BFSE	337+89	-0.032	+0.032
EFSE	339+04	-0.032	+0.032
NC/RC	339+81	-0.02	+0.02

(10/14/09)

STA	LT	RT
334+56	-0.02	-0.02
335+84	-0.02	0
337+12	-0.02	+0.02

CURVE 31

PC = 342+00

PT = 350+80

R = 2878

e = 0.046

L = 48(0.046)(213)(0.625) = 294 $\frac{1}{3}$ = 98

LR = 48(0.026)(213)(0.625) = 166

L2 = 128

	STA	LT	RT
NC/RC	341+32	-0.02	+0.02
BFSE	342+98	-0.046	+0.046
EFSE	349+82	-0.046	+0.046
NC/RC	351+48	-0.02	+0.02
	352+76	-0.02	0
	354+04	-0.02	-0.02
	358+15	-0.02	-0.02

PBSJ

Subject:	KC 12 SE DS = 55 V = 213	
Comp by: Check by:	Date: Job Number:	Sheet Number:

CURVE 31

PC = 361+97
PT = 376+23
R = 4000
e = 0.034

w = 72 bw = [1 + 0.5(6 − 1)] / 6 = 0.5833

L = 72(0.034)(213)(0.583) = 304 1/3 = 101

L_R = 72(0.014)(213)(0.583) = 125

L_2 = 72(0.02)(213)(0.5833) = 179

	STA	LT	RT
NC	358+15	−0.02	+0.02
FLAT	359+94	0	0
RC	361+73	+0.02	−0.02
BFSE	362+98	+0.034	−0.034
EFSE	375+22	+0.034	−0.034
RC	376+47	+0.02	−0.02

(10/14/09)

358+15	−0.02	−0.02
359+94	0	−0.02

CURVE 32

PC = 382+12
PT = 386+53
R = 5797
e = 0.026

L = 72(0.026)(213)(0.583) = 233 1/3 = 78

L_R = 72(0.006)(213)(0.583) = 54

L_2 = 179

	STA	LT	RT
RC		+0.02	−0.02
RC	382+36	+0.02	−0.02
BFSE	382+90	+0.026	−0.026
EFSE	385+75	+0.026	−0.026
	386+26	+0.026	−0.026
MATCH	386+53	+0.029	−0.029

Ramp X
(KC 21)

COMP: PCT
CHECK: MR
11/14
REV. C


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285W ENT2 (KC21)
             Description: I-285 WB ENTR AT US41
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )              607+10.69  1414786.4051  2206235.0871
             PC (        )              608+78.93  1414663.1752  2206120.5506
        Tangent Direction:          S 42^54'22" W
           Tangent Length:               168.2386

Element: Circular
             PC (        )              608+78.93  1414663.1752  2206120.5506
             PI (        )              610+45.02  1414541.5238  2206007.4811
             CC (        )                         1418019.5111  2202509.4691
             PT (        )              612+10.97  1414427.7578  2205886.4808
                   Radius:              4930.0000
                    Delta:                3^51'32" Right
  Degree of Curvature(Arc):               1^09'44"
                   Length:               332.0417
                  Tangent:               166.0836
                    Chord:               331.9789
           Middle Ordinate:                 2.7952
                 External:                  2.7967
        Tangent Direction:          S 42^54'22" W
         Radial Direction:          N 47^05'38" W
          Chord Direction:          S 44^50'08" W
         Radial Direction:          N 43^14'06" W
        Tangent Direction:          S 46^45'54" W

Element: Linear
             PT (        )              612+10.97  1414427.7578  2205886.4808
             PC (        )              614+62.33  1414255.5779  2205703.3522
        Tangent Direction:          S 46^45'54" W
           Tangent Length:               251.3603

Element: Circular
             PC (        )              614+62.33  1414255.5779  2205703.3522
             PI (        )              615+90.08  1414168.0711  2205610.2808
             CC (        )                         1416974.8922  2203146.6187
             PT (        )              617+17.73  1414087.1325  2205511.4443
                   Radius:              3732.5000
                    Delta:                3^55'14" Right
  Degree of Curvature(Arc):               1^32'06"
                   Length:               255.3977
                  Tangent:               127.7487
                    Chord:               255.3478
           Middle Ordinate:                 2.1842
                 External:                  2.1855
        Tangent Direction:          S 46^45'54" W
         Radial Direction:          N 43^14'06" W
          Chord Direction:          S 48^43'31" W
         Radial Direction:          N 39^18'52" W
        Tangent Direction:          S 50^41'08" W

Element: Linear
             PT (        )              617+17.73  1414087.1325  2205511.4443
            POE (        )              617+21.78  1414084.5680  2205508.3127
        Tangent Direction:          S 50^41'08" W
           Tangent Length:                 4.0476
```

10/16/09

ADDED T. O: 10-19-09
C: 10-19-09

COMP : PCT

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-285W ENT2 (KC21)
Description: I-285 WB ENTR AT US41
Style: Prop Main CL
Vertical Alignment Name: I-285W ENT2
Description: I-285 WB ENT
Style: Prop Main CL

	STATION	ELEVATION
Element: Parabola		
PVC	608+78.93	919.01
PVI	609+78.93	917.55
PVT	610+78.93	915.50
Length:	200.0000	
Stopping Sight Distance:	1911.4158	
Entrance Grade:	-1.4599	
Exit Grade:	-2.0556	
r = (g2 - g1) / L:	-0.2979	
K = 1 / (g2 - g1):	335.7115	
Middle Ordinate:	-0.1489	
Element: Linear		
PVT	610+78.93	915.50
PVC	612+05.97	912.89
Tangent Grade:	-2.0556	
Tangent Length:	127.0400	
Element: Parabola		
PVC	612+05.97	912.89
PVI	613+60.97	909.70
PVT	615+15.97	912.51
VLOW	613+70.80	911.19
Length:	310.0000	
Headlight Sight Distance:	377.7022	
Entrance Grade:	-2.0556	
Exit Grade:	1.8104	
r = (g2 - g1) / L:	1.2471	
K = 1 / (g2 - g1):	80.1851	
Middle Ordinate:	1.4981	
Element: Linear		
PVT	615+15.97	912.51
PVC	615+67.73	913.44
Tangent Grade:	1.8104	
Tangent Length:	51.7600	
Element: Parabola		
PVC	615+67.73	913.44
PVI	616+42.73	914.80
PVT	617+17.73	914.80
VHIGH	617+17.49	914.80
Length:	150.0000	
Stopping Sight Distance:	670.1173	
Entrance Grade:	1.8104	
Exit Grade:	-0.0029	
r = (g2 - g1) / L:	-1.2089	
K = 1 / (g2 - g1):	82.7203	
Middle Ordinate:	-0.3400	

PBSJ

Subject:	ICC21 SE		
Comp by: PCT	Date: 7/30/09	Sheet Number:	
Check by:	Job Number:		

$V = 185$ $L = 16$ $L = (0.02)(185)(16) = 60$

$L_1 = 30$

	LT	RT	
608+79	-0.04	+0.04	(EX)
609+99	0	0	
610+59	+0.02	-0.02	MATCH MAIN

Ramp A
(KC 15)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S I285E Ramp (KC15)
             Description: I-75 SB TO I-285 EB
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )              524+56.22  1415071.1847  2207341.1799
             PC (        )              527+27.69  1414841.4995  2207485.8831
        Tangent Direction:          S 32^12'40" E
           Tangent Length:              271.4670

Element: Circular
             PC (        )              527+27.69  1414841.4995  2207485.8831
             PI (        )              528+25.57  1414758.6801  2207538.0599
             CC (        )                         1414708.2391  2207274.3609
            PCC (        )              529+14.28  1414662.4509  2207520.1320
                     Radius:              250.0000
                      Delta:              42^45'53" Right
  Degree of Curvature(Arc):              22^55'06"
                     Length:               186.5960
                    Tangent:                97.8850
                      Chord:               182.2948
            Middle Ordinate:                17.2079
                   External:                18.4799
        Tangent Direction:          S 32^12'40" E
         Radial Direction:          S 57^47'20" W
          Chord Direction:          S 10^49'44" E
         Radial Direction:          N 79^26'48" W
        Tangent Direction:          S 10^33'12" W

Element: Circular
            PCC (        )              529+14.28  1414662.4509  2207520.1320
             PI (        )              530+16.91  1414561.5624  2207501.3361
             CC (        )                         1414716.5829  2207229.5746
             PT (        )              531+11.83  1414494.0320  2207424.0610
                     Radius:              295.5569
                      Delta:              38^17'47" Right
  Degree of Curvature(Arc):              19^23'09"
                     Length:               197.5501
                    Tangent:               102.6245
                      Chord:               193.8932
            Middle Ordinate:                16.3522
                   External:                17.3099
        Tangent Direction:          S 10^33'12" W
         Radial Direction:          N 79^26'48" W
          Chord Direction:          S 29^42'06" W
         Radial Direction:          N 41^09'00" W
        Tangent Direction:          S 48^51'00" W
```

10/14/09

COMP: PCT

Project Name: I-75 PBSJ
Description:
Horizontal Alignment Name: I-75S I285E Ramp (KC15)
Description: I-75 SB TO I-285 EB
Style: Prop Main CL
Vertical Alignment Name: I-75S I285E Ramp
Description:
Style: Prop Main CL

	STATION	ELEVATION
Element: Parabola		
PVC	526+96.00	893.06
PVI	527+36.00	894.38
PVT	527+76.00	895.41
Length:	80.0000	
Stopping Sight Distance:	1476.6336	
Entrance Grade:	3.3100	
Exit Grade:	2.5588	
r = (g2 - g1) / L:	-0.9390	
K = l / (g2 - g1):	106.5011	
Middle Ordinate:	-0.0751	
Element: Linear		
PVT	527+76.00	895.41
PVC	528+60.00	897.56
Tangent Grade:	2.5588	
Tangent Length:	84.0000	
Element: Parabola		
PVC	528+60.00	897.56
PVI	529+30.00	899.35
PVT	530+00.00	899.46
Length:	140.0000	
Stopping Sight Distance:	519.2955	
Entrance Grade:	2.5588	
Exit Grade:	0.1570	
r = (g2 - g1) / L:	-1.7156	
K = l / (g2 - g1):	58.2879	
Middle Ordinate:	-0.4203	

(I-155 TO I-285 E RAMP)

PBSJ

Subject: KC 15
DS=25 V=143

Comp by: PCT
Check by:
Date:
Job Number:
Sheet Number:

CURVE KC35

PC= 527+28
PT= 529+14

R= 250
e= 0.068

w=16
L=16 (0.068)(143)=156 $\frac{1}{3}$=52 $\boxed{\frac{1}{2}=78}$

L_R=16 (0.048)(143)=110
L_2=16(0.02)(143)=46

	STA	LT	RT
MATCH	527+71.10	+0.02	-0.02
	528+15	+0.04	-0.04
BFSE	528+81	+0.068	-0.068
MATCH	530+00	+0.09	-0.09

NEW — 10/14/09

MATCH	526+96	+0.02	
			527+71
BFSE	528+06	+0.068	
EFSE	529+50	+0.068	L=50
MATCH	530+00	+0.09	L=50

CURVE KC34 KC14 (I-75N TO WINDY HILL)

	STA	LT	RT
MATCH	549+00	-0.038	+0.038
MAIN	549+52	-0.030	+0.030
	549+86	-0.02	+0.02
MATCH	551+20	-0.02	+0.02

PT = 549+85
(MATCH I-75 NB)

L=16(0.048)(213)=164
$\frac{1}{3}$=55

L_R=16(0.028)(213)=95

L= 16(0.01)(213)= 34

06104.01

Ramp D
(KC 13)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N I285W Ramp (KC13)
             Description: I-75 NB TO I-285 WB
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )            529+78.23  1415602.4979  2207184.3441
             PC (        )            531+59.30  1415761.2383  2207097.2379
        Tangent Direction:       N 28^45'18" W
           Tangent Length:             181.0691

Element: Circular
             PC (        )            531+59.30  1415761.2383  2207097.2379
             PI (        )            533+25.91  1415907.3043  2207017.0864
             CC (        )                       1415880.5428  2207314.6555
             PT (        )            534+52.71  1416036.7256  2207122.0135
                   Radius:             248.0000
                    Delta:            67^47'17" Right
  Degree of Curvature(Arc):           23^06'11"
                   Length:             293.4155
                  Tangent:             166.6120
                    Chord:             276.5992
          Middle Ordinate:              42.1427
                 External:              50.7701
        Tangent Direction:        N 28^45'18" W
         Radial Direction:        N 61^14'42" E
          Chord Direction:        N  5^08'20" E
         Radial Direction:        S 50^58'01" E
        Tangent Direction:        N 39^01'59" E

Element: Linear
             PT (        )            534+52.71  1416036.7256  2207122.0135
            POE (        )            534+59.98  1416042.3685  2207126.5885
        Tangent Direction:       N 39^01'59" E
           Tangent Length:               7.2645
```

10/13/09

Comp: PCT


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N I285W Ramp (KC13)
             Description: I-75 NB TO I-285 WB
                   Style: Prop Main CL
  Vertical Alignment Name: I-75N I285W Ramp
             Description:
                   Style: Prop Main CL
                                    STATION          ELEVATION

Element: Linear
                     POB          530+37.72            893.57
                     PVC          530+97.00            894.73
            Tangent Grade:           1.9618
           Tangent Length:          59.2800

Element: Parabola
                     PVC          530+97.00            894.73
                     PVI          531+47.00            895.71
                    PVRC          531+97.00            896.13
                  Length:          100.0000
   Stopping Sight Distance:       1011.6148
           Entrance Grade:           1.9618
               Exit Grade:           0.8396
       r = ( g2 - g1 ) / L:         -1.1222
       K = 1 / ( g2 - g1 ):         89.1085
           Middle Ordinate:         -0.1403

Element: Parabola
                    PVRC          531+97.00            896.13
                     PVI          532+47.00            896.55
                     PVT          532+97.00            897.53
                  Length:          100.0000
           Entrance Grade:           0.8396
               Exit Grade:           1.9604
       r = ( g2 - g1 ) / L:          1.1208
       K = 1 / ( g2 - g1 ):         89.2190
           Middle Ordinate:          0.1401

Element: Linear
                     PVT          532+97.00            897.53
                     PVC          533+39.98            898.38
            Tangent Grade:           1.9604
           Tangent Length:          42.9791

Element: Parabola
                     PVC          533+39.98            898.38
                     PVI          533+99.98            899.55
                     PVT          534+59.98            900.32
                  Length:          120.0000
   Stopping Sight Distance:       1628.5256
           Entrance Grade:           1.9604
               Exit Grade:           1.2724
       r = ( g2 - g1 ) / L:         -0.5733
       K = 1 / ( g2 - g1 ):        174.4179
           Middle Ordinate:         -0.1032
```

PBSJ

Subject: KC 13
I-75 N I-285 W

Comp by: PCT
Check by:
Date:
Job Number:
Sheet Number:

CURVE KC33 $D_S = 25$ $T = 143$

PC = 531+59 $W = 16$

PT = 534+53 $L = 16(0.068)(143) = 156$ $\frac{1}{3} = 52$ $\boxed{\frac{1}{2} = 78}$

R = 248 $L_R = 16(0.048)(143) = 110$

e = 0.068 $L_2 = 16(0.02)(143) = 46$

$L = 16(0.020)(143) = 64$

	STA	LT	RT
MATCH MAIN	530+38	+0.02	-0.02
	531+27	+0.02	-0.02
BFSE	532+37	+0.068	-0.068
EFSE	534+011	+0.068	-0.068
	534+28	+0.08	-0.08
MATCH EX	534+59	+0.08	-0.08

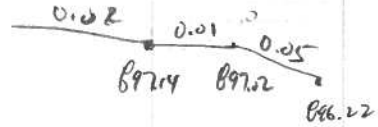
GORE = 0.05 531+97

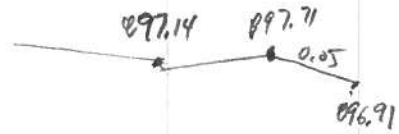
0.02 - 0.048

-0.02 -0.06

L = 27

$L_{0.008} = 16(0.008)(143) = 18$





Ramp E
(KC 14)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N Windy Hill Ramp (KC14)
             Description: I-75 NB TO WINDY HILL
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )            544+50.55  1416830.7862  2206362.3886
             PC (        )            546+86.88  1417012.0359  2206210.7264
        Tangent Direction:        N 39^55'16" W
           Tangent Length:             236.3322

Element: Circular
             PC (        )            546+86.88  1417012.0359  2206210.7264
             PI (        )            548+36.14  1417126.5078  2206114.9412
             CC (        )                       1415520.0064  2204427.6188
             PT (        )            549+84.99  1417227.7920  2206005.3049
                   Radius:            2325.0000
                    Delta:             7^20'47" Left
  Degree of Curvature(Arc):            2^27'52"
                   Length:             298.1113
                  Tangent:             149.2602
                    Chord:             297.9072
          Middle Ordinate:               4.7763
                 External:               4.7862
        Tangent Direction:        N 39^55'16" W
         Radial Direction:        N 50^04'44" E
          Chord Direction:        N 43^35'40" W
         Radial Direction:        N 42^43'57" E
        Tangent Direction:        N 47^16'03" W

Element: Linear
             PT (        )            549+84.99  1417227.7920  2206005.3049
            POE (        )            551+82.77  1417361.9970  2205860.0330
        Tangent Direction:        N 47^16'03" W
           Tangent Length:             197.7749
```

* SEE RAMP A SHEET FOR SE CALC.

C:

10/13/09

Comp: PCT


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N Windy Hill Ramp (KC14)
             Description: I-75 NB TO WINDY HILL
                   Style: Prop Main CL
  Vertical Alignment Name: KC14
             Description:
                   Style: Prop Main CL
                                    STATION          ELEVATION

Element: Parabola
                     PVC          549+00.00             933.22
                     PVI          549+68.00             933.46
                     PVT          550+36.00             932.97
                   VHIGH          549+44.58             933.30
                  Length:          136.0000
   Stopping Sight Distance:       1087.8078
            Entrance Grade:          0.3468
                Exit Grade:         -0.7113
       r = ( g2 - g1 ) / L:         -0.7781
       K = 1 / ( g2 - g1 ):         128.5214
           Middle Ordinate:         -0.1799

Element: Linear
                     PVT          550+36.00             932.97
                     POE          551+19.99             932.37
             Tangent Grade:         -0.7113
            Tangent Length:         83.9948
```

Ramp F
(KC 17)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S Windy Hill Ramp (KC17)
             Description: WINDY HILL TO I-75 SB
                   Style: Prop Main CL
                                        STATION      NORTHING        EASTING

Element: Circular
              PC (        )          548+49.28  1417004.5730  2205973.9544
              PI (        )          549+97.84  1417097.7287  2205858.2322
              CC (        )                     1409492.2092  2199926.5478
             PCC (        )          551+46.37  1417187.2758  2205739.6956
                     Radius:          9644.0000
                      Delta:            1^45'54" Left
  Degree of Curvature(Arc):            0^35'39"
                     Length:           297.0933
                    Tangent:           148.5584
                      Chord:           297.0816
           Middle Ordinate:              1.1440
                   External:             1.1441
         Tangent Direction:      N 51^09'58" W
          Radial Direction:      N 38^50'02" E
           Chord Direction:      N 52^02'55" W
          Radial Direction:      N 37^04'08" E
         Tangent Direction:      N 52^55'52" W

Element: Circular
             PCC (        )          551+46.37  1417187.2758  2205739.6955
              PI (        )          552+51.50  1417250.6433  2205655.8139
              CC (        )                     1416181.9065  2204980.2006
             PCC (        )          553+56.14  1417299.2343  2205562.5911
                     Radius:          1260.0000
                      Delta:            9^32'19" Left
  Degree of Curvature(Arc):            4^32'50"
                     Length:           209.7670
                    Tangent:           105.1264
                      Chord:           209.5249
           Middle Ordinate:              4.3628
                   External:             4.3779
         Tangent Direction:      N 52^55'52" W
          Radial Direction:      N 37^04'08" E
           Chord Direction:      N 57^42'02" W
          Radial Direction:      N 27^31'48" E
         Tangent Direction:      N 62^28'12" W

Element: Circular
             PCC (        )          553+56.14  1417299.2343  2205562.5911
              PI (        )          554+10.73  1417324.4682  2205514.1792
              CC (        )                     1415393.5697  2204569.2918
              PT (        )          554+65.30  1417347.2115  2205464.5485
                     Radius:          2149.0000
                      Delta:            2^54'38" Left
  Degree of Curvature(Arc):            2^39'58"
                     Length:           109.1637
                    Tangent:            54.5936
                      Chord:           109.1520
           Middle Ordinate:              0.6931
                   External:             0.6933
         Tangent Direction:      N 62^28'12" W
          Radial Direction:      N 27^31'48" E
           Chord Direction:      N 63^55'30" W
          Radial Direction:      N 24^37'11" E
         Tangent Direction:      N 65^22'49" W
```

```
Element: Linear
              PT (        )        554+65.30  1417347.2115  2205464.5485
             POE (        )        554+93.91  1417359.1293  2205438.5414
     Tangent Direction:          N 65^22'49" W
        Tangent Length:                28.6078
```

REV 10-20-09
C: CAICE 10-20-09
O: CAICE 10-20-09

COMP: PCT

008256.tpr

KC50 : Alignment Station Map
Station Back Station Ahead
192+72.42
1071+73.52 1071+73.52

CAiCE Visual Roads Design System
Profile Report

Profile Name : KC17 Fri Oct 23 18:12:41 2009
Description : I-75S WINDY HILL RAMP

		STATION	ELEVATION	GRADE PERCENT	TOTAL VC LEN	BACK VC LEN	AHEAD VC LEN	K-VALUE
VPI AT	1	548+95.80	926.49					
VPC		549+72.88	926.98	0.6410				
VPI AT	2	551+18.88	927.92		292.000	146.000	146.000	77.610
VPT		552+64.88	934.35	4.4034				
VPI AT	3	552+83.07	935.15					

End of Report Profile.

PBSJ

Subject: KC 16 / KC 17

Comp by: PCT | Date: | Sheet Number:

Check by: | Job Number:

KC17 MATCH EX DS=45 V=185 (I-75 SB ONT RAMP FROM WINDY HILL ROAD)

	STA	LT	RT
MATCH MAIN	548+95	-0.046	+0.046
	550+00	-0.042	+0.042
	552+77	-0.042	+0.042
	552+83	-0.04	+0.04

L=16(185)(0.002)=6

KC 16 CURVE KC16 DS=55 V=213 (I-75 SB TO I-285 WB)

PC= 553+02
PT= 556+80
R= 4500
e= 0.032

L= 36(0.032)(213)(0.67) = 165 $\frac{1}{3}$ = 55 $\boxed{\frac{1}{2} = 82}$

LR= 36(0.012)(213)(0.67) = 62

	STA	LT	RT
MATCH	553+02	-0.02	+0.02
PC	553+22	-0.02	+0.02
BFSE	553+84	-0.032	+0.032
EFSE	555+98	-0.032	+0.032
PC	556+60	-0.02	+0.02
	558+83	-0.02	+0.02
MATCH I-75	559+81	-0.001	+0.001

L= 36(0.019)(213)(0.67) = 98

06104-01

Ramp G

(KC 16)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S TO I285W (KC16)
             Description: I-75 SB TO I-285 WB
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )             552+82.60  1417173.3222  2205562.3694
             PC (        )             553+02.14  1417187.0029  2205548.4125
        Tangent Direction:          N 45^34'20" W
           Tangent Length:                19.5437

Element: Circular
             PC (        )             553+02.14  1417187.0029  2205548.4125
             PI (        )             554+91.08  1417319.2629  2205413.4836
             CC (        )                        1413973.3973  2202398.3747
             PT (        )             556+79.80  1417439.7468  2205267.9428
                   Radius:             4500.0000
                    Delta:               4^48'31" Left
  Degree of Curvature(Arc):              1^16'24"
                   Length:               377.6591
                  Tangent:               188.9405
                    Chord:               377.5483
           Middle Ordinate:                3.9613
                  External:                3.9648
        Tangent Direction:          N 45^34'20" W
         Radial Direction:          N 44^25'40" E
          Chord Direction:          N 47^58'36" W
         Radial Direction:          N 39^37'09" E
        Tangent Direction:          N 50^22'51" W

Element: Linear
             PT (        )             556+79.80  1417439.7468  2205267.9428
            POE (        )             564+44.64  1417927.4699  2204678.7884
        Tangent Direction:          N 50^22'51" W
           Tangent Length:               764.8377
```

Comp: PCT

KC16.txt

```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S TO I285W (KC16)
             Description: I-75 SB TO I-285 WB
                   Style: Prop Main CL
  Vertical Alignment Name: I-75S TO I285W
             Description:
                   Style: Prop Main CL
                                  STATION          ELEVATION

Element: Parabola
                     PVC         553+02.14          913.93
                     PVI         554+72.14          912.53
                     PVT         556+42.14          916.06
                    VLOW         553+98.56          913.53
                 Length:          340.0000
  Headlight Sight Distance:       603.9849
            Entrance Grade:        -0.8213
                Exit Grade:         2.0750
       r = ( g2 - g1 ) / L:        0.8519
       K = 1 / ( g2 - g1 ):      117.3890
           Middle Ordinate:        1.2310

Element: Linear
                     PVT         556+42.14          916.06
                     PVC         557+80.74          918.94
             Tangent Grade:         2.0750
            Tangent Length:       138.6000

Element: Parabola
                     PVC         557+80.74          918.94
                     PVI         558+80.74          921.01
                     PVT         559+80.74          920.83
                   VHIGH         559+64.64          920.84
                 Length:          200.0000
   Stopping Sight Distance:       578.2025
            Entrance Grade:        2.0750
                Exit Grade:       -0.1817
       r = ( g2 - g1 ) / L:       -1.1283
       K = 1 / ( g2 - g1 ):       88.6257
           Middle Ordinate:       -0.5642
```

170 170

100 100

*SE – SEE RAMP F CALC SHEET

Ramp H

(KC 18)

Ramp I
(KC 20)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N_HOV Ramp (KC20)
             Description: I-75 NB TO HOV NB
                   Style: Prop Main CL
                                    STATION      NORTHING       EASTING

Element: Linear
            POB (        )          254+44.95  1417454.6787  2205579.7389
             PC (        )          260+94.34  1417849.9995  2205064.5366
        Tangent Direction:      N 52^30'02" W
           Tangent Length:           649.3935

Element: Circular
             PC (        )          260+94.34  1417849.9995  2205064.5366
             PI (        )          263+65.15  1418014.8539  2204849.6899
             CC (        )                     1410075.0791  2199098.7497
             PT (        )          266+35.82  1418167.5919  2204626.0671
                  Radius:           9800.0000
                   Delta:             3^09'57" Left
  Degree of Curvature(Arc):           0^35'05"
                  Length:            541.4749
                 Tangent:            270.8063
                   Chord:            541.4060
          Middle Ordinate:              3.7395
                 External:              3.7409
        Tangent Direction:      N 52^30'02" W
         Radial Direction:      N 37^29'58" E
          Chord Direction:      N 54^05'00" W
         Radial Direction:      N 34^20'01" E
        Tangent Direction:      N 55^39'59" W
```

C: 10-19-09 COMP: PCT

O: 10-19-09

```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75N_HOV Ramp (KC20)
             Description: I-75 NB TO HOV NB
                   Style: Prop Main CL
  Vertical Alignment Name: I-75N_HOV Ramp
             Description:
                   Style: Prop Main CL
                                STATION          ELEVATION

Element: Linear
                     POB       258+66.22          922.94
                     PVC       259+03.29          922.47
           Tangent Grade:        -1.2604
          Tangent Length:        37.0748

Element: Parabola
                     PVC       259+03.29          922.47
                     PVI       260+48.29          920.65
                     PVT       261+93.29          924.09
                    VLOW       260+03.82          921.84
                  Length:       290.0000
 Headlight Sight Distance:      385.5754
          Entrance Grade:        -1.2604
              Exit Grade:         2.3757
     r = ( g2 - g1 ) / L:         1.2538
     K = 1 / ( g2 - g1 ):        79.7557
         Middle Ordinate:         1.3181
```

DS = 45

$L_2 = (12)(1.85)(0.02) = 45$

STA	LT	RT (SLD)
258+66	-0.02	+0.02
259+35	-0.02	+0.02
259+80	-0.02	0
260+25	-0.02	-0.02
260+70	-0.02	0
261+15.46	-0.02	+0.02

EC11 - SLD DS=55 L_2=103

158+19	-0.02
159+22	0
160+25	+0.02

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-75S_HOV Ramp (KC18)
             Description: SB HOV RAMP TO SB I-75
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )            1356+67.62  1417418.8994  2205566.4099
             PC (        )            1368+39.11  1418132.0497  2204636.9957
        Tangent Direction:        N 52^30'02" W
           Tangent Length:             1171.4922

Element: Circular
             PC (        )            1368+39.11  1418132.0497  2204636.9957
             PI (        )            1370+09.18  1418235.5810  2204502.0683
             CC (        )                        1416823.0070  2203632.5520
             PT (        )            1371+78.06  1418309.4132  2204348.8595
                 Radius:               1650.0000
                  Delta:              11^46'11" Left
  Degree of Curvature(Arc):            3^28'21"
                 Length:               338.9450
                Tangent:               170.0710
                  Chord:               338.3494
        Middle Ordinate:                 8.6957
               External:                 8.7417
        Tangent Direction:        N 52^30'02" W
         Radial Direction:        N 37^29'58" E
          Chord Direction:        N 58^23'08" W
         Radial Direction:        N 25^43'47" E
        Tangent Direction:        N 64^16'13" W

Element: Linear
             PT (        )            1371+78.06  1418309.4132  2204348.8595
             PC (        )            1374+39.58  1418422.9450  2204113.2703
        Tangent Direction:        N 64^16'13" W
           Tangent Length:               261.5182

Element: Circular
             PC (        )            1374+39.58  1418422.9450  2204113.2703
             PI (        )            1376+46.42  1418512.7401  2203926.9370
             CC (        )                        1419263.4402  2204518.3096
             PT (        )            1378+46.67  1418672.8699  2203796.0107
                 Radius:                933.0000
                  Delta:              25^00'00" Right
  Degree of Curvature(Arc):            6^08'28"
                 Length:               407.0980
                Tangent:               206.8411
                  Chord:               403.8763
        Middle Ordinate:                22.1158
               External:                22.6528
        Tangent Direction:        N 64^16'13" W
         Radial Direction:        N 25^43'47" E
          Chord Direction:        N 51^46'13" W
         Radial Direction:        N 50^43'47" E
        Tangent Direction:        N 39^16'13" W

Element: Linear
             PT (        )            1378+46.67  1418672.8699  2203796.0107
            POE (        )            1380+49.45  1418829.8561  2203667.6547
        Tangent Direction:        N 39^16'13" W
           Tangent Length:               202.7806
```

ADDED TO C: 10-19-09
ADDED TO O: 10-19-09
COMP: PCT

Project Name: I-75 PBSJ
Description:
Horizontal Alignment Name: I-75S_HOV Ramp (KC18)
Description: SB HOV RAMP TO SB I-75
Style: Prop Main CL
Vertical Alignment Name: I-75S_HOV Ramp (KC18)
Description:
Style: Prop Main CL

	STATION	ELEVATION
Element: Linear		
POB	1358+69.00	925.47
PVC	1361+27.51	921.89
Tangent Grade:	-1.3848	
Tangent Length:	258.5075	
Element: Parabola		
PVC	1361+27.51	921.89
PVI	1364+37.51	917.60
PVT	1367+47.51	937.44
VLOW	1362+37.80	921.13
Length:	620.0000	
Headlight Sight Distance:	365.8282	
Entrance Grade:	-1.3848	
Exit Grade:	6.4000	
r = (g2 - g1) / L:	1.2556	
K = 1 / (g2 - g1):	79.6420	
Middle Ordinate:	6.0333	
Element: Linear		
PVT	1367+47.51	937.44
PVC	1374+58.64	982.95
Tangent Grade:	6.4000	
Tangent Length:	711.1289	
Element: Parabola		
PVC	1374+58.64	982.95
PVI	1375+93.64	991.59
PVT	1377+28.64	994.29
Length:	270.0000	
Stopping Sight Distance:	380.2614	
Entrance Grade:	6.4000	
Exit Grade:	2.0000	
r = (g2 - g1) / L:	-1.6296	
K = 1 / (g2 - g1):	61.3636	
Middle Ordinate:	-1.4850	
Element: Linear		
PVT	1377+28.64	994.29
POE	1378+46.67	996.65
Tangent Grade:	2.0000	
Tangent Length:	118.0336	

$\frac{L}{2} = 45$

STA	LT	RT
1358+69	+0.02	-0.02
1362+59	+0.02	-0.02
1363+04	0	0
1363+49	-0.02	+0.02

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov2 (KC18)*

CURVE NO.: *KC40*

MAX. S.E. TABLE: 6%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1650.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	ft.
Min. Runoff Length - pg. 181 AASHTO (L1) =	124.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	16	ft.
Rate of SE @ Full Super (SE) =	0.044	
PC Station =	368+39.12	
PT Station =	371+78.06	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	60.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	131.00	ft.
*(L2) must be greater than AASHTO min. (L1)			

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~366+92.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~367+52.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	368+12.00	*0.02*
PC Station =		368+39.12	*0.029*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	368+83.00	*0.044*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	371+34.00	*0.044*
PT Station =		371+78.06	*0.029*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	372+05.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~372+65.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~373+25.00~~	~~-0.02~~
		372+38	0.02
		372+97	0
		373+56	0.02

Comp: JHO / PCT

L2 = 59

SUPERELEVATION CALCULATIONS

ALIGNMENT: *I-75 Rev Hov2 (KC18)*

CURVE NO.: *KC41*

MAX. S.E. TABLE: 6%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	933.00	ft.
Design Speed =	45	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.54	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	ft.
Min. Runoff Length - pg. 181 AASHTO (L1) =	124.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	16	ft.
Rate of SE @ Full Super (SE) =	0.056	
PC Station =	374+39.58	
PT Station =	378+46.68	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	60.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	166.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	~~372+69.00~~	~~-0.02~~
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~373+29.00~~	~~0~~
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	373+89.00	0.02
PC Station =		374+39.58	0.037
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	374+95.00	0.056
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	~~377+91.00~~	~~0.056~~
PT Station =		~~378+46.68~~	~~0.037~~
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	~~378+97.00~~	~~0.02~~
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~379+57.00~~	~~0~~
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~380+17.00~~	~~-0.02~~
* EFSE	1377+40	+0.056	
(MATCH KC50)	1378+47	-0.02	

$L_2 = (16)(185)(0.02) = 59$

Ramp J

(KC 10)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-285W I-75N at WHill (KC10)
             Description: I-285 WB TO I-75 NB
                   Style: Prop Main CL
                                          STATION       NORTHING        EASTING

Element: Linear
            POB (        )            561+54.60  1418006.8720  2205155.1110
             PC (        )            562+67.38  1418069.4421  2205061.2838
        Tangent Direction:        N 56^18'07" W
           Tangent Length:            112.7766

Element: Circular
             PC (        )            562+67.38  1418069.4421  2205061.2838
             PI (        )            567+30.45  1418326.3586  2204676.0239
             CC (        )                       1423151.1390  2208450.0919
            PCC (        )            571+91.75  1418638.4205  2204333.9001
                   Radius:            6108.0000
                    Delta:             8^40'15" Right
  Degree of Curvature(Arc):            0^56'17"
                   Length:            924.3663
                  Tangent:            463.0673
                    Chord:            923.4844
          Middle Ordinate:             17.4780
                 External:             17.5282
        Tangent Direction:        N 56^18'07" W
         Radial Direction:        N 33^41'53" E
          Chord Direction:        N 51^58'00" W
         Radial Direction:        N 42^22'08" E
        Tangent Direction:        N 47^37'52" W

Element: Circular
            PCC (        )            571+91.75  1418638.4205  2204333.9001
             PI (        )            578+78.03  1419100.9072  2203826.8604
             CC (        )                       1422184.7612  2207568.6284
             PT (        )            585+55.07  1419686.9485  2203469.7345
                   Radius:            4800.0000
                    Delta:            16^16'25" Right
  Degree of Curvature(Arc):            1^11'37"
                   Length:           1363.3248
                  Tangent:            686.2822
                    Chord:           1358.7469
          Middle Ordinate:             48.3212
                 External:             48.8126
        Tangent Direction:        N 47^37'52" W
         Radial Direction:        N 42^22'08" E
          Chord Direction:        N 39^29'40" W
         Radial Direction:        N 58^38'33" E
        Tangent Direction:        N 31^21'27" W
```

COMP: PCT

KC10.txt

Project Name: I-75 PBSJ
Description:
Horizontal Alignment Name: I-285W I-75N at WHill (KC10)
Description: I-285 WB TO I-75 NB
Style: Prop Main CL
Vertical Alignment Name: I-285W I-75N at WHill
Description:
Style: Prop Main CL

58100 TO 58600

850 TO 1000

	STATION	ELEVATION
Element: Parabola		
PVC	562+00.00	913.93
PVI	563+00.00	912.38
PVT	564+00.00	911.23
Length:	200.0000	100 100
Entrance Grade:	-1.5559	
Exit Grade:	-1.1456	
r = (g2 - g1) / L:	0.2052	
K = 1 / (g2 - g1):	487.4007	
Middle Ordinate:	0.1026	
Element: Linear		
PVT	564+00.00	911.23
PVC	565+42.88	909.59
Tangent Grade:	-1.1456	
Tangent Length:	142.8800	
Element: Parabola		
PVC	565+42.88	909.59
PVI	567+57.88	907.13
PVT	569+72.88	908.79
VLOW	567+99.75	908.12
Length:	430.0000	215 215
Headlight Sight Distance:	3652.7679	
Entrance Grade:	-1.1456	
Exit Grade:	0.7721	
r = (g2 - g1) / L:	0.4460	
K = 1 / (g2 - g1):	224.2359	
Middle Ordinate:	1.0307	
Element: Linear		
PVT	569+72.88	908.79
POE	570+59.66	909.46
Tangent Grade:	0.7721	
Tangent Length:	86.7800	

PBSJ

Subject: KC10 / KC9 SG

Comp by: PCT | Date: | Sheet Number:

Check by: | Job Number:

KC10 CURVE 1 DS = 55 Δ = 213 (I-285 W TO I-75 N AT WINDY HILL)

PC = 562+67 L = 48 (0.026)(213)(0.625) = 166

PT = 571+92 L_R = 48 (0.006)(213)(0.625) = 38

R = 6108

e = 0.026 (MATCH EX) Q

	STA	LT	RT	
MATCH	562+00	+0.026	-0.026	
MATCH	570+60	+0.026	-0.026	(MATCH I-75)

KC9 CURVE 1 DS = 45 Δ = 185 (I-285 N TO WINDY HILL ROAD)

PC = 667+64 L = 16(0.03)(185) = .90 $\frac{1}{3}$ = 30

PT = — L_R = 16(0.01)(185) = 30

R = 3130

e = 0.03 Q

	STA	LT	RT	
MATCH	667+82	+0.026	-0.026	L = 16(0.004)(185) = 12
BASE	667+94	+0.03	-0.03	
MATCH	671+83	+0.03	-0.03	L = 16(0.003)(185) = 9
MATCH	671+92	+0.033	-0.033	

Ramp K

(KC 9)

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 PBSJ
             Description:
Horizontal Alignment Name: I-285W Windy Hill Ramp (KC9)
             Description: I-285 WB TO WINDY HILL
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
             POB (        )             665+18.73  1418224.3360  2204863.2266
              PC (        )              667+63.92  1418391.1880  2204683.5747
         Tangent Direction:          N 47^06'56" W
            Tangent Length:               245.1824

Element: Circular
              PC (        )             667+63.92  1418391.1880  2204683.5747
              PI (        )             670+29.24  1418571.7484  2204489.1628
              CC (        )                        1420735.9162  2206861.2454
              PT (        )             672+93.36  1418781.8622  2204327.1435
                     Radius:             3200.0000
                      Delta:              9^28'47" Right
  Degree of Curvature(Arc):              1^47'26"
                     Length:              529.4416
                    Tangent:              265.3263
                      Chord:              528.8379
           Middle Ordinate:                10.9433
                   External:               10.9809
         Tangent Direction:          N 47^06'56" W
          Radial Direction:          N 42^53'04" E
           Chord Direction:          N 42^22'33" W
          Radial Direction:          N 52^21'51" E
         Tangent Direction:          N 37^38'09" W

Element: Linear
              PT (        )              672+93.36  1418781.8622  2204327.1435
             POE (        )             675+00.64  1418946.0120  2204200.5670
         Tangent Direction:          N 37^38'09" W
            Tangent Length:               207.2843
```

SE — SEE RAMP J

COMP: PCT

KC9.txt

Project Name: I-75 PBSJ
Description:
Horizontal Alignment Name: I-285W Windy Hill Ramp (KC9)
Description: I-285 WB TO WINDY HILL
Style: Prop Main CL
Vertical Alignment Name: I-285W Windy Hill Ramp
Description:
Style: Prop Main CL

66500 TO 67300
850 TO 990

	STATION	ELEVATION
Element: Linear		
POB	667+82.00	907.10
PVC	668+08.87	906.97
Tangent Grade:	-0.4837	
Tangent Length:	26.8735	
Element: Parabola		
PVC	668+08.87	906.97
PVI	669+93.87	906.08
PVT	671+78.87	913.74
VLOW	668+47.55	906.88
Length:	370.0000	185 185
Headlight Sight Distance:	366.9758	
Entrance Grade:	-0.4837	
Exit Grade:	4.1441	
r = (g2 - g1) / L:	1.2508	
K = l / (g2 - g1):	79.9513	
Middle Ordinate:	2.1404	
Element: Linear		
PVT	671+78.87	913.74
POE	671+92.09	914.29
Tangent Grade:	4.1441	
Tangent Length:	13.2165	

FREYS GIN

Road

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: FREYS GIN
Description: FREYS GIN ROAD
Style: Prop Side CL

Comp: JEK
Check: MRM
11/14/09
Rev. C

	STATION	NORTHING	EASTING
Element: Linear			
POB ( )	10+00.00	1436353.9663	2190476.1054
PC ( )	11+63.53	1436517.3061	2190468.1485
Tangent Direction:	N 2^47'20" W		
Tangent Length:	163.5334		
Element: Circular			
PC ( )	11+63.53	1436517.3061	2190468.1485
PI ( )	12+22.06	1436575.7677	2190465.3007
CC ( )		1436468.6503	2189469.3329
PT ( )	12+80.46	1436633.4979	2190455.6520
Radius:	1000.0000		
Design Speed(mph):	30.0000		
Superelevation:	-2.8000%		
Delta:	6^41'58" Left		
Degree of Curvature(Arc):	5^43'46"		
Length:	116.9285		
Tangent:	58.5309		
Chord:	116.8619		
Middle Ordinate:	1.7085		
External:	1.7115		
Tangent Direction:	N 2^47'20" W		
Radial Direction:	N 87^12'40" E		
Chord Direction:	N 6^08'19" W		
Radial Direction:	N 80^30'42" E		
Tangent Direction:	N 9^29'18" W		
Element: Linear			
PT ( )	12+80.46	1436633.4979	2190455.6520
PC ( )	15+07.65	1436857.5788	2190418.2004
Tangent Direction:	N 9^29'18" W		
Tangent Length:	227.1891		
Element: Circular			
PC ( )	15+07.65	1436857.5788	2190418.2004
PI ( )	16+00.26	1436948.9176	2190402.9346
CC ( )		1436816.3669	2190171.6207
PT ( )	16+85.03	1437008.2699	2190331.8494
Radius:	250.0000		
Delta:	40^39'06" Left		
Degree of Curvature(Arc):	22^55'06"		
Length:	177.3759		
Tangent:	92.6057		
Chord:	173.6788		
Middle Ordinate:	15.5668		
External:	16.6005		
Tangent Direction:	N 9^29'18" W		
Radial Direction:	N 80^30'42" E		
Chord Direction:	N 29^48'51" W		
Radial Direction:	N 39^51'36" E		
Tangent Direction:	N 50^08'24" W		
Element: Linear			
PT ( )	16+85.03	1437008.2699	2190331.8494
PC ( )	18+12.97	1437090.2734	2190233.6352
Tangent Direction:	N 50^08'24" W		
Tangent Length:	127.9476		
Element: Circular			
PC ( )	18+12.97	1437090.2734	2190233.6352
PI ( )	19+01.05	1437146.7216	2190166.0283
CC ( )		1439953.4662	2192624.2475
PT ( )	19+89.09	1437206.2978	2190101.1610
Radius:	3730.0000		
Design Speed(mph):	30.0000		

Superelevation:	NC
Delta:	2^42'19" Right
Degree of Curvature(Arc):	1^32'10"
Length:	176.1160
Tangent:	88.0744
Chord:	176.0996
Middle Ordinate:	1.0394
External:	1.0397
Tangent Direction:	N 50^08'24" W
Radial Direction:	N 39^51'36" E
Chord Direction:	N 48^47'14" W
Radial Direction:	N 42^33'55" E
Tangent Direction:	N 47^26'05" W

Element: Linear

PT ( )	19+89.09	1437206.2978	2190101.1610
POE ( )	20+37.52	1437239.0567	2190065.4927
Tangent Direction:	N 47^26'05" W		
Tangent Length:	48.4291		

COMP: JEK

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: FREYS GIN
             Description: FREYS GIN ROAD
                   Style: Prop Side CL
  Vertical Alignment Name: FREYS GIN
             Description: PROFILE FOR FREYS GIN REALIGNMENT
                   Style: Prop Side CL
                                        STATION          ELEVATION

Element: Linear
                      POB            10+04.95            1115.18
                      PVC            10+10.00            1115.16
           Tangent Grade:             -0.4457
          Tangent Length:              5.0520

Element: Parabola
                      PVC            10+10.00            1115.16
                      PVI            11+10.00            1114.71
                      PVT            12+10.00            1111.21
                  Length:            200.0000
   Stopping Sight Distance:          453.3273
          Entrance Grade:             -0.4457
              Exit Grade:             -3.5000
     r = ( g2 - g1 ) / L:             -1.5271
     K = l / ( g2 - g1 ):             65.4825
         Middle Ordinate:             -0.7636

Element: Linear
                      PVT            12+10.00            1111.21
                      PVC            13+85.00            1105.09
           Tangent Grade:             -3.5000
          Tangent Length:            175.0000

Element: Parabola
                      PVC            13+85.00            1105.09
                      PVI            15+85.00            1098.09
                      PVT            17+85.00            1096.09
                  Length:            400.0000
  Headlight Sight Distance:          933.3333
          Entrance Grade:             -3.5000
              Exit Grade:             -1.0000
     r = ( g2 - g1 ) / L:              0.6250
     K = l / ( g2 - g1 ):            160.0000
         Middle Ordinate:              1.2500

Element: Linear
                      PVT            17+85.00            1096.09
                      POE            20+20.87            1093.73
           Tangent Grade:             -1.0000
          Tangent Length:            235.8693
```

SUPERELEVATION CALCULATIONS

ALIGNMENT: *Freys Gin*

CURVE NO.: *1*

MAX. S.E. TABLE: 4%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	1000.00	ft.
Design Speed =	30	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.66	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	ft.
Min. Runoff Length - pg. 181 AASHTO (L1) =	51.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	11	ft.
Rate of SE @ Full Super (SE) =	0.026	
PC Station =	11+63.53	
PT Station =	12+80.46	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	40.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	51.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	10+90.00	*-0.02*
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	11+30.00	*0*
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	11+70.00	*0.02*
PC Station =		11+63.53	*0.016*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	11+81.00	*0.026*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	12+63.00	*0.026*
PT Station =		12+80.46	*0.016*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	12+74.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	13+14.00	*0*
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	13+54.00	*-0.02*

Comp: JGK

SUPERELEVATION CALCULATIONS

ALIGNMENT: *Freys Gin*

CURVE NO.: *2*

MAX. S.E. TABLE: 4%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	250.00	ft.
Design Speed =	30	mph
Normal Cross Slope =	-0.02	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.66	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	ft.
Min. Runoff Length - pg. 181 AASHTO (L1) =	51.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	11	ft.
Rate of SE @ Full Super (SE) =	0.040	
PC Station =	15+07.65	
PT Station =	16+85.03	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		2/3	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/3	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	34.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	67.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Normal Crown (ENC) =	PC Station - (FRT)*(L)+(CWO) =	14+29.00	*-0.02*
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	14+63.00	*0*
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	14+97.00	*0.02*
PC Station =		15+07.65	*0.026*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	15+30.00	*0.040*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	16+63.00	*0.040*
PT Station =		16+85.03	*0.027*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	16+96.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	17+30.00	*0*
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	17+64.00	*-0.02*

Ramp L

(KC 58)

COMP: JEK
CHECK: MRM
11/14/09
REV. C

TERRELL_RAMPA(KC58).txt

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: TerrellMill_RampA (KC58)
             Description: HOV Ramp to/from Terrell Mill Rd on the south
                   Style: Default
                                          STATION      NORTHING       EASTING

Element: Circular
                PC (         )          1308+33.13  1421302.5215  2202410.8836
                PI (         )          1309+99.73  1421453.8148  2202341.1270
                CC (         )                      1417115.4577  2193329.6669
                PT (         )          1311+66.30  1421602.7005  2202266.3694
                      Radius:           10000.0000
                       Delta:              1^54'32" Left
  Degree of Curvature(Arc):              0^34'23"
                      Length:             333.1697
                     Tangent:             166.6002
                       Chord:             333.1543
            Middle Ordinate:                1.3875
                    External:               1.3877
          Tangent Direction:        N 24^45'11" W
           Radial Direction:        N 65^14'49" E
            Chord Direction:        N 25^42'27" W
           Radial Direction:        N 63^20'17" E
          Tangent Direction:        N 26^39'43" W

Element: Linear
                PT (         )          1311+66.30  1421602.7005  2202266.3694
                PC (         )          1316+28.87  1422016.0862  2202058.8027
          Tangent Direction:        N 26^39'43" W
             Tangent Length:             462.5707

Element: Circular
                PC (         )          1316+28.87  1422016.0862  2202058.8027
                PI (         )          1317+95.45  1422164.9555  2201984.0533
                CC (         )                      1426503.3290  2210995.5053
                PT (         )          1319+62.00  1422316.2320  2201914.3039
                      Radius:           10000.0000
                       Delta:              1^54'31" Right
  Degree of Curvature(Arc):              0^34'23"
                      Length:             333.1331
                     Tangent:             166.5820
                       Chord:             333.1177
            Middle Ordinate:                1.3872
                    External:               1.3874
          Tangent Direction:        N 26^39'43" W
           Radial Direction:        N 63^20'17" E
            Chord Direction:        N 25^42'27" W
           Radial Direction:        N 65^14'49" E
          Tangent Direction:        N 24^45'11" W

Element: Linear
                PT (         )          1319+62.00  1422316.2320  2201914.3039
               POE (         )          1327+95.55  1423073.1950  2201565.2886
          Tangent Direction:        N 24^45'11" W
             Tangent Length:             833.5495
```

Comp: JEK

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: TerrellMill_RampA (KC58)
             Description: HOV Ramp to/from Terrell Mill Rd on the south
                   Style: Default
  Vertical Alignment Name: TerrellMill_RampA
             Description: HOV Ramp to/from Terrell Mill Rd on the south
                   Style: Prop Side CL
                                        STATION          ELEVATION

Element: Linear
                       POB        1317+19.94             967.41
                       PVC        1317+50.00             966.83
            Tangent Grade:            -1.9401
           Tangent Length:            30.0600

Element: Parabola
                       PVC        1317+50.00             966.83
                       PVI        1319+00.00             963.92
                       PVT        1320+50.00             956.42
                   Length:          300.0000
   Stopping Sight Distance:         502.6750
           Entrance Grade:           -1.9401
               Exit Grade:           -5.0000
      r = ( g2 - g1 ) / L:           -1.0200
      K = 1 / ( g2 - g1 ):           98.0424
          Middle Ordinate:           -1.1475

Element: Linear
                       PVT        1320+50.00             956.42
                       PVC        1325+28.78             932.48
            Tangent Grade:            -5.0000
           Tangent Length:          478.7773

Element: Parabola
                       PVC        1325+28.78             932.48
                       PVI        1326+28.78             927.48
                       PVT        1327+28.78             928.27
                      VLOW        1327+01.33             928.16
                   Length:          200.0000
  Headlight Sight Distance:         192.4942
           Entrance Grade:           -5.0000
               Exit Grade:            0.7955
      r = ( g2 - g1 ) / L:            2.8977
      K = 1 / ( g2 - g1 ):           34.5096
          Middle Ordinate:            1.4489

Element: Linear
                       PVT        1327+28.78             928.27
                       POE        1327+89.39             928.76
            Tangent Grade:            0.7955
           Tangent Length:            60.6131
```

Ramp M

(KC 59)

COMP: JEK
CHECK: MRM
11/14/09
REV. C

TERRELL_RAMPB(KC59).txt

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: TerrellMill_RampB (KC59)
             Description: HOV Ramp to/from Terrell Mill Rd on the north
                   Style: Default
                                          STATION      NORTHING       EASTING

Element: Linear
             POB (        )            2327+97.78  1423069.4816  2201549.3820
              PC (        )            2331+27.16  1423368.6010  2201411.4661
         Tangent Direction:          N 24^45'11" W
            Tangent Length:              329.3830

Element: Circular
              PC (        )            2331+27.16  1423368.6010  2201411.4661
              PI (        )            2332+93.78  1423519.9123  2201341.7005
              CC (        )                        1427555.6980  2210492.6675
              PT (        )            2334+60.37  1423673.4639  2201277.0146
                     Radius:            10000.0000
                      Delta:               1^54'33" Right
  Degree of Curvature(Arc):               0^34'23"
                     Length:              333.2100
                    Tangent:              166.6204
                      Chord:              333.1945
           Middle Ordinate:                 1.3878
                   External:                1.3880
         Tangent Direction:          N 24^45'11" W
          Radial Direction:          N 65^14'49" E
           Chord Direction:          N 23^47'55" W
          Radial Direction:          N 67^09'22" E
         Tangent Direction:          N 22^50'38" W

Element: Linear
              PT (        )            2334+60.37  1423673.4639  2201277.0146
             POE (        )            2345+69.98  1424696.0395  2200846.2390
         Tangent Direction:          N 22^50'38" W
            Tangent Length:             1109.6074
```

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: TerrellMill_RampB (KC59)
Description: HOV Ramp to/from Terrell Mill Rd on the north
Style: Default
Vertical Alignment Name: TerrellMill_RampB
Description: HOV Ramp to/from Terrell Mill Rd on the north
Style: Prop Side CL

COMP: JEK

	STATION	ELEVATION
Element: Linear		
POB	2328+28.02	929.66
PVC	2328+36.58	929.48
Tangent Grade:	-2.0000	
Tangent Length:	8.5641	
Element: Parabola		
PVC	2328+36.58	929.48
PVI	2329+61.58	926.98
PVT	2330+86.58	934.48
VLOW	2328+99.08	928.86
Length:	250.0000	
Headlight Sight Distance:	179.1492	
Entrance Grade:	-2.0000	
Exit Grade:	6.0000	
r = (g2 - g1) / L:	3.2000	
K = 1 / (g2 - g1):	31.2500	
Middle Ordinate:	2.5000	
Element: Linear		
PVT	2330+86.58	934.48
PVC	2334+50.00	956.29
Tangent Grade:	6.0000	
Tangent Length:	363.4150	
Element: Parabola		
PVC	2334+50.00	956.29
PVI	2336+50.00	968.29
PVT	2338+50.00	970.09
Length:	400.0000	
Stopping Sight Distance:	411.5566	
Entrance Grade:	6.0000	
Exit Grade:	0.8990	
r = (g2 - g1) / L:	-1.2752	
K = 1 / (g2 - g1):	78.4160	
Middle Ordinate:	-2.5505	
Element: Linear		
PVT	2338+50.00	970.09
POE	2338+62.52	970.20
Tangent Grade:	0.8990	
Tangent Length:	12.5200	

Ramp N

(KC 60)

COMP: JEK
CHECK: MRM
11/14/09
REV. C

ROSWELL_RAMPA(KC60).txt

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: Roswell_RampA (KC60)
             Description: HOV Ramp to/from Roswell Rd on the south
                   Style: Prop Side CL
                                    STATION      NORTHING       EASTING

Element: Circular
              PC (        )        1503+90.15  1436304.4550  2190735.2735
              PI (        )        1505+92.57  1436463.8701  2190610.5268
              CC (        )                    1437228.8577  2191916.5777
             PCC (        )        1507+92.56  1436650.6494  2190532.4985
                     Radius:         1500.0000
                      Delta:         15^22'16" Right
  Degree of Curvature(Arc):          3^49'11"
                     Length:         402.4141
                    Tangent:         202.4226
                      Chord:         401.2085
            Middle Ordinate:          13.4745
                   External:          13.5967
          Tangent Direction:      N 38^02'39" W
           Radial Direction:      N 51^57'21" E
            Chord Direction:      N 30^21'31" W
           Radial Direction:      N 67^19'37" E
          Tangent Direction:      N 22^40'23" W

Element: Circular
             PCC (        )        1507+92.56  1436650.6494  2190532.4985
              PI (        )        1511+31.33  1436963.2318  2190401.9151
              CC (        )                    1437491.9425  2192546.3337
              PT (        )        1514+64.72  1437300.6908  2190372.2295
                     Radius:         2182.5000
                      Delta:         17^38'45" Right
  Degree of Curvature(Arc):          2^37'31"
                     Length:         672.1606
                    Tangent:         338.7622
                      Chord:         669.5073
            Middle Ordinate:          25.8252
                   External:          26.1344
          Tangent Direction:      N 22^40'23" W
           Radial Direction:      N 67^19'37" E
            Chord Direction:      N 13^51'01" W
           Radial Direction:      N 84^58'22" E
          Tangent Direction:      N  5^01'38" W

Element: Linear
              PT (        )        1514+64.72  1437300.6908  2190372.2295
             POE (        )        1515+21.71  1437357.4599  2190367.2356
          Tangent Direction:      N  5^01'38" W
             Tangent Length:          56.9883
```

COMP: JEK

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: Roswell_RampA (KC60)
             Description: HOV Ramp to/from Roswell Rd on the south
                   Style: Prop Side CL
  Vertical Alignment Name: Roswell_RampA
             Description: HOV Ramp to/from Roswell Rd on the south
                   Style: Prop Side CL
                                          STATION          ELEVATION

Element: Linear
                       POB        1506+08.17            1104.01
                       PVC        1507+25.00            1105.43
            Tangent Grade:            1.2191
           Tangent Length:          116.8300

Element: Parabola
                       PVC        1507+25.00            1105.43
                       PVI        1509+50.00            1108.18
                       PVT        1511+75.00            1094.68
                     VHIGH        1508+00.99            1105.90
                   Length:          450.0000
   Stopping Sight Distance:         366.7927
           Entrance Grade:            1.2191
               Exit Grade:           -6.0000
      r = ( g2 - g1 ) / L:           -1.6042
      K = 1 / ( g2 - g1 ):           62.3346
         Middle Ordinate:            -4.0607

Element: Linear
                       PVT        1511+75.00            1094.68
                       PVC        1512+66.68            1089.18
            Tangent Grade:           -6.0000
           Tangent Length:           91.6755

Element: Parabola
                       PVC        1512+66.68            1089.18
                       PVI        1513+71.68            1082.88
                       PVT        1514+76.68            1083.93
                      VLOW        1514+46.68            1083.78
                   Length:          210.0000
  Headlight Sight Distance:         173.9753
           Entrance Grade:           -6.0000
               Exit Grade:            1.0000
      r = ( g2 - g1 ) / L:            3.3333
      K = 1 / ( g2 - g1 ):           30.0000
         Middle Ordinate:             1.8375

Element: Linear
                       PVT        1514+76.68            1083.93
                       POE        1514+87.90            1084.04
            Tangent Grade:            1.0000
           Tangent Length:           11.2196
```

SUPERELEVATION CALCULATIONS

ALIGNMENT: *Roswell Ramp A (KC60)*

CURVE NO.: *KC128*

MAX. S.E. TABLE: 8%

AASHTO BOOK: 2004

DESIGN DATA

Radius =	2182.50	ft.
Design Speed =	35	mph
Normal Cross Slope =	0.056	
Max. Relative Gradient - pg. 177 AASHTO (G) =	0.62	%
No. of lanes rotated (Use 1 for divided highways Case I only) pg. 178 AASHTO (n) =	1	
Adj.factor for no.of lanes rotated - pg. 178 AASHTO (b) =	1.00	ft.
Min. Runoff Length - pg. 181 AASHTO (L1) =	54.00	
Width of **ONE** traffic lane (Use total rotated width for divided highways Case I only) (w) =	16	ft.
Rate of SE @ Full Super (SE) =	0.028	
PC Station =	1507+92.56	
PT Station =	1514+64.72	

CALCULATED:

Fraction of RUNOFF (L1 or L2) on Tangent = (FRT) =		1/2	
Fraction of RUNOFF (L1 or L2) on Curve= (FRC) =		1/2	
Tangent Runout (NC to Flat) =(CWO) =	(NC/ SE) *L1 =	146.00	ft.
***Superelevation Runoff (Flat to FS) = (L2) =**	[((w*n)*(SE*100)) / G]*b =	73.00	ft.

*(L2) must be greater than AASHTO min. (L1)

Station at End Full SuperElevation First Curve (EFSE) =	PC Station - (FRT)*(L)+(CWO) =	1507+56.00	*0.06*
Station at FLAT or Begin SuperElevation (F) =	PC Station - (FRT)*(L) =	~~1507+56.00~~	*0*
Station at Reverse Crown (RC) =	ENC + (2*CWO) =	~~1510+48.00~~	*0.02*
PC Station =		1507+92.56	*0.029*
Station at Begin Full SuperElevation (BFSE) =	PC Station + (FRC)*(L) =	1508+29.00	*0.028*
Station at End Full SuperElevation (EFSE) =	PT Station - (FRC)*(L) =	1514+28.00	*0.028*
PT Station =		1514+64.72	*0.024*
Station at Reverse Crown End of Curve (RCend) =	EFSE + (TL-CWO) =	1515+01.00	*0.02*
Station at FLAT or End SuperElevation (Fend) =	PT Station + (FRT)*(TL) =	~~1515+01.00~~	*0*
Begin Normal Crown (BNC) =	EFSE + (TL+CWO) =	~~1516+47.00~~	*0.06*

Comp: JEK

Ramp O

(KC 61)

COMP: JLS
CHECK: MRM
11/14/09
REV. C

ROSWELL_RAMPB(KC61).txt

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: Roswell_RampB (KC61)
             Description: HOV Ramp to/from Roswell Rd on the north
                   Style: Prop Side CL
                                          STATION      NORTHING       EASTING

Element: Linear
             POB (        )             2515+02.47  1437357.9724  2190349.4906
              PC (        )             2517+75.47  1437630.9438  2190345.6775
         Tangent Direction:          N  0^48'01" W
            Tangent Length:               272.9980

Element: Circular
              PC (        )             2517+75.47  1437630.9438  2190345.6775
              PI (        )             2519+10.43  1437765.8892  2190343.7926
              CC (        )                         1437770.6158  2200344.7021
              PT (        )             2520+45.37  1437900.8363  2190345.5500
                     Radius:             10000.0000
         Design Speed(mph):                 60.0000
            Superelevation:                 2.0000%
                     Delta:               1^32'47" Right
  Degree of Curvature(Arc):               0^34'23"
                    Length:               269.9008
                   Tangent:               134.9586
                     Chord:               269.8926
           Middle Ordinate:                 0.9106
                  External:                 0.9106
         Tangent Direction:          N  0^48'01" W
          Radial Direction:          N 89^11'59" E
           Chord Direction:          N  0^01'37" W
          Radial Direction:          S 89^15'14" E
         Tangent Direction:          N  0^44'46" E

Element: Linear
              PT (        )             2520+45.37  1437900.8363  2190345.5500
              PC (        )             2529+93.22  1438848.6100  2190357.8930
         Tangent Direction:          N  0^44'46" E
            Tangent Length:               947.8540

Element: Circular
              PC (        )             2529+93.22  1438848.6100  2190357.8930
              PI (        )             2531+32.52  1438987.8915  2190359.7069
              CC (        )                         1438887.3636  2187382.1453
              PT (        )             2532+71.61  1439126.7336  2190348.5030
                     Radius:              2976.0000
                     Delta:               5^21'35" Left
  Degree of Curvature(Arc):               1^55'31"
                    Length:               278.3836
                   Tangent:               139.2934
                     Chord:               278.2821
           Middle Ordinate:                 3.2545
                  External:                 3.2581
         Tangent Direction:          N  0^44'46" E
          Radial Direction:          S 89^15'14" E
           Chord Direction:          N  1^56'01" W
          Radial Direction:          N 85^23'11" E
         Tangent Direction:          N  4^36'49" W
```

COMP: JEK

Project Name: I-75 REVERSIBLE
Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: Roswell_RampB (KC61)
Description: HOV Ramp to/from Roswell Rd on the north
Style: Prop Side CL
Vertical Alignment Name: Roswell_RampB
Description: HOV Ramp to/from Roswell Rd on the north
Style: Prop Side CL

	STATION	ELEVATION
Element: Linear		
POB	2515+24.65	1085.09
PVC	2515+39.54	1084.81
Tangent Grade:	-1.8680	
Tangent Length:	14.8873	
Element: Parabola		
PVC	2515+39.54	1084.81
PVI	2516+27.04	1083.18
PVT	2517+14.54	1088.51
VLOW	2515+80.58	1084.43
Length:	175.0000	
Headlight Sight Distance:	139.7796	
Entrance Grade:	-1.8680	
Exit Grade:	6.0966	
r = (g2 - g1) / L:	4.5512	
K = l / (g2 - g1):	21.9722	
Middle Ordinate:	1.7423	
Element: Linear		
PVT	2517+14.54	1088.51
PVC	2523+12.50	1124.97
Tangent Grade:	6.0966	
Tangent Length:	597.9627	
Element: Parabola		
PVC	2523+12.50	1124.97
PVI	2524+35.00	1132.44
PVT	2525+57.50	1134.89
Length:	245.0000	
Stopping Sight Distance:	385.9282	
Entrance Grade:	6.0966	
Exit Grade:	2.0000	
r = (g2 - g1) / L:	-1.6721	
K = l / (g2 - g1):	59.8062	
Middle Ordinate:	-1.2546	
Element: Linear		
PVT	2525+57.50	1134.89
POE	2525+59.21	1134.92
Tangent Grade:	2.0000	
Tangent Length:	1.7100	

Ramp P
(KC 43)

PRINTED 07-07-09
COMP: PCT
CHECK: MRM 11/14/09
REV. C


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-575GP EXIT (KC43)   RAMP "P"
             Description: I-575 SB EXIT TO I-75 SB
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
            POB (        )              12+72.75  1452660.4238  2178855.4345
             PC (        )              24+73.31  1453392.1861  2177903.6641
        Tangent Direction:          N 52^26'43" W
           Tangent Length:               1200.56

Element: Circular
             PC (        )              24+73.31  1453392.1861  2177903.6641
             PI (        )              25+97.51  1453467.8866  2177805.2038
             CC (        )                        1433572.8754  2162665.7204
             PT (        )              27+21.71  1453542.6051  2177705.9962
                   Radius:              25000.00
                    Delta:              0^34'09" Left
  Degree of Curvature(Arc):             0^13'45"
                   Length:                248.39
                  Tangent:                124.20
                    Chord:                248.39
          Middle Ordinate:                  0.31
                 External:                  0.31
        Tangent Direction:          N 52^26'43" W
         Radial Direction:          N 37^33'17" E
          Chord Direction:          N 52^43'48" W
         Radial Direction:          N 36^59'07" E
        Tangent Direction:          N 53^00'53" W

Element: Linear
             PT (        )              27+21.71  1453542.6051  2177705.9962
             PC (        )              33+01.05  1453891.1460  2177243.2210
        Tangent Direction:          N 53^00'53" W
           Tangent Length:                579.35

Element: Circular
             PC (        )              33+01.05  1453891.1460  2177243.2210
             PI (        )              34+51.61  1453981.7248  2177122.9550
             CC (        )                        1455025.4266  2178097.5087
             PT (        )              36+01.05  1454095.5094  2177024.3572
                   Radius:               1420.00
                    Delta:             12^06'17" Right
  Degree of Curvature(Arc):             4^02'06"
                   Length:                300.00
                  Tangent:                150.56
                    Chord:                299.44
          Middle Ordinate:                  7.92
                 External:                  7.96
        Tangent Direction:          N 53^00'53" W
         Radial Direction:          N 36^59'07" E
          Chord Direction:          N 46^57'44" W
         Radial Direction:          N 49^05'24" E
        Tangent Direction:          N 40^54'36" W
```

Comp: PCT


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-575GP EXIT (KC43)
             Description: I-575 SB EXIT TO I-75 SB
                   Style: Prop Main CL
  Vertical Alignment Name: I-575GP EXIT
             Description: I-575 EXIT TO I-75 SB
                   Style: Prop Main CL
                                        STATION          ELEVATION

Element: Linear
                     POB            25+24.55            1058.06
                     PVC            25+25.05            1058.05
            Tangent Grade:           -2.4849
           Tangent Length:              0.50

Element: Parabola
                     PVC            25+25.05            1058.05
                     PVI            29+13.05            1048.41
                     PVT            33+01.05            1049.59
                    VLOW            32+16.31            1049.46
                  Length:             776.00
  Headlight Sight Distance:          1233.53
           Entrance Grade:           -2.4849
              Exit Grade:             0.3046
      r = ( g2 - g1 ) / L:            0.3595
      K = l / ( g2 - g1 ):          278.1774
          Middle Ordinate:              2.71
```

Ramp Q
(KC 42)

Project Name: 1285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: I-575HOV ENT (KC42)
Description: HOV RAMP TO I-575
Style: Prop Main CL

RAMP "Q"

9/23/09
-ADDED TO C: CALCS

Comp: PCT
CHECK: MRM
11/14/09
REV. C

	STATION	NORTHING	EASTING
Element: Linear			
POB (11088)	1720+00.00	1453196.0506533	2178349.9033178
PC ( )	1720+61.54	1453233.5594385	2178301.1173214
Tangent Direction:	N 52^26'43" W		
Tangent Length:	61.5385		
Element: Circular			
PC ( )	1720+61.54	1453233.5594385	2178301.1173214
PI (11089)	1731+35.11	1453887.9178110	2177450.0227042
CC (CKC97)		1456724.9869086	2180985.4778504
PT ( )	1741+67.60	1454860.5349879	2176995.5309506
Radius:	4404.0728		
Delta:	27^23'57" Right		
Degree of Curvature(Arc):	1^18'04"		
Length:	2106.0603		
Tangent:	1073.5674		
Chord:	2086.0501		
Middle Ordinate:	125.2931		
External:	128.9620		
Tangent Direction:	N 52^26'43" W		
Radial Direction:	N 37^33'17" E		
Chord Direction:	N 38^44'45" W		
Radial Direction:	N 64^57'14" E		
Tangent Direction:	N 25^02'46" W		
Element: Linear			
PT ( )	1741+67.60	1454860.5349879	2176995.5309506
PC ( )	1743+48.47	1455024.3973932	2176918.9601129
Tangent Direction:	N 25^02'46" W		
Tangent Length:	180.8701		
Element: Circular			
PC ( )	1743+48.47	1455024.3973932	2176918.9601129
PI (11090)	1746+74.73	1455319.9822379	2176780.8370388
CC (CKC98)		1455430.8107123	2177788.6889293
PT ( )	1749+77.48	1455638.5183602	2176851.4282756
Radius:	960.0000		
Delta:	37^32'30" Right		
Degree of Curvature(Arc):	5^58'06"		
Length:	629.0146		
Tangent:	326.2643		
Chord:	617.8229		
Middle Ordinate:	51.0590		
External:	53.9272		
Tangent Direction:	N 25^02'46" W		
Radial Direction:	N 64^57'14" E		
Chord Direction:	N 6^16'31" W		
Radial Direction:	S 77^30'16" E		
Tangent Direction:	N 12^29'44" E		
Element: Linear			
PT ( )	1749+77.48	1455638.5183602	2176851.4282756
POE (11091)	1773+05.21	1457911.1061105	2177355.0596343
Tangent Direction:	N 12^29'44" E		
Tangent Length:	2327.7241		

9/23/09

comp: PCT

```
          Project Name: I285 ALT5
           Description: ALTERNATIVE 5
Horizontal Alignment Name: I-575HOV ENT (KC42)
           Description: HOV RAMP TO I-575
                 Style: Prop Main CL
  Vertical Alignment Name: I-575HOV ENT
           Description: I-575 HOV ENTRANCE
                 Style: Prop Main CL
                                    STATION          ELEVATION

Element: Parabola
                     PVC        1731+12.16           1035.01
                     PVI        1735+12.16           1023.50
                     PVT        1739+12.16           1047.50
                    VLOW        1733+71.52           1031.28
                 Length:          800.0000
  Headlight Sight Distance:       404.4845
          Entrance Grade:          -2.8783
              Exit Grade:           6.0000
      r = ( g2 - g1 ) / L:          1.1098
      K = 1 / ( g2 - g1 ):         90.1074
         Middle Ordinate:           8.8783

Element: Linear
                     PVT        1739+12.16           1047.50
                     PVC        1744+00.00           1076.77
           Tangent Grade:           6.0000
          Tangent Length:         487.8400

Element: Parabola
                     PVC        1744+00.00           1076.77
                     PVI        1749+00.00           1106.77
                     PVT        1754+00.00           1095.97
                   VHIGH        1751+35.38           1098.83
                 Length:         1000.0000
  Stopping Sight Distance:         514.3234
          Entrance Grade:           6.0000
              Exit Grade:          -2.1590
      r = ( g2 - g1 ) / L:         -0.8159
      K = 1 / ( g2 - g1 ):        122.5634
         Middle Ordinate:         -10.1988

Element: Linear
                     PVT        1754+00.00           1095.97
                     PVC        1756+25.78           1091.10
           Tangent Grade:          -2.1590
          Tangent Length:         225.7813

Element: Parabola
                     PVC        1756+25.78           1091.10
                     PVI        1758+25.78           1086.78
                     PVT        1760+25.78           1085.30
                 Length:          400.0000
          Entrance Grade:          -2.1590
              Exit Grade:          -0.7400
      r = ( g2 - g1 ) / L:          0.3548
      K = 1 / ( g2 - g1 ):        281.8800
         Middle Ordinate:           0.7095

Element: Linear
                     PVT        1760+25.78           1085.30
                     PVI        1761+00.00           1084.75
           Tangent Grade:          -0.7400
          Tangent Length:         74.2187

Element: Linear
                     PVI        1761+00.00           1084.75
                     PVI        1762+00.00           1083.85
           Tangent Grade:          -0.9000
          Tangent Length:         100.0000

Element: Linear
```

PVI	1762+00.00	1083.85
PVI	1763+00.00	1082.74
Tangent Grade:	-1.1100	
Tangent Length:	100.0000	

Element: Linear

PVI	1763+00.00	1082.74
PVI	1764+00.00	1081.43
Tangent Grade:	-1.3100	
Tangent Length:	100.0000	

Element: Linear

PVI	1764+00.00	1081.43
PVI	1765+00.00	1080.02
Tangent Grade:	-1.4100	
Tangent Length:	100.0000	

Element: Linear

PVI	1765+00.00	1080.02
PVI	1766+00.00	1078.46
Tangent Grade:	-1.5600	
Tangent Length:	100.0000	

Element: Linear

PVI	1766+00.00	1078.46
PVI	1767+00.00	1076.60
Tangent Grade:	-1.8600	
Tangent Length:	100.0000	

Element: Linear

PVI	1767+00.00	1076.60
PVI	1768+00.00	1074.56
Tangent Grade:	-2.0400	
Tangent Length:	100.0000	

ıent: Linear

PVI	1768+00.00	1074.56
POE	1768+31.98	1073.90
Tangent Grade:	-2.0638	
Tangent Length:	31.9800	

Subject:	KC42 SE RENSION HORT DS=55 VERT DS=45		
Comp by: PCT	Date: 9/23/09	Sheet Number:	
Check by:	Job Number:		

CURVE KC97

PC = 1720+61
PT = 1741+68
R = 4404
e = 0.032

W=16 V = 213
L = 16(213)(0.032) = 109 $\frac{L}{3}$ = 36
LR = 16(213)(0.012) = 41
L2 = 16(213)(0.02) = 68

	STA	LT	RT	
BEG PRO	1731+12	+0.032	-0.032	MATCH MAIN
EFSE	1741+32	+0.032	-0.032	

CURVE KC98

PC = 1743+48
PT = 1749+78
R = 960
e = 0.08

W=16 V=213
L = 16(213)(0.08) = 273 $\frac{L}{3}$ = 91
LR = 16(213)(0.06) = 204
L2 = 68

	STA	LT	RT	
MATCH	1742+75	+0.032	-0.032	L = 164
BFSE	1744+39	+0.08	-0.08	
EFSE	1748+87	+0.08	-0.08	
PC	1750+91	+0.02	-0.02	
FLAT	1751+59	0	0	
NC	1752+27	-0.02	+0.02	(MATCH EXIST)
NC	1768+31	-0.02	+0.02	

Ramp R
(KC 44)

PRINTED 07-07-09

COMP: PCT
CHECK: MRM
11/14/09
REV: C

```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-575GP ENT (KC44)  RAMP "R"
             Description: ENTR RAMP FROM I-75 NB
                   Style: Prop Main CL
                                        STATION      NORTHING       EASTING

Element: Circular
             PC (        )            38+18.65  1454520.6813  2177279.9823
             PI (        )            47+29.53  1455303.5186  2176814.2923
             CC (        )                      1455696.5638  2179256.6716
             PT (        )            55+53.23  1456192.9330  2177010.8716
                  Radius:              2300.00
                   Delta:             43^12'38" Right
  Degree of Curvature(Arc):            2^29'28"
                  Length:               1734.58
                 Tangent:                910.88
                   Chord:               1693.77
          Middle Ordinate:                161.59
                 External:                173.80
        Tangent Direction:        N 30^44'50" W
         Radial Direction:        N 59^15'10" E
          Chord Direction:        N  9^08'31" W
         Radial Direction:        S 77^32'12" E
        Tangent Direction:        N 12^27'48" E

Element: Linear
             PT (        )            55+53.23  1456192.9330  2177010.8716
            POE (        )            70+31.97  1457636.8262  2177330.0025
        Tangent Direction:        N 12^27'48" E
           Tangent Length:               1478.74
```

9/23/09
-ADDED TO C'CALC
COMP: DCT

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: I-575GP ENT (KC44)
Description: ENTR RAMP FROM I-75 NB
Style: Prop Main CL

	STATION	NORTHING	EASTING
Element: Circular			
PC (11096)	38+17.75	1454519.90691	512177280.4431360
PI (11097)	47+29.65	1455303.52921	992176814.0642763
CC (CKC101)		1455696.20248	442179256.8865917
PT ( )	55+54.10	1456193.83539	102177011.3662756
Radius:	2300.0000		
Delta:	43^15'17" Right		
Degree of Curvature(Arc):	2^29'28"		
Length:	1736.3578		
Tangent:	911.9063		
Chord:	1695.4170		
Middle Ordinate:	161.9190		
External:	174.1813		
Tangent Direction:	N 30^45'34" W		
Radial Direction:	N 59^14'26" E		
Chord Direction:	N 9^07'55" W		
Radial Direction:	S 77^30'16" E		
Tangent Direction:	N 12^29'44" E		
Element: Linear			
PT ( )	55+54.10	1456193.83539	102177011.3662756
POE (KC11098)	73+05.06	1457903.31707	372177390.2069088
Tangent Direction:	N 12^29'44" E		
Tangent Length:	1750.9563		

Subject:	(KC 44) I-575 ENT / I-575 EXIT (KC 43) DS=65 LT/RT DS=55 RT/LT		
Comp by: PCT	Date: 6/8/09	Sheet Number:	
Check by:	Job Number:		

PBSJ

KC 44:

~~CURVE~~ KC101 OLD (SEE BELOW)

PC = 38+18.65
PT = 55+53.23

R = 2300
e = 0.068

w=24 ∇=233 bw=0.75
L = 24(233)(0.068)(0.75) = 285 ⅓ = 95
L_{RC} = 24(233)(0.048)(0.75) = 201
L_2 = 24(233)(0.02)(0.75) = 84

	STA	LT	RT	
BEG PRO	38+18.65	+0.042	-0.042	MATCH I-75 NB
				L=24(233)(0.026)(0.75)=109
* BFSE	39+27	+0.068	-0.068	
EFSE	54+59	+0.068	-0.068	
RC	56+60	+0.02	-0.02	MATCH EXIST.

NEW 9/23/09

PC = 38+18
PT = 55+54

CURVE KC101	STA	LT	RT	
BEG PRO	38+18	+0.042	-0.042	(MATCH I-75 NB)
BFSE	39+27	+0.068	-0.068	L = 109
EFSE	54+59	+0.068	-0.068	
RC	56+60	+0.02	-0.02	
END PRO	56+62.05	+0.02	-0.02	MATCH [illegible]

KC 43:

CURVE KC100

PC = 33+01.05
PT = —
R = MATCH EX 1420
e = MATCH EX 0.065

w=24 ∇=233 bw=0.75
L = 24(233)(0.02)(0.75) = 84
L_R = 24(233)(0.022)(0.75) = 92

	STA	LT	RT	
BEG PRO	25+24	+0.042	-0.042	MATCH MAINSE
	26+81	+0.042	-0.042	
	27+73	+0.02	-0.02	
				L = 24(233)(0.045)(0.75) = 189
	31+12	+0.02	-0.02	
END PRO	33+01	+0.065	-0.065	MATCH EX

9/23/09

COMP: PLT

Project Name: I285 ALT5
Description: ALTERNATIVE 5
Horizontal Alignment Name: I-575GP ENT (KC44)
Description: ENTR RAMP FROM I-75 NB
Style: Prop Main CL
Vertical Alignment Name: I-575GP ENT
Description: I-575 ENT FROM I-75 NB
Style: Prop Main CL

	STATION	ELEVATION
Element: Parabola		
PVC	38+17.75	1026.47
PVI	43+17.75	1031.63
PVT	48+17.75	1054.60
Length:	1000.0000	
Headlight Sight Distance:	1092.8344	
Entrance Grade:	1.0318	
Exit Grade:	4.5951	
r = (g2 - g1) / L:	0.3563	
K = 1 / (g2 - g1):	280.6370	
Middle Ordinate:	4.4542	
Element: Linear		
PVT	48+17.75	1054.60
PVC	52+12.05	1072.72
Tangent Grade:	4.5951	
Tangent Length:	394.2996	
Element: Parabola		
PVC	52+12.05	1072.72
PVI	54+37.05	1083.06
PVT	56+62.05	1085.08
Length:	450.0000	
Stopping Sight Distance:	516.7917	
Entrance Grade:	4.5951	
Exit Grade:	0.8967	
r = (g2 - g1) / L:	-0.8219	
K = 1 / (g2 - g1):	121.6756	
Middle Ordinate:	-2.0803	

I-75 NB at I-575

(KC 45)

PRINTED 07-07-09

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-75N_I-575 (KC45)
             Description: I-75 NB SEGMENT AT I-575
                   Style: Prop Main CL
                                          STATION      NORTHING       EASTING

Element: Linear
             POB (        )            2702+32.98  1452168.2123  2179786.6319
              PC (        )            2702+44.86  1452174.3525  2179776.4642
         Tangent Direction:          N 58^52'20" W
            Tangent Length:                 11.88

Element: Circular
              PC (        )            2702+44.86  1452174.3525  2179776.4642
              PI (        )            2705+93.63  1452354.6484  2179477.9107
              CC (        )                        1457491.9325  2182987.7393
              PT (        )            2709+41.67  1452567.2302  2179201.4151
                     Radius:              6212.00
                      Delta:             6^25'37" Right
  Degree of Curvature(Arc):             0^55'20"
                     Length:               696.81
                    Tangent:               348.77
                      Chord:               696.44
           Middle Ordinate:                  9.77
                   External:                 9.78
         Tangent Direction:          N 58^52'20" W
          Radial Direction:          N 31^07'40" E
           Chord Direction:          N 55^39'32" W
          Radial Direction:          N 37^33'17" E
         Tangent Direction:          N 52^26'43" W

Element: Linear
              PT (        )            2709+41.67  1452567.2302  2179201.4151
              PC (        )            2720+61.54  1453249.8113  2178313.6124
         Tangent Direction:          N 52^26'43" W
            Tangent Length:                1119.87

Element: Circular
              PC (        )            2720+61.54  1453249.8113  2178313.6124
              PI (        )            2731+30.11  1453901.1237  2177466.4795
              CC (        )                        1456724.9869  2180985.4779
              PT (        )            2741+57.80  1454869.2136  2177014.1033
                     Radius:              4383.57
                      Delta:            27^23'57" Right
  Degree of Curvature(Arc):             1^18'25"
                     Length:              2096.26
                    Tangent:              1068.57
                      Chord:              2076.34
           Middle Ordinate:                124.71
                   External:               128.36
         Tangent Direction:          N 52^26'43" W
          Radial Direction:          N 37^33'17" E
           Chord Direction:          N 38^44'45" W
          Radial Direction:          N 64^57'14" E
         Tangent Direction:          N 25^02'46" W

Element: Linear
              PT (        )            2741+57.80  1454869.2136  2177014.1033
              PC (        )            2743+38.61  1455033.0218  2176937.5578
         Tangent Direction:          N 25^02'46" W
            Tangent Length:                 180.81
```

```
Element: Circular
              PC (         )        2743+38.61  1455033.0218  2176937.5578
              PI (         )        2745+41.41  1455216.7591  2176851.6996
              CC (         )                    1449571.8428  2165250.5768
              PT (         )        2747+44.19  1455397.7067  2176760.1081
                    Radius:           12900.00
                     Delta:           1^48'05" Left
  Degree of Curvature(Arc):           0^26'39"
                    Length:             405.58
                   Tangent:             202.81
                     Chord:             405.57
           Middle Ordinate:               1.59
                  External:               1.59
         Tangent Direction:      N 25^02'46" W
          Radial Direction:      N 64^57'14" E
           Chord Direction:      N 25^56'48" W
          Radial Direction:      N 63^09'09" E
         Tangent Direction:      N 26^50'51" W

Element: Linear
              PT (         )         2747+44.19  1455397.7067  2176760.1081
              PC (         )         2752+48.73  1455847.8648  2176532.2482
         Tangent Direction:      N 26^50'51" W
            Tangent Length:             504.54

Element: Circular
              PC (         )        2752+48.73  1455847.8648  2176532.2482
              PI (         )        2754+41.21  1456019.5969  2176445.3214
              CC (         )                    1461673.7287  2188041.7795
              PT (         )        2756+33.66  1456193.8460  2176363.5568
                    Radius:           12900.00
                     Delta:           1^42'35" Right
  Degree of Curvature(Arc):           0^26'39"
                    Length:             384.93
                   Tangent:             192.48
                     Chord:             384.92
           Middle Ordinate:               1.44
                  External:               1.44
         Tangent Direction:      N 26^50'51" W
          Radial Direction:      N 63^09'09" E
           Chord Direction:      N 25^59'34" W
          Radial Direction:      N 64^51'44" E
         Tangent Direction:      N 25^08'16" W

Element: Linear
              PT (         )         2756+33.66  1456193.8460  2176363.5568
              PC (         )         2759+38.97  1456470.2433  2176233.8603
         Tangent Direction:      N 25^08'16" W
            Tangent Length:             305.31

Element: Circular
              PC (         )        2759+38.97  1456470.2433  2176233.8603
              PI (         )        2761+26.25  1456639.7801  2176154.3069
              CC (         )                    1450990.3606  2164555.6376
              PT (         )        2763+13.49  1456806.9361  2176069.8657
                    Radius:           12900.00
                     Delta:           1^39'48" Left
  Degree of Curvature(Arc):           0^26'39"
                    Length:             374.52
                   Tangent:             187.27
                     Chord:             374.51
```

```
     Middle Ordinate:              1.36
            External:              1.36
   Tangent Direction:      N 25^08'16" W
    Radial Direction:      N 64^51'44" E
     Chord Direction:      N 25^58'10" W
    Radial Direction:      N 63^11'55" E
   Tangent Direction:      N 26^48'05" W

Element: Linear
          PT (        )        2763+13.49  1456806.9361  2176069.8657
         POE (        )        2777+21.82  1458063.9726  2175434.8559
   Tangent Direction:      N 26^48'05" W
      Tangent Length:            1408.32
```

PBSJ

Subject:	I-15 NB @ I-575 KC 45 $e_{max}=0.08$ DS=65		
Comp by: PCT	Date: 6/11/09	Sheet Number:	
Check by:	Job Number:		

CURVE KC102

PC = 2702+44.86

PT = 2709+41.67

R = 6212

e = 0.03

W = 72 V = 233 b_w = 0.58

L = 72 (233)(0.03)(0.58) = 292 $\frac{1}{3}$ = 97

L_{RC} = 72 (233)(0.01)(0.58) = 97

L_2 = 72 (233) (0.02) (0.58) = 194

	STA	LT	RT (TRAVEL LANE)
BEG PRO	2702+33	+0.02	-0.02
RC	2702+44	+0.02	-0.02
BF SE	2703+41	+0.03	-0.03
EF SE	2708+45	+0.03	-0.03
RC	2709+42	+0.02	-0.02

CURVE KC 103

PC = 2720+61.54

PT = 2741+57.80

R = 4384

e = 0.042

W = 72 V = 233 b_w = 0.58

L = 72 (233)(0.042)(0.58) = 409 $\frac{1}{3}$ = 136

L_R = 72 (233)(0.022)(0.58) = 214

L_2 = 194

	STA	LT	RT (TL)	
RC	2717+11	+0.02	-0.02	
BF SE	2719+25	+0.042	-0.042	
EF SE	2740+22	+0.042	-0.042	
RC	2742+36	+0.02	-0.02	
RC	2757+05	+0.02	-0.02	L = 48 (233)(0.02)(0.625) = 140
	2758+45	0	0	
	2759+85	-0.02	+0.02	
END PRO	2764+19	-0.02	+0.02	MATCH EX SE

I-75 SB at I-575

(KC 46)

PRINTED 07-07-09

COMP: PCT
CHECK: MRM
11/14/09
REV. C


```
            Project Name: I-75 REVERSIBLE
             Description: I-285 INTERCH AND I-75 N REVERSIBLE HOV
Horizontal Alignment Name: I-75S_I-575 (KC46)
             Description: I-75 SB SEGMENT AT I-575
                   Style: Prop Main CL
                                        STATION      NORTHING       EASTING

Element: Linear
             POB (        )          3702+28.33  1452144.0210  2179771.4200
              PC (        )          3706+23.23  1452349.8945  2179434.4312
        Tangent Direction:        N 58^34'42" W
           Tangent Length:               394.90

Element: Circular
              PC (        )          3706+23.23  1452349.8945  2179434.4312
              PI (        )          3709+48.30  1452519.3656  2179157.0288
              CC (        )                      1457528.0465  2182597.8734
              PT (        )          3712+72.75  1452717.5034  2178899.3197
                     Radius:              5068.00
        Design Speed(mph):                 65.00
           Superelevation:              3.2000%
                    Delta:             6^07'59" Right
  Degree of Curvature(Arc):            0^56'39"
                   Length:               649.53
                  Tangent:               325.07
                    Chord:               649.22
          Middle Ordinate:                 8.69
                 External:                 8.70
        Tangent Direction:        N 58^34'42" W
         Radial Direction:        N 31^25'18" E
          Chord Direction:        N 55^30'43" W
         Radial Direction:        N 37^33'17" E
        Tangent Direction:        N 52^26'43" W

Element: Linear
              PT (        )          3712+72.75  1452717.5034  2178899.3197
              PC (        )          3721+53.84  1453254.5403  2178200.8199
        Tangent Direction:        N 52^26'43" W
           Tangent Length:               881.08

Element: Circular
              PC (        )          3721+53.84  1453254.5403  2178200.8199
              PI (        )          3731+94.85  1453889.0524  2177375.5384
              CC (        )                      1456640.0750  2180803.7654
              PT (        )          3741+96.02  1454832.1707  2176934.8311
                     Radius:              4270.50
        Design Speed(mph):                 65.00
           Superelevation:              4.2000%
                    Delta:            27^23'57" Right
  Degree of Curvature(Arc):            1^20'30"
                   Length:              2042.18
                  Tangent:              1041.01
                    Chord:              2022.78
          Middle Ordinate:               121.49
                 External:               125.05
        Tangent Direction:        N 52^26'43" W
         Radial Direction:        N 37^33'17" E
          Chord Direction:        N 38^44'45" W
         Radial Direction:        N 64^57'14" E
        Tangent Direction:        N 25^02'46" W

Element: Linear
```

```
            PT (        )        3741+96.02  1454832.1707  2176934.8311
            PC (        )        3761+62.31  1456613.5572  2176102.4117
     Tangent Direction:      N 25^02'46" W
        Tangent Length:            1966.28

ment: Circular
            PC (        )        3761+62.31  1456613.5572  2176102.4117
            PI (        )        3764+19.75  1456846.7936  2175993.4232
            CC (        )                    1451152.3782  2164415.4307
            PT (        )        3766+77.13  1457075.4959  2175875.2159
                  Radius:           12900.00
     Design Speed(mph):                65.00
        Superelevation:             1.5000%
                 Delta:            2^17'12" Left
 Degree of Curvature(Arc):          0^26'39"
                Length:              514.82
               Tangent:              257.44
                 Chord:              514.79
       Middle Ordinate:                2.57
              External:                2.57
     Tangent Direction:      N 25^02'46" W
      Radial Direction:      N 64^57'14" E
       Chord Direction:      N 26^11'22" W
      Radial Direction:      N 62^40'02" E
     Tangent Direction:      N 27^19'58" W

Element: Linear
            PT (        )        3766+77.13  1457075.4959  2175875.2159
           POE (        )        3780+05.52  1458255.5829  2175265.2748
     Tangent Direction:      N 27^19'58" W
        Tangent Length:            1328.40
```

Subject:	I-75 SB @ I-575 KC46
	$e_{max} = 0.08$ DS = 65

Comp by: PCT	Date: 6/11/09	Sheet Number:
Check by:	Job Number:	

CURVE KC107

PC = 3706+23.23

PT = 3712+72.75

R = 6068

e = 0.032

w = 72 ∇ = 233 bw = 0.58

L = 72(233)(0.032)(0.58) = 311 ⅓ = 104 (½ = 156)

L_R = 72(233)(0.012)(0.58) = 117

L_2 = 72(233)(0.02)(0.58) = 194

	STA	LT	RT	
BEG PRO	3702+28	-0.02	+0.02	MATCH EX
	3702+74	-0.02	+0.02	
FLAT	3704+68	0	0	
RC	3706+62	+0.02	-0.02	
*BFSE	3707+79	+0.032	-0.032	(USE ½)
EFSE	3711+69	+0.032	-0.032	
RC	3712+86	+0.02	-0.02	
FLAT	3714+80	0	0	
NC	3716+74	-0.02	+0.02	

CURVE KC108

PC = 3721+53.84

PT = 3741+96.02

R = 4270

e = 0.042

w = 48 ∇ = 233 bw = 0.625

L = 48(233)(0.042)(0.625) = 294 ⅓ = 98

L_R = 48(233)(0.022)(0.625) = 154

L_2 = 48(233)(0.02)(0.625) = 140

	STA	LT	RT
NC	3718+17	-0.02	+0.02
FLAT	3719+57	0	0
RC	3720+97	+0.02	-0.02
BFSE	3722+51	+0.042	-0.042
EFSE	3740+99	+0.042	-0.042
RC	3742+53	+0.02	-0.02
FLAT	3743+93	0	0
NC	3745+33	-0.02	+0.02
END PRO	3766+78	-0.02	+0.02