

# ROADWAY DESIGN CALCULATIONS



**Interim Interchange at SR 400 (I-4) and Daryl Carter Parkway**

**FPID: 441113-1-52-01**

**60% (Phase II)**

Prepared by: AECOM Technical Services, Inc.  
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Orlando, FL 32801

Certificate of Authorization No: 8115

Date: May 18, 2018

Notes:

PRELIMINARY: NOT FOR CONSTRUCTION

Bookmarks have been provided per Section and Subsection

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**SR 400/Interstate 4 (I-4)**  
**FPID 441113-1-52-01**  
**Interim Daryl Carter Parkway Interchange**  
**Roadway Design Criteria – SHS facilities**

**Date: 5/18/18**

Design Element	Design Standard	Sources/Notes
<b>Design Year</b>	2040	Per Design Traffic Report in Project Scope
<b>Roadway Classification</b> SR 400 (I-4) SR 535 Side Streets	Urban Interstate, Strategic Intermodal System Urban Minor Arterial See separate document	Per FDOT classification Per Typical Section Package (TSP)
<b>Interchange Type</b> SR 400 (I-4)/US 27 SR 400 (I-4)/Daryl Center Pkwy.	Service Interchange Service Interchange	2011 AASHTO, Page 10-63
<b>Design Vehicle</b>	WB-62FL	2018 FDM, Section 201.5.2
<b>Design Speed</b> Main line/Express Lanes CD Road Flyover/Diamond Ramps Loop Ramps SR 535	70 mph 60 mph 50 mph 30 mph 45 mph	2018 FDM, 201.4.1 2011 AASHTO, Pages 10-81 Per TSP Per TSP Per TSP
<b>HORIZONTAL ALIGNMENT</b>		
<b>Maximum Curvature (Degree of Curve)</b> Main line/Express Lanes - (70 mph) CD Roads (60 mph) Flyover/Diamond Ramps - (50 mph) Loop Ramps (30 mph) Urban Arterials – (45 mph)	3° 00' 5° 15' 8° 15' 24° 45' 8° 15'	2018 FDM, Table 210.8.1
<b>Maximum Deflection without Horizontal Curve</b> Main line/Express Lanes CD Road Flyover/Diamond Ramps Loop Ramps Arterials w/curb & gutter (≥45 mph)	0° 45' 0° 45' 0° 45' 2° 00' 1° 00'	2018 FDM, Section 210.8.1
<b>Minimum Length of Horizontal Curve</b> Main line/Express Lanes CD Roads Ramps Arterials	<u>Desirable</u> 30V 15V 15V 15V <u>Minimum</u> 15V 400 ft. 400 ft. 400 ft.	2018 FDM, Table 210.8.1
<b>Minimum Stopping Sight Distance</b> Main line/Express Lanes CD Road Flyover/Diamond Ramps Loop Ramps Arterial DS=45 mph	820 ft. 570 ft. 425 ft. 200 ft. 360 ft.	2018 FDM, Table 211.10.1, Table 211.10.2 (adjustment for grades will be required)
<b>Decision Sight Distance</b> Main line/Express Lanes CD Road Flyover/Diamond Ramps Loop Ramps Arterial DS=45 mph	1,445 ft. 1,280 ft. 910 ft. 490 ft. 800 ft.	2011 AASHTO, Table 3-3, Page 3-7



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Design Element	Design Standard	Sources/Notes																
<b>Lane Drop Taper</b> Main line/Express Lanes CD Road Arterial, DS≥45 mph	70:1 Des, 50:1 Min 50:1 Min L=WS	2011 AASHTO, Page 10-80  2018 FDM, Section 212.6																
<b>Add Lane Taper</b> Freeway Auxiliary Lanes Tangent Curve Arterial, DS≥45 mph	300 ft. 100 ft. L=WS	2011 AASHTO, Figure 10-53 (B1 & B2), Pages 10-78 and 10-120 2018 FDM, Section 212.6																
<b>Minimum Spacing Ramp Terminals</b> Entrance to Exit (Weaving): System to Service Service to Service Exit to Entrance Entrance to Entrance Exit to Exit Turning Roadways: System Interchange Service Interchange	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Freeway</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>CD Road</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2000 ft.</td> <td style="text-align: center;">1600 ft.</td> </tr> <tr> <td style="text-align: center;">1600 ft.</td> <td style="text-align: center;">1000 ft.</td> </tr> <tr> <td style="text-align: center;">500 ft.</td> <td style="text-align: center;">400 ft.</td> </tr> <tr> <td style="text-align: center;">1000 ft.</td> <td style="text-align: center;">800 ft.</td> </tr> <tr> <td style="text-align: center;">1000 ft.</td> <td style="text-align: center;">800 ft.</td> </tr> <tr> <td style="text-align: center;">800 ft.</td> <td></td> </tr> <tr> <td style="text-align: center;">600 ft.</td> <td></td> </tr> </tbody> </table>	<u>Freeway</u>	<u>CD Road</u>	2000 ft.	1600 ft.	1600 ft.	1000 ft.	500 ft.	400 ft.	1000 ft.	800 ft.	1000 ft.	800 ft.	800 ft.		600 ft.		2011 AASHTO, Figure 10-68, Page 10-106
<u>Freeway</u>	<u>CD Road</u>																	
2000 ft.	1600 ft.																	
1600 ft.	1000 ft.																	
500 ft.	400 ft.																	
1000 ft.	800 ft.																	
1000 ft.	800 ft.																	
800 ft.																		
600 ft.																		
<b>Entrance and Exit Ramp Design</b> Flyover/Diamond Ramps Entrance Exit Loop Ramps Entrance Exit  <b>Entrance Acceleration Lengths</b> 50 mph to 70 mph 30 mph to 70 mph  All Speeds  Tapers  <b>Exit Deceleration Lengths</b> 70 mph to 50 mph 70 mph to 30 mph  All Speeds  Tapers	Taper Design with 50:1 (1200 ft.) Taper Design with 3° to 5° Parallel Design: 1,200' accel + 300 ft. Taper 800' decel + 300 ft. Taper  580 ft. +Taper (Single Lane)* 1350 ft. +Taper (Single Lane)*  (Two Lane Entrance) - First lane drop, treat as single lane entrance with single lane taper. Second lane drop has an auxiliary lane taper and a tangent length that makes the total two-lane entrance length 2500 ft. min. (including a 300 ft. taper).  Single Lane (Taper Design) – 50:1 min Single Lane (Parallel Design) - 300 ft. min  340 ft. +Taper (Single Lane)* 520 ft. +Taper (Single Lane)*  (Two Lane Exit) -2500 ft. min. (Includes 300 ft. Taper)  Tapered Design, Single Lane: 2° - 5° Parallel Design, Single Lane: 250 ft. Min (15:1 to 25:1)	2018/2019 FDOT Design Standard Index No. 525  Per Preliminary Engineering Report Per Preliminary Engineering Report  2011 AASHTO, Figure 10-69 & Table 10-3, Pages 10-108 and 10-110 2018/2019 FDOT Design Standard Index No. 525 *All acceleration lengths will be adjusted according to grade per 2011 AASHTO Table 10-4, Page 10-112  2011 AASHTO, Figure 10-53, Page 10-78  2011 AASHTO, Figure 10-69, Page 10-108  2011 AASHTO, Figure 10-70 & Table 10-5, Pages 10-114 & 10-115  2018/2019 FDOT Design Standard Index No. 525 *All deceleration lengths will be adjusted according to grade per 2011 AASHTO Table 10-4, Page 10-112 2011 AASHTO, Figure 10-53, Page 10-78  2011 AASHTO, Page 10-112, Page 10-116																



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Design Element	Design Standard	Sources/Notes
<b>Limited Access R/W at Interchanges</b> Rural Urban  Crossroad Overpass/No Interchange	300 ft. min. beyond end of Accel./Decel. taper 100 ft. min. beyond end of taper or radius point of return  200 ft. from mainline R/W line along crossroad	2018 FDM, Section 211.15
<b>VERTICAL ALIGNMENT</b>		
<b>Maximum Profile Grade</b> Main line/Express Lanes/CD Roads Flyover/Diamond Ramps Loop Ramps Urban Arterials, DS=45 mph	3% 5% 7% 6%	2018 FDM, Table 211.9.1
<b>Maximum Change in Grade w/o Vertical Curve</b> Main line/Express Lanes CD Roads Flyover/Diamond Ramps  Loop Ramps Urban Arterials, DS=45 mph	0.2% 0.4% 0.6%  1.0% 0.7%	2018 FDM, Table 210.10.2
<b>Minimum Grade (shoulder gutter, barrier wall)</b> Minimum Distance Between VPI's Minimum Grade	250 ft. 0.3%	2018 FDM, Section 210.10.1.1
<b>Crest Vertical Curve</b> Mainline (Open Highway) Mainline (Within interchange) CD Roads Flyover/Diamond Ramps Loop Ramps Urban Arterials, DS=45 mph	K=506, Min Length=1000 ft. K=506, Min Length=1800 ft. K=245, Min Length=400 ft. K=136, Min Length=300 ft. K=31, Min Length=90 ft. K=98, Min Length=135 ft.	2018 FDM, Table 211.9.2, Table 211.9.3
<b>Sag Vertical Curve</b> Mainline CD Roads Flyover/Diamond Ramps Loop Ramps Urban Arterials, DS=45 mph	K=206, Min Length=800 ft. K=136, Min Length=300 ft. K=96, Min Length=200 ft. K=37, Min Length=90 ft. K=79, Min Length=135 ft.	2018 FDM, Table 211.9.2, Table 211.9.3
<b>Minimum Vertical Clearance</b> Bridges over I-4 I-4 Bridges over Cross Roads Pedestrian Facilities over Roadway Overhead Signs & Signals Roadway over Railroad Overhead DMS Structures	16.5 ft. 16.5 ft. 17.5 ft. 17.5 ft. 23.5 ft.* 19.5 ft.	2018 FDM, Table 260.6.1  *For new structures. Does not apply to existing structures to remain.
<b>Roadway Base Clearance Above Base Clearance Water Elevation</b> Mainline/CD Roads Ramps (Proper) Low Point on Ramp at Cross Roads All other facilities (urban)	3 ft. 2 ft.* 1 ft.* 1 ft.*	2018 FDM, Section 210.10.3.2  *Clearance requires reduction in the design resilient modulus. Notify Pavement Design Engineer that clearance is less than 3 ft. See Flexible Pavement Design Manual.
<b>CROSS SECTION</b>		



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Design Element	Design Standard		Sources/Notes
<b>Lane Widths</b> Main line/Express Lanes CD Roads 1-Lane Ramp 2-Lane Ramp Urban Arterial	12 ft. - Tangent 12 ft. - Tangent 15 ft. - Tangent 24 ft. - Tangent 11 ft. travel lane/7 ft. bicycle lane		2018 FDM, Tables 210.2.1
<b>Median Width (Minimum)</b> <b>FREEWAYS</b> Without Barrier Interstate Other Freeways (≥ 60 mph) Other Freeways (< 60 mph) With Barrier I-4 Mainline (Orange & Osceola Cos.) All other <b>ARTERIAL AND COLLECTORS</b> DS ≤ 45 mph DS > 45 mph	64 ft. 60 ft. 40 ft. 52 ft. 26 ft. 22 ft. 40 ft.		2018 FDM, Table 211.3.1  Per TSP and Preliminary Engineering Report. To provide 44 ft. rail corridor.  2018 FDM, Table 210.3.1 2018 FDM, Table 210.3.1
<b>Shoulder Width, Roadway, Inside (or Left)</b> Freeways Mainline (Barrier-Separated, Osceola & Orange Cos.) CD, 2-Lane CD, 3-Lane 1-Lane Ramp 2-Lane Ramp 3-Lane Ramp Arterials 4-Lane 3-Lane 2-Lane	<b>Total</b>	<b>Paved</b>	Per TSP  2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 210.4.1 2018 FDM, Table 210.4.1 2018 FDM, Table 210.4.1
<b>Shoulder Width, Roadway, Outside (or Right)</b> Freeways Mainline Mainline (Barrier-Separated) CD, 3-Lane 1-Lane Ramp 2-Lane Ramp 3-Lane Ramp Arterials 4-Lane 3-Lane 2-Lane	<b>Total</b>	<b>Paved</b>	2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 2018 FDM, Table 211.4.1 Per TSP  2018 FDM, Table 210.4.1 2018 FDM, Table 210.4.1 2018 FDM, Table 210.4.1
<b>Shoulder Width on Bridge Structures</b> Freeways and Divided Arterials (DS ≥ 50 mph) Mainline CD Roads (2-Lane) 1-Lane Ramp 2-Lane Ramp 3-Lane Ramp Divided Arterials and Collectors Flush shoulders on approach roadway with 3 or more lanes	<b>Inside</b>	<b>Outside</b>	2018 FDM, Figure 260.1.1





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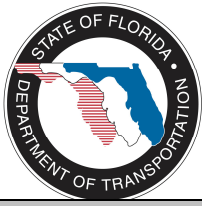
**Date: 5/18/18**

Design Element	Design Standard	Sources/Notes
<b>Cross Slope</b> Roadway 2-Lanes in Same Direction Roadway Additional Lane (Same Direction)  Inside Shoulder Main line (Barrier-Separated) Outside Shoulder Express Lanes (Barrier-Separated)	0.02 0.03  0.05 (0.06 for 4 or more lanes) Same as travel lane 0.06 Same as travel lane	2018 FDM, Fig 211.2.1  Per TSP Per TSP
<b>Max Lane “Roll-Over” Between Thru Lanes</b>	4%	2018 FDM, Figure 211.2.1
<b>Maximum Shoulder “Roll-Over”</b>	7%	2018/2019 FDOT Design Standard Index No. 510
<b>Recoverable Terrain/Clear Zone Widths (min. from edge of travel way)</b> Main line/Express Lanes CD Roads Auxiliary Lane (>55mph) One-Lane Ramp (50mph) Multi-Lane Ramp (50mph) One-Lane Ramp (<45mph) Multi-Lane Ramp (<45mph) Urban Arterials, DS=45 mph	36 ft. 36 ft. 24 ft. 14 ft. 24 ft. 10 ft. 18 ft. 24 ft.	2018 FDM, Table 215.2.1
<b>Lateral Offset Criteria</b> Urban Curb & Gutter, DS ≤ 45 mph Bridge Piers and Abutments  High Mast Lighting Overhead Sign Supports Other	The greater of the following: 16 ft. from edge of travel lane; or outside curb: 4 ft. from face of curb Median: 6 ft. from edge of traffic lane  Outside Clear Zone Outside Clear Zone 4 ft. from face of curb	2018 FDM, Table 215.2.2
<b>Border Width</b> Freeway & Ramps  Urban Arterials Flush Shoulders DS > 45 mph DS ≤ 45 mph Curb & Gutter DS = 45 mph DS ≤ 40 mph	94 ft. from edge of travel lane* 15’ min.  *Width may be reduced in area of crossroad terminal as long as the design meets the requirements for clear zone, lateral offsets, drainage, maintenance access, etc.  40 ft. (from shoulder point) 33 ft. (from shoulder point)  14 ft. (from lip of gutter), 12 ft. w/bicycle or aux. lane 12 ft. (from lip of gutter), 10 ft. w/bicycle or aux. lane	2018 FDM, Section 211.6 Per TSP. Design Variation Required.  2018 FDM, Table 210.7.1  2018 FDM, Table 210.7.1
<b>Roadside Slopes</b> Rural & Urban Freeways, Rural Arterials & Collectors, with projected 20 year AADT of 1500 or greater. Design Speed > 45 MPH	<b>Fill Height</b> 0–5 ft. 5–10 ft. 10–20 ft. >20 ft.  <b>Back Slope (All Fill Heights)</b> 1:4 or 1:3 w/Trapezoidal Ditch & 1:6 Front Slope  <b>Front slope</b> 1:6 1:6 to CZ then 1:4 1:6 to CZ then 1:3 1:2 w/Guardrail	2018 FDM, Table 215.2.3  CZ= Clear Zone



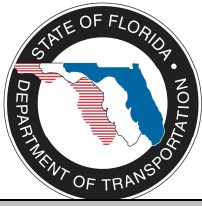
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Design Element	Design Standard	Sources/Notes																
Urban Arterials and Collectors with Curb & Gutter, Design Speed ≤45 MPH	<p style="text-align: center;"><b><u>Transverse Slope (All Fill Heights)</u></b>            1:10 or flatter (Freeways)            1:4 (Other)</p> <p style="text-align: center;"><b><u>Front and Back Slopes (All Fill Heights)</u></b>            1:2 or to suit property owner. Not flatter than 1:6</p> <p style="text-align: center;"><b><u>Transverse Slopes (All Fill Heights)</u></b>            1:4</p>																	
<b>Superelevation Transition Distribution</b> Tangent* Curve *	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Standard</u></th> <th style="text-align: center;"><u>Min</u></th> <th style="text-align: center;"><u>Max</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">80%</td> <td style="text-align: center;">50%</td> <td></td> </tr> <tr> <td style="text-align: center;">20%</td> <td></td> <td style="text-align: center;">50%</td> </tr> </tbody> </table>	<u>Standard</u>	<u>Min</u>	<u>Max</u>	80%	50%		20%		50%	2018 FDM, Section 2.9 * Superelevation transitions shall have; 1) a minimum longitudinal slope of 0.5 % or 2) a minimum outside EOP grade of 0.2% (0.5% for curb & gutter), where the cross slope is less than 1.5 %.							
<u>Standard</u>	<u>Min</u>	<u>Max</u>																
80%	50%																	
20%		50%																
<b>Superelevation Rates</b> Main line CD Roads Express Lanes  Directional Ramps (50 mph) Loop Ramps (30 mph)  Shoulders  Urban Arterials	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>e Max</u></th> <th style="text-align: center;"><u>Transition/Min L</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">1:200/100 ft.</td> </tr> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">1:225/100 ft.</td> </tr> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">1:250/100 ft.</td> </tr> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">1:200/100 ft.</td> </tr> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">1:150/50 ft.</td> </tr> <tr> <td style="text-align: center;">0.10 ft. /ft.</td> <td style="text-align: center;">*1:150/100 ft.</td> </tr> <tr> <td style="text-align: center;">0.05 ft. /ft.</td> <td style="text-align: center;">1:150/75 ft.</td> </tr> </tbody> </table>	<u>e Max</u>	<u>Transition/Min L</u>	0.10 ft. /ft.	1:200/100 ft.	0.10 ft. /ft.	1:225/100 ft.	0.10 ft. /ft.	1:250/100 ft.	0.10 ft. /ft.	1:200/100 ft.	0.10 ft. /ft.	1:150/50 ft.	0.10 ft. /ft.	*1:150/100 ft.	0.05 ft. /ft.	1:150/75 ft.	2018 FDM, Tables 210.9.1, 210.9.2, 210.9.3 2018/2019 FDOT Design Standard Index Nos.510, 511 *This rate should be applied only where non-FDOT standard shoulder breaks are necessary. Transition example locations: bridges, high side retaining walls, special drainage locations.
<u>e Max</u>	<u>Transition/Min L</u>																	
0.10 ft. /ft.	1:200/100 ft.																	
0.10 ft. /ft.	1:225/100 ft.																	
0.10 ft. /ft.	1:250/100 ft.																	
0.10 ft. /ft.	1:200/100 ft.																	
0.10 ft. /ft.	1:150/50 ft.																	
0.10 ft. /ft.	*1:150/100 ft.																	
0.05 ft. /ft.	1:150/75 ft.																	



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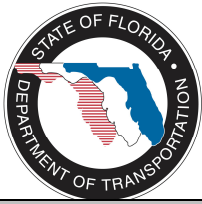
Design Element	Design Standard	Sources/Notes
<b>Design Year</b>	2040	Per Design Traffic Report in Project Scope
<b>Governing Standards</b>  Orange County	Florida Greenbook (2013)	Per Orange County
<b>Roadway Classification</b>  Orange County Daryl Carter Pkwy.	Urban Major Collector	Per Orange County
<b>Design Speed</b>  Daryl Carter Pkwy.	40 mph	Per Preliminary Engineering Report
<b>HORIZONTAL ALIGNMENT</b>		
<b>Maximum Curvature (Degree of Curve)</b> Rural (40-55 mph), $e_{max} = 0.10$  Urban - High-Speed Highways and Streets (30-45 mph), $e_{max} = 0.05$  Urban - Low Speed Streets (20-30 mph) $e_{max} = 0.05$ $e_{max} = 0.02$	13° 15' - 6° 30'  20° 00' - 8° 15'  75° 00' - 25° 45' 60° 00' - 19° 15'	Florida Greenbook (May 2013), Table 3-4, Pg. 3-20
<b>Maximum Deflection without Horizontal Curve</b> Arterials and Collectors (w/o curb & gutter)  Arterials and Collectors (w/curb & gutter)	0° 45' ( $V \geq 45$ mph), 2° 00' ( $V \leq 40$ mph)  1° 00' ( $V \geq 45$ mph), 2° 00' ( $V \leq 40$ mph)	2018 FDM 210.8.1
<b>Minimum Length of Horizontal Curve</b> Freeways Arterials and Collectors	<u>Desirable</u> 30V 15V  <u>Minimum</u> 15V 400 ft.	2011 AASHTO, Section 3.3.13, Page 3-111 2018 FDM, Table 210.8.1
<b>Minimum Stopping Sight Distance</b> V = 30 – 55 mph	200 – 495 ft.	Florida Greenbook (May 2013), Table 3-3, Pg. 3-11
<b>Maximum Deflection for Through Lanes Through Intersections</b> V = 30 mph V = 35 mph V = 40 mph V = 45 mph	8° 00' 6° 00' 5° 00' 3° 00'	2018 FDM, Table 212.7.1
<b>Lane Drop Taper</b>		



**SR 400/Interstate 4 (I-4)**  
**FPID 441113-1-52-01**  
**Interim Daryl Carter Parkway Interchange**  
**Roadway Design Criteria – Non SHS facilities**

**Date: 5/18/18**

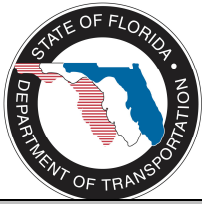
Design Element	Design Standard	Sources/Notes
V ≥ 45 mph V ≤ 40 mph	L = WS L = WS <sup>2</sup> /60	2018 FDM, Section 212.6
<b>Add Lane Taper</b>	50 ft.	2018 FDM, Section 212.6
<b>VERTICAL ALIGNMENT</b>		
<b>Maximum Profile Grade</b> Freeway (50 – 55 mph) Arterial Urban (30 – 45 mph) Rural (40 – 45 mph) Rural (50 – 55 mph) Collector Urban (30 – 45 mph)	4%  8% - 6% 5% 4%  9% - 8%	Florida Greenbook (May 2013), Table 3-6, Pg. 3-26
<b>Maximum Change in Grade w/o Vertical Curve</b> V = 30 – 55 mph	1.0% – 0.5%	Florida Greenbook (May 2013), Table 3-7, Pg. 3-28
<b>Minimum Grade (curb &amp; gutter, shoulder gutter, barrier wall)</b>	0.3%	Florida Greenbook (May 2013), Pg. 3-26
<b>Crest Vertical Curve</b> Minimum Length	L = AS <sup>2</sup> /1329  Where: A = Algebraic difference in grades in % S = Sight Distance	Florida Greenbook (May 2013), Figure 3-4, Pg. 3-29
<b>Sag Vertical Curve</b> Minimum Length	L = AS <sup>2</sup> /(400 + 3.5S)  Where: A = Algebraic difference in grades in % S = Sight Distance	Florida Greenbook (May 2013), Figure 3-6, Pg. 3-31
<b>Minimum Vertical Clearance</b> Freeways and Major Arterials Other Streets and Highways Ped or Shared Use Bridge over Roadway Bridge over Railroad	16.5 ft. 16 ft. 17 ft. 23.5 ft.	Florida Greenbook (May 2013), Section C.7.j.4.(b), Pg. 3-50  Per Preliminary Engineering Report
<b>Roadway Base Clearance Above Base Clearance Water Elevation</b> Freeways and Rural Multilane Mainline Ramps (proper) Low Point on Ramps at Cross Roads Rural Two-lane with ADT>1500 vpd All Other Facilities Including Urban	3 ft. 2 ft.* 1 ft.* 2 ft.* 1 ft.*	2018 FDM, Section 210.10.3.2  *Clearance requires reduction in the design resilient modulus. Notify Pavement Design Engineer that clearance is less than 3 ft. See Flexible Pavement Design Manual.
<b>CROSS SECTION</b>		
<b>Lane Widths (minimum)</b> Freeways	12 ft.	Florida Greenbook (May 2013), Table 3-8,



**SR 400/Interstate 4 (I-4)**  
**FPID 441113-1-52-01**  
**Interim Daryl Carter Parkway Interchange**  
**Roadway Design Criteria – Non SHS facilities**

**Date: 5/18/18**

Design Element	Design Standard		Sources/Notes
Major and Minor Arterials Major and Minor Collectors Local Roads and Auxiliary Lanes Bike Lanes	11 ft. 11 ft. 10 ft. 4 ft.*		Pg. 3-34  Florida Greenbook (May 2013), Section C.10.b, Pg. 3-94 *At least 1 foot additional width is needed when the bicycle lane is adjacent to a curb or other barrier, on-street parking is present, there is substantial truck traffic (>10%), or posted speeds exceed 50 mph.
<b>Median Width (minimum)</b> Freeways, V < 60 mph Rural Highways V ≥ 55 mph V < 55 mph Urban Streets V > 45 mph V ≤ 45 mph	40 ft.  40 ft. 22 ft.  19.5 ft. 15.5 ft.		Florida Greenbook (May 2013), Tables 3-11 & 3-12, Pg. 3-42
<b>Shoulder Width (minimum)</b> 2 lanes in each direction Roadway Bridge  3 or more lanes in each direction Roadway Bridge	<b><u>Outside</u></b>  10 ft. 10 ft.  10 ft. 10 ft.	<b><u>Median</u></b>  6 ft. 6 ft.  10 ft. 10 ft.	Florida Greenbook (May 2013), Table 3-10, Pg. 3-36
<b>Cross Slope</b> Roadway 2-Lanes in Same Direction Roadway Additional Lane (Same Direction) Lane Min/Max Shoulder Min/Max	0.02 0.03 0.015/0.04 0.03/ 0.08		Florida Greenbook (May 2013), Section C.7.b.2, Section C.7.c.2
<b>Max Lane “Roll-Over” Between Thru Lanes</b>	0.04		Florida Greenbook (May 2013), Section C.7.b.2
<b>Maximum Shoulder “Roll-Over”</b>	0.07		Florida Greenbook (May 2013), Section C.7.c.2
<b>Max Lane “Roll-Over” at Turning Roadway Terminals</b> Design Speed of Entrance/Exit Curve < 20 mph 25 and 30 mph ≥ 35 mph	0.05 – 0.08 0.05 – 0.06 0.04 – 0.05		Florida Greenbook (May 2013), Table 3-23, Pg. 3-85
<b>Clear Zone (minimum)</b> Rural (measured from edge of travel) Collectors (30 – 40 mph) Arterials (30 – 40 mph) Arterials & Collectors (45 – 50 mph) Arterials & Collectors (55 mph) Arterials & Collectors (≥ 60 mph) Urban (measured from face of curb)*	10 ft. 14 ft. 18 ft. 24 ft. 30 ft.		Florida Greenbook (May 2013), Table 3-13, Pg. 3-45  * Use rural values when no curb & gutter



**SR 400/Interstate 4 (I-4)**  
**FPID 441113-1-52-01**  
**Interim Daryl Carter Parkway Interchange**  
**Roadway Design Criteria – Non SHS facilities**  
**Date: 5/18/18**

Design Element	Design Standard		Sources/Notes
25 mph and below 30 – 45 mph	1.5 ft. 4 ft.**		**1.5 ft. min where 4 ft. deemed impractical
<b>Roadside Slopes</b> Fill slopes  Cut slopes and ditch backslopes  Ditch bottom width	1:4 or flatter, 1:3 max within clear zone  1:3 max within clear zone, 1:4 desirable  4 ft. min.		Florida Greenbook (May 2013), Section C.7.f.2
<b>Superelevation Rates</b> Rural Highways, Urban Freeways and High Speed Urban Arterials 2 lane & 4 lane (45 – 60 mph) 6 lane (45 – 60 mph) Urban Highways and High Speed Urban Streets (30 – 50 mph)	<b><u>E<sub>max</sub></u></b>  0.10 ft/ft 0.10 ft/ft  0.05 ft/ft	<b><u>Transition rate/(Min L)</u></b>  1:200 – 1:225/(100 ft.) 1:160 – 1:180/(100 ft.)  1:100 – 1:150/(50 – 75 ft.)	Florida Greenbook (May 2013), Section C.4.b and  2018/2019 FDOT Design Standard Index No. 510  2018/2019 FDOT Design Standard Index No. 511
<b>Superelevation Transition Distribution</b> Tangent Curve	<b><u>Standard</u></b>  80% 20%		2018/2019 FDOT Design Standard Index Nos. 510 & 511

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Saturday September 16, 2017 2:23 pm

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_BL400'

\* 1 des cha bl400 (B SURVEY SA 400 (I-4))

Chain BL400 contains:

GPRE9 CUR BB1 BB12 CUR BB2 BB31 DW2 CUR C1 RM33 X10 CL535 CL598 CL637 CL703 CUR C713 CL723 CL747 CL100 CUR CL4002 CL955

Beginning chain BL400 description

Point GPRE9 N 1,404,459.2993 E 427,327.9049 Sta 1770+37.10

Course from GPRE9 to PC BB1 N 61° 32' 55" E Dist 10,228.3616

Curve Data  
\*-----\*

Curve BB1

P.I. Station	1883+75.08	N	1,409,860.8650	E	437,296.5019
Delta	= 11° 03' 42"	(LT)			
Degree	= 0° 30' 00"				
Tangent	= 1,109.6205				
Length	= 2,212.3435				
Radius	= 11,459.1559				
External	= 53.5984				
Long Chord	= 2,208.9092				
Mid. Ord.	= 53.3489				
P.C. Station	1872+65.46	N	1,409,332.2270	E	436,320.8998
P.T. Station	1894+77.80	N	1,410,566.8666	E	438,152.5506
C.C.		N	1,419,407.3626	E	430,861.6053
Back	= N 61° 32' 55" E				
Ahead	= N 50° 29' 13" E				
Chord Bear	= N 56° 01' 04" E				

Course from PT BB1 to BB12 N 50° 29' 13" E Dist 7,372.1983

Equation: Sta 1968+50.00 (BK) = Sta 1970+06.96 (AH)

End Region 1

-----  
Begin Region 2

Point BB12 N 1,415,257.4647 E 443,840.0454 Sta 1970+06.96

Course from BB12 to PC BB2 N 50° 29' 13" E Dist 16,726.0407

Curve Data  
\*-----\*

Curve BB2

P.I. Station	2147+70.24	N	1,426,559.4399	E	457,544.0387
Delta	= 10° 20' 39"	(LT)			
Degree	= 0° 30' 00"				
Tangent	= 1,037.2382				
Length	= 2,068.8385				
Radius	= 11,459.1559				
External	= 46.8476				
Long Chord	= 2,066.0300				
Mid. Ord.	= 46.6569				
P.C. Station	2137+33.00	N	1,425,899.4919	E	456,743.8314
P.T. Station	2158+01.84	N	1,427,352.3477	E	458,212.7391
C.C.		N	1,434,739.9879	E	449,452.8860
Back	= N 50° 29' 13" E				
Ahead	= N 40° 08' 34" E				
Chord Bear	= N 45° 18' 53" E				

Course from PT BB2 to BB31 N 40° 08' 34" E Dist 207.3235

Equation: Sta 2160+09.16 (BK) = Sta 0+00.00 (AH) End Region 2  
-----  
Begin Region 3

Point BB31 N 1,427,510.8344 E 458,346.3992 Sta 0+00.00

Course from BB31 to DW2 N 40° 08' 34" E Dist 13,174.3993

Point DW2 N 1,437,581.8905 E 466,839.8452 Sta 131+74.40

Course from DW2 to PC C1 N 40° 07' 55" E Dist 25,892.5455

Curve Data  
\*-----\*

Curve C1  
 P.I. Station 401+54.06 N 1,458,209.5575 E 484,229.5411  
 Delta = 1° 27' 05" (LT)  
 Degree = 0° 04' 00"  
 Tangent = 1,087.1167  
 Length = 2,174.1171  
 Radius = 85,830.0012  
 External = 6.8844  
 Long Chord = 2,174.0590  
 Mid. Ord. = 6.8838  
 P.C. Station 390+66.94 N 1,457,378.3877 E 483,528.8418  
 P.T. Station 412+41.06 N 1,459,058.2079 E 484,908.9638  
 C.C. N 1,512,699.9706 E 417,906.3490  
 Back = N 40° 07' 55" E  
 Ahead = N 38° 40' 50" E  
 Chord Bear = N 39° 24' 22" E

Course from PT C1 to RM33 N 38° 40' 50" E Dist 365.0949

Equation: Sta 416+06.16 (BK) = Sta 416+12.49 (AH) End Region 3  
-----  
Begin Region 4

Point RM33 N 1,459,343.2167 E 485,137.1397 Sta 416+12.49

Course from RM33 to X10 N 38° 40' 50" E Dist 9,888.8667

Point X10 N 1,467,062.8942 E 491,317.4523 Sta 515+01.36

Course from X10 to CL535 N 38° 39' 53" E Dist 1,999.6562

Point CL535 N 1,468,624.2581 E 492,566.7592 Sta 535+01.01

Course from CL535 to CL598 N 38° 39' 53" E Dist 6,368.1677

Point CL598 N 1,473,596.6263 E 496,545.3411 Sta 598+69.18

Course from CL598 to CL637 N 38° 39' 53" E Dist 3,921.7658

Point CL637 N 1,476,658.8045 E 498,995.5068 Sta 637+90.95

Course from CL637 to CL703 N 38° 36' 21" E Dist 6,590.2992

Point CL703 N 1,481,808.8316 E 503,107.5943 Sta 703+81.25

Curve Data  
\*-----\*

Curve C713  
 P.I. Station 713+82.08 N 1,482,590.9362 E 503,732.0731  
 Delta = 38° 32' 42" (LT)  
 Degree = 2° 00' 06"  
 Tangent = 1,000.8303  
 Length = 1,925.5929



HA\_BL400DCP.OMP

Radius = 2,862.3200  
 External = 169.9295  
 Long Chord = 1,889.4861  
 Mid. Ord. = 160.4065  
 P.C. Station 703+81.25 N 1,481,808.8316 E 503,107.5943  
 P.T. Station 723+06.84 N 1,483,591.7660 E 503,733.1363  
 C.C. N 1,483,594.8067 E 500,870.8179  
 Back = N 38° 36' 21" E  
 Ahead = N 0° 03' 39" E  
 Chord Bear = N 19° 20' 00" E

Point CL723 N 1,483,591.7660 E 503,733.1363 Sta 723+06.84

Course from CL723 to CL747 N 0° 03' 39" E Dist 2,438.5184

Point CL747 N 1,486,030.2830 E 503,735.7269 Sta 747+45.36

Course from CL747 to CL100 N 0° 03' 39" E Dist 5,224.8462

Point CL100 N 1,491,255.1262 E 503,741.2774 Sta 799+70.20

Course from CL100 to PC CL4002 N 0° 04' 27" E Dist 7,164.9150

Curve Data

\*-----\*

Curve CL4002  
 P.I. Station 883+86.19 N 1,499,671.1021 E 503,752.1715  
 Delta = 47° 10' 49" (RT)  
 Degree = 2° 00' 00"  
 Tangent = 1,251.0679  
 Length = 2,359.1265  
 Radius = 2,864.9300  
 External = 261.2489  
 Long Chord = 2,293.0370  
 Mid. Ord. = 239.4169  
 P.C. Station 871+35.12 N 1,498,420.0352 E 503,750.5520  
 P.T. Station 894+94.24 N 1,500,520.2578 E 504,670.9237  
 C.C. N 1,498,416.3267 E 506,615.4796  
 Back = N 0° 04' 27" E  
 Ahead = N 47° 15' 16" E  
 Chord Bear = N 23° 39' 51" E

Course from PT CL4002 to CL955 N 47° 15' 16" E Dist 6,023.3876

Point CL955 N 1,504,608.6001 E 509,094.3449 Sta 955+17.63

=====  
 Ending chain BL400 description

DGS BY: MSP 11/1/17

CHECKED BY: BL 5/1/18

HA\_IWBCD2DCP.OMP

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Wednesday November 1, 2017 6:42 pm

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IWBCD2'

\* 1 des cha iwbcd2

Chain IWBCD2 contains:

CUR IWBCD2\_1 CUR IWBCD2\_2 IWBCD21

Beginning chain IWBCD2 description

Curve Data

\*-----\*

Curve IWBCD2\_1  
P.I. Station 7060+42.40 N 1,477,819.3370 E 499,821.5313  
Delta = 4° 48' 01" (LT)  
Degree = 0° 22' 55"  
Tangent = 628.7330  
Length = 1,256.7304  
Radius = 15,000.0000  
External = 13.1711  
Long Chord = 1,256.3629  
Mid. Ord. = 13.1595  
P.C. Station 7054+13.67 N 1,477,328.0086 E 499,429.2283  
P.T. Station 7066+70.40 N 1,478,341.7714 E 500,171.3418  
C.C. N 1,486,687.3778 E 487,707.3595  
Back = N 38° 36' 21" E  
Ahead = N 33° 48' 19" E  
Chord Bear = N 36° 12' 20" E

Curve Data

\*-----\*

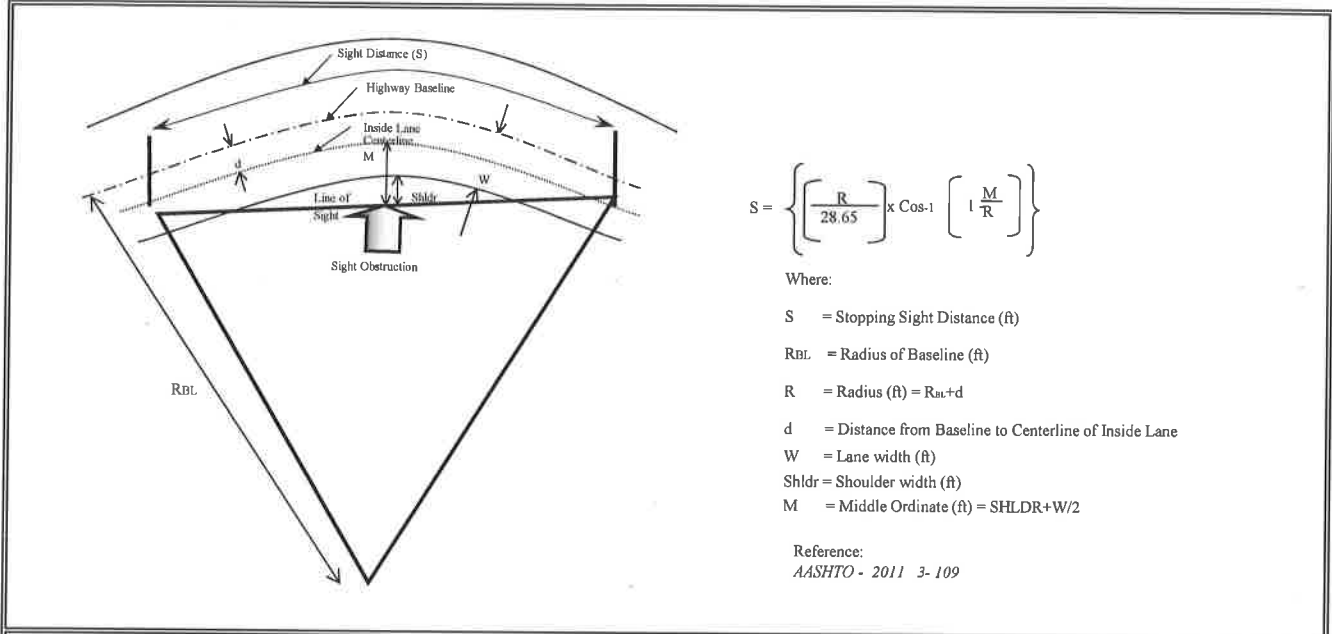
Curve IWBCD2\_2  
P.I. Station 7072+70.96 N 1,478,840.7970 E 500,505.4782  
Delta = 4° 35' 08" (RT)  
Degree = 0° 22' 55"  
Tangent = 600.5611  
Length = 1,200.4810  
Radius = 15,000.0000  
External = 12.0176  
Long Chord = 1,200.1607  
Mid. Ord. = 12.0080  
P.C. Station 7066+70.40 N 1,478,341.7714 E 500,171.3418  
P.T. Station 7078+70.88 N 1,479,311.5121 E 500,878.4406  
C.C. N 1,469,996.1650 E 512,635.3241  
Back = N 33° 48' 19" E  
Ahead = N 38° 23' 27" E  
Chord Bear = N 36° 05' 53" E

Course from PT IWBCD2\_2 to IWBCD21 N 38° 23' 27" E Dist 1,630.0000

Point IWBCD21 N 1,480,589.0934 E 501,890.7083 Sta 7095+00.88

Ending chain IWBCD2 description

## STOPPING SIGHT DISTANCE CALCULATIONS



**TYPE OF ROADWAY**  
*(Interstate, All other facilities)*

All Other Facilities

**DESIGN SPEED**  
**CURVE NO.**  
**RADIUS OF CURVE ( $R_{BL}$ )**  
**DIRECTION OF CURVE (LT or RT)**  
**DEGREE OF CURVE**  
**OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )**  
**LANE WIDTH ( $W$ )**  
**SHOULDER WIDTH (Shldr)**  
**VERTICAL GRADE (%)**  
**M DIMENSION**

60 mph
IWBCD2_1
15,000.00'
LT
0° 22' 55"
-6.00'
12'
8'
0.500%
14.0'

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

570.00'	FDOT PPM, TABLE 2.7.1, January 2016.
570.00'	AASHTO 2011, Table 3-1 & 3-2.
1,295.89'	EQUATION

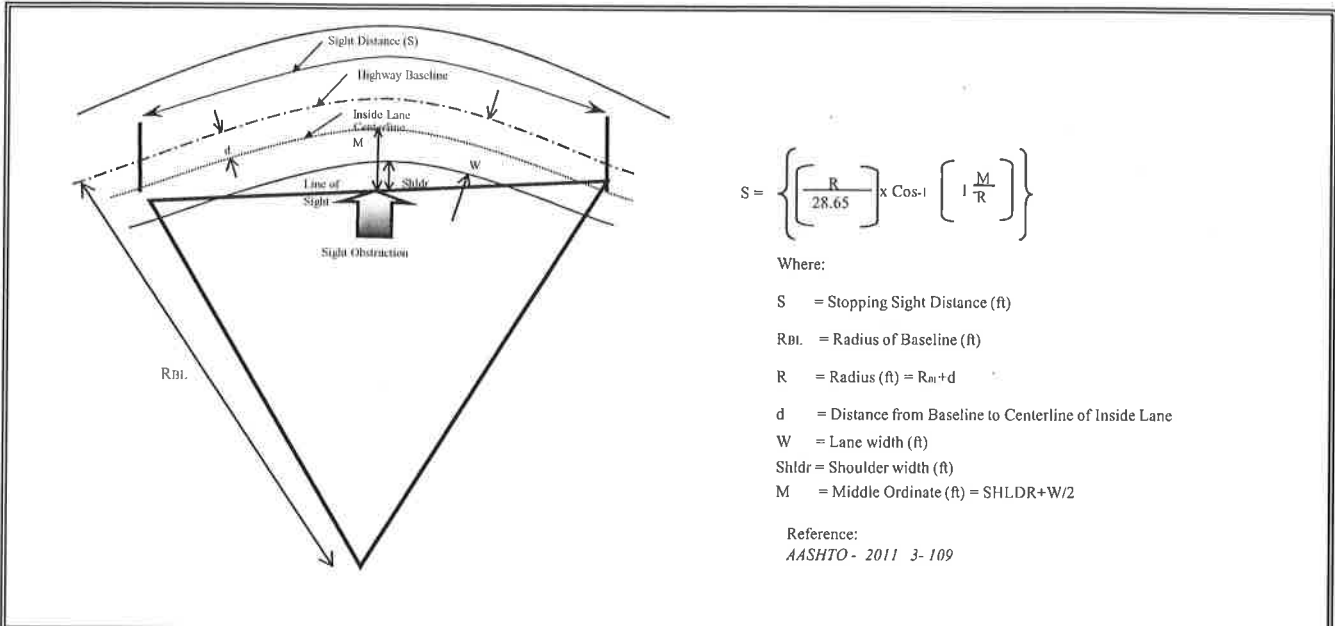
**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
 YES

COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

DESIGN SPEED

CURVE NO.

RADIUS OF CURVE (R<sub>BL</sub>)

DIRECTION OF CURVE (LT or RT)

DEGREE OF CURVE

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)

LANE WIDTH (W)

SHOULDER WIDTH (Shldr)

VERTICAL GRADE (%)

M DIMENSION

All Other Facilities

DESIGN SPEED	60 mph
CURVE NO.	IWBCD2 2
RADIUS OF CURVE (R <sub>BL</sub> )	15,000.00'
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	0° 22' 55"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)	-6.00'
LANE WIDTH (W)	12'
SHOULDER WIDTH (Shldr)	8'
VERTICAL GRADE (%)	0.500%
M DIMENSION	14.0'

FDOT REQUIRED SSD

AASHTO REQUIRED SSD

ACTUAL SSD

570.00'	FDOT PPM, TABLE 2.7.1, January 2016.
570.00'	AASHTO 2011, Table 3-1 & 3-2.
1,296.41'	EQUATION

SUFFICIENT FDOT SSD?

SUFFICIENT AASHTO SSD?

YES
YES

COMMENTS:

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Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for IWBCD2 (CFP TO WBI4)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Page      of       
 Sheet 1 of 1  
 Date: 9/7/17  
 Date: 9/15/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>IWBCD2_1 (LT)</u>	PC STATION	<u>7064+00.00</u>
DEGREE OF CURVE	<u>0° 22' 55"</u>	PT STATION	<u>7066+70.40</u>
RADIUS OF CURVE	<u>15,000.00'</u>		
DESIGN SPEED	<u>60 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
* No Transition Required		36	200	0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
* No Transition Required		36	200	0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP WITH RESPECT TO DIRECTION OF STATIONING.  
 \* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.



Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for  
IWBCD2 (CFP TO WB14)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 1  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>IWBCD2_2 (RT)</u>		PC STATION	<u>7066+70.40</u>		
DEGREE OF CURVE	<u>0° 22' 55"</u>		PT STATION	<u>7078+70.88</u>		
RADIUS OF CURVE	<u>15,000.00'</u>					
DESIGN SPEED	<u>60 mph</u>		BEGIN TRANSITION	<u>N/A</u> *		
e=	<u>NC</u>		BEGIN FULL SUPER	<u>N/A</u> *		
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>		END FULL SUPER	<u>N/A</u> *		
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>		END TRANSITION	<u>N/A</u> *		
	<u>DELTA 'e'</u>	<u>WIDTH</u>	<u>SLOPE RATIO</u>	<u>LENGTH</u>	<u>BEG STA.</u>	<u>END STA.</u>
				0.00		
* No Transition Required		24	200	0.00		
TOTAL LENGTH INTO CURVE				0.00		
				0.00		
* No Transition Required		24	200	0.00		
TOTAL LENGTH OUT OF CURVE				0.00		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
<hr/>						
NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP WITH RESPECT TO DIRECTION OF STATIONING.						
<hr/>						
* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.						
<hr/>						

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Thursday September 14, 2017 11:11 am

*DES. BY: JW 8/16/17  
CHECKED BY: MSP 9/13/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_IWBCD2'

\* 1 pri pro iwbcd2

Beginning profile IWBCD2 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	7065+44.16	129.8850				
VPI	2	7095+00.88	115.1015	-0.5000			

Ending profile IWBCD2 description

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Project: DCP Interim

Subject:

Job No. DCP

DCP

Operator: MP

Date: Tuesday August 22, 2017 7:12 pm

DES. BY: JW 8/21/17

CHECKED BY: MSP 8/23/17

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_ISLIP1'

\* 1 DES CHA ISLIP1

Chain ISLIP1 contains:

CUR ISLIP1\_1 CUR ISLIP1\_2

Beginning chain ISLIP1 description

Curve Data \*-----\*

Curve ISLIP1\_1

P.I. Station	102+04.05	N	1,477,483.3311	E	499,535.5785
Delta =	3° 53' 44.08"	(LT)			
Degree =	0° 57' 17.75"				
Tangent =	204.0506				
Length =	407.9440				
Radius =	6,000.0000				
External =	3.4687				
Long Chord =	407.8654				
Mid. Ord. =	3.4667				
P.C. Station	100+00.00	N	1,477,323.9471	E	499,408.1682
P.T. Station	104+07.94	N	1,477,651.0029	E	499,651.8661
C.C.		N	1,481,070.3794	E	494,721.5655
Back = N	38° 38' 18.81"	E			
Ahead = N	34° 44' 34.72"	E			
Chord Bear = N	36° 41' 26.76"	E			

Course from PT ISLIP1\_1 to PC ISLIP1\_2 N 34° 44' 34.73" E Dist 621.6757

Curve Data \*-----\*

Curve ISLIP1\_2

P.I. Station	112+29.64	N	1,478,326.2044	E	500,120.1475
Delta =	2° 00' 00.00"	(RT)			
Degree =	0° 30' 00.00"				
Tangent =	200.0204				
Length =	400.0001				
Radius =	11,459.1600				
External =	1.7456				
Long Chord =	399.9798				
Mid. Ord. =	1.7453				
P.C. Station	110+29.62	N	1,478,161.8443	E	500,006.1567
P.T. Station	114+29.62	N	1,478,486.4861	E	500,239.8050
C.C.		N	1,471,631.3140	E	509,422.3407
Back = N	34° 44' 34.72"	E			
Ahead = N	36° 44' 34.72"	E			
Chord Bear = N	35° 44' 34.72"	E			

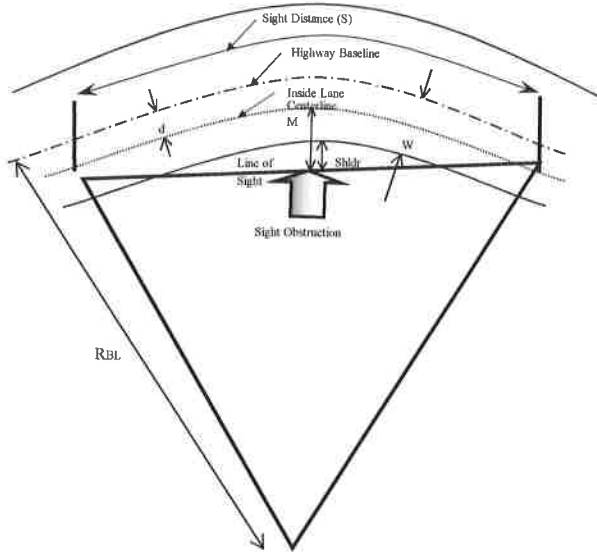
WAS THIS THE INTENT?

THE GEOMETRY RESULTED FROM MATCHING THE ULTIMATE RAMP TERMINAL ↓

Ending chain ISLIP1 description



## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- RBL = Radius of Baseline (ft)
- R = Radius (ft) =  $R_{BL} + d$
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) =  $SHLDR + W/2$

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

DESIGN SPEED

CURVE NO.

RADIUS OF CURVE ( $R_{BL}$ )

DIRECTION OF CURVE (LT or RT)

DEGREE OF CURVE

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )

LANE WIDTH ( $W$ )

SHOULDER WIDTH (Shldr)

VERTICAL GRADE (%)

M DIMENSION

All Other Facilities

DESIGN SPEED	50 mph
CURVE NO.	ISLIP1_1
RADIUS OF CURVE ( $R_{BL}$ )	6,000.00'
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	0° 57' 18"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	7.50'
LANE WIDTH ( $W$ )	15'
SHOULDER WIDTH (Shldr)	6' *
VERTICAL GRADE (%)	-1.300%
M DIMENSION	13.5'

FDOT REQUIRED SSD

AASHTO REQUIRED SSD

ACTUAL SSD

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
805.58'	EQUATION

SUFFICIENT FDOT SSD?

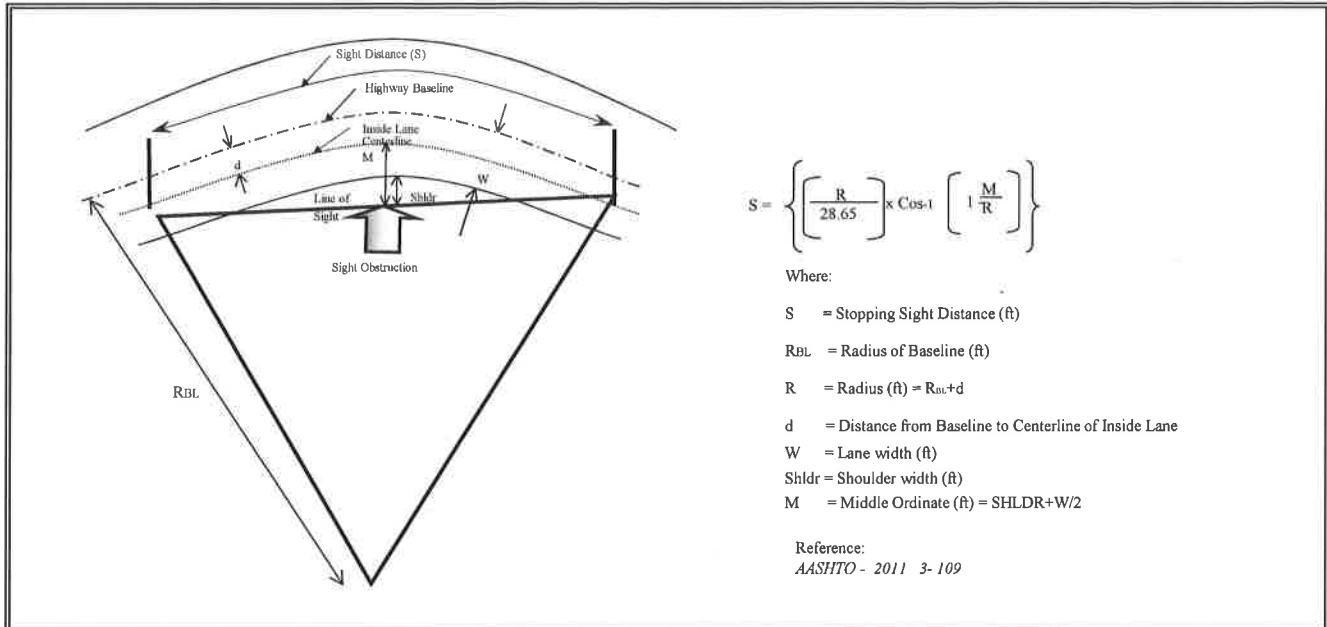
SUFFICIENT AASHTO SSD?

YES
YES

COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
(Interstate, All other facilities)

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE (R<sub>BL</sub>)  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)  
 LANE WIDTH (W)  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

50 mph
ISLIP1 2
11,459.16'
RT
0° 30' 0"
7.50'
15'
6'
-0.660%
13.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
1,112.13'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES
YES

COMMENTS:  
 NOT USED

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Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for  
Ramp ISLIP1 (WBCD2 TO DCP)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 2  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY (Rural or Urban)	<u>Rural</u>		
(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>ISLIP1_1 (LT)</u>	PC STATION	<u>100+00.00</u>
DEGREE OF CURVE	<u>0° 57' 18"</u>	PT STATION	<u>104+07.94</u>
RADIUS OF CURVE	<u>6,000.00'</u>		
DESIGN SPEED	<u>50 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>RC</u> ***	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>105+00.00</u> **
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>106+00.00</u> **

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
* No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
** TRANSITION ON TANGENT (+) 0.035 to (+) 0.02	0.015	15	200	100.00	105+00.00	106+00.00
TOTAL LENGTH OUT OF CURVE				<b>100.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\*\*\* MIN. REQD SUPERELEVATION. CURVE FALLS ENTIRELY WITHIN RAMP TERMINAL AND WILL BE CONSTRUCTED AT A CROSS SLOPE OF (+) 0.035 WHICH EXCEEDS THE MIN. REQD SUPERELEVATION. SEE RAMP TERMINAL CALCULATIONS.

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP WITH RESPECT TO DIRECTION OF STATIONING.  
 \* NO TRANSITION REQUIRED, CROSS SLOPE EXCEEDS SE REQUIREMENT.  
 \*\* TRANSITION JUST BEYOND PHYSICAL GORE IN ORDER TO ENTER CURVE ISLIP1\_2 AT NC.



Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for Ramp ISLIP1 (WBCD2 TO DCP)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 2 of 2  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>ISLIP1_2 (RT)</u>		PC STATION	<u>110+29.62</u>		
DEGREE OF CURVE	<u>0° 30' 0"</u>		PT STATION	<u>114+29.62</u>		
RADIUS OF CURVE	<u>11,459.00'</u>					
DESIGN SPEED	<u>50 mph</u>		BEGIN TRANSITION	<u>N/A</u>		
e=	<u>NC</u>		BEGIN FULL SUPER	<u>N/A</u>		
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )	<u>80</u>	<u>20</u>	END FULL SUPER	<u>N/A</u>		
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )	<u>80</u>	<u>20</u>	END TRANSITION	<u>N/A</u>		

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
* No Transition Required.				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
* No Transition Required.				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE	<u>N/A</u>
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>


---

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP WITH RESPECT TO DIRECTION OF STATIONING.

---

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Wednesday September 13, 2017 7:19 pm

*DES. BY: JW 8/17/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_ISLIP1'

*CHECKED BY: MSP 9/13/17*

\* 1 PRI PRO ISLIP1

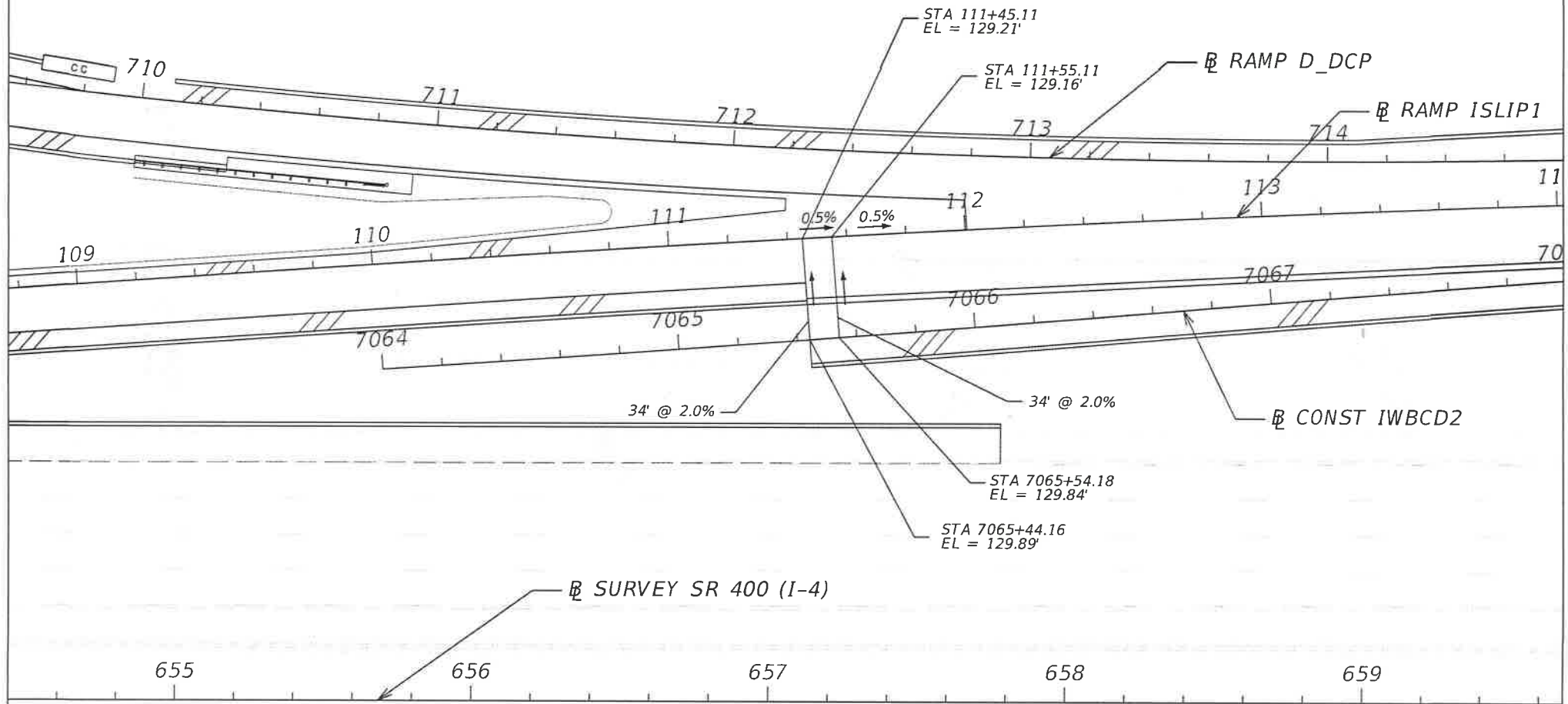
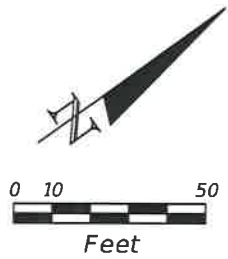
Beginning profile ISLIP1 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	100+00.00	133.3500				
VPI	2	100+50.00	133.2300	-0.2400			
VPI	3	101+00.00	133.1100	-0.2400			
VPI	4	101+50.00	132.8000	-0.6200			
VPI	5	101+89.51	132.6200	-0.4556			
VPI	6	102+00.00	132.5800	-0.3813			
VPI	7	102+50.00	132.3600	-0.4400			
VPI	8	103+00.00	131.9000	-0.9200			
VPI	9	103+50.00	131.2900	-1.2200			
VPI	10	104+00.00	130.6000	-1.3800			
VPI	11	104+50.00	129.9700	-1.2600			
VPC		104+74.00	129.6460	-1.3500	K = 108.1		
VPI	12	105+74.00	128.2960		200.0000	100.0000	100.0000
Low Point		106+19.96	128.6608				
VPT		106+74.00	128.7959	0.4999			
VPC		108+00.00	129.4257	0.4999	K = 300.0	SSD = 1229.1	
High Point		109+49.98	129.8006				
VPI	13	109+50.00	130.1755		300.0000	150.0000	150.0000
VPT		111+00.00	129.4255	-0.5000			
VPI	14	111+45.11	129.2000	-0.5000			

Ending profile ISLIP1 description

TAKE-OFF GRADE SKETCH  
RAMP ISLIP1 PROFILE

DES. BY: BM 9/27/17  
CHECKED BY: MSP 9/27/17





## Ramp Terminal - Detail

Sheet 1 of 2

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp ISLIP1 Entrance  
terminal with existing WBI-4

AECOM Project No: 60480256

Computed By: BM

Checked By: AS

Date: 8/22/2017

Date: 8/29/2017

MAINLINE				GORE		RAMP					
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	Gore Width	Gore Slope (%)	Inside Elev.	*Pavement Slope (%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
BL400	N/A	3.00%	133.77	0.00	3.50%	133.77	3.50%	12.00	133.35	ISLIP1	100+00.00
BL400	N/A	3.00%	133.66	0.00	3.50%	133.66	3.50%	12.21	133.23	ISLIP1	100+50.00
BL400	N/A	3.00%	133.56	0.00	3.50%	133.56	3.50%	12.84	133.11	ISLIP1	101+00.00
BL400	N/A	3.00%	133.29	0.00	3.50%	133.29	3.50%	13.88	132.80	ISLIP1	101+50.00
BL400	N/A	3.00%	133.14	0.00	3.50%	133.14	3.50%	15.00	132.62	ISLIP1	101+89.51
BL400	N/A	3.00%	132.96	2.22	3.50%	132.88	3.50%	15.00	132.36	ISLIP1	102+50.00
BL400	N/A	3.00%	132.57	4.52	3.50%	132.42	3.50%	15.00	131.90	ISLIP1	103+00.00
BL400	N/A	3.00%	132.07	7.23	3.50%	131.81	3.50%	15.00	131.29	ISLIP1	103+50.00
BL400	N/A	3.00%	131.49	10.36	3.50%	131.12	3.50%	15.00	130.60	ISLIP1	104+00.00
BL400	N/A	3.00%	130.97	13.75	3.50%	130.49	3.50%	15.00	129.97	ISLIP1	104+50.00
BL400	N/A	3.00%	130.47	17.00	3.50%	129.87	3.50%	15.00	129.35	ISLIP1	104+97.77

\* The sign convention for the cross slope % is relative to the Mainline PGL.



# Ramp Terminal - Data

Sheet 2 of 2

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
Description: Ramp ISLIP1 Entrance  
terminal with existing WBI-4

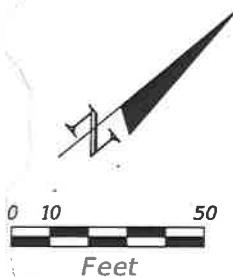
AECOM Project No: 60480256  
Computed By: BM  
Checked By: AS

Date: 8/22/2017  
Date: 8/29/2017

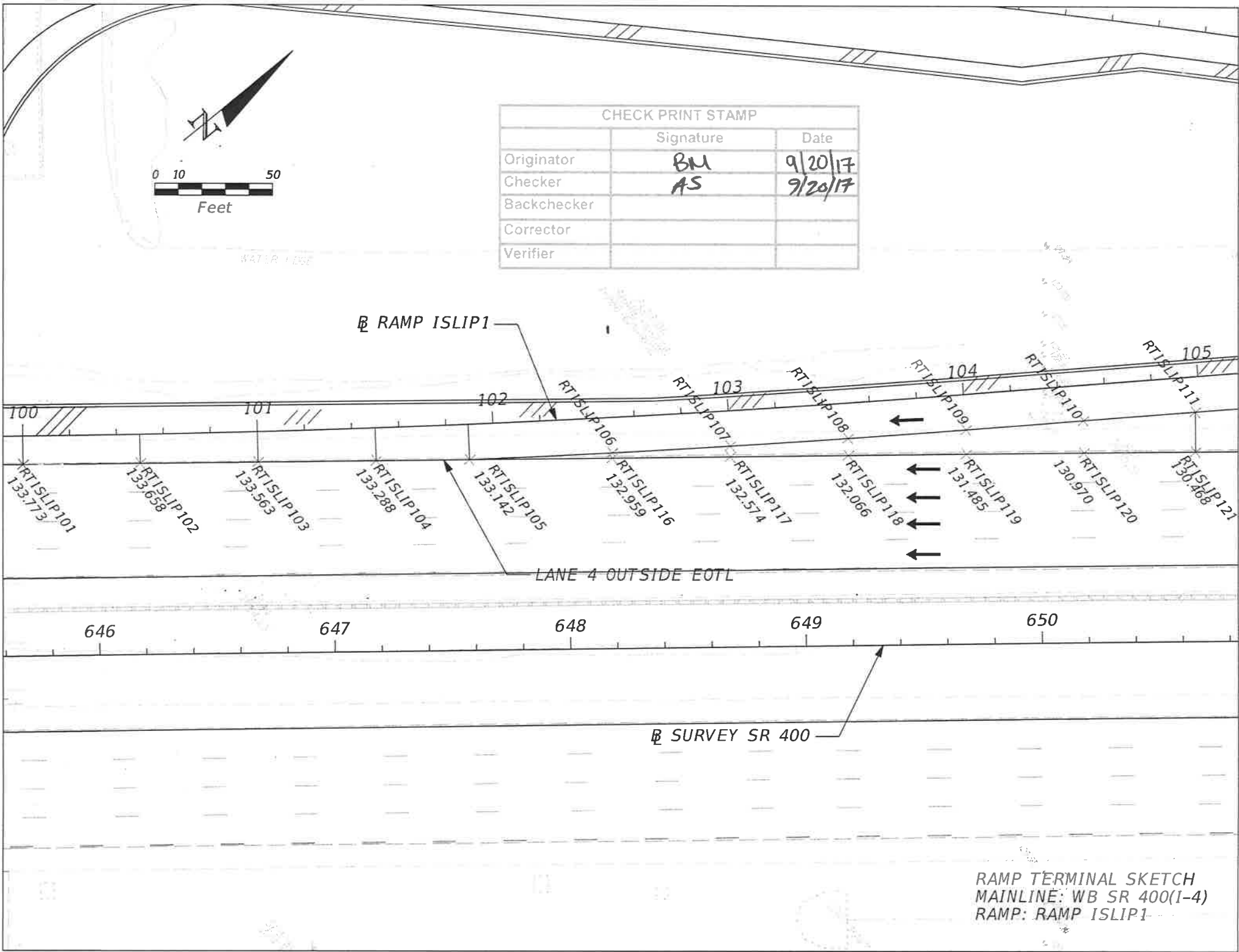
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	COGO Pt. No.	Gore Width	Baseline	Ramp Station	*Pavement Slope (%)	COGO Width	Pavement Width
BL400	N/A	3.00%	133.77	RTISLIP101	0.00	ISLIP1	100+00.00	3.50%	12.00	12.00
BL400	N/A	3.00%	133.66	RTISLIP102	0.00	ISLIP1	100+50.00	3.50%	12.21	12.21
BL400	N/A	3.00%	133.56	RTISLIP103	0.00	ISLIP1	101+00.00	3.50%	12.84	12.84
BL400	N/A	3.00%	133.29	RTISLIP104	0.00	ISLIP1	101+50.00	3.50%	13.88	13.88
BL400	N/A	3.00%	133.14	RTISLIP105	0.00	ISLIP1	101+89.51	3.50%	15.00	15.00
BL400	N/A	3.00%	132.96	RTISLIP116	2.22	ISLIP1	102+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	132.57	RTISLIP117	4.52	ISLIP1	103+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	132.07	RTISLIP118	7.23	ISLIP1	103+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	131.49	RTISLIP119	10.36	ISLIP1	104+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	130.97	RTISLIP120	13.75	ISLIP1	104+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	130.47	RTISLIP121	17.00	ISLIP1	104+97.77	3.50%	15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL. Nominal, actual slope varies.





CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: WB SR 400(I-4)  
 RAMP: RAMP ISLIP1

DES. BY: BM 8/22/17  
 CHECKED BY: AS 9/19/17

RT\_ISLIP1DCP.OBM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject:  
 Job No. DCP Operator: BM  
 Date: Tuesday August 22, 2017 9:43 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_ISLIP1'

\* 1 \$ POINTS ALONG WBI4 OUTSIDE EOP (SAWCUT) \$

\* 2 PRINT POINT RTISLIP101 RTISLIP102 RTISLIP103 RTISLIP104 RTISLIP105-  
 RTISLIP116 RTISLIP117 RTISLIP118 RTISLIP119 RTISLIP120 RTISLIP121

Point	North	East	Station	Elevation
RTISLIP101	1,477,316.4543	499,417.5414	0+00.00	133.7732
RTISLIP102	1,477,355.5883	499,448.8249	0+00.00	133.6579
RTISLIP103	1,477,394.7278	499,480.1126	0+00.00	133.5626
RTISLIP104	1,477,433.8781	499,511.4091	0+00.00	133.2882
RTISLIP105	1,477,464.8260	499,536.1486	0+00.00	133.1424
RTISLIP116	1,477,512.1609	499,573.9877	0+00.00	132.9590
RTISLIP117	1,477,551.2724	499,605.2531	0+00.00	132.5740
RTISLIP118	1,477,590.3675	499,636.5054	0+00.00	132.0663
RTISLIP119	1,477,629.4436	499,667.7425	0+00.00	131.4850
RTISLIP120	1,477,668.4241	499,698.9033	0+00.00	130.9697
RTISLIP121	1,477,705.6495	499,728.6610	0+00.00	130.4684

\* 3 \$ PAVEMENT AND GORE WIDTH CALCULATIONS \$

\* 4 INV RTISLIP106 RTISLIP116

Inverse RTISLIP106 to RTISLIP116 S 51° 21' 41.22" E Distance 2.2206

\* 5 INV RTISLIP107 RTISLIP117

Inverse RTISLIP107 to RTISLIP117 S 51° 21' 41.19" E Distance 4.5172

\* 6 INV RTISLIP108 RTISLIP118

Inverse RTISLIP108 to RTISLIP118 S 51° 21' 41.19" E Distance 7.2310

\* 7 INV RTISLIP109 RTISLIP119

Inverse RTISLIP109 to RTISLIP119 S 51° 21' 41.20" E Distance 10.3617

\* 8 INV RTISLIP110 RTISLIP120

Inverse RTISLIP110 to RTISLIP120 S 51° 21' 41.20" E Distance 13.7547

\* 9 INV RTISLIP111 RTISLIP121

Inverse RTISLIP111 to RTISLIP121 S 51° 21' 41.19" E Distance 17.0000

\* 10 \$ POINTS ALONG RAMP INSIDE EOT \$

\* 11 LAY OFF CHA ISLIP1 RTISLIP101-RTISLIP111

Point	North	East	Station	Offset	R
-------	-------	------	---------	--------	---

RT\_ISLIP1DCP.OBM

RTISLIP101	1,477,316.4543	499,417.5414	100+00.00	12.0000
RTISLIP102	1,477,355.5883	499,448.8249	100+50.00	12.2088
RTISLIP103	1,477,394.7278	499,480.1126	101+00.00	12.8351
RTISLIP104	1,477,433.8781	499,511.4091	101+50.00	13.8792
RTISLIP105	1,477,464.8260	499,536.1486	101+89.51	15.0001
RTISLIP106	1,477,513.5475	499,572.2532	102+50.00	15.0000
RTISLIP107	1,477,554.0929	499,601.7247	103+00.00	15.0000
RTISLIP108	1,477,594.8825	499,630.8573	103+50.00	15.0000
RTISLIP109	1,477,635.9135	499,659.6490	104+00.00	15.0000
RTISLIP110	1,477,677.0127	499,688.1595	104+50.00	15.0000
RTISLIP111	1,477,716.2644	499,715.3823	104+97.77	15.0000

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved. DES. BY: JW 8/22/17  
Project: DCP Interim  
Subject:  
Job No. DCP Operator: MP  
Date: Tuesday August 22, 2017 7:13 pm  
CHECKED BY: MSP 8/23/17

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_ISLIP2'

\* 1 DES CHA ISLIP2

Chain ISLIP2 contains:  
CUR ISLIP2\_1 SHIFT ISLIP21 ISLIP22

Beginning chain ISLIP2 description

Curve Data

\*-----\*

Curve ISLIP2_1					
P.I. Station	203+18.95	N	1,479,691.0717	E	501,179.1775
Delta =	4° 22' 54.37"	(RT)			
Degree =	0° 41' 14.09"				
Tangent =	318.9470				
Length =	637.5830				
Radius =	8,337.0000				
External =	6.0987				
Long Chord =	637.4277				
Mid. Ord. =	6.0943				
P.C. Station	200+00.00	N	1,479,441.0835	E	500,981.1041
P.T. Station	206+37.58	N	1,479,925.1960	E	501,395.7715
C.C.		N	1,474,263.6137	E	507,515.5800
Back =	N 38° 23' 27.19"	E			
Ahead =	N 42° 46' 21.57"	E			
Chord Bear =	N 40° 34' 54.38"	E			

----- Shift: 15.0000 (LT) at station 206+37.58

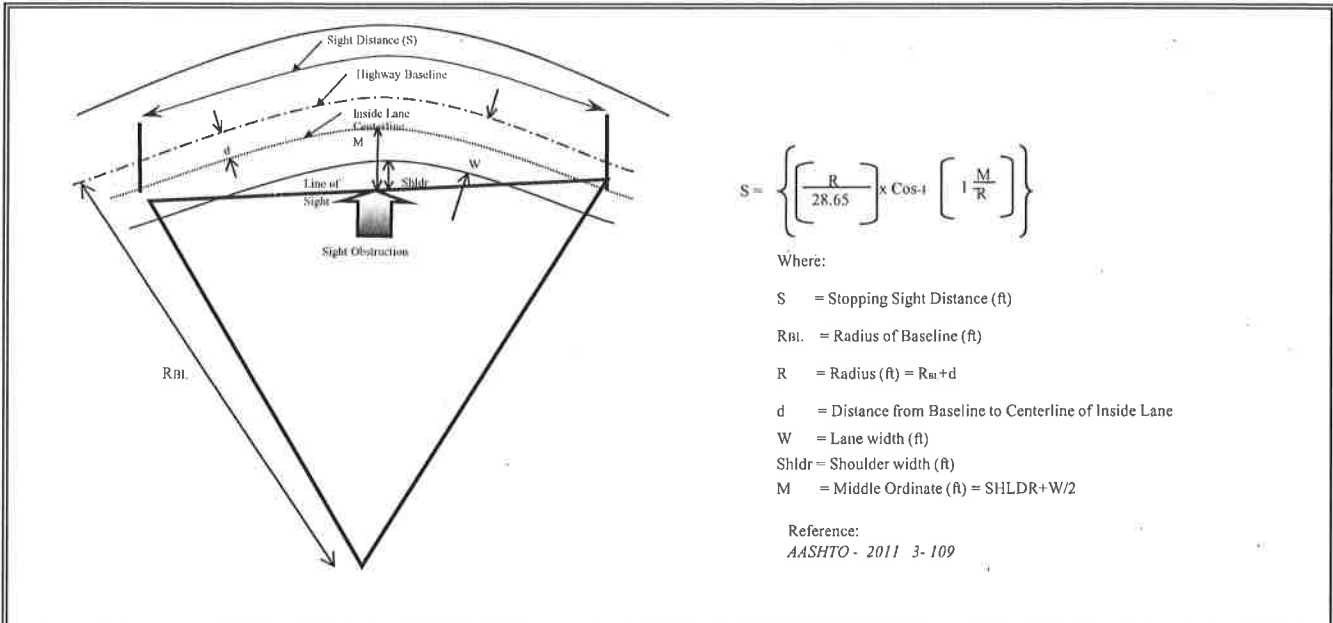
Point ISLIP21 N 1,479,935.3824 E 501,384.7608 Sta 206+37.58

Course from ISLIP21 to ISLIP22 N 42° 46' 21.57" E Dist 1,223.1969

Point ISLIP22 N 1,480,833.2750 E 502,215.4229 Sta 218+60.78

Ending chain ISLIP2 description

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
(Interstate, All other facilities)

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE (R<sub>BL</sub>)  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)  
 LANE WIDTH (W)  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

DESIGN SPEED	50 mph
CURVE NO.	ISLIP2 1
RADIUS OF CURVE (R <sub>BL</sub> )	8,337.00'
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	0° 41' 14"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)	-7.50'
LANE WIDTH (W)	15'
SHOULDER WIDTH (Shldr)	6'
VERTICAL GRADE (%)	0.380%
M DIMENSION	13.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

FDOT REQUIRED SSD	425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
AASHTO REQUIRED SSD	425.00'	AASHTO 2011, Table 3-1 & 3-2.
ACTUAL SSD	949.38'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
 YES

COMMENTS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp ISLIP2 (WBI4 TO IWBCD2)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 2  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>ISLIP2_1 (RT)</u>		PC STATION	<u>200+00.00</u>		
DEGREE OF CURVE	<u>0° 41' 14"</u>		PT STATION	<u>206+37.58</u>		
RADIUS OF CURVE	<u>8,337.00'</u>					
DESIGN SPEED	<u>50 mph</u>		BEGIN TRANSITION	<u>N/A</u>	*	
e=	<u>NC</u>		BEGIN FULL SUPER	<u>N/A</u>	*	
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>		END FULL SUPER	<u>N/A</u>	*	
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>		END TRANSITION	<u>N/A</u>	*	

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
* No Transition Required		15	200	0.00		
TOTAL LENGTH INTO CURVE				0.00		
<b>1-LANE RAMP</b>				0.00		
* No Transition Required		15	200	0.00		
TOTAL LENGTH OUT OF CURVE				0.00		

ZERO XSLOPE INTO CURVE	<u>N/A</u>
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>


---

\* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.



Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for Ramp ISLIP2 (WB14 TO IWBCD2)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: JW

Page      of       
 Sheet 2 of 2  
 Date: 8/10/17  
 Date: 9/6/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY (Rural or Urban)	<u>Rural</u>					
(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>N/A</u>	PC STATION	<u>N/A</u>			
DEGREE OF CURVE	<u>N/A</u>	PT STATION	<u>N/A</u>			
RADIUS OF CURVE	<u>N/A</u>					
DESIGN SPEED	<u>50 mph</u>	BEGIN TRANSITION	<u>    </u>			
e=	<u>N/A</u>	BEGIN FULL SUPER	<u>    </u>			
SE SPLIT INTO CURVE (Tangent/Curve)	<u>    </u>	END FULL SUPER	<u>    </u>			
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>    </u>	END TRANSITION	<u>    </u>			

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
TRANS. ON TANGENT (+) 0.02 to (+) 0.035	0.015	15	200	100.00	213+00.00	214+00.00
TOTAL LENGTH				<b>100.00</b>		
<b>1-LANE RAMP</b>				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE	<u>N/A</u>
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP WITH RESPECT TO DIRECTION OF STATIONING.

\* TRANSITION TO MEET CROSS SLOPE AT RAMP TERMINAL.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim  
 Subject:  
 Job No. DCP  
 Date: Wednesday September 13, 2017

Operator: MP  
 5:50 pm

*DES. BY Jw 8/18/17*  
*CHECKED BY: MSP 9/13/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_ISLIP2'

\* 1 PRI PRO ISLIP2

Beginning profile ISLIP2 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	200+00.00	122.4200				
VPI	2	200+50.00	122.1800	-0.4800			
VPI	3	201+00.00	121.9400	-0.4800			
VPI	4	201+50.00	121.7000	-0.4800			
VPI	5	202+00.00	121.4700	-0.4600			
VPI	6	202+50.00	121.2500	-0.4400			
VPI	7	203+00.00	121.0300	-0.4400			
VPI	8	203+50.00	120.8200	-0.4200			
VPI	9	204+00.00	120.6200	-0.4000			
VPI	10	204+50.00	120.4200	-0.4000			
VPI	11	204+99.74	120.2200	-0.4021			
VPI	12	205+50.00	120.0400	-0.3581			
VPI	13	206+00.00	119.8500	-0.3800			
VPI	14	206+37.58	119.7300	-0.3193			
VPI	15	206+37.58	119.4300				
VPI	16	206+50.00	119.3800	-0.4026			
VPI	17	207+00.00	119.2100	-0.3400			
VPI	18	207+36.90	119.0800	-0.3523			
VPC		207+50.00	119.0262	-0.4108	K = 191.9	SSD = 840.3	
VPI	19	209+00.00	118.4100		300.0000	150.0000	150.0000
VPT		210+50.00	115.4493	-1.9738			
VPC		212+76.00	110.9885	-1.9738	K = 96.0		
VPI	20	213+76.00	109.0147		200.0000	100.0000	100.0000
Low Point		214+65.53	109.1181				
VPT		214+76.00	109.1238	0.1091			
VPI	21	215+00.00	109.1500	0.1091			
VPI	22	215+44.81	109.2600	0.2455			
VPI	23	215+50.00	109.2600	0.0000			
VPI	24	216+00.00	109.2800	0.0400			



VA\_ISLIP2DCP.OMP

VPI	25	216+50.00	109.4800	0.4000
VPI	26	217+00.00	109.6400	0.3200
VPI	27	217+50.00	109.7800	0.2800
VPI	28	218+00.00	109.9100	0.2600
VPI	29	218+18.30	109.9300	0.1093
VPI	30	218+50.00	110.0200	0.2839
VPI	31	218+60.78	110.0600	0.3711

---

Ending profile ISLIP2 description



## Ramp Terminal - Detail

Sheet 1 of 2

**Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)**  
**Description: Ramp ISLIP2 Exit**  
**terminal with existing WBI-4**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Date: 8/25/2017  
 Date: 8/29/2017

MAINLINE				GORE		RAMP					
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	Gore Width	Gore Slope (%)	Inside Elev.	*Pavement Slope (%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
BL400	N/A	3.00%	110.48	29.18	2.14%	109.86	3.50%	15.00	109.34	ISLIP2	214+00.00
BL400	N/A	3.00%	110.49	25.69	3.26%	109.65	3.50%	15.00	109.13	ISLIP2	214+50.00
BL400	N/A	3.00%	110.44	22.20	3.50%	109.67	3.50%	15.00	109.15	ISLIP2	215+00.00
BL400	N/A	3.00%	110.44	19.08	3.50%	109.78	3.50%	15.00	109.26	ISLIP2	215+44.81
BL400	N/A	3.00%	110.43	18.72	3.50%	109.78	3.50%	15.00	109.26	ISLIP2	215+50.00
BL400	N/A	3.00%	110.33	15.23	3.50%	109.80	3.50%	15.00	109.28	ISLIP2	216+00.00
BL400	N/A	3.00%	110.41	11.74	3.50%	110.00	3.50%	15.00	109.48	ISLIP2	216+50.00
BL400	N/A	3.00%	110.44	8.25	3.50%	110.16	3.50%	15.00	109.64	ISLIP2	217+00.00
BL400	N/A	3.00%	110.46	4.76	3.50%	110.30	3.50%	15.00	109.78	ISLIP2	217+50.00
BL400	N/A	3.00%	110.48	1.28	3.50%	110.43	3.50%	15.00	109.91	ISLIP2	218+00.00
BL400	N/A	3.00%	110.45	0.00	3.50%	110.45	3.50%	15.00	109.93	ISLIP2	218+18.30
BL400	N/A	3.00%	110.47	0.00	3.50%	110.47	3.50%	12.78	110.02	ISLIP2	218+50.00
BL400	N/A	3.00%	110.48	0.00	3.50%	110.48	3.50%	12.00	110.06	ISLIP2	218+60.78

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Sheet 2 of 2

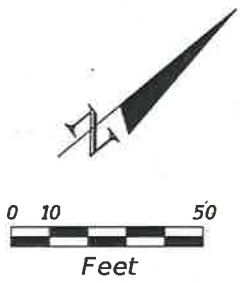
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp ISLIP2 Exit  
terminal with existing WBI-4

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

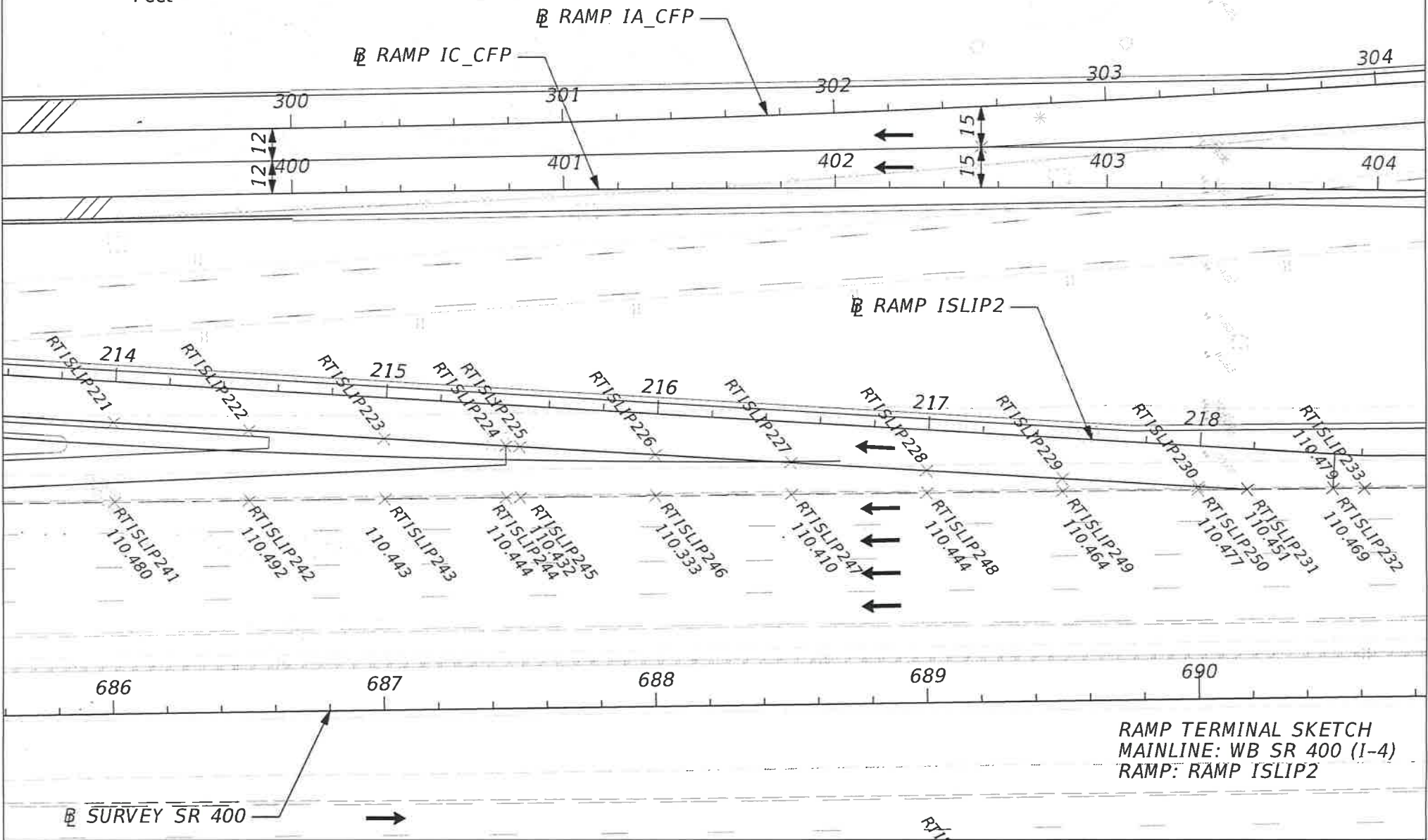
Date: 8/25/2017  
 Date: 8/29/2017

Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	COGO Pt. No.	Gore Width	Baseline	Ramp Station	*Pavement Slope (%)	COGO Width	Pavement Width
BL400	N/A	3.00%	110.48	RTISLIP241	29.18	ISLIP2	214+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.49	RTISLIP242	25.69	ISLIP2	214+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.44	RTISLIP243	22.20	ISLIP2	215+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.44	RTISLIP244	19.08	ISLIP2	215+44.81	3.50%	15.00	15.00
BL400	N/A	3.00%	110.43	RTISLIP245	18.72	ISLIP2	215+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.33	RTISLIP246	15.23	ISLIP2	216+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.41	RTISLIP247	11.74	ISLIP2	216+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.44	RTISLIP248	8.25	ISLIP2	217+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.46	RTISLIP249	4.76	ISLIP2	217+50.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.48	RTISLIP250	1.28	ISLIP2	218+00.00	3.50%	15.00	15.00
BL400	N/A	3.00%	110.45	RTISLIP231	0.00	ISLIP2	218+18.30	3.50%	15.00	15.00
BL400	N/A	3.00%	110.47	RTISLIP232	0.00	ISLIP2	218+50.00	3.50%	12.78	12.78
BL400	N/A	3.00%	110.48	RTISLIP233	0.00	ISLIP2	218+60.78	3.50%	12.00	12.00

\* The sign convention for the cross slope % is relative to the Mainline PGL. Nominal, actual slope varies.



CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: WB SR 400 (I-4)  
 RAMP: RAMP ISLIP2

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject: [ None ]  
 Job No. DCP Operator: BM  
 Date: Monday August 28, 2017 2:20 pm

DES BY: BM 8/28/17  
 CHECKED BY: AS 9/19/17

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_ISLIP2EX'

\* 1 \$ POINTS ALONG WBI4 OUTSIDE EOP (SAWCUT) \$

\* 2 PRINT POINT RTISLIP231-RTISLIP233 RTISLIP241-RTISLIP250

Point	North	East	Station	Elevation
RTISLIP231	1,480,791.9038	502,197.5839	0+00.00	110.4513
RTISLIP232	1,480,816.6810	502,217.4858	0+00.00	110.4687
RTISLIP233	1,480,825.7602	502,224.7785	0+00.00	110.4785
RTISLIP241	1,480,466.6249	501,936.3084	0+00.00	110.4796
RTISLIP242	1,480,505.4654	501,967.5064	0+00.00	110.4916
RTISLIP243	1,480,544.3523	501,998.7418	0+00.00	110.4429
RTISLIP244	1,480,579.2049	502,026.7366	0+00.00	110.4444
RTISLIP245	1,480,583.2392	502,029.9771	0+00.00	110.4318
RTISLIP246	1,480,622.1260	502,061.2124	0+00.00	110.3325
RTISLIP247	1,480,661.0129	502,092.4477	0+00.00	110.4104
RTISLIP248	1,480,699.8998	502,123.6830	0+00.00	110.4442
RTISLIP249	1,480,738.7867	502,154.9183	0+00.00	110.4637
RTISLIP250	1,480,777.6736	502,186.1537	0+00.00	110.4772

\* 3 \$ PAVEMENT AND GORE WIDTH CALCULATIONS \$

\* 4 INV RTISLIP221 RTISLIP241

Inverse RTISLIP221 to RTISLIP241 S 51° 20' 38.94" E Distance 29.1790

\* 5 INV RTISLIP222 RTISLIP242

Inverse RTISLIP222 to RTISLIP242 S 51° 13' 38.43" E Distance 25.6911

\* 6 INV RTISLIP223 RTISLIP243

Inverse RTISLIP223 to RTISLIP243 S 51° 13' 38.43" E Distance 22.2033

\* 7 INV RTISLIP224 RTISLIP244

Inverse RTISLIP224 to RTISLIP244 S 51° 13' 38.43" E Distance 19.0773

\* 8 INV RTISLIP225 RTISLIP245

Inverse RTISLIP225 to RTISLIP245 S 51° 13' 38.43" E Distance 18.7154

\* 9 INV RTISLIP226 RTISLIP246

Inverse RTISLIP226 to RTISLIP246 S 51° 13' 38.43" E Distance 15.2276

\* 10 INV RTISLIP227 RTISLIP247

Inverse RTISLIP227 to RTISLIP247 S 51° 13' 38.43" E Distance 11.7398

\* 11 INV RTISLIP228 RTISLIP248

RT\_I SLI P2EXDCP. OBM

Inverse RTI SLIP228 to RTI SLIP248 S 51° 13' 38.43" E Distance 8.2520

\* 12 INV RTI SLIP229 RTI SLIP249

Inverse RTI SLIP229 to RTI SLIP249 S 51° 13' 38.43" E Distance 4.7642

\* 13 INV RTI SLIP230 RTI SLIP250

Inverse RTI SLIP230 to RTI SLIP250 S 51° 13' 38.44" E Distance 1.2763

\* 14 \$ POINT ALONG RAMP INSIDE EOT \$

\* 15 LAY OFF CHA I SLIP2 RTI SLIP221-RTI SLIP232

Poi nt	North	East	Stati on	Offset	R
RTI SLIP221	1,480,484.8513	501,913.5222	214+00.00	15.0000	
RTI SLIP222	1,480,521.5540	501,947.4767	214+50.00	15.0000	
RTI SLIP223	1,480,558.2567	501,981.4313	215+00.00	15.0000	
RTI SLIP224	1,480,591.1517	502,011.8633	215+44.81	15.0000	
RTI SLIP225	1,480,594.9594	502,015.3858	215+50.00	15.0000	
RTI SLIP226	1,480,631.6621	502,049.3404	216+00.00	15.0000	
RTI SLIP227	1,480,668.3648	502,083.2949	216+50.00	15.0000	
RTI SLIP228	1,480,705.0675	502,117.2495	217+00.00	15.0000	
RTI SLIP229	1,480,741.7702	502,151.2040	217+50.00	15.0000	
RTI SLIP230	1,480,778.4729	502,185.1586	218+00.00	15.0000	
RTI SLIP231	1,480,791.9038	502,197.5839	218+18.30	15.0000	
RTI SLIP232	1,480,816.6810	502,217.4858	218+50.00	12.7831	



# Ramp Terminal - Detail

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp ISLIP2 and IWBCD2

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Date: 4/25/2018  
 Date: 4/25/2018

MAINLINE						GORE		RAMP					
Baseline	Mainline Station	PGL Elev.	*Outside Travel Lane Slope(%)	Outside EOT Offset	Outside EOT Elev.	Gore Width	Gore Slope(%)	Inside Elev.	*Pavement Slope(%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
IWBCD2	7080+36.19	122.42	2.00%	29.27	121.84	0.00	N/A	122.42	2.00%	0.00	122.42	ISLIP2	200+00.00
IWBCD2	7080+86.19	122.17	2.00%	27.39	121.63	0.00	N/A	122.17	2.00%	0.15	122.18	ISLIP2	200+50.00
IWBCD2	7081+36.19	121.92	2.00%	25.39	121.42	0.00	N/A	121.92	2.00%	0.60	121.94	ISLIP2	201+00.00
IWBCD2	7081+86.18	121.68	2.00%	24.00	121.20	0.00	N/A	121.68	2.00%	1.35	121.70	ISLIP2	201+50.00
IWBCD2	7082+36.17	121.43	2.00%	24.00	120.95	0.00	N/A	121.43	2.00%	2.40	121.47	ISLIP2	202+00.00
IWBCD2	7082+86.15	121.18	2.00%	24.00	120.70	0.00	N/A	121.18	2.00%	3.75	121.25	ISLIP2	202+50.00
IWBCD2	7083+36.13	120.93	2.00%	24.00	120.45	0.00	N/A	120.93	2.00%	5.40	121.03	ISLIP2	203+00.00
IWBCD2	7083+86.09	120.68	2.00%	24.00	120.20	0.00	N/A	120.68	2.00%	7.35	120.82	ISLIP2	203+50.00
IWBCD2	7084+36.04	120.43	2.00%	24.00	119.95	0.00	N/A	120.43	2.00%	9.59	120.62	ISLIP2	204+00.00
IWBCD2	7084+85.97	120.18	2.00%	24.00	119.70	0.00	N/A	120.18	2.00%	12.14	120.42	ISLIP2	204+50.00
IWBCD2	7085+36.53	119.92	2.00%	24.00	119.44	0.00	N/A	119.92	2.00%	15.00	120.22	ISLIP2	204+99.74
IWBCD2	7085+86.78	119.67	2.00%	24.00	119.19	3.17	2.00%	119.74	2.00%	15.00	120.04	ISLIP2	205+50.00
IWBCD2	7086+36.75	119.42	2.00%	24.00	118.94	6.62	2.00%	119.55	2.00%	15.00	119.85	ISLIP2	206+00.00
IWBCD2	7086+86.68	119.17	2.00%	24.00	118.69	10.36	2.00%	119.38	2.00%	15.00	119.68	ISLIP2	206+50.00
IWBCD2	7087+36.53	118.92	2.00%	24.00	118.44	14.18	2.00%	119.21	2.00%	15.00	119.51	ISLIP2	207+00.00
IWBCD2	7087+73.33	118.74	2.00%	24.00	118.26	17.00	2.00%	119.08	2.00%	15.00	119.38	ISLIP2	207+36.90

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp ISLIP2 and IWBCD2

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Sheet 2 of 4  
 Date: 4/25/2018  
 Date: 4/25/2018

Baseline	Mainline Station	PGL Elev.	PGL Offset	Pavement Width 1	*Pavement Slope(%) 1	Pavement Width 2	Pavement Slope(%) 2	Pavement Width 3	Pavement Slope(%) 3	Outside Travel Lane width	*Outside Travel Lane Slope(%)	Outside EOT Offset	Outside EOT Elev.	COGO Distance	Gore Width	Baseline	Ramp Station	*Pavement Slope(%)	COGO Width	Pavement Width
IWBCD2	7080+36.19	122.42	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	29.27	2.00%	29.27	121.84	0.00	0.00	ISLIP2	200+00.00	2.00%	0.00	0.00
IWBCD2	7080+86.19	122.17	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	27.39	2.00%	27.39	121.63	0.15	0.00	ISLIP2	200+50.00	2.00%	0.00	0.15
IWBCD2	7081+36.19	121.92	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	25.39	2.00%	25.39	121.42	0.60	0.00	ISLIP2	201+00.00	2.00%	0.00	0.60
IWBCD2	7081+86.18	121.68	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	121.20	1.35	0.00	ISLIP2	201+50.00	2.00%	0.00	1.35
IWBCD2	7082+36.17	121.43	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	120.95	2.40	0.00	ISLIP2	202+00.00	2.00%	0.00	2.40
IWBCD2	7082+86.15	121.18	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	120.70	3.75	0.00	ISLIP2	202+50.00	2.00%	0.00	3.75
IWBCD2	7083+36.13	120.93	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	120.45	5.40	0.00	ISLIP2	203+00.00	2.00%	0.00	5.40
IWBCD2	7083+86.09	120.68	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	120.20	7.35	0.00	ISLIP2	203+50.00	2.00%	0.00	7.35
IWBCD2	7084+36.04	120.43	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	119.95	9.59	0.00	ISLIP2	204+00.00	2.00%	0.00	9.59
IWBCD2	7084+85.97	120.18	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	119.70	12.14	0.00	ISLIP2	204+50.00	2.00%	0.00	12.14
IWBCD2	7085+36.53	119.92	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	119.44	0.00	0.00	ISLIP2	204+99.74	2.00%	-15.00	15.00
IWBCD2	7085+86.78	119.67	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	119.19	3.17	3.17	ISLIP2	205+50.00	2.00%	-15.00	15.00
IWBCD2	7086+36.75	119.42	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	118.94	6.62	6.62	ISLIP2	206+00.00	2.00%	-15.00	15.00
IWBCD2	7086+86.68	119.17	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	118.69	25.32	10.36	ISLIP2	206+50.00	2.00%	15.00	15.00
IWBCD2	7087+36.53	118.92	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	118.44	29.14	14.18	ISLIP2	207+00.00	2.00%	15.00	15.00
IWBCD2	7087+73.33	118.74	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	24.00	2.00%	24.00	118.26	31.96	17.00	ISLIP2	207+36.90	2.00%	15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL.





# Ramp Terminal - Graph Input

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)

Description: Ramp ISLIP2 and IWBCD2

AECOM Project No: 60480256

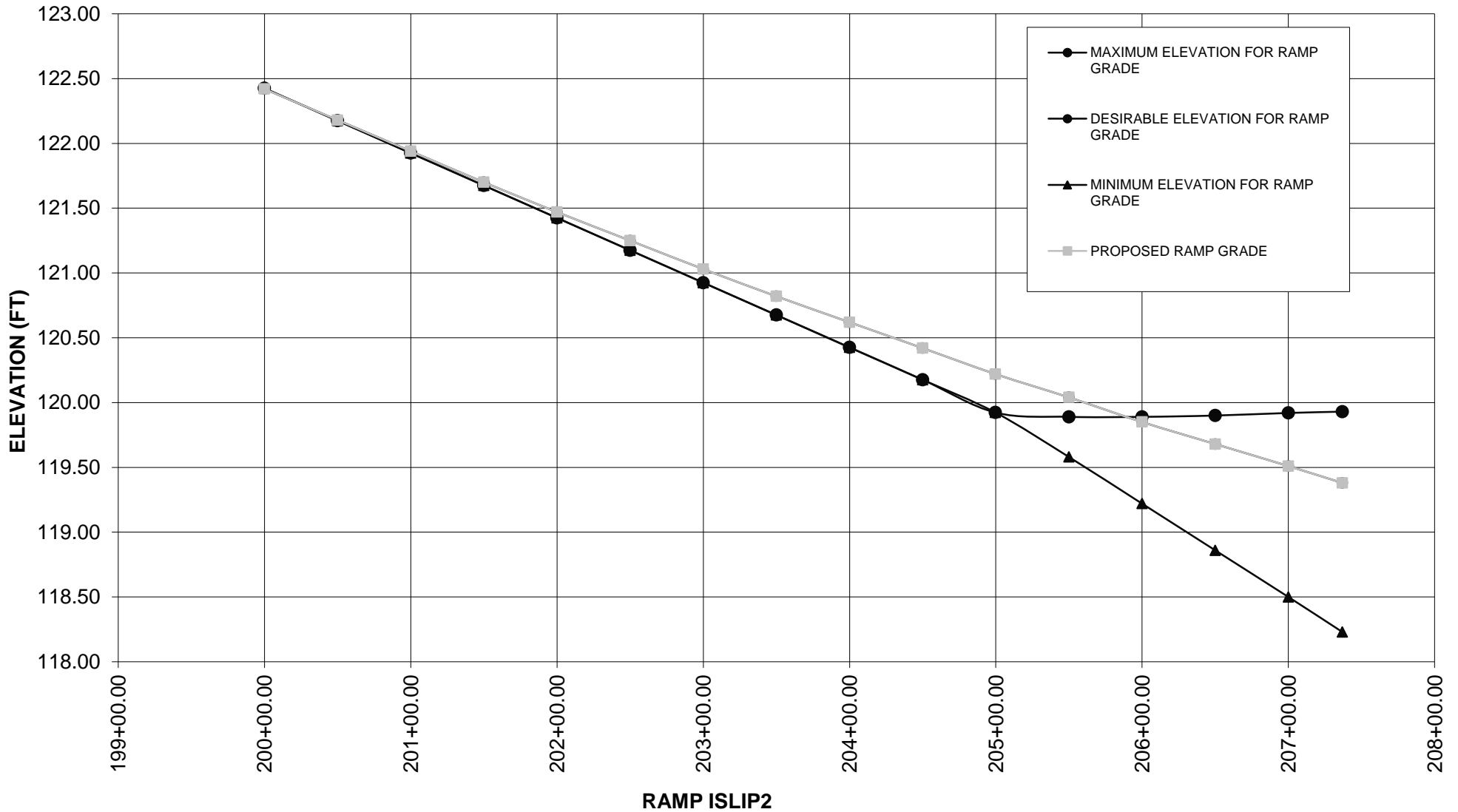
Computed By: BM

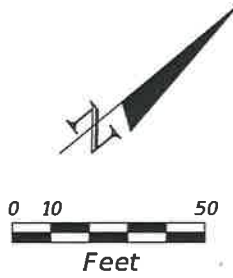
Checked By: MSP

Date: 4/25/2018

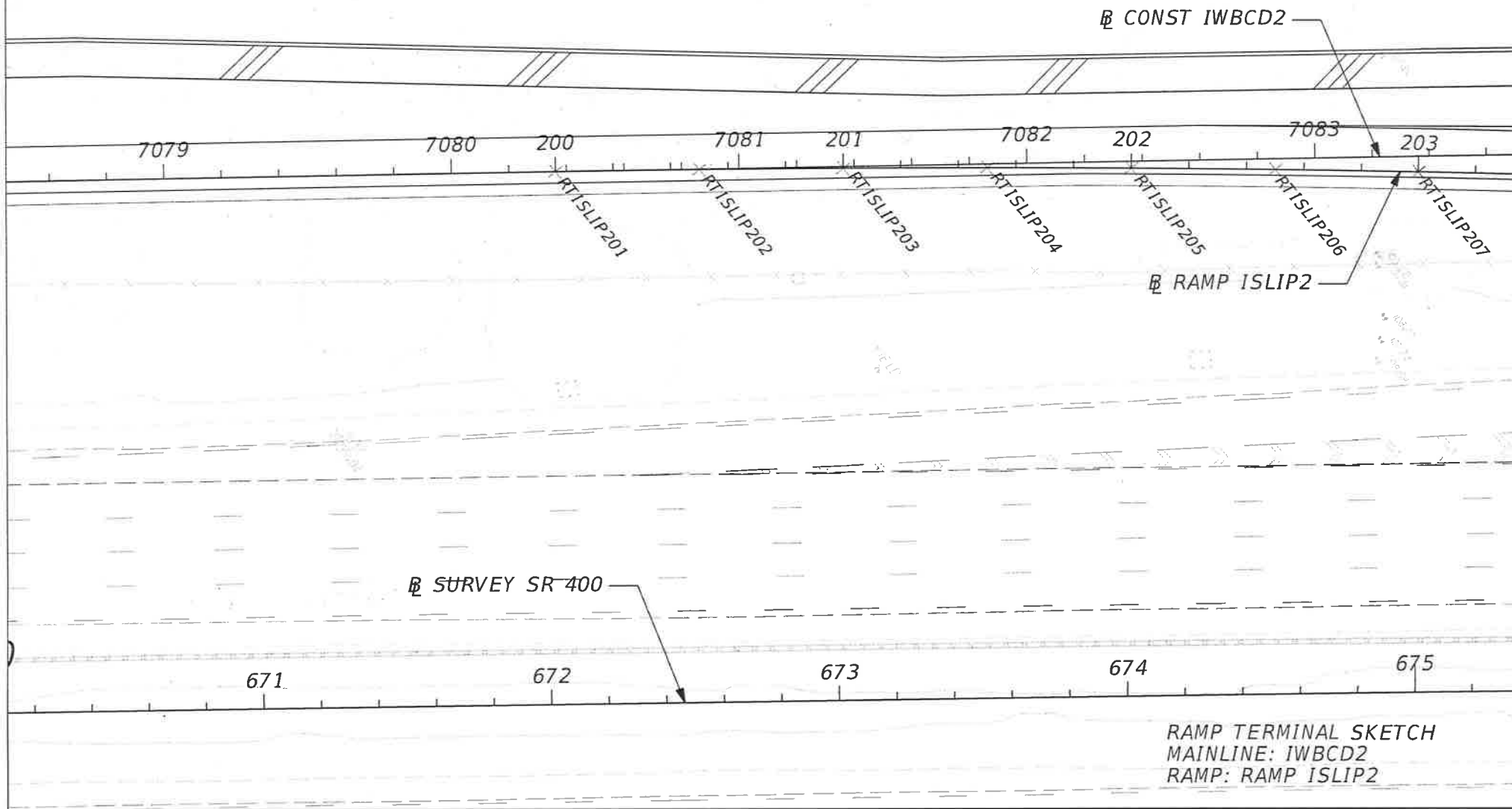
Date: 4/25/2018

MINIMUM ELEVATION FOR RAMP GRADE					DESIRABLE ELEVATION FOR RAMP GRADE					MAXIMUM ELEVATION FOR RAMP GRADE				
Mainline Rollover	Gore Slope(%)	Ramp Rollover	Outside Ramp Elevation	Inside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Outside Ramp Elevation	Inside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Outside Ramp Elevation	Inside Ramp Elevation
5.00%	N/A	0.00%	122.42	122.42	0.00%	N/A	0.00%	122.42	122.42	5.00%	N/A	0.00%	122.42	122.42
5.00%	N/A	0.00%	122.17	122.18	0.00%	N/A	0.00%	122.17	122.18	5.00%	N/A	0.00%	122.17	122.18
5.00%	N/A	0.00%	121.92	121.94	0.00%	N/A	0.00%	121.92	121.94	5.00%	N/A	0.00%	121.92	121.94
5.00%	N/A	0.00%	121.68	121.70	0.00%	N/A	0.00%	121.68	121.70	5.00%	N/A	0.00%	121.68	121.70
5.00%	N/A	0.00%	121.43	121.47	0.00%	N/A	0.00%	121.43	121.47	5.00%	N/A	0.00%	121.43	121.47
5.00%	N/A	0.00%	121.18	121.25	0.00%	N/A	0.00%	121.18	121.25	5.00%	N/A	0.00%	121.18	121.25
5.00%	N/A	0.00%	120.93	121.03	0.00%	N/A	0.00%	120.93	121.03	5.00%	N/A	0.00%	120.93	121.03
5.00%	N/A	0.00%	120.68	120.82	0.00%	N/A	0.00%	120.68	120.82	5.00%	N/A	0.00%	120.68	120.82
5.00%	N/A	0.00%	120.43	120.62	0.00%	N/A	0.00%	120.43	120.62	5.00%	N/A	0.00%	120.43	120.62
5.00%	N/A	0.00%	120.18	120.42	0.00%	N/A	0.00%	120.18	120.42	5.00%	N/A	0.00%	120.18	120.42
5.00%	N/A	0.00%	119.92	120.22	0.00%	N/A	0.00%	119.92	120.22	5.00%	N/A	0.00%	119.92	120.22
5.00%	-3.00%	5.00%	119.58	119.88	0.00%	2.00%	0.00%	119.74	120.04	5.00%	7.00%	5.00%	119.89	120.19
5.00%	-3.00%	5.00%	119.22	119.52	0.00%	2.00%	0.00%	119.55	119.85	5.00%	7.00%	5.00%	119.89	120.19
5.00%	-3.00%	5.00%	118.86	119.16	0.00%	2.00%	0.00%	119.38	119.68	5.00%	7.00%	5.00%	119.90	120.20
5.00%	-3.00%	5.00%	118.50	118.80	0.00%	2.00%	0.00%	119.21	119.51	5.00%	7.00%	5.00%	119.92	120.22
5.00%	-3.00%	5.00%	118.23	118.53	0.00%	2.00%	0.00%	119.08	119.38	5.00%	7.00%	5.00%	119.93	120.23

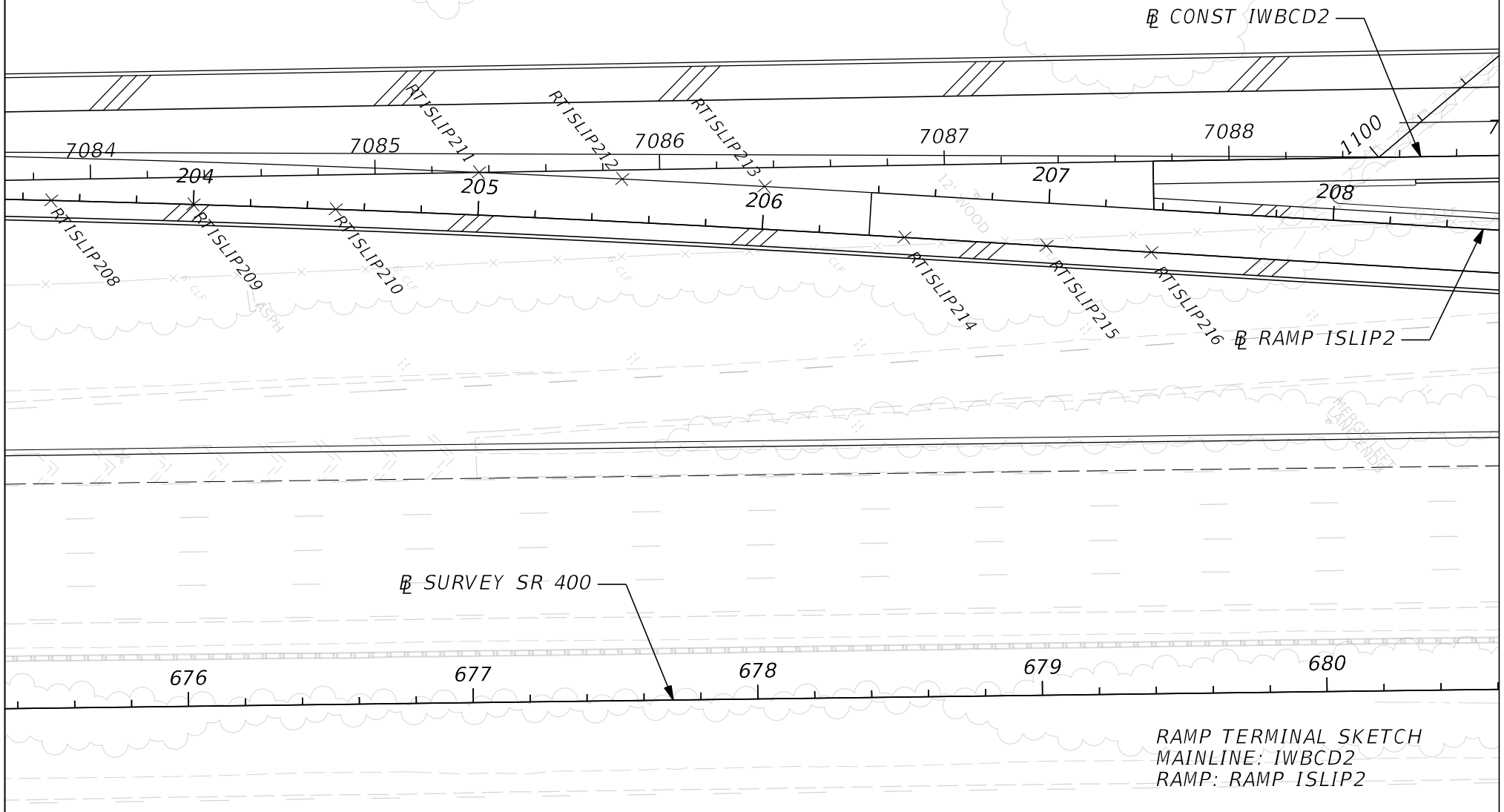
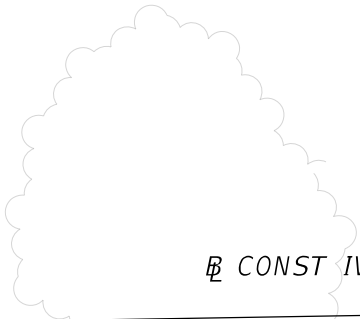
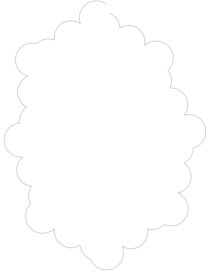
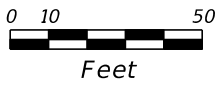
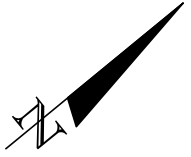




CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: IWBCD2  
 RAMP: RAMP ISLIP2



RAMP TERMINAL SKETCH  
MAINLINE: IWBCD2  
RAMP: RAMP ISLIP2

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject: [ None ]  
 Job No. DCP Operator: BM  
 Date: Wednesday April 4, 2018 4:21 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_I SLI P2'

\* 1 LAY OFF CHA I WBCD2 RTI SLI P201-RTI SLI P216

Point	North	East	Station	Offset	R
RTI SLI P201	1, 479, 441. 0835	500, 981. 1041	7080+36. 19	0. 0000	-
RTI SLI P202	1, 479, 480. 1797	501, 012. 2725	7080+86. 19	0. 1499	-
RTI SLI P203	1, 479, 519. 0884	501, 043. 6749	7081+36. 19	0. 5997	-
RTI SLI P204	1, 479, 557. 8080	501, 075. 3101	7081+86. 19	1. 3494	-
RTI SLI P205	1, 479, 596. 3372	501, 107. 1769	7082+36. 18	2. 3988	-
RTI SLI P206	1, 479, 634. 6745	501, 139. 2743	7082+86. 16	3. 7481	-
RTI SLI P207	1, 479, 672. 8187	501, 171. 6009	7083+36. 13	5. 3970	-
RTI SLI P208	1, 479, 710. 7684	501, 204. 1558	7083+86. 09	7. 3457	-
RTI SLI P209	1, 479, 748. 5221	501, 236. 9377	7084+36. 04	9. 5939	-
RTI SLI P210	1, 479, 786. 0785	501, 269. 9454	7084+85. 98	12. 1417	-
RTI SLI P211	1, 479, 833. 2422	501, 291. 8237	7085+36. 53	0. 0000	-
RTI SLI P212	1, 479, 870. 6642	501, 325. 5163	7085+86. 78	3. 1681	-
RTI SLI P213	1, 479, 907. 6872	501, 359. 2549	7086+36. 76	6. 6200	-
RTI SLI P214	1, 479, 934. 3107	501, 404. 2038	7086+85. 54	25. 3168	-
RTI SLI P215	1, 479, 971. 0134	501, 438. 1584	7087+35. 39	29. 1369	-
RTI SLI P216	1, 479, 998. 1005	501, 463. 2173	7087+72. 18	31. 9562	-

\* 2 EL PRO I WBCD2 7080+36. 19 7080+86. 19 7081+36. 19 7081+86. 18 7082+36. 17 7082+86. 15 7083+36. 13 7083+86. 09 7084+36. 04 7084+85. 97 7085+36. 53 7085+86. 78-7086+36. 75 7086+86. 68 7087+36. 53 7087+73. 33

El ev at 7080+36. 19	=	122. 4249,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7080+86. 19	=	122. 1749,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7081+36. 19	=	121. 9249,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7081+86. 18	=	121. 6750,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7082+36. 17	=	121. 4250,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7082+86. 15	=	121. 1751,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7083+36. 13	=	120. 9252,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7083+86. 09	=	120. 6754,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7084+36. 04	=	120. 4257,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7084+85. 97	=	120. 1760,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7085+36. 53	=	119. 9232,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7085+86. 78	=	119. 6720,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7086+36. 75	=	119. 4221,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7086+86. 68	=	119. 1725,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7087+36. 53	=	118. 9232,	grade = -0. 5000,	On tang betw 1 & 2
El ev at 7087+73. 33	=	118. 7392,	grade = -0. 5000,	On tang betw 1 & 2

\* 3 LAY OFF CHA I SLI P2 RTI SLI P201-RTI SLI P216

Point	North	East	Station	Offset	R
RTI SLI P201	1, 479, 441. 0835	500, 981. 1041	200+00. 00	0. 0000	-
RTI SLI P202	1, 479, 480. 1797	501, 012. 2725	200+50. 00	0. 0000	-
RTI SLI P203	1, 479, 519. 0884	501, 043. 6749	201+00. 00	0. 0000	-
RTI SLI P204	1, 479, 557. 8080	501, 075. 3101	201+50. 00	0. 0000	-
RTI SLI P205	1, 479, 596. 3372	501, 107. 1769	202+00. 00	0. 0000	-
RTI SLI P206	1, 479, 634. 6745	501, 139. 2743	202+50. 00	0. 0000	-
RTI SLI P207	1, 479, 672. 8187	501, 171. 6009	203+00. 00	0. 0000	-

		RT_I SLI P2DCP. OBM		
RTI SLI P208	1, 479, 710. 7684	501, 204. 1558	203+50. 00	0. 0000
RTI SLI P209	1, 479, 748. 5221	501, 236. 9377	204+00. 00	0. 0000
RTI SLI P210	1, 479, 786. 0785	501, 269. 9454	204+50. 00	0. 0000
RTI SLI P211	1, 479, 833. 2422	501, 291. 8237	204+99. 74	-15. 0000
RTI SLI P212	1, 479, 870. 6642	501, 325. 5163	205+50. 00	-15. 0000
RTI SLI P213	1, 479, 907. 6872	501, 359. 2549	206+00. 00	-15. 0000
RTI SLI P214	1, 479, 934. 3107	501, 404. 2038	206+50. 00	15. 0000
RTI SLI P215	1, 479, 971. 0134	501, 438. 1584	207+00. 00	15. 0000
RTI SLI P216	1, 479, 998. 1005	501, 463. 2173	207+36. 90	15. 0000

\* 4 END

DES. BY: AJS 8/8/17  
CHECKED BY: MSP 8/8/17

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim

Subject:

Job No. DCP Operator: AS

Date: Tuesday August 8, 2017 7:25 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 NOR NE STA 2 FILE: 'HA\_IC1\_535'

\* 1 DES/CHA IC1\_535

Chain IC1\_535 contains:

IC153501 CUR IC1\_5351 CUR IC1\_5352

Beginning chain IC1\_535 description

Point IC153501 N 1,469,574.2536 E 494,092.3989 Sta 900+00.00

Course from IC153501 to PC IC1\_5351 N 5° 59' 28.00" W Dist 265.0861

Curve Data

\*-----\*

Curve IC1\_5351

P.I. Station	904+55.42	N	1,470,027.1895	E	494,044.8644
Delta =	35° 12' 03.81"	(RT)			
Degree =	9° 32' 57.47"				
Tangent =	190.3373				
Length =	368.6246				
Radius =	600.0000				
External =	29.4667				
Long Chord =	362.8544				
Mid. Ord. =	28.0873				
P.C. Station	902+65.09	N	1,469,837.8918	E	494,064.7307
P.T. Station	906+33.71	N	1,470,193.3230	E	494,137.7512
C.C.		N	1,469,900.5163	E	494,661.4536
Back =	N 5° 59' 28.00" W				
Ahead =	N 29° 12' 35.81" E				
Chord Bear =	N 11° 36' 33.90" E				

~~LENGTH OF CURVE < 400', HOWEVER  
THIS CURVE IS ALONG EXISTING RAMP  
AND WILL ONLY BE USED AS REFERENCE.~~

Course from PT IC1\_5351 to PC IC1\_5352 N 29° 12' 35.81" E Dist 703.8536

Curve Data

\*-----\*

Curve IC1\_5352

P.I. Station	915+74.49	N	1,471,014.4671	E	494,596.8602
Delta =	9° 27' 16.81"	(RT)			
Degree =	1° 59' 59.47"				
Tangent =	236.9220				
Length =	472.7682				
Radius =	2,865.0000				
External =	9.7795				
Long Chord =	472.2320				

Mid. Ord.	=	9.7462		
P.C. Station		913+37.56	N	1,470,807.6728 E 494,481.2396
P.T. Station		918+10.33	N	1,471,199.4597 E 494,744.8797
C.C.			N	1,469,409.5207 E 496,981.9187
Back	=	N 29° 12' 35.81"	E	
Ahead	=	N 38° 39' 52.61"	E	
Chord Bear	=	N 33° 56' 14.21"	E	

=====

Ending chain IC1\_535 description

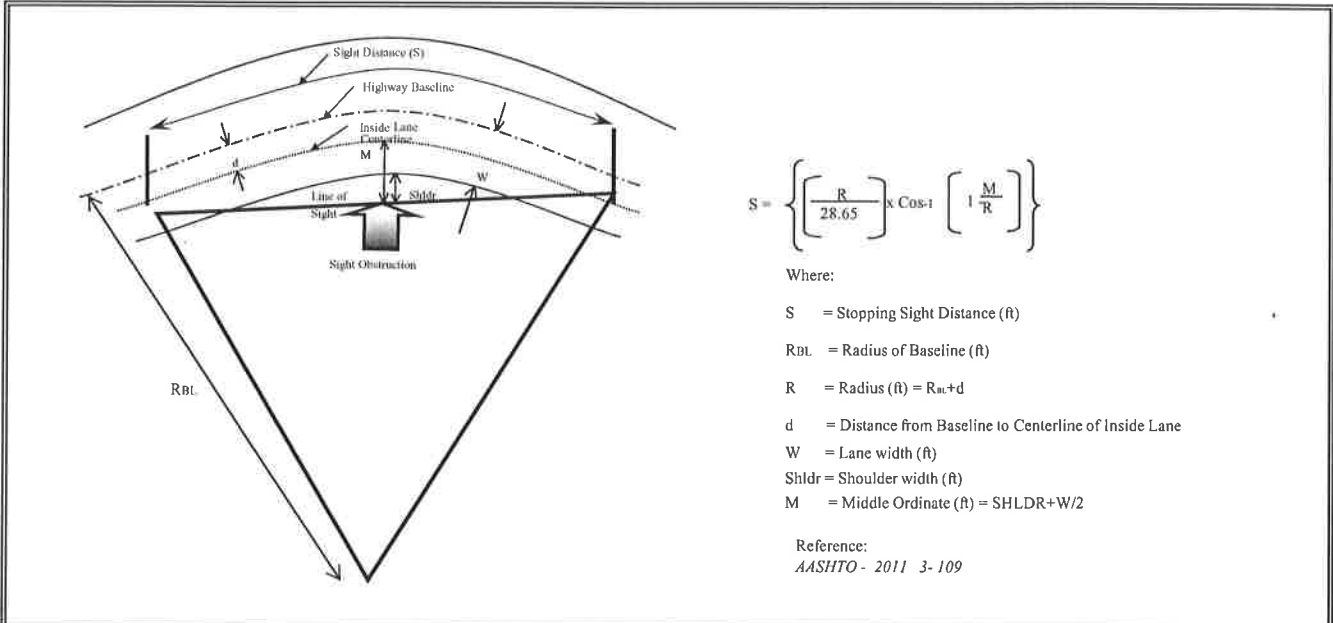


Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Stopping sight Distance Calculations for  
Ramp IC1\_535 (NB SR 535 to EB14)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Sheet 2 of 2  
 Date: 8/10/2017  
 Date: 8/24/2017

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
*(Interstate, All other facilities)*

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

DESIGN SPEED	50 mph
CURVE NO.	IC1 535 2
RADIUS OF CURVE ( $R_{BL}$ )	2,865.00'
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	1° 59' 59"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	-7.50'
LANE WIDTH ( $W$ )	15'
SHOULDER WIDTH (Shldr)	6'
VERTICAL GRADE (%)	-2.900%
M DIMENSION	13.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

FDOT REQUIRED SSD	443.90'	FDOT PPM, TABLE 2.7.1, January 2016.
AASHTO REQUIRED SSD	443.90'	AASHTO 2011, Table 3-1 & 3-2.
ACTUAL SSD	557.16'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
 YES

COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for  
Ramp IC1\_535 (NB SR 535 TO EBI4)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Sheet 1 of 1  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>EB</u>					
CURVE NO.	<u>IC1_535_2 (RT)</u>		PC STATION	<u>913+37.56</u>		
DEGREE OF CURVE	<u>1° 59' 59"</u>		PT STATION	<u>918+10.33</u>		
RADIUS OF CURVE	<u>2,865.00'</u>					
DESIGN SPEED	<u>50 mph</u>		BEGIN TRANSITION	<u>913+37.56</u>		
e=	<u>0.040</u> *EXIST		BEGIN FULL SUPER	<u>913+37.56</u>		
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>		END FULL SUPER	<u>918+10.33</u> *		
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>		END TRANSITION	<u>918+10.33</u> *		
TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
<b>1-LANE RAMP</b>				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
<hr/>						
NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.						
<hr/>						
* THIS IS AN EXISTING CURVE TO BE MILLED & RESURFACED. CALCULATION SHOWN FOR INFORMATION ONLY.						
<hr/>						



## Ramp Terminal - Data

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)

Description: Ramp terminal for Ramp IC1\_535 and EB I-4

Note: This is an existing ramp terminal to be milled and resurfaced. Spreadsheet used to analyze existing cross slopes ONLY.

AECOM Project No: 60480256

Computed By: AS

Checked By: MSP

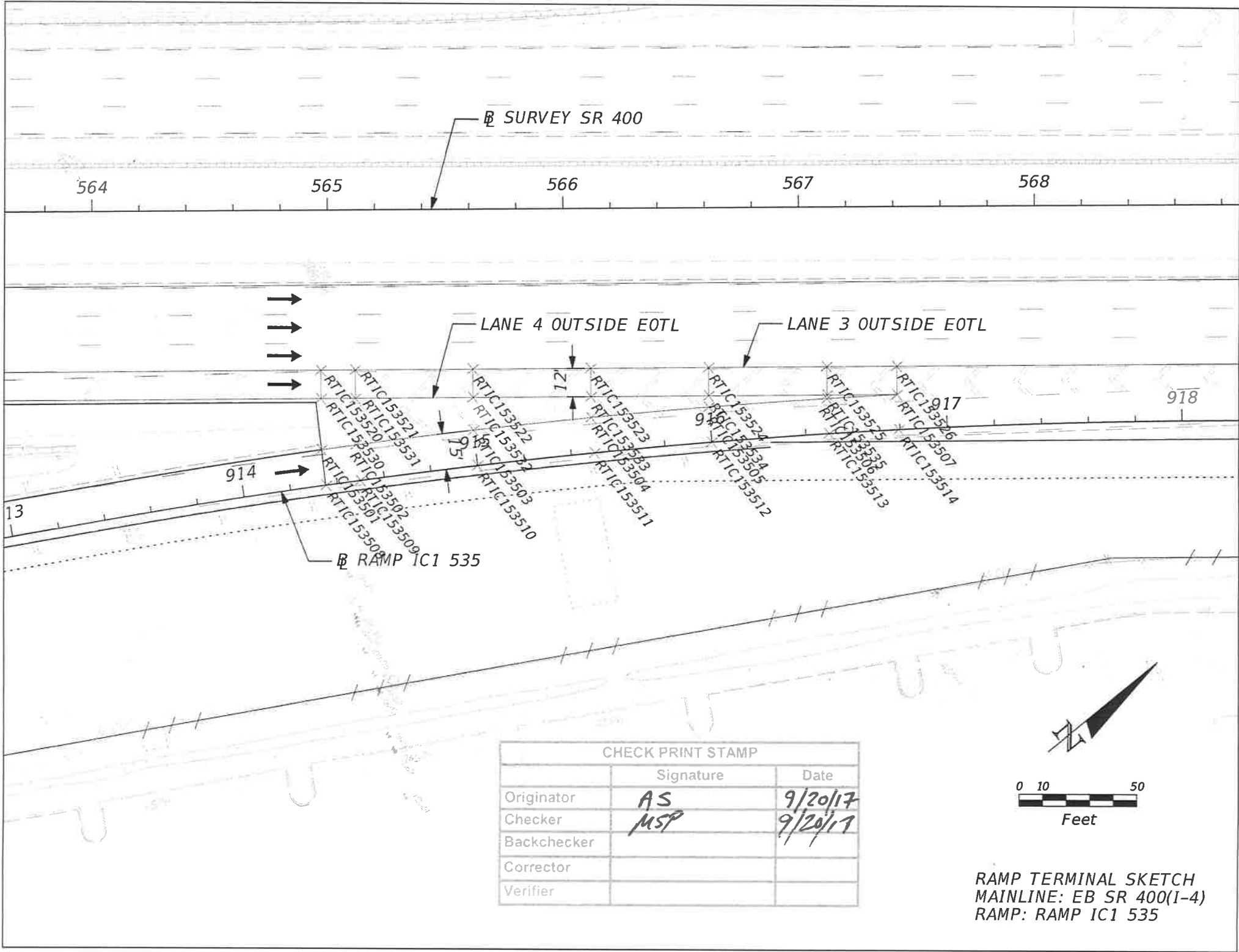
Sheet 1 of 1

Date: 8/15/2017

Date: 8/30/2017

MAINLINE							GORE		RAMP							
Baseline	Lane 3 Outside EOT Elev. (Exist)	COGO Point No.	Lane 4 Outside EOT Elev. (Exist)	COGO Point No.	Lane 4 Width	*Outside Travel Lane Slope (%)	Gore Width	Gore Slope	Inside Elev. (Exist)	COGO Point No.	*Pavement Slope (%)	Pavement Width	Outside Elev. (Exist)	COGO Point No.	Baseline	Ramp Station
BL400	115.72	RTIC153520	115.41	RTIC153530	12.00	-2.58%	21.63	-4.51%	114.44	RTIC153508	-3.37%	15.00	113.93	RTIC153501	IC1_535	914+35.34
BL400	115.32	RTIC153521	114.92	RTIC153531	12.00	-3.31%	19.75	-3.37%	114.26	RTIC153509	-4.00%	15.00	113.66	RTIC153502	IC1_535	914+50.00
BL400	113.79	RTIC153522	113.46	RTIC153532	12.00	-2.74%	13.88	-2.79%	113.08	RTIC153510	-4.15%	15.00	112.45	RTIC153503	IC1_535	915+00.00
BL400	112.11	RTIC153523	111.86	RTIC153533	12.00	-2.07%	8.88	-2.04%	111.68	RTIC153511	-4.40%	15.00	111.02	RTIC153504	IC1_535	915+50.00
BL400	110.77	RTIC153524	110.50	RTIC153534	12.00	-2.30%	4.76	-2.28%	110.39	RTIC153512	-4.02%	15.00	109.79	RTIC153505	IC1_535	916+00.00
BL400	109.71	RTIC153525	109.44	RTIC153535	12.00	-2.18%	1.51	-2.19%	109.41	RTIC153513	-4.15%	15.00	108.79	RTIC153506	IC1_535	916+50.00
BL400	109.11	RTIC153526	108.86	RTIC153507	12.00	-2.14%	0.00	N/A	108.86	RTIC153514	-3.99%	15.00	108.26	RTIC153507	IC1_535	916+79.55

\* The sign convention for the cross slope % is relative to the Mainline PGL.



⊕ SURVEY SR 400

564

565

566

567

568

LANE 4 OUTSIDE EOTL

LANE 3 OUTSIDE EOTL

⊕ RAMP IC1 535

13

914

915

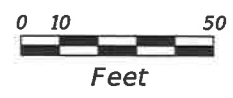
916

917

918

CHECK PRINT STAMP

	Signature	Date
Originator	AS	9/20/17
Checker	MSP	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: EB SR 400(I-4)  
 RAMP: RAMP IC1 535

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject:  
 Job No. DCP Operator: AS  
 Date: Wednesday August 16, 2017 8:04 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RTIC

CHECK PRINT STAMP		
	Signature	Date
Originator	AS	8/17/17
Checker	MSP	8/30/17
Backchecker		
Corrector		
Verifier		

- \* 1 \$ I-4 LANE 3 OUTSIDE EOT EXIST ELEVATIONS
- \* 2 PRI POI RTIC153520-RTIC153526

Point	North	East	Station	Elevation
RTIC153520	1,470,920.9616	494,491.3059	0+00.00	115.7208
RTIC153521	1,470,932.3724	494,500.4360	0+00.00	115.3186
RTIC153522	1,470,971.3486	494,531.6224	0+00.00	113.7915
RTIC153523	1,471,010.3989	494,562.8680	0+00.00	112.1105
RTIC153524	1,471,049.5113	494,594.1633	0+00.00	110.7737
RTIC153525	1,471,088.6739	494,625.4988	0+00.00	109.7056
RTIC153526	1,471,111.8397	494,644.0346	0+00.00	109.1126

- \* 3 \$ I-4 LANE 4 OUTSIDE EOT EXIST ELEVATIONS \$
- \* 4 PRI POI RTIC153530-RTIC153535 RTIC153507

Point	North	East	Station	Elevation
RTIC153530	1,470,913.4645	494,500.6757	0+00.00	115.4109
RTIC153531	1,470,924.8753	494,509.8058	0+00.00	114.9213
RTIC153532	1,470,963.8515	494,540.9922	0+00.00	113.4628
RTIC153533	1,471,002.9017	494,572.2378	0+00.00	111.8626
RTIC153534	1,471,042.0142	494,603.5331	0+00.00	110.4974
RTIC153535	1,471,081.1768	494,634.8686	0+00.00	109.4439
RTIC153507	1,471,104.3426	494,653.4044	0+00.00	108.8561

- \* 5 \$ RAMP IC1\_535 POINTS ALONG BASELINE CONST \$
- \* 6 LAY OFF CHA IC1\_535 RTIC153501-RTIC153507

Point	North	East	Station	Offset	R
RTIC153501	1,470,899.9485	494,517.5678	914+35.34	-15.0000	
RTIC153502	1,470,912.5374	494,525.2256	914+50.00	-15.0000	
RTIC153503	1,470,955.1805	494,551.8290	915+00.00	-15.0000	
RTIC153504	1,470,997.3529	494,579.1726	915+50.00	-15.0000	
RTIC153505	1,471,039.0417	494,607.2479	916+00.00	-15.0000	
RTIC153506	1,471,080.2343	494,636.0465	916+50.00	-15.0000	
RTIC153507	1,471,104.3426	494,653.4044	916+79.55	-15.0000	

- \* 7 \$ RAMP IC1\_535 INSIDE EXIST ELEVATIONS \$
- \* 8 PRI POI RTIC153501-RTIC153507

Point	North	East	Station	Elevation
RTIC153501	1,470,899.9485	494,517.5678	914+50.00	114.4353
RTIC153502	1,470,912.5374	494,525.2256	914+50.00	114.2561
RTIC153503	1,470,955.1805	494,551.8290	915+00.00	113.0758
RTIC153504	1,470,997.3529	494,579.1726	915+50.00	111.6813
RTIC153505	1,471,039.0417	494,607.2479	916+00.00	110.3890
RTIC153506	1,471,080.2343	494,636.0465	916+50.00	109.4109
RTIC153507	1,471,104.3426	494,653.4044	0+00.00	108.8561

\* 9 \$ RAMP IC1\_535 OUTSIDE EXIST ELEVATIONS \$

\* 10 PRI POI RTIC153508-RTIC153514

Point	North	East	Station	Elevation
RTIC153508	1,470,892.1844	494,530.4021	914+35.34	113.9294
RTIC153509	1,470,904.7091	494,538.0209	914+50.00	113.6561
RTIC153510	1,470,947.1302	494,564.4857	915+00.00	112.4528
RTIC153511	1,470,989.0830	494,591.6869	915+50.00	111.0214
RTIC153512	1,471,030.5547	494,619.6160	916+00.00	109.7863
RTIC153513	1,471,071.5326	494,648.2646	916+50.00	108.7877
RTIC153514	1,471,095.5134	494,665.5306	916+79.55	108.2577

\* 11 \$ GORE WIDTH CALCULATIONS \$

\* 12 INV RTIC153501 RTIC153530

Inverse RTIC153501 to RTIC153530 N 51° 20' 07.39" W Distance 21.6340

\* 13 INV RTIC153502 RTIC153531

Inverse RTIC153502 to RTIC153531 N 51° 20' 07.39" W Distance 19.7482

\* 14 INV RTIC153503 RTIC153532

Inverse RTIC153503 to RTIC153532 N 51° 20' 07.38" W Distance 13.8789

\* 15 INV RTIC153504 RTIC153533

Inverse RTIC153504 to RTIC153533 N 51° 20' 07.38" W Distance 8.8815

\* 16 INV RTIC153505 RTIC153534

Inverse RTIC153505 to RTIC153534 N 51° 20' 07.38" W Distance 4.7577

\* 17 INV RTIC153506 RTIC153535

Inverse RTIC153506 to RTIC153535 N 51° 20' 07.38" W Distance 1.5086

DES. BY: SF 6/3/16  
CHECKED BY: GLF 6/10/16

CLDCPORA.OSF

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: Orange

Subject:

Job No. ORA Operator: SF

Date: Friday June 3, 2016 9:29 am

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 RED NE STA 2 FILE: 'CLDCP'

\* 1 des cha CLDCP

Chain CLDCP contains:

CLDCP1 CLDCP2

Beginning chain CLDCP description

Point CLDCP1 N 1,477,959.5354 E 498,497.9869 Sta 100+00.00

Course from CLDCP1 to CLDCP2 S 51° 21' 11" E Dist 2,542.7687

Point CLDCP2 N 1,476,371.5296 E 500,483.9150 Sta 125+42.77

Ending chain CLDCP description

PER EAST BRG PLANS TYP

FROM  $\phi$  OF DCP TO BACK OF S/W ON BRD

= 2' + 29' + 30' + 6' = 67', ALIGNMENT CHECK OK

INTERSECT DEVELOPMENT CROSSOVER ANGLE LESS 95° DUE TO R/W AND EXIST R/W CONSTRAINTS.

DES. BY: SF 6/3/16  
CHECKED BY: GLF 6/10/16

EBDCPORA.OSF

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: Orange

Subject:

Job No. ORA Operator: SF

Date: Friday June 3, 2016 9:49 am

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 RED NE STA 2 FILE: 'EBDCP'

\* 1 des cha EBDCP

Chain EBDCP contains:

EBDCP1 CUR EBDCP1 CUR EBDCP2 CUR EBDCP3 CUR EBDCP4 EBDCP2

Beginning chain EBDCP description

Point EBDCP1 N 1,477,683.9966 E 498,820.1529 Sta 200+00.00

Course from EBDCP1 to PC EBDCP1 S 51° 21' 11" E Dist 315.8995

Curve Data  
\*-----\*

Curve EBDCP1  
P.I. Station 203+50.72 N 1,477,464.9655 E 499,094.0688  
Delta = 19° 45' 10" (LT)  
Degree = 28° 38' 52"  
Tangent = 34.8206  
Length = 68.9501  
Radius = 200.0000  
External = 3.0086  
Long Chord = 68.6091  
Mid. Ord. = 2.9640  
P.C. Station 203+15.90 N 1,477,486.7116 E 499,066.8736  
P.T. Station 203+84.85 N 1,477,453.6899 E 499,127.0133  
C.C. N 1,477,642.9136 E 499,191.7772  
Back = S 51° 21' 11" E  
Ahead = S 71° 06' 21" E  
Chord Bear = S 61° 13' 46" E

DESIGN SPD = 25 MPH w/NC : OK

Course from PT EBDCP1 to PC EBDCP2 S 71° 06' 21" E Dist 84.4822

Curve Data  
\*-----\*

Curve EBDCP2  
P.I. Station 205+08.33 N 1,477,413.7042 E 499,243.8412  
Delta = 19° 45' 10" (RT)  
Degree = 25° 34' 43"  
Tangent = 38.9991  
Length = 77.2241  
Radius = 224.0000  
External = 3.3696  
Long Chord = 76.8422  
Mid. Ord. = 3.3196  
P.C. Station 204+69.33 N 1,477,426.3328 E 499,206.9434  
P.T. Station 205+46.56 N 1,477,389.3485 E 499,274.2999  
C.C. N 1,477,214.4022 E 499,134.4078  
Back = S 71° 06' 21" E  
Ahead = S 51° 21' 11" E  
Chord Bear = S 61° 13' 46" E

DESIGN SPD = 25 MPH w/NC SUPER : OK

Course from PT EBDCP2 to PC EBDCP3 S 51° 21' 11" E Dist 462.8713



EBDCPORA.OSF

Curve Data

\*-----\*

Curve EBDCP3  
 P.I. Station = 210+49.58 N 1,477,075.1991 E 499,667.1689  
 Delta = 20° 19' 35" (RT)  
 Degree = 25° 34' 43"  
 Tangent = 40.1554  
 Length = 79.4668  
 Radius = 224.0000 ✓  
 External = 3.5708  
 Long Chord = 79.0507  
 Mid. Ord. = 3.5147  
 P.C. Station = 210+09.43 N 1,477,100.2769 E 499,635.8071  
 P.T. Station = 210+88.89 N 1,477,040.7888 E 499,687.8665  
 C.C. = N 1,476,925.3306 E 499,495.9150  
 Back = S 51° 21' 11" E  
 Ahead = S 31° 01' 36" E  
 Chord Bear = S 41° 11' 24" E

Course from PT EBDCP3 to PC EBDCP4 S 31° 01' 36" E Dist 112.5526

Curve Data

\*-----\*

Curve EBDCP4  
 P.I. Station = 212+37.30 N 1,476,913.6160 E 499,764.3605  
 Delta = 20° 19' 35" (LT)  
 Degree = 28° 38' 52"  
 Tangent = 35.8531  
 Length = 70.9525  
 Radius = 200.0000 ✓  
 External = 3.1882  
 Long Chord = 70.5810  
 Mid. Ord. = 3.1382  
 P.C. Station = 212+01.45 N 1,476,944.3395 E 499,745.8805  
 P.T. Station = 212+72.40 N 1,476,891.2252 E 499,792.3621  
 C.C. = N 1,477,047.4272 E 499,917.2658  
 Back = S 31° 01' 36" E  
 Ahead = S 51° 21' 11" E  
 Chord Bear = S 41° 11' 24" E

Course from PT EBDCP4 to EBDCP2 S 51° 21' 11" E Dist 324.2423

Point EBDCP2 N 1,476,688.7299 E 500,045.5986 Sta 215+96.64

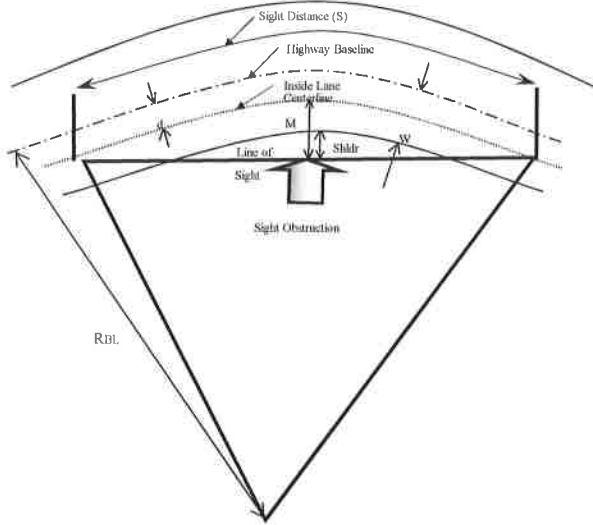
Ending chain EBDCP description

REVISE ALIGNMENTS ACROSS THE DCP BRIDGE TO PROVIDE 2.5' SHOULDERS INSTEAD OF CURRENT 10' SHOULDERS ADJACENT TO THE EXIST BRIDGE RAILINGS. THIS WILL PROVIDE A LARGER SHOULDER ADJACENT TO BIKE LANES AT THE MEDIAN WHICH WILL ALSO HELP TO INCREASE THE CROSS OVER INTERSECTION ANGLE FROM CURRENT 42°

2.5' shoulders do not accommodate SSD or the truck turning movements at ramp intersections. No changes were made.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County) AECOM Project No: 60480256 Sheet 1 of 4  
 Description: Stopping Sight Distance Calculations for Computed By: MSP Date: 11/16/2016  
Eastbound Daryl Carter Pkwy Checked By: JW Date: 12/14/16  
Diverging Diamond (DDI) Section

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \text{Cos}^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- RBL = Radius of Baseline (ft)
- R = Radius (ft) = RBL + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

URBAN MAJOR COLLECTOR

DESIGN SPEED  
CURVE NO.  
RADIUS OF CURVE ( $R_{BL}$ )  
DIRECTION OF CURVE (LT or RT)  
DEGREE OF CURVE  
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )  
LANE WIDTH ( $W$ )  
SHOULDER WIDTH (Shldr)  
VERTICAL GRADE (%)  
*M DIMENSION*

DESIGN SPEED	25 mph	
CURVE NO.	EBDCP1	*
RADIUS OF CURVE ( $R_{BL}$ )	200.00'	
DIRECTION OF CURVE (LT or RT)	LT	
DEGREE OF CURVE	28° 38' 52"	
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	6.50'	
LANE WIDTH ( $W$ )	13'	**
SHOULDER WIDTH (Shldr)	7'	***
VERTICAL GRADE (%)	4.000%	****
<i>M DIMENSION</i>	13.5'	

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

146.00'	FDOT PPM, TABLE 2.7.1, January 2016.
145.67'	AASHTO 2011, Table 3-1 & 3-2.
150.15'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

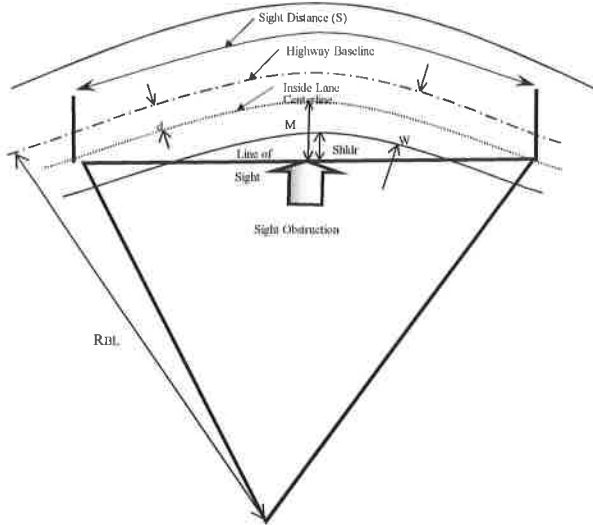
YES  
YES

COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 7 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County) AECOM Project No: 60480256 Sheet 2 of 4  
 Description: Stopping Sight Distance Calculations for Computed By: MSP Date: 11/16/2016  
Eastbound Daryl Carter Pkwy Checked By: JW Date: 12/14/16  
Diverging Diamond (DDI) Section

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ \frac{M}{1-R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

DESIGN SPEED

CURVE NO.

RADIUS OF CURVE (R<sub>BL</sub>)

DIRECTION OF CURVE (LT or RT)

DEGREE OF CURVE

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)

LANE WIDTH (W)

SHOULDER WIDTH (Shldr)

VERTICAL GRADE (%)

M DIMENSION

URBAN MAJOR COLLECTOR

DESIGN SPEED	25 mph	
CURVE NO.	EBDCP2	*
RADIUS OF CURVE (R <sub>BL</sub> )	224.00'	
DIRECTION OF CURVE (LT or RT)	RT	
DEGREE OF CURVE	25° 34' 43"	
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)	19.50'	
LANE WIDTH (W)	13'	**
SHOULDER WIDTH (Shldr)	8'	***
VERTICAL GRADE (%)	2.500%	****
M DIMENSION	14.5'	

FDOT REQUIRED SSD

AASHTO REQUIRED SSD

ACTUAL SSD

FDOT REQUIRED SSD	151.00'	FDOT PPM, TABLE 2.7.1, January 2016.
AASHTO REQUIRED SSD	151.00'	AASHTO 2011, Table 3-1 & 3-2.
ACTUAL SSD	154.93'	EQUATION

SUFFICIENT FDOT SSD?

SUFFICIENT AASHTO SSD?

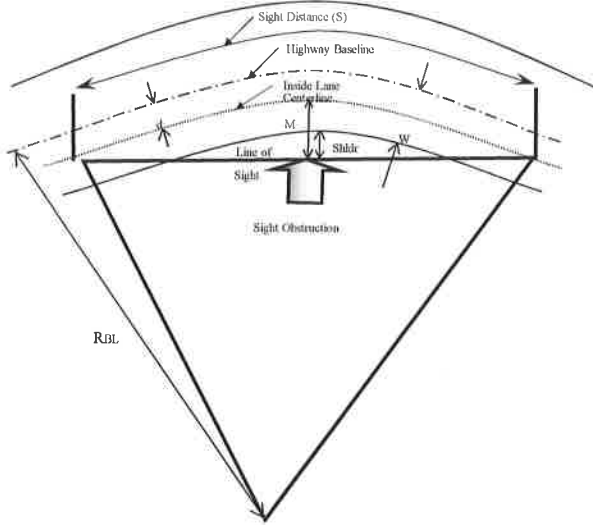
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH AN 8 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County) AECOM Project No: 60480256 Sheet 3 of 4  
 Description: Stopping Sight Distance Calculations for Computed By: MSP Date: 11/16/2016  
Eastbound Daryl Carter Pkwy Checked By: JW Date: 12/14/16  
Diverging Diamond (DDI) Section

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ \frac{M}{1 - R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

URBAN MAJOR COLLECTOR

DESIGN SPEED  
CURVE NO.  
RADIUS OF CURVE (R<sub>BL</sub>)  
DIRECTION OF CURVE (LT or RT)  
DEGREE OF CURVE  
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)  
LANE WIDTH (W)  
SHOULDER WIDTH (Shldr)  
VERTICAL GRADE (%)  
M DIMENSION

25 mph	
EBDCP3	*
224.00'	
RT	
25° 34' 43"	
19.50'	
13'	**
9'	***
-2.200%	****
15.5'	

FDOT REQUIRED SSD  
AASHTO REQUIRED SSD  
ACTUAL SSD

155.60'	FDOT PPM, TABLE 2.7.1, January 2016..
155.60'	AASHTO 2011, Table 3-1 & 3-2.
160.25'	EQUATION

SUFFICIENT FDOT SSD?  
SUFFICIENT AASHTO SSD?

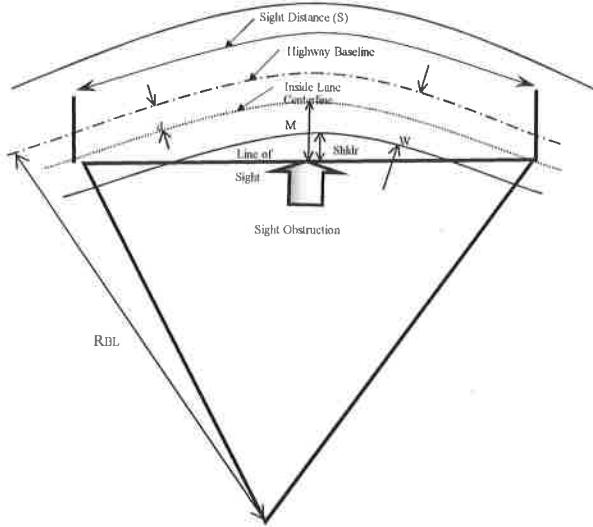
YES
YES

COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 9 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County) AECOM Project No: 60480256 Sheet 4 of 4  
 Description: Stopping Sight Distance Calculations for Computed By: MSP Date: 11/16/2016  
Eastbound Daryl Carter Pkwy Checked By: JLW Date: 12/14/16  
Diverging Diamond (DDI) Section

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \text{Cos-1} \left[ \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

URBAN MAJOR COLLECTOR

DESIGN SPEED  
CURVE NO.  
RADIUS OF CURVE (R<sub>BL</sub>)  
DIRECTION OF CURVE (LT or RT)  
DEGREE OF CURVE  
OFFSET DISTANCE FROM BASELINE TO  
CENTERLINE OF INSIDE LANE (d)  
LANE WIDTH (W)  
SHOULDER WIDTH (Shldr)  
VERTICAL GRADE (%)  
M DIMENSION

DESIGN SPEED	25 mph	
CURVE NO.	EBDCP4	*
RADIUS OF CURVE (R <sub>BL</sub> )	200.00'	
DIRECTION OF CURVE (LT or RT)	LT	
DEGREE OF CURVE	28° 38' 52"	
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)	6.50'	
LANE WIDTH (W)	13'	**
SHOULDER WIDTH (Shldr)	10'	***
VERTICAL GRADE (%)	-4.500%	****
M DIMENSION	16.5'	

FDOT REQUIRED SSD  
AASHTO REQUIRED SSD  
ACTUAL SSD

161.00'	FDOT PPM, TABLE 2.7.1, January 2016.
161.50'	AASHTO 2011, Table 3-1 & 3-2.
166.21'	EQUATION

SUFFICIENT FDOT SSD?  
SUFFICIENT AASHTO SSD?

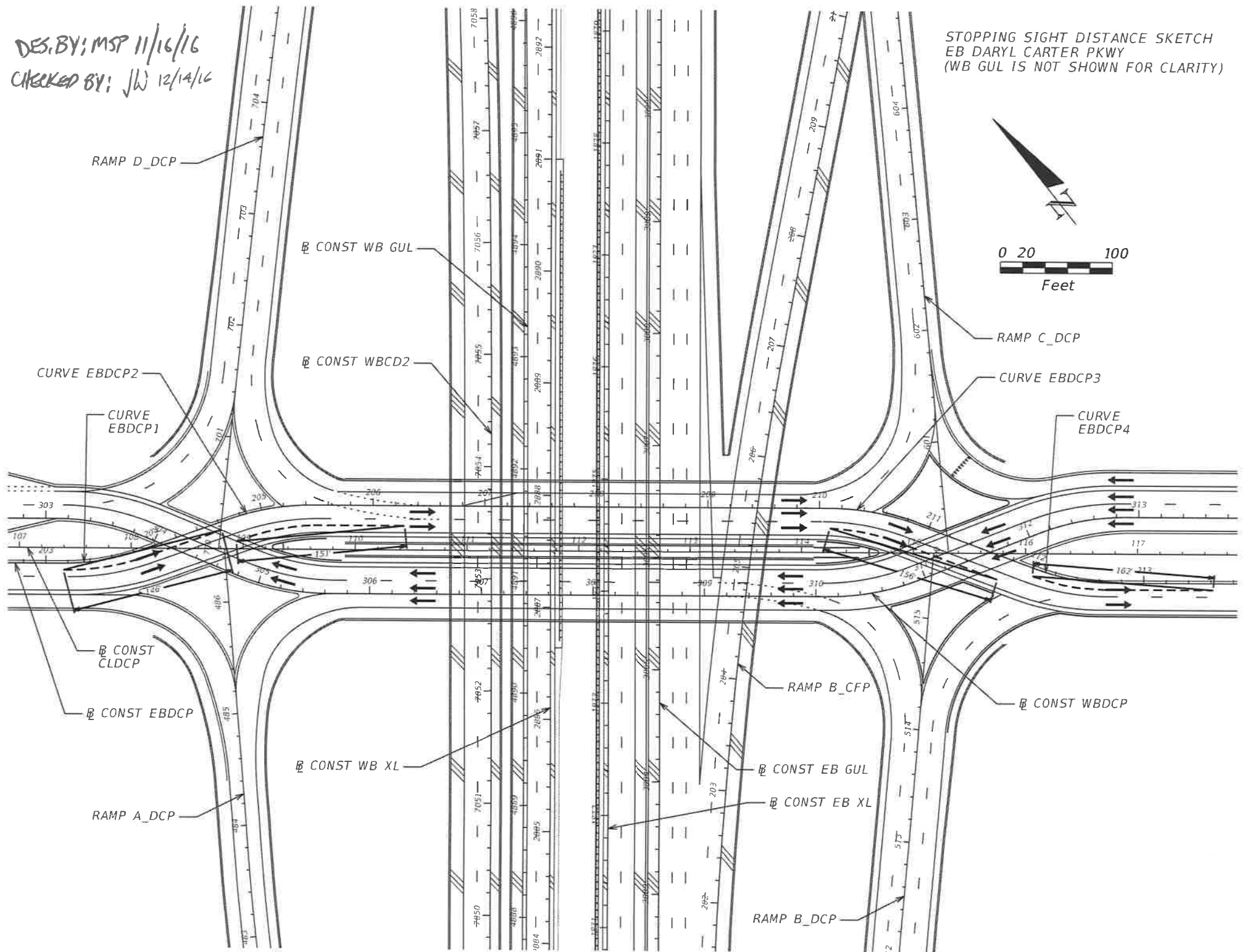
YES  
YES

COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 10 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.

DES. BY: MSP 11/16/16  
CHECKED BY: JW 12/14/16

STOPPING SIGHT DISTANCE SKETCH  
EB DARYL CARTER PKWY  
(WB GUL IS NOT SHOWN FOR CLARITY)





Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Eastbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Sheet 1 of 4  
 Date: 11/17/16  
 Date: 12/14/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>EB</u>		
CURVE NO.	<u>EBDCP1 (LT)</u>	PC STATION	<u>203+15.90</u>
DEGREE OF CURVE	<u>28° 38' 52"</u>	PT STATION	<u>203+84.85</u>
RADIUS OF CURVE	<u>200.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Eastbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: [Signature]

Sheet 2 of 4  
 Date: 11/17/16  
 Date: 12/14/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>EB</u>		
CURVE NO.	<u>EBDCP2 (RT)</u>	PC STATION	<u>204+69.33</u>
DEGREE OF CURVE	<u>25° 34' 43"</u>	PT STATION	<u>205+46.56</u>
RADIUS OF CURVE	<u>224.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A *</u>
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A *</u>
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A *</u>
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A *</u>

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.





Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Eastbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Sheet 3 of 4  
 Date: 11/17/16  
 Date: 12/14/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>EB</u>		
CURVE NO.	<u>EBDCP3 (RT)</u>	PC STATION	<u>210+09.43</u>
DEGREE OF CURVE	<u>25° 34' 43"</u>	PT STATION	<u>210+88.89</u>
RADIUS OF CURVE	<u>224.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Eastbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JL

Sheet 4 of 4  
 Date: 11/17/16  
 Date: 12/19/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )			
TRAVEL DIRECTION	<u>EB</u>		
CURVE NO.	<u>EBDCP4 (LT)</u>	PC STATION	<u>212+01.45</u>
DEGREE OF CURVE	<u>28° 38' 52"</u>	PT STATION	<u>212+72.40</u>
RADIUS OF CURVE	<u>200.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.

Des. by: SF 2/14/17  
 Checked by: ALF 2/16/17

HA\_WBDCPORA.OSF

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: Orange

Subject:

Job No. ORA Operator: SF

Date: Tuesday February 14, 2017 11:24 am

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 NOR NE STA 2 FILE: 'HA\_WBDCP'

\* 1 DES CHA WBDCP

Chain WBDCP contains:

WBDCP1 CUR WBDCP1 CUR WBDCP2 CUR WBDCP3 CUR WBDCP4 WBDCP2

Beginning chain WBDCP description

Point WBDCP1 N 1,477,715.2370 E 498,845.1336 Sta 300+00.00

Course from WBDCP1 to PC WBDCP1 S 51° 21' 11" E Dist 310.2912

Curve Data  
 \*-----\*

Curve WBDCP1

P.I. Station	303+49.62	N	1,477,496.8958	E	499,118.1867
Delta =	22° 14' 50"	(RT)			
Degree =	28° 38' 52"				
Tangent =	39.3241				
Length =	77.6576				
Radius =	200.0000				
External =	3.8293				
Long Chord =	77.1706				
Mid. Ord. =	3.7574				
P.C. Station	303+10.29	N	1,477,521.4545	E	499,087.4742
P.T. Station	303+87.95	N	1,477,462.5375	E	499,137.3149
C.C.		N	1,477,365.2524	E	498,962.5705
Back = S	51° 21' 11" E				
Ahead = S	29° 06' 21" E				
Chord Bear = S	40° 13' 46" E				

Course from PT WBDCP1 to PC WBDCP2 S 29° 06' 21" E Dist 89.6368

Curve Data  
 \*-----\*

Curve WBDCP2

P.I. Station	305+21.63	N	1,477,345.7385	E	499,202.3402
Delta =	22° 14' 50"	(LT)			
Degree =	25° 34' 43"				
Tangent =	44.0430				
Length =	86.9765				
Radius =	224.0000				
External =	4.2888				
Long Chord =	86.4311				
Mid. Ord. =	4.2082				
P.C. Station	304+77.59	N	1,477,384.2199	E	499,180.9165
P.T. Station	305+64.56	N	1,477,318.2329	E	499,236.7382
C.C.		N	1,477,493.1791	E	499,376.6303
Back = S	29° 06' 21" E				
Ahead = S	51° 21' 11" E				
Chord Bear = S	40° 13' 46" E				

Course from PT WBDCP2 to PC WBDCP3 S 51° 21' 11" E Dist 446.3461

HA\_WBDCPORA.OSF

Curve Data  
\*-----\*

Curve WBDCP3  
P.I. Station           310+53.79   N           1,477,012.7026   E           499,618.8282  
Delta                 =           21° 40' 25"   (LT)  
Degree                =           25° 34' 43"  
Tangent               =           42.8794  
Length                =           84.7338  
Radius                =           224.0000  
External              =           4.0672  
Long Chord            =           84.2295  
Mid. Ord.             =           3.9947  
P.C. Station           310+10.91   N           1,477,039.4816   E           499,585.3390  
P.T. Station           310+95.64   N           1,477,000.1850   E           499,659.8399  
C.C.                   N           1,477,214.4278   E           499,725.2311  
Back                 = S 51° 21' 11" E  
Ahead                = S 73° 01' 36" E  
Chord Bear           = S 62° 11' 24" E

Course from PT WBDCP3 to PC WBDCP4 S 73° 01' 36" E Dist 85.7687

Curve Data  
\*-----\*

Curve WBDCP4  
P.I. Station           312+21.99   N           1,476,963.3000   E           499,780.6872  
Delta                 =           21° 40' 25"   (RT)  
Degree                =           27° 01' 35"  
Tangent               =           40.5823  
Length                =           80.1945  
Radius                =           212.0000  
External              =           3.8493  
Long Chord            =           79.7172  
Mid. Ord.             =           3.7807  
P.C. Station           311+81.41   N           1,476,975.1470   E           499,741.8726  
P.T. Station           312+61.61   N           1,476,937.9556   E           499,812.3824  
C.C.                   N           1,476,772.3814   E           499,679.9845  
Back                 = S 73° 01' 36" E  
Ahead                = S 51° 21' 11" E  
Chord Bear           = S 62° 11' 24" E

Course from PT WBDCP4 to WBDCP2 S 51° 21' 11" E Dist 512.0948

Point WBDCP2           N   1,476,618.1429   E           500,212.3337   Sta   317+73.70

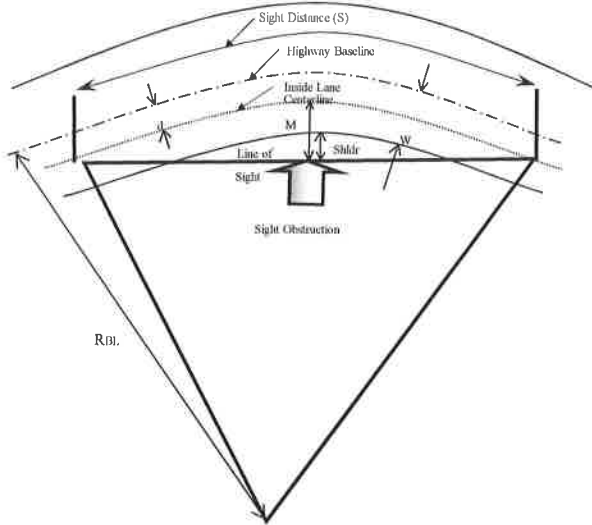
=====  
Ending chain WBDCP description

Job: **SR 400 (I-4) 242484-8-52-01 (Orange County)**  
 Description: **Stopping Sight Distance Calculations for Westbound Daryl Carter Pkwy**  
**Diverging Diamond (DDI) Section**

AECOM Project No: **60480256**  
 Computed By: **MSP**  
 Checked By: **JW**

Page      of       
 Sheet **1** of **4**  
 Date: **11/16/2016**  
 Date: **12/14/16**

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos-i \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>n</sub>+d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR+W/2

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*

URBAN MAJOR COLLECTOR

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE (*R<sub>BL</sub>*)  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)  
 LANE WIDTH (*W*)  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
*M DIMENSION*

25 mph
WBDCP1 *
200.00'
RT
28° 38' 52"
-6.50'
13' **
10' ***
-5.000% ****
16.5'

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

162.00'	FDOT PPM, TABLE 2.7.1, January 2016..
162.67'	AASHTO 2011, Table 3-1 & 3-2.
166.21'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
 YES

COMMENTS:

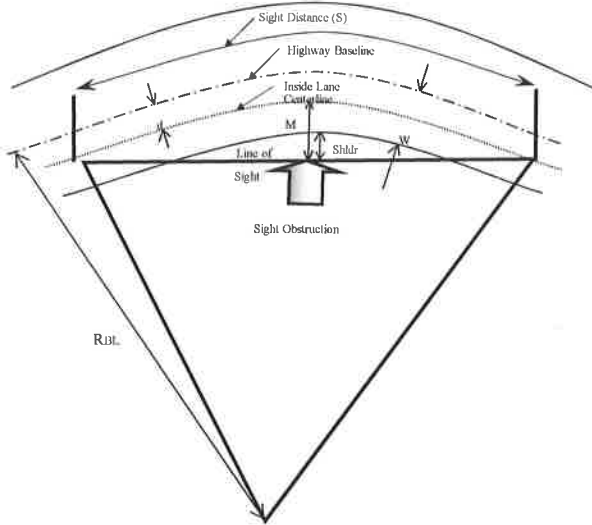
- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 7 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description: Stopping Sight Distance Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: VW

Page    of     
 Sheet 2 of 4  
 Date: 11/16/2016  
 Date: 12/14/16

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ \frac{M}{1 - R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>m</sub>+d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR+W/2

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*

URBAN MAJOR COLLECTOR

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

25 mph
WBDCP2
224.00'
LT
25° 34' 43"
-19.50'
13'
9'
-2.500%
15.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

156.50'	FDOT PPM, TABLE 2.7.1, January 2016..
156.50'	AASHTO 2011, Table 3-1 & 3-2.
160.25'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
 YES

COMMENTS:

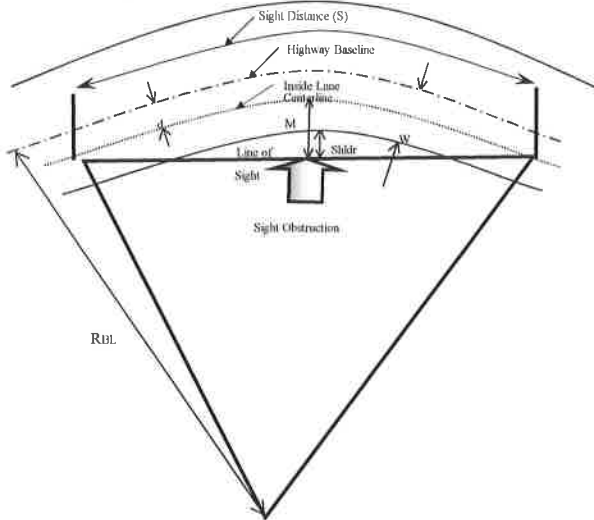
- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH AN 8 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description: Stopping Sight Distance Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Page      of       
 Sheet 3 of 4  
 Date: 11/16/2016  
 Date: 12/14/16

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*

DESIGN SPEED

CURVE NO.

RADIUS OF CURVE ( $R_{BL}$ )

DIRECTION OF CURVE (LT or RT)

DEGREE OF CURVE

OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE ( $d$ )

LANE WIDTH ( $W$ )

SHOULDER WIDTH (Shldr)

VERTICAL GRADE (%)

*M DIMENSION*

### URBAN MAJOR COLLECTOR

DESIGN SPEED	25 mph
CURVE NO.	WBDCP3 *
RADIUS OF CURVE ( $R_{BL}$ )	224.00'
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	25° 34' 43"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	-19.50'
LANE WIDTH ( $W$ )	13' **
SHOULDER WIDTH (Shldr)	8' ***
VERTICAL GRADE (%)	2.300% ****
<i>M DIMENSION</i>	14.5'

**FDOT REQUIRED SSD**

**AASHTO REQUIRED SSD**

**ACTUAL SSD**

152.60'	FDOT PPM, TABLE 2.7.1, January 2016.
152.60'	AASHTO 2011, Table 3-1 & 3-2.
154.93'	EQUATION

**SUFFICIENT FDOT SSD?**

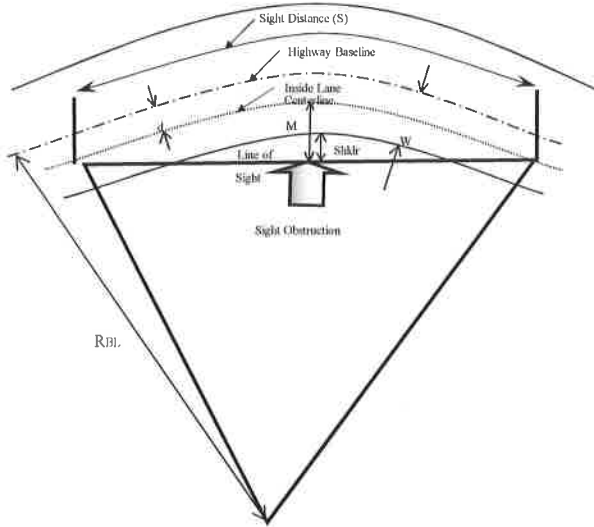
**SUFFICIENT AASHTO SSD?**

YES
YES

COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 9 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ \frac{M}{1 - R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>BL</sub> + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
AASHTO - 2011 3-109

TYPE OF ROADWAY  
(Interstate, All other facilities)

DESIGN SPEED

CURVE NO.

RADIUS OF CURVE ( $R_{BL}$ )

DIRECTION OF CURVE (LT or RT)

DEGREE OF CURVE

OFFSET DISTANCE FROM BASELINE TO  
CENTERLINE OF INSIDE LANE ( $d$ )

LANE WIDTH ( $W$ )

SHOULDER WIDTH (Shldr)

VERTICAL GRADE (%)

M DIMENSION

### URBAN MAJOR COLLECTOR

25 mph	
WBDCP4	*
212.00'	
RT	
27° 1' 35"	
6.50'	
13'	**
10'	***
4.500%	****
16.5'	

FDOT REQUIRED SSD

AASHTO REQUIRED SSD

ACTUAL SSD

145.00'	FDOT PPM, TABLE 2.7.1, January 2016..
145.00'	AASHTO 2011, Table 3-1 & 3-2.
165.81'	EQUATION

SUFFICIENT FDOT SSD?

SUFFICIENT AASHTO SSD?

YES
YES

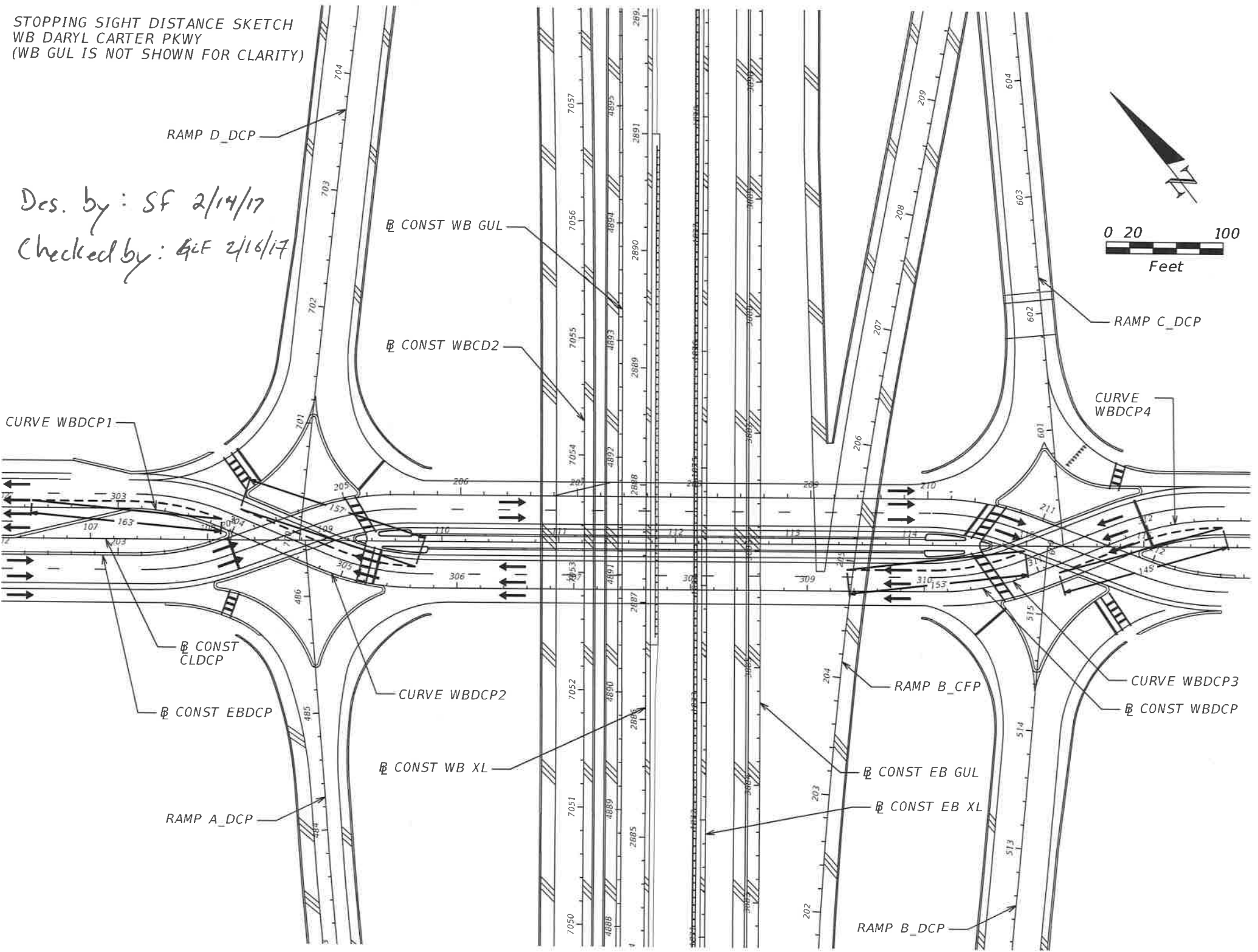
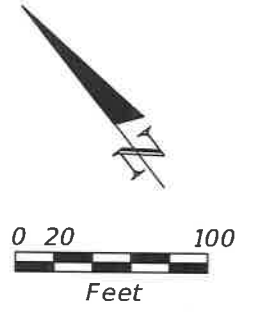
COMMENTS:

- \* THIS CURVE IS PART OF THE DDI "CROSSOVER."
- \*\* LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.
- \*\*\* ALTHOUGH A 10 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.
- \*\*\*\* GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.



STOPPING SIGHT DISTANCE SKETCH  
WB DARYL CARTER PKWY  
(WB GUL IS NOT SHOWN FOR CLARITY)

Des. by: SF 2/14/17  
Checked by: GCF 2/16/17





Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Sheet 1 of 4  
 Date: 11/17/16  
 Date: 12/14/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>WBDCP1 (RT)</u>	PC STATION	<u>303+10.29</u>
DEGREE OF CURVE	<u>28° 38' 52"</u>	PT STATION	<u>303+87.95</u>
RADIUS OF CURVE	<u>200.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A *</u>
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A *</u>
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A *</u>
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A *</u>

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Sheet 2 of 4  
 Date: 11/17/16  
 Date: 12/14/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>WBDCP2 (LT)</u>	PC STATION	<u>304+77.59</u>
DEGREE OF CURVE	<u>25° 34' 43"</u>	PT STATION	<u>305+64.56</u>
RADIUS OF CURVE	<u>224.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A *</u>
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A *</u>
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A *</u>
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A *</u>

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: MSP  
 Checked By: JW

Sheet 3 of 4  
 Date: 11/17/16  
 Date: 12/12/16

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>WBDCP3 (LT)</u>	PC STATION	<u>310+10.91</u>
DEGREE OF CURVE	<u>25° 34' 43"</u>	PT STATION	<u>310+95.64</u>
RADIUS OF CURVE	<u>224.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description Super Elevation Transition Calculations for  
Westbound Daryl Carter Pkwy  
Diverging Diamond (DDI) Section

AECOM Project No: 60480256  
 Computed By: SF  
 Checked By: GLF

Sheet 4 of 4  
 Date: 2/14/17  
 Date: 2/16/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Urban</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>WBDCP4 (RT)</u>	PC STATION	<u>311+81.41</u>
DEGREE OF CURVE	<u>27° 1' 35"</u>	PT STATION	<u>312+61.61</u>
RADIUS OF CURVE	<u>212.00'</u>		
DESIGN SPEED	<u>25 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A</u> *
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A</u> *
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A</u> *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

\* Existing pavement's NC cross slope to be used. The curve meets minimum radius requirement with no superelevation for low speed urban streets per 2013 Florida Greenbook Table 3-4.

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DES. BY: JW 8/9/17

Project: DCP Interim

Subject:

CHECKED BY: MSP 8/23/17

Job No. DCP Operator: MP

Date: Wednesday August 23, 2017 9:57 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IB\_DCP'

\* 1 des cha ib\_dcp

Chain IB\_DCP contains:

IBDCP1 CUR IB\_DCP\_1 CUR IB\_DCP\_2 IBDCP2

Beginning chain IB\_DCP description

Description: CUR IMSP1

Point IBDCP1 N 1,475,671.6493 E 498,322.5754 Sta 496+46.69

Course from IBDCP1 to PC IB\_DCP\_1 N 42° 39' 45.27" E Dist 324.1914

Curve Data

\*-----\*

Curve IB\_DCP\_1

P.I. Station 502+05.71 N 1,476,082.7320 E 498,701.4147  
 Delta = 6° 45' 12.41" (RT)  
 Degree = 1° 26' 22.53"  
 Tangent = 234.8330  
 Length = 469.1221  
 Radius = 3,980.0000  
 External = 6.9219  
 Long Chord = 468.8506  
 Mid. Ord. = 6.9099  
 P.C. Station 499+70.88 N 1,475,910.0458 E 498,542.2732  
 P.T. Station 504+40.00 N 1,476,235.5054 E 498,879.7594  
 C.C. N 1,473,212.8815 E 501,468.9957  
 Back = N 42° 39' 45.27" E  
 Ahead = N 49° 24' 57.67" E  
 Chord Bear = N 46° 02' 21.47" E

Course from PT IB\_DCP\_1 to PC IB\_DCP\_2 N 49° 24' 57.67" E Dist 250.0870

Curve Data

\*-----\*

Curve IB\_DCP\_2

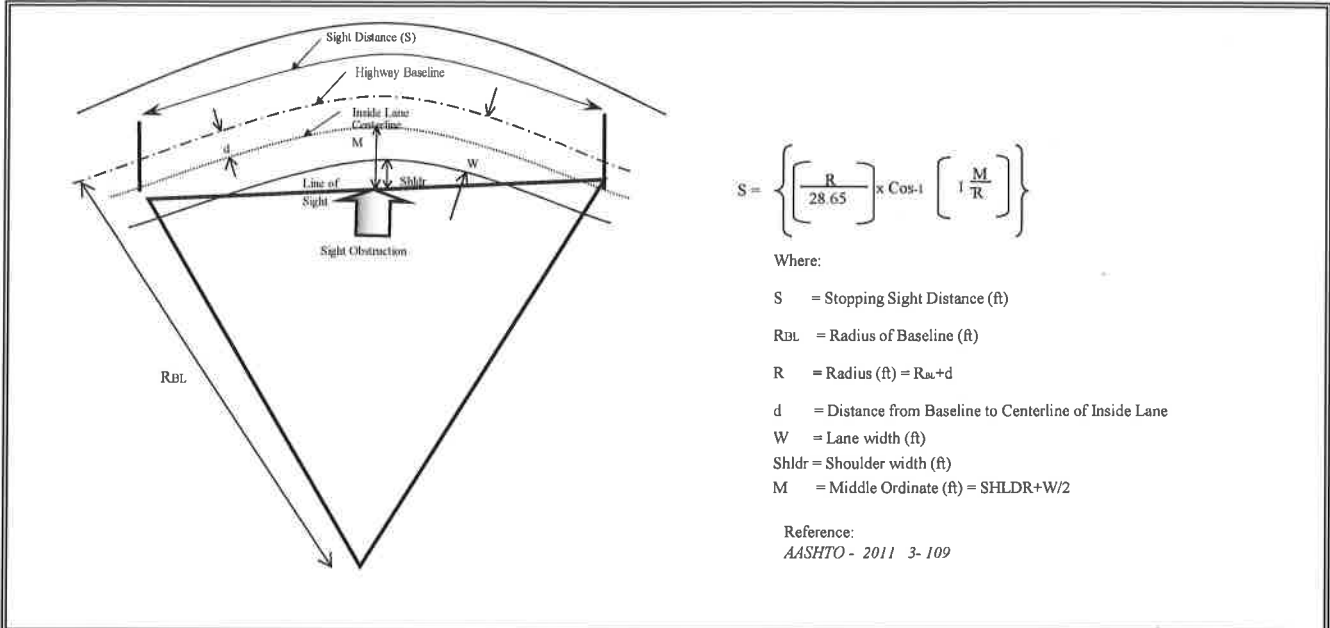
P.I. Station 509+35.00 N 1,476,557.5361 E 499,255.6918  
 Delta = 6° 06' 59.96" (LT)  
 Degree = 1° 14' 59.67"  
 Tangent = 244.9169  
 Length = 489.3685  
 Radius = 4,584.0000  
 External = 6.5381  
 Long Chord = 489.1362  
 Mid. Ord. = 6.5288  
 P.C. Station 506+90.09 N 1,476,398.2025 E 499,069.6888  
 P.T. Station 511+79.46 N 1,476,735.7818 E 499,423.6583  
 C.C. N 1,479,879.5361 E 496,087.5131  
 Back = N 49° 24' 57.67" E  
 Ahead = N 43° 17' 57.71" E  
 Chord Bear = N 46° 21' 27.69" E

Course from PT IB\_DCP\_2 to IBDCP2 N 43° 17' 57.71" E Dist 378.9137

Point IBDCP2 N 1,477,011.5477 E 499,683.5212 Sta 515+58.37

Ending chain IB\_DCP description

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
(Interstate, All other facilities)

All Other Facilities

DESIGN SPEED

50 mph

CURVE NO.

IB\_DCP\_1

RADIUS OF CURVE (R<sub>BL</sub>)

3,980.00'

DIRECTION OF CURVE (LT or RT)

RT

DEGREE OF CURVE

1° 26' 23"

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)

-7.50'

LANE WIDTH (W)

15'

SHOULDER WIDTH (Shldr)

6'

VERTICAL GRADE (%)

4.000%

M DIMENSION

13.5'

FDOT REQUIRED SSD

399.00'

FDOT PPM, TABLE 2.7.1, January 2016.

AASHTO REQUIRED SSD

399.33'

AASHTO 2011, Table 3-1 & 3-2.

ACTUAL SSD

656.38'

EQUATION

SUFFICIENT FDOT SSD?

YES

SUFFICIENT AASHTO SSD?

YES

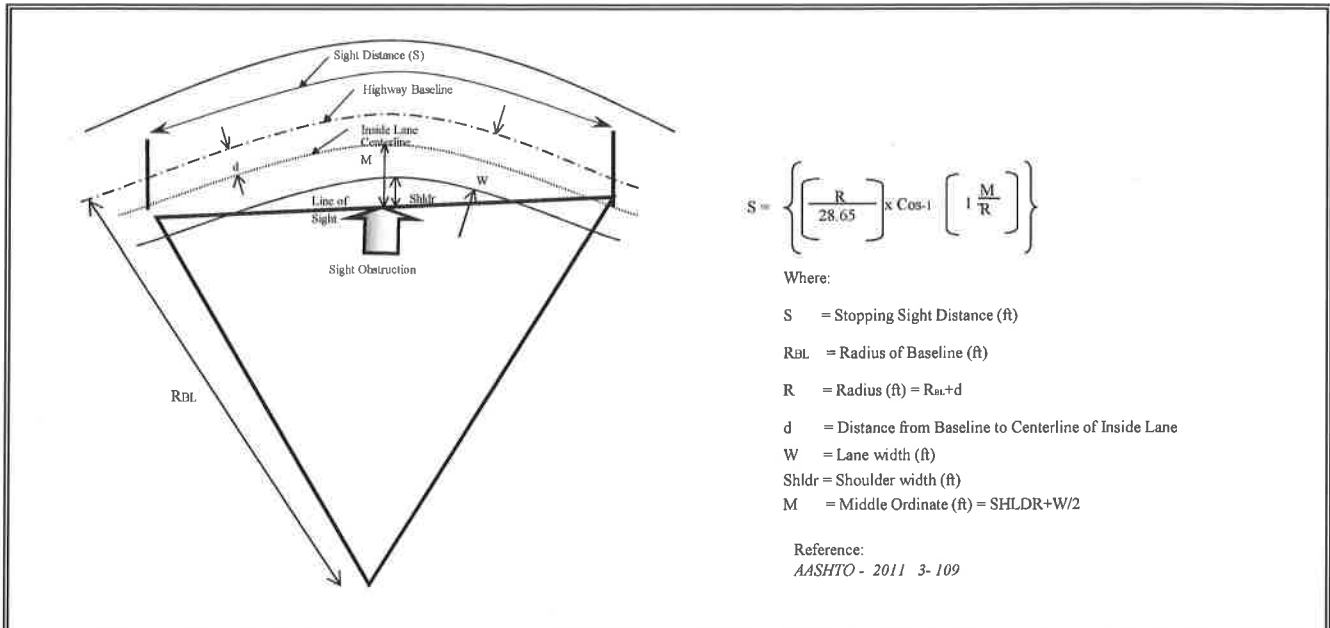
COMMENTS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
*(Interstate, All other facilities)*

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

50 mph
IB_DCP_2
4,584.00'
LT
1° 14' 60"
-6.00'
12'
6'
1.887%
12.0'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
663.03'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
 YES

COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for  
Ramp IB\_DCP (EBI4 TO DCP)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 2  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY (*Rural or Urban*) Rural  
*(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)*  
 TRAVEL DIRECTION EB  
 CURVE NO. IB\_DCP\_1 (RT)  
 DEGREE OF CURVE 1° 26' 23"  
 RADIUS OF CURVE 3,980.00'  
 DESIGN SPEED 50 mph  
 e= 0.030  
 SE SPLIT INTO CURVE (Tangent/Curve) 9 91 \*\*  
 SE SPLIT OUT OF CURVE (Tangent/Curve) 80 20

PC STATION 499+70.88  
 PT STATION 504+40.00  
 BEGIN TRANSITION 499+61.88 \*  
 BEGIN FULL SUPER 500+61.88 \*  
 END FULL SUPER 504+20.00 \*  
 END TRANSITION 505+20.00 \*

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
<b>1-LANE RAMP</b>				0.00		
* (+) 0.035 to (+) 0.03	0.005	15	200	100.00	499+61.88	500+61.88
TOTAL LENGTH INTO CURVE				<b>100.00</b>		
				0.00		
<b>1-LANE RAMP</b>				0.00		
(+) 0.03 to (+) 0.02	0.010	15	200	100.00	504+20.00	505+20.00
TOTAL LENGTH OUT OF CURVE				<b>100.00</b>		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.

\* LANE SLOPED AT (+) 0.035 THROUGH RAMP TERMINAL.

\*\* SPLIT CHOSEN TO BEGIN TRANSITION OUTSIDE OF RAMP TERMINAL.



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IB\_DCP (EBI4 TO DCP)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 2 of 2  
 Date: 8/10/2017  
 Date: 8/24/2017

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	Rural				
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>					
TRAVEL DIRECTION	EB				
CURVE NO.	B_DCP2 (LT)		PC STATION	506+90.09	
DEGREE OF CURVE	1° 14' 60"		PT STATION	511+79.46	
RADIUS OF CURVE	4,584.00'				
DESIGN SPEED	50 mph		BEGIN TRANSITION	505+79.69	
e=	0.026		BEGIN FULL SUPER	507+17.69	
SE SPLIT INTO CURVE (Tangent/Curve)	80	20	END FULL SUPER	511+35.30	
SE SPLIT OUT OF CURVE (Tangent/Curve)	80	20	END TRANSITION	513+56.10	

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>2-LANE RAMP</b>				0.00		
				0.00		
* (+) 0.02 to Full Super (-) 0.026 (left lane) = (-) 0.02 to Full Super (+) 0.026 (right lane)	0.046	15	200	138.00	505+79.69	507+17.69
TOTAL LENGTH INTO CURVE				<b>138.00</b>		
<b>4-LANE RAMP</b>				0.00		
Full Super (-) 0.026 to (-) 0.02 (left lanes)	0.006	24	200	50.00	511+69.46	512+19.46 **
Full Super (+) 0.026 to (-) 0.02 (right lanes)	0.046	24	200	220.80	511+35.30	513+56.10
TOTAL LENGTH OUT OF CURVE				<b>270.80</b>		

ZERO XSLOPE INTO CURVE	506+39.69
ZERO XSLOPE OUT OF CURVE	512+60.10

NOTE: CHAIN AND PGL ARE IN THE CENTER.

\* LEFT LANE WIDTH VARIES FROM 15' TO 12'. USED 15' TO ACHIEVE GREATER TRANSITION LENGTH.

\*\* THE LOW SPEED CRITERIA FOR MINIMUM TRANSITION LENGTH OF 50' WAS USED, ASSUME 30 MPH APPROACHING THE INTERSECTION.

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP  
 Date: Thursday September 14, 2017 10:40 am

*DES. BY: JW 8/14/17*

*CHECKED BY: MSP 9/14/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_IB\_DCP'

\* 1 pri pro ib\_dcp

Beginning profile IB\_DCP description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	496+46.69	126.8700				
VPI	2	496+89.17	127.1500	0.6591			
VPI	3	497+00.00	127.2400	0.8310			
VPI	4	497+50.00	127.5400	0.6000			
VPI	5	498+00.00	127.7500	0.4200			
VPI	6	498+50.00	128.1300	0.7600			
VPI	7	499+00.00	128.4100	0.5600			
VPI	8	499+50.00	128.6800	0.5400			
VPI	9	499+61.55	128.7800	0.8658			
VPI	10	500+00.00	129.0900	0.8062			
VPI	11	500+50.00	129.5300	0.8800			
VPI	12	505+39.59	134.9702	1.1112			
VPC		505+39.59	134.9702	1.0168	K = 96.0		
VPI	13	506+39.59	135.9869		200.0000	100.0000	100.0000
VPT		507+39.59	139.0870	3.1000			
VPC		510+06.13	147.3497	3.1000	K = 142.9	SSD = 663.8	
VPI	14	511+56.13	151.9997		300.0000	150.0000	150.0000
VPT		513+06.13	153.4998	1.0000			
VPI	15	515+08.26	155.5211	1.0000			

Ending profile IB\_DCP description

DES. BY: BM 9/27/17  
CHECKED BY: 9/27/17  
MSP

TAKE-OFF GRADE SKETCH  
RAMP IB\_DCP PROFILE

STA 515+20.00  
EL = 155.63'

STA 515+08.26  
EL = 155.52'

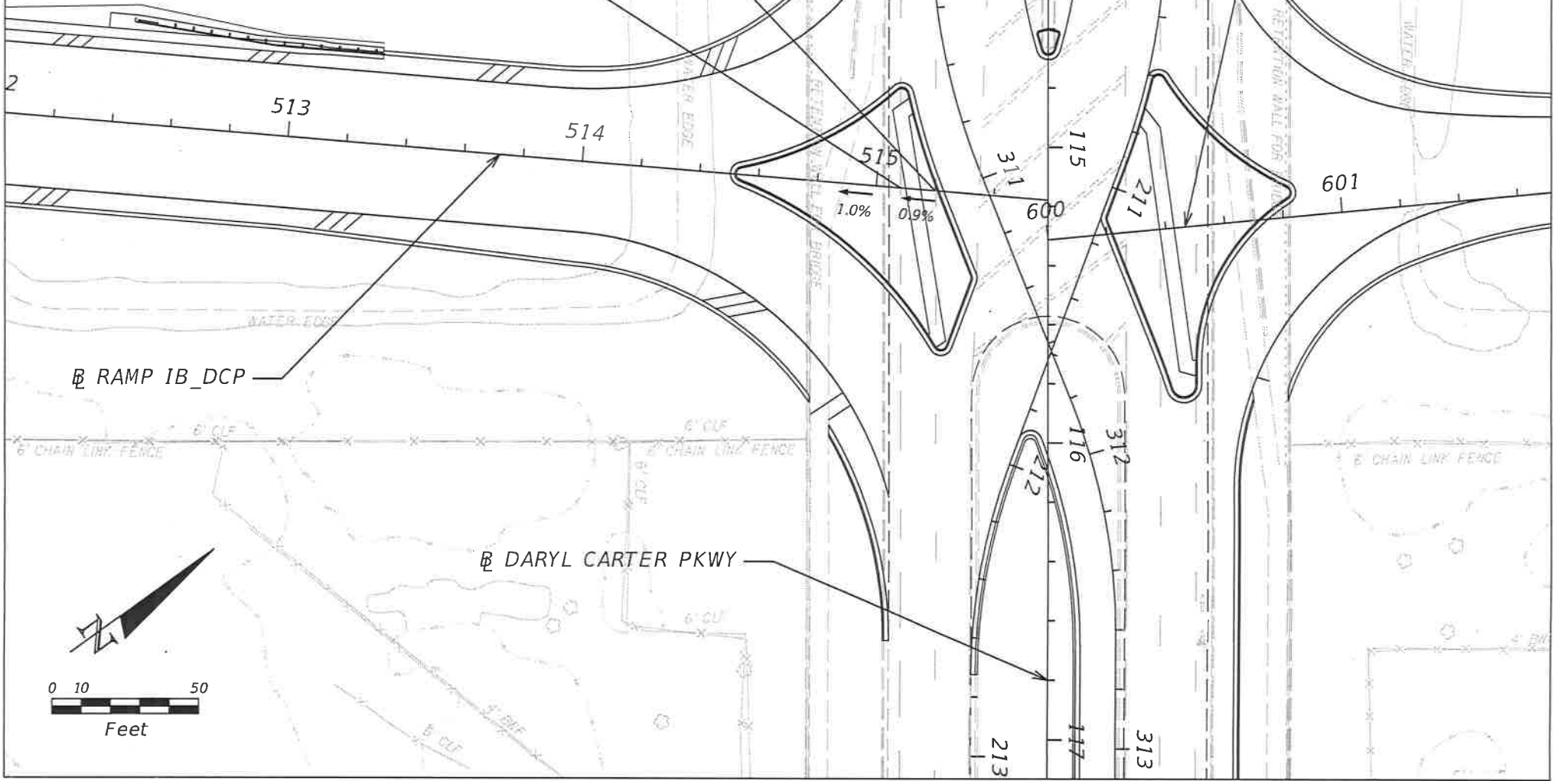
⊕ EBDP

⊕ WBDP

⊕ RAMP IC\_DCP

⊕ RAMP IB\_DCP

⊕ DARYL CARTER PKWY





## Ramp Terminal - Detail

Sheet 1 of 2

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp IB\_DCP Exit terminal  
 with existing EBI-4

AECOM Project No: 60480256  
 Computed By: AS  
 Checked By: MSP

Date: 8/17/2017  
 Date: 9/14/2017

MAINLINE				GORE		RAMP					
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	Gore Width	Gore Slope (%)	Inside Elev.	*Pavement Slope (%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
BL400	N/A	-3.00%	127.29	0.00	-3.50%	127.29	-3.50%	12.00	126.87	IB_DCP	496+46.69
BL400	N/A	-3.00%	127.67	0.00	-3.50%	127.67	-3.50%	15.00	127.15	IB_DCP	496+89.17
BL400	N/A	-3.00%	127.78	0.76	-3.50%	127.76	-3.50%	15.00	127.24	IB_DCP	497+00.00
BL400	N/A	-3.00%	128.21	4.24	-3.50%	128.06	-3.50%	15.00	127.54	IB_DCP	497+50.00
BL400	N/A	-3.00%	128.54	7.73	-3.50%	128.27	-3.50%	15.00	127.75	IB_DCP	498+00.00
BL400	N/A	-3.00%	129.04	11.22	-3.50%	128.65	-3.50%	15.00	128.13	IB_DCP	498+50.00
BL400	N/A	-3.00%	129.44	14.71	-3.50%	128.93	-3.50%	15.00	128.41	IB_DCP	499+00.00
BL400	N/A	-3.00%	<b>129.84</b>	18.19	-3.50%	129.20	-3.50%	15.00	128.68	IB_DCP	499+50.00
BL400	N/A	-3.00%	<b>129.96</b>	19.00	-3.50%	129.30	-3.50%	15.00	128.78	IB_DCP	499+61.55
BL400	N/A	-3.00%	<b>130.37</b>	21.80	-3.50%	129.61	-3.50%	15.00	129.09	IB_DCP	500+00.00
BL400	N/A	-3.00%	<b>130.96</b>	25.98	-3.50%	130.05	-3.50%	15.00	129.53	IB_DCP	500+50.00

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Sheet 2 of 2

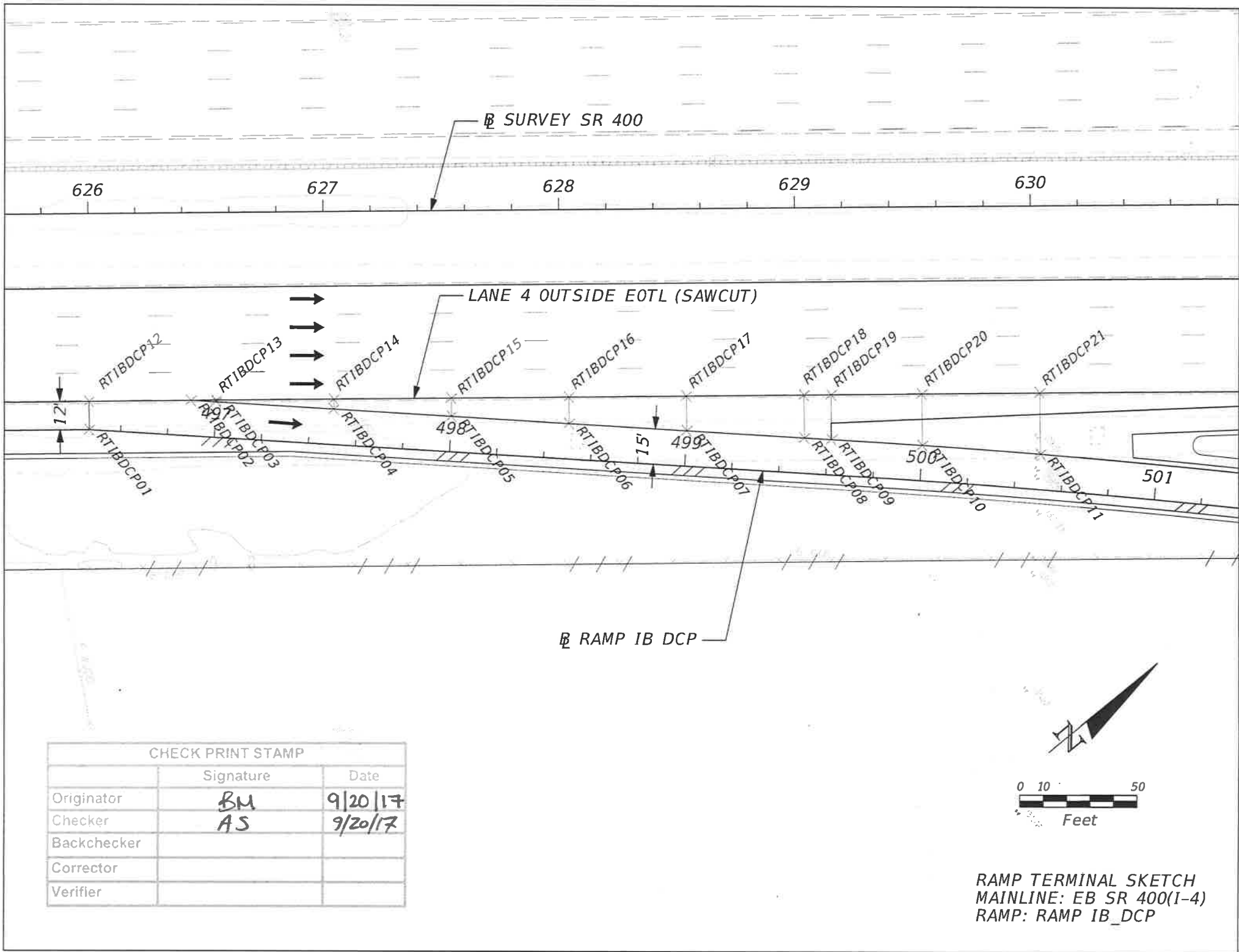
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp IB\_DCP Exit terminal  
with existing EBI-4

AECOM Project No: 60480256  
 Computed By: AS  
 Checked By: MSP

Date: 8/17/2017  
 Date: 9/14/2017

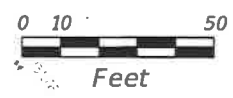
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	COGO Pt. No.	Gore Width	Baseline	Ramp Station	*Pavement Slope (%)	COGO Width	Pavement Width
BL400	N/A	-3.00%	127.29	RTIBDCP12	0.00	IB_DCP	496+46.69	-3.50%	0.00	12.00
BL400	N/A	-3.00%	127.67	RTIBDCP02	0.00	IB_DCP	496+89.17	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	127.78	RTIBDCP13	0.76	IB_DCP	497+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	128.21	RTIBDCP14	4.24	IB_DCP	497+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	128.54	RTIBDCP15	7.73	IB_DCP	498+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	129.04	RTIBDCP16	11.22	IB_DCP	498+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	129.44	RTIBDCP17	14.71	IB_DCP	499+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	<b>129.84</b>	RTIBDCP18	18.19	IB_DCP	499+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	<b>129.96</b>	RTIBDCP19	19.00	IB_DCP	499+61.55	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	<b>130.37</b>	RTIBDCP20	21.80	IB_DCP	500+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	<b>130.96</b>	RTIBDCP21	25.98	IB_DCP	500+50.00	-3.50%	-15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL. Nominal, actual slope varies.



CHECK PRINT STAMP

	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: EB SR 400(1-4)  
 RAMP: RAMP IB\_DCP

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim

Subject:

Job No. DCP Operator: AS

Date: Thursday August 17, 2017 8:00 am

CHECK PRINT STAMP		
	Signature	Date
Originator	AS	8/17/17
Checker	MSP	8/30/17
Backchecker		
Corrector		
Verifier		

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RTIB

\* 1 \$ POINTS ALONG EB1-4 OUTSIDE EOP (SAWCUT) \$

\* 2 PRI POI RTIBDCP12 RTIBDCP02 RTIBDCP13-RTIBDCP21

Point	North	East	Station	Elevation
RTIBDCP12	1,475,679.1461	498,313.2053	0+00.00	127.2856
RTIBDCP02	1,475,713.0546	498,340.3349	0+00.00	127.6742
RTIBDCP13	1,475,721.4903	498,347.0841	0+00.00	127.7844
RTIBDCP14	1,475,760.4371	498,378.2446	0+00.00	128.2105
RTIBDCP15	1,475,799.3840	498,409.4052	0+00.00	128.5387
RTIBDCP16	1,475,838.3308	498,440.5657	0+00.00	129.0440
RTIBDCP17	1,475,877.2776	498,471.7262	0+00.00	129.4410
RTIBDCP18	1,475,916.2244	498,502.8868	0+00.00	129.6973
RTIBDCP19	1,475,925.2184	498,510.0826	0+00.00	129.7269
RTIBDCP20	1,475,955.2507	498,534.1109	0+00.00	129.9182
RTIBDCP21	1,475,994.3033	498,565.3561	0+00.00	130.0866

\* 3 \$ PAVEMENT AND GORE WIDTH CALCULATIONS \$

\* 4 INV RTIBDCP12 RTIBDCP01

Inverse RTIBDCP12 to RTIBDCP01 S 51° 20' 14.73" E Distance 12.0000

\* 5 INV RTIBDCP13 RTIBDCP03

Inverse RTIBDCP13 to RTIBDCP03 S 51° 20' 14.73" E Distance 0.7554

\* 6 INV RTIBDCP14 RTIBDCP04

Inverse RTIBDCP14 to RTIBDCP04 S 51° 20' 14.73" E Distance 4.2433

\* 7 INV RTIBDCP15 RTIBDCP05

Inverse RTIBDCP15 to RTIBDCP05 S 51° 20' 14.73" E Distance 7.7311

\* 8 INV RTIBDCP16 RTIBDCP06

Inverse RTIBDCP16 to RTIBDCP06 S 51° 20' 14.73" E Distance 11.2189

\* 9 INV RTIBDCP17 RTIBDCP07

Inverse RTIBDCP17 to RTIBDCP07 S 51° 20' 14.73" E Distance 14.7067

\* 10 INV RTIBDCP18 RTIBDCP08

Inverse RTIBDCP18 to RTIBDCP08 S 51° 20' 14.73" E Distance 18.1946



\* 11 INV RTIBDCP19 RTIBDCP09

Inverse RTIBDCP19 to RTIBDCP09 S 51° 20' 14.73" E Distance 19.0000

\* 12 INV RTIBDCP20 RTIBDCP10

Inverse RTIBDCP20 to RTIBDCP10 S 51° 20' 14.73" E Distance 21.7967

\* 13 INV RTIBDCP21 RTIBDCP11

Inverse RTIBDCP21 to RTIBDCP11 S 51° 20' 14.73" E Distance 25.9781

\* 14 \$ POINTS ALONG RAMP INSIDE EOT \$

\* 15 LAY OFF CHA IB\_DCP RTIBDCP01-RTIBDCP11

Point	North	East	Station	Offset	R
RTIBDCP01	1,475,671.6493	498,322.5754	496+46.69	0.0000	-
RTIBDCP02	1,475,713.0546	498,340.3349	496+89.17	-15.0000	-
RTIBDCP03	1,475,721.0184	498,347.6739	497+00.00	-15.0000	-
RTIBDCP04	1,475,757.7862	498,381.5579	497+50.00	-15.0000	-
RTIBDCP05	1,475,794.5541	498,415.4419	498+00.00	-15.0000	-
RTIBDCP06	1,475,831.3220	498,449.3259	498+50.00	-15.0000	-
RTIBDCP07	1,475,868.0898	498,483.2098	499+00.00	-15.0000	-
RTIBDCP08	1,475,904.8577	498,517.0938	499+50.00	-15.0000	-
RTIBDCP09	1,475,913.3484	498,524.9186	499+61.55	-15.0000	-
RTIBDCP10	1,475,941.6336	498,551.1306	500+00.00	-15.0000	-
RTIBDCP11	1,475,978.0739	498,585.6408	500+50.00	-15.0000	-

DES. BY: JW 8/8/17  
CHECKED BY: MSP 8/8/17

File: c:\pwworking\aecom\_na\msphillips\d0165016\HA\_IC\_DCPDCP.OBM 8/8/2017,  
6:56:48 PM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim

Subject:

Job No. DCP Operator: BM

Date: Tuesday August 8, 2017 4:28 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IC\_DCP'

\* 1 des ✓ cha ic\_dcp

Chain IC\_DCP contains:

ICDCP1 CUR IC\_DCP1 CUR IC\_DCP2

Beginning chain IC\_DCP description

=====

Point ICDCP1 N 1,477,003.2005 E 499,693.9601 Sta  
600+00.00

Course from ICDCP1 to PC IC\_DCP1 N 33° 08' 33.55" E Dist 597.5658

Curve Data

\*-----\*

Curve IC_DCP1			
P.I. Station	608+20.08	N	1,477,689.8634 E
500,142.3188			
Delta	=	3° 03' 27.79" (LT)	
Degree	=	0° 41' 14.09"	
Tangent	=	222.5143	
Length	=	444.9230	
Radius	=	8,337.0000	
External	=	2.9689	
Long Chord	=	444.8702	
Mid. Ord.	=	2.9679	
P.C. Station	✓ 605+97.57	N	1,477,503.5495 E
500,020.6645			
P.T. Station	✓ 610+42.49	N	1,477,882.4013 E
500,253.8615			
C.C.		N	1,482,061.5996 E
493,039.9949			

Back = N 33° 08' 33.55" E  
Ahead = N 30° 05' 05.76" E  
Chord Bear = N 31° 36' 49.66" E

Course from PT IC\_DCP1 to PC IC\_DCP2 N 30° 05' 05.76" E Dist 232.8261

Curve Data

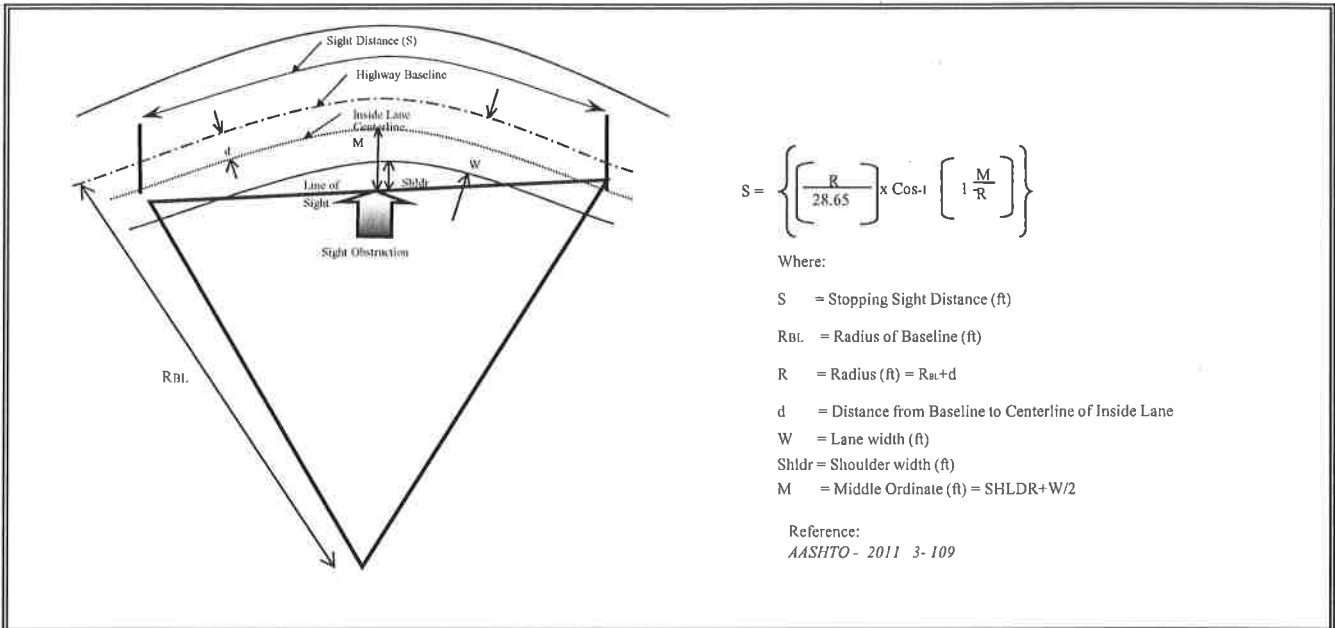
\*-----\*

Curve IC\_DCP2  
P.I. Station 618+96.16 N 1,478,621.0661 E  
500,681.7910  
Delta = 8° 30' 16.21" (RT)  
Degree = 0° 41' 10.24"  
Tangent = 620.8420  
Length = 1,239.4035  
Radius = 8,350.0000  
External = 23.0487  
Long Chord = 1,238.2661  
Mid. Ord. = 22.9853  
P.C. Station 612+75.32 N 1,478,083.8619 E  
500,370.5733  
P.T. Station 625+14.72 N 1,479,106.3383 E  
501,069.0323  
C.C. N 1,473,898.1469 E  
507,595.6886  
Back = N 30° 05' 05.76" E  
Ahead = N 38° 35' 21.97" E  
Chord Bear = N 34° 20' 13.87" E

=====  
=====

Ending chain IC\_DCP description

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
(Interstate, All other facilities)

All Other Facilities

DESIGN SPEED

50 mph

CURVE NO.

IC\_DCP\_1

RADIUS OF CURVE (R<sub>BL</sub>)

8,337.00'

DIRECTION OF CURVE (LT or RT)

LT

DEGREE OF CURVE

0° 41' 14"

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)

-18.00'

LANE WIDTH (W)

12'

SHOULDER WIDTH (Shldr)

6' \*

VERTICAL GRADE (%)

-4.500%

M DIMENSION

12.0'

FDOT REQUIRED SSD

459.00'

FDOT PPM, TABLE 2.7.1, January 2016.

AASHTO REQUIRED SSD

460.00'

AASHTO 2011, Table 3-1 & 3-2.

ACTUAL SSD

893.70'

EQUATION

SUFFICIENT FDOT SSD?

YES

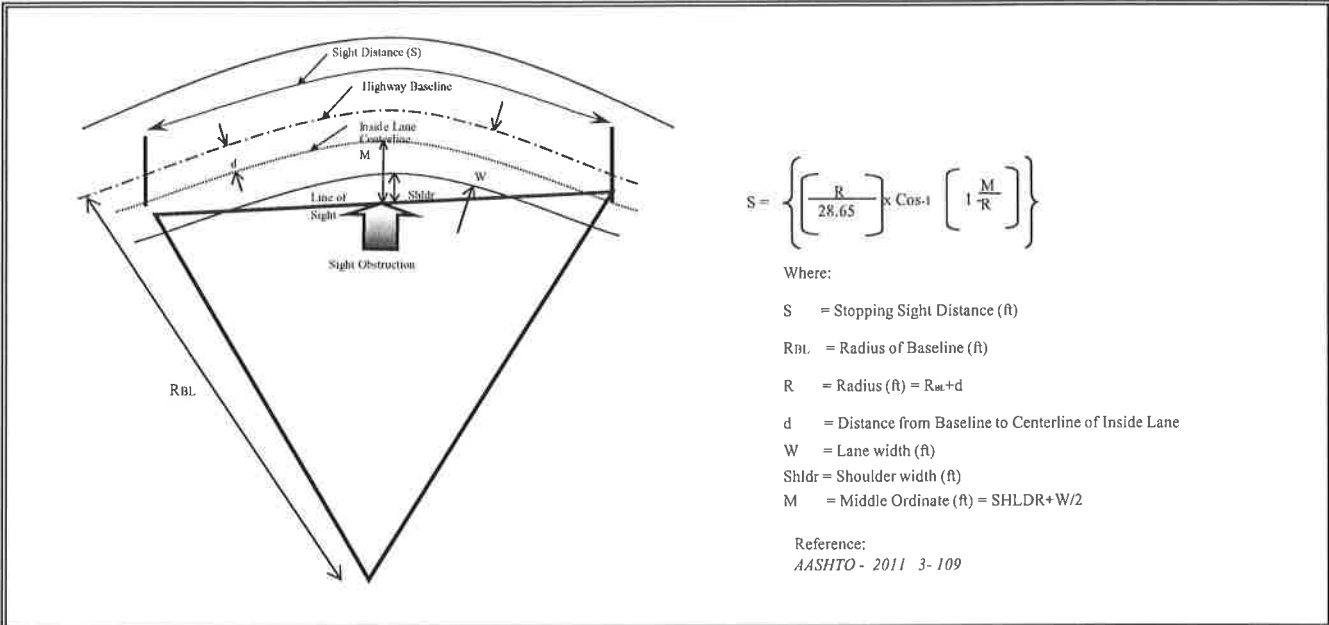
SUFFICIENT AASHTO SSD?

YES

COMMENTS:

\* INSIDE BRIDGE SHOULDER WIDTH

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
(Interstate, All other facilities)

All Other Facilities

DESIGN SPEED

50 mph

CURVE NO.

IC DCP 2

RADIUS OF CURVE (R<sub>BL</sub>)

8,350.00'

DIRECTION OF CURVE (LT or RT)

RT

DEGREE OF CURVE

0° 41' 10"

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)

-7.50'

LANE WIDTH (W)

15'

SHOULDER WIDTH (Shldr)

12'

VERTICAL GRADE (%)

-4.500%

M DIMENSION

19.5'

FDOT REQUIRED SSD

459.00'

FDOT PPM, TABLE 2.7.1, January 2016.

AASHTO REQUIRED SSD

460.00'

AASHTO 2011, Table 3-1 & 3-2.

ACTUAL SSD

1,141.97'

EQUATION

SUFFICIENT FDOT SSD?

YES

SUFFICIENT AASHTO SSD?

YES

COMMENTS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IC DCP (DCP TO EB14)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 2  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY (Rural or Urban)	<u>Rural</u>					
(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)						
TRAVEL DIRECTION	<u>EB</u>					
CURVE NO.	<u>IC_DCP_1 (LT)</u>	PC STATION	<u>605+97.57</u>			
DEGREE OF CURVE	<u>0° 41' 14"</u>	PT STATION	<u>610+42.49</u>			
RADIUS OF CURVE	<u>8,337.00'</u>	BEGIN TRANSITION	<u>N/A *</u>			
DESIGN SPEED	<u>50 mph</u>	BEGIN FULL SUPER	<u>N/A *</u>			
e=	<u>NC</u>	END FULL SUPER	<u>N/A *</u>			
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A *</u>			
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>					
TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>2-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
<b>2-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
PAVEMENT SLOPED AT RC (+0.02) THROUGH CURVE TO MATCH ULTIMATE CONDITIONS WHICH EXCEED THE REQUIRED MIN. SE.						
NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.						
* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.						



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IC\_DCP (DCP TO EBI4)**

AECOM Project No: 60480256  
 Computed By: AS  
 Checked By: MSP

Page      of       
 Sheet 2 of 2  
 Date: 9/15/17  
 Date: 9/15/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>				
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>					
TRAVEL DIRECTION	<u>EB</u>				
CURVE NO.	<u>IC_DCP_2 (RT)</u>	PC STATION	<u>612+75.32</u>		
DEGREE OF CURVE	<u>0° 41' 10"</u>	PT STATION	<u>625+14.72</u>		
RADIUS OF CURVE	<u>8,350.00'</u>	BEGIN TRANSITION	<u>N/A</u>		
DESIGN SPEED	<u>50 mph</u>	BEGIN FULL SUPER	<u>N/A</u>		
e=	<u>NC</u>	END FULL SUPER	<u>N/A</u>		
SE SPLIT INTO CURVE (Tangent/Curve)	<u>    </u>	END TRANSITION	<u>N/A</u>		
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>    </u>				

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
<b>1-LANE RAMP</b>				0.00		
* (+) 0.02 to (+) 0.035 at Ramp Terminal STA. 619+37.19	0.015	15	200	100.00	618+37.19	619+37.19
TOTAL LENGTH OUT OF CURVE				<b>100.00</b>		

ZERO XSLOPE INTO CURVE	<u>N/A</u>	* MIN. REQD SUPERELEVATION. PORTION OF CURVE LIES WITHIN THE RAMP TERMINAL WITH EB 1-4. CROSS SLOPE OF RAMP WITHIN RAMP TERMINAL WILL BE (+) 0.035 WHICH EXCEEDS REQD MIN. SUPERELEVATION.
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>	

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Wednesday December 6, 2017 3:21 pm

DES. BY: MSP 12/6/17  
 Checked By:  
 SF 12/6/17

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_IC\_DCP'

\* 1 pri pro ic\_dcp

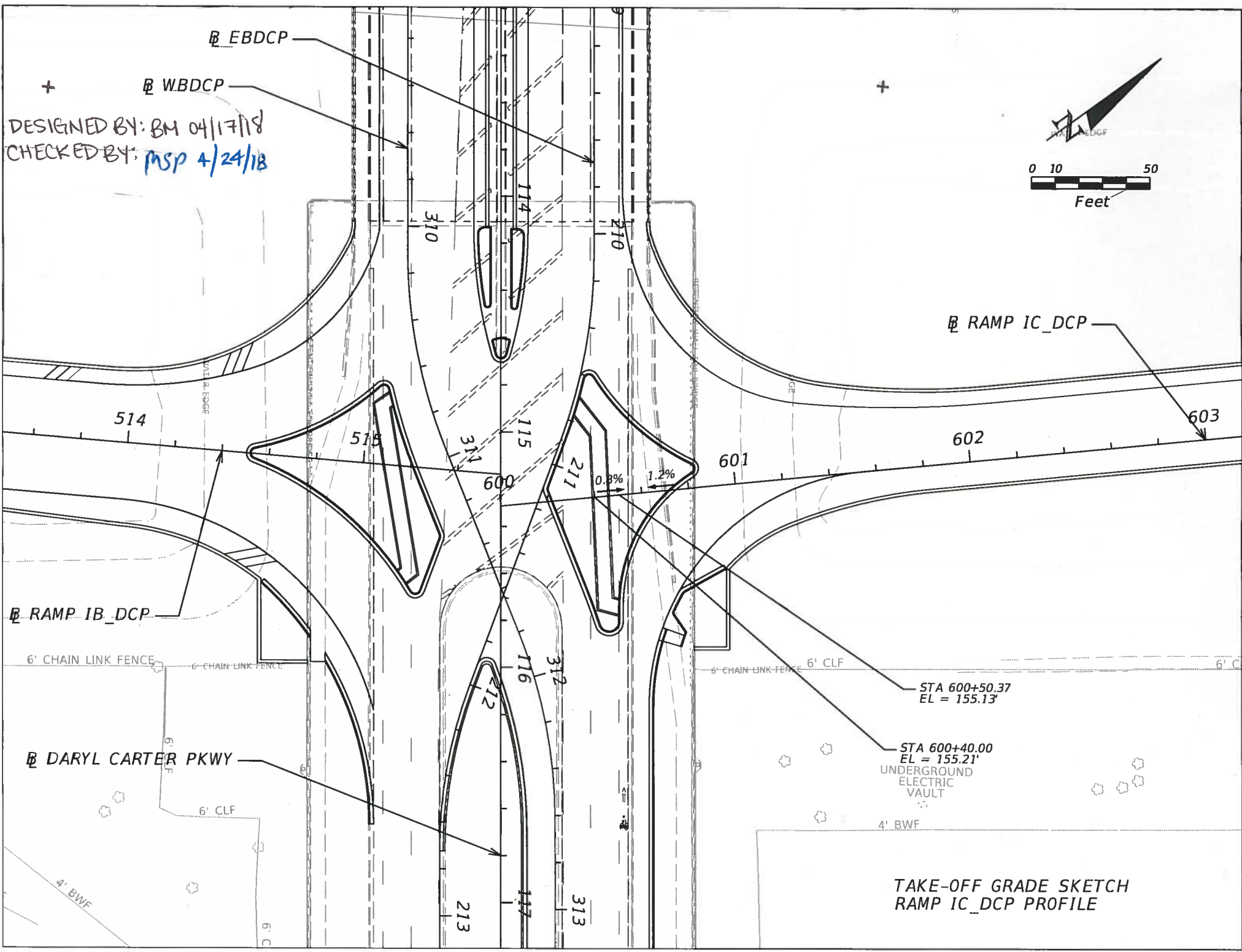
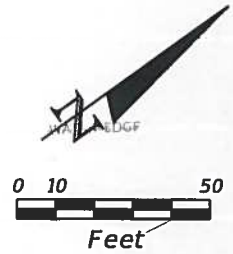
Beginning profile IC\_DCP description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	600+50.37	155.1261				
VPC		602+39.18	157.3919	1.2000	K = 136.0	SSD = 541.7	
High Point		604+02.38	158.3711				
VPI	2	606+47.18	162.2879		816.0000	408.0000	408.0000
VPT		610+55.18	142.7040	-4.8000			
VPC		614+74.00	122.6006	-4.8000	K = 100.1	min = 96	
VPI	3	616+74.00	113.0007		400.0000	200.0000	200.0000
VPT		618+74.00	111.3892	-0.8058			
VPI	4	619+37.19	110.8800	-0.8058			
VPI	5	619+50.00	110.7800	-0.7806			
VPI	6	620+00.00	110.3100	-0.9400			
VPI	7	620+50.00	110.0000	-0.6200			
VPI	8	621+00.00	109.7400	-0.5200			
VPI	9	621+50.00	109.5700	-0.3400			
VPI	10	622+00.00	109.3000	-0.5400			
VPI	11	622+50.00	109.3300	0.0600			
VPI	12	622+91.08	109.4100	0.1947			

Ending profile IC\_DCP description



DESIGNED BY: BM 04/17/18  
CHECKED BY: MSP 4/24/18



TAKE-OFF GRADE SKETCH  
RAMP IC\_DCP PROFILE



## Ramp Terminal - Detail

Sheet 1 of 2

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp IC\_DCP Entrance  
terminal with existing EBI-4

AECOM Project No: 60480256  
 Computed By: AS  
 Checked By: MSP

Date: 8/21/2017  
 Date: 8/30/2017

MAINLINE				GORE		RAMP					
Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	Gore Width	Gore Slope (%)	Inside Elev.	*Pavement Slope (%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
BL400	N/A	-3.00%	112.00	17.00	-3.50%	111.40	-3.50%	15.00	110.88	IC_DCP	619+37.19
BL400	N/A	-3.00%	111.87	16.12	-3.50%	111.30	-3.50%	15.00	110.78	IC_DCP	619+50.00
BL400	N/A	-3.00%	111.28	12.89	-3.50%	110.83	-3.50%	15.00	110.31	IC_DCP	620+00.00
BL400	N/A	-3.00%	110.87	9.95	-3.50%	110.52	-3.50%	15.00	110.00	IC_DCP	620+50.00
BL400	N/A	-3.00%	110.51	7.32	-3.50%	110.26	-3.50%	15.00	109.74	IC_DCP	621+00.00
BL400	N/A	-3.00%	110.26	4.98	-3.50%	110.09	-3.50%	15.00	109.57	IC_DCP	621+50.00
BL400	N/A	-3.00%	109.93	2.94	-3.50%	109.82	-3.50%	15.00	109.30	IC_DCP	622+00.00
BL400	N/A	-3.00%	109.90	1.20	-3.50%	109.85	-3.50%	15.00	109.33	IC_DCP	622+50.00
BL400	N/A	-3.00%	109.93	0.00	-3.50%	109.93	-3.50%	15.00	109.41	IC_DCP	622+91.08

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Sheet 2 of 2

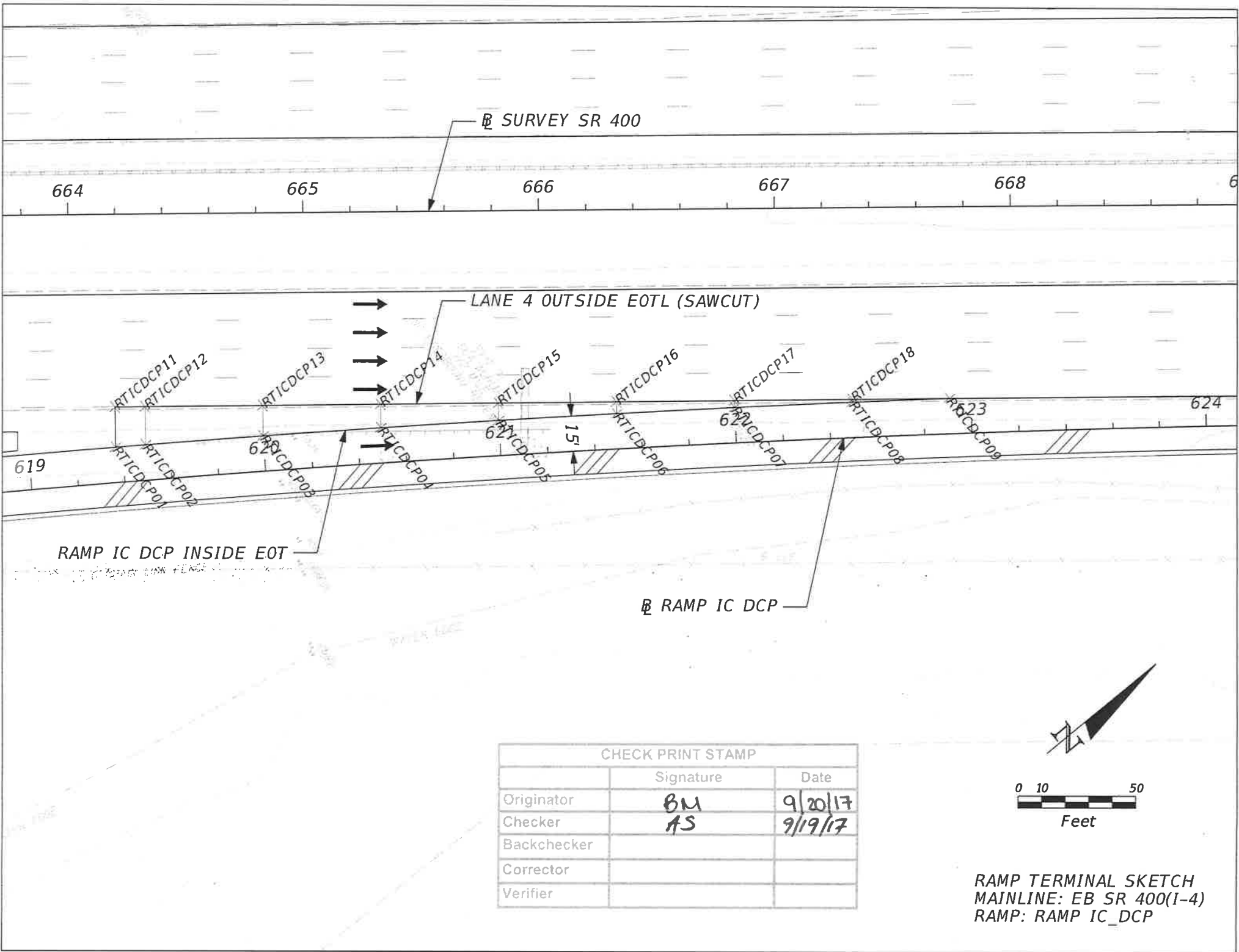
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp IC\_DCP Entrance  
terminal with existing EBI-4

AECOM Project No: 60480256  
 Computed By: AS  
 Checked By: MSP

Date: 8/21/2017  
 Date: 8/30/2017

Baseline	Mainline Station	*Outside Travel Lane Slope (%)	Outside EOT Elev.	COGO Pt. No.	Gore Width	Baseline	Ramp Station	*Pavement Slope (%)	COGO Width	Pavement Width
BL400	N/A	-3.00%	112.00	RTICDCP11	17.00	IC_DCP	619+37.19	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	111.87	RTICDCP12	16.12	IC_DCP	619+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	111.28	RTICDCP13	12.89	IC_DCP	620+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	110.87	RTICDCP14	9.95	IC_DCP	620+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	110.51	RTICDCP15	7.32	IC_DCP	621+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	110.26	RTICDCP16	4.98	IC_DCP	621+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	109.93	RTICDCP17	2.94	IC_DCP	622+00.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	109.90	RTICDCP18	1.20	IC_DCP	622+50.00	-3.50%	-15.00	15.00
BL400	N/A	-3.00%	109.93	RTICDCP09	0.00	IC_DCP	622+91.08	-3.50%	-15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL. Nominal, actual slope varies.



⊕ SURVEY SR 400

664                      665                      666                      667                      668                      6

LANE 4 OUTSIDE EOTL (SAWCUT)

RTICDCP11  
RTICDCP12

RTICDCP13

RTICDCP14

RTICDCP15

RTICDCP16

RTICDCP17

RTICDCP18

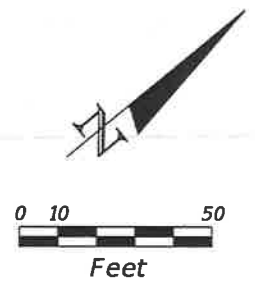
619

624

RAMP IC DCP INSIDE EOT

⊕ RAMP IC DCP

CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/19/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
MAINLINE: EB SR 400(I-4)  
RAMP: RAMP IC\_DCP

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Project: DCP Interim

Subject:

Job No. DCP Operator: AS

Date: Monday August 21, 2017 8:02 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RTIC'

CHECK PRINT STAMP		
	Signature	Date
Originator	AS	8/21/17
Checker	MSP	8/20/17
Backchecker		
Corrector		
Verifier		

\* 1 \$ POINTS ALONG EBI4 OUTSIDE EOP (SAWCUT) \$

\* 2 PRI POI RTICDCP11-RTICDCP18 RTICDCP09

Point	North	East	Station	Elevation
RTICDCP11	1,478,661.9594	500,699.0710	0+00.00	111.9996
RTICDCP12	1,478,671.9631	500,707.0538	0+00.00	111.8665
RTICDCP13	1,478,711.0333	500,738.2313	0+00.00	111.2795
RTICDCP14	1,478,750.1179	500,769.4204	0+00.00	110.8696
RTICDCP15	1,478,789.2156	500,800.6198	0+00.00	110.5136
RTICDCP16	1,478,828.3248	500,831.8285	0+00.00	110.2626
RTICDCP17	1,478,867.4444	500,863.0454	0+00.00	109.9254
RTICDCP18	1,478,906.5727	500,894.2694	0+00.00	109.8958
RTICDCP09	1,478,938.7281	500,919.9290	0+00.00	109.9329

\* 3 \$ PAVEMENT AND GORE WIDTH CALCULATIONS \$

\* 4 INV RTICDCP11 RTICDCP01

Inverse RTICDCP11 to RTICDCP01 S 51° 24' 38.03" E Distance 17.0000

\* 5 INV RTICDCP12 RTICDCP02

Inverse RTICDCP12 to RTICDCP02 S 51° 24' 38.03" E Distance 16.1232

\* 6 INV RTICDCP13 RTICDCP03

Inverse RTICDCP13 to RTICDCP03 S 51° 24' 38.03" E Distance 12.8879

\* 7 INV RTICDCP14 RTICDCP04

Inverse RTICDCP14 to RTICDCP04 S 51° 24' 38.03" E Distance 9.9518

\* 8 INV RTICDCP15 RTICDCP05

Inverse RTICDCP15 to RTICDCP05 S 51° 24' 38.03" E Distance 7.3153

\* 9 INV RTICDCP16 RTICDCP06

Inverse RTICDCP16 to RTICDCP06 S 51° 24' 38.03" E Distance 4.9783

\* 10 INV RTICDCP17 RTICDCP07

Inverse RTICDCP17 to RTICDCP07 S 51° 24' 38.03" E Distance 2.9410

\* 11 INV RTICDCP18 RTICDCP08

Inverse RTICDCP18 to RTICDCP08 S 51° 24' 38.03" E Distance 1.2034

\* 12 \$ POINTS ALONG RAMP INSIDE EOT \$

\* 13 LAY OFF (CHA IC\_DCH RTICDCP01-RTICDCP09

Point	North	East	Station	Offset	R
RTICDCP01	1,478,651.3559	500,712.3588	619+37.19	-15.0000	-
RTICDCP02	1,478,661.9065	500,719.6563	619+50.00	-15.0000	-
RTICDCP03	1,478,702.9947	500,748.3049	620+00.00	-15.0000	-
RTICDCP04	1,478,743.9106	500,777.1991	620+50.00	-15.0000	-
RTICDCP05	1,478,784.6528	500,806.3377	621+00.00	-15.0000	-
RTICDCP06	1,478,825.2197	500,835.7197	621+50.00	-15.0000	-
RTICDCP07	1,478,865.6100	500,865.3442	622+00.00	-15.0000	-
RTICDCP08	1,478,905.8222	500,895.2100	622+50.00	-15.0000	-
RTICDCP09	1,478,938.7281	500,919.9290	622+91.08	-15.0000	-

DES. BY: MSP 6/20/16  
 CHECKED BY: GLF 8/30/16

D\_DCPORA.OSF

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Project: Orange

Subject:

Job No. ORA Operator: SF

Date: Friday July 22, 2016 8:53 am

SYSTEM FIX 4 ASEC 0 BEAR PRI 0 RED NE STA 2 FILE: 'D\_DCP'

\* 1 DES CHA D\_DCP

Chain D\_DCP contains:

DCP1 CUR D\_DCP1 CUR D\_DCP2 DCP2

Beginning chain D\_DCP description

Point DCP1 N 1,477,411.1040 E 499,183.8441 Sta 700+00.00

Course from DCP1 to PC D\_DCP1 N 44° 32' 29" E Dist 294.0000

Curve Data

\*-----\*

Curve D\_DCP1  
 P.I. Station 705+02.74 N 1,477,769.4263 E 499,536.4758  
 Delta = 2° 23' 30" (RT)  
 Degree = 0° 34' 23"  
 Tangent = 208.7364  
 Length = 417.4122  
 Radius = 10,000.0000 SE = 1/2  
 External = 2.1783  
 Long Chord = 417.3819  
 Mid. Ord. = 2.1778  
 P.C. Station 702+94.00 N 1,477,620.6507 E 499,390.0629  
 P.T. Station 707+11.41 N 1,477,911.9626 E 499,688.9693  
 C.C. N 1,470,606.4056 E 506,517.5005  
 Back = N 44° 32' 29" E  
 Ahead = N 46° 55' 59" E  
 Chord Bear = N 45° 44' 14" E

Course from PT D\_DCP1 to PC D\_DCP2 N 46° 55' 59" E Dist 120.0000

Curve Data

\*-----\*

MIN TANGENT REQ'D FOR SE TRANS  
 = 0.8 (150') = 120'

Curve D\_DCP2  
 P.I. Station 712+30.42 N 1,478,266.3703 E 500,068.1352  
 Delta = 11° 41' 00" (LT)  
 Degree = 1° 28' 09"  
 Tangent = 399.0101  
 Length = 795.2532  
 Radius = 3,900.0000 SE = 0.02  
 External = 20.3583  
 Long Chord = 793.8762  
 Mid. Ord. = 20.2526  
 P.C. Station 708+31.41 N 1,477,993.9049 E 499,776.6360  
 P.T. Station 716+26.67 N 1,478,592.2195 E 500,298.4205  
 C.C. N 1,480,843.0721 E 497,113.5089  
 Back = N 46° 55' 59" E  
 Ahead = N 35° 14' 59" E  
 Chord Bear = N 41° 05' 29" E

Course from PT D\_DCP2 to DCP2 N 35° 14' 59" E Dist 100.2250

D\_DCPORA.OSF

Point DCP2            N    1,478,674.0676    E    500,356.2646    Sta    717+26.89

=====  
Ending chain D\_DCP description

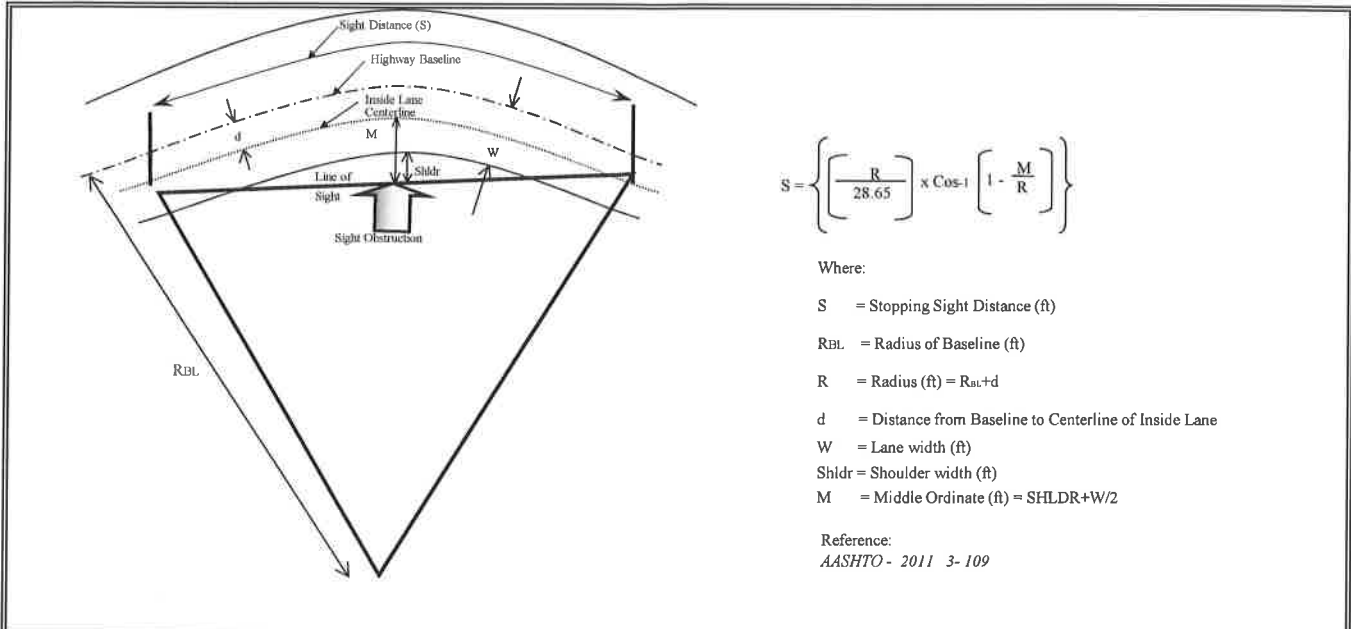


Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description: Stopping Sight Distance Calculations for Ramp D\_DCP

AECOM Project No: 60480256  
 Computed By: SF  
 Checked By: GLF

Page      of       
 Sheet 1 of 2  
 Date: 7/22/2016  
 Date: 8/30/2016

## STOPPING SIGHT DISTANCE CALCULATIONS



**TYPE OF ROADWAY**  
*(Interstate, All other facilities)*

**RAMP**

DESIGN SPEED

50 mph

CURVE NO.

D\_DCP-1

RADIUS OF CURVE ( $R_{BL}$ )

10,000.00'

DIRECTION OF CURVE (LT or RT)

RT

DEGREE OF CURVE

0° 34' 23"

OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )

6.00'

LANE WIDTH ( $W$ )

12'

SHOULDER WIDTH (Shldr)

6'

\*\*

VERTICAL GRADE (%)

2.470%

*M DIMENSION*

12.0'

**FDOT REQUIRED SSD**

415.60'

FDOT PPM, TABLE 2.7.1, January 2016.

**AASHTO REQUIRED SSD**

415.60'

AASHTO 2011, Table 3-1 & 3-2.

**ACTUAL SSD**

979.53'

EQUATION

**SUFFICIENT FDOT SSD?**

YES

**SUFFICIENT AASHTO SSD?**

YES

COMMENTS:

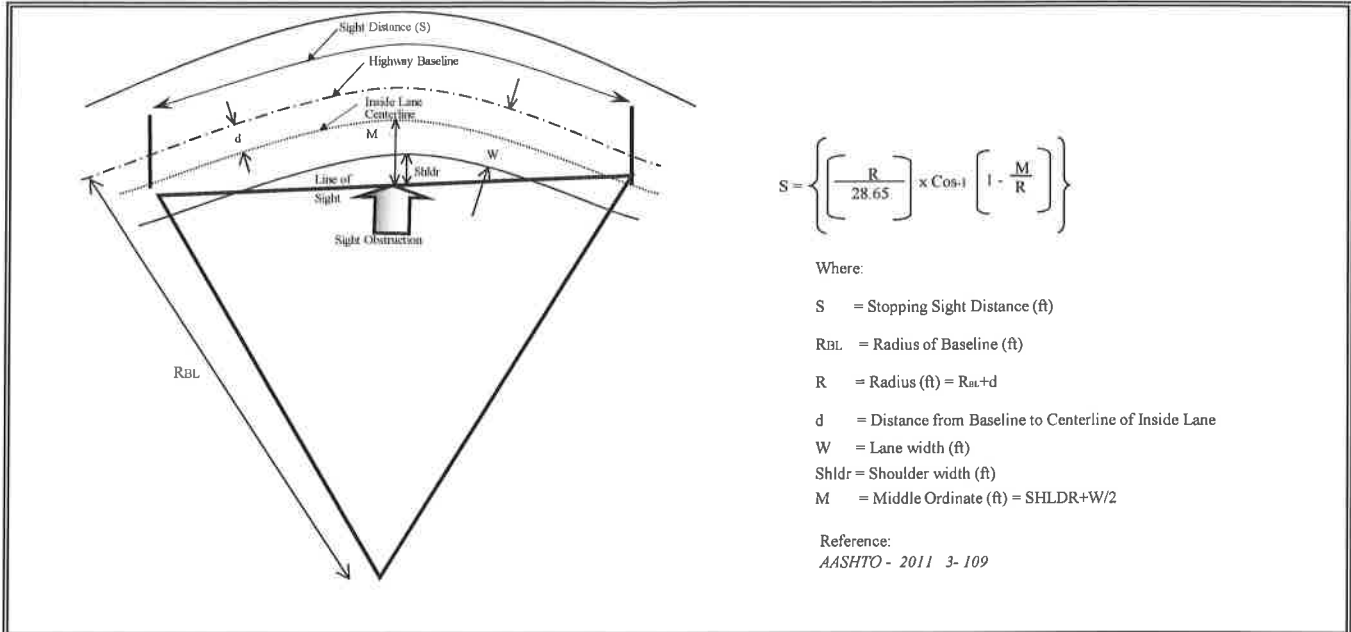
\*\* PROPOSED INSIDE SHOULDER WIDTH

Job: **SR 400 (I-4) 242484-8-52-01 (Orange County)**  
 Description: **Stopping Sight Distance Calculations for Ramp D\_DCP**

AECOM Project No: 60480256  
 Computed By: SF  
 Checked By: GLF

Page      of       
 Sheet 2 of 2  
 Date: 7/22/2016  
 Date: 8/30/2016

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- $R_{BL}$  = Radius of Baseline (ft)
- R = Radius (ft) =  $R_{BL} + d$
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) =  $SHLDR + W/2$

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*  
 DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

### RAMP

DESIGN SPEED	50 mph
CURVE NO.	D_DCP-2
RADIUS OF CURVE ( $R_{BL}$ )	3,900.00'
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	1° 28' 9"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	6.00'
LANE WIDTH ( $W$ )	12'
SHOULDER WIDTH (Shldr)	6'
VERTICAL GRADE (%)	0.184%
M DIMENSION	12.0'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

425.00'
425.00'
612.46'

FDOT PPM, TABLE 2.7.1, January 2016.  
 AASHTO 2011, Table 3-1 & 3-2.  
 EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
 YES

COMMENTS:

- \* WIDTH VARIES FROM 12 FT TO 15 FT. USED 12 FT TO DEMONSTRATE CURVE MEETS LESSER "ACTUAL SSD."
- \*\* PROPOSED OUTSIDE SHOULDER WIDTH



Job: SR 400 (I-4) 242484-8-52-01 (Orange County)  
 Description: Super Elevation Transition Calculations for  
Ramp D\_DCP (WBCD to DCP)

AECOM Project No: 60480256  
 Computed By: SF  
 Checked By: GLF

Page      of       
 Sheet 1 of 2  
 Date: 7/22/16  
 Date: 8/30/16

**SUPERELEVATION CALCULATIONS FOR RAMP D\_DCP**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>D_DCP-1 (RT)</u>		PC STATION	<u>702+94.00</u>		
DEGREE OF CURVE	<u>0° 34' 23"</u>		PT STATION	<u>707+11.41</u>		
RADIUS OF CURVE	<u>10,000.00'</u>		BEGIN TRANSITION	<u>N/A</u> *		
DESIGN SPEED	<u>50 mph</u>		BEGIN FULL SUPER	<u>N/A</u> *		
e=	<u>NC</u>		END FULL SUPER	<u>N/A</u> *		
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )	<u>80</u>	<u>20</u>	END TRANSITION	<u>N/A</u> *		
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )	<u>80</u>	<u>20</u>				
TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
<b>4-LANE RAMP</b>		24	200	0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
				0.00		
<b>2-LANE RAMP</b>		12	200	0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
* REMAINS AT NC THROUGH ENTIRE CURVE.						
NOTE: CHAIN AND PGL ARE IN CENTER OF 4-LANE AND 2-LANE RAMP SECTIONS.						



Job: **SR 400 (I-4) 242484-8-52-01 (Orange County)**  
 Description: **Super Elevation Transition Calculations for Ramp D\_DCP (WBCD to DCP)**

AECOM Project No: 60480256  
 Computed By: SF  
 Checked By: GLF

Page      of       
 Sheet 2 of 2  
 Date: 7/22/16  
 Date: 8/30/16

**SUPERELEVATION CALCULATIONS FOR RAMP D\_DCP**

TYPE OF ROADWAY (*Rural or Urban*)  
*(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)*  
 TRAVEL DIRECTION  
 CURVE NO.  
 DEGREE OF CURVE  
 RADIUS OF CURVE  
 DESIGN SPEED  
 e=  
 SE SPLIT INTO CURVE (Tangent/Curve)  
 SE SPLIT OUT OF CURVE (Tangent/Curve)

Rural  
WB  
D\_DCP-2 (LT)  
1° 28' 9"  
3,900.00'  
50 mph  
0.030  
80 20  
80 20

PC STATION 708+31.41  
 PT STATION 716+26.67  
 BEGIN TRANSITION 707+11.41  
 BEGIN FULL SUPER 708+61.41  
 END FULL SUPER N/A \*  
 END TRANSITION N/A \*

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>2-LANE RAMP</b>				0.00		
** (-) 0.02 to (+) 0.03 (INSIDE LANE)	0.050	15	200	150.00	707+11.41	708+61.41
(-) 0.02 (NC) to (-) 0.03 (OUTSIDE LANE)	0.010	12	200	100.00	707+51.41	708+51.41
TOTAL LENGTH INTO CURVE				<b>250.00</b>		
				0.00		
<b>1-LANE RAMP</b>				0.00		
* No transition needed as aux. lane is at (+) 0.03		15	200	0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE 707+71.41  
 ZERO XSLOPE OUT OF CURVE N/A

NOTE: SIGN CONVENTION REFERENCES THE LEFT SIDE OF THE PGL FOR THE OUTSIDE LANE AND RIGHT SIDE OF THE PGL FOR THE INSIDE LANE PER STATIONING.

\*\* INSIDE LANE WIDTH VARIES FROM 15' TO 12'. USED 15' TO ACHIEVE GREATER TRANSITION LENGTH.

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Wednesday November 1, 2017 2:41 pm

*DES. BY: SF 11/3/17*  
*CHECKED BY: MSP 11/6/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_D\_DCP'

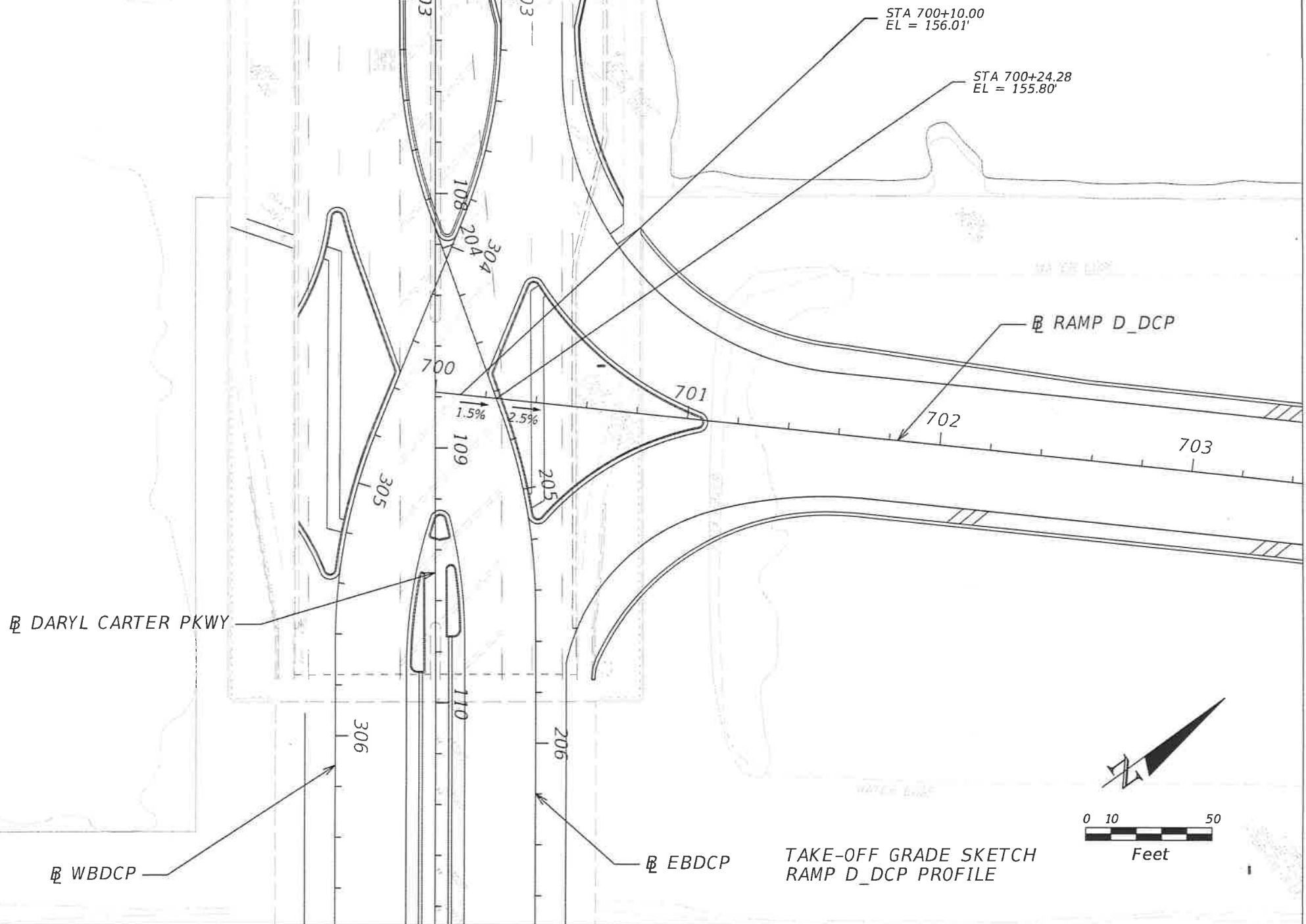
\* 1 pri pro d\_dcp

Beginning profile D\_DCP description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	700+24.28	155.7989				
VPC		710+10.00	131.4240	-2.4728	K = 97.7		
VPI	2	711+15.00	128.8276		210.0000	105.0000	105.0000
VPT		712+20.00	128.4883	-0.3232			
VPI	3	712+78.25	128.3000	-0.3232			
VPI	4	713+00.00	128.2300	-0.3218			
VPI	5	713+50.00	128.0900	-0.2800			
VPI	6	714+00.00	127.9200	-0.3400			
VPI	7	714+50.00	127.7500	-0.3400			
VPI	8	715+00.00	127.5500	-0.4000			
VPI	9	715+17.46	127.4800	-0.4009			
VPI	10	715+50.00	127.3500	-0.3995			
VPI	11	716+00.00	127.1400	-0.4200			
VPI	12	716+50.00	126.9000	-0.4800			
VPI	13	717+00.00	126.6600	-0.4800			
VPI	14	717+26.89	126.5200	-0.5206			

Ending profile D\_DCP description

DES. BY: BM 9/27/17  
CHECKED BY: MSP 9/27/17



TAKE-OFF GRADE SKETCH  
RAMP D\_DCP PROFILE



## Ramp Terminal - Detail

Job: INTERIM DARYL CARTER PKWY 441113-1-52-01  
 Description: Ramp D\_DCP and IWBCD2

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Sheet 1 of 4  
 Date: 10/23/2017  
 Date: 10/25/2017

MAINLINE						GORE		RAMP					
Baseline	Mainline Station	PGL Elev.	*Outside Travel Lane Slope (%)	Outside EOT Offset	Outside EOT Elev.	Gore Width	Gore Slope (%)	Inside Elev.	*Pavement Slope (%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
IWBCD2	7065+99.84	129.61	-2.00%	24.00	129.13	19.00	-2.00%	128.75	-3.00%	15.00	128.30	D_DCP	712+78.25
IWBCD2	7066+21.61	129.50	-2.00%	24.00	129.02	16.65	-2.00%	128.68	-3.00%	15.00	128.23	D_DCP	713+00.00
IWBCD2	7066+71.67	129.25	-2.00%	24.00	128.77	11.59	-2.00%	128.54	-3.00%	15.00	128.09	D_DCP	713+50.00
IWBCD2	7067+21.55	129.00	-2.00%	24.00	128.52	7.18	-2.00%	128.37	-3.00%	15.00	127.92	D_DCP	714+00.00
IWBCD2	7067+71.52	128.75	-2.00%	24.00	128.27	3.58	-2.00%	128.20	-3.00%	15.00	127.75	D_DCP	714+50.00
IWBCD2	7068+21.54	128.50	-2.00%	24.00	128.02	0.78	-2.00%	128.00	-3.00%	15.00	127.55	D_DCP	715+00.00
IWBCD2	7068+39.03	128.41	-2.00%	24.00	127.93	0.00	-2.00%	127.93	-3.00%	15.00	127.48	D_DCP	715+17.46
IWBCD2	7068+72.09	128.25	-2.00%	24.00	127.77	0.00	-2.00%	127.77	-3.00%	13.79	127.35	D_DCP	715+50.00
IWBCD2	7069+21.95	128.00	-2.00%	24.00	127.52	0.00	N/A	127.52	-3.00%	12.63	127.14	D_DCP	716+00.00
IWBCD2	7069+71.83	127.75	-2.00%	24.00	127.27	0.00	N/A	127.27	-3.00%	12.20	126.90	D_DCP	716+50.00
IWBCD2	7070+21.71	127.50	-2.00%	24.00	127.02	0.00	N/A	127.02	-3.00%	12.02	126.66	D_DCP	717+00.00
IWBCD2	7070+48.53	127.36	-2.00%	24.00	126.88	0.00	N/A	126.88	-3.00%	12.00	126.52	D_DCP	717+26.89

\* The sign convention for the cross slope % is relative to the Mainline PGL.



### Ramp Terminal - Data

Job: INTERIM DARYL CARTER PKWY 441113-1-52-01  
 Description: Ramp D DCP and IWBCD2

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Sheet 2 of 4

Date: 10/23/2017  
 Date: 10/25/2017

Baseline	Mainline Station	PGL Elev.	PGL Offset	Pavement Width 1	*Pavement Slope(%) 1	Pavement Width 2	*Pavement Slope(%) 2	Pavement Width 3	*Pavement Slope(%) 3	Outside Travel Lane Width	*Outside Travel Lane Slope(%)	Outside EOT Offset	Outside EOT Elev.	COGO Distance	Gore Width	Baseline	Ramp Station	*Pavement Slope(%)	COGO Width	Pavement Width
IWBCD2	7065+99.84	129.61	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	129.13	-43.00	19.00	D DCP	712+78.25	-3.00%	15.00	15.00
IWBCD2	7066+21.61	129.50	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	129.02	-40.65	16.65	D DCP	713+00.00	-3.00%	15.00	15.00
IWBCD2	7066+71.67	129.25	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	128.77	-35.59	11.59	D DCP	713+50.00	-3.00%	15.00	15.00
IWBCD2	7067+21.55	129.00	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	128.52	-31.18	7.18	D DCP	714+00.00	-3.00%	15.00	15.00
IWBCD2	7067+71.52	128.75	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	128.27	-27.58	3.58	D DCP	714+50.00	-3.00%	15.00	15.00
IWBCD2	7068+21.54	128.50	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	128.02	-24.78	0.78	D DCP	715+00.00	-3.00%	15.00	15.00
IWBCD2	7068+39.03	128.41	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	127.93	-24.00	0.00	D DCP	715+17.46	-3.00%	15.00	15.00
IWBCD2	7068+72.09	128.25	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	127.77	-37.79	0.00	D DCP	715+50.00	-3.00%	0.00	13.79
IWBCD2	7069+21.95	128.00	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	127.52	-36.63	0.00	D DCP	716+00.00	-3.00%	0.00	12.63
IWBCD2	7069+71.83	127.75	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	127.27	-36.20	0.00	D DCP	716+50.00	-3.00%	0.00	12.20
IWBCD2	7070+21.71	127.50	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	127.02	-36.02	0.00	D DCP	717+00.00	-3.00%	0.00	12.02
IWBCD2	7070+48.53	127.36	0.00	12.00	-2.00%	0.00	0.00%	0.00	0.00%	12.00	-2.00%	24.00	126.88	-36.00	0.00	D DCP	717+26.89	-3.00%	0.00	12.00

\* The sign convention for the cross slope % is relative to the Mainline PGL.





## Ramp Terminal - Graph Input

Job: INTERIM DARYL CARTER PKWY 441113-1-52-01

Description: Ramp D\_DCP and IWBCD2

AECOM Project No: 60480256

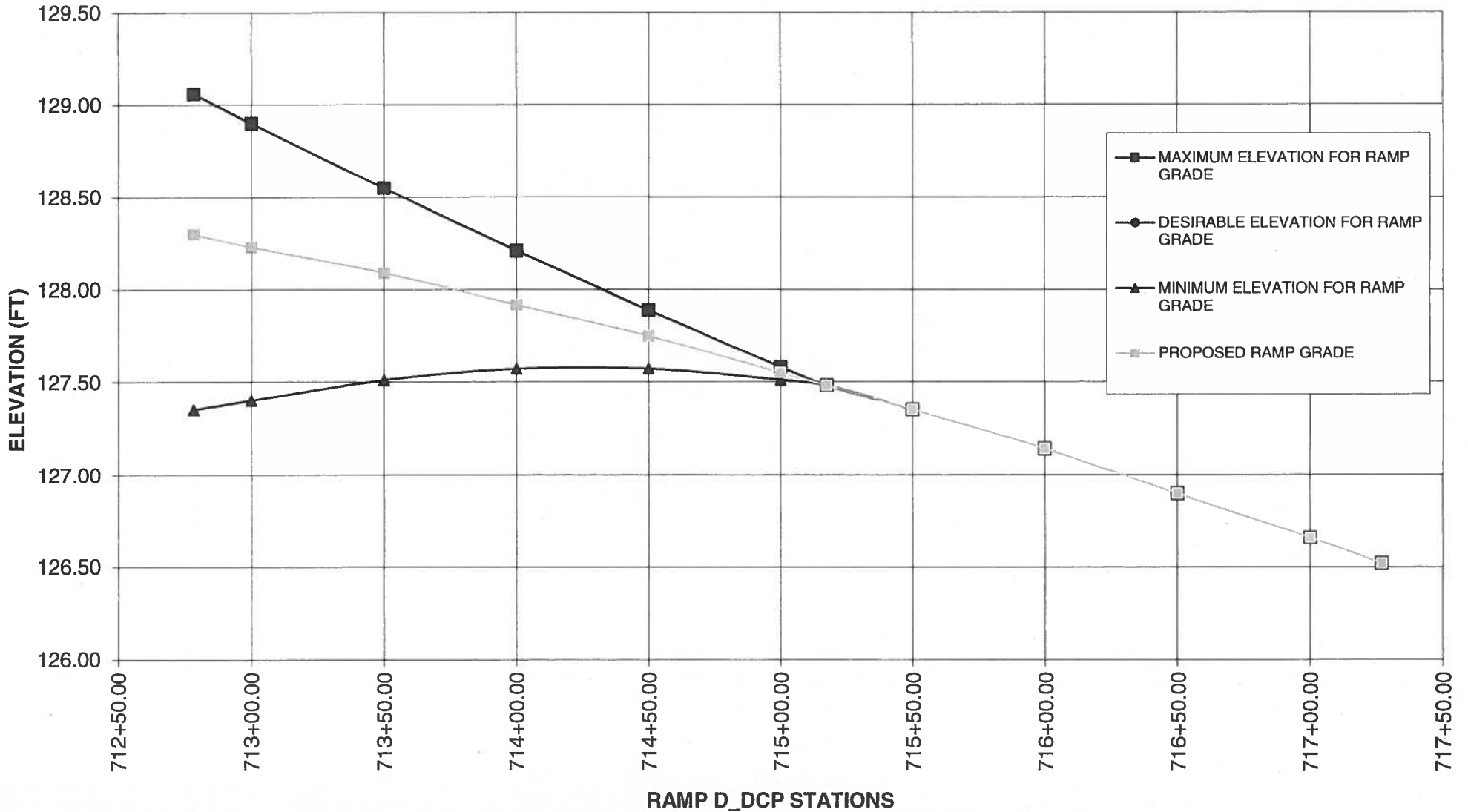
Computed By: BM

Checked By: MSP

Date: 10/23/2017

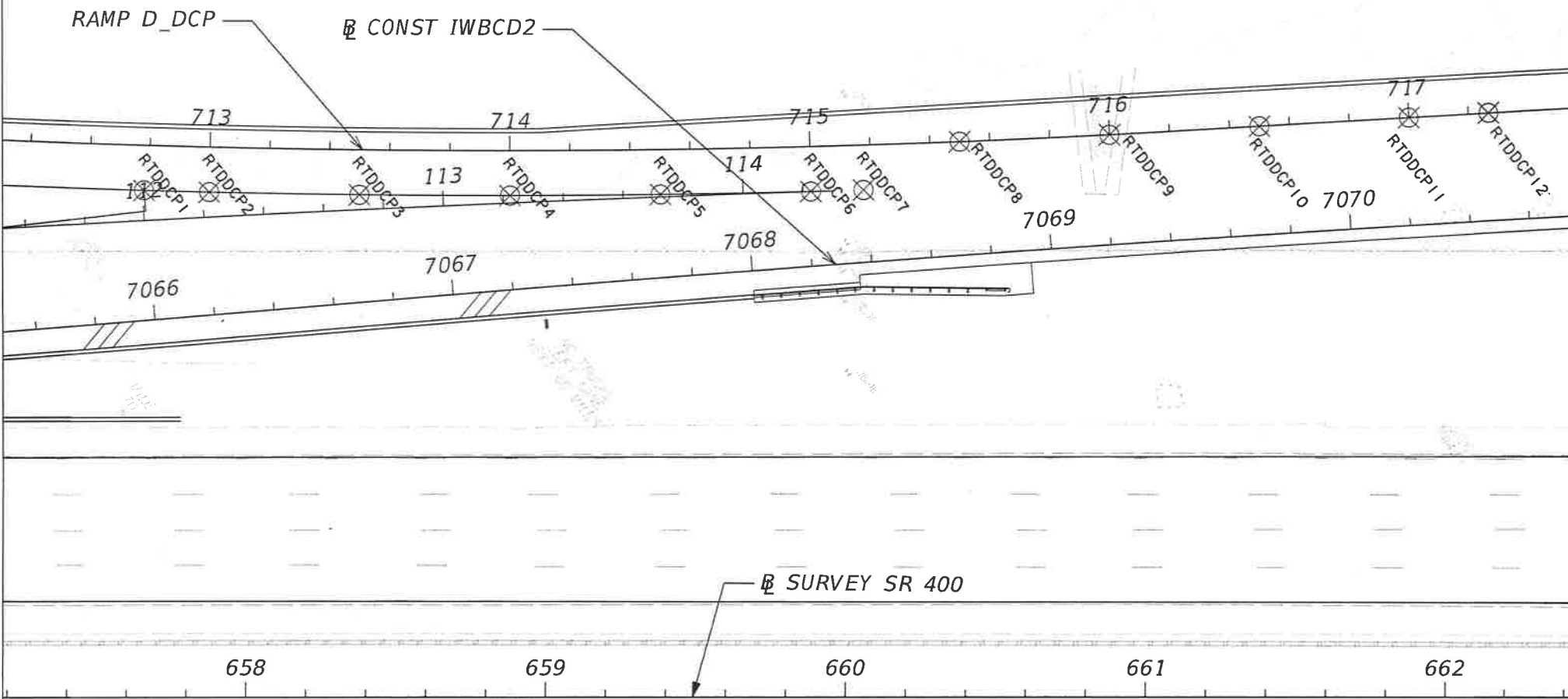
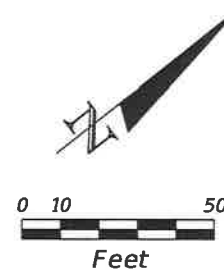
Date: 10/25/2017

MINIMUM ELEVATION FOR RAMP GRADE					DESIRABLE ELEVATION FOR RAMP GRADE					MAXIMUM ELEVATION FOR RAMP GRADE				
Mainline Rollover	Gore Slope(%)	Ramp Rollover	Inside Ramp Elevation	Outside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Inside Ramp Elevation	Outside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Inside Ramp Elevation	Outside Ramp Elevation
5.00%	-7.00%	4.00%	127.80	127.35	1.00%	-2.00%	0.00%	128.75	128.30	5.00%	2.00%	4.00%	129.51	129.06
5.00%	-7.00%	4.00%	127.85	127.40	1.00%	-2.00%	0.00%	128.68	128.23	5.00%	2.00%	4.00%	129.35	128.90
5.00%	-7.00%	4.00%	127.96	127.51	1.00%	-2.00%	0.00%	128.54	128.09	5.00%	2.00%	4.00%	129.00	128.55
5.00%	-7.00%	4.00%	128.02	127.57	1.00%	-2.00%	0.00%	128.37	127.92	5.00%	2.00%	4.00%	128.66	128.21
5.00%	-7.00%	4.00%	128.02	127.57	1.00%	-2.00%	0.00%	128.20	127.75	5.00%	2.00%	4.00%	128.34	127.89
5.00%	-7.00%	4.00%	127.96	127.51	1.00%	-2.00%	0.00%	128.00	127.55	5.00%	2.00%	4.00%	128.03	127.58
5.00%	N/A	1.00%	127.93	127.48	0.00%	N/A	1.00%	127.93	127.48	5.00%	N/A	1.00%	127.93	127.48
5.00%	N/A	1.00%	127.77	127.35	0.00%	N/A	1.00%	127.77	127.35	5.00%	N/A	1.00%	127.77	127.35
5.00%	N/A	1.00%	127.52	127.14	0.00%	N/A	1.00%	127.52	127.14	5.00%	N/A	1.00%	127.52	127.14
5.00%	N/A	1.00%	127.27	126.90	0.00%	N/A	1.00%	127.27	126.90	5.00%	N/A	1.00%	127.27	126.90
5.00%	N/A	1.00%	127.02	126.66	0.00%	N/A	1.00%	127.02	126.66	5.00%	N/A	1.00%	127.02	126.66
5.00%	N/A	1.00%	126.88	126.52	0.00%	N/A	1.00%	126.88	126.52	5.00%	N/A	1.00%	126.88	126.52



RAMP TERMINAL SKETCH  
 MAINLINE: IWBCD2  
 RAMP: D\_DCP

CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



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Project: DCP Interim

Subject:

Job No. DCP Operator: BM  
 Date: Thursday November 2, 2017 10:07 am

*DES. BY: BM 11/2/17  
 CHECKED BY: MSP 11/3/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_D\_DCP\_IWBCD2'

\* 1 LAY OFF CHA D\_DCP RTDDCP1-RTDDCP12

Point	North	East	Station	Offset	R
RTDDCP1	1,478,307.3292	500,096.3318	712+78.25	15.0000	
RTDDCP2	1,478,324.0015	500,110.4253	713+00.00	15.0000	
RTDDCP3	1,478,362.6295	500,142.4739	713+50.00	15.0000	
RTDDCP4	1,478,401.6651	500,174.0246	714+00.00	15.0000	
RTDDCP5	1,478,441.1021	500,205.0723	714+50.00	15.0000	
RTDDCP6	1,478,480.9338	500,235.6119	715+00.00	15.0000	
RTDDCP7	1,478,494.9380	500,246.1581	715+17.46	15.0000	
RTDDCP8	1,478,530.0501	500,253.5612	715+50.00	0.0000	
RTDDCP9	1,478,570.4961	500,282.9565	716+00.00	0.0000	
RTDDCP10	1,478,611.2755	500,311.8879	716+50.00	0.0000	
RTDDCP11	1,478,652.1077	500,340.7450	717+00.00	0.0000	
RTDDCP12	1,478,674.0673	500,356.2643	717+26.89	0.0000	

\* 2 LAY OFF CHA IWBCD2 RTDDCP1-RTDDCP12

Point	North	East	Station	Offset	R
RTDDCP1	1,478,307.3292	500,096.3318	7065+99.85	-43.0000	
RTDDCP2	1,478,324.0015	500,110.4253	7066+21.61	-40.6516	
RTDDCP3	1,478,362.6295	500,142.4739	7066+71.67	-35.5922	
RTDDCP4	1,478,401.6651	500,174.0246	7067+21.55	-31.1814	
RTDDCP5	1,478,441.1021	500,205.0723	7067+71.52	-27.5786	
RTDDCP6	1,478,480.9338	500,235.6119	7068+21.55	-24.7849	
RTDDCP7	1,478,494.9380	500,246.1581	7068+39.03	-24.0000	
RTDDCP8	1,478,530.0501	500,253.5612	7068+72.09	-37.7939	
RTDDCP9	1,478,570.4961	500,282.9565	7069+21.95	-36.6266	
RTDDCP10	1,478,611.2755	500,311.8879	7069+71.83	-36.1966	
RTDDCP11	1,478,652.1077	500,340.7450	7070+21.71	-36.0240	
RTDDCP12	1,478,674.0673	500,356.2643	7070+48.53	-36.0000	

\* 3 ELEV PRO IWBCD2 STA 7065+99.85 7066+21.61 7066+71.67 7067+21.55 7067+71.52 7068+21.55 7068+39.03 7068+72.09 7069+21.95 7069+71.83 7070+21.71 7070+48.53

Elev at 7065+99.85	=	129.6066,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7066+21.61	=	129.4978,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7066+71.67	=	129.2475,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7067+21.55	=	128.9981,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7067+71.52	=	128.7482,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7068+21.55	=	128.4981,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7068+39.03	=	128.4107,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7068+72.09	=	128.2454,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7069+21.95	=	127.9961,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7069+71.83	=	127.7467,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7070+21.71	=	127.4973,	grade = -0.5000,	On tang betw 1 & 2
Elev at 7070+48.53	=	127.3632,	grade = -0.5000,	On tang betw 1 & 2

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved. DES. BY: JW 8/21/17  
 Project: DCP Interim  
 Subject:  
 Job No. DCP Operator: MP  
 Date: Tuesday August 22, 2017 6:12 pm  
 CHECKED BY: MSP 8/23/17

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IA\_CFP'

\* 1 des cha ia\_cfp

Chain IA\_CFP contains:  
 CUR IA\_CFP\_1 IACFP2

Beginning chain IA\_CFP description

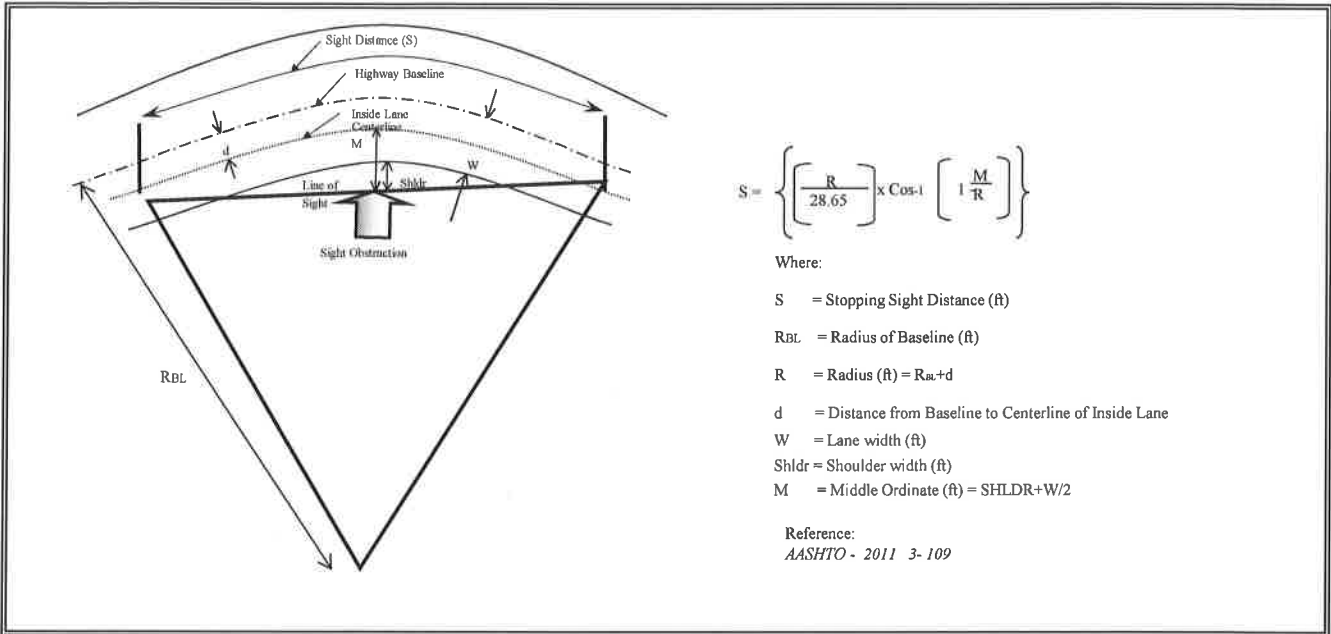
Curve Data					
*-----*					
Curve IA_CFP_1					
P.I. Station	302+47.08	N	1,480,797.6588	E	502,025.3408
Delta	= 3° 23' 23.45"	(LT)			
Degree	= 0° 41' 10.24"				
Tangent	= 247.0818				
Length	= 494.0195				
Radius	= 8,350.0000				
External	= 3.6549				
Long Chord	= 493.9474				
Mid. Ord.	= 3.6533				
P.C. Station	300+00.00	N	1,480,603.9980	E	501,871.8973
P.T. Station	304+94.02	N	1,481,000.0538	E	502,167.0648
C.C.		N	1,485,789.5412	E	495,327.2322
Back	= N 38° 23' 27.20"	E			
Ahead	= N 35° 00' 03.74"	E			
Chord Bear	= N 36° 41' 45.47"	E			

Course from PT IA\_CFP\_1 to IACFP2 N 35° 00' 03.74" E Dist 542.9465

Point IACFP2 N 1,481,444.8039 E 502,478.4942 Sta 310+36.97

Ending chain IA\_CFP description

## STOPPING SIGHT DISTANCE CALCULATIONS



**TYPE OF ROADWAY**  
*(Interstate, All other facilities)*  
**DESIGN SPEED**  
**CURVE NO.**  
**RADIUS OF CURVE ( $R_{BL}$ )**  
**DIRECTION OF CURVE (LT or RT)**  
**DEGREE OF CURVE**  
**OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )**  
**LANE WIDTH ( $W$ )**  
**SHOULDER WIDTH (Shldr)**  
**VERTICAL GRADE (%)**  
**M DIMENSION**

### All Other Facilities

DESIGN SPEED	50 mph
CURVE NO.	IA_CFP_1
RADIUS OF CURVE ( $R_{BL}$ )	8,350.00'
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	0° 41' 10"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	7.50'
LANE WIDTH ( $W$ )	15'
SHOULDER WIDTH (Shldr)	6'
VERTICAL GRADE (%)	2.000%
M DIMENSION	13.5'

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
950.12'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
 YES

COMMENTS:

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Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IA CFP (EB CFP TO IWBCD2)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 1  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>				
( <i>Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2</i> )					
TRAVEL DIRECTION	<u>WB</u>				
CURVE NO.	<u>IA_CFP_1 (LT)</u>	PC STATION	<u>300+00.00</u>		
DEGREE OF CURVE	<u>0° 41' 10"</u>	PT STATION	<u>304+94.02</u>		
RADIUS OF CURVE	<u>8,350.00'</u>				
DESIGN SPEED	<u>50 mph</u>	BEGIN TRANSITION	<u>N/A *</u>		
e=	<u>NC</u>	BEGIN FULL SUPER	<u>N/A *</u>		
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80 20</u>	END FULL SUPER	<u>N/A *</u>		
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80 20</u>	END TRANSITION	<u>N/A *</u>		

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
* No Transition Required		15	200	0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
<b>1-LANE RAMP</b>				0.00		
* No Transition Required		15	200	0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE	<u>N/A</u>
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP WITH RESPECT TO STATIONING.

\* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.



Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for Ramp IA\_CFP (EB CFP TO IWBCD2)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: JW

Page      of       
 Sheet 2 of 2  
 Date: 8/10/17  
 Date: 9/6/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY (*Rural or Urban*) Rural  
 (*Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2*)  
 TRAVEL DIRECTION WB  
 CURVE NO. N/A PC STATION N/A  
 DEGREE OF CURVE      PT STATION N/A  
 RADIUS OF CURVE       
 DESIGN SPEED      BEGIN TRANSITION       
 e=      BEGIN FULL SUPER       
 SE SPLIT INTO CURVE (Tangent/Curve)      END FULL SUPER       
 SE SPLIT OUT OF CURVE (Tangent/Curve)      END TRANSITION     

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
(+) 0.02 to Meet Exist (-) 0.039	0.059	15	200	177.00	308+59.97	310+36.97
TOTAL LENGTH				<b>177.00</b>		
<b>1-LANE RAMP</b>				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		

ZERO XSLOPE INTO CURVE N/A  
 ZERO XSLOPE OUT OF CURVE N/A

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP WITH RESPECT TO DIRECTION OF STATIONING.  
 \* TRANSITION AT THE END OF RAMP TO MEET CROSS SLOPE OF EXISTING PAVEMENT.



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Project: DCP Interim  
 Subject:  
 Job No. DCP  
 Date: Thursday September 14, 2017

Operator: MP  
 8:59 am

*DES. BY: LW 8/10/17*  
*CHECKED BY: MSP 9/15/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_IA\_CFP'

\* 1 pri pro ia\_cfp

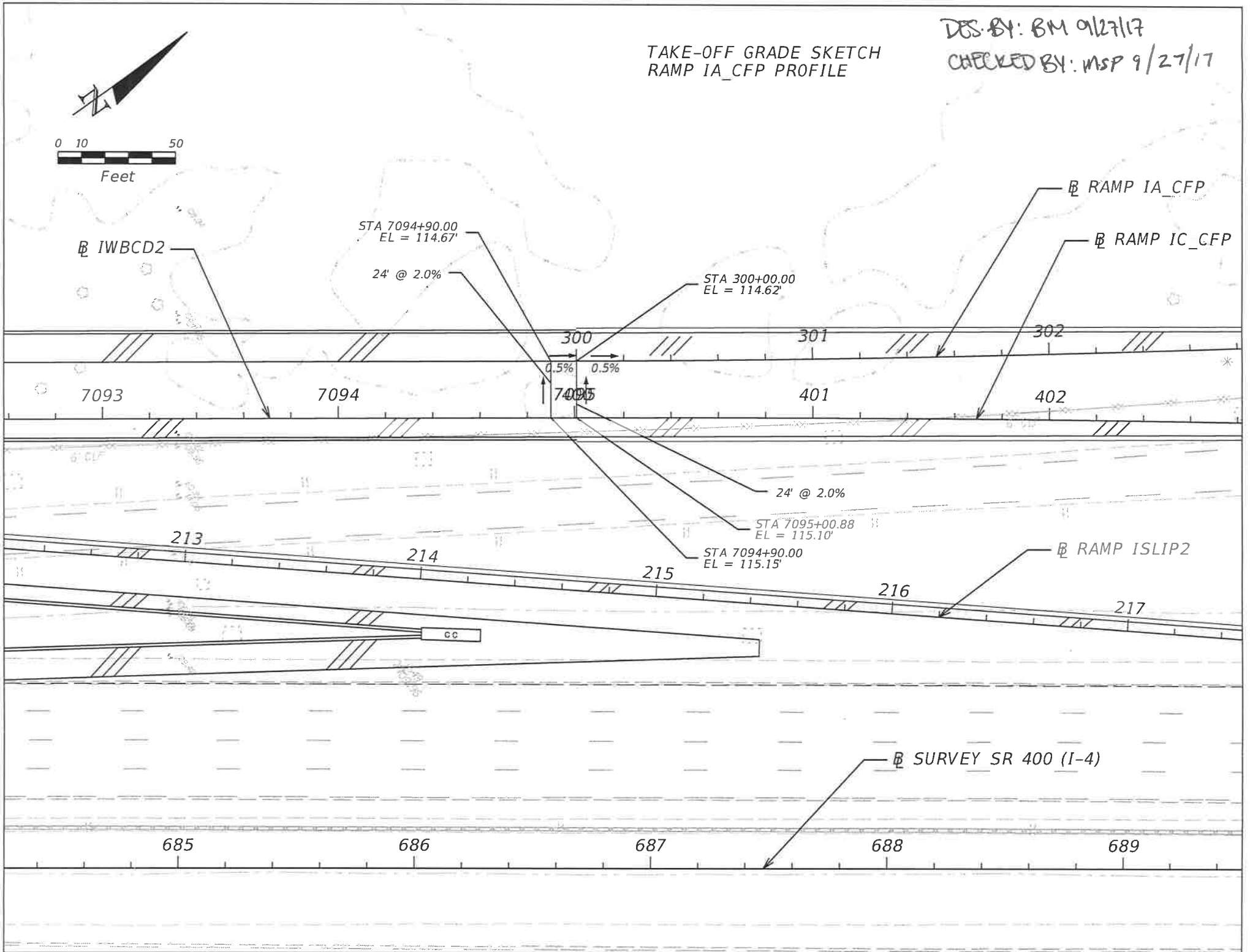
Beginning profile IA\_CFP description:

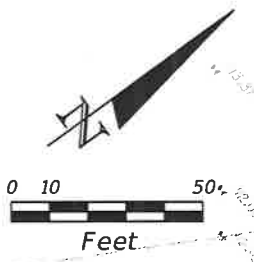
		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	300+00.00	114.6215				
VPC		301+00.00	114.1215	-0.5000	K = 126.5		
Low Point		301+63.23	113.9634				
VPI	2	302+00.00	113.6215		200.0000	100.0000	100.0000
VPT		303+00.00	114.7030	1.0815			
VPC		303+00.00	114.7030	1.0815	K = 189.7	SSD = 832.3	
VPI	3	304+50.00	116.3252		300.0000	150.0000	150.0000
High Point		305+05.15	115.8123				
VPT		306+00.00	115.5752	-0.5000			
VPC		306+00.00	115.5752	-0.5000	K = 200.0		
VPI	4	307+00.00	115.0752		200.0000	100.0000	100.0000
Low Point		307+00.00	115.3252				
VPT		308+00.00	115.5752	0.5000			
VPI	5	310+36.97	116.7600	0.5000			

Ending profile IA\_CFP description

TAKE-OFF GRADE SKETCH  
RAMP IA\_CFP PROFILE

DES. BY: BM 9/27/17  
CHECKED BY: MSP 9/27/17

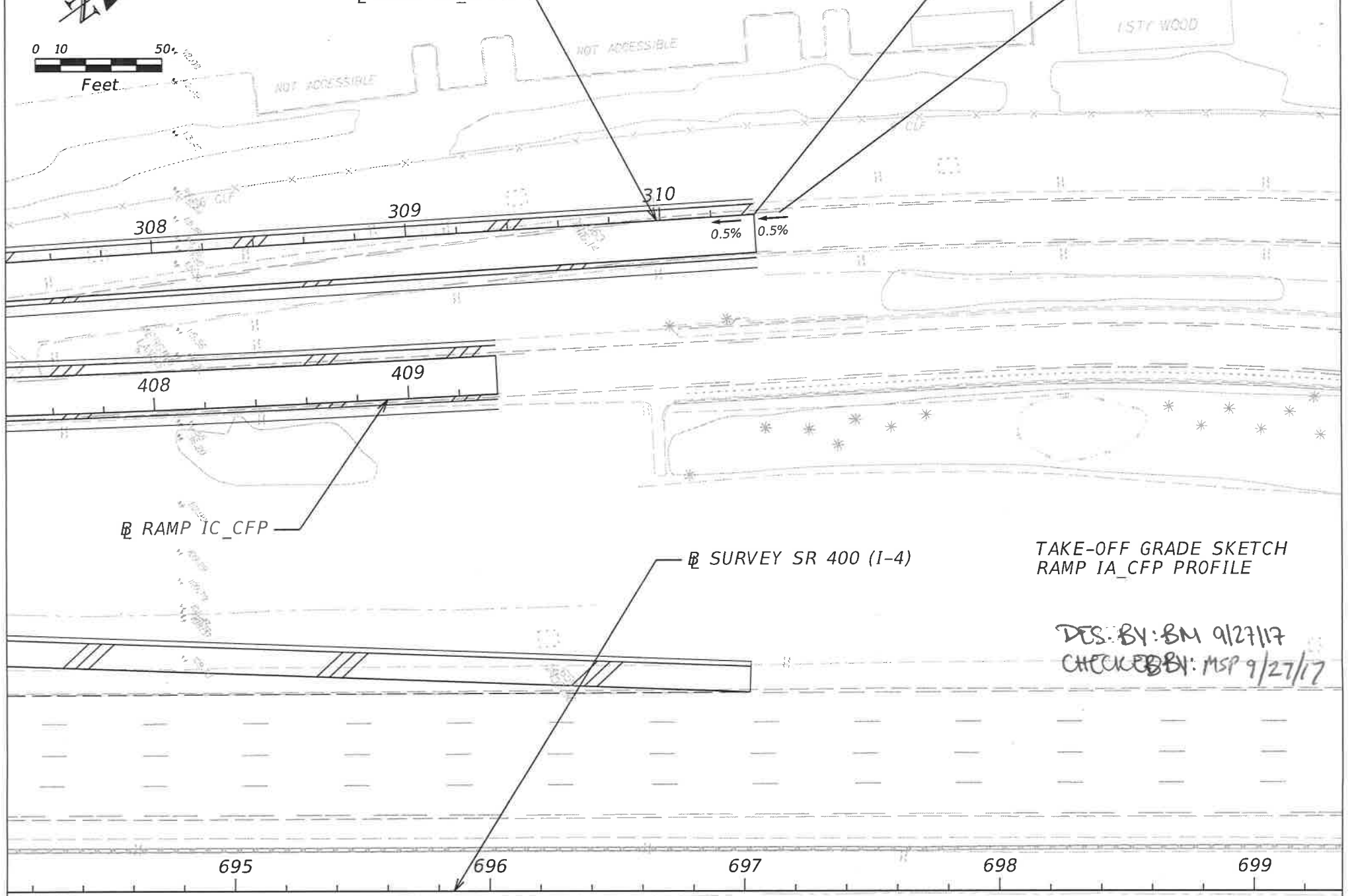




⊕ RAMP IA\_CFP

STA 310+36.97  
EL = 116.76'

STA 310+46.97  
EL = 116.81'



TAKE-OFF GRADE SKETCH  
RAMP IA\_CFP PROFILE

DES: BY: BM 9/27/17  
CHECKED BY: MSP 9/27/17

DES. BY: JW 8/8/17  
CHECKED BY: MSP 8/8/17

File: c:\pwworking\aecom\_na\msphillips\d0165016\HA\_IB\_CFPDCP.OBM 8/8/2017,  
6:45:50 PM

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Project: DCP Interim

Subject:

Job No. DCP Operator: BM

Date: Tuesday August 8, 2017 4:29 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IB\_CFP'

\* 1 des~~cha~~ ib\_cfp

Chain IB\_CFP contains:

CUR IB\_CFP1 IBCFP1

Beginning chain IB\_CFP description

=====

Curve Data  
\*-----\*

Curve IB\_CFP1  
P.I. Station 102+17.40 N 1,480,390.0908 E  
502,091.8042  
Delta = 4° 58' 45.13" (RT)  
Degree = 1° 08' 45.30"  
Tangent = 217.3956  
Length = 434.5174  
Radius = 5,000.0000  
External = 4.7239  
Long Chord = 434.3807  
Mid. Ord. = 4.7194  
P.C. Station 100+00.00 N 1,480,220.0093 E  
501,956.4044  
P.T. Station 104+34.52 N 1,480,547.7786 E  
502,241.4552  
C.C. N 1,477,105.8742 E  
505,868.2023  
Back = N 38° 31' 22.35" E  
Ahead = N 43° 30' 07.48" E  
Chord Bear = N 41° 00' 44.91" E

Course from PT IB\_CFP1 to IBCFP1 N 43° 30' 07.48" E Dist 165.4825

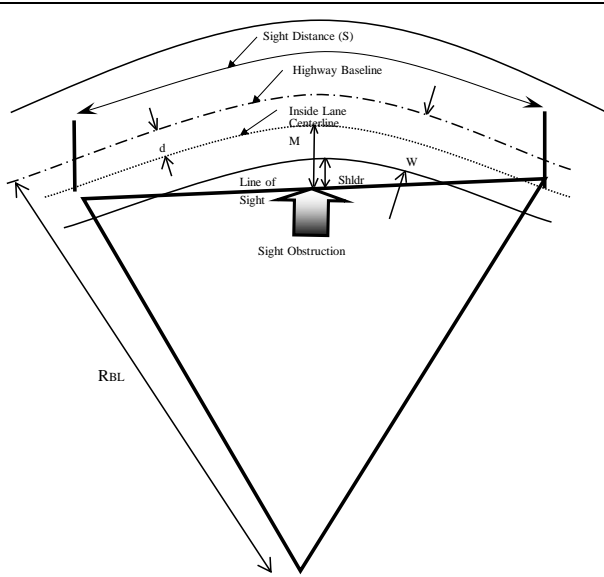
Point IBCFP1                    N    1,480,667.8112 E        502,355.3702 Sta  
106+00.00

=====  
====  
Ending chain IB\_CFP description

Job: **Interim Daryl Carter Pkwy 441113-1-52-01 (Or)**  
 Description: **Stopping Sight Distance Calculations for Ramp IB\_CFP (EBI4 TO CFP)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- RBL = Radius of Baseline (ft)
- R = Radius (ft) = RBL + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
 AASHTO - 2011 3-109

**TYPE OF ROADWAY**  
*(Interstate, All other facilities)*

**All Other Facilities**

**DESIGN SPEED**  
**CURVE NO.**  
**RADIUS OF CURVE (R<sub>BL</sub>)**  
**DIRECTION OF CURVE (LT or RT)**  
**DEGREE OF CURVE**  
**OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (d)**  
**LANE WIDTH (W)**  
**SHOULDER WIDTH (Shldr)**  
**VERTICAL GRADE (%)**  
**M DIMENSION**

50 mph
IB_CFP_1
5,000.00'
RT
1° 8' 45"
-7.50'
15'
6'
2.000%
13.5'

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
735.51'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
YES

**COMMENTS:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IB\_CFP (EBI4 TO CFP)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 1  
 Date: 8/10/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>EB</u>					
CURVE NO.	<u>IB_CFP_1 (RT)</u>		PC STATION	<u>100+00.00</u>		
DEGREE OF CURVE	<u>1° 8' 45"</u>		PT STATION	<u>104+34.52</u>		
RADIUS OF CURVE	<u>5,000.00'</u>					
DESIGN SPEED	<u>50 mph</u>		BEGIN TRANSITION	<u>N/A</u> *		
e=	<u>0.024</u>	EXIST**	BEGIN FULL SUPER	<u>N/A</u> *		
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80</u>	<u>20</u>	END FULL SUPER	<u>N/A</u> *		
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80</u>	<u>20</u>	END TRANSITION	<u>N/A</u> *		
TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH INTO CURVE		15	200	0.00		
				0.00		
<b>1-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH OUT OF CURVE		15	200	0.00		
				0.00		
ZERO XSLOPE INTO CURVE	<u>N/A</u>		** MIN. REQD SUPERELEVATION. CURVE FALLS PARTIALLY WITHIN EXISTING RAMP TERMINAL AND WILL BE MILLED & RESURFACED AT EXISTING CROSS SLOPE WHICH EXCEEDS MIN. REQD SUPERELEVATION. SEE RAMP TERMINAL FOR EXISTING CROSS SLOPES. THE REST OF THE CURVE FALLS WITHIN A SECTION OF WIDENING WHICH WILL HAVE A CROSS SLOPE OF (+) 0.035. THIS ALSO EXCEEDS THE MIN. REQD SE.			
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP WITH RESPECT TO STATIONING.						
* NO TRANSITION REQUIRED, EXISTING CROSS SLOPE MEETS OR EXCEEDS SE REQUIREMENT.						



## Ramp Terminal - Data

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)

Description: Ramp terminal for Ramp IB\_CFP and EB I-4

Note: This is an existing ramp terminal to be milled and resurfaced. Spreadsheet used to analyze existing cross slopes ONLY.

AECOM Project No: 60480256

Computed By: BM

Checked By: AS

Sheet 1 of 1

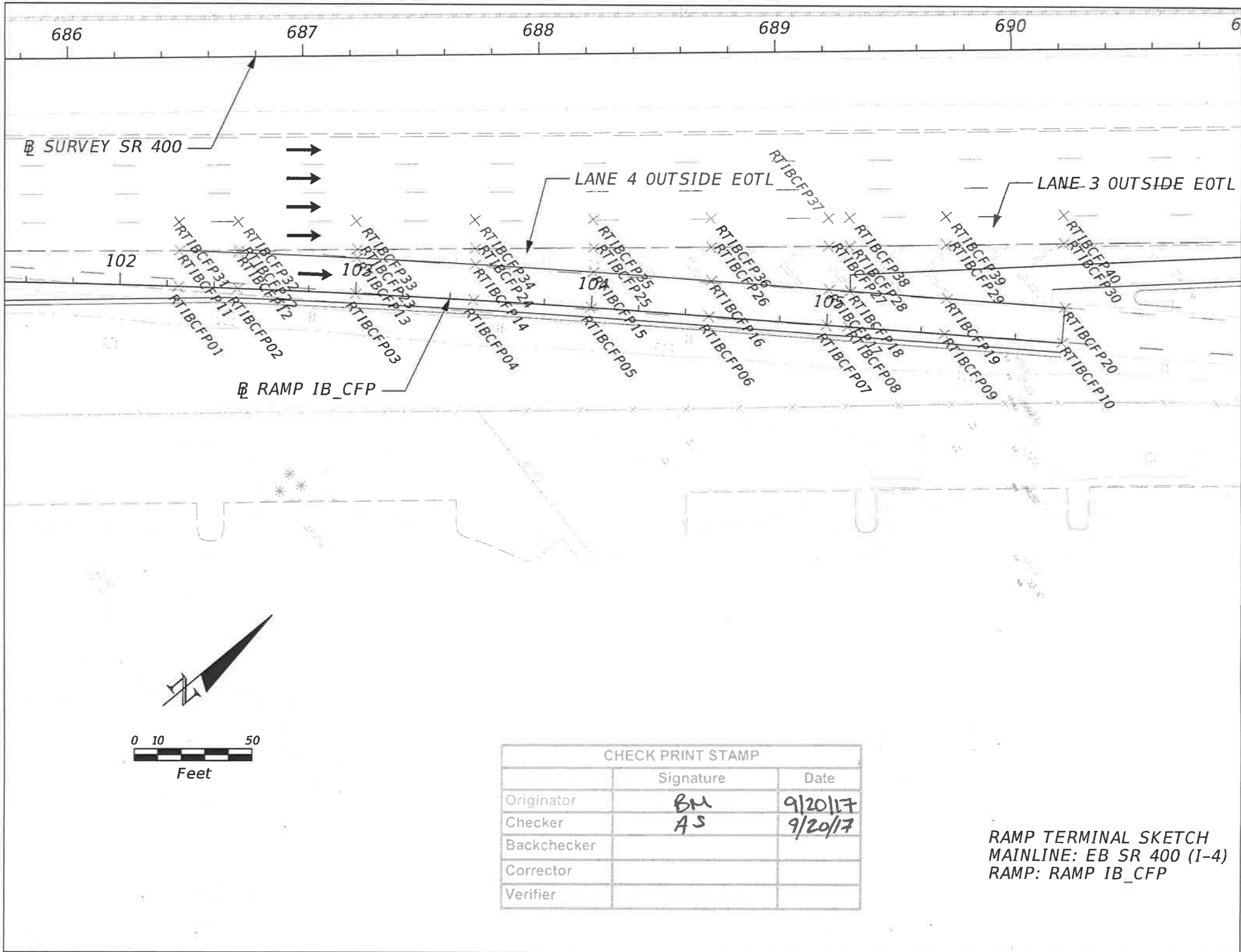
Date: 8/28/2017

Date: 9/19/17

MAINLINE							GORE		RAMP							
Baseline	Lane 3 Outside EOT Elev. (Exist)	COGO Point No.	Lane 4 Outside EOT Elev. (Exist)	COGO Point No.	Lane 4 Width	*Outside Travel Lane Slope (%)	Gore Width	Gore Slope	Inside Elev. (Exist)	COGO Point No.	*Pavement Slope (%)	Pavement Width	Outside Elev. (Exist)	COGO Point No.	Baseline	Ramp Station
BL400	110.68	RTIBCFP31	110.28	RTIBCFP11	12.00	-3.40%	N/A	N/A	110.28	RTIBCFP11	-4.07%	15.00	109.66	RTIBCFP01	IB_CFP	102+24.83
BL400	110.65	RTIBCFP32	110.23	RTIBCFP22	12.00	-3.52%	1.08	-3.87%	110.19	RTIBCFP12	-4.11%	15.00	109.57	RTIBCFP02	IB_CFP	102+50.00
BL400	110.53	RTIBCFP33	110.02	RTIBCFP23	12.00	-4.21%	3.60	-3.34%	109.90	RTIBCFP13	-4.44%	15.00	109.24	RTIBCFP03	IB_CFP	103+00.00
BL400	110.49	RTIBCFP34	109.96	RTIBCFP24	12.00	-4.42%	6.63	-5.03%	109.63	RTIBCFP14	-4.94%	15.00	108.89	RTIBCFP04	IB_CFP	103+50.00
BL400	110.43	RTIBCFP35	109.87	RTIBCFP25	12.00	-4.64%	10.15	-5.17%	109.35	RTIBCFP15	-5.24%	15.00	108.56	RTIBCFP05	IB_CFP	104+00.00
BL400	110.42	RTIBCFP36	109.98	RTIBCFP26	12.00	-3.65%	14.15	-5.91%	109.15	RTIBCFP16	-3.80%	15.00	108.58	RTIBCFP06	IB_CFP	104+50.00
BL400	110.33	RTIBCFP37	109.96	RTIBCFP27	12.00	-3.11%	18.26	-5.12%	109.02	RTIBCFP17	-2.77%	15.00	108.61	RTIBCFP07	IB_CFP	105+00.00
BL401	110.33	RTIBCFP38	109.96	RTIBCFP28	12.00	-3.11%	19.00	-5.06%	109.00	RTIBCFP18	-2.55%	15.00	108.62	RTIBCFP08	IB_CFP	105+09.03
BL402	110.35	RTIBCFP39	109.95	RTIBCFP29	12.00	-3.30%	22.57	-4.81%	108.87	RTIBCFP19	-1.23%	15.00	108.68	RTIBCFP09	IB_CFP	105+50.00
BL403	110.35	RTIBCFP40	109.94	RTIBCFP30	12.00	-3.43%	26.94	-4.61%	108.70	RTIBCFP20	-0.19%	15.00	108.67	RTIBCFP10	IB_CFP	106+00.00

\* The sign convention for the cross slope % is relative to the Mainline PGL.





DES. BY: BM 8/29/17  
 CHECKED BY: AS 9/19/17

RT\_IB\_CFPDCP.OBM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim  
 Subject: [ None ]  
 Job No. DCP Operator: BM  
 Date: Tuesday August 29, 2017 10:12 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_IB\_CFP'

\* 1 \$ I-4 LANE 3 OUTSIDE EOT EXIST ELEVATIONS \$

\* 2 PRINT POINT RTIBCFP31 RTIBCFP32 RTIBCFP33 RTIBCFP34 RTIBCFP35 RTIBCFP36 RTIBCFP37 RTIBCFP38 RTIBCFP39 RTIBCFP40

Point	North	East	Station	Elevation
RTIBCFP31	1,480,410.0659	502,079.6744	0+00.00	110.6827
RTIBCFP32	1,480,429.7284	502,095.4777	0+00.00	110.6498
RTIBCFP33	1,480,468.7681	502,126.8550	0+00.00	110.5280
RTIBCFP34	1,480,507.7861	502,158.2150	0+00.00	110.4895
RTIBCFP35	1,480,546.7787	502,189.5545	0+00.00	110.4284
RTIBCFP36	1,480,585.7072	502,220.8425	0+00.00	110.4200
RTIBCFP37	1,480,624.5480	502,252.0599	0+00.00	110.3324
RTIBCFP38	1,480,631.4422	502,257.6014	0+00.00	110.3349
RTIBCFP39	1,480,663.3819	502,283.0054	0+00.00	110.3479
RTIBCFP40	1,480,702.3734	502,314.0182	0+00.00	110.3520

\* 3 \$ I-4 LANE 4 OUTSIDE EOT EXIST ELEVATION \$

\* 4 PRINT POINT RTIBCFP11 RTIBCFP22 RTIBCFP23 RTIBCFP24 RTIBCFP25 RTIBCFP26 RTIBCFP27 RTIBCFP28 RTIBCFP29 RTIBCFP30

Point	North	East	Station	Elevation
RTIBCFP11	1,480,402.5578	502,089.0354	0+00.00	110.2750
RTIBCFP22	1,480,422.2203	502,104.8387	0+00.00	110.2280
RTIBCFP23	1,480,461.2600	502,136.2161	0+00.00	110.0227
RTIBCFP24	1,480,500.2780	502,167.5760	0+00.00	109.9594
RTIBCFP25	1,480,539.2706	502,198.9155	0+00.00	109.8711
RTIBCFP26	1,480,578.1991	502,230.2035	0+00.00	109.9816
RTIBCFP27	1,480,617.0398	502,261.4209	0+00.00	109.9593
RTIBCFP28	1,480,623.9814	502,267.0002	0+00.00	109.9615
RTIBCFP29	1,480,655.9212	502,292.4042	0+00.00	109.9518
RTIBCFP30	1,480,694.9036	502,323.4098	0+00.00	109.9398

\* 5 \$ RAMP IB\_CFP POINTS ALONG BASELINE CONST \$

\* 6 LAY OFF CHA IB\_CFP RTIBCFP11-RTIBCFP20

Point	North	East	Station	Offset	R
RTIBCFP11	1,480,402.5578	502,089.0354	102+24.83	-15.0000	
RTIBCFP12	1,480,421.5431	502,105.6812	102+50.00	-15.0000	
RTIBCFP13	1,480,459.0019	502,139.0255	103+00.00	-15.0000	
RTIBCFP14	1,480,496.1254	502,172.7427	103+50.00	-15.0000	
RTIBCFP15	1,480,532.9099	502,206.8294	104+00.00	-15.0000	
RTIBCFP16	1,480,569.3345	502,241.2328	104+50.00	-15.0000	
RTIBCFP17	1,480,605.6020	502,275.6519	105+00.00	-15.0000	
RTIBCFP18	1,480,612.1542	502,281.8702	105+09.03	-15.0000	

		RT_IB_CFPDCP. OBM		
RTI BCFP19	1, 480, 641. 8695	502, 310. 0709	105+50. 00	-15. 0000
RTI BCFP20	1, 480, 678. 1369	502, 344. 4899	106+00. 00	-15. 0000

\* 7 \$ RAMP IB\_CFP INSIDE EXISTING ELEVATIONS \$

\* 8 PRINT POINT RTI BCFP11 RTI BCFP12 RTI BCFP13 RTI BCFP14 RTI BCFP15 RTI BCFP16 RTI BCFP17 RTI BCFP18 RTI BCFP19 RTI BCFP20

Poi nt	North	East	Stati on	El evati on
RTI BCFP11	1, 480, 402. 5578	502, 089. 0354	0+00. 00	110. 2750
RTI BCFP12	1, 480, 421. 5431	502, 105. 6812	0+00. 00	110. 1862
RTI BCFP13	1, 480, 459. 0019	502, 139. 0255	0+00. 00	109. 9024
RTI BCFP14	1, 480, 496. 1254	502, 172. 7427	0+00. 00	109. 6263
RTI BCFP15	1, 480, 532. 9099	502, 206. 8294	0+00. 00	109. 3465
RTI BCFP16	1, 480, 569. 3345	502, 241. 2328	0+00. 00	109. 1459
RTI BCFP17	1, 480, 605. 6020	502, 275. 6519	0+00. 00	109. 0238
RTI BCFP18	1, 480, 612. 1542	502, 281. 8702	0+00. 00	108. 9997
RTI BCFP19	1, 480, 641. 8695	502, 310. 0709	0+00. 00	108. 8671
RTI BCFP20	1, 480, 678. 1369	502, 344. 4899	0+00. 00	108. 6990

\* 9 \$ RAMP IB\_CFP OUTSIDE EXISTING ELEVATIONS \$

\* 10 PRINT POINT RTI BCFP01 RTI BCFP02 RTI BCFP03 RTI BCFP04 RTI BCFP05 RTI BCFP06 RTI BCFP07 RTI BCFP08 RTI BCFP09 RTI BCFP10

Poi nt	North	East	Stati on	El evati on
RTI BCFP01	1, 480, 392. 6973	502, 100. 3390	0+00. 00	109. 6645
RTI BCFP02	1, 480, 411. 6259	502, 116. 9350	0+00. 00	109. 5700
RTI BCFP03	1, 480, 448. 9726	502, 150. 1796	0+00. 00	109. 2362
RTI BCFP04	1, 480, 485. 9851	502, 183. 7959	0+00. 00	108. 8853
RTI BCFP05	1, 480, 522. 6595	502, 217. 7807	0+00. 00	108. 5612
RTI BCFP06	1, 480, 559. 0088	502, 252. 1131	0+00. 00	108. 5756
RTI BCFP07	1, 480, 595. 2763	502, 286. 5321	0+00. 00	108. 6088
RTI BCFP08	1, 480, 601. 8285	502, 292. 7504	0+00. 00	108. 6178
RTI BCFP09	1, 480, 631. 5438	502, 320. 9512	0+00. 00	108. 6828
RTI BCFP10	1, 480, 667. 8112	502, 355. 3702	0+00. 00	108. 6709

\* 11 \$ GORE WIDTH CALCULATIONS \$

\* 12 INV RTI BCFP12 RTI BCFP22

Inverse RTI BCFP12 to RTI BCFP22 N 51° 12' 36. 48" W Di stance 1. 0809

\* 13 INV RTI BCFP13 RTI BCFP23

Inverse RTI BCFP13 to RTI BCFP23 N 51° 12' 36. 49" W Di stance 3. 6044

\* 14 INV RTI BCFP14 RTI BCFP24

Inverse RTI BCFP14 to RTI BCFP24 N 51° 12' 36. 49" W Di stance 6. 6286

\* 15 INV RTI BCFP15 RTI BCFP25

Inverse RTI BCFP15 to RTI BCFP25 N 51° 12' 36. 49" W Di stance 10. 1532

\* 16 INV RTI BCFP16 RTI BCFP26

Inverse RTI BCFP16 to RTI BCFP26 N 51° 12' 36. 49" W Di stance 14. 1502

RT\_IB\_CFPDCP.OBM

\* 17 INV RTIBCFP17 RTIBCFP27  
Inverse RTIBCFP17 to RTIBCFP27 N 51° 12' 36.49" W Distance 18.2577  
\* 18 INV RTIBCFP18 RTIBCFP28  
Inverse RTIBCFP18 to RTIBCFP28 N 51° 30' 07.84" W Distance 19.0000  
\* 19 INV RTIBCFP19 RTIBCFP29  
Inverse RTIBCFP19 to RTIBCFP29 N 51° 30' 07.84" W Distance 22.5735  
\* 20 INV RTIBCFP20 RTIBCFP30  
Inverse RTIBCFP20 to RTIBCFP30 N 51° 30' 07.84" W Distance 26.9350  
\* 21 END

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DES. BY: JW 8/21/17

Project: DCP Interim

Subject:

Job No. DCP Operator: MP

CHECKED BY: MSP 8/22/17

Date: Monday August 21, 2017 4:08 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_IC\_CFP'

\* 1 des cha ic\_cfp

Chain IC\_CFP contains:

CUR IC\_CFP\_1 CUR IC\_CFP\_2 ICCFP1

Beginning chain IC\_CFP description

Curve Data

\*-----\*

Curve IC\_CFP\_1

P.I. Station	402+09.42	N	1,480,753.2329	E	502,020.7611
Delta =	1° 35' 59.01"	(RT)			
Degree =	0° 22' 55.10"				
Tangent =	209.4170				
Length =	418.8068				
Radius =	15,000.0000				
External =	1.4618				
Long Chord =	418.7932				
Mid. Ord. =	1.4616				
P.C. Station	400+00.00	N	1,480,589.0935	E	501,890.7083
P.T. Station	404+18.81	N	1,480,913.6776	E	502,155.3455
C.C.		N	1,471,273.7464	E	513,647.5918
Back =	N 38° 23' 27.20"	E			
Ahead =	N 39° 59' 26.20"	E			
Chord Bear =	N 39° 11' 26.70"	E			

Curve Data

\*-----\*

Curve IC\_CFP\_2

P.I. Station	406+48.33	N	1,481,089.5240	E	502,302.8490
Delta =	4° 15' 36.26"	(LT)			
Degree =	0° 55' 42.49"				
Tangent =	229.5197				
Length =	458.8278				
Radius =	6,171.0000				
External =	4.2668				
Long Chord =	458.7221				
Mid. Ord. =	4.2639				
P.C. Station	404+18.81	N	1,480,913.6776	E	502,155.3454
P.T. Station	408+77.63	N	1,481,275.8417	E	502,436.8825
C.C.		N	1,484,879.5453	E	497,427.4353
Back =	N 39° 59' 26.20"	E			
Ahead =	N 35° 43' 49.95"	E			
Chord Bear =	N 37° 51' 38.08"	E			

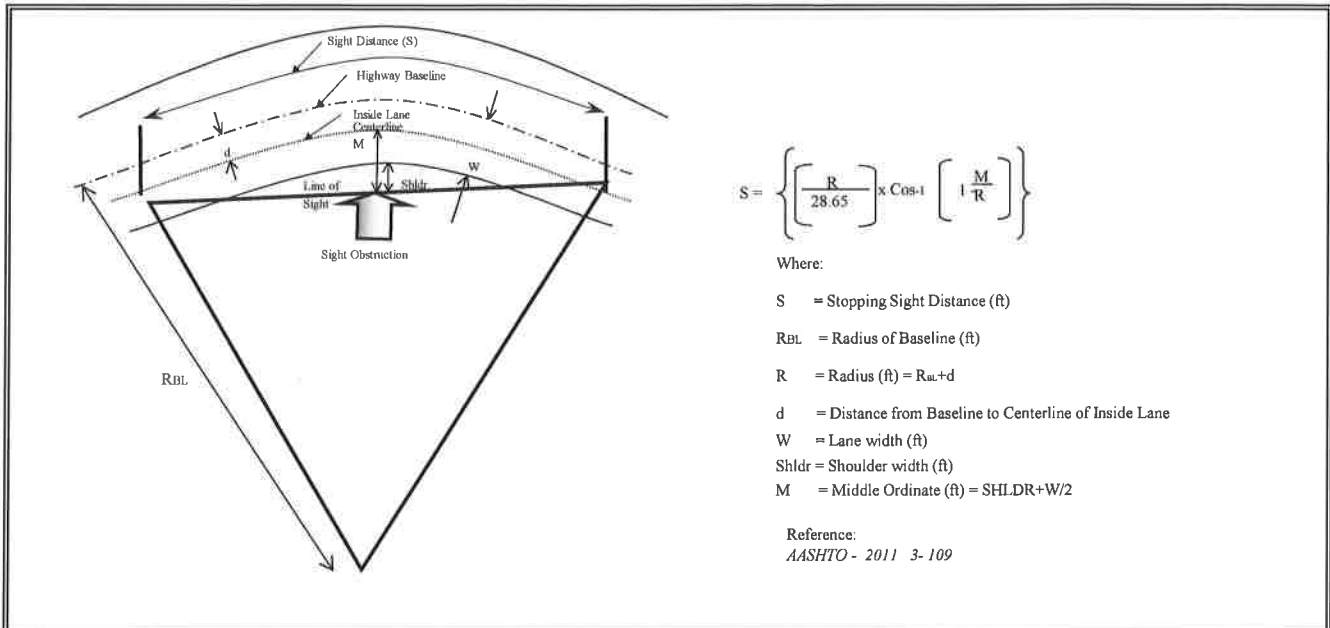
Course from PT IC\_CFP\_2 to ICCFP1 N 35° 43' 49.95" E Dist 57.3650

Point ICCFP1 N 1,481,322.4091 E 502,470.3822 sta 409+35.00

Ending chain IC\_CFP description

Job: **Interim Daryl Carter Pkwy 441113-1-52-01 (Oral)** AECOM Project No: 60480256  
 Description: **Stopping Sight Distance Calculations for Ramp IC\_CFP (NB CFP TO WBI4)** Computed By: BM  
 Checked By: AS

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- R<sub>BL</sub> = Radius of Baseline (ft)
- R = Radius (ft) = R<sub>w</sub>+d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR+W/2

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*  
 DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

All Other Facilities

DESIGN SPEED	50 mph
CURVE NO.	IC_CFP_1
RADIUS OF CURVE ( $R_{BL}$ )	15,000.00'
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	0° 22' 55"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	-7.50'
LANE WIDTH ( $W$ )	15'
SHOULDER WIDTH (Shldr)	6'
VERTICAL GRADE (%)	-1.075% *
M DIMENSION	13.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
1,273.11'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

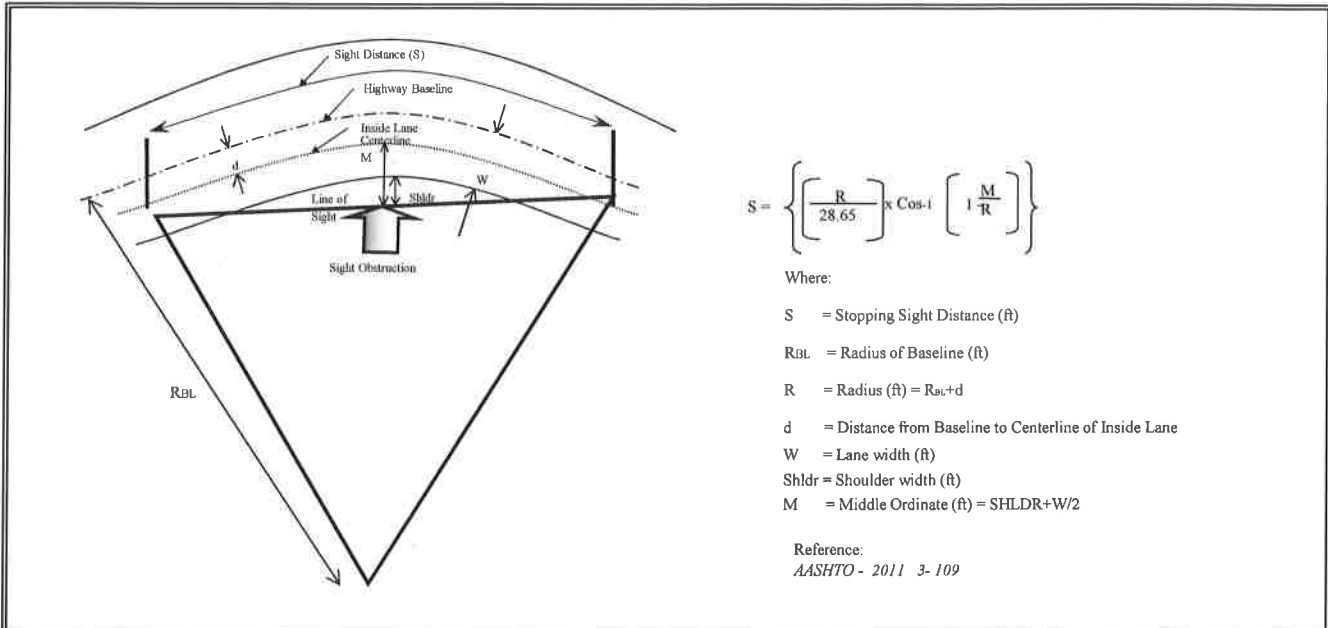
YES  
 YES

COMMENTS:

\* MAXIMUM DOWN HILL GARDE WITH RESPECT TO DIRECTION OF TRAVEL  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Oran) AECOM Project No: 60480256  
 Description: Stopping Sight Distance Calculations for Computed By: BM  
Ramp IC\_CFP (NB CFP TO WBI4) Checked By: AS

## STOPPING SIGHT DISTANCE CALCULATIONS



TYPE OF ROADWAY  
*(Interstate, All other facilities)*

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE (R<sub>BL</sub>)  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE (d)  
 LANE WIDTH (W)  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
 M DIMENSION

50 mph
IC_CFP_2
6,171.00'
LT
0° 55' 42"
-7.50'
15'
6'
-0.600%
13.5'

FDOT REQUIRED SSD  
 AASHTO REQUIRED SSD  
 ACTUAL SSD

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
815.97'	EQUATION

SUFFICIENT FDOT SSD?  
 SUFFICIENT AASHTO SSD?

YES  
YES

COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for Ramp IC\_CFP (NB CFP TO IWBCD2)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Page      of       
 Sheet 1 of 2  
 Date: 8/16/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	<u>WB</u>					
CURVE NO.	<u>IC_CFP_1 (LT)</u>		PC STATION	<u>400+00.00</u>		
DEGREE OF CURVE	<u>0° 22' 55"</u>		PT STATION	<u>404+18.81</u>		
RADIUS OF CURVE	<u>15,000.00'</u>					
DESIGN SPEED	<u>50 mph</u>		BEGIN TRANSITION	<u>N/A *</u>		
e=	<u>NC</u>		BEGIN FULL SUPER	<u>N/A *</u>		
SE SPLIT INTO CURVE (Tangent/Curve)	<u>80</u>	<u>20</u>	END FULL SUPER	<u>N/A *</u>		
SE SPLIT OUT OF CURVE (Tangent/Curve)	<u>80</u>	<u>20</u>	END TRANSITION	<u>N/A *</u>		
TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH INTO CURVE		15	200	0.00		
				0.00		
<b>1-LANE RAMP</b>				0.00		
* No Transition Required				0.00		
TOTAL LENGTH OUT OF CURVE		15	200	0.00		
				0.00		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					
NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP WITH RESPECT TO STATIONING.						
* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.						





Job: Interim Daryl Carter Pkwy 441113-1-52-01  
 Description: Super Elevation Transition Calculations for  
Ramp IC\_CFP (NB CFP TO IWBCD2)

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: AS

Sheet 2 of 2  
 Date: 8/16/17  
 Date: 8/24/17

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	<u>Rural</u>		
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>			
TRAVEL DIRECTION	<u>WB</u>		
CURVE NO.	<u>IC_CFP_2 (LT)</u>	PC STATION	<u>404+18.81</u>
DEGREE OF CURVE	<u>0° 55' 42"</u>	PT STATION	<u>408+77.63</u>
RADIUS OF CURVE	<u>6,171.00'</u>		
DESIGN SPEED	<u>50 mph</u>	BEGIN TRANSITION	<u>N/A</u> *
e=	<u>RC</u>	BEGIN FULL SUPER	<u>N/A</u>
SE SPLIT INTO CURVE ( <i>Tangent/Curve</i> )		END FULL SUPER	<u>N/A</u>
SE SPLIT OUT OF CURVE ( <i>Tangent/Curve</i> )		END TRANSITION	<u>N/A</u>

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
<b>1-LANE RAMP</b>				0.00		
Transition out (+) 0.02 (RC) to meet existing cross slope (0.00) at STA. 409+35.00				0.00		
	0.020	15	200	100.00	408+35.00	409+35.00
TOTAL LENGTH OUT OF CURVE				<b>100.00</b>		
ZERO XSLOPE INTO CURVE	<u>N/A</u>					
ZERO XSLOPE OUT OF CURVE	<u>N/A</u>					

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP WITH RESPECT TO DIRECTION OF STATIONING.  
 \* NO TRANSITION REQUIRED, CROSS SLOPE MEETS RC REQUIREMENT.

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Project: DCP Interim

Subject:

Job No. DCP Operator: MP

Date: Wednesday September 13, 2017 6:52 pm

*DES. BY: JW 8/11/17*

*CHECKED BY: MSP 9/15/17*

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_IC\_CFP'

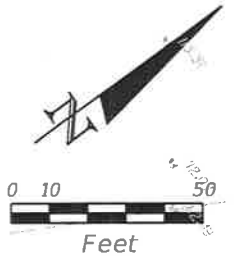
\* 1 pri pro ic\_cfp

Beginning profile IC\_CFP description:

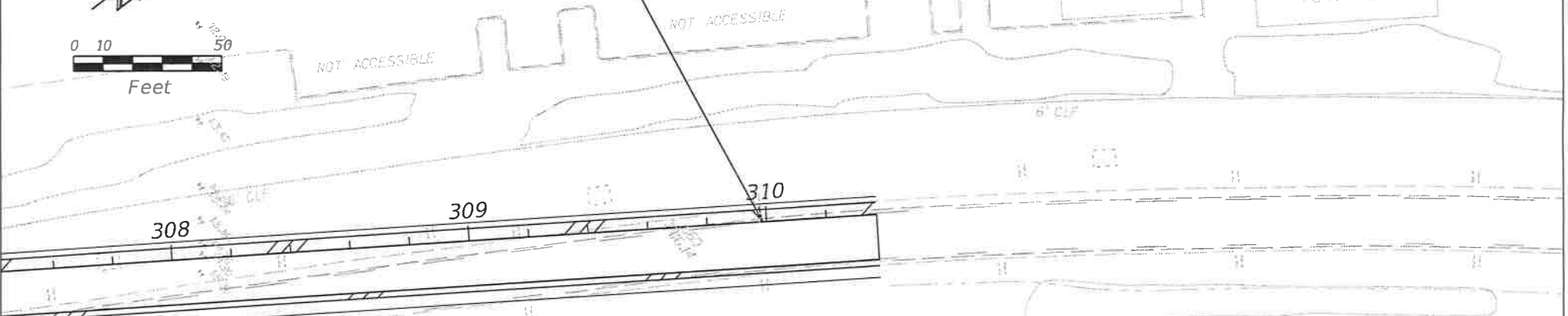
		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	400+00.00	115.1000				
VPI	2	400+50.00	114.8600	-0.4800			
VPC		400+90.00	114.6571	-0.5071	K = 125.2		
Low Point		401+53.47	114.4962				
VPI	3	401+90.00	114.1500		200.0000	100.0000	100.0000
VPT		402+90.00	115.2409	1.0909			
VPI	4	403+00.00	115.3500	1.0909			
VPC		403+24.00	115.6055	1.0644	K = 215.6	SSD = 925.6	
VPI	5	404+74.00	117.2021		300.0000	150.0000	150.0000
High Point		405+53.52	116.8270				
VPT		406+24.00	116.7118	-0.3268			
VPC		406+30.00	116.6922	-0.3268	K = 258.9		
Low Point		407+14.63	116.5539				
VPI	6	407+50.00	116.3000		240.0000	120.0000	120.0000
VPT		408+70.00	117.0200	0.6000			
VPI	7	409+20.00	117.3200	0.6000			
VPI	8	409+35.00	117.4400	0.8000			

Ending profile IC\_CFP description

DES. BY: BM 9/22/17  
CHECKED BY: MSP 9/27/17



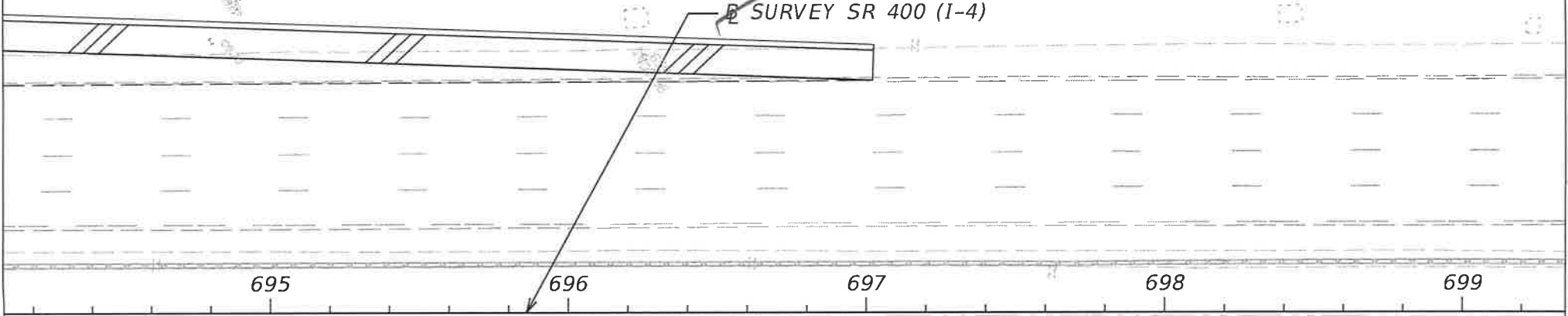
RAMP IA\_CFP



STA 409+45.00  
EL = 117.54'  
STA 409+35.00  
EL = 117.44'

TAKE-OFF GRADE SKETCH  
RAMP IC\_CFP PROFILE

SURVEY SR 400 (I-4)





## Ramp Terminal - Detail

Sheet 1 of 4

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: Ramp IC\_CFP and IA\_CFP

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Date: 4/24/2018  
 Date: 4/24/2018

MAINLINE						GORE		RAMP					
Baseline	Mainline Station	PGL Elev.	Inside Travel Lane Slope(%)	Inside EOT Offset	Inside EOT Elev.	Gore Width	Gore Slope(%)	Outside Elev.	*Pavement Slope(%)	Pavement Width	Inside Elev.	Baseline	Ramp Station
IA_CFP	300+00.00	114.62	2.00%	12.00	114.86	0.00	N/A	114.86	1.99%	12.00	115.10	IC_CFP	400+00.00
IA_CFP	300+49.86	114.37	2.00%	12.12	114.61	0.00	N/A	114.61	2.03%	12.12	114.86	IC_CFP	400+50.00
IA_CFP	300+99.70	114.12	2.00%	12.47	114.37	0.00	N/A	114.37	1.91%	12.47	114.61	IC_CFP	401+00.00
IA_CFP	301+49.54	113.97	2.00%	13.05	114.23	0.00	N/A	114.23	2.06%	13.05	114.50	IC_CFP	401+50.00
IA_CFP	301+99.35	114.02	2.00%	13.86	114.29	0.00	N/A	114.29	2.08%	13.86	114.58	IC_CFP	402+00.00
IA_CFP	302+49.14	114.26	2.00%	14.91	114.55	0.00	N/A	114.55	2.12%	14.91	114.87	IC_CFP	402+50.00
IA_CFP	302+53.46	114.29	2.00%	15.00	114.59	0.00	2.00%	114.59	2.10%	15.00	114.90	IC_CFP	402+53.64
IA_CFP	302+99.72	114.70	2.00%	15.00	115.00	2.39	2.00%	115.05	2.00%	15.00	115.35	IC_CFP	403+00.00
IA_CFP	303+49.57	115.17	2.00%	15.00	115.47	5.42	2.00%	115.58	1.93%	15.00	115.87	IC_CFP	403+50.00
IA_CFP	303+99.36	115.52	2.00%	15.00	115.82	8.91	2.00%	116.00	1.87%	15.00	116.28	IC_CFP	404+00.00
IA_CFP	304+49.00	115.73	2.00%	15.00	116.03	12.75	2.00%	116.28	2.00%	15.00	116.58	IC_CFP	404+50.00
IA_CFP	304+98.58	115.81	2.00%	15.00	116.11	16.52	2.00%	116.44	2.13%	15.00	116.76	IC_CFP	405+00.00
IA_CFP	305+05.17	115.81	2.00%	15.00	116.11	17.00	2.00%	116.45	2.20%	15.00	116.78	IC_CFP	405+06.63

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Sheet 2 of 4

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)

Description: Ramp IC\_CFP and IA\_CFP

AECOM Project No: 60480256

Computed By: BM

Checked By: MSP

Date: 4/24/2018

Date: 4/24/2018

Baseline	Mainline Station	PGL Elev.	Inside Travel Lane Width	Inside Travel Lane Slope(%)	Inside EOT Offset	Inside EOT Elev.	COGO Distance	Gore Width	Baseline	Ramp Station	*Pavement Slope(%)	COGO Width	Pavement Width
IA_CFP	300+00.00	114.62	12.00	2.00%	12.00	114.86	24.00	0.00	IC_CFP	400+00.00	2.00%	0.00	12.00
IA_CFP	300+49.86	114.37	12.12	2.00%	12.12	114.61	24.23	0.00	IC_CFP	400+50.00	2.00%	0.00	12.12
IA_CFP	300+99.70	114.12	12.47	2.00%	12.47	114.37	24.93	0.00	IC_CFP	401+00.00	2.00%	0.00	12.47
IA_CFP	301+49.54	113.97	13.05	2.00%	13.05	114.23	26.09	0.00	IC_CFP	401+50.00	2.00%	0.00	13.05
IA_CFP	301+99.35	114.02	13.86	2.00%	13.86	114.29	27.72	0.00	IC_CFP	402+00.00	2.00%	0.00	13.86
IA_CFP	302+49.14	114.26	14.91	2.00%	14.91	114.55	29.81	0.00	IC_CFP	402+50.00	2.00%	0.00	14.91
IA_CFP	302+53.46	114.29	15.00	2.00%	15.00	114.59	15.00	0.00	IC_CFP	402+53.64	2.00%	-15.00	15.00
IA_CFP	302+99.72	114.70	15.00	2.00%	15.00	115.00	17.39	2.39	IC_CFP	403+00.00	2.00%	-15.00	15.00
IA_CFP	303+49.57	115.17	15.00	2.00%	15.00	115.47	20.42	5.42	IC_CFP	403+50.00	2.00%	-15.00	15.00
IA_CFP	303+99.36	115.52	15.00	2.00%	15.00	115.82	23.91	8.91	IC_CFP	404+00.00	2.00%	-15.00	15.00
IA_CFP	304+49.00	115.73	15.00	2.00%	15.00	116.03	27.75	12.75	IC_CFP	404+50.00	2.00%	-15.00	15.00
IA_CFP	304+98.58	115.81	15.00	2.00%	15.00	116.11	31.52	16.52	IC_CFP	405+00.00	2.00%	-15.00	15.00
IA_CFP	305+05.17	115.81	15.00	2.00%	15.00	116.11	32.00	17.00	IC_CFP	405+06.63	2.00%	-15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Graph Input

Sheet 3 of 4

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)

Description: Ramp IC\_CFP and IA\_CFP

AECOM Project No: 60480256

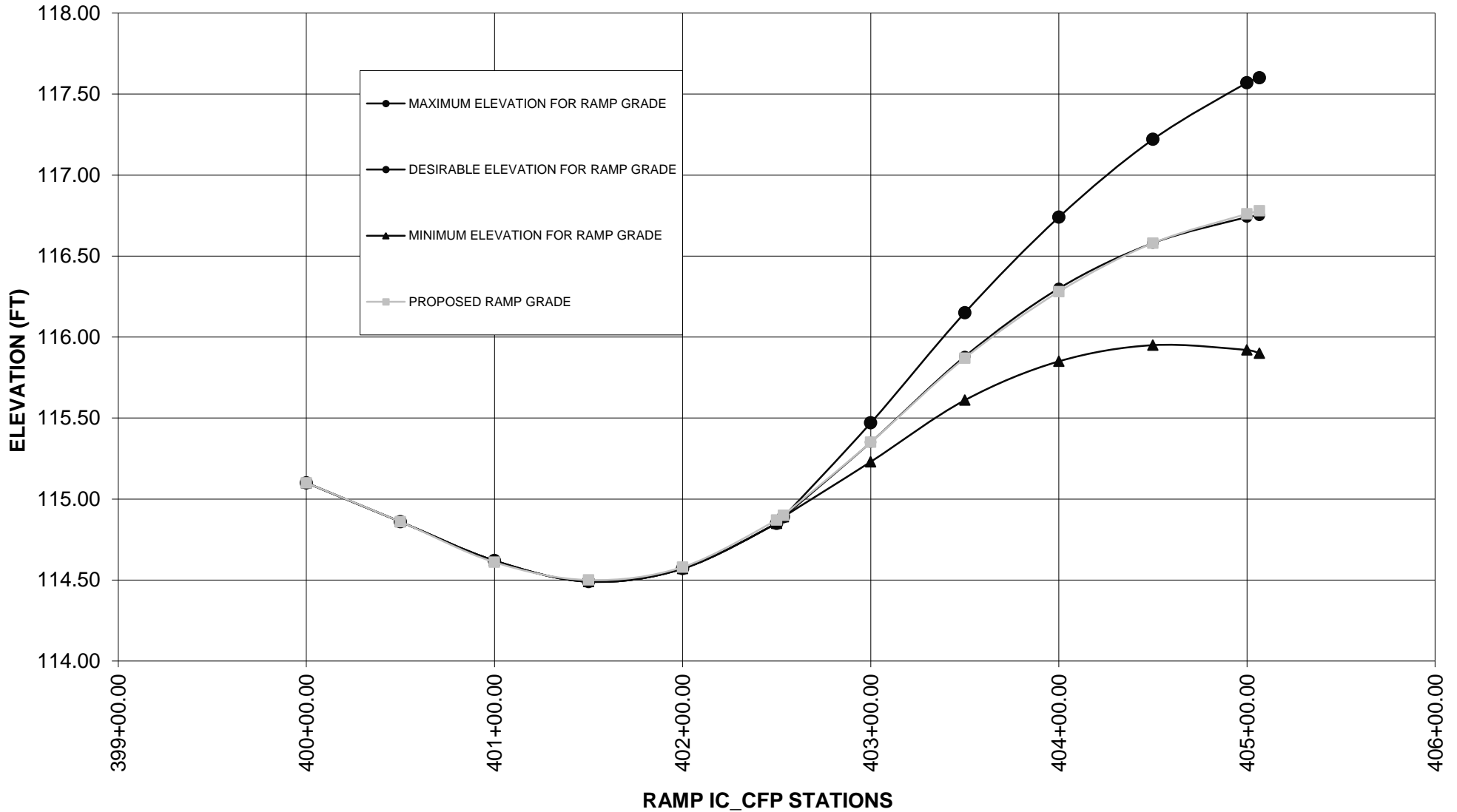
Computed By: BM

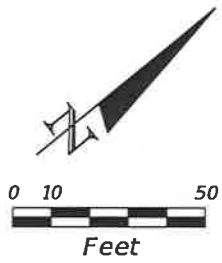
Checked By: MSP

Date: 4/24/2018

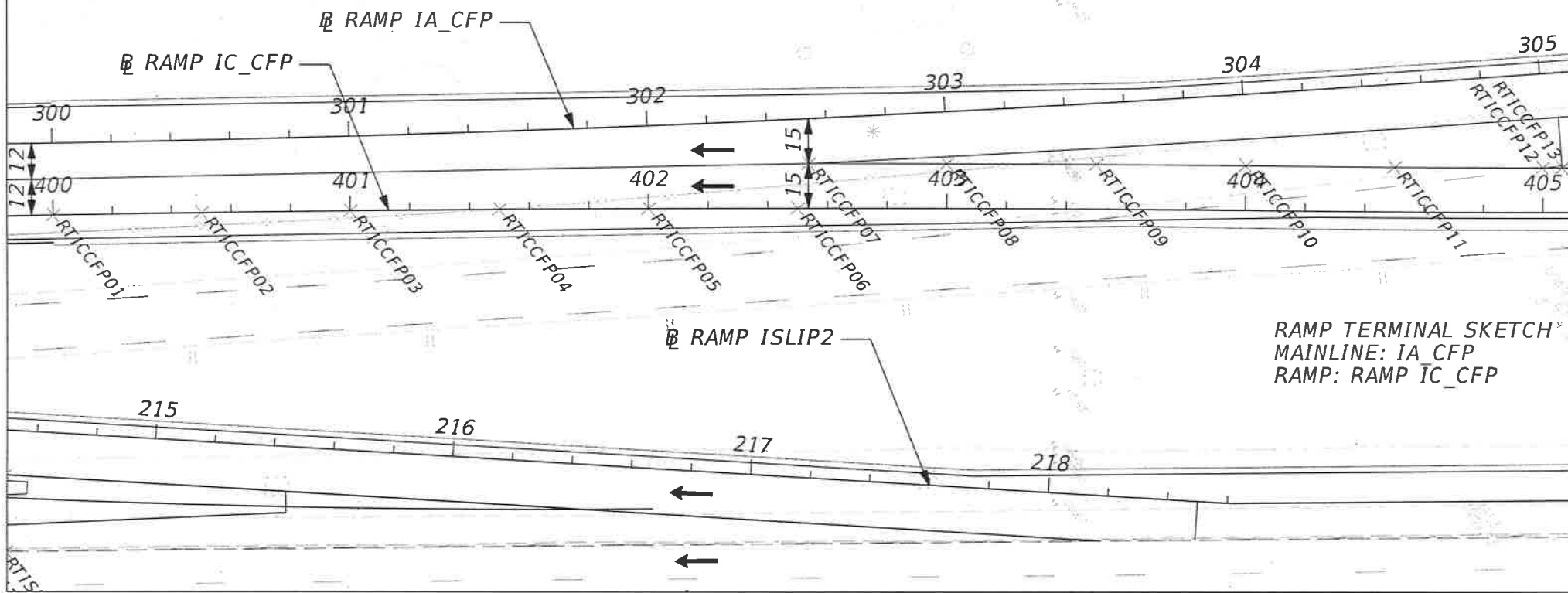
Date: 4/24/2018

MINIMUM ELEVATION FOR RAMP GRADE					DESIRABLE ELEVATION FOR RAMP GRADE					MAXIMUM ELEVATION FOR RAMP GRADE				
Mainline Rollover	Gore Slope(%)	Ramp Rollover	Outside Ramp Elevation	Inside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Outside Ramp Elevation	Inside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Outside Ramp Elevation	Inside Ramp Elevation
5.00%	N/A	0.00%	114.86	115.10	0.00%	N/A	0.00%	114.86	115.10	5.00%	N/A	0.00%	114.86	115.10
5.00%	N/A	0.00%	114.61	114.86	0.00%	N/A	0.00%	114.61	114.86	5.00%	N/A	0.00%	114.61	114.86
5.00%	N/A	0.00%	114.37	114.62	0.00%	N/A	0.00%	114.37	114.62	5.00%	N/A	0.00%	114.37	114.62
5.00%	N/A	0.00%	114.23	114.49	0.00%	N/A	0.00%	114.23	114.49	5.00%	N/A	0.00%	114.23	114.49
5.00%	N/A	0.00%	114.29	114.57	0.00%	N/A	0.00%	114.29	114.57	5.00%	N/A	0.00%	114.29	114.57
5.00%	N/A	0.00%	114.55	114.85	0.00%	N/A	0.00%	114.55	114.85	5.00%	N/A	0.00%	114.55	114.85
5.00%	N/A	0.00%	114.59	114.89	0.00%	N/A	0.00%	114.59	114.89	5.00%	N/A	0.00%	114.59	114.89
5.00%	-3.00%	5.00%	114.93	115.23	0.00%	2.00%	0.00%	115.05	115.35	5.00%	7.00%	5.00%	115.17	115.47
5.00%	-3.00%	5.00%	115.31	115.61	0.00%	2.00%	0.00%	115.58	115.88	5.00%	7.00%	5.00%	115.85	116.15
5.00%	-3.00%	5.00%	115.55	115.85	0.00%	2.00%	0.00%	116.00	116.30	5.00%	7.00%	5.00%	116.44	116.74
5.00%	-3.00%	5.00%	115.65	115.95	0.00%	2.00%	0.00%	116.28	116.58	5.00%	7.00%	5.00%	116.92	117.22
5.00%	-3.00%	5.00%	115.62	115.92	0.00%	2.00%	0.00%	116.44	116.74	5.00%	7.00%	5.00%	117.27	117.57
5.00%	-3.00%	5.00%	115.60	115.90	0.00%	2.00%	0.00%	116.45	116.75	5.00%	7.00%	5.00%	117.30	117.60





CHECK PRINT STAMP		
	Signature	Date
Originator	BM	9/20/17
Checker	AS	9/20/17
Backchecker		
Corrector		
Verifier		



RAMP TERMINAL SKETCH  
 MAINLINE: IA\_CFP  
 RAMP: RAMP IC\_CFP



DES. BY: SM 8/21/17  
 CHECKED BY: AS 9/19/17

RT\_IC\_CFPDCP.OBM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject: [ None ]  
 Job No. DCP Operator: BM  
 Date: Thursday August 31, 2017 10:33 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'RT\_IC\_CFP'

\* 1 LAY OFF CHA IA\_CFP RTICCFP01-RTICCFP13

Point	North	East	Station	Offset	R
RTICCFP01	1,480,589.0935	501,890.7083	300+00.00	24.0000	-
RTICCFP02	1,480,628.2312	501,921.8247	300+49.86	24.2326	-
RTICCFP03	1,480,667.2651	501,953.0714	300+99.70	24.9304	-
RTICCFP04	1,480,706.1946	501,984.4481	301+49.54	26.0932	-
RTICCFP05	1,480,745.0192	502,015.9543	301+99.35	27.7208	-
RTICCFP06	1,480,783.7387	502,047.5898	302+49.14	29.8130	-
RTICCFP07	1,480,796.0639	502,038.2984	302+53.46	15.0000	-
RTICCFP08	1,480,831.9010	502,067.7859	302+99.72	17.3927	-
RTICCFP09	1,480,870.4472	502,099.7107	303+49.57	20.4212	-
RTICCFP10	1,480,908.8868	502,131.7638	303+99.36	23.9142	-
RTICCFP11	1,480,947.2085	502,163.7908	304+49.00	27.7515	-
RTICCFP12	1,480,985.7130	502,195.4964	304+98.58	31.5152	-
RTICCFP13	1,480,990.8362	502,199.6756	305+05.17	32.0000	-

\* 2 EL PRO IA\_CFP 300+00.00 300+49.86 300+99.70 301+49.54 301+99.35 30-  
 2+49.14 302+53.46 302+99.72 303+49.57 303+99.36 304+49.00 304+98.58 305+05.17

Elev at 300+00.00 = 114.6215, grade = -0.5000, on tang betw 1 & 2  
 Elev at 300+49.86 = 114.3722, grade = -0.5000, on tang betw 1 & 2  
 Elev at 300+99.70 = 114.1230, grade = -0.5000, on tang betw 1 & 2  
 Elev at 301+49.54 = 113.9708, grade = -0.1083, on curve vpi 2  
 Elev at 301+99.35 = 114.0150, grade = 0.2856, on curve vpi 2  
 Elev at 302+49.14 = 114.2552, grade = 0.6793, on curve vpi 2  
 Elev at 302+53.46 = 114.2853, grade = 0.7135, on curve vpi 2  
 Elev at 302+99.72 = 114.6999, grade = 1.0793, on curve vpi 2  
 Elev at 303+49.57 = 115.1743, grade = 0.8202, on curve vpi 3  
 Elev at 303+99.36 = 115.5173, grade = 0.5577, on curve vpi 3  
 Elev at 304+49.00 = 115.7292, grade = 0.2960, on curve vpi 3  
 Elev at 304+98.58 = 115.8112, grade = 0.0346, on curve vpi 3  
 Elev at 305+05.17 = 115.8123, grade = -0.0001, on curve vpi 3

\* 3 LAY OFF CHA IC\_CFP RTICCFP01-RTICCFP13

Point	North	East	Station	Offset	R
RTICCFP01	1,480,589.0935	501,890.7083	400+00.00	0.0000	-
RTICCFP02	1,480,628.2312	501,921.8247	400+50.00	0.0000	-
RTICCFP03	1,480,667.2651	501,953.0714	401+00.00	0.0000	-
RTICCFP04	1,480,706.1946	501,984.4481	401+50.00	0.0000	-
RTICCFP05	1,480,745.0192	502,015.9543	402+00.00	0.0000	-
RTICCFP06	1,480,783.7387	502,047.5898	402+50.00	0.0000	-
RTICCFP07	1,480,796.0639	502,038.2984	402+53.64	-15.0000	-
RTICCFP08	1,480,831.9010	502,067.7859	403+00.00	-15.0000	-
RTICCFP09	1,480,870.4472	502,099.7107	403+50.00	-15.0000	-
RTICCFP10	1,480,908.8868	502,131.7638	404+00.00	-15.0000	-
RTICCFP11	1,480,947.2085	502,163.7908	404+50.00	-15.0000	-
RTICCFP12	1,480,985.7130	502,195.4964	405+00.00	-15.0000	-
RTICCFP13	1,480,990.8362	502,199.6756	405+06.63	-15.0000	-

DES-BY: MSP 4/23/18  
 CHECKED BY: AS 5/18/18

HA\_DIV01DCP.OBM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.  
 Project: DCP Interim  
 Subject: [ None ]  
 Job No. DCP Operator: BM  
 Date: Monday April 23, 2018 2:46 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA\_DIV01'

\* 1 des cha div01

DES. SPEED = 50 MPH

Chain DIV01 contains:  
 CUR DIV011 CUR DIV012 DIV02

(E = NC FOR MIN. RADIUS OF 2400' PER  
 FOOT DESIGN STANDARD 102-600)

Beginning chain DIV01 description

Curve Data

\*-----\*

Curve DIV011  
 P.I. Station 102+86.13 N 1,481,508.5722 E 502,760.1941  
 Delta = 13° 35' 50.63" (LT)  
 Degree = 2° 23' 14.37"  
 Tangent = 286.1274  
 Length = 569.5664  
 Radius = 2,400.0000  
 External = 16.9958  
 Long Chord = 568.2308  
 Mid. Ord. = 16.8763  
 P.C. Station 100+00.00 N 1,481,284.5269 E 502,582.2261  
 P.T. Station 105+69.57 N 1,481,768.1777 E 502,880.5014  
 C.C. N 1,482,777.2999 E 500,702.9633  
 Back = N 38° 27' 41.43" E  
 Ahead = N 24° 51' 50.81" E  
 Chord Bear = N 31° 39' 46.12" E

Curve Data

\*-----\*

Curve DIV012  
 P.I. Station 107+72.70 N 1,481,952.4819 E 502,965.9123  
 Delta = 6° 50' 17.34" (RT)  
 Degree = 1° 41' 06.61"  
 Tangent = 203.1331  
 Length = 405.7839  
 Radius = 3,400.0000  
 External = 6.0627  
 Long Chord = 405.5431  
 Mid. Ord. = 6.0519  
 P.C. Station 105+69.57 N 1,481,768.1777 E 502,880.5014  
 P.T. Station 109+75.35 N 1,482,125.3056 E 503,072.6598  
 C.C. N 1,480,338.5878 E 505,965.3471  
 Back = N 24° 51' 50.81" E  
 Ahead = N 31° 42' 08.14" E  
 Chord Bear = N 28° 16' 59.47" E

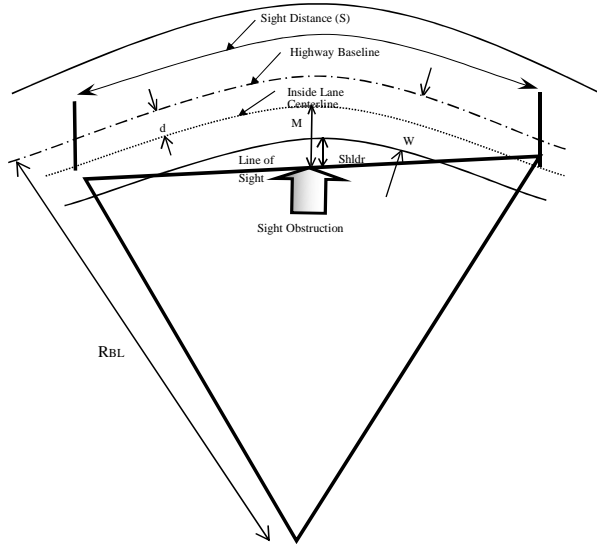
Course from PT DIV012 to DIV02 N 31° 42' 08.14" E Dist 59.0606

Point DIV02 N 1,482,175.5538 E 503,103.6965 Sta 110+34.41

Ending chain DIV01 description

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Oral) AECOM Project No: 60480256  
 Description: Stopping Sight Distance Calculations for DIVERSION 1 (EB/WB CFP TO WB I-4) Computed By: BM  
 Checked By: MSP

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- RBL = Radius of Baseline (ft)
- R = Radius (ft) = RBL + d
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) = SHLDR + W/2

Reference:  
 AASHTO - 2011 3-109

TYPE OF ROADWAY  
*(Interstate, All other facilities)*

All Other Facilities

DESIGN SPEED  
 CURVE NO.  
 RADIUS OF CURVE ( $R_{BL}$ )  
 DIRECTION OF CURVE (LT or RT)  
 DEGREE OF CURVE  
 OFFSET DISTANCE FROM BASELINE TO  
 CENTERLINE OF INSIDE LANE ( $d$ )  
 LANE WIDTH ( $W$ )  
 SHOULDER WIDTH (Shldr)  
 VERTICAL GRADE (%)  
**M DIMENSION**

DESIGN SPEED	50 mph
CURVE NO.	DIV011
RADIUS OF CURVE ( $R_{BL}$ )	2,400.00'
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	2° 23' 14"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )	7.50'
LANE WIDTH ( $W$ )	15'
SHOULDER WIDTH (Shldr)	2'
VERTICAL GRADE (%)	-2.000%
<b>M DIMENSION</b>	<b>9.5'</b>

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

425.00'	FDOT PPM, TABLE 2.7.1, January 2016.
425.00'	AASHTO 2011, Table 3-1 & 3-2.
427.86'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
YES

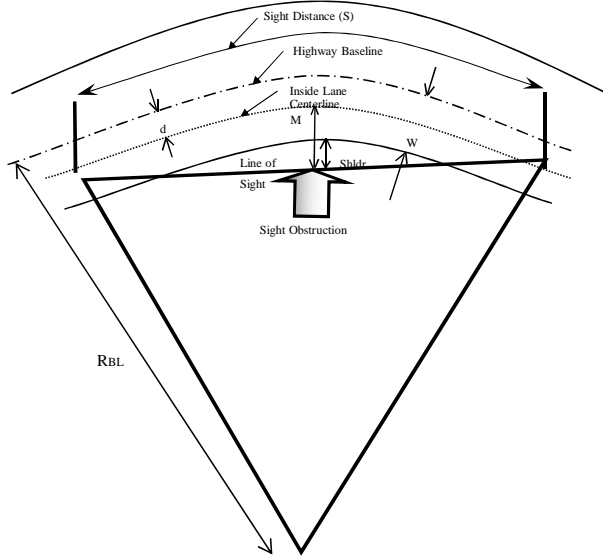
COMMENTS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Job: **Interim Daryl Carter Pkwy 441113-1-52-01 (Or)**  
 Description: **Stopping Sight Distance Calculations for DIVERSION 1 (EB/WB CFP TO WB I-4)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

## STOPPING SIGHT DISTANCE CALCULATIONS



$$S = \left\{ \left[ \frac{R}{28.65} \right] \times \cos^{-1} \left[ 1 - \frac{M}{R} \right] \right\}$$

Where:

- S = Stopping Sight Distance (ft)
- RBL = Radius of Baseline (ft)
- R = Radius (ft) =  $R_{BL} + d$
- d = Distance from Baseline to Centerline of Inside Lane
- W = Lane width (ft)
- Shldr = Shoulder width (ft)
- M = Middle Ordinate (ft) =  $SHLDR + W/2$

Reference:  
 AASHTO - 2011 3-109

**TYPE OF ROADWAY**  
*(Interstate, All other facilities)*

**All Other Facilities**

**DESIGN SPEED**  
**CURVE NO.**  
**RADIUS OF CURVE ( $R_{BL}$ )**  
**DIRECTION OF CURVE (LT or RT)**  
**DEGREE OF CURVE**  
**OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE ( $d$ )**  
**LANE WIDTH ( $W$ )**  
**SHOULDER WIDTH (Shldr)**  
**VERTICAL GRADE (%)**  
**M DIMENSION**

50 mph
DIV012
3,400.00'
RT
1° 41' 7"
7.50'
15'
2'
-3.955%
9.5'

**FDOT REQUIRED SSD**  
**AASHTO REQUIRED SSD**  
**ACTUAL SSD**

453.64'	FDOT PPM, TABLE 2.7.1, January 2016.
454.91'	AASHTO 2011, Table 3-1 & 3-2.
507.85'	EQUATION

**SUFFICIENT FDOT SSD?**  
**SUFFICIENT AASHTO SSD?**

YES  
YES

**COMMENTS:**  
**NOT USED**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for**  
**DIVERSION 1 (EB/WB TO WB I-4)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Page      of       
 Sheet 1 of 2  
 Date: 4/23/18  
 Date: 5/17/18

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	Rural				
<small>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</small>					
TRAVEL DIRECTION	WB				
CURVE NO.	DIV011 (LT)		PC STATION	100+00.00	
DEGREE OF CURVE	2° 23' 14"		PT STATION	105+69.57	
RADIUS OF CURVE	2,400.00'				
DESIGN SPEED	50 mph		BEGIN TRANSITION	N/A	
e=	0.047 *		BEGIN FULL SUPER	N/A	
SE SPLIT INTO CURVE (Tangent/Curve)	80 20		END FULL SUPER	N/A	
SE SPLIT OUT OF CURVE (Curve/Curve)	80 20		END TRANSITION	N/A	

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
<b>1-LANE RAMP</b>				0.00		
(+) 0.035 to (+) 0.02 at Transition to start just beyond physical gore.				0.00		
	0.015	15	200	100.00	103+55.00	104+55.00
TOTAL LENGTH OUT OF CURVE				<b>100.00</b>		

ZERO XSLOPE INTO CURVE	N/A
ZERO XSLOPE OUT OF CURVE	N/A


---

NOTE: CHAIN AND PGL ARE ON THE LEFT EOP IN THE DIRECTION OF STATIONING.

---

\*PER FDOT DESIGN STANDARD 102-600 SUPERELEVATION IS NC FOR 2,400' RADIUS FOR TTCP.

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Job: **Interim Daryl Carter Pkwy 441113-1-52-01**  
 Description: **Super Elevation Transition Calculations for  
 DIVERSION 1 (EB/WB TO WB I-4)**

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Page      of       
 Sheet 2 of 2  
 Date: 4/23/2018  
 Date: 5/17/2018

**SUPERELEVATION CALCULATIONS**

TYPE OF ROADWAY ( <i>Rural or Urban</i> )	Rural					
<i>(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)</i>						
TRAVEL DIRECTION	WB					
CURVE NO.	DIV012 (RT)		PC STATION	105+69.57		
DEGREE OF CURVE	1° 41' 7"		PT STATION	109+75.35		
RADIUS OF CURVE	3,400.00'					
DESIGN SPEED	50 mph		BEGIN TRANSITION	N/A		
e=	0.035 *		BEGIN FULL SUPER	N/A		
SE SPLIT INTO CURVE (Curve/Curve)	80	20	END FULL SUPER	N/A		
SE SPLIT OUT OF CURVE (Tangent/Curve)	80	20	END TRANSITION	N/A		
<b>TRANSITION DESCRIPTION</b>						
	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
<b>1-LANE RAMP</b>				0.00		
No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				<b>0.00</b>		
				0.00		
<b>1-LANE RAMP</b>				0.00		
No Transition Required				0.00		
TOTAL LENGTH OUT OF CURVE				<b>0.00</b>		
ZERO XSLOPE INTO CURVE	N/A					
ZERO XSLOPE OUT OF CURVE	N/A					
<hr/>						
NOTE: CHAIN AND PGL ARE ON THE LEFT EOP IN THE DIRECTION OF STATIONING.						
<hr/>						
*PER FDOT DESIGN STANDARD 102-600 SUPERELEVATION IS NC FOR 2,400' RADIUS FOR TTCP.						
<hr/>						

DES. BY: MSP 4/23/18  
CHECKED BY: AS 5/18/18

VA\_DIV01DCP.OBM

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.

Project: DCP Interim  
Subject: [ None ]  
Job No. DCP Operator: BM  
Date: Thursday April 26, 2018 9:14 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA\_DIV01'

\* 1 pri pro div01

DES. SPEED = 50 MPH  
DES. SPEED = 35 MPH (FOR VERTICAL  
CURVE; CLOSE TO INTERSECTION)

Beginning profile DIV01 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	100+00.00	110.0400				
VPI	2	100+50.00	110.2600	0.4400			
VPI	3	101+00.00	110.3300	0.1400			
VPI	4	101+19.64	110.3500	0.1018			
VPI	5	101+50.00	110.4500	0.3294			
VPI	6	102+00.00	110.5800	0.2600			
VPI	7	102+50.00	110.9000	0.6400			
VPI	8	103+00.00	111.4100	1.0200			
VPI	9	103+52.49	112.0300	1.1812			
VPC		106+23.99	113.6617	0.6010	K = 50.6	SSD = 372.7	
High Point		106+54.37	113.7530				
VPI	10	107+23.99	114.2627		200.0000	100.0000	100.0000
VPT		108+23.99	110.9075	-3.3552			
VPI	11	108+32.26	110.6300	-3.3552			
VPI	12	108+43.00	110.2052	-3.9551			

Ending profile DIV01 description



Job: Interim Daryl Carter Parkway 441113-1-52-01  
 Description: DIVERSION 1 under existing WB CFP TO WB I-4 FLYOVER RAMP

AECOM Project No: 60480256

Computed By: BM Date: 04/25/18  
 Checked By: MSP Date: 05/17/18

**VERTICAL CLEARANCE CALCULATIONS**

**DATE ENTRY FOR UNDERPASS**

POINT #	UNDERPASS NAME	UNDERPASS STATION	UNDERPASS PGL ELEV.	*PAVEMENT WIDTH 1	**PAVEMENT SLOPE (%) 1	*PAVEMENT WIDTH 2	**PAVEMENT SLOPE (%) 2	*PAVEMENT WIDTH 3	**PAVEMENT SLOPE (%) 3	OFFSET ELEV.
VCDIV011	DIV01	105+48.97	113.21	2.00	-2.00					113.17
VCDIV012	DIV01	105+99.80	113.52	2.00	-2.00					113.48
VCDIV013	DIV01	105+79.71	113.40	17.00	2.00					113.74
VCDIV014	DIV01	106+28.81	113.69	17.00	2.00					114.03

<b>STRUCTURE DEPTH (FT)</b>
7.50

<b>MAXIMUM UNDERPASS PGL ELEVATIONS</b>
116.84
120.81
118.27
121.86

<b>MINIMUM VERTICAL CLEARANCE (FT)</b>
16.50

\*\*NOTE\*\* NO STRUCTURE DEPTH AS THE BOTTOM OF BEAMS WERE SURVEYED AND USED IN THESE CALCULATIONS

**DATA ENTRY AND PROPOSED VALUES FOR OVERPASS**

POINT #	OVERPASS NAME	OVERPASS STATION	MINIMUM OFFSET ELEV.	*PAVEMENT WIDTH 1	**PAVEMENT SLOPE (%) 1	*PAVEMENT WIDTH 2	**PAVEMENT SLOPE (%) 2	*PAVEMENT WIDTH 3	**PAVEMENT SLOPE (%) 3	MINIMUM OVERPASS PGL ELEV.
VCDIV011	IC_CFP	N/A	137.17	0.00	0.00					137.17
VCDIV012	IC_CFP	N/A	137.48	0.00	0.00					137.48
VCDIV013	IC_CFP	N/A	137.74	0.00	0.00					137.74
VCDIV014	IC_CFP	N/A	138.03	0.00	0.00					138.03

**DESIGN VALUES & VERTICAL CLEARANCE CHECK**

POINT #	*** ACTUAL OVERPASS PGL ELEV.	ACTUAL OFFSET ELEV.	ACTUAL VERTICAL CLEARANCE	(+) OR (-) CLEARANCE
VCDIV011	140.80	140.80	20.13	3.63
VCDIV012	144.77	144.77	23.79	7.29
VCDIV013	142.61	142.61	21.37	4.87
VCDIV014	146.20	146.20	24.67	8.17

\* Distance from PGL is entered as a positive value.  
 \*\* Sign convention for the Pavement Slope % is relative to the Mainline PGL.  
 \*\*\* Elevations taken from .TIN file





## Ramp Terminal - Detail

**Job:** Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
**Description:** DIVERSION 1 ENTRANCE  
terminal with existing WBI-4

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Date: 4/26/2018  
 Date: 5/17/2018

MAINLINE				GORE		RAMP					
Baseline	Mainline Station	*Outside Travel Lane Slope(%)	Outside EOT Elev.	Gore Width	Gore Slope(%)	Inside Elev.	*Pavement Slope(%)	Pavement Width	Outside Elev.	Baseline	Ramp Station
BL400	N/A	-3.00%	110.25	0.00	N/A	110.25	-3.50%	6.00	110.46	DIV01	100+00.00
BL400	N/A	-3.00%	110.49	0.00	N/A	110.49	-3.50%	6.52	110.72	DIV01	100+50.00
BL400	N/A	-3.00%	110.62	0.00	N/A	110.62	-3.50%	8.09	110.90	DIV01	101+00.00
BL400	N/A	-3.00%	110.87	0.00	N/A	110.87	-3.50%	15.00	111.40	DIV01	101+19.64
BL400	N/A	-3.00%	111.03	1.72	3.50%	110.97	-3.50%	15.00	111.50	DIV01	101+50.00
BL400	N/A	-3.00%	111.29	5.38	3.50%	111.10	-3.50%	15.00	111.63	DIV01	102+00.00
BL400	N/A	-3.00%	111.77	10.09	3.50%	111.42	-3.50%	15.00	111.95	DIV01	102+50.00
BL400	N/A	-3.00%	112.48	15.84	3.50%	111.93	-3.50%	15.00	112.46	DIV01	103+00.00
BL400	N/A	-3.00%	113.34	23.00	3.50%	112.54	-3.50%	15.00	113.07	DIV01	103+52.49

\* The sign convention for the cross slope % is relative to the Mainline PGL.



## Ramp Terminal - Data

Sheet 2 of 2

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)  
 Description: DIVERSION 1 ENTRANCE  
terminal with existing WBI-4

AECOM Project No: 60480256  
 Computed By: BM  
 Checked By: MSP

Date: 4/26/2018  
 Date: 5/17/2018

Baseline	Mainline Station	*Outside Travel Lane Slope(%)	Outside EOT Elev.	COGO Pt. No.	Gore Width	Baseline	Ramp Station	*Pavement Slope(%)	COGO Width	Pavement Width
BL400	N/A	-3.00%	110.25	RTDIV0101	0.00	DIV01	100+00.00	-3.50%	6.00	6.00
BL400	N/A	-3.00%	110.49	RTDIV0102	0.00	DIV01	100+50.00	-3.50%	6.52	6.52
BL400	N/A	-3.00%	110.62	RTDIV0103	0.00	DIV01	101+00.00	-3.50%	8.09	8.09
BL400	N/A	-3.00%	110.87	RTDIV0104	0.00	DIV01	101+19.64	-3.50%	15.00	15.00
BL400	N/A	-3.00%	111.03	RTDIV0115	1.72	DIV01	101+50.00	-3.50%	15.00	15.00
BL400	N/A	-3.00%	111.29	RTDIV0116	5.38	DIV01	102+00.00	-3.50%	15.00	15.00
BL400	N/A	-3.00%	111.77	RTDIV0117	10.09	DIV01	102+50.00	-3.50%	15.00	15.00
BL400	N/A	-3.00%	112.48	RTDIV0118	15.84	DIV01	103+00.00	-3.50%	15.00	15.00
BL400	N/A	-3.00%	113.34	RTDIV0119	23.00	DIV01	103+52.49	-3.50%	15.00	15.00

\* The sign convention for the cross slope % is relative to the Mainline PGL. Nominal, actual slope varies.

