ROADWAY DESIGN CALCULATIONS

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

FPID: 441113-1-52-01

90% (Phase III)

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Notes:
PRELIMINARY: NOT FOR CONSTRUCTION
Bookmarks have been provided per Section and Subsection

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Design Element	Design Standard	Sources/Notes
Design Year	2040	Per Design Traffic Report in Project Scope
Roadway Classification 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)
Interchange Type SR 400 (I-4)/US 27 SR 400 (I-4)/Daryl Center Pkwy.	 Service Interchange Service Interchange	 2011 AASHTO, Page 10-63
Design Vehicle	WB-62FL	2018 FDM, Section 201.5.2
Design Speed Mainline/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
HORIZONTAL ALIGNMENT		
Maximum Curvature (Degree of Curve) Mainline/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
Maximum Deflection without Horizontal Curve Mainline/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
Minimum Length of Horizontal Curve Mainline/Express Lanes CD Roads Ramps Arterials	**Desirable** / **Minimum** 30V / 15V 15V / 400 ft. 15V / 400 ft. 15V / 400 ft.	2018 FDM, Table 210.8.1
Minimum Stopping Sight Distance Mainline/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)
Decision Sight Distance Mainline/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
Lane Drop Taper		
Mainline/Express Lanes	70:1 Des, 50:1 Min	2011 AASHTO, Page 10-80
CD Road	50:1 Min	
Arterial, DS≥45 mph	L=WS	2018 FDM, Section 212.6
Add Lane Taper		
Freeway Auxiliary Lanes		
Tangent	300 ft.	2011 AASHTO, Figure 10-53 (B1 & B2), Pages 10-78 and 10-120
Curve	100 ft.	
Arterial, DS≥45 mph	L=WS	2018 FDM, Section 212.6
Minimum Spacing Ramp Terminals	**Freeway** / **CD Road**	
Entrance to Exit (Weaving):		
System to Service	2000 ft. / 1600 ft.	
Service to Service	1600 ft. / 1000 ft.	
Exit to Entrance	500 ft. / 400 ft.	2011 AASHTO, Figure 10-68, Page 10-106
Entrance to Entrance	1000 ft. / 800 ft.	
Exit to Exit	1000 ft. / 800 ft.	
Turning Roadways:		
System Interchange	800 ft.	
Service Interchange	600 ft.	
Entrance and Exit Ramp Design		
Flyover/Diamond Ramps		
Entrance	Taper Design with 50:1 (1200 ft.)	
Exit	Taper Design with 3° to 5°	2018/2019 FDOT Design Standard Index No. 525
Loop Ramps	Parallel Design:	
Entrance	1,200' accel + 300 ft. Taper	Per Preliminary Engineering Report
Exit	800' decel + 300 ft. Taper	Per Preliminary Engineering Report
Entrance Acceleration Lengths		
50 mph to 70 mph	580 ft. +Taper (Single Lane)*	2011 AASHTO, Figure 10-69 & Table 10-3, Pages 10-108 and 10-110
30 mph to 70 mph	1350 ft. +Taper (Single Lane)*	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
All Speeds	(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).	2011 AASHTO, Figure 10-53, Page 10-78
Tapers	Single Lane (Taper Design) – 50:1 min Single Lane (Parallel Design) - 300 ft. min	2011 AASHTO, Figure 10-69, Page 10-108
Exit Deceleration Lengths		
70 mph to 50 mph	340 ft. +Taper (Single Lane)*	2011 AASHTO, Figure 10-70 & Table 10-5, Pages10-114 & 10-115
70 mph to 30 mph	520 ft. +Taper (Single Lane)*	
All Speeds	(Two Lane Exit) -2500 ft. min. (Includes 300 ft. Taper)	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
Tapers	Tapered Design, Single Lane: 2° - 5° Parallel Design, Single Lane: 250 ft. Min (15:1 to 25:1)	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
Limited Access R/W at Interchanges 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
VERTICAL ALIGNMENT		
Maximum Profile Grade Mainline/Express Lanes/CD Roads Flyover/Diamond Ramps Loop Ramps Urban Arterials, DS=45 mph	 3% 5% 7% 6%	2018 FDM, Table 211.9.1
Maximum Change in Grade w/o Vertical Curve Mainline/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
Minimum Grade (shoulder gutter, barrier wall) Minimum Distance Between VPI's Minimum Grade	 250 ft. 0.3%	2018 FDM, Section 210.10.1.1
Crest Vertical Curve 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
Sag Vertical Curve 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
Minimum Vertical Clearance 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.
Roadway Base Clearance Above Base Clearance Water Elevation 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.
CROSS SECTION		

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Design Element	Design Standard	Sources/Notes
Lane Widths		
Mainline/Express Lanes	12 ft. - Tangent	
CD Roads	12 ft. - Tangent	2018 FDM, Tables 210.2.1
1-Lane Ramp	15 ft. - Tangent	
2-Lane Ramp	24 ft. - Tangent	
Urban Arterial	11 ft. travel lane/7 ft. bicycle lane	
Median Width (Minimum)		
FREEWAYS		
Without Barrier		
Interstate	64 ft.	
Other Freeways (≥ 60 mph)	60 ft.	2018 FDM, Table 211.3.1
Other Freeways (< 60 mph)	40 ft.	
With Barrier		
I-4 Mainline (Orange & Osceola Cos.)	52 ft.	Per TSP and Preliminary Engineering Report. To provide 44 ft. rail corridor.
All other	26 ft.	
ARTERIAL AND COLLECTORS		
DS ≤ 45 mph	22 ft.	2018 FDM, Table 210.3.1
DS > 45 mph	40 ft.	2018 FDM, Table 210.3.1
Shoulder Width, Roadway, Inside (or Left)		
Freeways	**Total** / **Paved**	
Mainline (Barrier-Separated, Osceola & Orange Cos.)	10 ft. / 10 ft.	Per TSP
CD, 2-Lane	8 ft. / 4 ft.	2018 FDM, Table 211.4.1
CD, 3-Lane	12 ft. / 10 ft.	2018 FDM, Table 211.4.1
1-Lane Ramp	6 ft. / 2 ft.	2018 FDM, Table 211.4.1
2-Lane Ramp	8 ft. / 4 ft.	2018 FDM, Table 211.4.1
3-Lane Ramp	12 ft. / 10 ft.	2018 FDM, Table 211.4.1
Arterials		
4-Lane	12 ft. / 4 ft.	2018 FDM, Table 210.4.1
3-Lane	12 ft. / 0 ft.	2018 FDM, Table 210.4.1
2-Lane	8 ft. / 0 ft.	2018 FDM, Table 210.4.1
Shoulder Width, Roadway, Outside (or Right)		
Freeways	**Total** / **Paved**	
Mainline	12 ft. / 10 ft.	2018 FDM, Table 211.4.1
Mainline (Barrier-Separated)	12 ft. / 12 ft.	2018 FDM, Table 211.4.1
CD, 3-Lane	12 ft. / 10 ft.	2018 FDM, Table 211.4.1
1-Lane Ramp	6 ft. / 4 ft.	2018 FDM, Table 211.4.1
2-Lane Ramp	12 ft. / 10 ft.	2018 FDM, Table 211.4.1
3-Lane Ramp	12 ft. / 10 ft.	Per TSP
Arterials		
4-Lane	12 ft. / 5 ft.	2018 FDM, Table 210.4.1
3-Lane	12 ft. / 5 ft.	2018 FDM, Table 210.4.1
2-Lane	12 ft. / 5 ft.	2018 FDM, Table 210.4.1
Shoulder Width on Bridge Structures	**Inside** / **Outside**	
Freeways and Divided Arterials (DS ≥ 50 mph)		
Mainline	10 ft. / 10 ft.	
CD Roads (2-Lane)	6 ft. / 10 ft.	
1-Lane Ramp	6 ft. / 6 ft.	2018 FDM, Figure 260.1.1
2-Lane Ramp	6 ft. / 10 ft.	
3-Lane Ramp	10 ft. / 10 ft.	
Divided Arterials and Collectors		
Flush shoulders on approach roadway with 3 or more lanes	10 ft. / 10 ft.	

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Design Element	Design Standard	Sources/Notes
Cross Slope		
Roadway 2-Lanes in Same Direction	0.02	
Roadway Additional Lane (Same Direction)	0.03	2018 FDM, Fig 211.2.1
Inside Shoulder	0.05 (0.06 for 4 or more lanes)	
Mainline (Barrier-Separated)	Same as travel lane	Per TSP
Outside Shoulder	0.06	
Express Lanes (Barrier-Separated)	Same as travel lane	Per TSP
Max Lane "Roll-Over" Between Thru Lanes	4%	2018 FDM, Figure 211.2.1
Maximum Shoulder "Roll-Over"	7%	2018/2019 FDOT Design Standard Index No. 510
Recoverable Terrain/Clear Zone Widths (min. from edge of travel way)		
Mainline/Express Lanes	36 ft.	
CD Roads	36 ft.	
Auxiliary Lane (>55mph)	24 ft.	2018 FDM, Table 215.2.1
One-Lane Ramp (50mph)	14 ft.	
Multi-Lane Ramp (50mph)	24 ft.	
One-Lane Ramp (<45mph)	10 ft.	
Multi-Lane Ramp (<45mph)	18 ft.	
Urban Arterials, DS=45 mph	24 ft.	
Lateral Offset Criteria		
Urban Curb & Gutter, DS ≤ 45 mph		
Bridge Piers and Abutments	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	2018 FDM, Table 215.2.2
High Mast Lighting	Outside Clear Zone	
Overhead Sign Supports	Outside Clear Zone	
Other	4 ft. from face of curb	
Border Width		
Freeway & Ramps	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.	2018 FDM, Section 211.6 Per TSP. Design Variation Required.
Urban Arterials		
Flush Shoulders		
DS > 45 mph	40 ft. (from shoulder point)	2018 FDM, Table 210.7.1
DS ≤ 45 mph	33 ft. (from shoulder point)	
Curb & Gutter		
DS = 45 mph	14 ft. (from lip of gutter), 12 ft. w/bicycle or aux. lane	2018 FDM, Table 210.7.1
DS ≤ 40 mph	12 ft. (from lip of gutter), 10 ft. w/bicycle or aux. lane	
Roadside Slopes Rural & Urban Freeways, Rural Arterials & Collectors, with projected 20 year AADT of 1500 or greater. Design Speed > 45 MPH	**Fill Height** / **Front slope**: 0–5 ft. 1:6; 5–10 ft. 1:6 to CZ then 1:4; 10–20 ft. 1:6 to CZ then 1:3; >20 ft. 1:2 w/Guardrail. **Back Slope (All Fill Heights)**: 1:4 or 1:3 w/Trapezoidal Ditch & 1:6 Front Slope	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	**Transverse Slope (All Fill Heights)** 1:10 or flatter (Freeways) 1:4 (Other) **Front and Back Slopes (All Fill Heights)** 1:2 or to suit property owner. Not flatter than 1:6 **Transverse Slopes (All Fill Heights)** 1:4	
Superelevation Transition Distribution Tangent* Curve *	**Standard** / **Min** / **Max** 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 %.
Superelevation Rates	**e Max** / **Transition/Min L**	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.
Mainline	0.10 ft. /ft. / 1:200/100 ft.	
CD Roads	0.10 ft. /ft. / 1:225/100 ft.	
Express Lanes	0.10 ft. /ft. / 1:250/100 ft.	
Directional Ramps (50 mph)	0.10 ft. /ft. / 1:200/100 ft.	
Loop Ramps (30 mph)	0.10 ft. /ft. / 1:150/50 ft.	
Shoulders	0.10 ft. /ft. / *1:150/100 ft.	
Urban Arterials	0.05 ft. /ft. / 1:150/75 ft.	

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Design Element	Design Standard	Sources/Notes
Design Year	2040	Per Design Traffic Report in Project Scope
Governing Standards Orange County	Florida Greenbook (2013)	Per Orange County
Roadway Classification Orange County Daryl Carter Pkwy.	Urban Major Collector	Per Orange County
Design Speed Daryl Carter Pkwy.	40 mph	Per Preliminary Engineering Report
HORIZONTAL ALIGNMENT		
Maximum Curvature (Degree of Curve) Rural (40-55 mph), emax = 0.10 Urban - High-Speed Highways and Streets (30-45 mph), emax = 0.05 Urban - Low Speed Streets (20-30 mph) emax = 0.05 emax = 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
Maximum Deflection without Horizontal Curve Arterials and Collectors (w/o curb & gutter) Arterials and Collectors (w/curb & gutter)	 0° 45' (V≥ 45 mph), 2° 00' (V≤ 40 mph) 1° 00' (V≥ 45 mph), 2° 00' (V≤ 40 mph)	 2018 FDM 210.8.1
Minimum Length of Horizontal Curve Freeways Arterials and Collectors	**Desirable** / **Minimum** 30V / 15V 15V / 400 ft.	 2011 AASHTO, Section 3.3.13, Page 3-111 2018 FDM, Table 210.8.1
Minimum Stopping Sight Distance V = 30 – 55 mph	200 – 495 ft.	Florida Greenbook (May 2013), Table 3-3, Pg. 3-11
Maximum Deflection for Through Lanes Through Intersections 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
Lane Drop Taper		

Design Element	Design Standard	Sources/Notes
V ≥ 45 mph V ≤ 40 mph	L = WS $L = WS^2/60$	2018 FDM, Section 212.6
Add Lane Taper	50 ft.	2018 FDM, Section 212.6
VERTICAL ALIGNMENT		
Maximum Profile Grade 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
Maximum Change in Grade w/o Vertical Curve V = 30 – 55 mph	1.0% – 0.5%	Florida Greenbook (May 2013), Table 3-7, Pg. 3-28
Minimum Grade (curb & gutter, shoulder gutter, barrier wall)	0.3%	Florida Greenbook (May 2013), Pg. 3-26
Crest Vertical Curve Minimum Length	$L = AS^2/1329$ Where: A = Algebraic difference in grades in % S = Sight Distance	Florida Greenbook (May 2013), Figure 3-4, Pg. 3-29
Sag Vertical Curve Minimum Length	$L = AS^2/(400 + 3.5S)$ Where: A = Algebraic difference in grades in % S = Sight Distance	Florida Greenbook (May 2013), Figure 3-6, Pg. 3-31
Minimum Vertical Clearance 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
Roadway Base Clearance Above Base Clearance Water Elevation 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.
CROSS SECTION		
Lane Widths (minimum) Freeways	 12 ft.	Florida Greenbook (May 2013), Table 3-8,

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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.
Median Width (minimum) 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
Shoulder Width (minimum) 2 lanes in each direction Roadway Bridge 3 or more lanes in each direction Roadway Bridge	**Outside** 10 ft. 10 ft. 10 ft. 10 ft.	**Median** 6 ft. 6 ft. 10 ft. 10 ft.	 Florida Greenbook (May 2013), Table 3-10, Pg. 3-36
Cross Slope 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
Max Lane "Roll-Over" Between Thru Lanes	0.04		Florida Greenbook (May 2013), Section C.7.b.2
Maximum Shoulder "Roll-Over"	0.07		Florida Greenbook (May 2013), Section C.7.c.2
Max Lane "Roll-Over" at Turning Roadway Terminals 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
Clear Zone (minimum) 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

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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
Roadside Slopes 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
Superelevation Rates 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)	**Emax** 0.10 ft/ft 0.10 ft/ft 0.05 ft/ft	**Transition rate/(Min L)** 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
Superelevation Transition Distribution Tangent Curve	**Standard** 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 (℄ SURVEY SR 400 (I-4))

Chain BL400 contains:
GPRE9 CUR BB1 BB12 CUR BB2 BB31 DW2 CUR C1 RM33 X10 CL535 CL598 CL637 CL703 CU-
R 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				

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

DES. BY: MSP 11/1/17
CHECKED BY: BL 5/1/18

HA_IWBCD2DCP.OMP

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

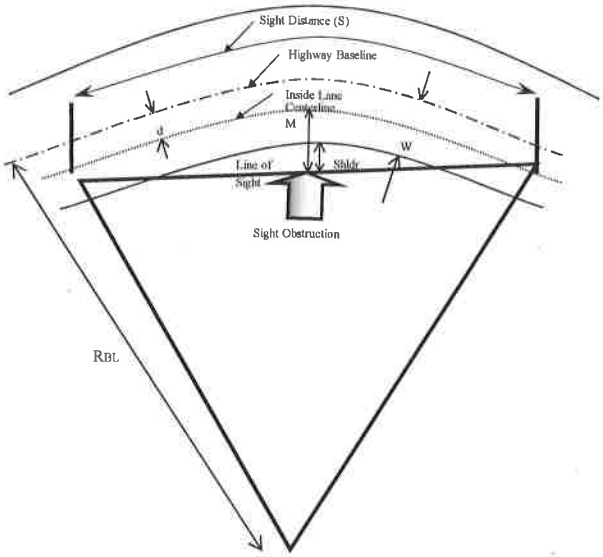
Point IWBCD21 N 1,480,589.0934 E 501,890.7083 Sta 7095+00.88

Ending chain IWBCD2 description

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page	___ of ___
Description:	Stopping Sight Distance Calculations for Ramp IWBCD2 (CFP TO WBI4)	Computed By:	BM	Sheet	2 of 2
		Checked By:	MSP	Date:	9/7/2017
				Date:	9/15/17

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*)	All Other Facilities
DESIGN SPEED	60 mph
CURVE NO.	IWBCD2_1
RADIUS OF CURVE (R_{BL})	15,000.00 '
DIRECTION OF CURVE (LT or RT)	LT
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	570.00 '	*FDOT PPM, TABLE 2.7.1, January 2016.*
AASHTO REQUIRED SSD	570.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	1,295.89 '	*EQUATION*

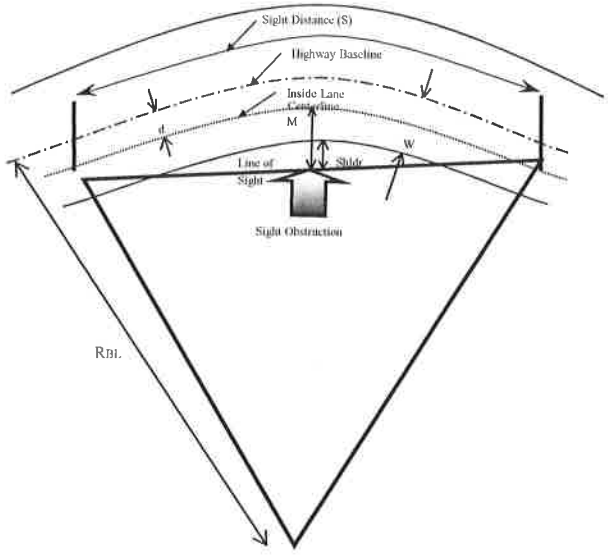
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page	___ of ___
Description:	Stopping Sight Distance Calculations for	Computed By:	BM	Sheet	1 of 2
	Ramp IWBCD2 (CFP TO WBI4)	Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	All Other Facilities
DESIGN SPEED	60 mph
CURVE NO.	IWBCD2_2
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*)	-6.00 '
LANE WIDTH (*W*)	12 '
SHOULDER WIDTH (Shldr)	8 '
VERTICAL GRADE (%)	0.500%
M DIMENSION	14.0 '

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

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

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

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

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.

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	BM	Sheet 1 of 1	
	IWBCD2 (CFP TO WBI4)	Checked By:	AS	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	WB			
CURVE NO.	IWBCD2_2 (RT)	PC STATION	7066+70.40	
DEGREE OF CURVE	0° 22' 55"	PT STATION	7078+70.88	
RADIUS OF CURVE	15,000.00 '			
DESIGN SPEED	60 mph	BEGIN TRANSITION	N/A	*
e=	NC	BEGIN FULL SUPER	N/A	*
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A	*

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
* No Transition Required		24	200	0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
* No Transition Required		24	200	0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

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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

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject:
Job No. 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.

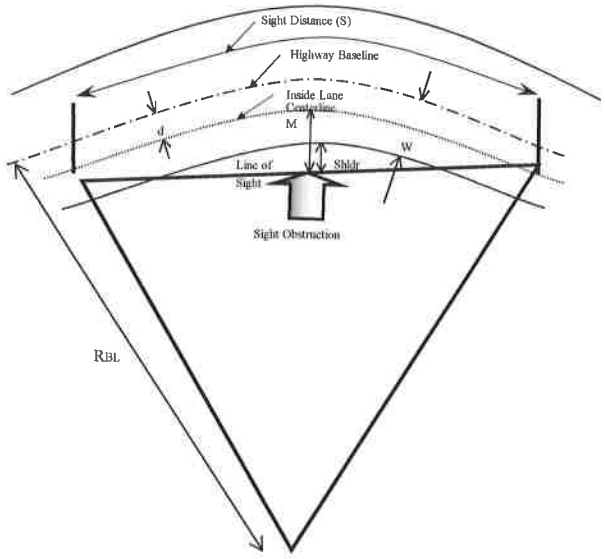
THE GEOMETRY RESULTED FROM MATCHING THE ULTIMATE RAMP TERMINAL VLO

Ending chain ISLIP1 description

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page	___ of ___
Description:	Stopping Sight Distance Calculations for	Computed By:	BM	Sheet	1 of 2
	Ramp ISLIP1 (IWBCD2 TO DCP)	Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

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)

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

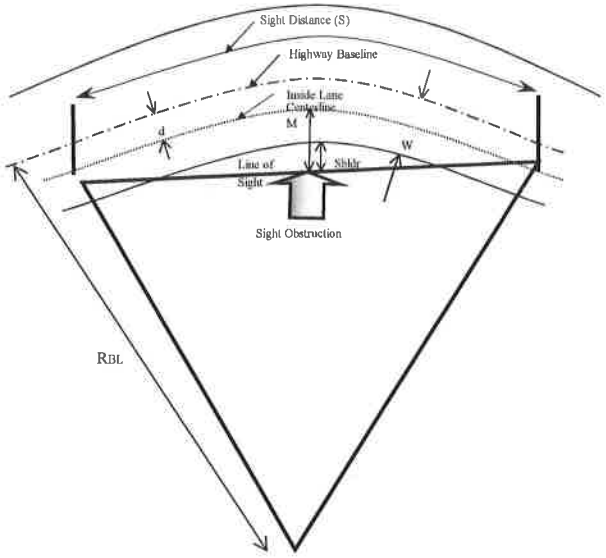
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Page ___ of ___ Sheet	2 of 2
Description:	**Stopping Sight Distance Calculations for Ramp ISLIP1 (IWBCD2 TO DCP)**	Computed By:	BM	Date:	8/10/2017
		Checked By:	AS	Date:	8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	ISLIP1_2
RADIUS OF CURVE (R_{BL})	11,459.16 '
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	0° 30' 0"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)	7.50 '
LANE WIDTH (*W*)	15 '
SHOULDER WIDTH (Shldr)	6 '
VERTICAL GRADE (%)	-0.660%
M DIMENSION	13.5 '

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	1,112.13 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:
NOT USED

AECOM

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

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 WB
CURVE NO. ISLIP1_1 (LT)
DEGREE OF CURVE 0° 57' 18"
RADIUS OF CURVE 6,000.00 '
DESIGN SPEED 50 mph
e= RC ***
SE SPLIT INTO CURVE (Tangent/Curve) 80 20
SE SPLIT OUT OF CURVE (Tangent/Curve) 80 20

PC STATION 100+00.00
PT STATION 104+07.94
BEGIN TRANSITION N/A *
BEGIN FULL SUPER N/A *
END FULL SUPER 105+00.00 **
END TRANSITION 106+00.00 **

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				**0.00**		
				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				**100.00**		

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.

AECOM

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

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 WB
CURVE NO. ISLIP1_2 (RT)
DEGREE OF CURVE 0° 30' 0"
RADIUS OF CURVE 11,459.00 '
DESIGN SPEED 50 mph
e= NC
SE SPLIT INTO CURVE (Tangent/Curve) 80 20
SE SPLIT OUT OF CURVE (Tangent/Curve) 80 20

PC STATION 110+29.62
PT STATION 114+29.62

BEGIN TRANSITION N/A
BEGIN FULL SUPER N/A
END FULL SUPER N/A
END TRANSITION N/A

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				**0.00**		
				0.00		
				0.00		
* No Transition Required.				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

VA_ISLIP1DCP.OMP

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

Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Wednesday September 13, 2017 7:19 pm

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

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_ISLIP1'

* 1 PRI PRO ISLIP1

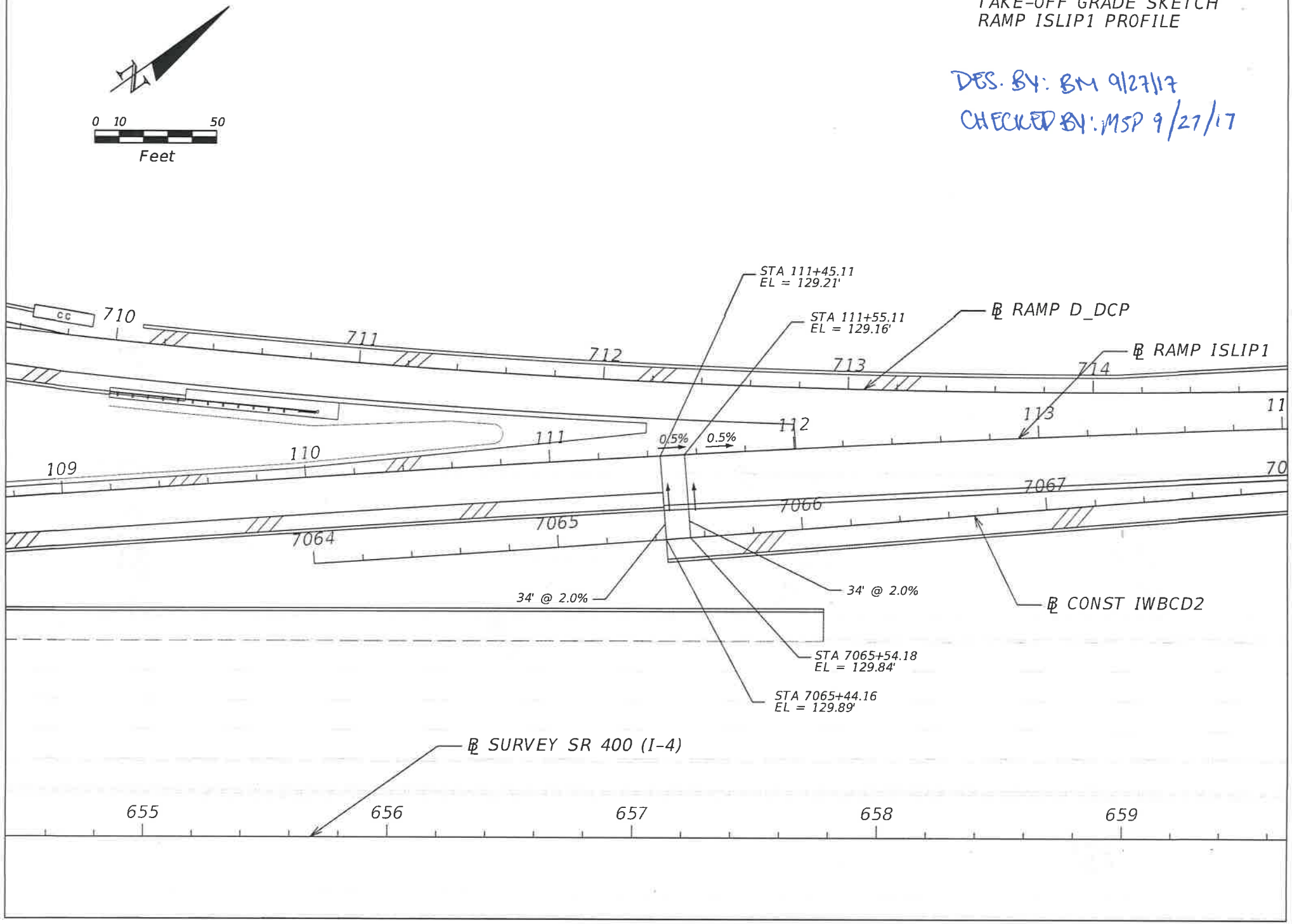
Beginning profile ISLIP1 description:

		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

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 Date: 8/22/2017
Checked By: AS 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	645+68.20	3.00%	133.77	0.00	3.50%	133.77	3.50%	12.00	133.35	ISLIP1	100+00.00
BL400	646+18.30	3.00%	133.66	0.00	3.50%	133.66	3.50%	12.21	133.23	ISLIP1	100+50.00
BL400	646+68.41	3.00%	133.56	0.00	3.50%	133.56	3.50%	12.84	133.11	ISLIP1	101+00.00
BL400	647+18.54	3.00%	133.29	0.00	3.50%	133.29	3.50%	13.88	132.80	ISLIP1	101+50.00
BL400	647+58.16	3.00%	133.14	0.00	3.50%	133.14	3.50%	15.00	132.62	ISLIP1	101+89.51
BL400	648+18.76	3.00%	132.96	2.22	3.50%	132.88	3.50%	15.00	132.36	ISLIP1	102+50.00
BL400	648+68.83	3.00%	132.57	4.52	3.50%	132.42	3.50%	15.00	131.90	ISLIP1	103+00.00
BL400	649+18.88	3.00%	132.07	7.23	3.50%	131.81	3.50%	15.00	131.29	ISLIP1	103+50.00
BL400	649+68.91	3.00%	131.49	10.36	3.50%	131.12	3.50%	15.00	130.60	ISLIP1	104+00.00
BL400	650+18.81	3.00%	130.97	13.75	3.50%	130.49	3.50%	15.00	129.97	ISLIP1	104+50.00
BL400	650+66.47	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

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 Date: 8/22/2017
Checked By: AS 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	645+68.20	3.00%	133.77	RTISLIP101	0.00	ISLIP1	100+00.00	3.50%	12.00	12.00
BL400	646+18.30	3.00%	133.66	RTISLIP102	0.00	ISLIP1	100+50.00	3.50%	12.21	12.21
BL400	646+68.41	3.00%	133.56	RTISLIP103	0.00	ISLIP1	101+00.00	3.50%	12.84	12.84
BL400	647+18.54	3.00%	133.29	RTISLIP104	0.00	ISLIP1	101+50.00	3.50%	13.88	13.88
BL400	647+58.16	3.00%	133.14	RTISLIP105	0.00	ISLIP1	101+89.51	3.50%	15.00	15.00
BL400	648+18.76	3.00%	132.96	RTISLIP116	2.22	ISLIP1	102+50.00	3.50%	15.00	15.00
BL400	648+68.83	3.00%	132.57	RTISLIP117	4.52	ISLIP1	103+00.00	3.50%	15.00	15.00
BL400	649+18.88	3.00%	132.07	RTISLIP118	7.23	ISLIP1	103+50.00	3.50%	15.00	15.00
BL400	649+68.91	3.00%	131.49	RTISLIP119	10.36	ISLIP1	104+00.00	3.50%	15.00	15.00
BL400	650+18.81	3.00%	130.97	RTISLIP120	13.75	ISLIP1	104+50.00	3.50%	15.00	15.00
BL400	650+66.47	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.

Ramp Terminal - Graph Input

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

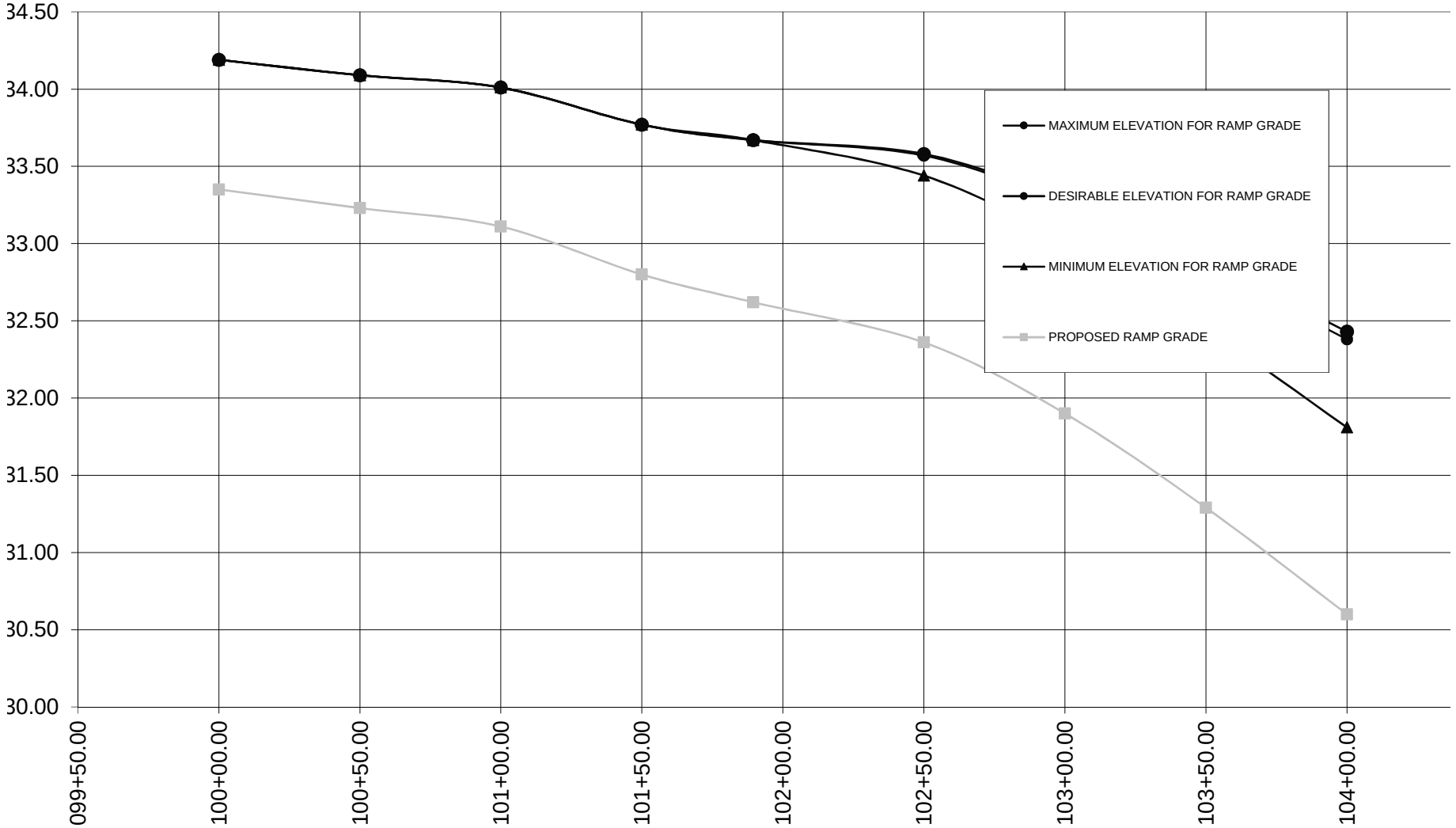
AECOM Project No: 60480256
Computed By: BM Date: 8/22/2017
Checked By: AS Date: 4/29/76

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%	N/A	0.50%	133.77	134.19	0.00%	N/A	0.50%	133.77	134.19	0.50%	N/A	0.50%	133.77	134.19
5.00%	N/A	0.50%	133.66	134.09	0.00%	N/A	0.50%	133.66	134.09	0.50%	N/A	0.50%	133.66	134.09
5.00%	N/A	0.50%	133.56	134.01	0.00%	N/A	0.50%	133.56	134.01	0.50%	N/A	0.50%	133.56	134.01
5.00%	N/A	0.50%	133.29	133.77	0.00%	N/A	0.50%	133.29	133.77	0.50%	N/A	0.50%	133.29	133.77
5.00%	N/A	0.50%	133.14	133.67	0.00%	N/A	0.50%	133.14	133.67	0.50%	N/A	0.50%	133.14	133.67
5.00%	-2.00%	5.50%	132.91	133.44	0.00%	3.50%	0.50%	133.04	133.57	0.50%	4.00%	1.00%	133.05	133.58
5.00%	-2.00%	5.50%	132.48	133.01	0.00%	3.50%	0.50%	132.73	133.26	0.50%	4.00%	1.00%	132.75	133.28
5.00%	-2.00%	5.50%	131.92	132.45	0.00%	3.50%	0.50%	132.32	132.85	0.50%	4.00%	1.00%	132.36	132.89
5.00%	-2.00%	5.50%	131.28	131.81	0.00%	3.50%	0.50%	131.85	132.38	0.50%	4.00%	1.00%	131.90	132.43

AECOM

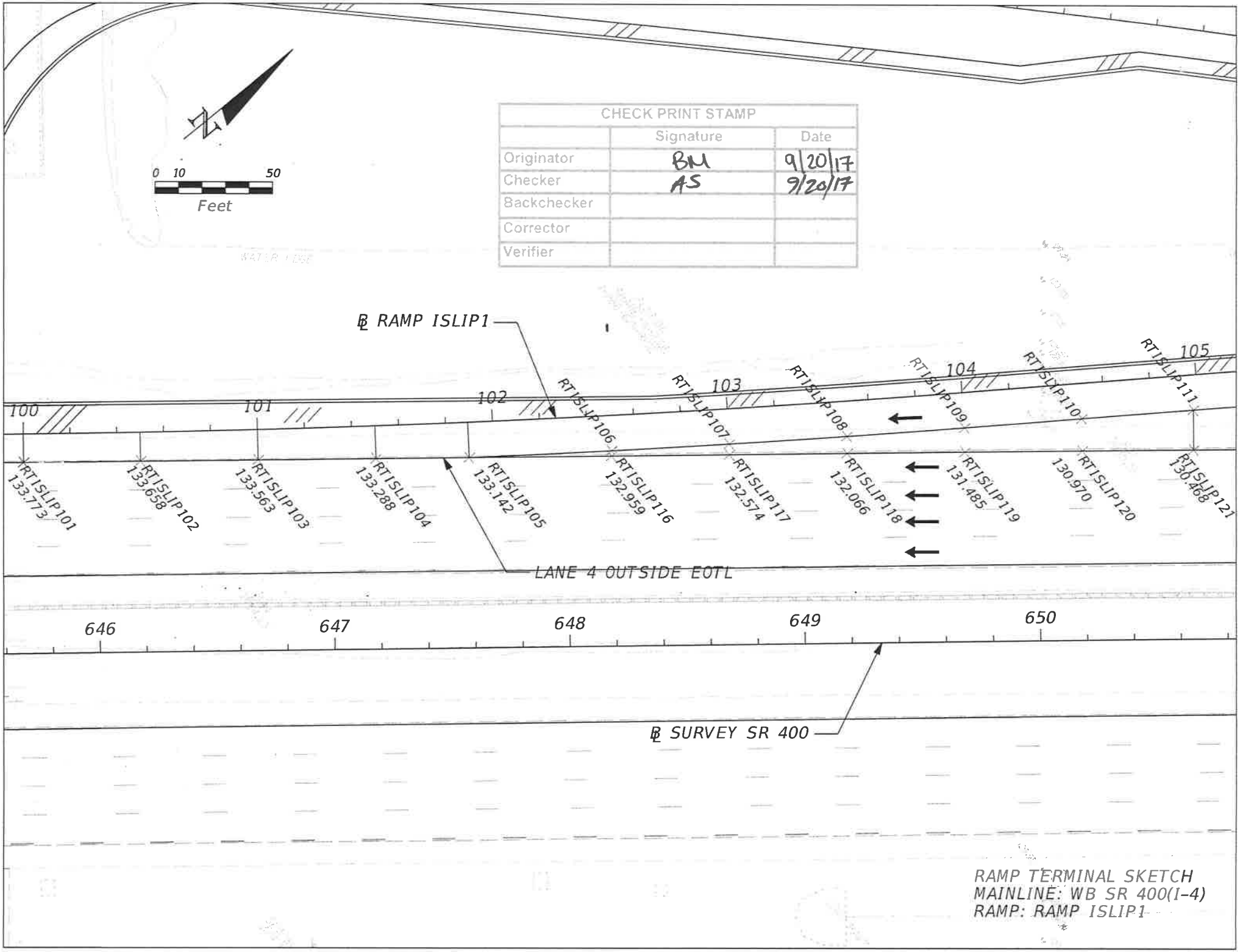
RAMP ISLIP1

SHEET 4 OF 4



RAMP IC_DCP STATIONS

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_ISLIP1_WBI4.xls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Checker
AS
9/20/17
Backchecker
Corrector
Verifier
℄ RAMP ISLIP1
100
101
102
103
104
105
RTISLIP101 133.773
RTISLIP102 133.658
RTISLIP103 133.563
RTISLIP104 133.288
RTISLIP105 133.142
RTISLIP106
RTISLIP107
RTISLIP108
RTISLIP109
RTISLIP110
RTISLIP111
RTISLIP116 132.959
RTISLIP117 132.574
RTISLIP118 132.066
RTISLIP119 131.485
RTISLIP120 130.970
RTISLIP121 130.468
LANE 4 OUTSIDE EOTL
646
647
648
649
650
℄ SURVEY SR 400
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

HA_ISLIP2DCP.OMP

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved. DES. BY: JTW 8/22/17

Project: DCP Interim
Subject:
Job No. DCP Operator: MP CHECKED BY: MSP 8/23/17
Date: Tuesday August 22, 2017 7:13 pm

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

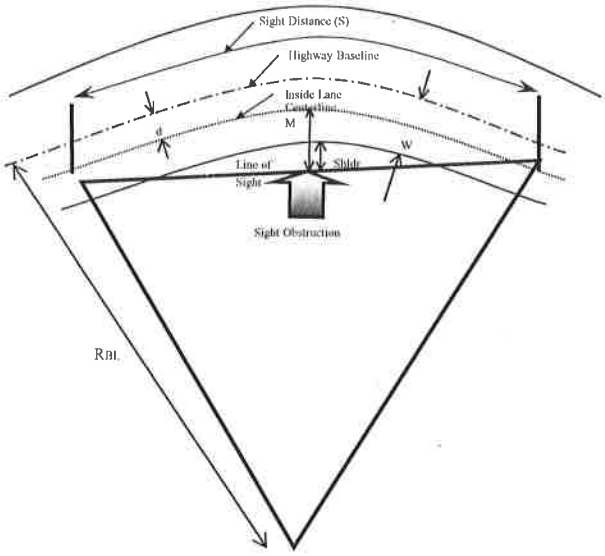
Point ISLIP22 N 1,480,833.2750 E 502,215.4229 Sta 218+60.78

Ending chain ISLIP2 description

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page ___ of ___	
Description:	Stopping Sight Distance Calculations for	Computed By:	BM	Sheet 1 of 2	
	Ramp ISLIP2 (IWBCD2 TO DCP)	Checked By:	AS	Date: 8/10/2017	Date: 8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	ISLIP2_1
RADIUS OF CURVE (R_{BL})	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	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?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

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

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	WB			
CURVE NO.	ISLIP2_1 (RT)	PC STATION	200+00.00	
DEGREE OF CURVE	0° 41' 14"	PT STATION	206+37.58	
RADIUS OF CURVE	8,337.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A	*
e=	NC	BEGIN FULL SUPER	N/A	*
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A	*

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

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

* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.

AECOM

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: JW

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
DEGREE OF CURVE N/A
RADIUS OF CURVE N/A
DESIGN SPEED 50 mph
e= N/A
SE SPLIT INTO CURVE (Tangent/Curve)
SE SPLIT OUT OF CURVE (Tangent/Curve)

PC STATION N/A
PT STATION N/A
BEGIN TRANSITION
BEGIN FULL SUPER
END FULL SUPER
END TRANSITION

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

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 TO MEET CROSS SLOPE AT RAMP TERMINAL.

VA_ISLIP2DCP.OMP

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

Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Wednesday September 13, 2017 5:50 pm

DES. BY TW 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			

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

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 Date: 8/25/2017
Checked By: AS 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	686+01.53	3.00%	110.48	29.18	2.14%	109.86	3.50%	15.00	109.34	ISLIP2	214+00.00
BL400	686+51.35	3.00%	110.49	25.69	3.26%	109.65	3.50%	15.00	109.13	ISLIP2	214+50.00
BL400	687+01.23	3.00%	110.44	22.20	3.50%	109.67	3.50%	15.00	109.15	ISLIP2	215+00.00
BL400	687+45.93	3.00%	110.44	19.08	3.50%	109.78	3.50%	15.00	109.26	ISLIP2	215+44.81
BL400	687+51.11	3.00%	110.43	18.72	3.50%	109.78	3.50%	15.00	109.26	ISLIP2	215+50.00
BL400	688+00.99	3.00%	110.33	15.23	3.50%	109.80	3.50%	15.00	109.28	ISLIP2	216+00.00
BL400	688+50.86	3.00%	110.41	11.74	3.50%	110.00	3.50%	15.00	109.48	ISLIP2	216+50.00
BL400	689+00.74	3.00%	110.44	8.25	3.50%	110.16	3.50%	15.00	109.64	ISLIP2	217+00.00
BL400	689+50.62	3.00%	110.46	4.76	3.50%	110.30	3.50%	15.00	109.78	ISLIP2	217+50.00
BL400	690+00.50	3.00%	110.48	1.28	3.50%	110.43	3.50%	15.00	109.91	ISLIP2	218+00.00
BL400	690+18.75	3.00%	110.45	0.00	3.50%	110.45	3.50%	15.00	109.93	ISLIP2	218+18.30
BL400	690+50.53	3.00%	110.47	0.00	3.50%	110.47	3.50%	12.78	110.02	ISLIP2	218+50.00
BL400	690+62.18	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

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 Date: 8/25/2017
Checked By: AS 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	686+01.53	3.00%	110.48	RTISLIP241	29.18	ISLIP2	214+00.00	3.50%	15.00	15.00
BL400	686+51.35	3.00%	110.49	RTISLIP242	25.69	ISLIP2	214+50.00	3.50%	15.00	15.00
BL400	687+01.23	3.00%	110.44	RTISLIP243	22.20	ISLIP2	215+00.00	3.50%	15.00	15.00
BL400	687+45.93	3.00%	110.44	RTISLIP244	19.08	ISLIP2	215+44.81	3.50%	15.00	15.00
BL400	687+51.11	3.00%	110.43	RTISLIP245	18.72	ISLIP2	215+50.00	3.50%	15.00	15.00
BL400	688+00.99	3.00%	110.33	RTISLIP246	15.23	ISLIP2	216+00.00	3.50%	15.00	15.00
BL400	688+50.86	3.00%	110.41	RTISLIP247	11.74	ISLIP2	216+50.00	3.50%	15.00	15.00
BL400	689+00.74	3.00%	110.44	RTISLIP248	8.25	ISLIP2	217+00.00	3.50%	15.00	15.00
BL400	689+50.62	3.00%	110.46	RTISLIP249	4.76	ISLIP2	217+50.00	3.50%	15.00	15.00
BL400	690+00.50	3.00%	110.48	RTISLIP250	1.28	ISLIP2	218+00.00	3.50%	15.00	15.00
BL400	690+18.75	3.00%	110.45	RTISLIP231	0.00	ISLIP2	218+18.30	3.50%	15.00	15.00
BL400	690+50.53	3.00%	110.47	RTISLIP232	0.00	ISLIP2	218+50.00	3.50%	12.78	12.78
BL400	690+62.18	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.

Ramp Terminal - Graph Input

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

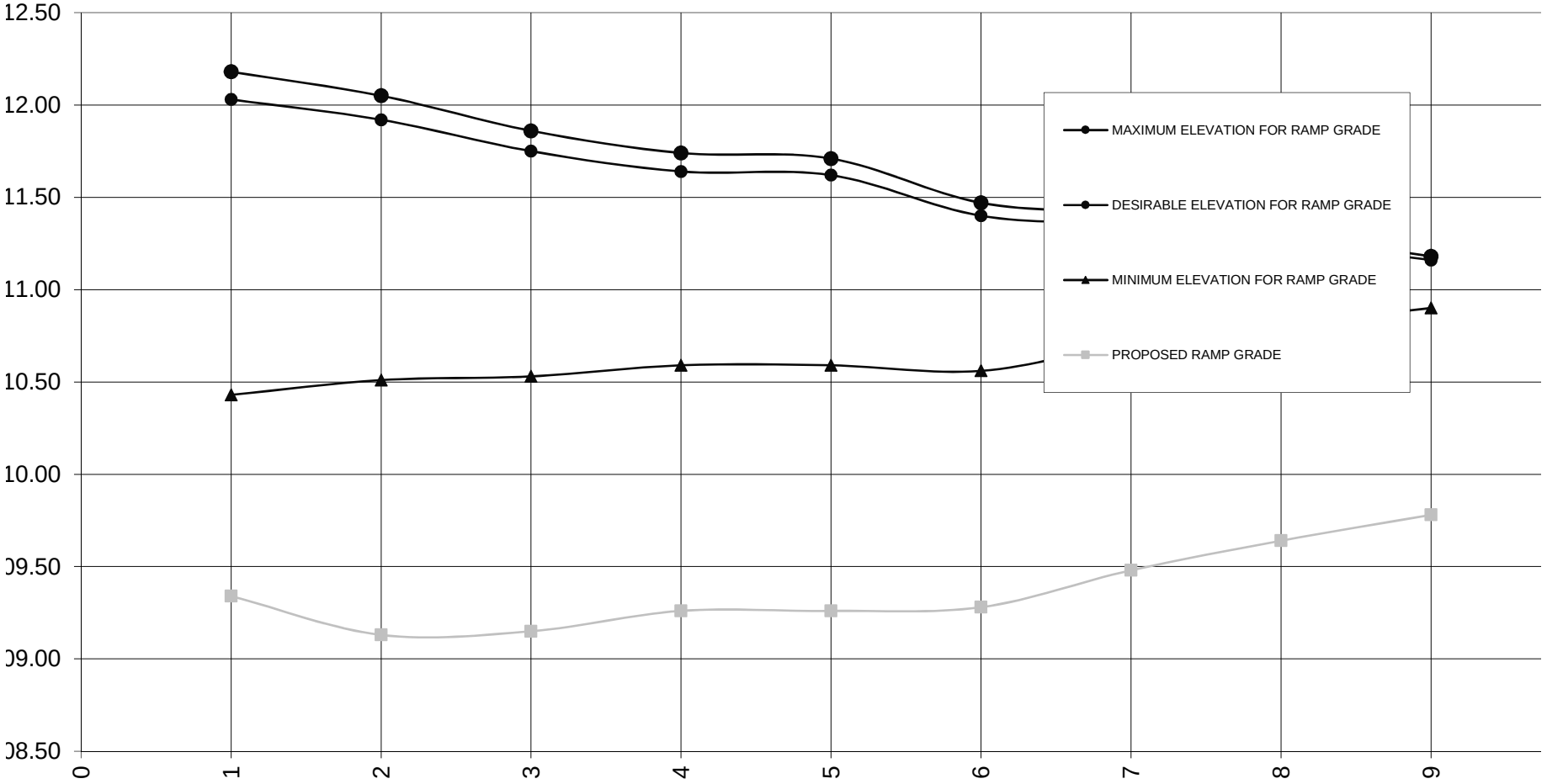
AECOM Project No: 60480256
Computed By: BM Date: 8/25/2017
Checked By: AS Date: 4/29/76

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%	-2.00%	5.50%	109.90	110.43	0.00%	3.50%	0.50%	111.50	112.03	0.50%	4.00%	1.00%	111.65	112.18
5.00%	-2.00%	5.50%	109.98	110.51	0.00%	3.50%	0.50%	111.39	111.92	0.50%	4.00%	1.00%	111.52	112.05
5.00%	-2.00%	5.50%	110.00	110.53	0.00%	3.50%	0.50%	111.22	111.75	0.50%	4.00%	1.00%	111.33	111.86
5.00%	-2.00%	5.50%	110.06	110.59	0.00%	3.50%	0.50%	111.11	111.64	0.50%	4.00%	1.00%	111.21	111.74
5.00%	-2.00%	5.50%	110.06	110.59	0.00%	3.50%	0.50%	111.09	111.62	0.50%	4.00%	1.00%	111.18	111.71
5.00%	-2.00%	5.50%	110.03	110.56	0.00%	3.50%	0.50%	110.87	111.40	0.50%	4.00%	1.00%	110.94	111.47
5.00%	-2.00%	5.50%	110.18	110.71	0.00%	3.50%	0.50%	110.82	111.35	0.50%	4.00%	1.00%	110.88	111.41
5.00%	-2.00%	5.50%	110.28	110.81	0.00%	3.50%	0.50%	110.73	111.26	0.50%	4.00%	1.00%	110.77	111.30
5.00%	-2.00%	5.50%	110.37	110.90	0.00%	3.50%	0.50%	110.63	111.16	0.50%	4.00%	1.00%	110.65	111.18

AECOM

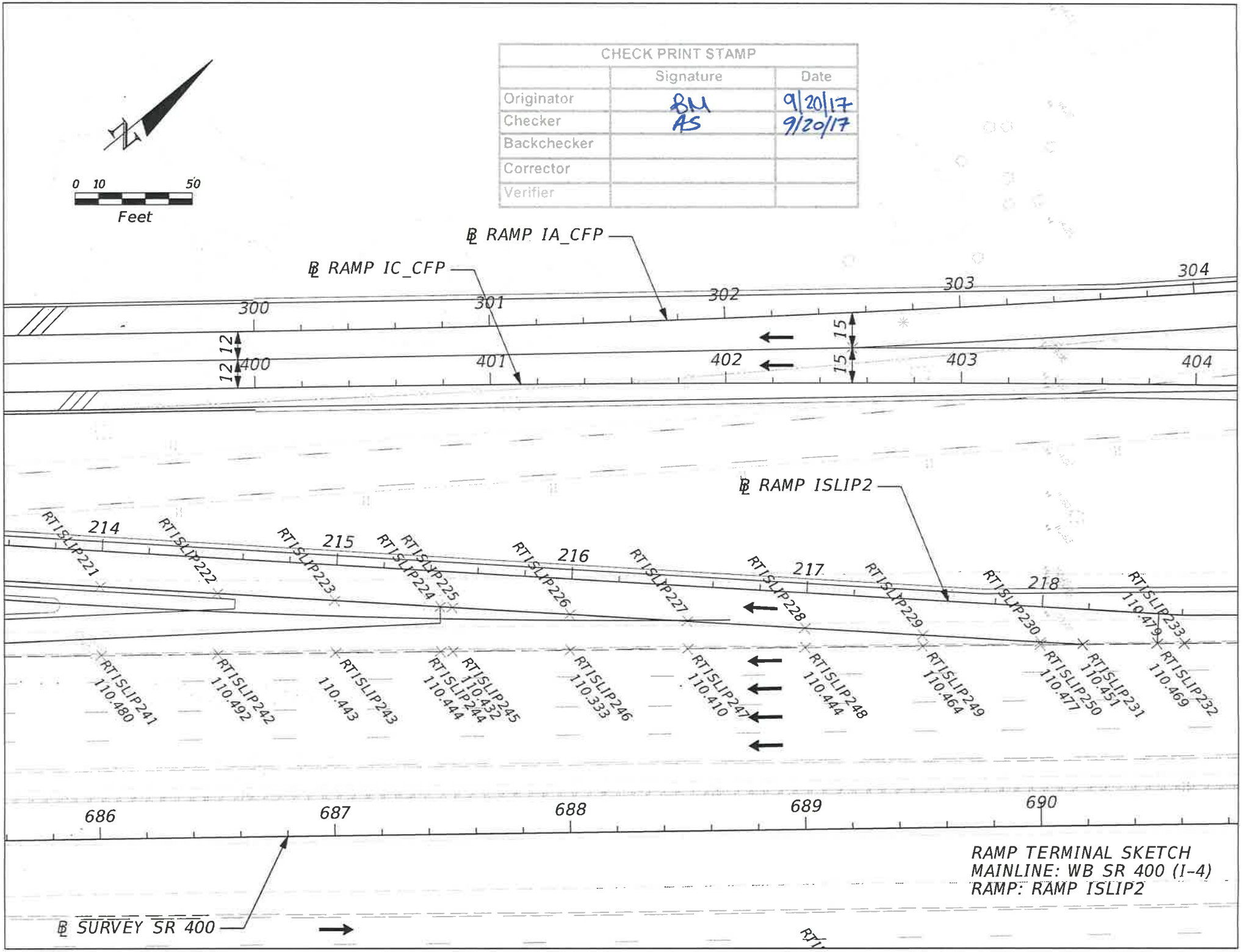
RAMP ISLIP1

SHEET 4 OF 4



RAMP IC_DCP STATIONS

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_ISLIP2_WBI4.xls


CHECK PRINT STAMP
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Originator
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Checker
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Backchecker
Corrector
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RTISLIP245
110.432
RTISLIP246
110.333
RTISLIP247
110.410
RTISLIP248
110.444
RTISLIP249
110.464
RTISLIP250
110.477
RTISLIP231
110.451
RTISLIP232
110.469
686
687
688
689
690
℄ SURVEY SR 400
RAMP TERMINAL SKETCH
MAINLINE: WB SR 400 (I-4)
RAMP: RAMP ISLIP2

RT_ISLIP2EXDCP.OBM

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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

Inverse RTISLIP228 to RTISLIP248 S 51° 13' 38.43" E Distance 8.2520

* 12 INV RTISLIP229 RTISLIP249

Inverse RTISLIP229 to RTISLIP249 S 51° 13' 38.43" E Distance 4.7642

* 13 INV RTISLIP230 RTISLIP250

Inverse RTISLIP230 to RTISLIP250 S 51° 13' 38.44" E Distance 1.2763

* 14 $ POINT ALONG RAMP INSIDE EOT $

* 15 LAY OFF CHA ISLIP2 RTISLIP221-RTISLIP232

Point	North	East	Station	Offset	R
RTISLIP221	1,480,484.8513	501,913.5222	214+00.00	15.0000	
RTISLIP222	1,480,521.5540	501,947.4767	214+50.00	15.0000	
RTISLIP223	1,480,558.2567	501,981.4313	215+00.00	15.0000	
RTISLIP224	1,480,591.1517	502,011.8633	215+44.81	15.0000	
RTISLIP225	1,480,594.9594	502,015.3858	215+50.00	15.0000	
RTISLIP226	1,480,631.6621	502,049.3404	216+00.00	15.0000	
RTISLIP227	1,480,668.3648	502,083.2949	216+50.00	15.0000	
RTISLIP228	1,480,705.0675	502,117.2495	217+00.00	15.0000	
RTISLIP229	1,480,741.7702	502,151.2040	217+50.00	15.0000	
RTISLIP230	1,480,778.4729	502,185.1586	218+00.00	15.0000	
RTISLIP231	1,480,791.9038	502,197.5839	218+18.30	15.0000	
RTISLIP232	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 Date: 4/25/2018
Checked By: MSP 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(%)	Outside Elev.	*Pavement Slope(%)	Pavement Width	Inside 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 Date: 4/25/2018
Checked By: MSP Date: 4/25/2018

Baseline	Mainline Station	*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	2.00%	29.27	121.84	0.00	0.00	ISLIP2	200+00.00	2.00%	0.00	0.00
IWBCD2	7080+86.19	2.00%	27.39	121.63	0.15	0.00	ISLIP2	200+50.00	2.00%	0.00	0.15
IWBCD2	7081+36.19	2.00%	25.39	121.42	0.60	0.00	ISLIP2	201+00.00	2.00%	0.00	0.60
IWBCD2	7081+86.18	2.00%	24.00	121.20	1.35	0.00	ISLIP2	201+50.00	2.00%	0.00	1.35
IWBCD2	7082+36.17	2.00%	24.00	120.95	2.40	0.00	ISLIP2	202+00.00	2.00%	0.00	2.40
IWBCD2	7082+86.15	2.00%	24.00	120.70	3.75	0.00	ISLIP2	202+50.00	2.00%	0.00	3.75
IWBCD2	7083+36.13	2.00%	24.00	120.45	5.40	0.00	ISLIP2	203+00.00	2.00%	0.00	5.40
IWBCD2	7083+86.09	2.00%	24.00	120.20	7.35	0.00	ISLIP2	203+50.00	2.00%	0.00	7.35
IWBCD2	7084+36.04	2.00%	24.00	119.95	9.59	0.00	ISLIP2	204+00.00	2.00%	0.00	9.59
IWBCD2	7084+85.97	2.00%	24.00	119.70	12.14	0.00	ISLIP2	204+50.00	2.00%	0.00	12.14
IWBCD2	7085+36.53	2.00%	24.00	119.44	0.00	0.00	ISLIP2	204+99.74	2.00%	-15.00	15.00
IWBCD2	7085+86.78	2.00%	24.00	119.19	3.17	3.17	ISLIP2	205+50.00	2.00%	-15.00	15.00
IWBCD2	7086+36.75	2.00%	24.00	118.94	6.62	6.62	ISLIP2	206+00.00	2.00%	-15.00	15.00
IWBCD2	7086+86.68	2.00%	24.00	118.69	25.32	10.36	ISLIP2	206+50.00	2.00%	15.00	15.00
IWBCD2	7087+36.53	2.00%	24.00	118.44	29.14	14.18	ISLIP2	207+00.00	2.00%	15.00	15.00
IWBCD2	7087+73.33	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**

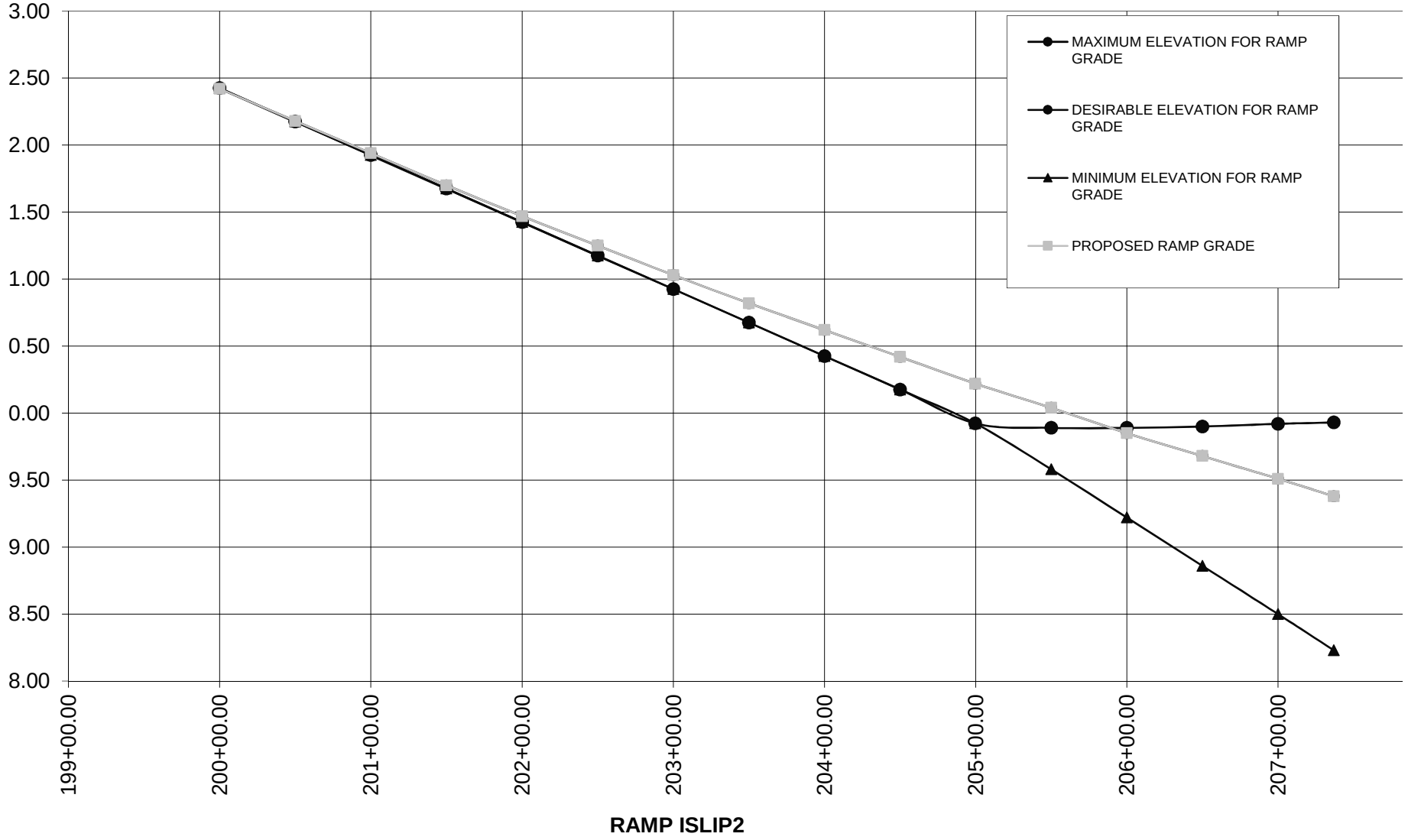
AECOM Project No: 60480256
Computed By: BM Date: 4/25/2018
Checked By: MSP Date: 4/25/2018

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

AECOM

RAMP ISLIP2 @ IWBCD2

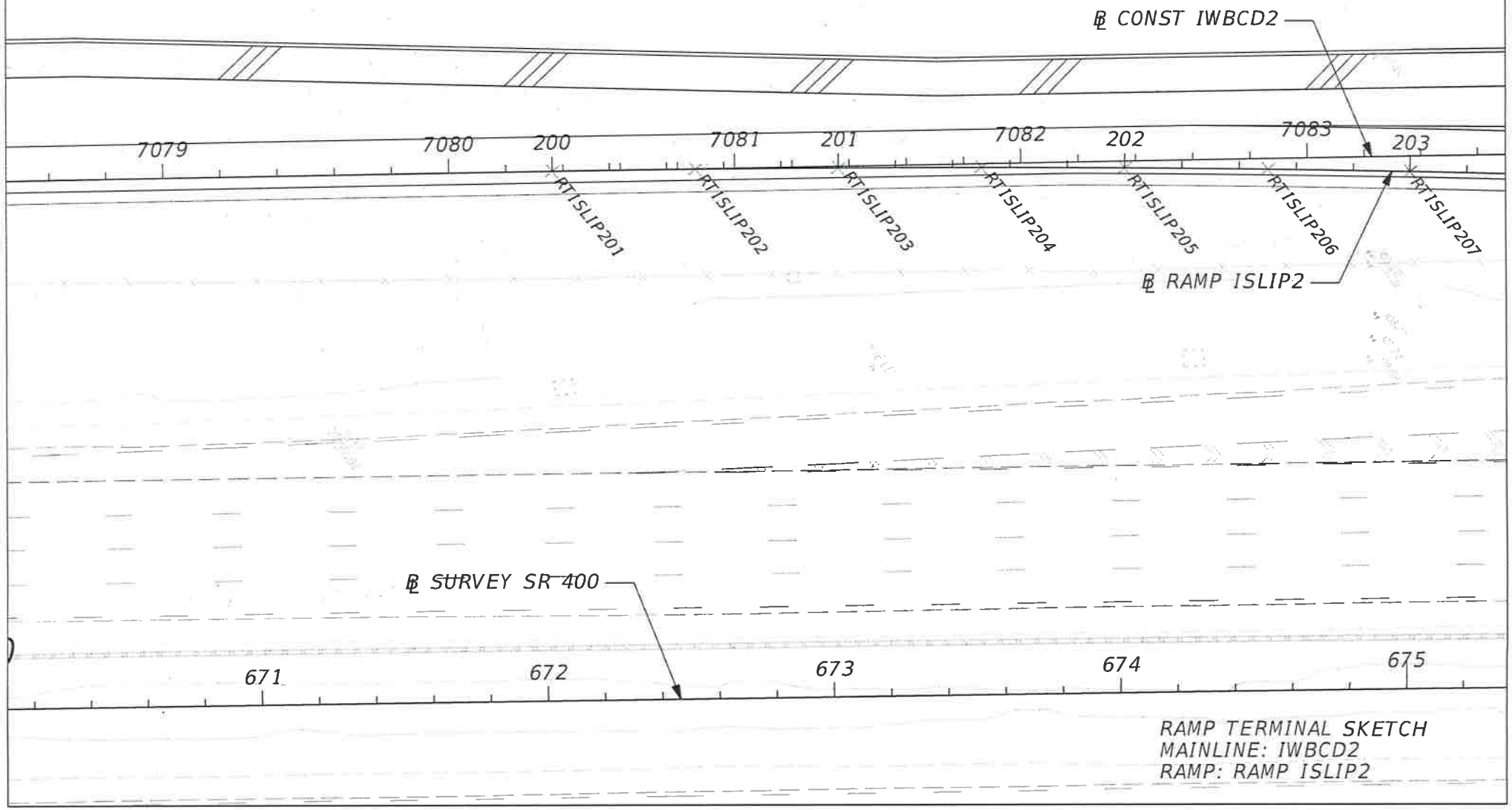
SHEET 4 OF 4



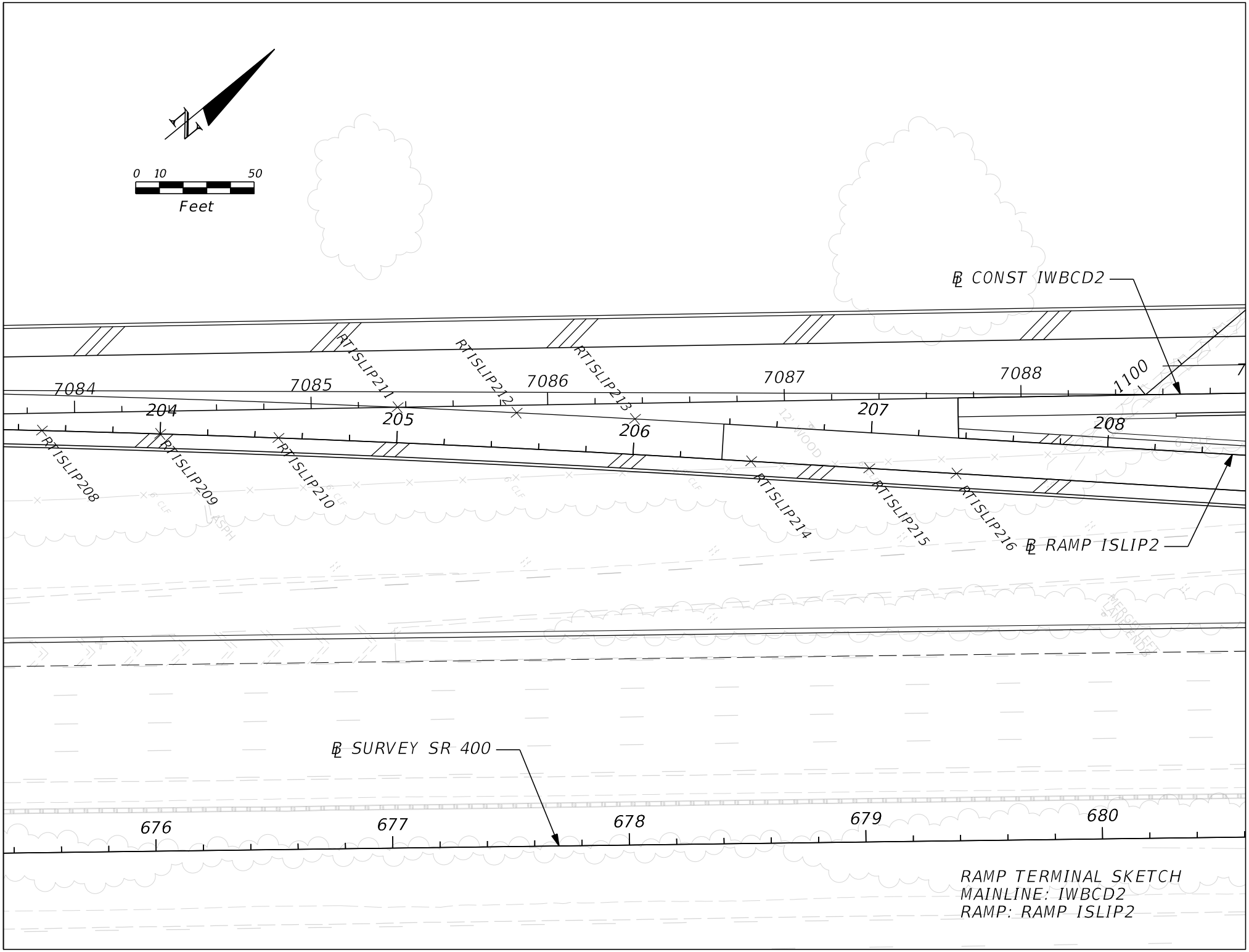
pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_ISLIP2_IWBCD2.xls

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

0 10 50
Feet



RAMP TERMINAL SKETCH
MAINLINE: IWBCD2
RAMP: RAMP ISLIP2


0 10 50
Feet
℄ CONST IWBCD2
℄ RAMP ISLIP2
℄ SURVEY SR 400
7084
7085
7086
7087
7088
1100
204
205
206
207
208
676
677
678
679
680
RTISLIP208
RTISLIP209
RTISLIP210
RTISLIP211
RTISLIP212
RTISLIP213
RTISLIP214
RTISLIP215
RTISLIP216
RAMP TERMINAL SKETCH
MAINLINE: IWBCD2
RAMP: RAMP ISLIP2

RT_ISLIP2DCP.OBM
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_ISLIP2'

* 1 LAY OFF CHA IWBCD2 RTISLIP201-RTISLIP216

Point	North	East	Station	Offset	R
RTISLIP201	1,479,441.0835	500,981.1041	7080+36.19	0.0000	
RTISLIP202	1,479,480.1797	501,012.2725	7080+86.19	0.1499	
RTISLIP203	1,479,519.0884	501,043.6749	7081+36.19	0.5997	
RTISLIP204	1,479,557.8080	501,075.3101	7081+86.19	1.3494	
RTISLIP205	1,479,596.3372	501,107.1769	7082+36.18	2.3988	
RTISLIP206	1,479,634.6745	501,139.2743	7082+86.16	3.7481	
RTISLIP207	1,479,672.8187	501,171.6009	7083+36.13	5.3970	
RTISLIP208	1,479,710.7684	501,204.1558	7083+86.09	7.3457	
RTISLIP209	1,479,748.5221	501,236.9377	7084+36.04	9.5939	
RTISLIP210	1,479,786.0785	501,269.9454	7084+85.98	12.1417	
RTISLIP211	1,479,833.2422	501,291.8237	7085+36.53	0.0000	
RTISLIP212	1,479,870.6642	501,325.5163	7085+86.78	3.1681	
RTISLIP213	1,479,907.6872	501,359.2549	7086+36.76	6.6200	
RTISLIP214	1,479,934.3107	501,404.2038	7086+85.54	25.3168	
RTISLIP215	1,479,971.0134	501,438.1584	7087+35.39	29.1369	
RTISLIP216	1,479,998.1005	501,463.2173	7087+72.18	31.9562	

* 2 EL PRO IWBCD2 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

Elev at 7080+36.19 = 122.4249, grade = -0.5000, On tang betw 1 & 2
Elev at 7080+86.19 = 122.1749, grade = -0.5000, On tang betw 1 & 2
Elev at 7081+36.19 = 121.9249, grade = -0.5000, On tang betw 1 & 2
Elev at 7081+86.18 = 121.6750, grade = -0.5000, On tang betw 1 & 2
Elev at 7082+36.17 = 121.4250, grade = -0.5000, On tang betw 1 & 2
Elev at 7082+86.15 = 121.1751, grade = -0.5000, On tang betw 1 & 2
Elev at 7083+36.13 = 120.9252, grade = -0.5000, On tang betw 1 & 2
Elev at 7083+86.09 = 120.6754, grade = -0.5000, On tang betw 1 & 2
Elev at 7084+36.04 = 120.4257, grade = -0.5000, On tang betw 1 & 2
Elev at 7084+85.97 = 120.1760, grade = -0.5000, On tang betw 1 & 2
Elev at 7085+36.53 = 119.9232, grade = -0.5000, On tang betw 1 & 2
Elev at 7085+86.78 = 119.6720, grade = -0.5000, On tang betw 1 & 2
Elev at 7086+36.75 = 119.4221, grade = -0.5000, On tang betw 1 & 2
Elev at 7086+86.68 = 119.1725, grade = -0.5000, On tang betw 1 & 2
Elev at 7087+36.53 = 118.9232, grade = -0.5000, On tang betw 1 & 2
Elev at 7087+73.33 = 118.7392, grade = -0.5000, On tang betw 1 & 2

* 3 LAY OFF CHA ISLIP2 RTISLIP201-RTISLIP216

Point	North	East	Station	Offset	R
RTISLIP201	1,479,441.0835	500,981.1041	200+00.00	0.0000	
RTISLIP202	1,479,480.1797	501,012.2725	200+50.00	0.0000	
RTISLIP203	1,479,519.0884	501,043.6749	201+00.00	0.0000	
RTISLIP204	1,479,557.8080	501,075.3101	201+50.00	0.0000	
RTISLIP205	1,479,596.3372	501,107.1769	202+00.00	0.0000	
RTISLIP206	1,479,634.6745	501,139.2743	202+50.00	0.0000	
RTISLIP207	1,479,672.8187	501,171.6009	203+00.00	0.0000	

RTISLIP208	1,479,710.7684	501,204.1558	203+50.00	0.0000
RTISLIP209	1,479,748.5221	501,236.9377	204+00.00	0.0000
RTISLIP210	1,479,786.0785	501,269.9454	204+50.00	0.0000
RTISLIP211	1,479,833.2422	501,291.8237	204+99.74	-15.0000
RTISLIP212	1,479,870.6642	501,325.5163	205+50.00	-15.0000
RTISLIP213	1,479,907.6872	501,359.2549	206+00.00	-15.0000
RTISLIP214	1,479,934.3107	501,404.2038	206+50.00	15.0000
RTISLIP215	1,479,971.0134	501,438.1584	207+00.00	15.0000
RTISLIP216	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				

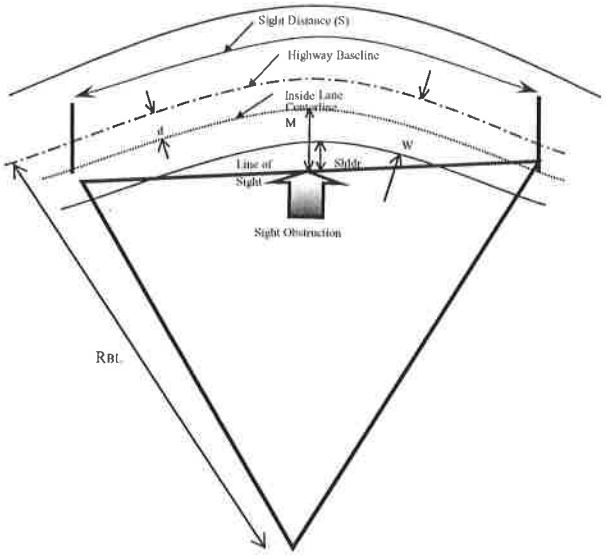
==========

Ending chain IC1_535 description

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Sheet	2 of 2
Description:	**Stopping sight Distance Calculations for Ramp IC1_535 (NB SR 535 to EBI4)**	Computed By:	BM	Date:	8/10/2017
		Checked By:	AS	Date:	8/24/2017

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)

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*)	All Other Facilities
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	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?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Sheet	1 of 1
Description:	**Super Elevation Transition Calculations for**	Computed By:	BM	Date:	8/10/17
	Ramp IC1_535 (NB SR 535 TO EBI4)	Checked By:	AS	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.	IC1_535_2 (RT)	PC STATION	913+37.56	
DEGREE OF CURVE	1° 59' 59"	PT STATION	918+10.33	
RADIUS OF CURVE	2,865.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	913+37.56	
e=	0.040 *EXIST	BEGIN FULL SUPER	913+37.56	
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	918+10.33	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	918+10.33	*

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
1-LANE RAMP				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
1-LANE RAMP				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.

* THIS IS AN EXISITING CURVE TO BE MILLED & RESURFACED. CALCULATION SHOWN FOR INFORMATION ONLY.

AECOM

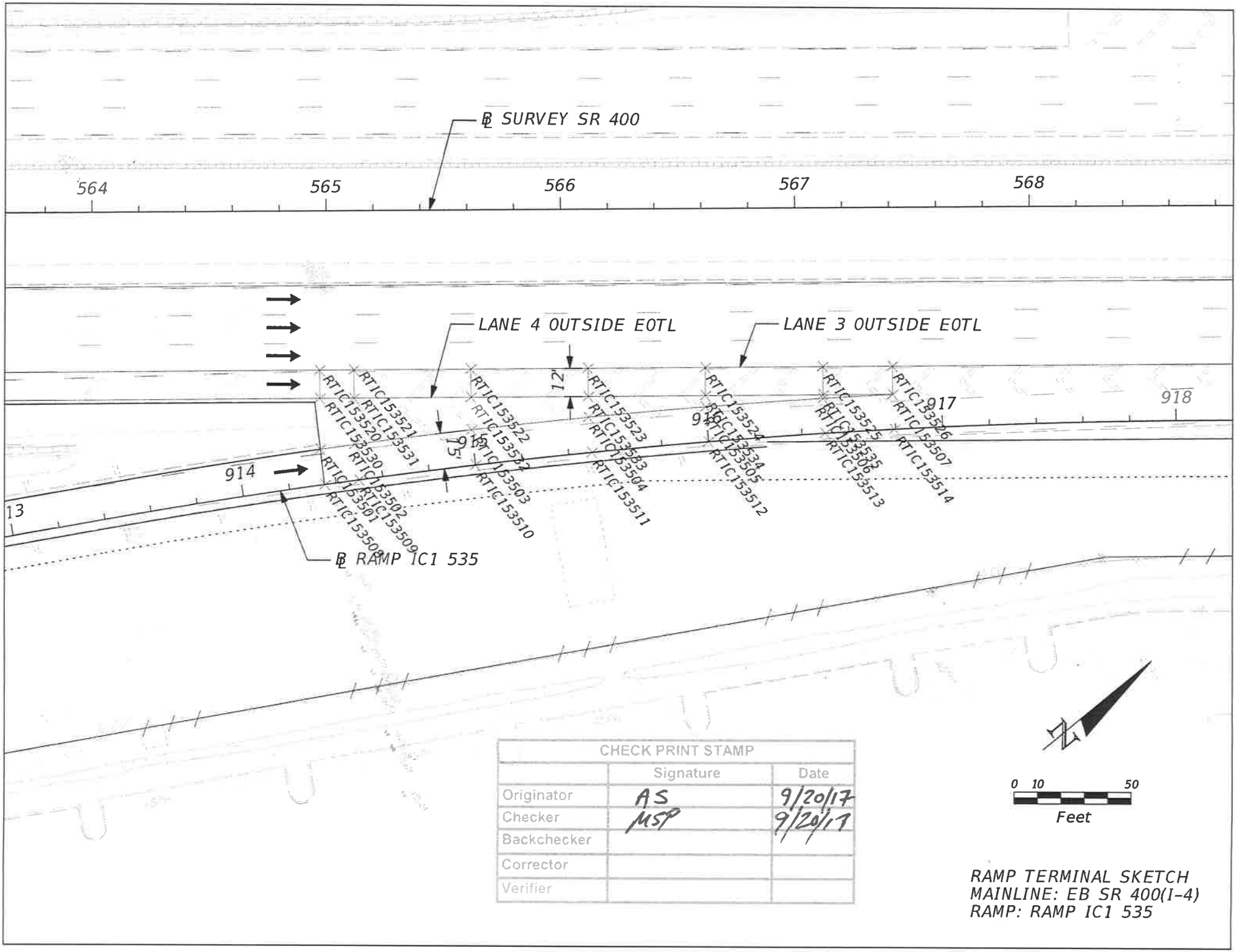
Ramp Terminal - Data

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 Date: 8/15/2017
Checked By: MSP 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.



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 EXIST BRG PLANS TYP

FROM ℄ OF DCP TO BACK OF S/W ON BRD
= 2' + 24' + 30' + 6' = 62', ALIGNMENT CHKD OK.

• INTERSECTN CROSSOVER ANGLE LESS 45° DUE TO R/W AND EXIST RDWY DEVELOPMENT 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	DESN SPD = 25 MPH w/ NC ∴ OK			
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					

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	DESN SPD = 25 MPH w/ NC SUPER ∴ OK			
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					

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

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

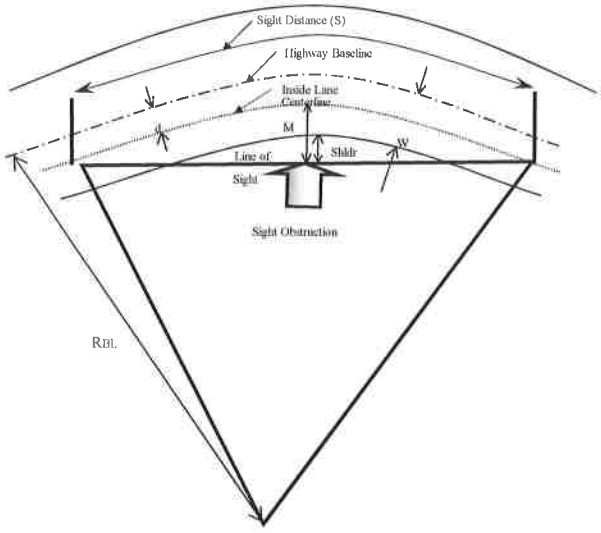
REVISE ALIGNMENTS ACROSS THE DCP BRIDGE TO PROVIDE 2.5' SHOULDERS INSTEAD OF CURRENT 10' SHOULDERS ADJACENT TO THE EXIST. BRIDGE RAILINGS. THIS WILL PROVIDE A LARGER SHOULDER ADJACENT TO BIKE LANES AT THE MEDIAN. WHICH WILL ALSO HELP TO INCREASE THE CROSS OVER INTERSECTION ANGLE FROM CURRENT 42°

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

AECOM

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 Eastbound Daryl Carter Pkwy	Computed By:	MSP	Date:	11/16/2016
		Checked By:	JW	Date:	12/14/16
	Diverging Diamond (DDI) Section				

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
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%	****
M DIMENSION	13.5 '	

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

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.

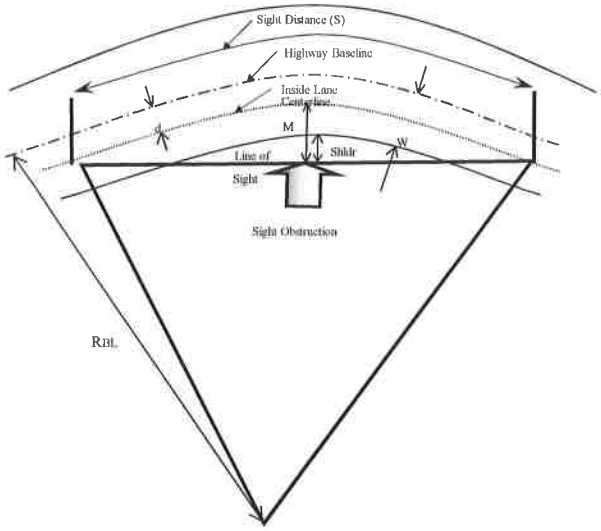
*** ALTHOUGH A 7 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.

**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.

AECOM

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 Eastbound Daryl Carter Pkwy	Computed By:	MSP	Date:	11/16/2016
		Checked By:	JW	Date:	12/14/16
	Diverging Diamond (DDI) Section				

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	EBDCP2	*
RADIUS OF CURVE (R_{BL})	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	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?	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.

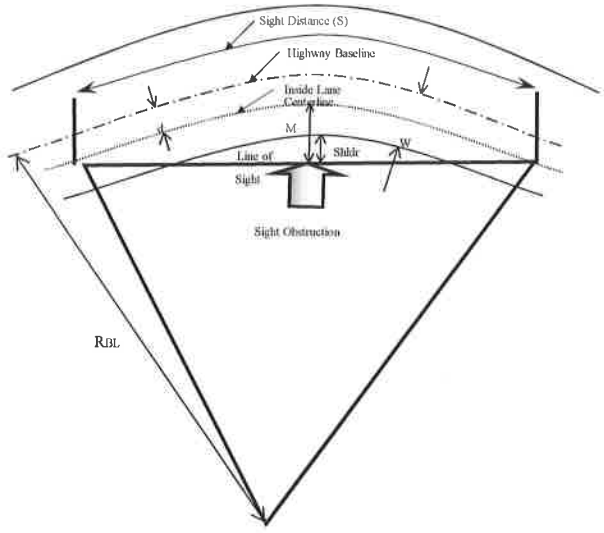
*** ALTHOUGH AN 8 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS CURB & GUTTER SECTION.

**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

AECOM

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 Eastbound Daryl Carter Pkwy	Computed By:	MSP	Date:	11/16/2016
		Checked By:	JW	Date:	12/14/16
	Diverging Diamond (DDI) Section				

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	EBDCP3	*
RADIUS OF CURVE (R_{BL})	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)	9 '	***
VERTICAL GRADE (%)	-2.200%	****
M DIMENSION	15.5 '	

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

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 A 9 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.

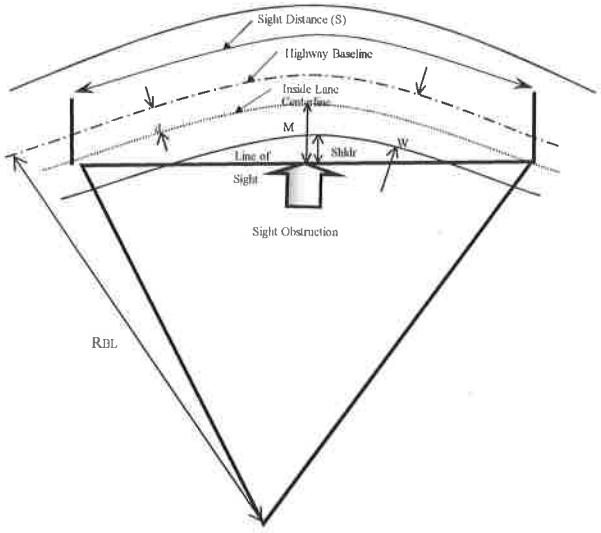
**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

AECOM

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 Eastbound Daryl Carter Pkwy**	Computed By:	MSP	Date:	11/16/2016
		Checked By:	JW	Date:	12/14/16

Diverging Diamond (DDI) Section

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	EBDCP4	*
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)	10 '	***
VERTICAL GRADE (%)	-4.500%	****
M DIMENSION	16.5 '	

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

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

* THIS CURVE IS PART OF THE DDI "CROSSOVER."

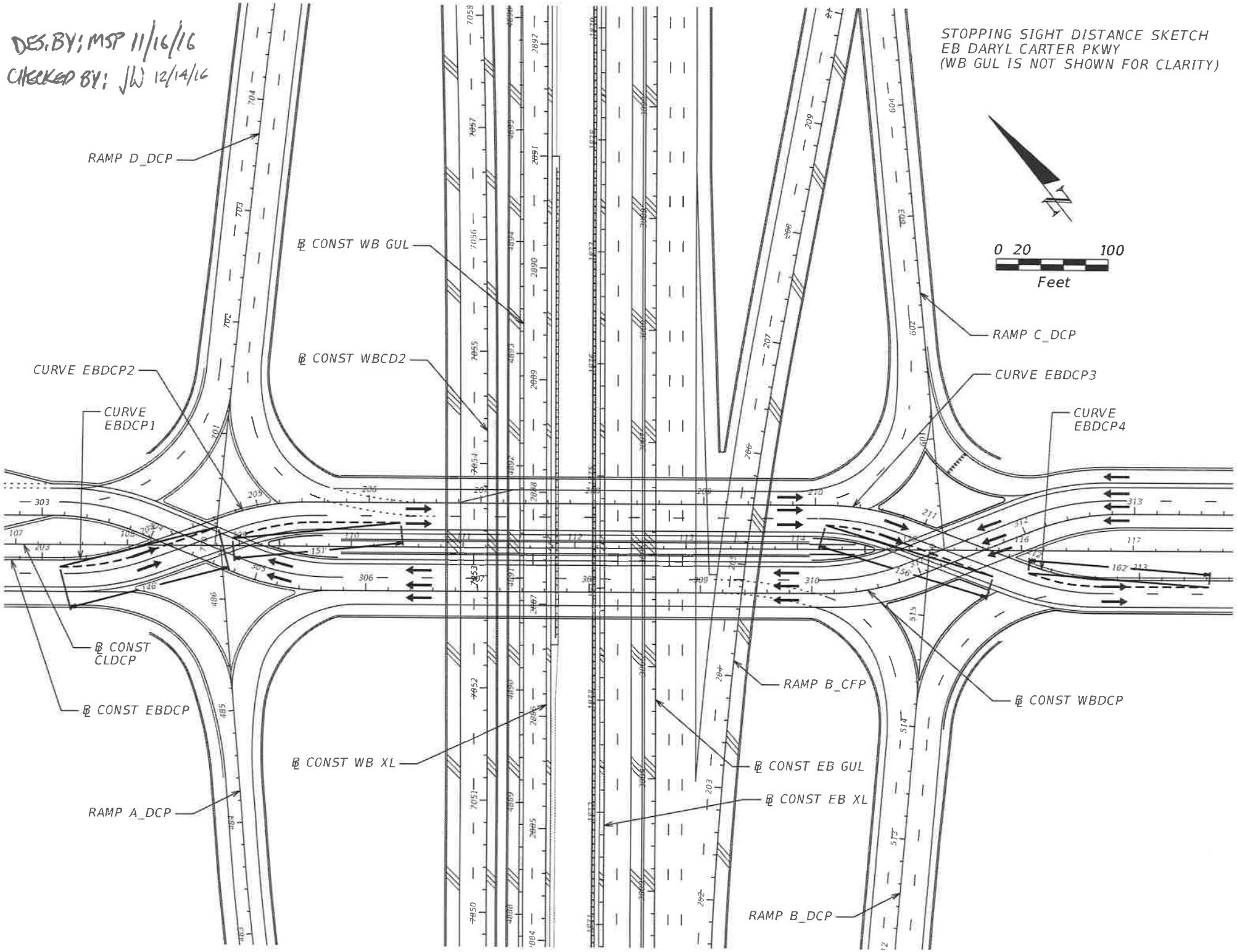
** LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.

*** ALTHOUGH 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)



AECOM

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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: [illegible]

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

SUPERELEVATION CALCULATIONS

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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: JCO

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

SUPERELEVATION CALCULATIONS

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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: JLO

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

SUPERELEVATION CALCULATIONS

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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: GLF 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

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

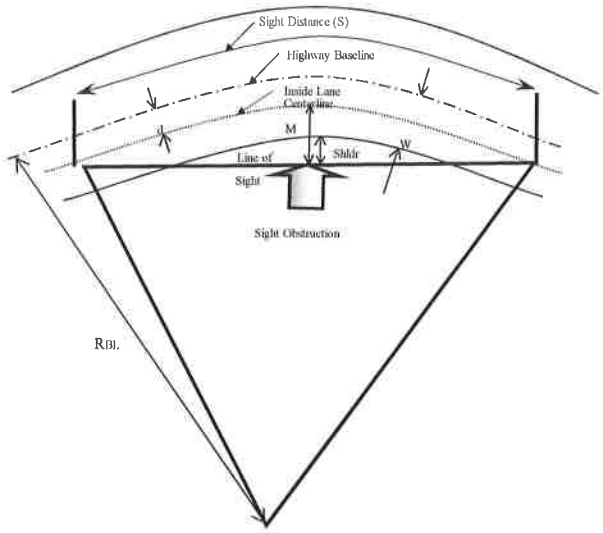
==========

Ending chain WBDCP description

AECOM

				Page	___ of ___
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 Westbound Daryl Carter Pkwy	Computed By:	MSP	Date:	11/16/2016
		Checked By:	JW	Date:	12/14/16
	Diverging Diamond (DDI) Section				

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	WBDCP1	*
RADIUS OF CURVE (R_{BL})	200.00 '	
DIRECTION OF CURVE (LT or RT)	RT	
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 (%)	-5.000%	****
M DIMENSION	16.5 '	

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

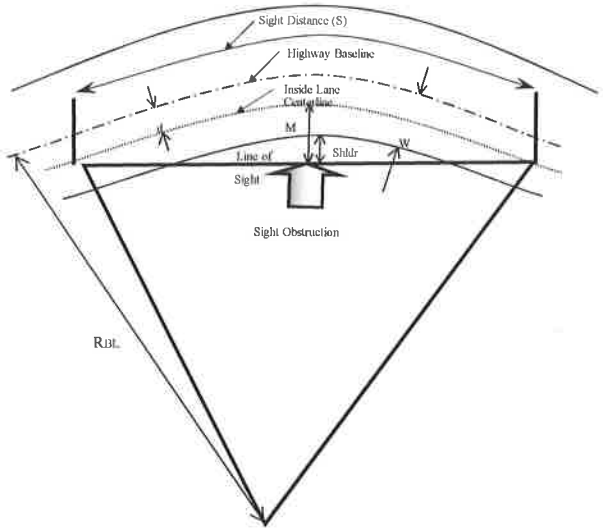
*** ALTHOUGH A 7 FT INSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.

**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF INSIDE TRAVEL LANE.

AECOM

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

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	WBDCP2	*
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)	9 '	***
VERTICAL GRADE (%)	-2.500%	****
M DIMENSION	15.5 '	

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

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.

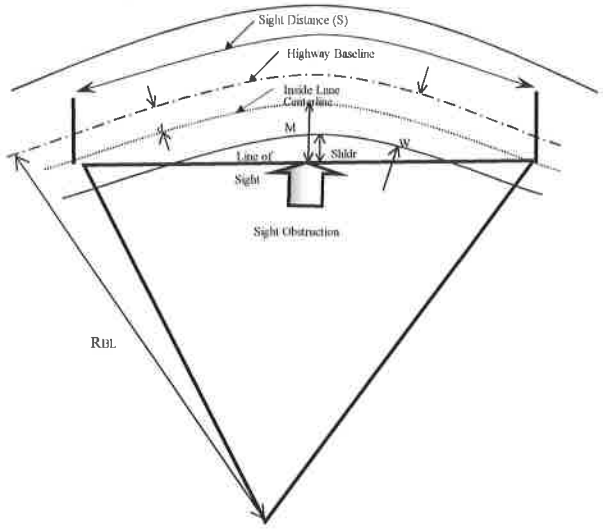
*** ALTHOUGH AN 8 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS CURB & GUTTER SECTION.

**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

AECOM

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

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)

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*)	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%	****
M DIMENSION	14.5 '	

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

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 A 9 FT OUTSIDE SHOULDER IS REQUIRED, SUFFICIENT SSD IS MET AS THIS IS A CURB & GUTTER SECTION.

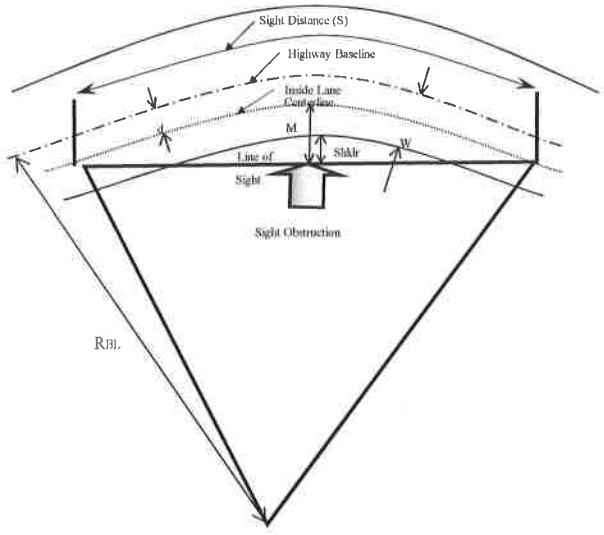
**** GRADE OBTAINED FROM GDTMRD01.TIN FILE ALONG THE CENTER OF OUTSIDE TRAVEL LANE.

AECOM

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

Diverging Diamond (DDI) Section

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	URBAN MAJOR COLLECTOR	
DESIGN SPEED	25 mph	
CURVE NO.	WBDCP4	*
RADIUS OF CURVE (R_{BL})	212.00 '	
DIRECTION OF CURVE (LT or RT)	RT	
DEGREE OF CURVE	27° 1' 35"	
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	145.00 '	*FDOT PPM, TABLE 2.7.1, January 2016..*
AASHTO REQUIRED SSD	145.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	165.81 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

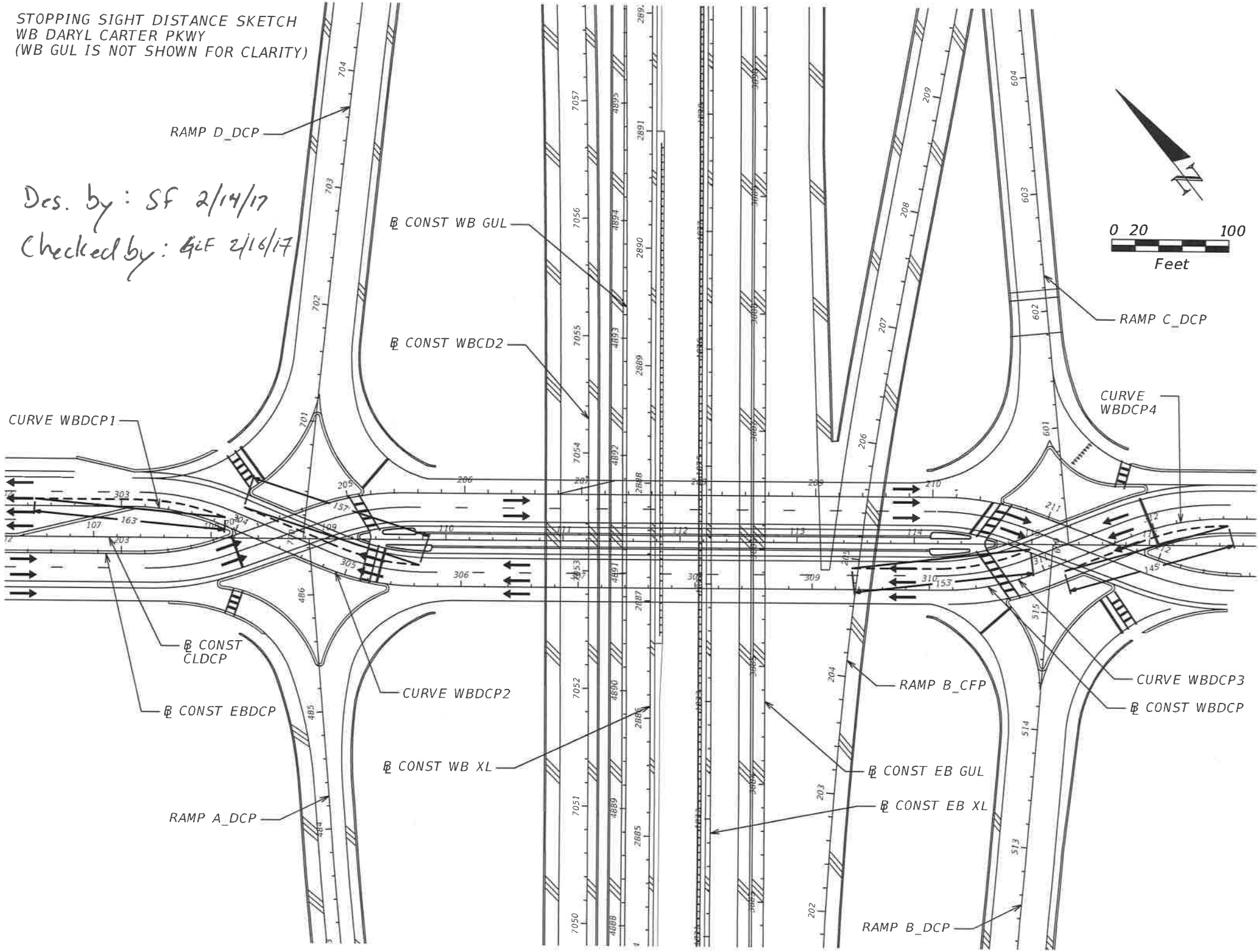
COMMENTS:

* THIS CURVE IS PART OF THE DDI "CROSSOVER."

** LANE VARIES FROM 12 FT TO 14 FT, USED AVERAGE OF 13 FT.

*** ALTHOUGH 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: GLF 2/16/17
RAMP D_DCP
℄ CONST WB GUL
℄ CONST WBCD2
CURVE WBDCP1
℄ CONST CLDCP
℄ CONST EBDCP
CURVE WBDCP2
℄ CONST WB XL
RAMP A_DCP
RAMP C_DCP
CURVE WBDCP4
CURVE WBDCP3
℄ CONST WBDCP
RAMP B_CFP
℄ CONST EB GUL
℄ CONST EB XL
RAMP B_DCP
0 20 100
Feet

AECOM

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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: 12/14/16

SUPERELEVATION CALCULATIONS

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

AECOM

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
DES. BY: JW 8/9/17
CHECKED BY: MSP 8/23/17

Project: DCP Interim
Subject:
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

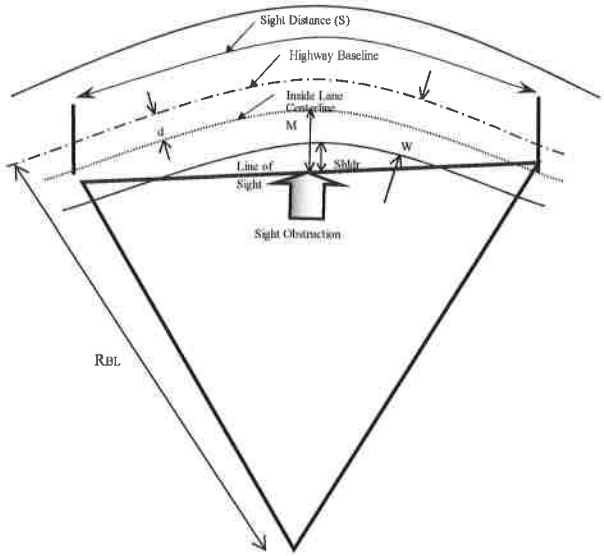
==========

Ending chain IB_DCP description

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page ___ of ___	
Description:	Stopping Sight Distance Calculations for	Computed By:	BM	Sheet 1 of 2	
	Ramp IB_DCP (EBI4 TO DCP)	Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	IB_DCP_1
RADIUS OF CURVE (R_{BL})	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

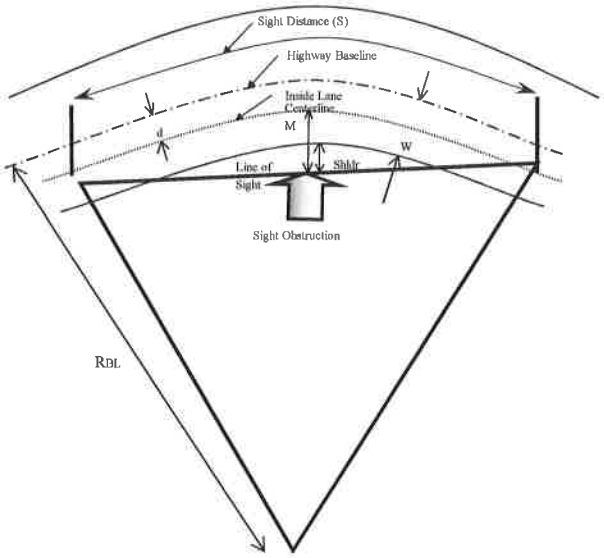
COMMENTS:

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_IB_DCP.xls

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Stopping Sight Distance Calculations for Ramp IB_DCP (EBI4 TO DCP)**	Computed By:	BM	Sheet 2 of 2	
		Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	IB_DCP_2
RADIUS OF CURVE (R_{BL})	4,584.00 '
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	1° 14' 60"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)	-6.00 '
LANE WIDTH (*W*)	12 '
SHOULDER WIDTH (Shldr)	6 '
VERTICAL GRADE (%)	1.887%
M DIMENSION	12.0 '

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	663.03 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_IB_DCP.xls

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	BM	Sheet 1 of 2	
	Ramp IB_DCP (EBI4 TO DCP)	Checked By:	AS	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)	PC STATION	499+70.88
DEGREE OF CURVE	1° 26' 23"	PT STATION	504+40.00
RADIUS OF CURVE	3,980.00 '		
DESIGN SPEED	50 mph	BEGIN TRANSITION	499+61.88 *
e=	0.030	BEGIN FULL SUPER	500+61.88 *
SE SPLIT INTO CURVE (Tangent/Curve)	9 91 **	END FULL SUPER	504+20.00 *
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	505+20.00 *

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

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

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.

AECOM

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

Date: 8/10/2017
Date: 8/24/2017

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.	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.	
				0.00			
2-LANE RAMP				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				**138.00**			
4-LANE RAMP				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				**270.80**			

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.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Friday August 24, 2018 10:45 am

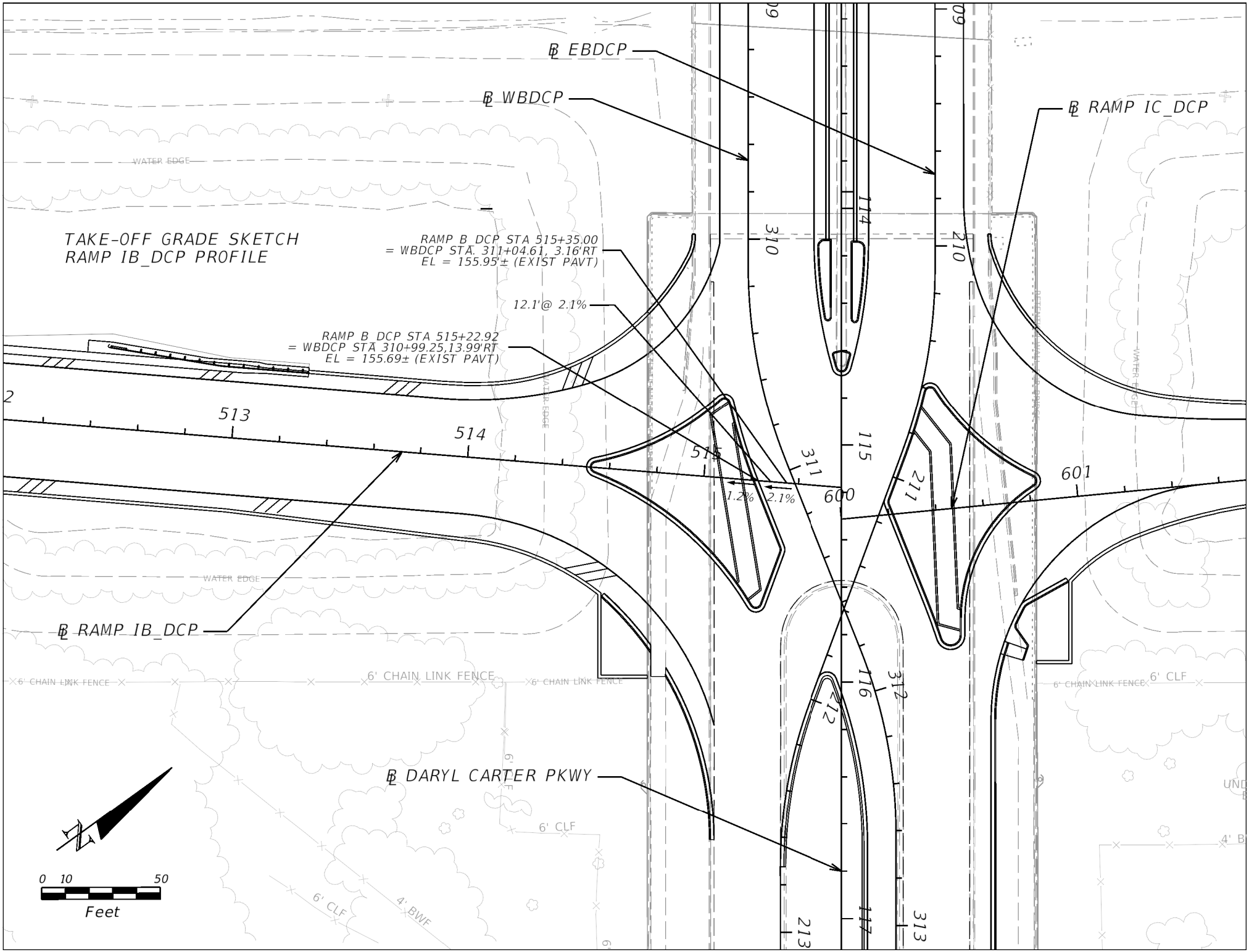
SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_IB_DCP'

* 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			
VPI	16	515+22.92	155.6900	1.1520			

Ending profile IB_DCP description


TAKE-OFF GRADE SKETCH
RAMP IB_DCP PROFILE
℄ EBDCP
℄ WBDCP
℄ RAMP IC_DCP
℄ RAMP IB_DCP
℄ DARYL CARTER PKWY
RAMP B_DCP STA 515+35.00
= WBDCP STA. 311+04.61, 3.16'RT
EL = 155.95'± (EXIST PAVT)
12.1'@ 2.1%
RAMP B_DCP STA 515+22.92
= WBDCP STA 310+99.25,13.99'RT
EL = 155.69± (EXIST PAVT)
1.2%
2.1%
513
514
515
600
601
310
311
210
211
115
116
212
312
213
313
117
114
WATER EDGE
6' CHAIN LINK FENCE
6' CLF
4' BWF
0 10 50
Feet

Ramp Terminal - Detail

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 Date: 8/17/2017
Checked By: MSP 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	625+99.74	-3.00%	127.24	0.00	-3.50%	127.24	-3.50%	12.00	126.82	IB_DCP	496+46.69
BL400	626+43.16	-3.00%	127.66	0.00	-3.50%	127.66	-3.50%	15.00	127.13	IB_DCP	496+89.17
BL400	626+53.97	-3.00%	127.78	0.76	-3.50%	127.75	-3.50%	15.00	127.23	IB_DCP	497+00.00
BL400	627+03.85	-3.00%	128.19	4.24	-3.50%	128.04	-3.50%	15.00	127.52	IB_DCP	497+50.00
BL400	627+53.72	-3.00%	128.47	7.73	-3.50%	128.20	-3.50%	15.00	127.68	IB_DCP	498+00.00
BL400	628+03.60	-3.00%	129.06	11.22	-3.50%	128.67	-3.50%	15.00	128.15	IB_DCP	498+50.00
BL400	628+53.48	-3.00%	129.44	14.71	-3.50%	128.93	-3.50%	15.00	128.41	IB_DCP	499+00.00
BL400	629+03.36	-3.00%	129.87	18.19	-3.50%	129.23	-3.50%	15.00	128.71	IB_DCP	499+50.00
BL400	629+14.88	-3.00%	129.99	19.00	-3.50%	129.32	-3.50%	15.00	128.80	IB_DCP	499+61.55
BL400	629+53.34	-3.00%	130.38	21.80	-3.50%	129.62	-3.50%	15.00	129.10	IB_DCP	500+00.00
BL400	630+03.35	-3.00%	130.96	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

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 Date: 8/17/2017
Checked By: MSP 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	625+99.74	-3.00%	127.24	RTIBDCP12	0.00	IB_DCP	496+46.69	-3.50%	0.00	12.00
BL400	626+43.16	-3.00%	127.66	RTIBDCP02	0.00	IB_DCP	496+89.17	-3.50%	-15.00	15.00
BL400	626+53.97	-3.00%	127.78	RTIBDCP13	0.76	IB_DCP	497+00.00	-3.50%	-15.00	15.00
BL400	627+03.85	-3.00%	128.19	RTIBDCP14	4.24	IB_DCP	497+50.00	-3.50%	-15.00	15.00
BL400	627+53.72	-3.00%	128.47	RTIBDCP15	7.73	IB_DCP	498+00.00	-3.50%	-15.00	15.00
BL400	628+03.60	-3.00%	129.06	RTIBDCP16	11.22	IB_DCP	498+50.00	-3.50%	-15.00	15.00
BL400	628+53.48	-3.00%	129.44	RTIBDCP17	14.71	IB_DCP	499+00.00	-3.50%	-15.00	15.00
BL400	629+03.36	-3.00%	129.87	RTIBDCP18	18.19	IB_DCP	499+50.00	-3.50%	-15.00	15.00
BL400	629+14.88	-3.00%	129.99	RTIBDCP19	19.00	IB_DCP	499+61.55	-3.50%	-15.00	15.00
BL400	629+53.34	-3.00%	130.38	RTIBDCP20	21.80	IB_DCP	500+00.00	-3.50%	-15.00	15.00
BL400	630+03.35	-3.00%	130.96	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.

Ramp Terminal - Graph Input

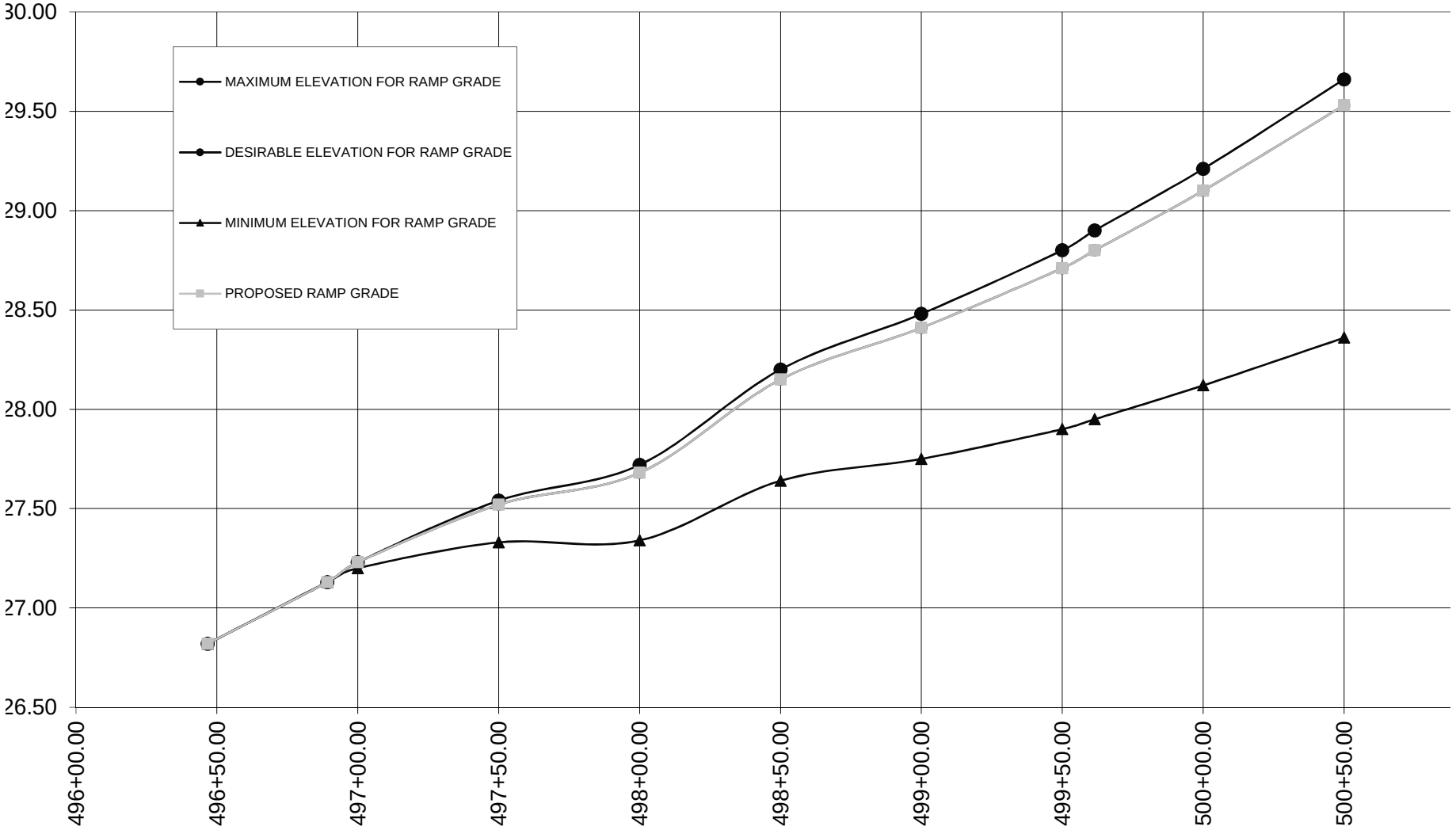
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)
Description: **Ramp IB_DCP Exit terminal**
with existing EBI-4

AECOM Project No: 60480256
Computed By: AS Date: 8/17/2017
Checked By: MSP Date: 4/29/92

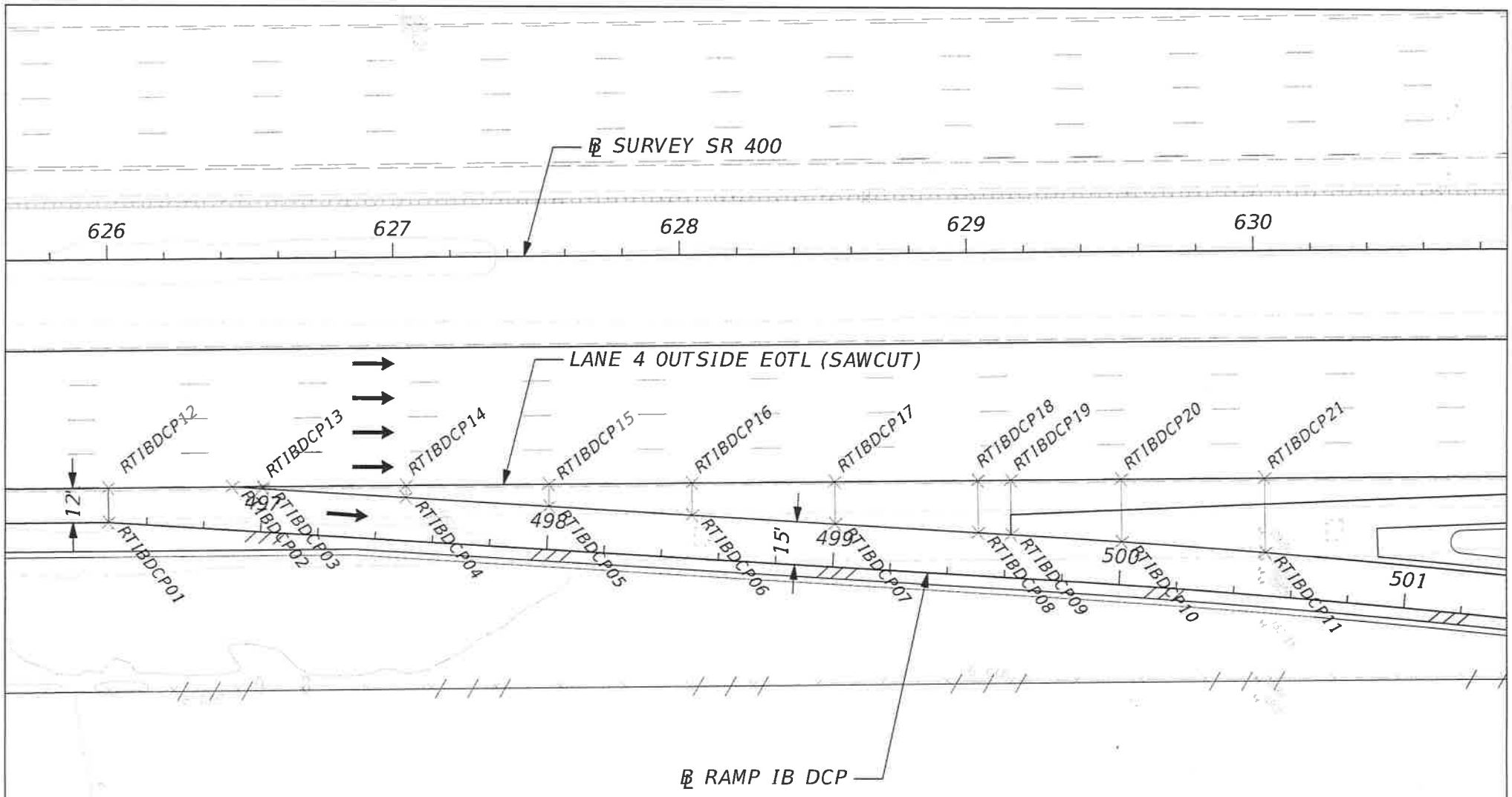
MINIMUM ELEVATION FOR RAMP GRADE					DESIRABLE ELEVATION FOR RAMP GRADE					MAXIMUM ELEVATION FOR RAMP GRADE				
Mainline Rollover	Gore Slope(%)	Ramp Rollover	Inside Ramp Elevation	Outside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Inside Ramp Elevation	Outside Ramp Elevation	Ramp Rollover	Gore Slope(%)	Mainline Rollover	Inside Ramp Elevation	Outside Ramp Elevation
5.00%	N/A	0.50%	127.24	126.82	0.00%	N/A	0.50%	127.24	126.82	0.50%	N/A	0.50%	127.24	126.82
5.00%	N/A	0.50%	127.66	127.13	0.00%	N/A	0.50%	127.66	127.13	0.50%	N/A	0.50%	127.66	127.13
5.00%	-8.00%	4.50%	127.72	127.20	0.00%	-3.50%	0.50%	127.75	127.23	0.50%	-3.00%	0.00%	127.75	127.23
5.00%	-8.00%	4.50%	127.85	127.33	0.00%	-3.50%	0.50%	128.04	127.52	0.50%	-3.00%	0.00%	128.06	127.54
5.00%	-8.00%	4.50%	127.86	127.34	0.00%	-3.50%	0.50%	128.20	127.68	0.50%	-3.00%	0.00%	128.24	127.72
5.00%	-8.00%	4.50%	128.16	127.64	0.00%	-3.50%	0.50%	128.67	128.15	0.50%	-3.00%	0.00%	128.72	128.20
5.00%	-8.00%	4.50%	128.27	127.75	0.00%	-3.50%	0.50%	128.93	128.41	0.50%	-3.00%	0.00%	129.00	128.48
5.00%	-8.00%	4.50%	128.42	127.90	0.00%	-3.50%	0.50%	129.23	128.71	0.50%	-3.00%	0.00%	129.32	128.80
5.00%	-8.00%	4.50%	128.47	127.95	0.00%	-3.50%	0.50%	129.32	128.80	0.50%	-3.00%	0.00%	129.42	128.90
5.00%	-8.00%	4.50%	128.64	128.12	0.00%	-3.50%	0.50%	129.62	129.10	0.50%	-3.00%	0.00%	129.73	129.21
5.00%	-8.00%	4.50%	128.88	128.36	0.00%	-3.50%	0.50%	130.05	129.53	0.50%	-3.00%	0.00%	130.18	129.66

AECOM

RAMP IB_DCP @ GEBI4



pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_IB_DCP_EBI4.xls



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

0 10 50
Feet

RAMP TERMINAL SKETCH
MAINLINE: EB SR 400(I-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

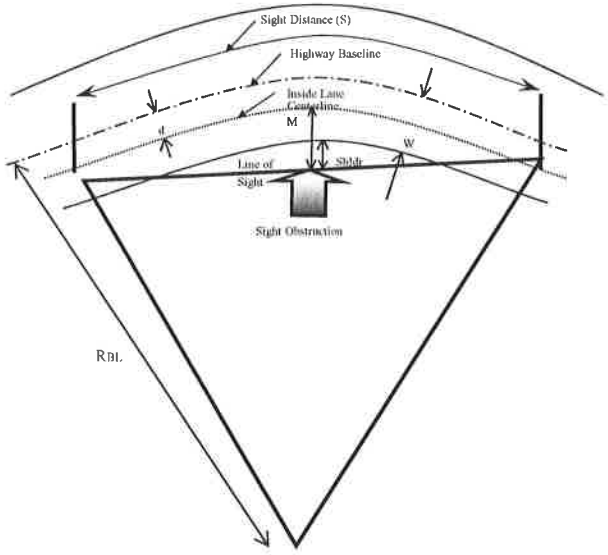
Curve IC_DCP2
P.I. Station 618+96.16 N 1,478,621.0661 E
500,681.7910
Delta = 8° 30' 16.21" (RT)
Degree = 0° 41' 10.24"
Tangent = 620.8420
Length = 1,239.4035
Radius = 8,350.0000
External = 23.0487
Long Chord = 1,238.2661
Mid. Ord. = 22.9853
P.C. Station 612+75.32 N 1,478,083.8619 E
500,370.5733
P.T. 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

AECOM

Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Page ___ of ___	
Description:	Stopping Sight Distance Calculations for Ramp IC_DCP (DCP TO EBI4)	Computed By:	BM	Sheet 1 of 2	
		Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

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)

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*)	All Other Facilities	
DESIGN SPEED	50 mph	
CURVE NO.	IC_DCP_1	
RADIUS OF CURVE (R_{BL})	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*

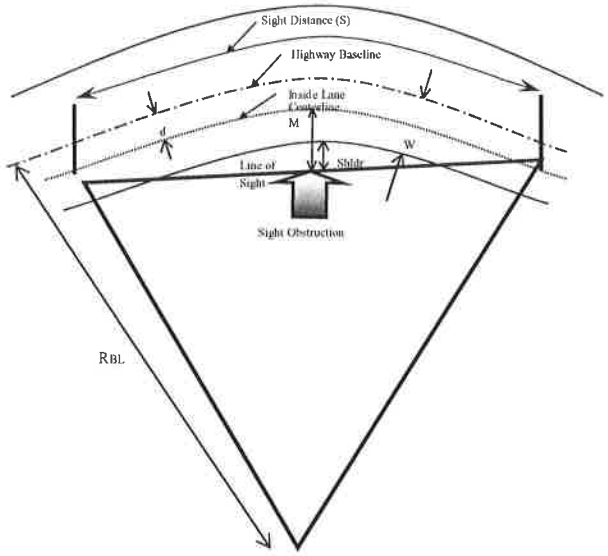
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:
* INSIDE BRIDGE SHOULDER WIDTH

AECOM

				Page ___ of ___	
Job:	Interim Daryl Carter Pkwy 441113-1-52-01 (Ora	AECOM Project No:	60480256	Sheet 2 of 2	
Description:	Stopping Sight Distance Calculations for Ramp IC_DCP (DCP TO EBI4)	Computed By:	BM	Date:	8/10/2017
		Checked By:	AS	Date:	8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	IC_DCP_2
RADIUS OF CURVE (R_{BL})	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:

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_IC_DCP.xls

AECOM

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: BM
Checked By: AS

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.	IC_DCP_1 (LT)	PC STATION	605+97.57
DEGREE OF CURVE	0° 41' 14"	PT STATION	610+42.49
RADIUS OF CURVE	8,337.00 '		
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A *
e=	NC	BEGIN FULL SUPER	N/A *
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A *
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
2-LANE RAMP				0.00		
* No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
2-LANE RAMP				0.00		
* No Transition Required				0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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

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.

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	AS	Sheet 2 of 2	
	Ramp IC_DCP (DCP TO EBI4)	Checked By:	MSP	Date:	9/15/17
				Date:	9/15/17

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.	IC_DCP_2 (RT)	PC STATION	612+75.32
DEGREE OF CURVE	0° 41' 10"	PT STATION	625+14.72
RADIUS OF CURVE	8,350.00 '		
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A
e=	NC	BEGIN FULL SUPER	N/A
SE SPLIT INTO CURVE (Tangent/Curve)		END FULL SUPER	N/A
SE SPLIT OUT OF CURVE (Tangent/Curve)		END TRANSITION	N/A

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
1-LANE RAMP				0.00		
No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
1-LANE RAMP				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				**100.00**		

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

* MIN. REQD SUPERELEVATION. PORTION OF CURVE LIES WITHIN THE RAMP TERMINAL WITH EB I-4. CROSS SLOPE OF RAMP WITHIN RAMP TERMINAL WILL BE (+) 0.035 WHICH EXCEEDS REQD MIN. SUPERELEVATION.

NOTE: CHAIN AND PGL ARE ON THE RIGHT EOP.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Friday August 24, 2018 10:47 am

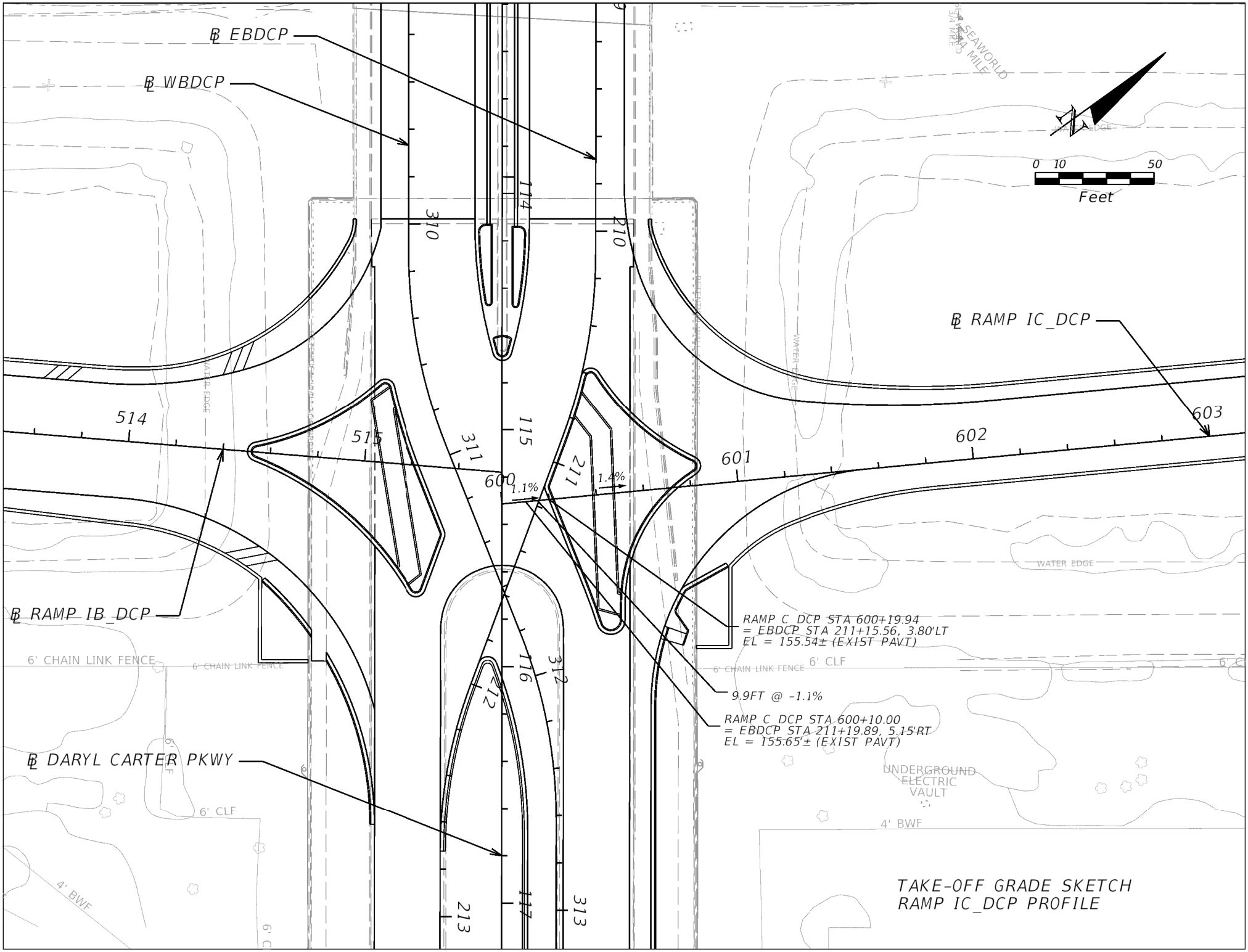
SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_IC_DCP'

* 1 pri pro ic_dcp

Beginning profile IC_DCP description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	600+19.94	155.5400				
VPI	2	600+50.37	155.1261	-1.3601			
VPC		602+39.18	157.3919	1.2000	K = 136.0 SSD = 541.7		
High Point		604+02.38	158.3711				
VPI	3	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		
VPI	4	616+74.00	113.0007		400.0000	200.0000	200.0000
VPT		618+74.00	111.3892	-0.8058			
VPI	5	619+37.19	110.8800	-0.8058			
VPI	6	619+50.00	110.7800	-0.7806			
VPI	7	620+00.00	110.3100	-0.9400			
VPI	8	620+50.00	110.0000	-0.6200			
VPI	9	621+00.00	109.7400	-0.5200			
VPI	10	621+50.00	109.5700	-0.3400			
VPI	11	622+00.00	109.3000	-0.5400			
VPI	12	622+50.00	109.3300	0.0600			
VPI	13	622+91.08	109.4100	0.1947			

Ending profile IC_DCP description


℄ EBDCP
℄ WBDCP
℄ RAMP IC_DCP
℄ RAMP IB_DCP
℄ DARYL CARTER PKWY
SEAWORLD 3/4 MILE
0 10 50
Feet
514
515
600
601
602
603
310
311
312
313
114
115
116
117
210
211
212
213
1.1%
1.4%
RAMP C_DCP STA 600+19.94
= EBDCP STA 211+15.56, 3.80'LT
EL = 155.54± (EXIST PAVT)
9.9FT @ -1.1%
RAMP C_DCP STA 600+10.00
= EBDCP STA 211+19.89, 5.15'RT
EL = 155.65'± (EXIST PAVT)
6' CHAIN LINK FENCE
6' CLF
4' BWF
WATER EDGE
UNDERGROUND ELECTRIC VAULT
TAKE-OFF GRADE SKETCH
RAMP IC_DCP PROFILE

Ramp Terminal - Detail

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: KAP Date: 8/22/2019
Checked By: MSP Date: 8/22/2019

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	664+19.28	-3.00%	112.00	17.00	-3.50%	111.40	-3.50%	15.00	110.88	IC_DCP	619+37.19
BL400	664+32.08	-3.00%	111.87	16.12	-3.50%	111.30	-3.50%	15.00	110.78	IC_DCP	619+50.00
BL400	664+82.06	-3.00%	111.28	12.89	-3.50%	110.83	-3.50%	15.00	110.31	IC_DCP	620+00.00
BL400	665+32.07	-3.00%	110.87	9.95	-3.50%	110.52	-3.50%	15.00	110.00	IC_DCP	620+50.00
BL400	665+82.09	-3.00%	110.51	7.32	-3.50%	110.26	-3.50%	15.00	109.74	IC_DCP	621+00.00
BL400	666+32.12	-3.00%	110.26	4.98	-3.50%	110.09	-3.50%	15.00	109.57	IC_DCP	621+50.00
BL400	666+82.17	-3.00%	109.93	2.94	-3.50%	109.82	-3.50%	15.00	109.30	IC_DCP	622+00.00
BL400	667+32.23	-3.00%	109.90	1.20	-3.50%	109.85	-3.50%	15.00	109.33	IC_DCP	622+50.00
BL400	667+73.37	-3.00%	109.93	0.00	-3.50%	109.93	-3.50%	15.00	109.41	IC_DCP	622+91.08
BL400	667+82.31	-3.00%	109.93	0.00	-3.50%	109.93	-3.50%	14.77	109.41	IC_DCP	623+00.00
BL400	668+32.40	-3.00%	109.94	0.00	-3.50%	109.94	-3.50%	13.63	109.47	IC_DCP	623+50.00
BL400	668+82.49	-3.00%	110.01	0.00	-3.50%	110.01	-3.50%	12.79	109.56	IC_DCP	624+00.00
BL400	669+32.57	-3.00%	110.01	0.00	-3.50%	110.01	-3.50%	12.25	109.58	IC_DCP	624+50.00
BL400	669+82.64	-3.00%	110.03	0.00	-3.50%	110.03	-3.50%	12.01	109.61	IC_DCP	625+00.00
BL400	669+97.38	-3.00%	110.01	0.00	-3.50%	110.01	-3.50%	12.00	109.59	IC_DCP	625+14.72

* 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 IC_DCP Entrance terminal with existing EBI-4**

AECOM Project No: 60480256
Computed By: KAP Date: 8/22/2019
Checked By: MSP Date: 8/22/2019

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	664+19.28	-3.00%	112.00	RTICDCP11	17.00	IC_DCP	619+37.19	-3.50%	-15.00	15.00
BL400	664+32.08	-3.00%	111.87	RTICDCP12	16.12	IC_DCP	619+50.00	-3.50%	-15.00	15.00
BL400	664+82.06	-3.00%	111.28	RTICDCP13	12.89	IC_DCP	620+00.00	-3.50%	-15.00	15.00
BL400	665+32.07	-3.00%	110.87	RTICDCP14	9.95	IC_DCP	620+50.00	-3.50%	-15.00	15.00
BL400	665+82.09	-3.00%	110.51	RTICDCP15	7.32	IC_DCP	621+00.00	-3.50%	-15.00	15.00
BL400	666+32.12	-3.00%	110.26	RTICDCP16	4.98	IC_DCP	621+50.00	-3.50%	-15.00	15.00
BL400	666+82.17	-3.00%	109.93	RTICDCP17	2.94	IC_DCP	622+00.00	-3.50%	-15.00	15.00
BL400	667+32.23	-3.00%	109.90	RTICDCP18	1.20	IC_DCP	622+50.00	-3.50%	-15.00	15.00
BL400	667+73.37	-3.00%	109.93	RTICDCP09	0.00	IC_DCP	622+91.08	-3.50%	-15.00	15.00
BL400	667+82.31	-3.00%	109.93	RTICDCP10	0.00	IC_DCP	623+00.00	-3.50%	-14.77	14.77
BL400	668+32.40	-3.00%	109.94	RTICDCP20	0.00	IC_DCP	623+50.00	-3.50%	-13.63	13.63
BL400	668+82.49	-3.00%	110.01	RTICDCP21	0.00	IC_DCP	624+00.00	-3.50%	-12.79	12.79
BL400	669+32.57	-3.00%	110.01	RTICDCP22	0.00	IC_DCP	624+50.00	-3.50%	-12.25	12.25
BL400	669+82.64	-3.00%	110.03	RTICDCP23	0.00	IC_DCP	625+00.00	-3.50%	-12.01	12.01
BL400	669+97.38	-3.00%	110.01	RTICDCP24	0.00	IC_DCP	625+14.72	-3.50%	-12.00	12.00

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

Ramp Terminal - Graph Input

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

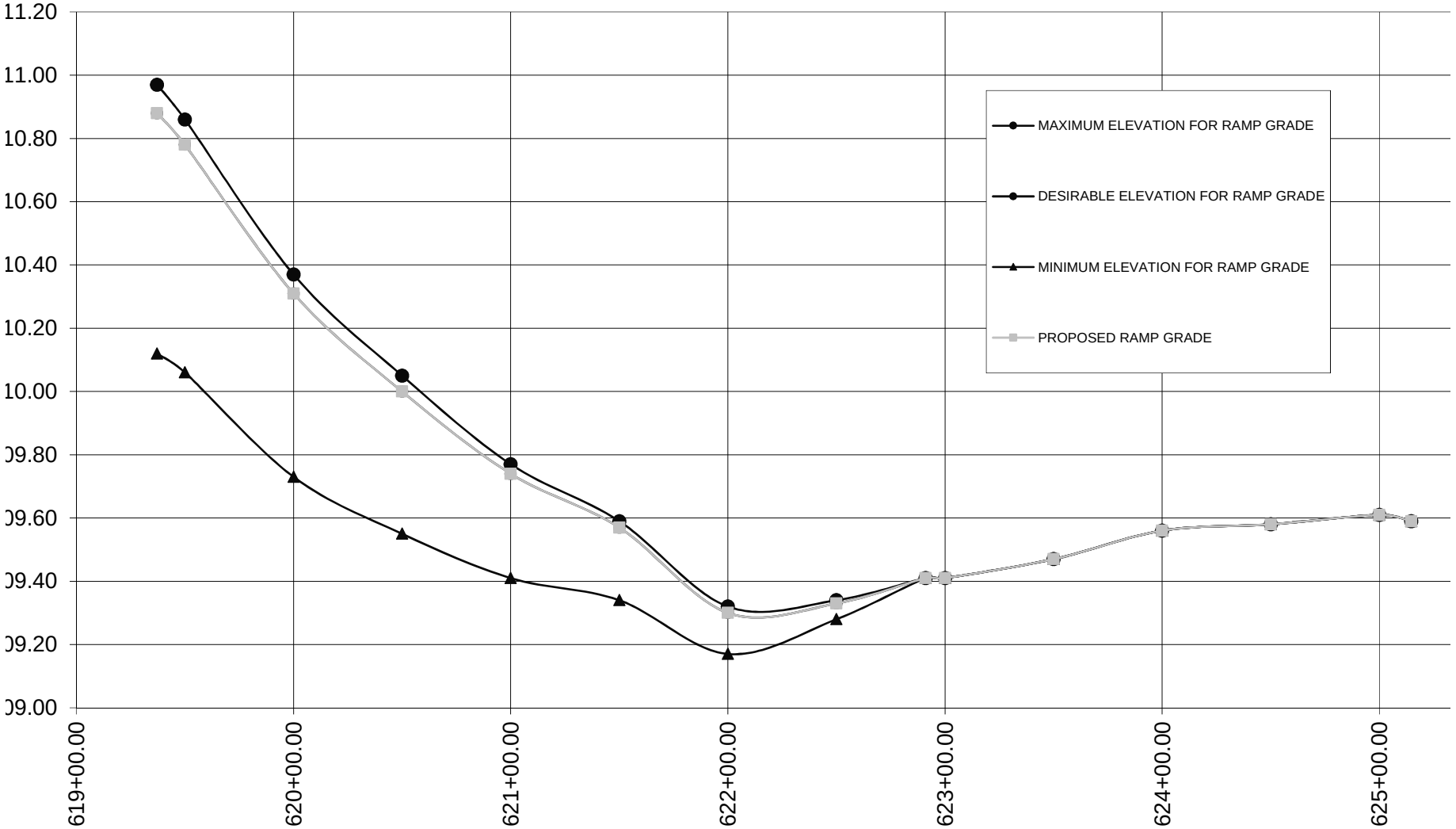
AECOM Project No: 60480256
Computed By: KAP Date: 8/22/2019
Checked By: MSP Date: 8/22/2019

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%	-8.00%	4.50%	110.64	110.12	0.00%	-3.50%	0.50%	111.40	110.88	0.50%	-3.00%	0.00%	111.49	110.97
5.00%	-8.00%	4.50%	110.58	110.06	0.00%	-3.50%	0.50%	111.30	110.78	0.50%	-3.00%	0.00%	111.38	110.86
5.00%	-8.00%	4.50%	110.25	109.73	0.00%	-3.50%	0.50%	110.83	110.31	0.50%	-3.00%	0.00%	110.89	110.37
5.00%	-8.00%	4.50%	110.07	109.55	0.00%	-3.50%	0.50%	110.52	110.00	0.50%	-3.00%	0.00%	110.57	110.05
5.00%	-8.00%	4.50%	109.93	109.41	0.00%	-3.50%	0.50%	110.26	109.74	0.50%	-3.00%	0.00%	110.29	109.77
5.00%	-8.00%	4.50%	109.86	109.34	0.00%	-3.50%	0.50%	110.09	109.57	0.50%	-3.00%	0.00%	110.11	109.59
5.00%	-8.00%	4.50%	109.69	109.17	0.00%	-3.50%	0.50%	109.82	109.30	0.50%	-3.00%	0.00%	109.84	109.32
5.00%	-8.00%	4.50%	109.80	109.28	0.00%	-3.50%	0.50%	109.85	109.33	0.50%	-3.00%	0.00%	109.86	109.34
5.00%	N/A	0.50%	109.93	109.41	0.00%	N/A	0.50%	109.93	109.41	0.50%	N/A	0.50%	109.93	109.41
5.00%	N/A	0.50%	109.93	109.41	0.00%	N/A	0.50%	109.93	109.41	0.50%	N/A	0.50%	109.93	109.41
5.00%	N/A	0.50%	109.94	109.47	0.00%	N/A	0.50%	109.94	109.47	0.50%	N/A	0.50%	109.94	109.47
5.00%	N/A	0.50%	110.01	109.56	0.00%	N/A	0.50%	110.01	109.56	0.50%	N/A	0.50%	110.01	109.56
5.00%	N/A	0.50%	110.01	109.58	0.00%	N/A	0.50%	110.01	109.58	0.50%	N/A	0.50%	110.01	109.58
5.00%	N/A	0.50%	110.03	109.61	0.00%	N/A	0.50%	110.03	109.61	0.50%	N/A	0.50%	110.03	109.61
5.00%	N/A	0.50%	110.01	109.59	0.00%	N/A	0.50%	110.01	109.59	0.50%	N/A	0.50%	110.01	109.59

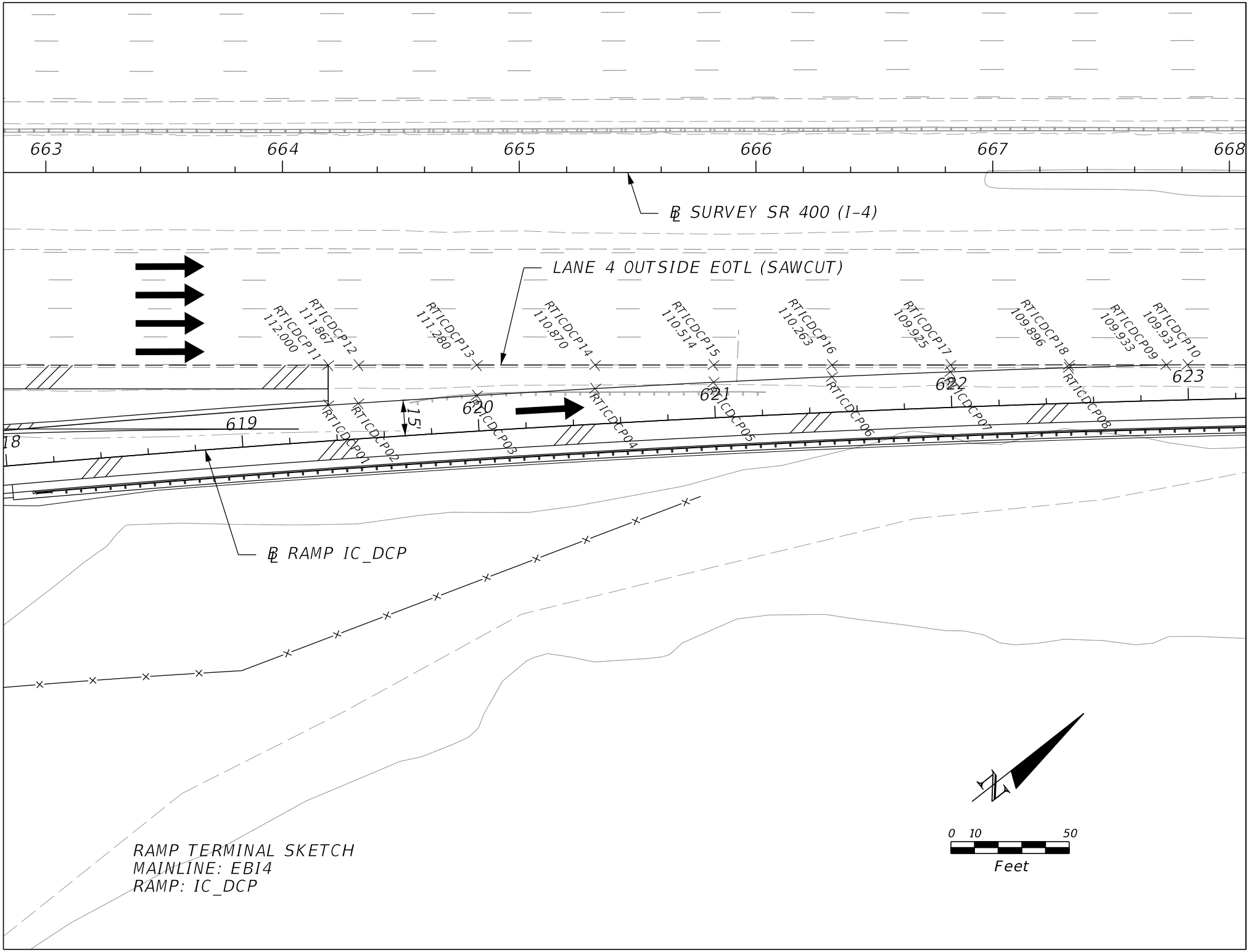
AECOM

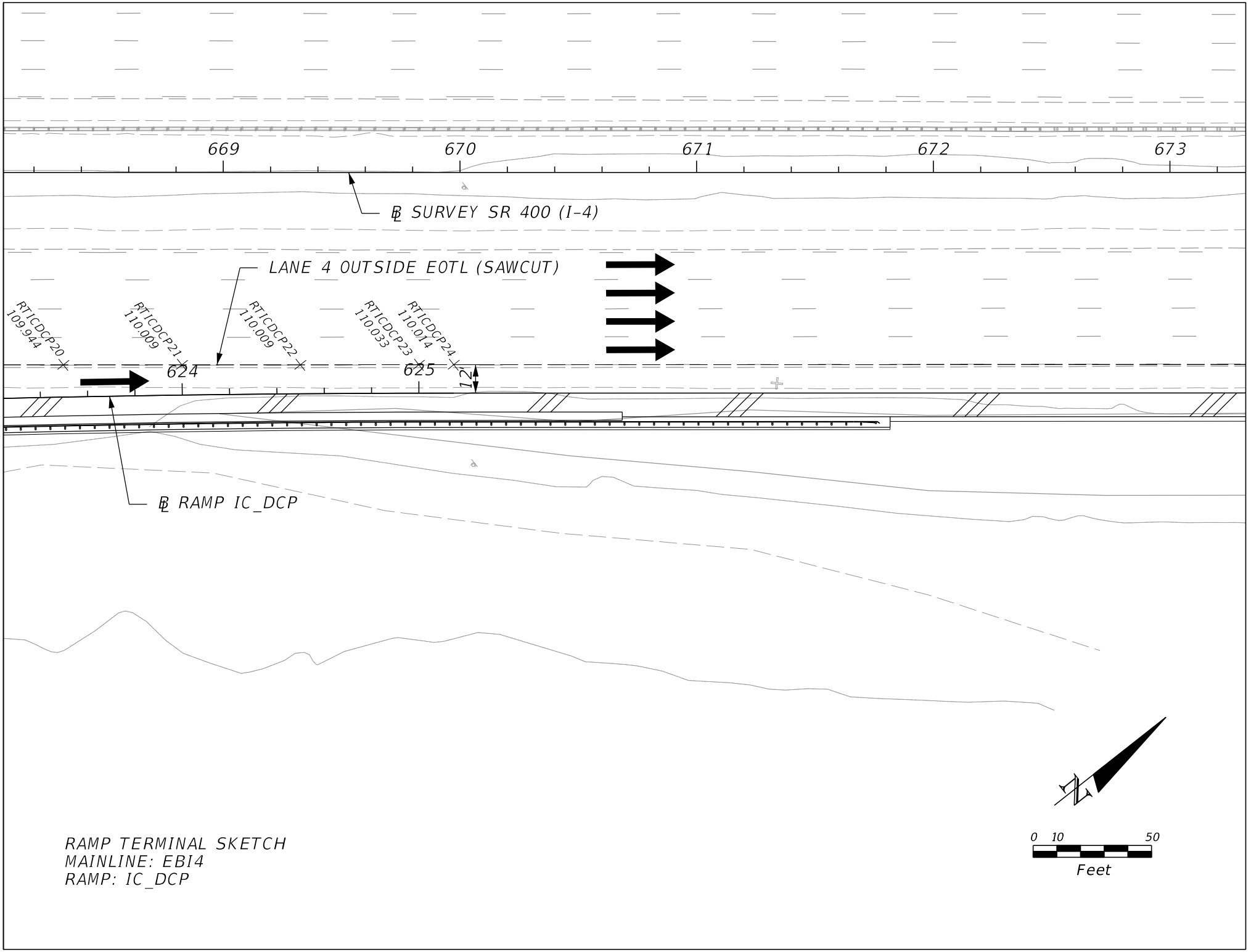
RAMP IC_DCP @ GEBI4

SHEET 4 OF 4



pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_IC_DCP_EBI4.xls


663
664
665
666
667
668
℄ SURVEY SR 400 (I-4)
LANE 4 OUTSIDE EOTL (SAWCUT)
RTICDCP11 112.000
RTICDCP12 111.867
RTICDCP13 111.280
RTICDCP14 110.870
RTICDCP15 110.514
RTICDCP16 110.263
RTICDCP17 109.925
RTICDCP18 109.896
RTICDCP09 109.933
RTICDCP10 109.931
618
619
620
621
622
623
15'
RTICDCP01
RTICDCP02
RTICDCP03
RTICDCP04
RTICDCP05
RTICDCP06
RTICDCP07
RTICDCP08
℄ RAMP IC_DCP
RAMP TERMINAL SKETCH
MAINLINE: EBI4
RAMP: IC_DCP
0 10 50
Feet



RAMP TERMINAL SKETCH
MAINLINE: EBI4
RAMP: IC_DCP

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject: [None]
Job No. DCP Operator: KP
Date: Thursday August 22, 2019 4:28 pm

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

* 1 PRI POI RTICDCP11-RTICDCP18 RTICDCP09-RTICDCP10 RTICDCP20-RTICDCP24

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
RTICDCP10	1,478,945.7132	500,925.5030	0+00.00	109.9309
RTICDCP20	1,478,984.8715	500,956.7508	0+00.00	109.9443
RTICDCP21	1,479,024.0205	500,987.9913	0+00.00	110.0089
RTICDCP22	1,479,063.1631	501,019.2266	0+00.00	110.0088
RTICDCP23	1,479,102.3020	501,050.4590	0+00.00	110.0332
RTICDCP24	1,479,113.8231	501,059.6526	0+00.00	110.0136

* 2 $ PAVEMENT AND GORE WIDTH CALCULATIONS $

* 3 INV RTICDCP11 RTICDCP01

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

* 4 INV RTICDCP12 RTICDCP02

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

* 5 INV RTICDCP13 RTICDCP03

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

* 6 INV RTICDCP14 RTICDCP04

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

* 7 INV RTICDCP15 RTICDCP05

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

```
*        8   INV RTICDCP16   RTICDCP06

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

*        9   INV RTICDCP17   RTICDCP07

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

*       10   INV RTICDCP18   RTICDCP08

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

*       11   $ POINTS ALONG RAMP INSIDE EOT $


*       12   LAY OFF CHA IC_DCP RTICDCP01-RTICDCP10 RTICDCP20-RTICDCP24
```

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	
RTICDCP10	1,478,945.7132	500,925.5030	623+00.00	-14.7655	
RTICDCP20	1,478,984.8715	500,956.7508	623+50.00	-13.6273	
RTICDCP21	1,479,024.0205	500,987.9913	624+00.00	-12.7892	
RTICDCP22	1,479,063.1631	501,019.2266	624+50.00	-12.2512	
RTICDCP23	1,479,102.3020	501,050.4590	625+00.00	-12.0130	
RTICDCP24	1,479,113.8231	501,059.6526	625+14.72	-12.0000	

```
*       13   END
```

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

D_DCPORA.OSF

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
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 = N/C
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

MIN TANGENT REQD FOR SE TRAILS = 0.8(150') = 120'

Curve Data

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 = 0.03
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

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

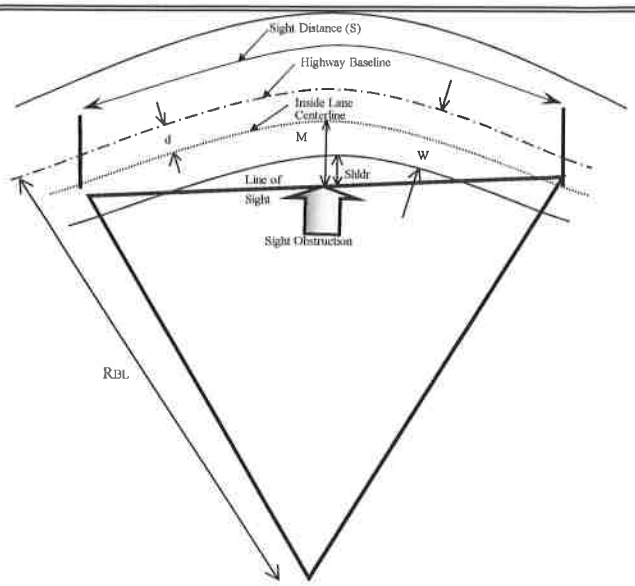
==========

Ending chain D_DCP description

AECOM

Job:	SR 400 (I-4) 242484-8-52-01 (Orange County)	AECOM Project No:	60480256	Page	___ of ___
Description:	Stopping Sight Distance Calculations for Ramp D_DCP	Computed By:	SF	Sheet	1 of 2
		Checked By:	GLF	Date:	7/22/2016
				Date:	8/30/2016

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)

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*)	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:

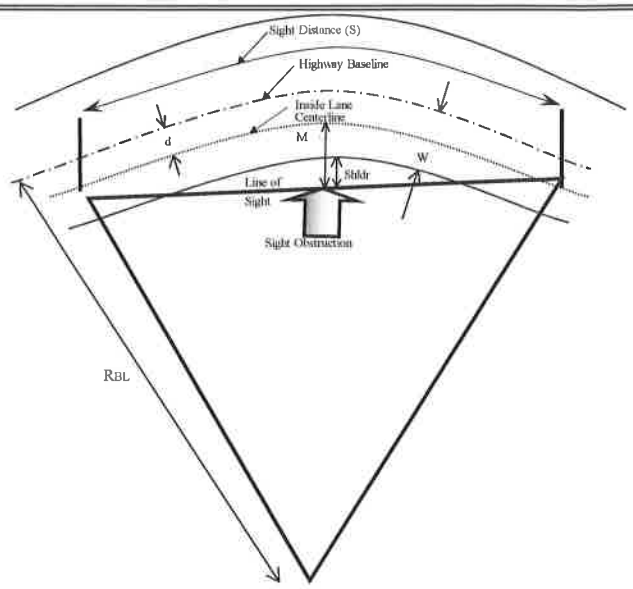
** PROPOSED INSIDE SHOULDER WIDTH

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_D_DCP.xls

AECOM

Job:	SR 400 (I-4) 242484-8-52-01 (Orange County)	AECOM Project No:	60480256	Page ___ of ___	
Description:	Stopping Sight Distance Calculations for Ramp D_DCP	Computed By:	SF	Sheet 2 of 2	
		Checked By:	GLF	Date:	7/22/2016
				Date:	8/30/2016

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)

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*)	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	425.00 '	*FDOT PPM, TABLE 2.7.1, January 2016.*
AASHTO REQUIRED SSD	425.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	612.46 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

* WIDTH VARIES FROM 12 FT TO 15 FT. USED 12 FT TO DEMONSTRATE CURVE MEETS LESSER "ACTUAL SSD."

** PROPOSED OUTSIDE SHOULDER WIDTH

AECOM

Job: **Interim Daryl Carter Pkwy 441113-1-52-01**
Description: **Super Elevation Transition Calculations for Ramp D_DCP (IWBCD2 to DCP)**

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

Date: 7/22/16
Date: 8/30/16

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.	D_DCP-1 (RT)	PC STATION	702+94.00
DEGREE OF CURVE	0° 34' 23"	PT STATION	707+11.41
RADIUS OF CURVE	10,000.00 '		
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A *
e=	NC	BEGIN FULL SUPER	N/A *
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A *
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A *

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
				0.00		
4-LANE RAMP		24	200	0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
				0.00		
				0.00		
2-LANE RAMP		12	200	0.00		
TOTAL LENGTH OUT OF CURVE				**0.00**		

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

* REMAINS AT NC THROUGH ENTIRE CURVE.

NOTE: CHAIN AND PGL ARE IN CENTER OF 4-LANE AND 2-LANE RAMP SECTIONS.

AECOM

Job: **Interim Daryl Carter Pkwy 441113-1-52-01**
Description: **Super Elevation Transition Calculations for Ramp D_DCP (IWBCD2 to DCP)**

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

Date: 7/22/16
Date: 8/30/16

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.	D_DCP-2 (LT)	PC STATION	708+31.41	
DEGREE OF CURVE	1° 28' 9"	PT STATION	716+26.67	
RADIUS OF CURVE	3,900.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	707+11.41	
e=	0.030	BEGIN FULL SUPER	708+61.41	
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A	*

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

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.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Friday August 24, 2018 10:49 am

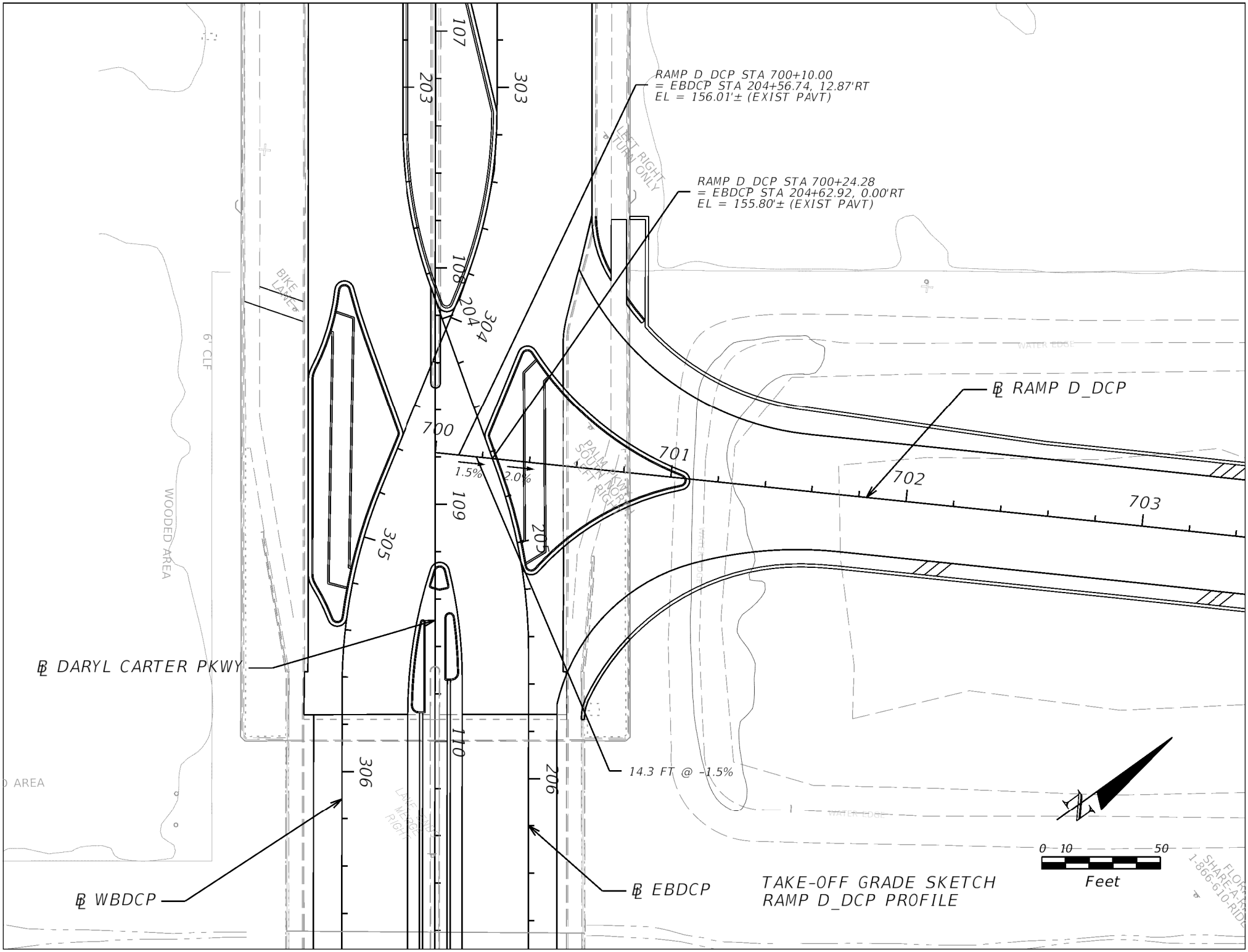
SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_D_DCP'

* 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				
VPI	2	700+48.00	155.3245	-2.0000			
VPI	3	701+07.98	153.7291	-2.6598			
VPC		710+10.00	131.4240	-2.4728	K = 97.7		
VPI	4	711+15.00	128.8276		210.0000	105.0000	105.0000
VPT		712+20.00	128.4883	-0.3232			
VPI	5	712+78.25	128.3000	-0.3232			
VPI	6	713+00.00	128.2300	-0.3218			
VPI	7	713+50.00	128.0900	-0.2800			
VPI	8	714+00.00	127.9200	-0.3400			
VPI	9	714+50.00	127.7500	-0.3400			
VPI	10	715+00.00	127.5500	-0.4000			
VPI	11	715+17.46	127.4800	-0.4009			
VPI	12	715+50.00	127.3500	-0.3995			
VPI	13	716+00.00	127.1400	-0.4200			
VPI	14	716+50.00	126.9000	-0.4800			
VPI	15	717+00.00	126.6600	-0.4800			
VPI	16	717+26.89	126.5200	-0.5206			

Ending profile D_DCP description


RAMP D_DCP STA 700+10.00
= EBDCP STA 204+56.74, 12.87'RT
EL = 156.01'± (EXIST PAVT)
RAMP D_DCP STA 700+24.28
= EBDCP STA 204+62.92, 0.00'RT
EL = 155.80'± (EXIST PAVT)
℄ RAMP D_DCP
℄ DARYL CARTER PKWY
℄ WBDCP
℄ EBDCP
14.3 FT @ -1.5%
1.5%
2.0%
700
701
702
703
107
203
303
108
204
304
109
205
305
110
206
306
BIKE LANE
6' CLF
WOODED AREA
LEFT RIGHT TURN ONLY
WATER EDGE
PALM COAST NORTH LEFT RIGHT
LANE ENDS MERGE RIGHT
0 10 50
Feet
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 Date: 10/23/2017
Checked By: MSP 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 Date: 10/23/2017
Checked By: MSP Date: 10/25/2017

Baseline	Mainline Station	*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	-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	-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	-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	-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	-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	-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	-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	-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	-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	-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	-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	-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

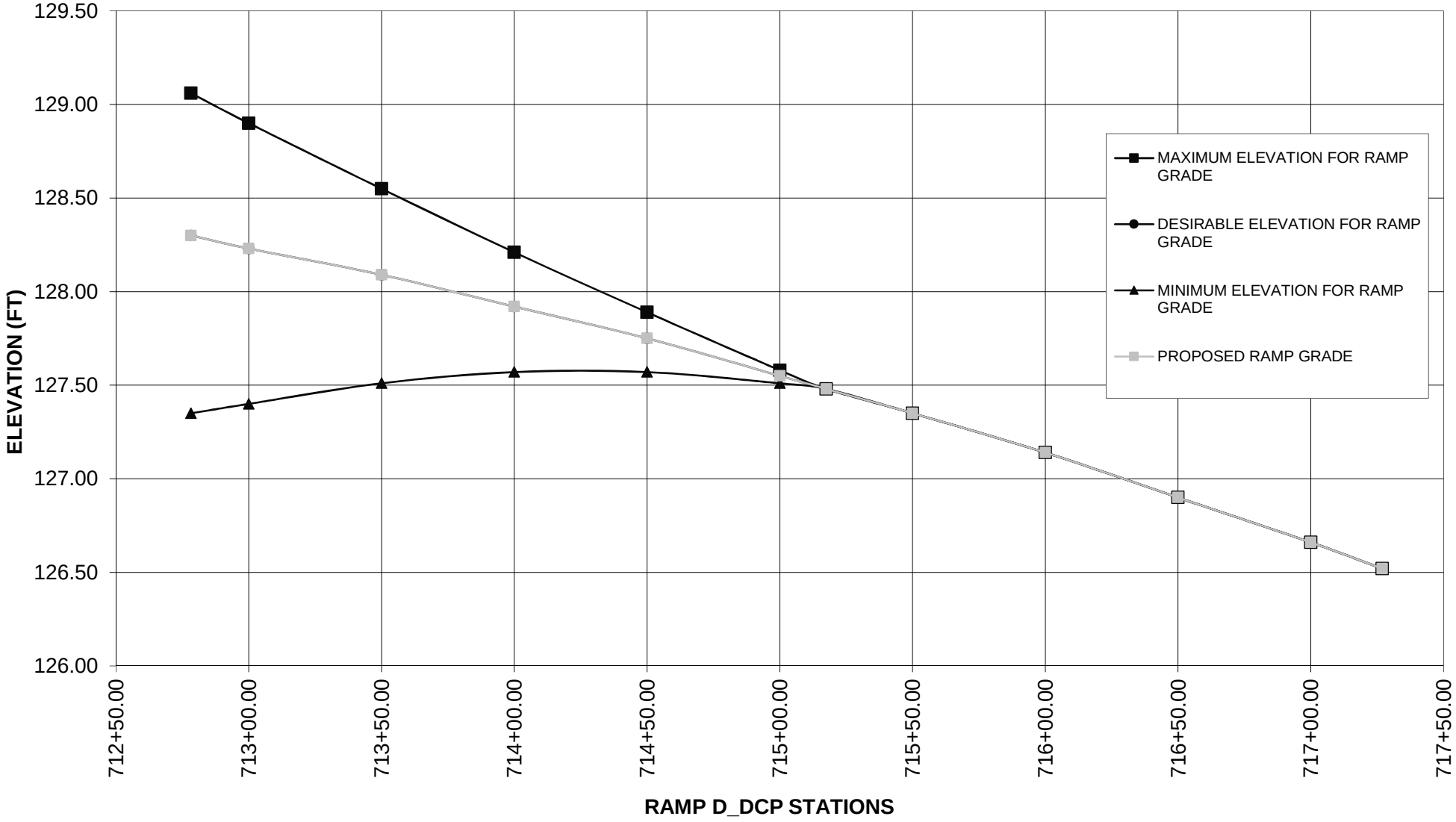
Job: INTERIM DARYL CARTER PKWY 441113-1-52-01
Description: **Ramp D_DCP and IWBCD2**

AECOM Project No: 60480256
Computed By: BM Date: 10/23/2017
Checked By: MSP 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

AECOM

RAMP D_DCP @ IWBCD2

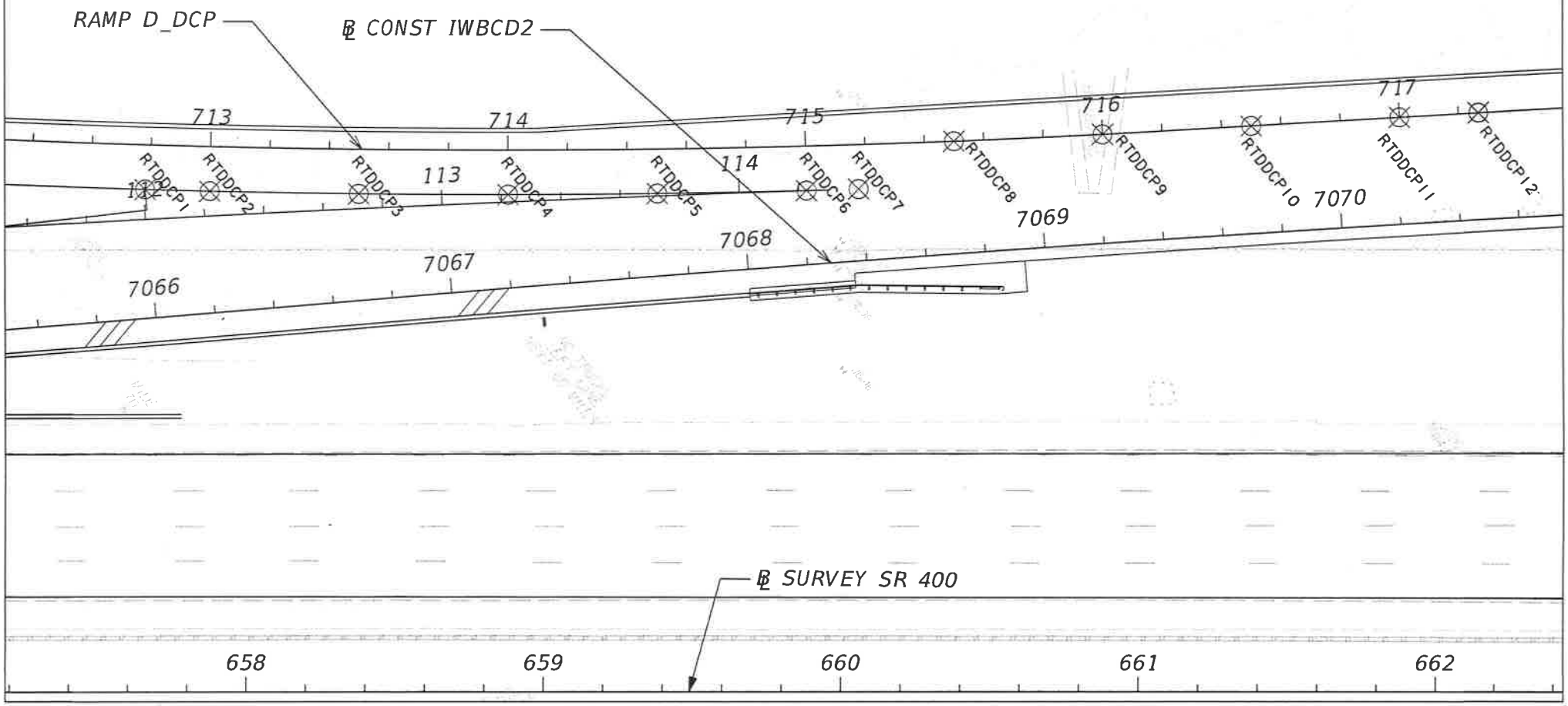


pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_D_DCP_IWBCD2.xls

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

RAMP TERMINAL SKETCH
MAINLINE: IWBCD2
RAMP: D_DCP

0 10 50
Feet



RT_D_DCP_IWBCD2DCP.OBM

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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 70-67+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

HA_IA_CFPDCP.OMP

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved. DES. BY: JW 8/21/17

Project: DCP Interim
Subject:
Job No. DCP Operator: MP CHECKED BY: MSP 8/23/17
Date: Tuesday August 22, 2017 6:12 pm

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

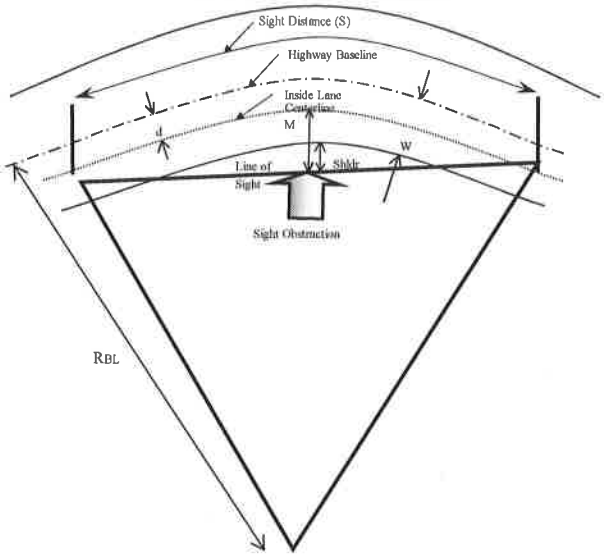
Point IACFP2 N 1,481,444.8039 E 502,478.4942 Sta 310+36.97

Ending chain IA_CFP description

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Page	___ of ___
Description:	**Stopping Sight Distance Calculations for**	Computed By:	BM	Sheet	1 of 2
	Ramp IA_CFP (SB CFP TO WBI4)	Checked By:	AS	Date:	8/10/2017
				Date:	8/24/2017

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

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_IA_CFP.xls

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ____ of ____	
Description:	**Super Elevation Transition Calculations for**	Computed By:	BM	Sheet 1 of 1	
	Ramp IA_CFP (EB CFP TO IWBCD2)	Checked By:	AS	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	WB			
CURVE NO.	IA_CFP_1 (LT)	PC STATION	300+00.00	
DEGREE OF CURVE	0° 41' 10"	PT STATION	304+94.02	
RADIUS OF CURVE	8,350.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A	*
e=	NC	BEGIN FULL SUPER	N/A	*
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A	*

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

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 STATIONING.

* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.

AECOM

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

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
DEGREE OF CURVE
RADIUS OF CURVE
DESIGN SPEED
e=
SE SPLIT INTO CURVE (Tangent/Curve)
SE SPLIT OUT OF CURVE (Tangent/Curve)

PC STATION N/A
PT STATION N/A
BEGIN TRANSITION
BEGIN FULL SUPER
END FULL SUPER
END TRANSITION

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

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.

VA_IA_CFPDCP.OMP

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

Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Thursday September 14, 2017 8:59 am

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

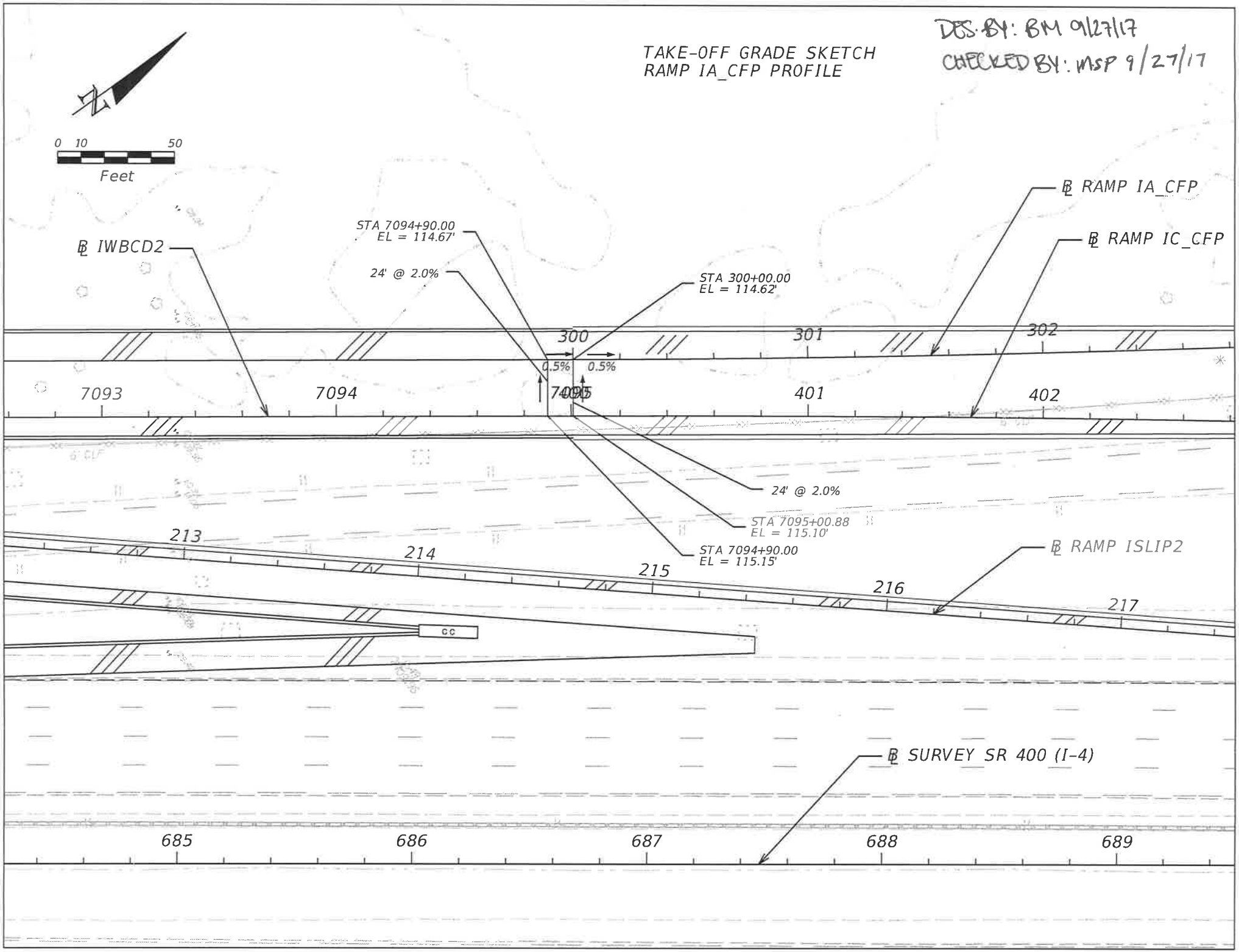
SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_IA_CFP'

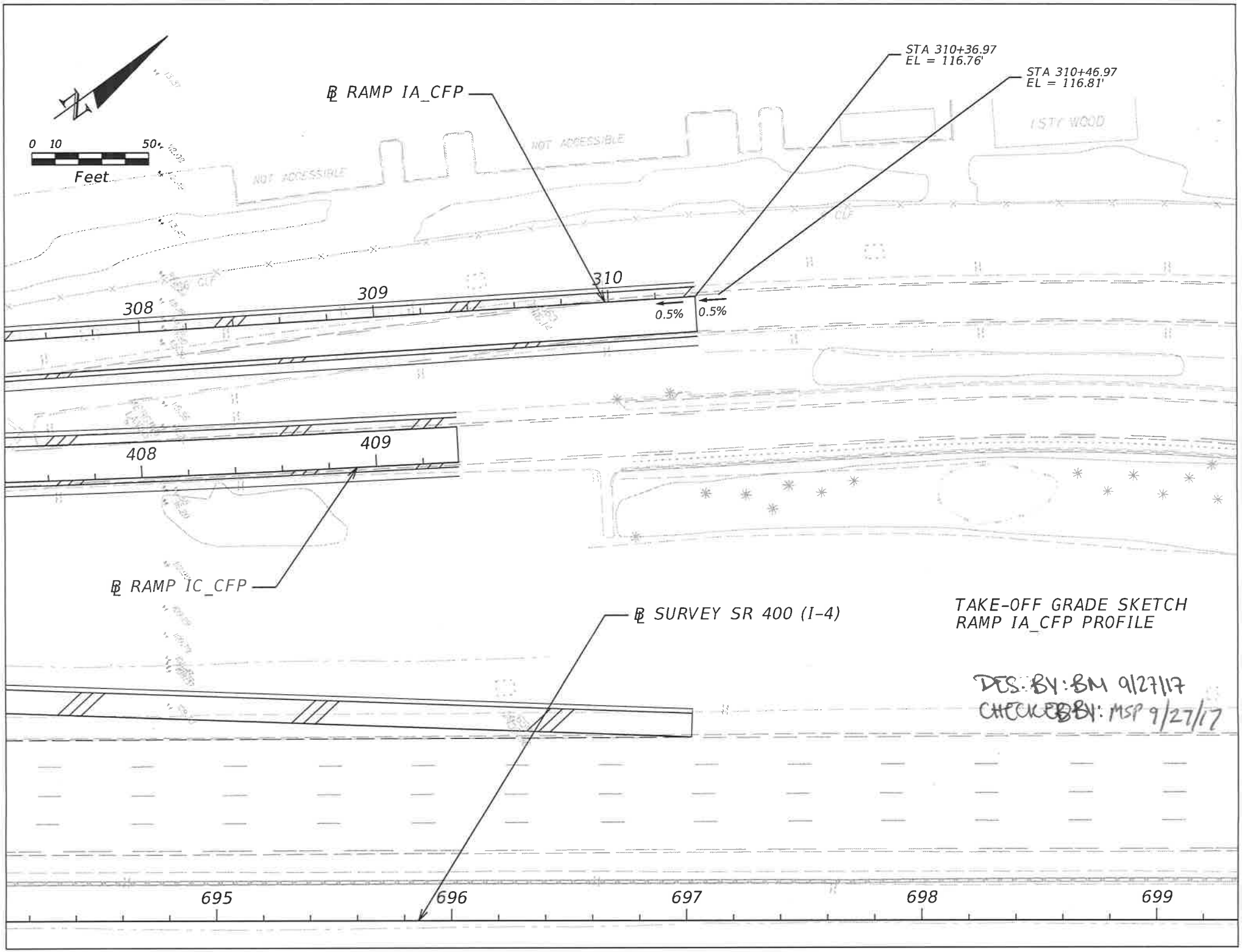
* 1 pri pro ia_cfp

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
0 10 50
Feet
℄ IWBCD2
STA 7094+90.00
EL = 114.67'
24' @ 2.0%
STA 300+00.00
EL = 114.62'
℄ RAMP IA_CFP
℄ RAMP IC_CFP
300
301
302
0.5%
0.5%
7093
7094
7095
401
402
24' @ 2.0%
STA 7095+00.88
EL = 115.10'
STA 7094+90.00
EL = 115.15'
213
214
215
216
217
℄ RAMP ISLIP2
CC
℄ SURVEY SR 400 (I-4)
685
686
687
688
689



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

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

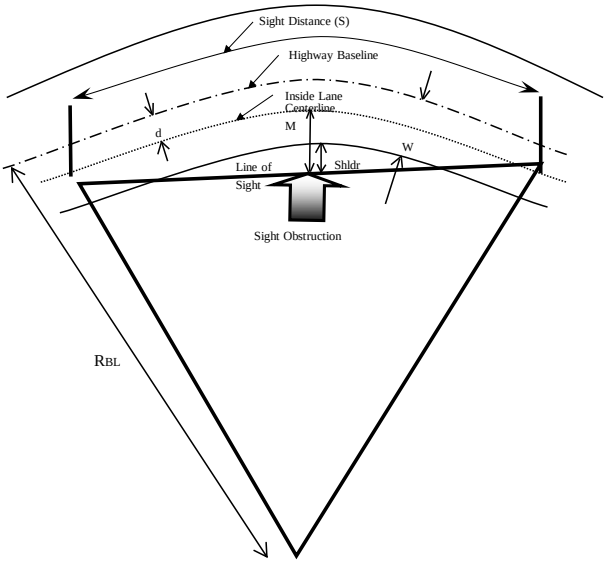
==========

Ending chain IB_CFP description

AECOM

				Page	of
Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Sheet 1	of 2
Description:	**Stopping Sight Distance Calculations for Ramp IB_CFP (EBI4 TO CFP)**	Computed By:	BM	Date:	8/10/2017
		Checked By:	AS	Date:	8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	IB_CFP_1
RADIUS OF CURVE (R_{BL})	5,000.00 '
DIRECTION OF CURVE (LT or RT)	RT
DEGREE OF CURVE	1° 8' 45"
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	425.00 '	*FDOT PPM, TABLE 2.7.1, January 2016.*
AASHTO REQUIRED SSD	425.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	735.51 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

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 *(Rural or Urban)*	Rural			
(Rural=PPM Table 2.9.1 / Urban=PPM Table 2.9.2)				
TRAVEL DIRECTION	EB			
CURVE NO.	IB_CFP_1 (RT)	PC STATION	100+00.00	
DEGREE OF CURVE	1° 8' 45"	PT STATION	104+34.52	
RADIUS OF CURVE	5,000.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A	*
e=	0.024 EXIST**	BEGIN FULL SUPER	N/A	*
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A	*
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A	*

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

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

** MIN. REQD SUPERELEVATION. CURVE FALLS PARTIALLY WITHIN EXISITING RAMP TERMINAL AND WILL BE MILLED & RESURFACED AT EXISITING CROSS SLOPE WHICH EXCEEDS MIN. REQD SUPERELEVATION. SEE RAMP TERMINAL FOR EXISITING 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.

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

* NO TRANSITION REQUIRED, EXISTING CROSS SLOPE MEETS OR EXCEEDS SE REQUIREMENT.

AECOM

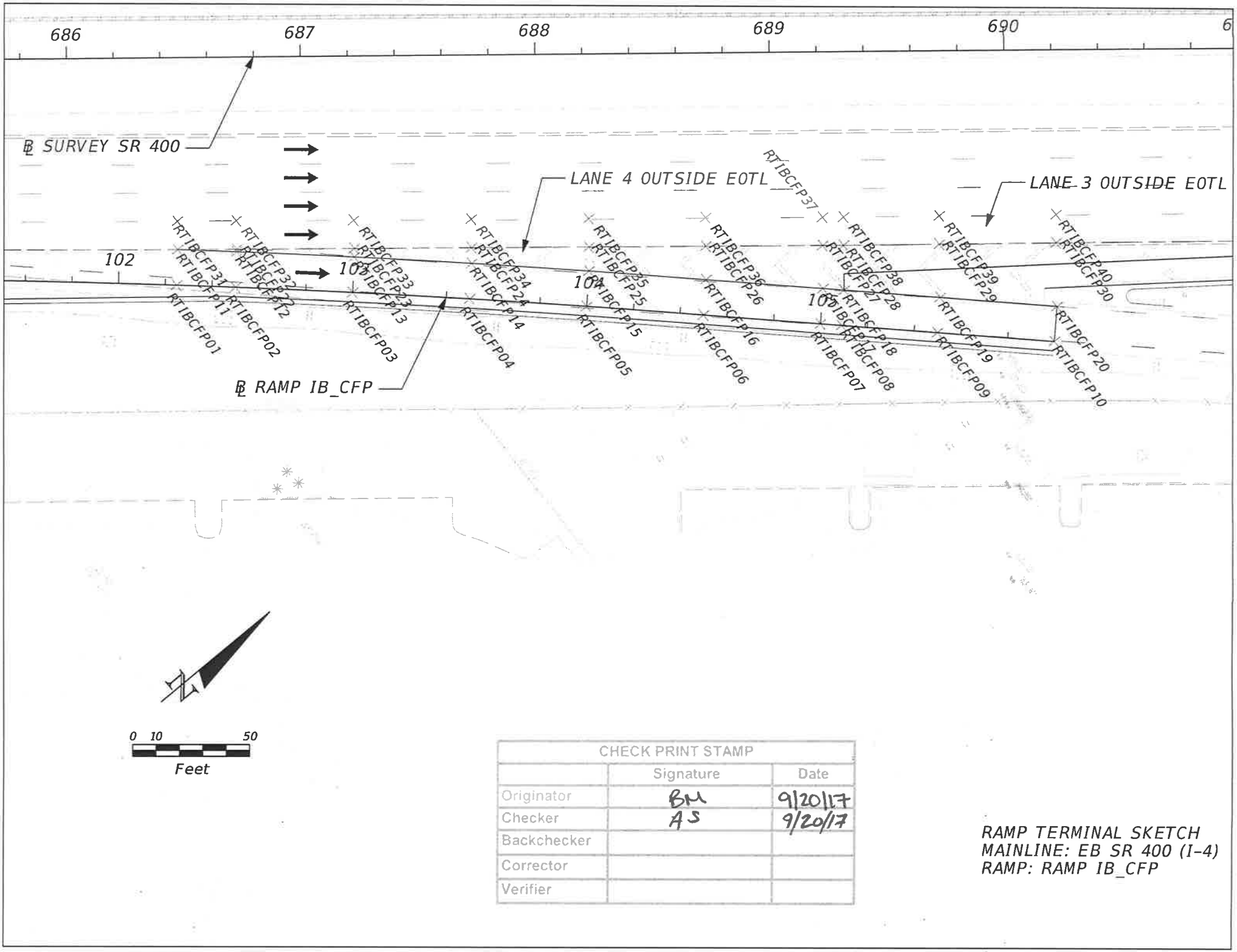
Ramp Terminal - Data

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 Date: 8/28/2017
Checked By: AS Date: 9/19/2017

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	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.
** See below for COGO point stations.



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 (I-4)
RAMP: RAMP IB_CFP

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 RTIB-CFP36 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 RTIB-CFP26 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	

RTIBCFP19	1,480,641.8695	502,310.0709	105+50.00	-15.0000
RTIBCFP20	1,480,678.1369	502,344.4899	106+00.00	-15.0000

* 7 $ RAMP IB_CFP INSIDE EXISTING ELEVATIONS $

* 8 PRINT POINT RTIBCFP11 RTIBCFP12 RTIBCFP13 RTIBCFP14 RTIBCFP15 RTIB-CFP16 RTIBCFP17 RTIBCFP18 RTIBCFP19 RTIBCFP20

Point	North	East	Station	Elevation
RTIBCFP11	1,480,402.5578	502,089.0354	0+00.00	110.2750
RTIBCFP12	1,480,421.5431	502,105.6812	0+00.00	110.1862
RTIBCFP13	1,480,459.0019	502,139.0255	0+00.00	109.9024
RTIBCFP14	1,480,496.1254	502,172.7427	0+00.00	109.6263
RTIBCFP15	1,480,532.9099	502,206.8294	0+00.00	109.3465
RTIBCFP16	1,480,569.3345	502,241.2328	0+00.00	109.1459
RTIBCFP17	1,480,605.6020	502,275.6519	0+00.00	109.0238
RTIBCFP18	1,480,612.1542	502,281.8702	0+00.00	108.9997
RTIBCFP19	1,480,641.8695	502,310.0709	0+00.00	108.8671
RTIBCFP20	1,480,678.1369	502,344.4899	0+00.00	108.6990

* 9 $ RAMP IB_CFP OUTSIDE EXISITING ELEVATIONS $

* 10 PRINT POINT RTIBCFP01 RTIBCFP02 RTIBCFP03 RTIBCFP04 RTIBCFP05 RTIB-CFP06 RTIBCFP07 RTIBCFP08 RTIBCFP09 RTIBCFP10

Point	North	East	Station	Elevation
RTIBCFP01	1,480,392.6973	502,100.3390	0+00.00	109.6645
RTIBCFP02	1,480,411.6259	502,116.9350	0+00.00	109.5700
RTIBCFP03	1,480,448.9726	502,150.1796	0+00.00	109.2362
RTIBCFP04	1,480,485.9851	502,183.7959	0+00.00	108.8853
RTIBCFP05	1,480,522.6595	502,217.7807	0+00.00	108.5612
RTIBCFP06	1,480,559.0088	502,252.1131	0+00.00	108.5756
RTIBCFP07	1,480,595.2763	502,286.5321	0+00.00	108.6088
RTIBCFP08	1,480,601.8285	502,292.7504	0+00.00	108.6178
RTIBCFP09	1,480,631.5438	502,320.9512	0+00.00	108.6828
RTIBCFP10	1,480,667.8112	502,355.3702	0+00.00	108.6709

* 11 $ GORE WIDTH CALCULATIONS $

* 12 INV RTIBCFP12 RTIBCFP22

Inverse RTIBCFP12 to RTIBCFP22 N 51° 12' 36.48" W Distance 1.0809

* 13 INV RTIBCFP13 RTIBCFP23

Inverse RTIBCFP13 to RTIBCFP23 N 51° 12' 36.49" W Distance 3.6044

* 14 INV RTIBCFP14 RTIBCFP24

Inverse RTIBCFP14 to RTIBCFP24 N 51° 12' 36.49" W Distance 6.6286

* 15 INV RTIBCFP15 RTIBCFP25

Inverse RTIBCFP15 to RTIBCFP25 N 51° 12' 36.49" W Distance 10.1532

* 16 INV RTIBCFP16 RTIBCFP26

Inverse RTIBCFP16 to RTIBCFP26 N 51° 12' 36.49" W Distance 14.1502

```
*       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
```

HA_IC_CFPDCP.OMP

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DES. BY: JW 8/21/17

CHECKED BY: MSP 8/22/17

Project: DCP Interim
Subject:
Job No. DCP Operator: MP
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

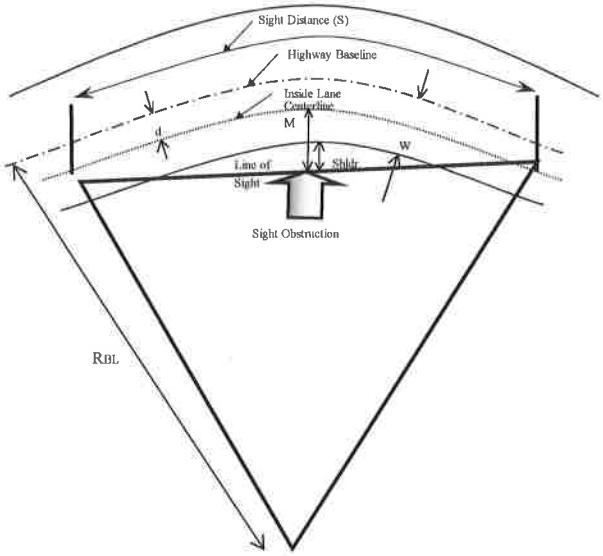
==========

Ending chain IC_CFP description

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Page ___ of ___ Sheet 1 of 2	
Description:	**Stopping Sight Distance Calculations for Ramp IC_CFP (NB CFP TO WBI4)**	Computed By:	BM	Date:	8/10/2017
		Checked By:	AS	Date:	8/24/2017

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)

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

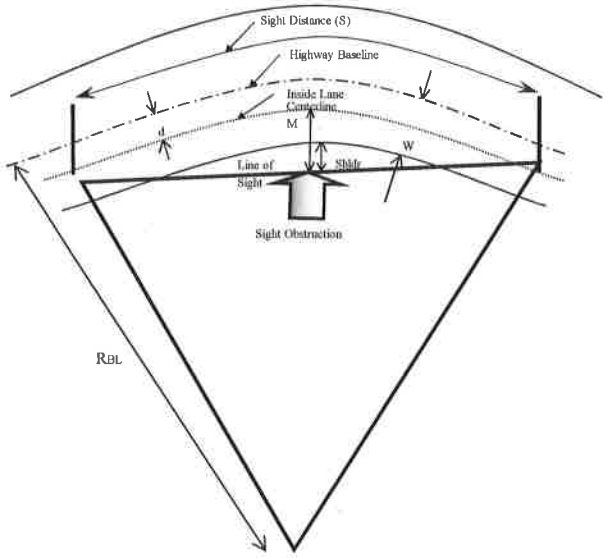
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:
* MAXIMUM DOWN HILL GARDE WITH RESPECT TO DIRECTION OF TRAVEL

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Ora**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Stopping Sight Distance Calculations for**	Computed By:	BM	Sheet 2 of 2	
	Ramp IC_CFP (NB CFP TO WBI4)	Checked By:	AS	Date: 8/10/2017	Date: 8/24/2017

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)

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*)	All Other Facilities
DESIGN SPEED	50 mph
CURVE NO.	IC_CFP_2
RADIUS OF CURVE (R_{BL})	6,171.00 '
DIRECTION OF CURVE (LT or RT)	LT
DEGREE OF CURVE	0° 55' 42"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)	-7.50 '
LANE WIDTH (*W*)	15 '
SHOULDER WIDTH (Shldr)	6 '
VERTICAL GRADE (%)	-0.600%
M DIMENSION	13.5 '

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	815.97 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\SSD\SSD_Calcs_IC_CFP.xls

AECOM

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

Date: 8/16/17
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	WB		
CURVE NO.	IC_CFP_1 (LT)	PC STATION	400+00.00
DEGREE OF CURVE	0° 22' 55"	PT STATION	404+18.81
RADIUS OF CURVE	15,000.00 '		
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A *
e=	NC	BEGIN FULL SUPER	N/A *
SE SPLIT INTO CURVE (Tangent/Curve)	80 20	END FULL SUPER	N/A *
SE SPLIT OUT OF CURVE (Tangent/Curve)	80 20	END TRANSITION	N/A *

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

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 STATIONING.

* NO TRANSITION REQUIRED, CROSS SLOPE MEETS NC REQUIREMENT.

AECOM

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

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
1-LANE RAMP				0.00		
				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
1-LANE RAMP				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				**100.00**		

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 RC REQUIREMENT.

VA_IC_CFPDCP.OMP

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

Project: DCP Interim
Subject:
Job No. DCP Operator: MP
Date: Wednesday September 13, 2017 6:52 pm

DES. BY: IW 8/11/17
CHECKED BY: MSP 9/15/17

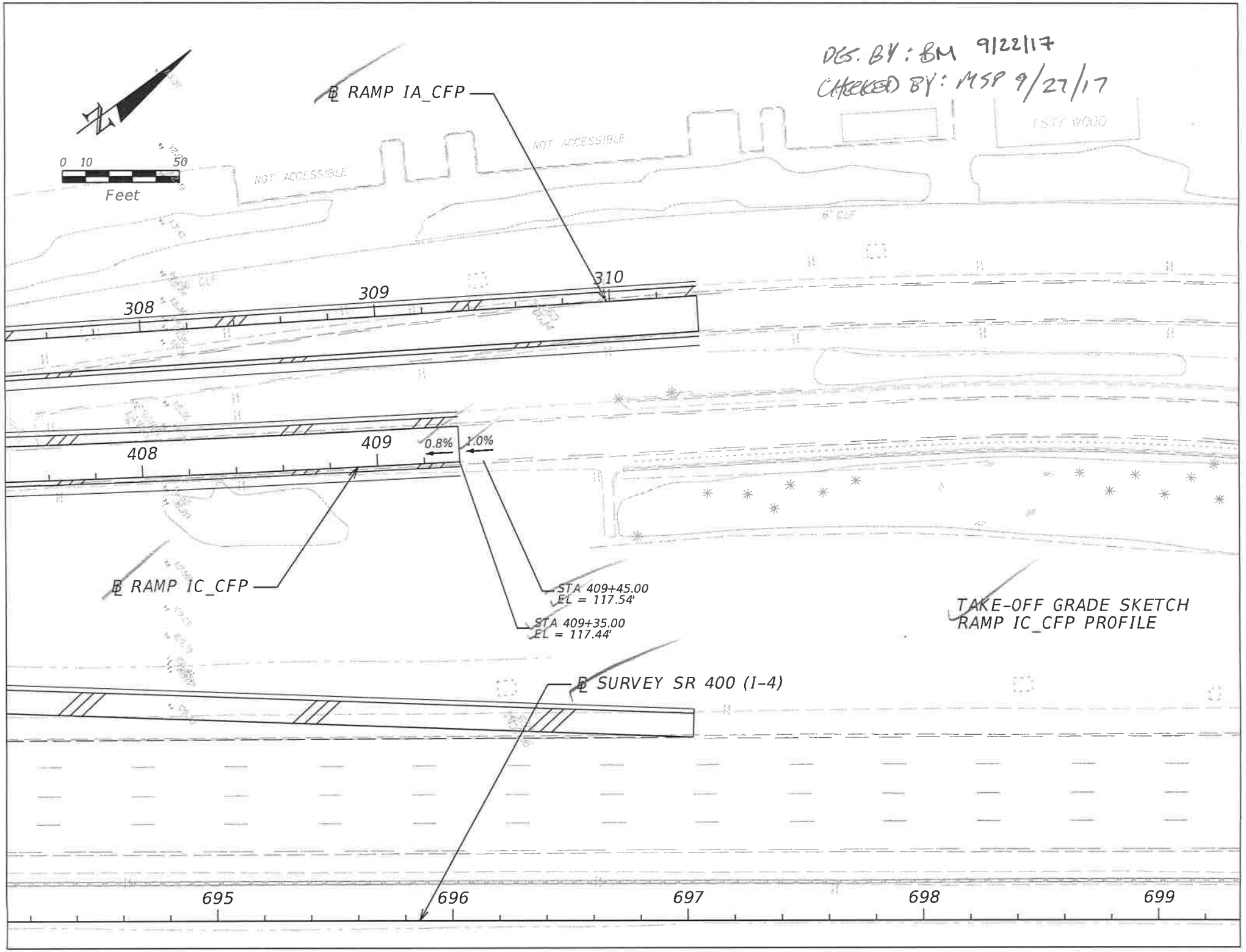
SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_IC_CFP'

* 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
NOT ACCESSIBLE
NOT ACCESSIBLE
1 STY WOOD
0 10 50
Feet
308
309
310
408
409
0.8%
1.0%
℄ RAMP IC_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)
695
696
697
698
699

Ramp Terminal - Detail

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 Date: 4/24/2018
Checked By: MSP 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

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 Date: 4/24/2018
Checked By: MSP 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

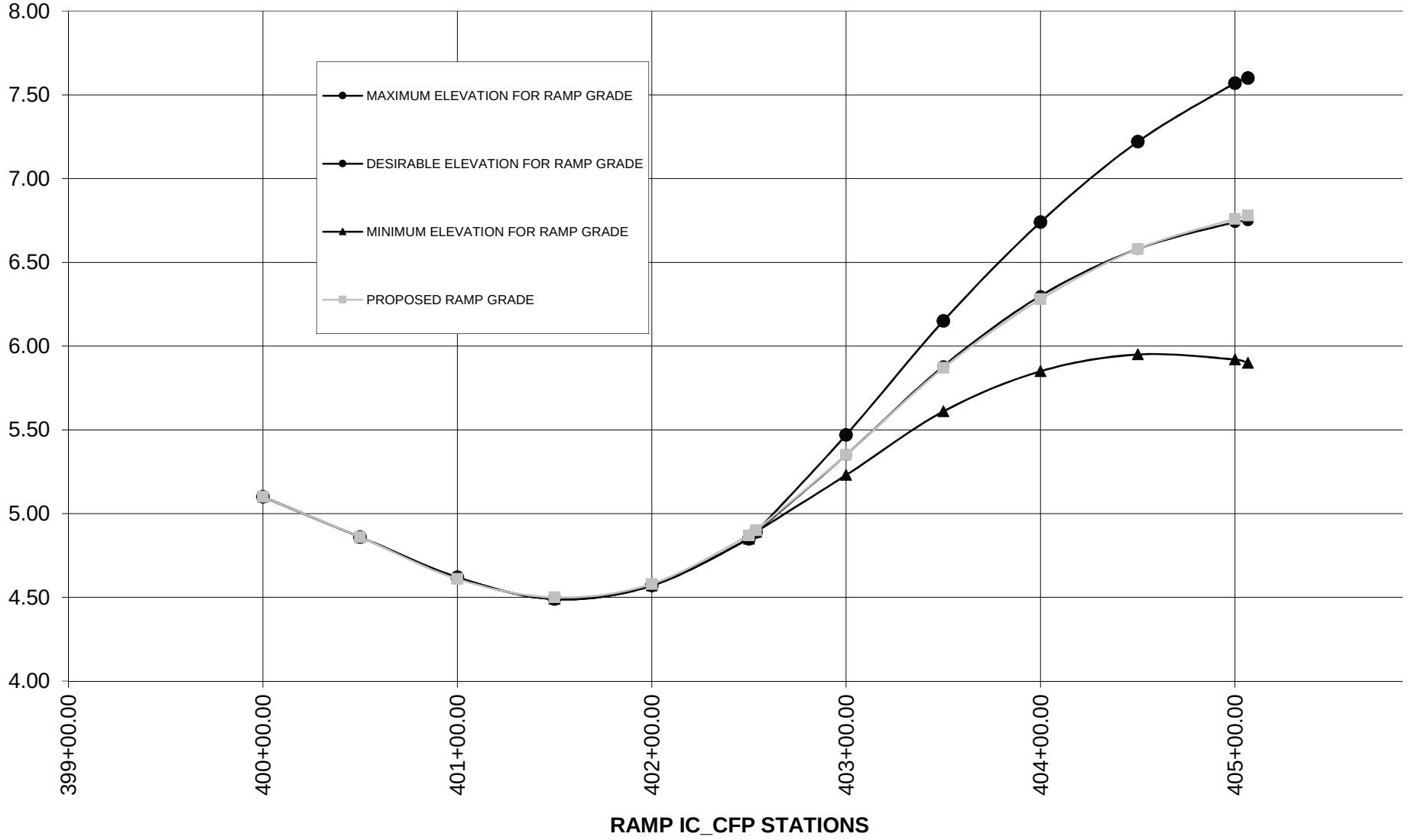
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)
Description: **Ramp IC_CFP and IA_CFP**

AECOM Project No: 60480256
Computed By: BM Date: 4/24/2018
Checked By: MSP 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

AECOM

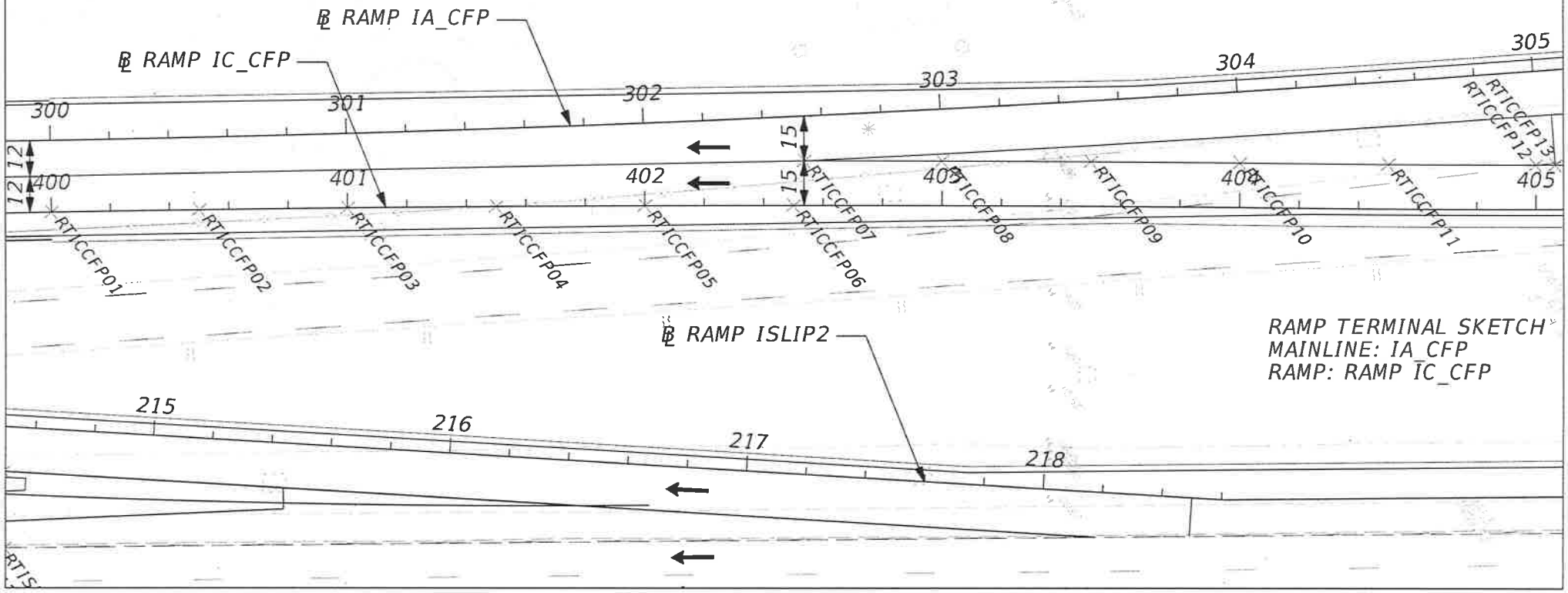
RAMP IC_CFP @ RAMP IA_CFP



pw:\\617479-PWINT.aecomonline.local:AECOM_DS01_NA\Documents\60480256-I4-BTU Orange County\400 Technical\430 Roadway\Design Calculations\Segment G\RT\Gore_Detail_IC_CFP_IA_CFP.xls

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

0 10 50
Feet



RAMP TERMINAL SKETCH
MAINLINE: IA_CFP
RAMP: RAMP IC_CFP

DES. BY: BM 8/31/17
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+99.35 302+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	

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject: [None]
Job No. DCP Operator: KP
Date: Wednesday July 24, 2019 11:26 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA_DIV01'

* 1 DES CHA DIV01

Chain DIV01 contains:
CUR DIV011 CUR DIV012 DIV02

Beginning chain DIV01 description

		Curve Data				
Curve DIV011						
P.I. Station		103+11.27	N	1,481,482.5855	E	502,748.4915
Delta	=	13° 39' 14.10" (LT)				
Degree	=	2° 12' 13.26"				
Tangent	=	311.2720				
Length	=	619.5951				
Radius	=	2,600.0000				
External	=	18.5665				
Long Chord	=	618.1300				
Mid. Ord.	=	18.4348				
P.C. Station		100+00.00	N	1,481,238.8513	E	502,554.8838
P.T. Station		106+19.60	N	1,481,765.1339	E	502,879.0926
C.C.			N	1,482,856.0220	E	500,519.0157
Back	= N 38° 27' 41.43" E					
Ahead	= N 24° 48' 27.33" E					
Chord Bear	= N 31° 38' 04.38" E					

		Curve Data				
Curve DIV012						
P.I. Station		108+24.41	N	1,481,951.0500	E	502,965.0278
Delta	=	6° 53' 40.81" (RT)				
Degree	=	1° 41' 06.61"				
Tangent	=	204.8162				
Length	=	409.1379				
Radius	=	3,400.0000				
External	=	6.1635				
Long Chord	=	408.8911				
Mid. Ord.	=	6.1523				
P.C. Station		106+19.60	N	1,481,765.1339	E	502,879.0926
P.T. Station		110+28.73	N	1,482,125.3056	E	503,072.6598
C.C.			N	1,480,338.5878	E	505,965.3471
Back	= N 24° 48' 27.33" E					
Ahead	= N 31° 42' 08.14" E					
Chord Bear	= N 28° 15' 17.74" 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+87.79

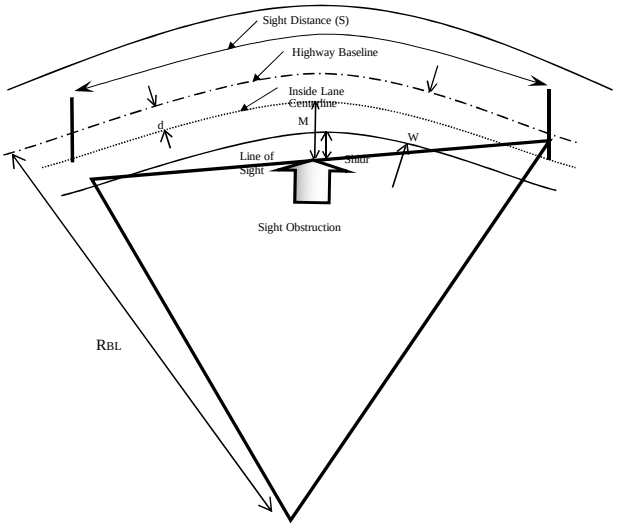
Ending chain DIV01 description

* 2 END

AECOM

				Page	of
Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Orange Count**	AECOM Project No:	60480256	Sheet 1	of 2
Description:	**Stopping Sight Distance Calculations for**	Computed By:	KAP	Date:	5/8/2019
	DIVERSION 1 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019

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)

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*)	All Other Facilities
DESIGN SPEED		50 mph
CURVE NO.		DIV011
RADIUS OF CURVE (R_{BL})		2,600.00 '
DIRECTION OF CURVE (LT or RT)		LT
DEGREE OF CURVE		2° 12' 13"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)		7.50 '
LANE WIDTH (*W*)		15 '
SHOULDER WIDTH (Shldr)		3.5 '
VERTICAL GRADE (%)		-2.000%
M DIMENSION		11.0 '

FDOT REQUIRED SSD	425.00 '	*FDOT FDM, TABLE 211.10.2, January 2*
AASHTO REQUIRED SSD	425.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	479.15 '	*EQUATION*

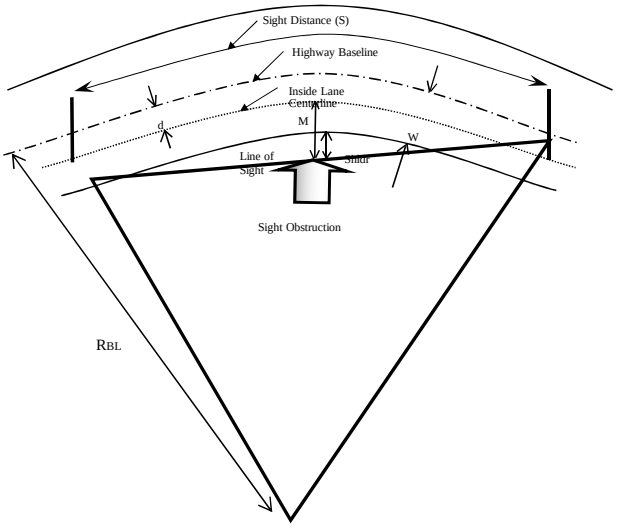
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

				Page	of
Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Orange Count**	AECOM Project No:	60480256	Sheet	2 of 2
Description:	**Stopping Sight Distance Calculations for**	Computed By:	KAP	Date:	5/8/2019
	DIVERSION 1 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019

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)

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*)	All Other Facilities
DESIGN SPEED		50 mph
CURVE NO.		DIV012
RADIUS OF CURVE (R_{BL})		3,400.00 '
DIRECTION OF CURVE (LT or RT)		RT
DEGREE OF CURVE		1° 41' 7"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)		7.50 '
LANE WIDTH (*W*)		15 '
SHOULDER WIDTH (Shldr)		2 '
VERTICAL GRADE (%)		3.955%
M DIMENSION		9.5 '

FDOT REQUIRED SSD	399.27 '	*FDOT FDM, TABLE 211.10.2, January 2*
AASHTO REQUIRED SSD	399.59 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	507.85 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:
NOT USED

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	KAP	Sheet 1 of 2	
	DIVERSION 1 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	5/2/2019
				Date:	7/24/2019

SUPERELEVATION CALCULATIONS

TYPE OF ROADWAY *(Rural or Urban)*	Rural			
(Rural=FDM Table 210.9.1 / Urban=FDM Table 210.9.2)				
TRAVEL DIRECTION	WB			
CURVE NO.	DIV011 (LT)	PC STATION	100+00.00	
DEGREE OF CURVE	2° 12' 13"	PT STATION	106+19.60	
RADIUS OF CURVE	2,600.00 '			
DESIGN SPEED	50 mph	BEGIN TRANSITION	N/A	
e=	0.044 *	BEGIN FULL SUPER	N/A	
SE SPLIT INTO CURVE (Tangent/Curve)	N/A N/A	END FULL SUPER	N/A	
SE SPLIT OUT OF CURVE (Curve/Curve)	N/A N/A	END TRANSITION	N/A	

TRANSITION DESCRIPTION	DELTA 'e'	WIDTH	SLOPE RATIO	LENGTH	BEG STA.	END STA.
				0.00		
1-LANE RAMP				0.00		
No Transition Required				0.00		
TOTAL LENGTH INTO CURVE				**0.00**		
1-LANE RAMP				0.00		
(+) 0.035 to (+) 0.02 Transition to start just beyond physical gore.				0.00		
	0.015	15	200	100.00	104+20.00	105+20.00
TOTAL LENGTH OUT OF CURVE				**100.00**		

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 2,600' RADIUS FOR TTCP.

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page	of
Description:	**Super Elevation Transition Calculations for**	Computed By:	KAP	Sheet 2	of 2
	DIVERSION 1 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	5/2/2019
				Date:	7/24/2019

SUPERELEVATION CALCULATIONS

TYPE OF ROADWAY *(Rural or Urban)*	Rural			
(Rural=FDM Table 210.9.1 / Urban=FDM Table 210.9.2)				
TRAVEL DIRECTION	WB			
CURVE NO.	DIV012 (RT)	PC STATION	106+19.60	
DEGREE OF CURVE	1° 41' 7"	PT STATION	110+28.73	
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)	N/A N/A	END FULL SUPER	N/A	
SE SPLIT OUT OF CURVE (Tangent/Curve)	N/A N/A	END TRANSITION	N/A	

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

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 3,400' RADIUS FOR TTCP.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject: [None]
Job No. DCP Operator: KP
Date: Wednesday July 24, 2019 11:37 am

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_DIV01'

* 1 PRI PRO DIV01

Beginning profile DIV01 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	100+72.11	110.4701				
VPI	2	101+00.00	110.4500	-0.0722			
VPI	3	101+50.00	110.4900	0.0800			
VPI	4	102+00.00	110.6200	0.2600			
VPI	5	102+50.00	110.7200	0.2000			
VPI	6	102+87.76	110.8800	0.4237			
VPI	7	103+00.00	110.9700	0.7353			
VPI	8	103+50.00	111.4400	0.9400			
VPI	9	104+00.00	111.9996	1.1191			
VPI	10	104+13.49	112.1500	1.1152			
VPC		106+40.15	114.4126	0.9983	K = 47.0 SSD = 350.2		
High Point		106+87.07	114.6468				
VPI	11	107+42.44	115.4337		204.5788	102.2894	102.2894
VPT		108+44.73	112.0025	-3.3545			
VPI	12	108+85.64	110.6300	-3.3545			
VPI	13	108+96.38	110.2053	-3.9544			

Ending profile DIV01 description

* 2 END

AECOM

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: KAP Date: 05/06/19
Checked By: MSP Date: 07/24/19

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+99.91	114.01	3.50	-6.00					113.80
VCDIV012	DIV01	106+50.84	114.51	3.50	-6.00					114.30
VCDIV013	DIV01	106+33.10	114.34	17.00	2.00					114.68
VCDIV014	DIV01	106+82.19	114.64	17.00	2.00					114.98

STRUCTURE DEPTH (FT) ****
7.00

MINIMUM VERTICAL CLEARANCE (FT)
16.50

MAXIMUM UNDERPASS PGL ELEVATIONS
117.36
121.35
118.77
122.36

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	137.30	0.00	0.00					137.30
VCDIV012	IC_CFP	N/A	137.80	0.00	0.00					137.80
VCDIV013	IC_CFP	N/A	138.18	0.00	0.00					138.18
VCDIV014	IC_CFP	N/A	138.48	0.00	0.00					138.48

DESIGN VALUES & VERTICAL CLEARANCE CHECK

POINT #	ACTUAL OVERPASS PGL ELEV.	*** ACTUAL OFFSET ELEV.	ACTUAL VERTICAL CLEARANCE	(+) OR (-) CLEARANCE
VCDIV011	140.65	140.65	19.85	**3.35**
VCDIV012	144.64	144.64	23.34	**6.84**
VCDIV013	142.61	142.61	20.93	**4.43**
VCDIV014	146.20	146.20	24.21	**7.71**

* 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
****Approximately 6.75 ft structure depth per existing bridge plans, used 7 ft to be conservative.

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: KAP Date: 5/2/2019
Checked By: GLF Date: 5/7/2019

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	696+63.06	-3.00%	110.47	0.00	N/A	110.47	-3.50%	0.00	110.47	DIV01	100+72.11
BL400	696+90.97	-3.00%	110.49	0.00	N/A	110.49	-3.50%	0.92	110.45	DIV01	101+00.00
BL400	697+41.07	-3.00%	110.61	0.00	N/A	110.61	-3.50%	3.33	110.49	DIV01	101+50.00
BL400	697+91.28	-3.00%	110.86	0.00	N/A	110.86	-3.50%	6.71	110.62	DIV01	102+00.00
BL400	698+41.64	-3.00%	111.11	0.00	N/A	111.11	-3.50%	11.06	110.72	DIV01	102+50.00
BL400	698+79.79	-3.00%	111.41	0.00	N/A	111.41	-3.50%	15.00	110.88	DIV01	102+87.76
BL400	698+92.02	-3.00%	111.54	1.39	3.50%	111.49	-3.50%	15.00	110.97	DIV01	103+00.00
BL400	699+41.92	-3.00%	112.23	7.66	3.50%	111.96	-3.50%	15.00	111.44	DIV01	103+50.00
BL400	699+91.68	-3.00%	113.05	14.89	3.50%	112.52	-3.50%	15.00	112.00	DIV01	104+00.00
BL400	700+05.08	-3.00%	113.26	17.00	3.50%	112.67	-3.50%	15.00	112.15	DIV01	104+13.49

* 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: **DIVERSION 1 ENTRANCE terminal with existing WBI-4**

AECOM Project No: 60480256
Computed By: KAP Date: 5/2/2019
Checked By: GLF Date: 5/7/2019

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	696+63.06	-3.00%	110.47	RTDIV0101	0.00	DIV01	100+72.11	-3.50%	0.00	0.00
BL400	696+90.97	-3.00%	110.49	RTDIV0102	0.00	DIV01	101+00.00	-3.50%	0.92	0.92
BL400	697+41.07	-3.00%	110.61	RTDIV0103	0.00	DIV01	101+50.00	-3.50%	3.33	3.33
BL400	697+91.28	-3.00%	110.86	RTDIV0104	0.00	DIV01	102+00.00	-3.50%	6.71	6.71
BL400	698+41.64	-3.00%	111.11	RTDIV0105	0.00	DIV01	102+50.00	-3.50%	11.06	11.06
BL400	698+79.79	-3.00%	111.41	RTDIV0106	0.00	DIV01	102+87.76	-3.50%	15.00	15.00
BL400	698+92.02	-3.00%	111.54	RTDIV0117	1.39	DIV01	103+00.00	-3.50%	15.00	15.00
BL400	699+41.92	-3.00%	112.23	RTDIV0118	7.66	DIV01	103+50.00	-3.50%	15.00	15.00
BL400	699+91.68	-3.00%	113.05	RTDIV0119	14.89	DIV01	104+00.00	-3.50%	15.00	15.00
BL400	700+05.08	-3.00%	113.26	RTDIV0120	17.00	DIV01	104+13.49	-3.50%	15.00	15.00

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

Ramp Terminal - Graph Input

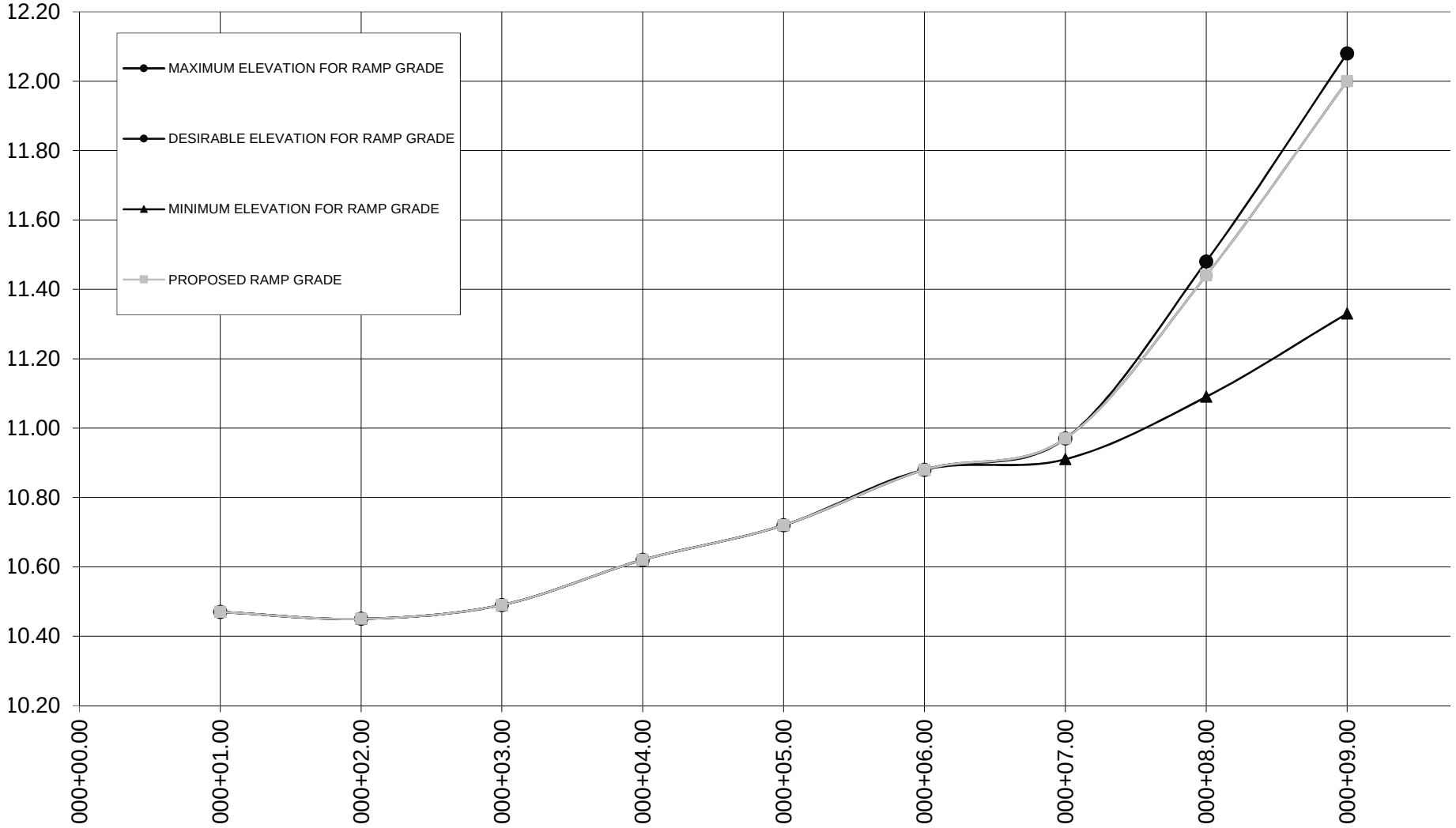
Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)
Description: **DIVERSION 1 ENTRANCE**
terminal with existing WBI-4

AECOM Project No: 60480256
Computed By: KAP Date: 5/2/2019
Checked By: GLF Date: 5/7/2019

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%	N/A	0.50%	110.47	110.47	0.00%	N/A	0.50%	110.47	110.47	0.50%	N/A	0.50%	110.47	110.47
5.00%	N/A	0.50%	110.49	110.45	0.00%	N/A	0.50%	110.49	110.45	0.50%	N/A	0.50%	110.49	110.45
5.00%	N/A	0.50%	110.61	110.49	0.00%	N/A	0.50%	110.61	110.49	0.50%	N/A	0.50%	110.61	110.49
5.00%	N/A	0.50%	110.86	110.62	0.00%	N/A	0.50%	110.86	110.62	0.50%	N/A	0.50%	110.86	110.62
5.00%	N/A	0.50%	111.11	110.72	0.00%	N/A	0.50%	111.11	110.72	0.50%	N/A	0.50%	111.11	110.72
5.00%	N/A	0.50%	111.41	110.88	0.00%	N/A	0.50%	111.41	110.88	0.50%	N/A	0.50%	111.41	110.88
5.00%	-8.00%	4.50%	111.43	110.91	0.00%	-3.50%	0.50%	111.49	110.97	0.50%	-3.00%	0.00%	111.49	110.97
5.00%	-8.00%	4.50%	111.61	111.09	0.00%	-3.50%	0.50%	111.96	111.44	0.50%	-3.00%	0.00%	112.00	111.48
5.00%	-8.00%	4.50%	111.85	111.33	0.00%	-3.50%	0.50%	112.52	112.00	0.50%	-3.00%	0.00%	112.60	112.08
5.00%	-8.00%	4.50%	111.90	111.38	0.00%	-3.50%	0.50%	112.67	112.15	0.50%	-3.00%	0.00%	112.75	112.23

AECOM

RAMP DIV01 **SHEET 4 OF 4**



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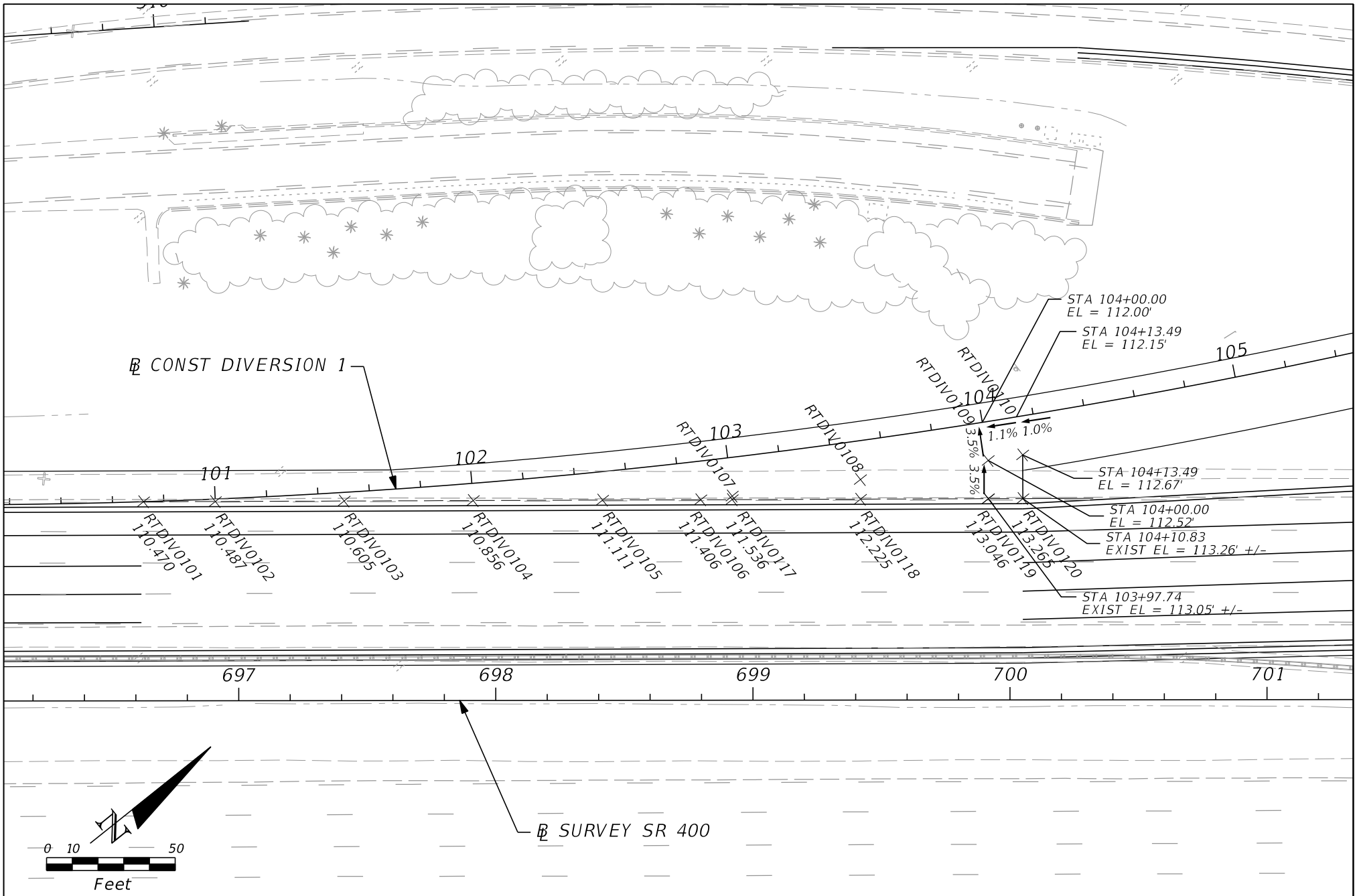
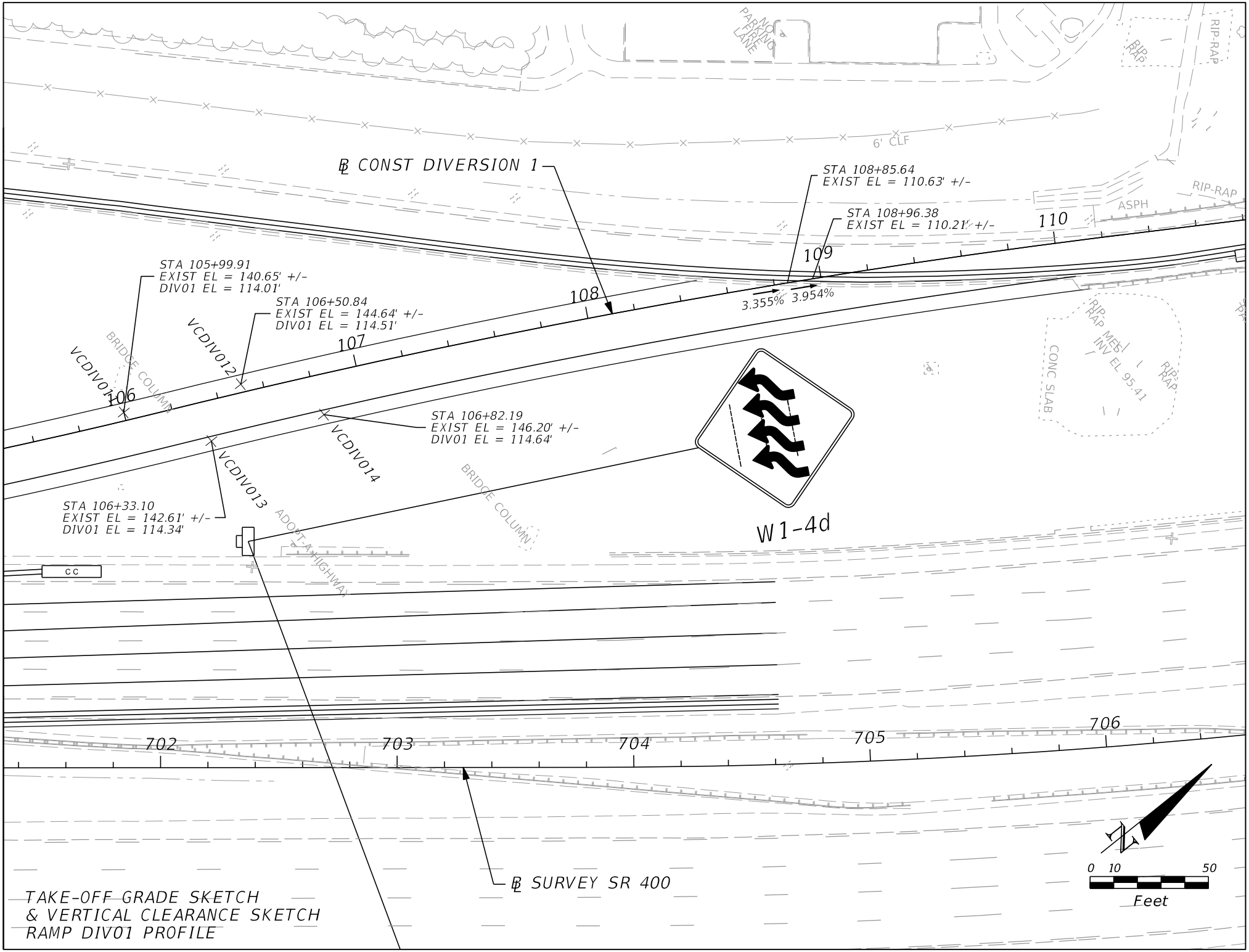


TAKE-OFF GRADE SKETCH
& RAMP TERMINAL SKETCH
RAMP DIV01 PROFILE


PARKING LANE
RIP-RAP
6' CLF
℄ CONST DIVERSION 1
STA 108+85.64
EXIST EL = 110.63' +/-
STA 108+96.38
EXIST EL = 110.21' +/-
ASPH
110
109
108
107
106
STA 105+99.91
EXIST EL = 140.65' +/-
DIV01 EL = 114.01'
STA 106+50.84
EXIST EL = 144.64' +/-
DIV01 EL = 114.51'
VCDIV011
VCDIV012
BRIDGE COLUMN
3.355%
3.954%
RIP-RAP MED
INV EL 95.41
CONC SLAB
STA 106+82.19
EXIST EL = 146.20' +/-
DIV01 EL = 114.64'
VCDIV013
VCDIV014
STA 106+33.10
EXIST EL = 142.61' +/-
DIV01 EL = 114.34'
ADOPT-A-HIGHWAY
W1-4d
CC
702
703
704
705
706
℄ SURVEY SR 400
0 10 50
Feet
TAKE-OFF GRADE SKETCH
& VERTICAL CLEARANCE SKETCH
RAMP DIV01 PROFILE

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject: [None]
Job No. DCP Operator: KP
Date: Wednesday July 24, 2019 12:46 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'HA_DIV02'

* 1 DES CHA DIV02

Chain DIV02 contains:
CUR DIV021 CUR DIV022

Beginning chain DIV02 description

		Curve Data				
Curve DIV021						
P.I. Station		201+85.84	N	1,480,327.1653	E	501,825.4341
Delta	=	15° 13' 47.95" (LT)				
Degree	=	4° 07' 19.19"				
Tangent	=	185.8358				
Length	=	369.4806				
Radius	=	1,390.0000				
External	=	12.3676				
Long Chord	=	368.3938				
Mid. Ord.	=	12.2586				
P.C. Station		200+00.00	N	1,480,181.9429	E	501,709.4799
P.T. Station		203+69.48	N	1,480,497.7480	E	501,899.1668
C.C.			N	1,481,049.2482	E	500,623.2564
Back	= N	38° 36' 21.40" E				
Ahead	= N	23° 22' 33.45" E				
Chord Bear	= N	30° 59' 27.43" E				

		Curve Data				
Curve DIV022						
P.I. Station		205+10.72	N	1,480,627.3976	E	501,955.2066
Delta	=	11° 36' 15.16" (RT)				
Degree	=	4° 07' 19.19"				
Tangent	=	141.2427				
Length	=	281.5190				
Radius	=	1,390.0000				
External	=	7.1576				
Long Chord	=	281.0381				
Mid. Ord.	=	7.1210				
P.C. Station		203+69.48	N	1,480,497.7480	E	501,899.1668
P.T. Station		206+51.00	N	1,480,743.1248	E	502,036.1801
C.C.			N	1,479,946.2477	E	503,175.0773
Back	= N	23° 22' 33.45" E				
Ahead	= N	34° 58' 48.61" E				
Chord Bear	= N	29° 10' 41.03" E				

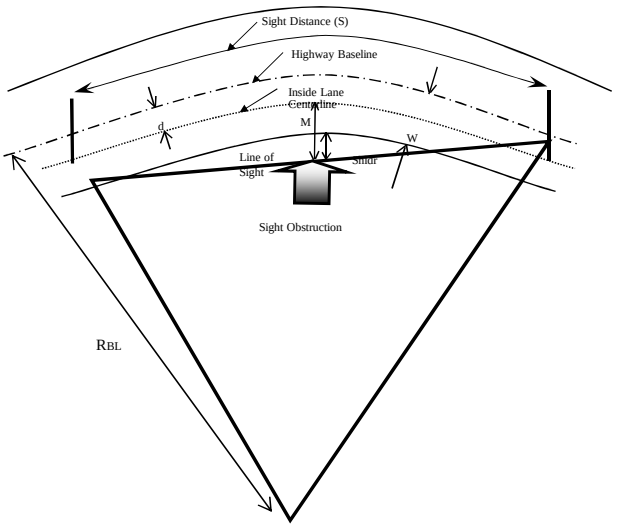
Ending chain DIV02 description

* 2 END

AECOM

				Page	of
Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Orange Count**	AECOM Project No:	60480256	Sheet 1	of 2
Description:	**Stopping Sight Distance Calculations for**	Computed By:	KAP	Date:	6/24/2019
	DIVERSION 2 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019

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)

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*)	All Other Facilities
DESIGN SPEED		40 mph
CURVE NO.		DIV021
RADIUS OF CURVE (R_{BL})		1,390.00 '
DIRECTION OF CURVE (LT or RT)		LT
DEGREE OF CURVE		4° 7' 19"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)		7.50 '
LANE WIDTH (*W*)		15 '
SHOULDER WIDTH (Shldr)		2 '
VERTICAL GRADE (%)		-2.000%
M DIMENSION		9.5 '

FDOT REQUIRED SSD	305.00 '	*FDOT FDM, TABLE 211.10.2, January 2*
AASHTO REQUIRED SSD	305.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	326.06 '	*EQUATION*

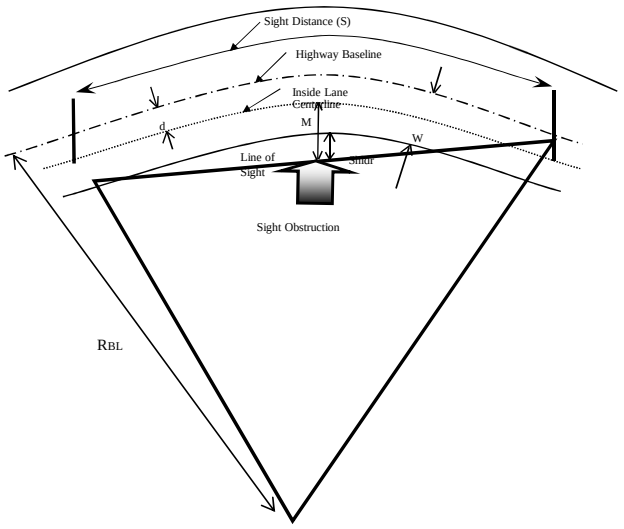
SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:

AECOM

				Page	of
Job:	**Interim Daryl Carter Pkwy 441113-1-52-01 (Orange Count**	AECOM Project No:	60480256	Sheet 2	of 2
Description:	**Stopping Sight Distance Calculations for**	Computed By:	KAP	Date:	6/24/2019
	DIVERSION 2 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019

STOPPING SIGHT DISTANCE CALCULATIONS



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

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*)	All Other Facilities
DESIGN SPEED		40 mph
CURVE NO.		DIV022
RADIUS OF CURVE (R_{BL})		1,390.00 '
DIRECTION OF CURVE (LT or RT)		RT
DEGREE OF CURVE		4° 7' 19"
OFFSET DISTANCE FROM BASELINE TO CENTERLINE OF INSIDE LANE (*d*)		7.50 '
LANE WIDTH (*W*)		15 '
SHOULDER WIDTH (Shldr)		2 '
VERTICAL GRADE (%)		-2.000%
M DIMENSION		9.5 '

FDOT REQUIRED SSD	305.00 '	*FDOT FDM, TABLE 211.10.2, January 2*
AASHTO REQUIRED SSD	305.00 '	*AASHTO 2011, Table 3-1 & 3-2.*
ACTUAL SSD	324.31 '	*EQUATION*

SUFFICIENT FDOT SSD?	YES
SUFFICIENT AASHTO SSD?	YES

COMMENTS:
NOT USED

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	KAP	Sheet 1 of 2	
	DIVERSION 2 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019
				Date:	7/24/2019

SUPERELEVATION CALCULATIONS

TYPE OF ROADWAY *(Rural or Urban)*	Rural			
(Rural=FDM Table 210.9.1 / Urban=FDM Table 210.9.2)				
TRAVEL DIRECTION	WB			
CURVE NO.	DIV021 (LT)	PC STATION	200+00.00	
DEGREE OF CURVE	4° 7' 19"	PT STATION	203+69.48	
RADIUS OF CURVE	1,390.00 '			
DESIGN SPEED	40 mph	BEGIN TRANSITION	N/A	
e=	0.052 *	BEGIN FULL SUPER	N/A	
SE SPLIT INTO CURVE (Tangent/Curve)	N/A N/A	END FULL SUPER	N/A	
SE SPLIT OUT OF CURVE (Curve/Curve)	N/A N/A	END TRANSITION	N/A	

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

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 1,390' RADIUS FOR TTCP.

AECOM

Job:	**Interim Daryl Carter Pkwy 441113-1-52-01**	AECOM Project No:	60480256	Page ___ of ___	
Description:	**Super Elevation Transition Calculations for**	Computed By:	KAP	Sheet 2 of 2	
	DIVERSION 2 (EB/WB CFP TO WB I-4)	Checked By:	MSP	Date:	7/24/2019
				Date:	7/24/2019

SUPERELEVATION CALCULATIONS

TYPE OF ROADWAY *(Rural or Urban)*	Rural			
(Rural=FDM Table 210.9.1 / Urban=FDM Table 210.9.2)				
TRAVEL DIRECTION	WB			
CURVE NO.	DIV022 (RT)	PC STATION	203+69.48	
DEGREE OF CURVE	4° 7' 19"	PT STATION	206+51.00	
RADIUS OF CURVE	1,390.00 '			
DESIGN SPEED	40 mph	BEGIN TRANSITION	N/A	
e=	0.052 *	BEGIN FULL SUPER	N/A	
SE SPLIT INTO CURVE (Curve/Curve)	N/A N/A	END FULL SUPER	N/A	
SE SPLIT OUT OF CURVE (Tangent/Curve)	N/A N/A	END TRANSITION	N/A	

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

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 1,390' RADIUS FOR TTCP.

Copyright: (c) 2013 Bentley Systems, Incorporated. All rights reserved.
Project: DCP Interim
Subject: [None]
Job No. DCP Operator: KP
Date: Wednesday July 24, 2019 12:44 pm

SYSTEM FIX 4 ASEC 2 BEAR PRI 0 RED NE STA 2 FILE: 'VA_DIV02'

* 1 PRI PRO DIV02

Beginning profile DIV02 description:

		STATION	ELEV	GRADE	TOTAL L	BACK L	AHEAD L
VPI	1	200+42.03	110.2490				
VPI	2	200+52.73	110.2313	-0.1654			
VPI	3	201+20.00	110.1037	-0.1897			
VPC		201+42.50	109.9439	-0.7104	K = 61.1		
Low Point		201+85.88	109.7898				
VPI	4	202+10.00	109.4644		135.0000	67.5000	67.5000
VPT		202+77.50	110.4770	1.5002			
VPI	5	203+60.00	111.7147	1.5002			
VPI	6	204+47.93	112.5200	0.9158			
VPI	7	204+58.00	112.5518	0.3158			

Ending profile DIV02 description

* 2 END

Ramp Terminal - Detail

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)
Description: **DIVERSION 2 ENTRANCE terminal with existing WBI-4**

AECOM Project No: 60480256
Computed By: KAP Date: 6/3/2019
Checked By: MSP Date: 7/24/2019

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	682+90.25	-3.00%	110.23	0.00	N/A	110.23	-3.50%	0.00	110.23	DIV02	200+52.73
BL400	683+37.64	-3.00%	110.23	0.00	N/A	110.23	-3.50%	2.60	110.14	DIV02	201+00.00
BL400	683+88.01	-3.00%	110.13	0.00	N/A	110.13	-3.50%	7.13	109.88	DIV02	201+50.00
BL400	684+38.80	-3.00%	110.19	0.00	N/A	110.19	-3.50%	13.66	109.71	DIV02	202+00.00
BL400	684+47.79	-3.00%	110.18	0.00	N/A	110.18	-3.50%	15.00	109.66	DIV02	202+08.80
BL400	684+88.85	-3.00%	110.18	6.96	3.50%	109.94	-3.50%	15.00	109.42	DIV02	202+50.00
BL400	685+23.56	-3.00%	110.31	13.83	3.50%	109.83	-3.50%	15.00	109.31	DIV02	202+85.00
BL400	685+38.20	-3.00%	110.33	17.00	3.50%	109.74	-3.50%	15.00	109.22	DIV02	202+99.82

* 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: **DIVERSION 2 ENTRANCE terminal with existing WBI-4**

AECOM Project No: 60480256
Computed By: KAP Date: 6/3/2019
Checked By: MSP Date: 7/24/2019

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	682+90.25	-3.00%	110.23	RTDIV0201	0.00	DIV02	200+52.73	-3.50%	0.00	0.00
BL400	683+37.64	-3.00%	110.23	RTDIV0202	0.00	DIV02	201+00.00	-3.50%	2.60	2.60
BL400	683+88.01	-3.00%	110.13	RTDIV0203	0.00	DIV02	201+50.00	-3.50%	7.13	7.13
BL400	684+38.80	-3.00%	110.19	RTDIV0204	0.00	DIV02	202+00.00	-3.50%	13.66	13.66
BL400	684+47.79	-3.00%	110.18	RTDIV0205	0.00	DIV02	202+08.80	-3.50%	15.00	15.00
BL400	684+88.85	-3.00%	110.18	RTDIV0216	6.96	DIV02	202+50.00	-3.50%	15.00	15.00
BL400	685+23.56	-3.00%	110.31	RTDIV0217	13.83	DIV02	202+85.00	-3.50%	15.00	15.00
BL400	685+38.20	-3.00%	110.33	RTDIV0218	17.00	DIV02	202+99.82	-3.50%	15.00	15.00

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

Ramp Terminal - Graph Input

Job: Interim Daryl Carter Pkwy 441113-1-52-01 (Orange County)
Description: **DIVERSION 2 ENTRANCE**
terminal with existing WBI-4

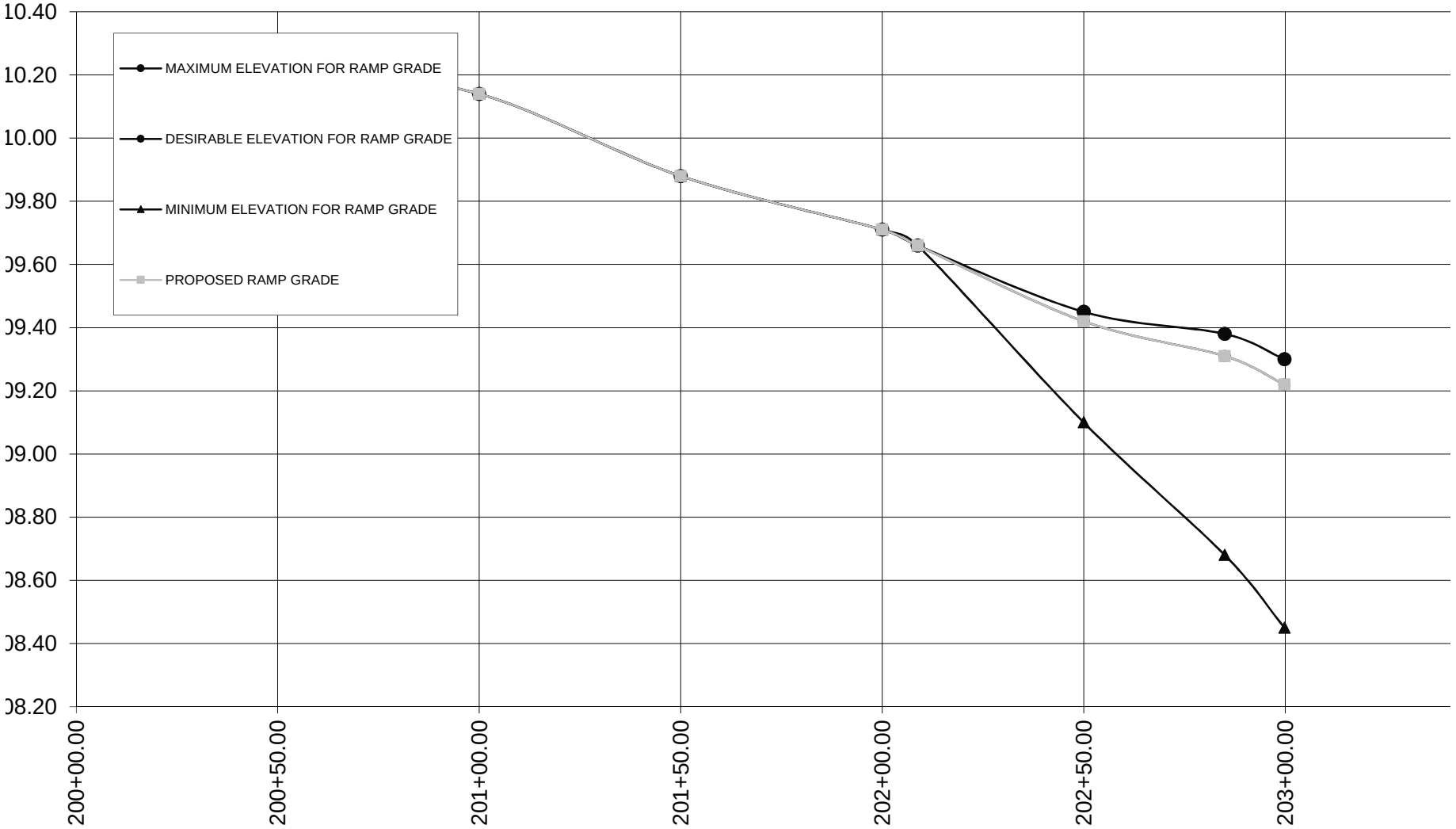
AECOM Project No: 60480256
Computed By: KAP Date: 6/3/2019
Checked By: MSP Date: 7/24/2019

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%	N/A	0.50%	110.23	110.23	0.00%	N/A	0.50%	110.23	110.23	0.50%	N/A	0.50%	110.23	110.23
5.00%	N/A	0.50%	110.23	110.14	0.00%	N/A	0.50%	110.23	110.14	0.50%	N/A	0.50%	110.23	110.14
5.00%	N/A	0.50%	110.13	109.88	0.00%	N/A	0.50%	110.13	109.88	0.50%	N/A	0.50%	110.13	109.88
5.00%	N/A	0.50%	110.19	109.71	0.00%	N/A	0.50%	110.19	109.71	0.50%	N/A	0.50%	110.19	109.71
5.00%	N/A	0.50%	110.18	109.66	0.00%	N/A	0.50%	110.18	109.66	0.50%	N/A	0.50%	110.18	109.66
5.00%	-8.00%	4.50%	109.62	109.10	0.00%	-3.50%	0.50%	109.94	109.42	0.50%	-3.00%	0.00%	109.97	109.45
5.00%	-8.00%	4.50%	109.20	108.68	0.00%	-3.50%	0.50%	109.83	109.31	0.50%	-3.00%	0.00%	109.90	109.38
5.00%	-8.00%	4.50%	108.97	108.45	0.00%	-3.50%	0.50%	109.74	109.22	0.50%	-3.00%	0.00%	109.82	109.30

AECOM

RAMP DIV02

SHEET 4 OF 4



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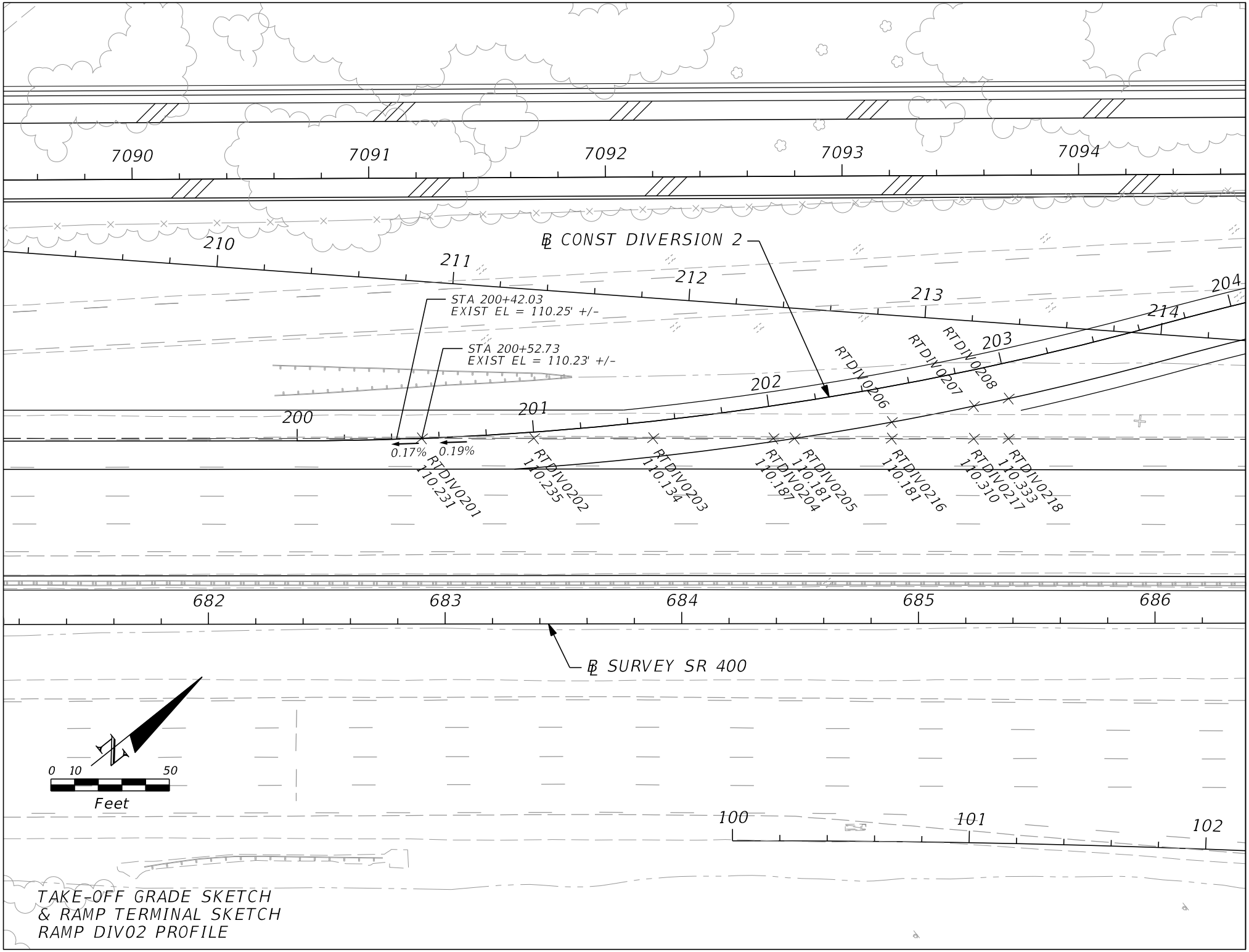
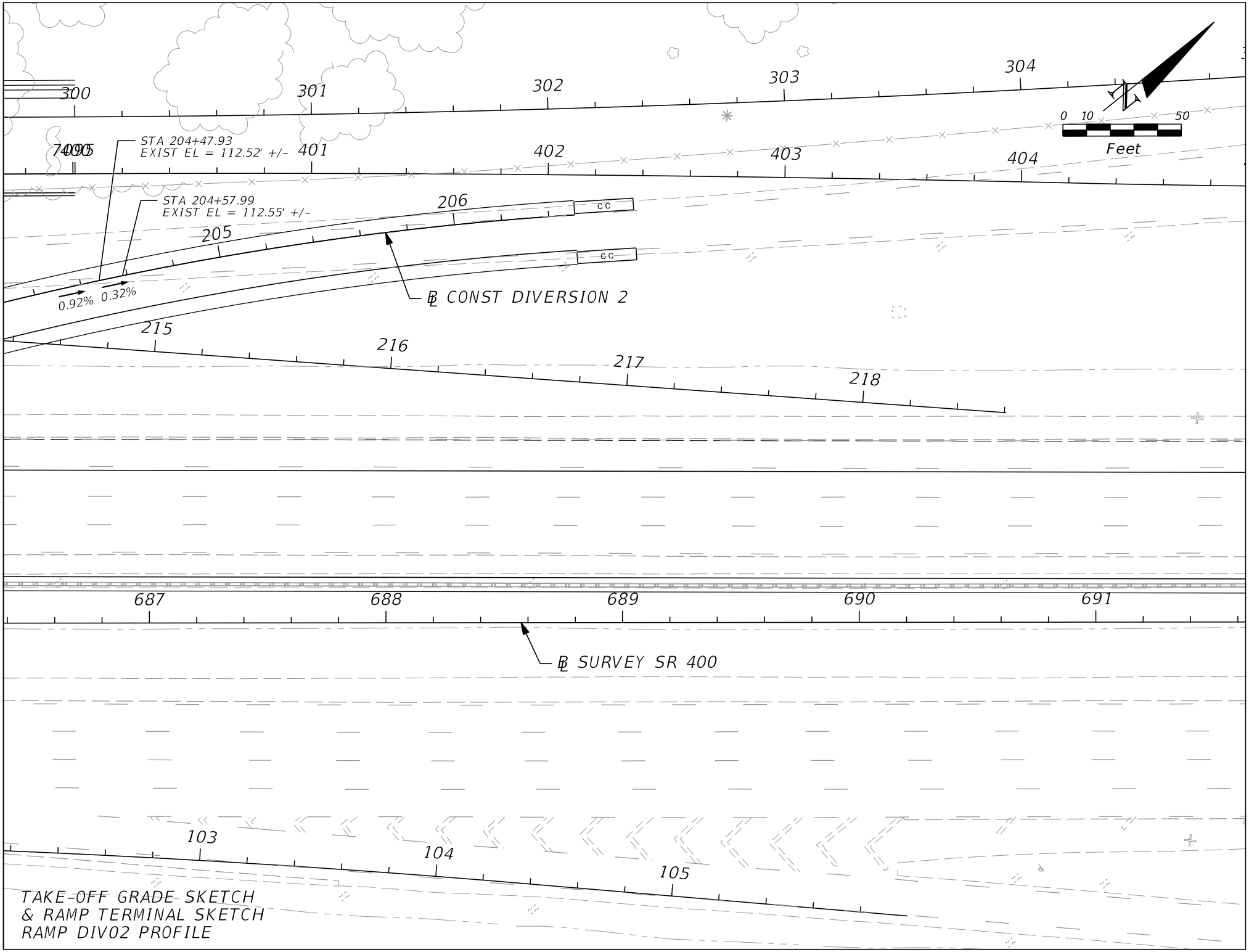


TAKE-OFF GRADE SKETCH
& RAMP TERMINAL SKETCH
RAMP DIV02 PROFILE


300
301
302
303
304
401
402
403
404
STA 204+47.93
EXIST EL = 112.52' +/-
STA 204+57.99
EXIST EL = 112.55' +/-
205
206
CC
CC
0.92%
0.32%
℄ CONST DIVERSION 2
215
216
217
218
687
688
689
690
691
℄ SURVEY SR 400
103
104
105
0
10
50
Feet
TAKE-OFF GRADE SKETCH
& RAMP TERMINAL SKETCH
RAMP DIV02 PROFILE

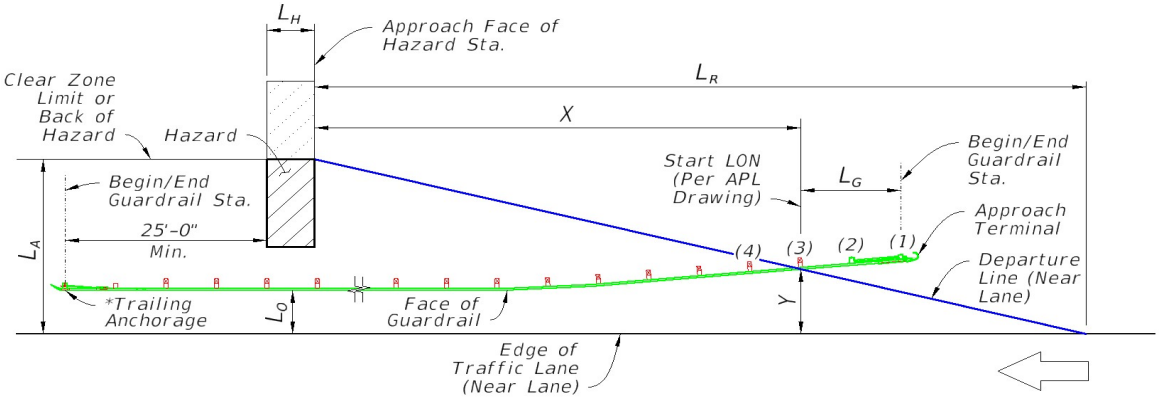
GUARDRAIL LENGTH OF NEED v1.1 - ROADSIDE HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001

CHECKED BY: GLF	
DATE: 6/14/19	

Roadway Name / Feature:	BL400 @ 685+43.00 (RT)
FPID:	441113-1-52-01
Designer:	KAP

PART A: LENGTH OF NEED FOR NEAR LANE



	Input:	Comment:
Direction of Near Lane Traffic	*Eastbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	70	
Approach Face of Hazard Station	685+40.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	6	*SIGN HAZARD*
Lateral Area Concern, L_A (Ft.)	21.5781	*the lesser distance from the 'Edge of Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	10.5895	*the typical guardrail offset from the 'Edge of Traffic Lane,' near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

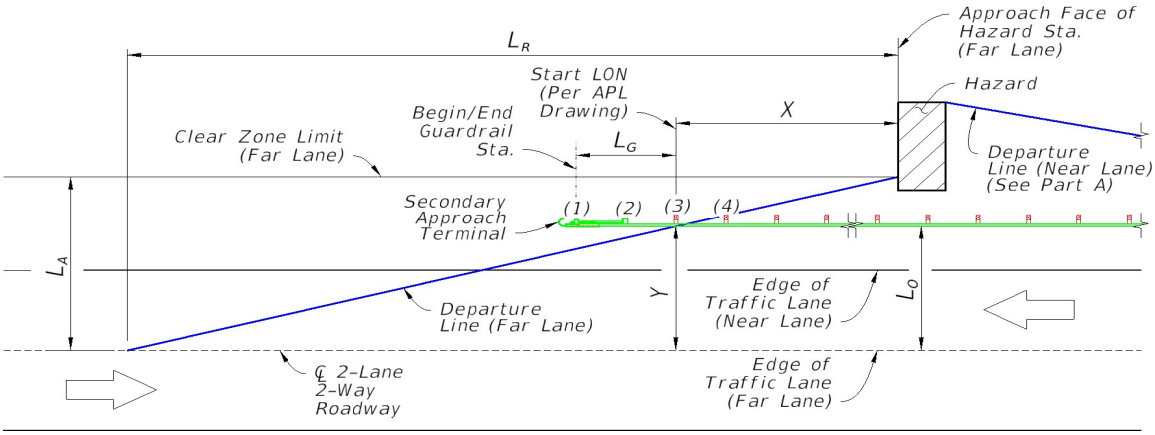
	Output:
End Treatment Offset, Y (Ft.)	10.6
Runout Length, L_R (Ft.)	360
Length of Need, X (Ft.)	**183.3**
Unadjusted Begin/End Guardrail Sta. @ Primary Approach Terminal	**683+44.2**
Unadjusted Begin/End Guardrail Sta. @ Trailing Anchorage (If Applicable)	**685+71.**

$$X = \frac{L_A - Y}{L_A / L_R}$$

AASHTO RDG (5-3)

** **NOTE:** If the Trailing Anchorage shown herein is in the Clear Zone of an opposing Traffic Lane, use an Approach Terminal in its place.*

PART B: LENGTH OF NEED FOR FAR LANE - OPPOSING DIRECTION (IF APPLICABLE)
('Part A' Extension, If Required For *2-Lane, 2-Way Road* with Hazard in Far Lane's Clear Zone)



	Input:	*Comment:*
PART B Required? (User Input Needed)	***No***	*Is this a 2-lane, 2-way road with the Hazard in the Far Lane's Clear Zone limit? If "No" Part B will be excluded from the placement calculation output below.*
Lateral Area Concern, L_A (Ft.)	32	*the lesser distance from the 'Edge of Traffic Lane' (Far Lane) to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	22	*the typical guardrail offset from the 'Edge of Traffic Lane' (Far Lane), near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*per the APL Drawings, "Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4. For "Non-Gating" Terminals, the Start LON is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_g, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail; measured to Post(1); enter zero for 'Parallel' Terminals*
Flare's Taper Length (Ft.)	35	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
End Treatment Offset, Y (Ft.)	N.A.
Direction of Far Lane Traffic	N.A.
Approach Face of Hazard Station (Far Lane)	N.A.
Runout Length, L_R (Ft.)	N.A.
Length of Need, X (Ft.)	**N.A.**
Unadjusted Begin/End Guardrail Sta. @ Secondary Approach Terminal	**N.A.**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY: GUARDRAIL ROADSIDE HAZARD SHIELDING

	Limit:	*Output:*	
Adjusted Begin/End Guardrail Sta. @ PRIMARY Approach Terminal (From Part A)	≤	**683+39.8**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to a multiple of 6'-3" panels.*
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**10.6**	
Adjusted Begin/End Guardrail Sta. @ Trailing Anchorage (From Part A, If Applicable)	≥	**685+71.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**10.6**	
Adjusted Begin/End Guardrail Sta. @ SECONDARY Approach Terminal (From Part B, If Applicable)	-	**N.A.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**N.A.**	

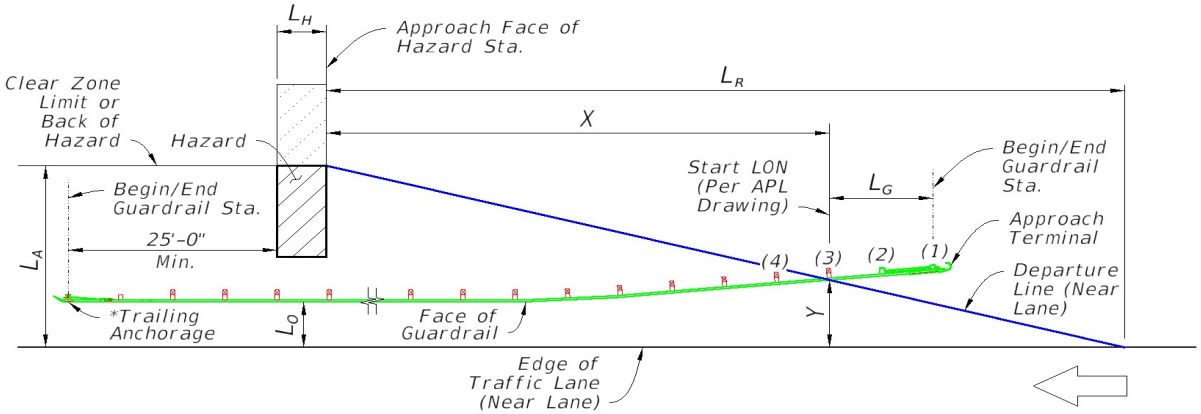
GUARDRAIL LENGTH OF NEED v1.1 - ROADSIDE HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	EBI4 @ SR535 (RT)
FPID:	441113-1-52-01
Designer:	KP

PART A: LENGTH OF NEED FOR NEAR LANE



	Input:	Comment:
Direction of Near Lane Traffic	*Eastbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	284520	
Design Speed (MPH)	70	
Approach Face of Hazard Station	571+00.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	900	*DITCH/TRUSS SIGN HAZARD*
Lateral Area Concern, L_A (Ft.)	24	*the lesser distance from the 'Edge of Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	12	*the typical guardrail offset from the 'Edge of Traffic Lane,' near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

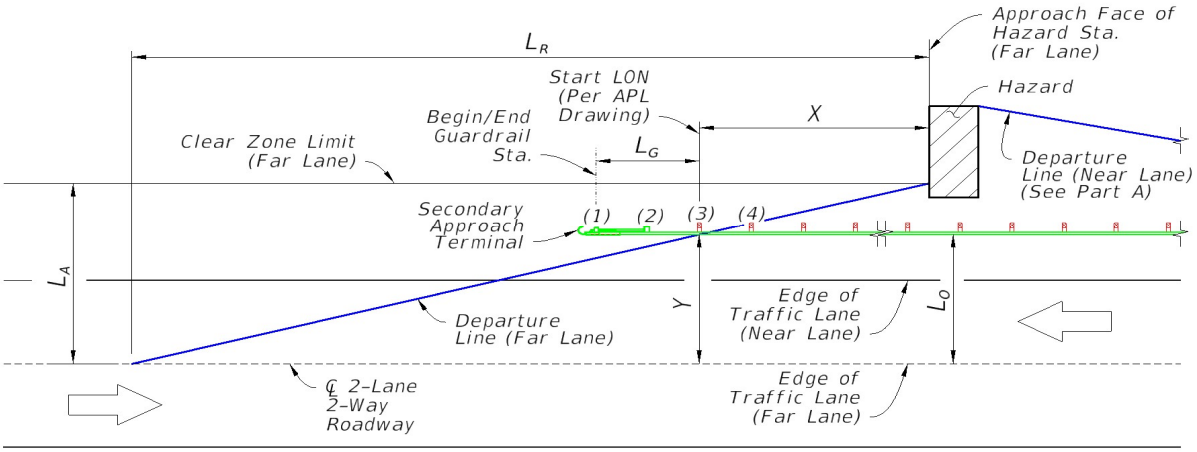
	Output:
End Treatment Offset, Y (Ft.)	12.0
Runout Length, L_R (Ft.)	360
Length of Need, X (Ft.)	**180.0**
Unadjusted Begin/End Guardrail Sta. @ Primary Approach Terminal	**569+07.5**
Unadjusted Begin/End Guardrail Sta. @ Trailing Anchorage (If Applicable)	**580+25.**

$$X = \frac{L_A - Y}{L_A / L_R}$$

AASHTO RDG (5-3)

** **NOTE:** If the Trailing Anchorage shown herein is in the Clear Zone of an opposing Traffic Lane, use an Approach Terminal in its place.*

PART B: LENGTH OF NEED FOR FAR LANE - OPPOSING DIRECTION (IF APPLICABLE)
('Part A' Extension, If Required For *2-Lane, 2-Way Road* with Hazard in Far Lane's Clear Zone)



	Input:	Comment:
PART B Required? (User Input Needed)	**No**	*Is this a 2-lane, 2-way road with the Hazard in the Far Lane's Clear Zone limit? If "No" Part B will be excluded from the placement calculation output below.*
Lateral Area Concern, L_A (Ft.)	32	*the lesser distance from the 'Edge of Traffic Lane' (Far Lane) to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	22	*the typical guardrail offset from the 'Edge of Traffic Lane' (Far Lane), near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*per the APL Drawings, "Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4. For "Non-Gating" Terminals, the Start LON is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_g, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail; measured to Post(1); enter zero for 'Parallel' Terminals*
Flare's Taper Length (Ft.)	35	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
End Treatment Offset, Y (Ft.)	N.A.
Direction of Far Lane Traffic	N.A.
Approach Face of Hazard Station (Far Lane)	N.A.
Runout Length, L_R (Ft.)	N.A.
Length of Need, X (Ft.)	**N.A.**
Unadjusted Begin/End Guardrail Sta. @ Secondary Approach Terminal	**N.A.**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY: GUARDRAIL ROADSIDE HAZARD SHIELDING

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ PRIMARY Approach Terminal (From Part A)	≤	**569+06.3**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to a multiple of 6'-3" panels.*
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**12.0**	
Adjusted Begin/End Guardrail Sta. @ Trailing Anchorage (From Part A, If Applicable)	≥	**580+25.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**12.0**	
Adjusted Begin/End Guardrail Sta. @ SECONDARY Approach Terminal (From Part B, If Applicable)	-	**N.A.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**N.A.**	

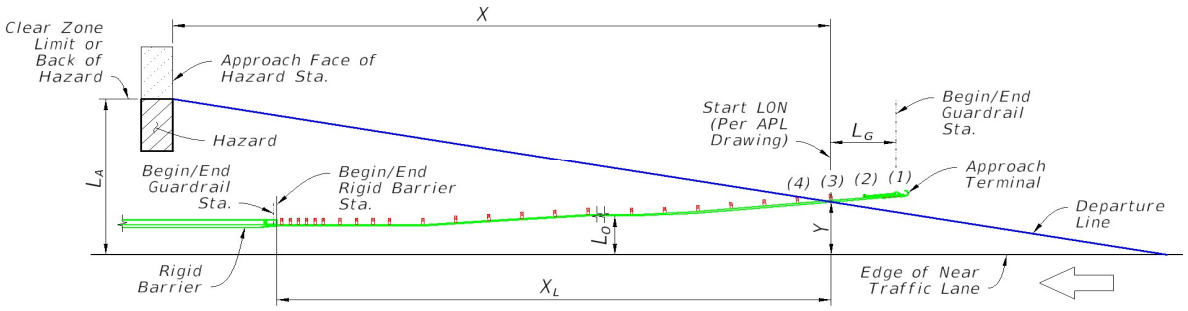
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	WBI4 @ 663+00.00 (LT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	284520	
Design Speed (MPH)	70	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	663+00.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	663+00.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*BARRIER WALL HAZARD*
Lateral Area Concern, L_A (Ft.)	13.25	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	12	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	12.0
Runout Length, L_R (Ft.)	360
Length of Need, X (Ft.)	**34.0**
Length of Need, X_L (Ft.)	**34.0**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**662+99.4**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**663+45.9**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**662+99.4**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**663+83.7**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**12.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

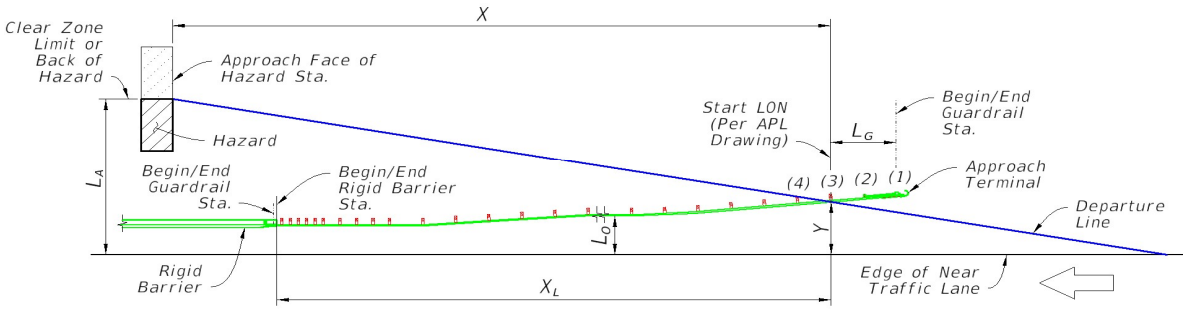
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	ISLIP1 @ 107+50.00 (LT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	107+50.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	106+21.8	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	600	*POND HAZARD*
Lateral Area Concern, L_A (Ft.)	60	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	6	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	6.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**207.0**
Length of Need, X_L (Ft.)	**78.8**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**107+49.4**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**108+40.7**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**107+49.4**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**108+46.2**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**6.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

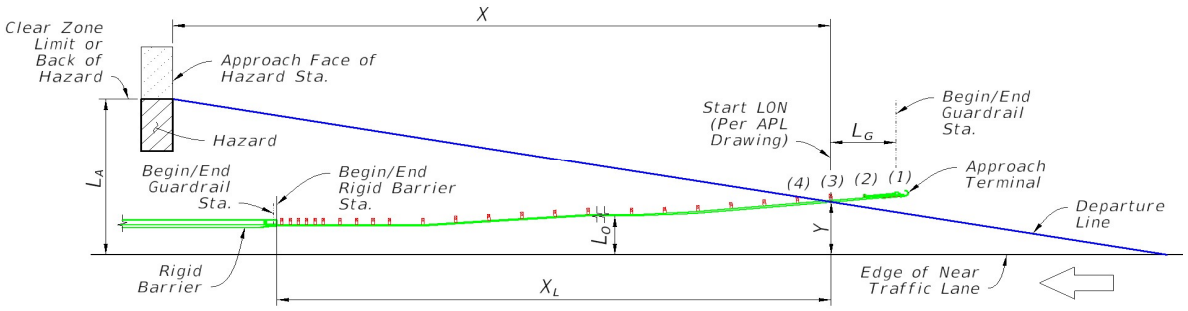
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	ISLIP2 @ 210+72.00 (RT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	210+72.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	210+00.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*EMBANKMENT*
Lateral Area Concern, L_A (Ft.)	14	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	6	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	6.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**131.4**
Length of Need, X_L (Ft.)	**59.4**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**210+71.4**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**211+43.3**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**210+71.4**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**211+55.7**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**6.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

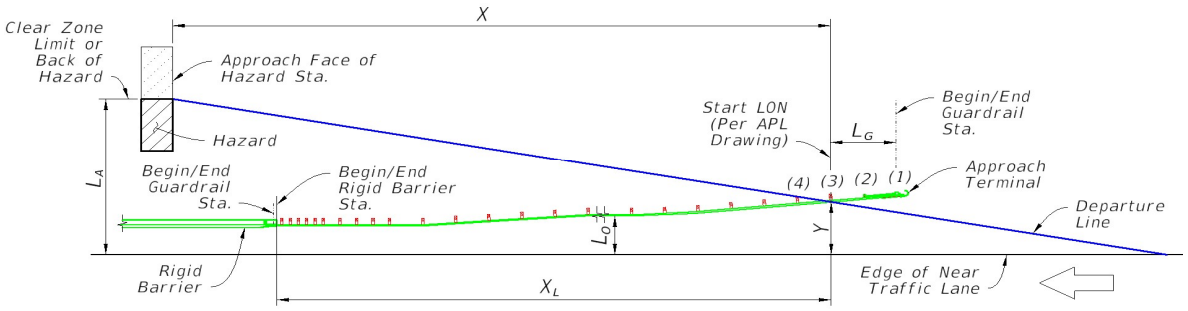
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	IB_DCP @ 503+16.10 (RT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Eastbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	504+00.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	505+39.9	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*BARRIER WALL HAZARD*
Lateral Area Concern, L_A (Ft.)	7.25	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	6	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	6.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**39.7**
Length of Need, X_L (Ft.)	**-100.2**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**504+00.6**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**504+88.3**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**504+00.6**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≤	**503+16.3**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**6.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

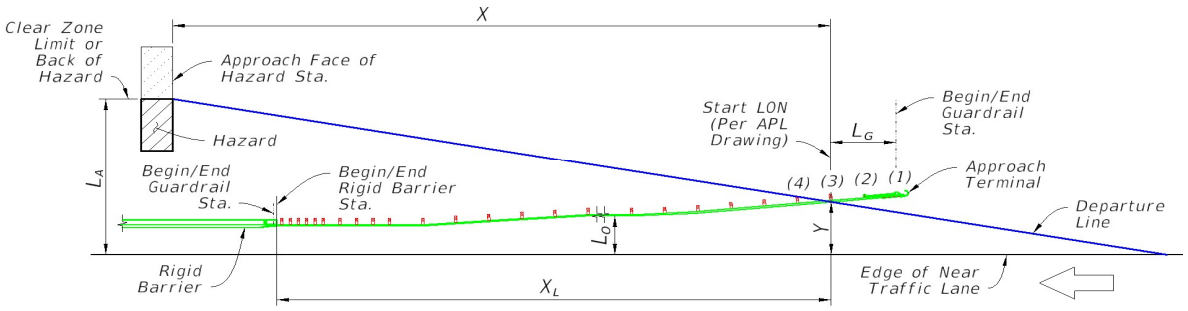
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	IB_DCP @ 512+46.23 (LT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Eastbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	25	*LOW SPEED LOCATION OF RAMP*
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	513+30.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	513+00.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*BARRIER WALL HAZARD*
Lateral Area Concern, L_A (Ft.)	7.25	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	6	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	6.0
Runout Length, L_R (Ft.)	110
Length of Need, X (Ft.)	**19.0**
Length of Need, X_L (Ft.)	**49.0**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**513+30.6**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**512+69.1**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**513+30.6**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≤	**512+46.3**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**6.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

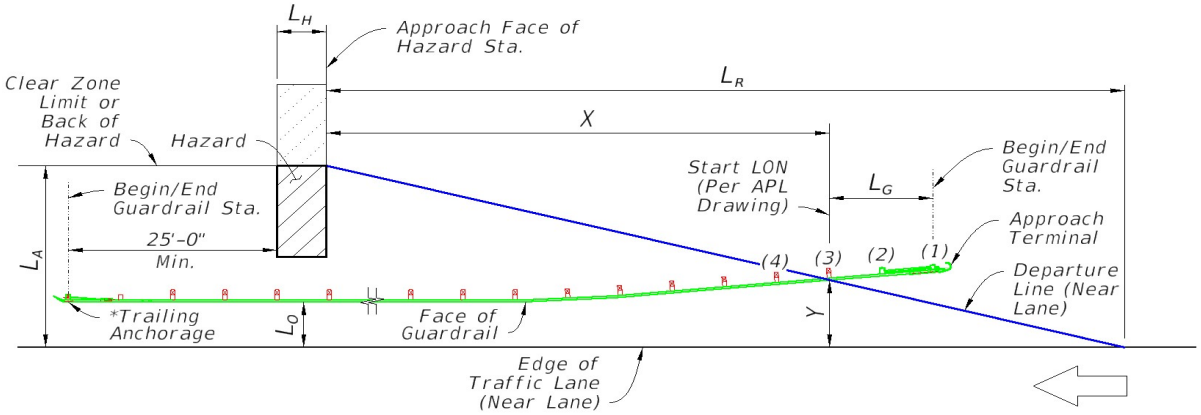
GUARDRAIL LENGTH OF NEED v1.1 - ROADSIDE HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	IC_DCP (STATIONING = BL400) (RT)
FPID:	441113-1-52-01
Designer:	KP

PART A: LENGTH OF NEED FOR NEAR LANE



	Input:	Comment:
Direction of Near Lane Traffic	*Eastbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Face of Hazard Station	665+00.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	650	*POND HAZARD*
Lateral Area Concern, L_A (Ft.)	60	*the lesser distance from the 'Edge of Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	12	*the typical guardrail offset from the 'Edge of Traffic Lane,' near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

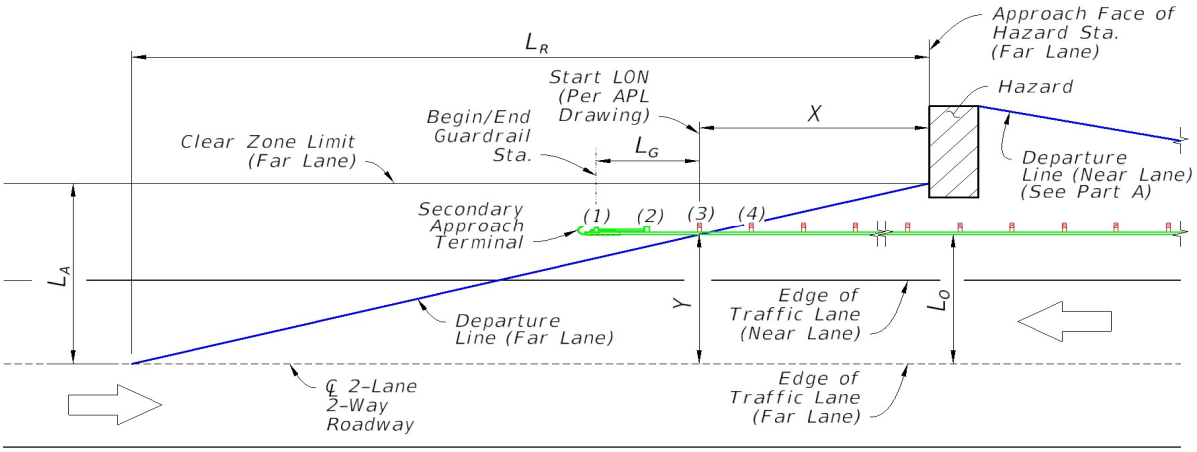
	Output:
End Treatment Offset, Y (Ft.)	12.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**184.0**
Unadjusted Begin/End Guardrail Sta. @ Primary Approach Terminal	**663+03.5**
Unadjusted Begin/End Guardrail Sta. @ Trailing Anchorage (If Applicable)	**671+75.**

$$X = \frac{L_A - Y}{L_A / L_R}$$

AASHTO RDG (5-3)

** **NOTE:** If the Trailing Anchorage shown herein is in the Clear Zone of an opposing Traffic Lane, use an Approach Terminal in its place.*

PART B: LENGTH OF NEED FOR FAR LANE - OPPOSING DIRECTION (IF APPLICABLE)
('Part A' Extension, If Required For *2-Lane, 2-Way Road* with Hazard in Far Lane's Clear Zone)



	Input:	Comment:
PART B Required? (User Input Needed)	**No**	*Is this a 2-lane, 2-way road with the Hazard in the Far Lane's Clear Zone limit? If "No" Part B will be excluded from the placement calculation output below.*
Lateral Area Concern, L_A (Ft.)	32	*the lesser distance from the 'Edge of Traffic Lane' (Far Lane) to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	22	*the typical guardrail offset from the 'Edge of Traffic Lane' (Far Lane), near the 'Hazard' location (outside of flare)*
Length of Gating, L_G (Ft.)	12.5	*per the APL Drawings, "Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4. For "Non-Gating" Terminals, the Start LON is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_g, assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail; measured to Post(1); enter zero for 'Parallel' Terminals*
Flare's Taper Length (Ft.)	35	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
End Treatment Offset, Y (Ft.)	N.A.
Direction of Far Lane Traffic	N.A.
Approach Face of Hazard Station (Far Lane)	N.A.
Runout Length, L_R (Ft.)	N.A.
Length of Need, X (Ft.)	**N.A.**
Unadjusted Begin/End Guardrail Sta. @ Secondary Approach Terminal	**N.A.**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY: GUARDRAIL ROADSIDE HAZARD SHIELDING

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ PRIMARY Approach Terminal (From Part A)	≤	**663+00.**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to a multiple of 6'-3" panels.*
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**12.0**	
Adjusted Begin/End Guardrail Sta. @ Trailing Anchorage (From Part A, If Applicable)	≥	**671+75.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**12.0**	
Adjusted Begin/End Guardrail Sta. @ SECONDARY Approach Terminal (From Part B, If Applicable)	-	**N.A.**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) :		**N.A.**	

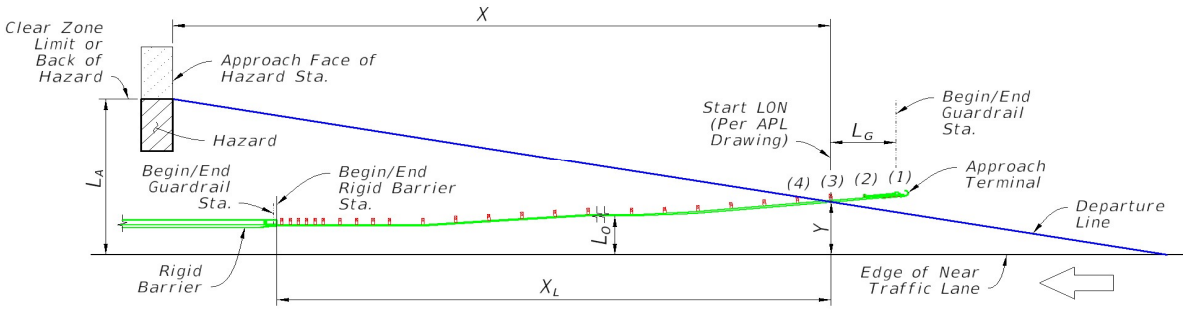
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	D_DCP @ 707+80.00 (LT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	707+80.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	707+80.	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*BARRIER WALL HAZARD*
Lateral Area Concern, L_A (Ft.)	7.25	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	8	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	8.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	-23.8
Length of Need, X_L (Ft.)	-23.8
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**707+79.4**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**707+68.1**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**707+79.4**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**708+63.7**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**8.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

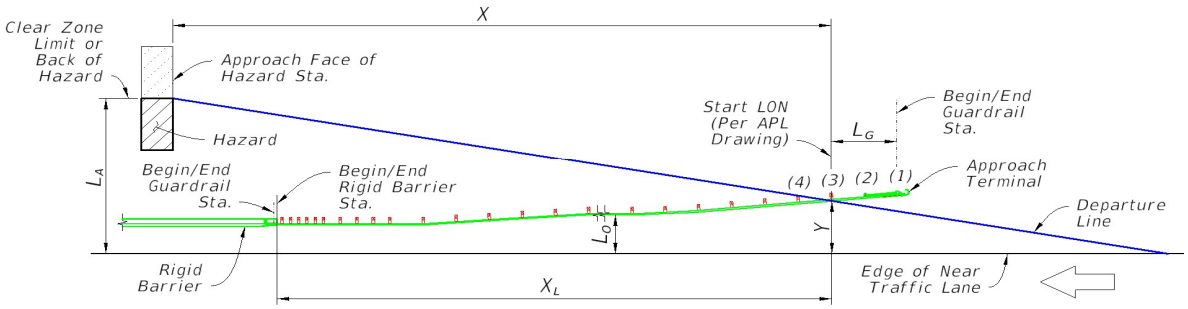
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	D_DCP @ 707+80.00 (RT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	707+80.	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	707+03.9	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	600	*POND HAZARD*
Lateral Area Concern, L_A (Ft.)	60	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	6	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	6.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**207.0**
Length of Need, X_L (Ft.)	**130.9**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**707+79.4**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**709+22.7**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**707+79.4**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**709+26.2**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**6.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*

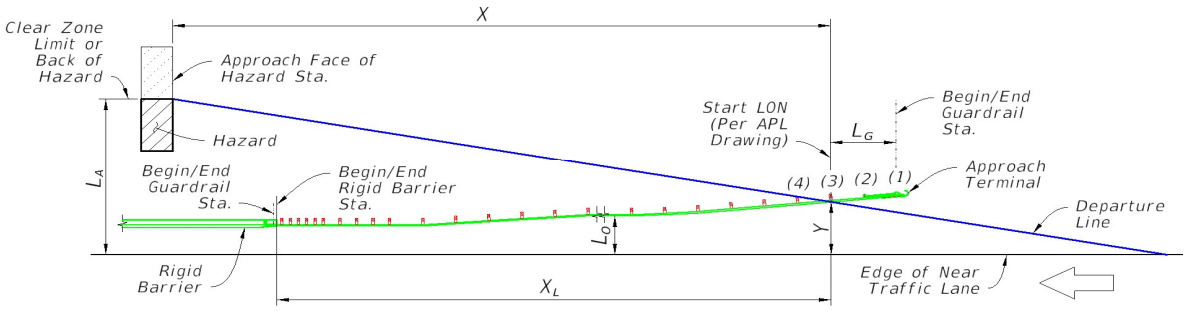
GUARDRAIL LENGTH OF NEED v1.1 - RIGID BARRIER & HAZARD SHIELDING:

For FDOT Standard Plans, Index 536-001
(New or Compatible Rigid Barrier
End with No Approach Slab Conflict)

CHECKED BY: GLF	
DATE: 4/1/19	

Roadway Name / Feature:	IC_CFP @ 400+06.90 (RT)
FPID:	441113-1-52-01
Designer:	KP

PART E: LENGTH OF NEED FOR SIMPLE LAYOUT TO RIGID BARRIER - (ANY OPPOSING LANE'S RIGID BARRIER IS OUTSIDE OF CLEAR ZONE)



	Input:	Comment:
Direction of Near Lane Traffic	*Westbound*	*for relative stationing calculations*
AADT (Vehicles Per Day)	22660	
Design Speed (MPH)	50	
Approach Transition Connection Type	*TL-3*	*from Index 536-001, either TL-2 or TL-3 length*
Begin/End Rigid Barrier Sta.	400+06.9	*enter as total feet (do not input a plus sign); located at the end of the 'Rigid Barrier' (not the Begin/End Guardrail Sta.)*
Approach Face of Hazard Sta.	400+06.9	*enter as total feet (do not input a plus sign)*
Length of Hazard, L_H (Ft.)	0	*BARRIER WALL HAZARD*
Lateral Area Concern, L_A (Ft.)	9.25	*the lesser distance from the 'Edge of Near Traffic Lane' to the 'Clear Zone Limit' or 'Back of Hazard'*
Lateral Offset of Guardrail, L_O (Ft.)	8	*the typical guardrail offset from the 'Edge of Traffic Lane' at the connection point to the Approach Terminal segment (offset excludes Flare, if applicable)*
Approach Terminal Design Length (Ft.)	53.1	*from Index 536-001, predefined length is 53.1' for TL-3 and 40.6' for TL-2; values may be adjusted per specific SPI design length (requires specific Plans callout, see SPI)*
Length of Gating, L_G (Ft.)	12.5	*"Gating" Terminals typically have a 'Start LON' at Post 3 or Post 4, per the APL Drawings. For "Non-Gating" Terminals, the 'Start LON' is at 'Post 1' (L_G =0).* *NOTE: The flare rate effect on L_G assumed parallel to the roadway, is negligible and may be omitted.*
Terminal Flare @ Post(1) (Ft.)	0	*4 Ft. Max. per Index 536-001 detail, measured offset at Post(1); enter zero for "Parallel" Terminals*
Flare's Taper Length (Ft.)	0	*default value is acceptable at 35'-0", but this may be refined per specific APL drawing (Input used to calculate 'Y')*

	Output:
Approach Transition Length	31.3
End Treatment Offset, Y (Ft.)	8.0
Runout Length, L_R (Ft.)	230
Length of Need, X (Ft.)	**31.1**
Length of Need, X_L (Ft.)	**31.1**
Unadjusted Begin/End Guardrail Sta. @ Rigid Barrier	**400+06.2**
Unadjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)	**400+49.8**

$$X = \frac{L_A - Y}{L_A / L_R}$$ AASHTO RDG (5-3)

DESIGN OUTPUT SUMMARY:

	Limit:	Output:	
Adjusted Begin/End Guardrail Sta. @ Connection to Rigid Barrier	=	**400+06.2**	***Outputs assume linear stationing:*** *To adjust for curvature, lengthen the guardrail with the Begin/End Guardrail stations placed outside of the stationing limits shown here. Use CADD measurement to bring the final guardrail length to buildable length, including the Approach Transition, End Treatment, and 6'-3" panel multiple.*
***Adjusted Begin/End Guardrail Sta. @ Approach Terminal, Post(1)**	≥	**400+90.6**	
Guardrail Offset from Nearest Edge of Traffic Lane (Ft.) @ Post(1):		**8.0**	

** **NOTE:** Stationing is automatically adjusted to the Approach Transition length plus the Approach Terminal length plus the 6'-3" panel length increment (not accounting for curvature effects). Where 'Length of Need' does not govern, the minimum length of guardrail required is the Approach Transition length plus the Approach Terminal length (stationing outputs account for this).*