PROJECT DESIGN CRITERIA

Project Name: Seward Meridian Parkway Road Imp. Ph II Palmer-Wasilla Highway to Seldon Road

IRIS Program No.: Z512210000 Federal Project No.: 0001(417)

Functional Classification: Urban Arterial Terrain: Rolling

P-W Hwy to Bogard ADT:

Present ADT (2012): 11,020 Mid-Design ADT (2027): 19,846 Design ADT (2037): 29,378

Bogard to Seldon ADT:

Present ADT (2012): N/A Mid-Design ADT (2027): 6,942 Design ADT (2037): 10,276

Design Hourly Volume (%): 11.1 Trucks (%): 5.32 Directional Split (%/%): 60/40

Pavement Design Year: 15 Pavement Design ESAL: SMP: 989,397 (from Draft Geotech. Rec.)

Design Turning Vehicle: WB-67

Project Type: New Construction/Reconstruction NHS: ☐ Non-NHS: ☒

FHWA 10 CONTROLLING DESIGN CRITERIA		SOURCE	STANDARD	AS PROPOSED	EXCEPTION[1]
Design Speed[1]		GB, Sec. 2.3.6, p. 2-57	20-45 mph	45 mph	No
Lane Width	Travel	GB, Sec. 7.3.3, p. 7-29	10-12 ft	12 ft	No
	Auxiliary	GB, Sec. 9.7.1, p. 9-124 & Sec. 7.3.3, p. 7-29	10-12 ft	12 ft	No
Shoulder Width	Outside	GB, Sec. 7.3.3, p. 7-30 & Sec. 7.2.3, p. 7-5, Table 7-3	8 ft	8 ft	No
	Inside	N/A	N/A	N/A	N/A
	Auxiliary	GB, Sec. 9.7.1, p. 9-124 & Sec. 7.2.3, p. 7-5, Table 7-3	2-8 ft	2 ft	No
Horizontal Curve Radius (min)		GB, Sec. 3.3.5, p. 3-45, Table 3-9	643 ft	>643 ft	No
Superelevation Rate, e (max)		HPCM, Sec. 1160.5.6, p. 1160-22	6 %	5.4 %	No
Stopping Sight Distance (SSD)		GB, Sec. 7.3.2, p. 7-28 & Sec. 7.2.2, p. 7-3, Table 7-1	360 ft	>360 ft	No
Grade	Min.	GB, Sec. 7.3.2, p. 7-28	0.3%	0.5 %	No
	Max.	GB, Sec. 7.3.2, p. 7-29, Table 7-4	7%	5.8 %	No
Cross Slope		HPCM, Sec. 1130.1.2, p. 1130-1	2%	2%	No
Vertical Clearance		HPCM, Sec. 1130, p. 1130-5, Table 1130-1	20' 6"	>20'6"	No
Design Loading Structural Capacity[1]		GB, Sec. 7.3.5, p. 7-38	HL-93	HL-93	No

[1] *On low speed roadways (<50 mph) on the NHS, only Design Speed and Design Loading Structural Capacity require a Design Exception; all other criteria require a Design Waiver. For projects off the NHS, all criteria require a Design Waiver.*

OTHER DESIGN CRITERIA		SOURCE	STANDARD	AS PROPOSED	WAIVER
Superelevation Transition, Δ		GB, Sec. 3.3.8, p. 3-61, Table 3-15	0.54%	0.54 %	No
Bridge Clear-Roadway Width		GB, Sec. 7.3.5, p. 7-38	78 ft	78 ft	No
Vertical Curvature (min)	K (crest)	GB, Sec. 3.4.6, p. 3-155, Table 3-34	61	111	No
	K (sag)	GB, Sec. 3.4.6. p. 3-161, Table 3-36	79	114	No
Lateral Offset to Obstruction		GB, Sec. 7.3.4, p. 7-37 & RDG, Sec. 10, p. 10-1	Min. 0.5 ft	> 0.5 ft	No
Surfacing Material		HPCM, Sec. 1180.3, p. 1180-1	Paved	Paved	No
Clear Zone	Slope (fill)	HPCM, Sec. 1130, p. 1130-6, Table 1130-2	4:1 or flatter	4:1 or flatter	No
	Width (fill)		24-28 ft	24 ft	No
	Slope (cut)		N/A	N/A	N/A
	Width (cut)		N/A	N/A	N/A
Bicycle Lane Width		N/A	N/A	N/A	N/A
Sidewalk/Pathway Width		GB, Sec. 4.17.1, p. 4-56	4-6 ft	10 ft	No
Intersection Sight Distance*, Passenger Car	Left Turn (GB Case B1)	GB, Sec. 9.5.3, p. 9-36-9-40	565 ft	>565 ft	No
	Right Turn (GB Case B2)	GB, Sec. 9.5.3, p. 9-40-9-42	430 ft	>430 ft	No
	Crossing (GB Case B3)	GB, Sec. 9.5.3, p. 9-43	565 ft	>565 ft	No
Passing Sight Distance		N/A	N/A	N/A	N/A
Degree of Access Control		HPCM, Sec. 1190.3, p. 1190-2 & GB, Sec. 2.5.4, p. 2-73	Driveway Permits		No
Median	Treatment	GB, Sec. 7.3.3, p. 7-32/33	Raised Curb		No
	Width		4-60 ft	Min. 6 ft	No
Illumination		RPRL	Continuous		No
Curb Type		CRSD	Sloped Curb		No

* Attach calculations

Notes:
GB – AASHTO "A Policy on Geometric Design on Highways and Streets", 2011; RDG – AASHTO "Roadside Design Guide", 2011; HPCM – Alaska Highway Preconstruction Manual; RPRL – IES Recommended Practice for Roadway Lighting (RP-8-14); CRSD – Central Region Standard Detail

Proposed by: _____ Date: 7/10/2018
Designer (Consultant or Staff)

Recommended by: _____ Date: 7/10/18
Engineering Manager

Accepted by: _____ Date: 7/30/18
FOR: Regional Preconstruction Engineer

Calculation Sheet for Cases B1, B2, and B3 (Intersection Sight Distance, Passenger Car)

EQUATIONS:

1.) $t_g = t_g + (n - 1) * (0.5)$, *if* $n > 2$

t_g = time gap for minor road vehicle to enter the major road (s)

t_g = time gap at design speed of major road (s)

n = number of lanes to cross

2.) $ISD = 1.47 * V_{major} * t_g$ *(from Green Book, pg. 9-37, Equation 9-1)*

ISD = Intersection Sight Distance (length of the leg of sight triangle along the major road) (ft)

V_{major} = design speed of the major road (mph)

CASE B1: Left Turn from the Minor Road *(Green Book, pg. 9-36)*

Given: $n = 3$ lanes, $V_{major} = 45$ mph, $t_g = 7.5$ s *(from Green Book, pg. 9-37, Table 9-5);*

$t_g = 7.5 + (3 - 1) * (0.5) = 8.5$ s

$ISD = 1.47 * 45 * 8.5 = 562.275$ ft => **use 565 ft**

CASE B2: Right Turn from the Minor Road *(Green Book, pg. 9-40)*

Given: $n = 0$ lanes, $V_{major} = 45$ mph, $t_g = 6.5$ s *(from Green Book, pg. 9-40, Table 9-7);*

$t_g = t_g = 6.5 = 6.5$ s

$ISD = 1.47 * 45 * 6.5 = 429.975$ ft => **use 430 ft**

CASE B3: Crossing Maneuver from the Minor Road *(Green Book, pg. 9-43)*

Given: $n = 5$ lanes, $V_{major} = 45$ mph, $t_g = 6.5$ s *(from Green Book, pg. 9-40, Table 9-7);*

$t_g = 6.5 + (5 - 1) * (0.5) = 8.5$ s

$ISD = 1.47 * 45 * 8.5 = 562.275$ ft => **use 565 ft**