DESIGN DESIGNATION

State Route Number: _____ Route Name: **KNIK ARM CROSSING**

Project Limits: Burma Road in MatSu Borough to 3rd Avenue in Anchorage

State Project Number: 56047 Federal Aid Number: ACSTP-0001(277)

Project Description: Provide a new bridge crossing of *Knik Arm* with roadway connections in the MatSu Borough and the Municipality of Anchorage

Design Functional Classification: Rural Arterial ☑ Urban Arterial ☑ Major Collector ☐ Minor Collector ☑ Local ☐

New Construction - Reconstruction ☑ Rehabilitation (3R) ☐ Other: _____

Project Design Life (years): 5 ☐ 10 ☐ 20 ☑ 25 ☐ Other: _____

SEGMENT	CONSTRUCTION YEAR 2010	MID-LIFE YEAR	DESIGN YEAR 2030
Point MacKenzie Highway, Burma Road to Port of Anchorage ADT:	4,000		22,800
Knik Arm Crossing, Port of Anchorage to Government Hill ADT:	5,100		46,700
Knik Arm Crossing, Government Hill to 3rd Avenue (Phase II) ADT:	4,300		39,900
Rural Collector Road (Holstein-Heifer Avenue, Alsop Road, Lu Young Lane) ADT:	900		5,200
Point MacKenzie Highway Rural Two-Way Frontage Road ADT:	1,000		5,700
Rural Highway DHV (13%):	520		3,000
Urban Highway DHV (13%):	660		6,100
Rural Collector Road DHV (15%):	140		780
Rural Frontage Road DHV (15%):	150		860
Rural Highway Directional Distribution (60/40):	310/210		1,800/1,200
Urban Highway Directional Distribution (60/40):	400/260		3,700/2,400
Rural Collector Road Directional Distribution (60/40):	80/60		470/310
Rural Frontage Road Directional Distribution (60/40):	90/60		520/340
Commercial Trucks on Rural Highway (7%):	280		1,600
Commercial Trucks on Urban Highway (12%):	610		5,600
Commercial Trucks on Rural Collector (4%):	40		230
Pedestrians (Number/Day):	<100		
Bicyclists (Number/Day):	<200		

Design Vehicles for Turning: WB-120

Design Vehicle Loading: ☐ HS15 ☐ HS20 ☐ HS25 ☑ Other: HL-93

PROPOSED: 22 March 2011

Michael R. Tooley Date
Senior Transportation Engineer
HDR Alaska

APPROVED: 3/24/11

Loran E. Frazier, PE Date
Chief Engineer
Knik Arm Bridge and Toll Authority

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PROJECT DESIGN CRITERIA

Project: **KNIK ARM CROSSING**, Burma Road to Port of Anchorage			
New Construction / Reconstruction ☑	Rehabilitation (3R) ☐	Other:	
Design Functional Classification:	Rural Principal Arterial (PGDHS* p8)		
Terrain:	Rolling		
Level-of-Service:	"B" (PGDHS p504)		
Design Year:	2030		
Present Year ADT:	0		
Design Year ADT:	22,800		
DHV (13%):	3,000		
Directional Split (D, 60/40%):	1,800/1,200		
Trucks (PTT, 7%):	1,600		
Design Vehicle:	WB-120 Tractor Double Trailer		
Design Speed:	70 MPH (PGDHS p503)		
Minimum Radius of Curvature:	2040-feet (PGDHS Exhibit 3-26)		
Maximum Allowable Grade:	4% (PGDHS Exhibit 8-1)		
Minimum Allowable Grade:	0.0% (PCM Figure 1120-1)		
Stopping Sight Distance:	730-feet (PGDHS Exhibit 3-1)		
Passing Sight Distance:	2480-feet (PGDHS Exhibit 3-7)		
Minimum K-value for Vertical Curves:	Sag (Exh 3-75)	Crest (Exh 3-73 and 3-72)	
	181 SSD	2197 PSD	247 SSD
Number of Roadways:	Divided 4-Lane		
Median Width (EOTW to EOTW):	92-feet (PGDHS p509)		
Width of Traveled Way:	12-foot lanes (PGDHS p504-505)		
Width of Shoulders:	Outside	Inside	
	10-feet	4-feet	
Surface Treatment:	Traveled Way	Shoulders	Slopes
	Paved	Paved	Seeded
Clear Zone:	30-feet (PCM Table 1130-2)		
Side Slope Ratios (w/in Clear Zone):	Foreslopes	Backslopes	
	6:1 (PCM Table 1130-2)	3:1 (PCM Table 1130-2)	
Degree of Access Control:	Controlled-access (PGDHS p11 and 92)		
Illumination:	Ramp and intersection safety lighting		
Curb Usage and Type:	Intersection delineation		
Pedestrian Provisions:	Joint-use Pathway		
Bicycle Provisions:	12-foot Pathway in Phase II (PCM Table 1210-1)		
Miscellaneous Criteria:			

* AASHTO Policy on Geometric Design of Highways and Streets, 2004

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Michael R. Tooley — Date
Senior Transportation Engineer
HDR Alaska

APPROVED: 3/24/11

Loran E. Frazier, PE — Date
Chief Engineer
Knik Arm Bridge and Toll Authority

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PROJECT DESIGN CRITERIA

Project: **KNIK ARM CROSSING**, Port of Anchorage to Government Hill			
New Construction / Reconstruction ☑	Rehabilitation (3R) ☐	Other:	
Design Functional Classification:	Urban Principal Arterial (PGDHS* p10)		
Terrain:	Rolling		
Level-of-Service:	"C" desirable, "D" minimum (PGDHS p504)		
Design Year:	2030		
Present Year ADT:	0		
Design Year ADT:	46,700		
DHV (13%):	6,100		
Directional Split (D, 60/40%):	3,700/2,400		
Trucks (PTT, 12%):	5,600		
Design Vehicle:	WB-120 Tractor Double Trailer		
Design Speed:	60 MPH des, 50 MPH min (PGDHS p503)		
Minimum Radius of Curvature:	1330-feet des, 833-feet min (PGDHS Exhibit 3-26)		
Maximum Allowable Grade:	4% des, 5% min (PGDHS Exhibit 8-1)		
Minimum Allowable Grade:	0.3% (Drainage for Curb and Gutter, PCM Figure 1120-1)		
Stopping Sight Distance:	570-feet des, 425-feet min (PGDHS Exhibit 3-1)		
Passing Sight Distance:	2135-feet des, 1835-feet min (PGDHS Exhibit 3-7)		
Minimum K-value for Vertical Curves:	Sag (Exh 3-75)	Crest (Exh 3-73 and 3-72)	
	136 SSD desirable 96 SSD minimum	1628 PSD 1203 PSD	151 SSD 84 SSD
Number of Roadways:	Divided 4-Lane		
Median Width (EOTW to EOTW):	10-feet (PGDHS p513)		
Width of Traveled Way:	12-foot lanes (PGDHS p504-505)		
Width of Shoulders:	Outside	Inside	
	10-feet	4-feet	
Surface Treatment:	Traveled Way	Shoulders	Slopes
	Paved	Paved	Seeded
Clear Zone:	30-feet des, 22-feet min (PCM Table 1130-2)		
Side Slope Ratios (w/in Clear Zone):	Foreslopes	Backslopes	
	6:1 (PCM Table 1130-2)	3:1 (PCM Table 1130-2)	
Degree of Access Control:	Controlled-access (PGDHS p11 and 92)		
Illumination:	Ramp and intersection safety and bridge navigation lighting		
Curb Usage and Type:	Intersection delineation		
Pedestrian Provisions:	Joint-use Pathway		
Bicycle Provisions:	12-foot Pathway in Phase II (PCM Table 1210-1)		
Miscellaneous Criteria:			

* AASHTO Policy on Geometric Design of Highways and Streets, 2004

PROPOSED: 22 March, 2011

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Senior Transportation Engineer
HDR Alaska

APPROVED: 3/24/11

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Chief Engineer
Knik Arm Bridge and Toll Authority

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PROJECT DESIGN CRITERIA

Project: **KNIK ARM CROSSING**			
New Construction / Reconstruction ☑	Rehabilitation (3R) ☐	Other:	
Design Functional Classification:	Minor Collector Road (and Frontage Roads) (PGDHS* p8)		
Terrain:	Rolling		
Level-of-Service:	"C" (PGDHS p420)		
Design Year:	2030		
Present Year ADT:	0		
Design Year ADT:	5,700		
DHV (15%):	860		
Directional Split (D, 60/40%):	520/340		
Trucks (PTT, 4%):	230		
Design Vehicle:	WB-67 Tractor-Trailer		
Design Speed:	50 MPH (PGDHS Exhibit 6-1)		
Minimum Radius of Curvature:	833-feet (PGDHS Exhibit 3-26)		
Maximum Allowable Grade:	7% (PGDHS Exhibit 6-4)		
Minimum Allowable Grade:	0.0% (PCM Figure 1120-1)		
Stopping Sight Distance:	425-feet (PGDHS Exhibit 3-1)		
Passing Sight Distance:	1835-feet (PGDHS Exhibit 3-7)		
Minimum K-value for Vertical Curves:	Sag (Exh 3-75)	Crest (Exh 3-73 and 3-72)	
	96 SSD	1203 PSD	84 SSD
Number of Roadways:	Two-way 2-Lane (Collector and Frontage Roads)		
Median Width (EOTW to EOTW):	20-feet (12+2+4+2) (PGDHS p719)		
Width of Traveled Way:	12-foot lanes (PGDHS Exhibit 6-5)		
Width of Shoulders:	8-feet (PGDHS Exhibit 6-5)		
Surface Treatment:	Traveled Way	Shoulders	Slopes
	Paved	Paved	Seeded
Clear Zone:	26-feet (PCM Table 1130-2)		
Side Slope Ratios (w/in Clear Zone):	Foreslopes	Backslopes	
	4:1 (PCM Table 1130-2)	3:1 (PCM Table 1130-2)	
Degree of Access Control:	ADOT&PF Driveway Regulations		
Illumination:	Intersection safety lighting		
Curb Usage and Type:	Intersection delineation		
Pedestrian Provisions:	Joint-use Pathway		
Bicycle Provisions:	12-foot Pathway in Phase II (PCM Table 1210-1)		
Miscellaneous Criteria:			

* AASHTO Policy on Geometric Design of Highways and Streets, 2004

PROPOSED: 22nd March, 2011

Michael R. Tooley Date
Senior Transportation Engineer
HDR Alaska

APPROVED: 3/24/11

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Chief Engineer
Knik Arm Bridge and Toll Authority

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