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(907) 465-3900

January 30, 1981

Re: Knik Arm Crossing
Turnagain Arm Crossing

200H-3076/0803

The Honorable Vic Fischer
Senate District E
Alaska State Senate
Pouch V
Juneau, Alaska 99811

Dear Senator Fischer:

In answer to Mr. Summer Putnam's questions of Mr. Matlock, we are attaching updated estimates of cost (January 1981 dollars) for the Knik Arm and Turnagain Arm Crossings. In the case of the latter, we have updated both the bridge and causeway alternatives which were last studied in 1967 and 1968, but have not included the cost of the connecting roadway to the south.

The shortest route to the Kenai Peninsula would be on new alignment through the national forest and the national moose range (Points M to N to O on the map) although a much shorter initial connection could be made to Hope (M to L to K on the map). If you need cost estimates to include either of these connections, we will develop and furnish them.

In the case of both the Knik and Turnagain Arm Crossings, there would have to be rather extensive studies and coordination with other agencies before final design could actually begin.

We do consider both crossings to be feasible although, admittedly, expensive.

Sincerely,

R. D. Shumway, P.E.
Deputy Commissioner

Attachment

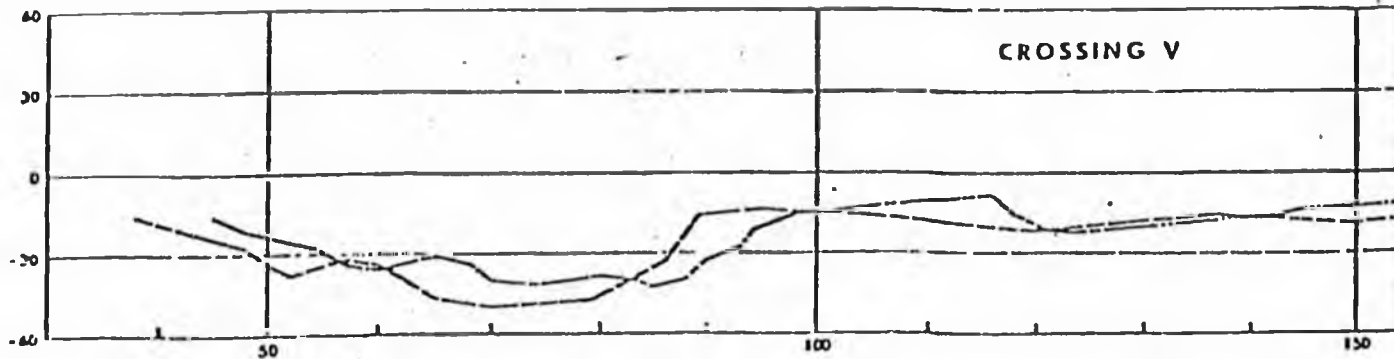
RDS/CSM/kgm

bcc: John Bates
R. D. Redick
Bridge Design
C. S. Matlock



Topographic data on this figure is from U.S.G.S. Quadrangle Maps.

LOCATION MAP



KNIK ARM CROSSING

1/9/81

1971 Estimate

1981 Estimate

	1971 Estimate		1981 Estimate	
	<u>BRIDGE CROSSING IV</u>	<u>CAUSEWAY DAM CROSSING V</u>	<u>BRIDGE CROSSING IV</u>	<u>CAUSEWAY DAM CROSSING V</u>
Total for Crossing	\$114,938,200	\$189,590,600	\$281,598,600	\$464,497,000
Contingencies and Variations (10%)	<u>11,061,800</u>	<u>19,409,400</u>	<u>27,101,400</u>	<u>47,553,000</u>
Estimated Construction Cost	* \$126,000,000	* \$209,000,000	308,700,000	512,050,000
Borings and Soil Testing	** 410,000	** 837,000	** 1,004,500	** 2,050,600
Hydrographic and Land Surveys (0.75%)	945,000	1,567,500	2,315,200	3,840,400
Model Testing and/or Test Structure	520,000	225,000	1,274,000	551,300
Engineering and Administration				
Basic Design (4.0%)	5,040,000	8,360,000	12,348,000	20,482,000
Construction Supervision (4.0%)	5,040,000	8,360,000	12,348,000	20,482,000
Administration (1.5%)	<u>1,890,000</u>	<u>3,135,000</u>	<u>4,630,500</u>	<u>7,680,800</u>
Estimated Crossing Cost	\$140,000,000	\$231,000,000	\$343,000,000	\$567,000,000
Estimated Approach Cost			<u>88,000,000</u>	<u>84,000,000</u>
Total Project Cost			\$431,000,000	\$651,000,000

(Based on January 1981 Dollars)

* Based on 1971 start and 1975 finish

** Includes Geophysical Surveys

B) SUMMARY - BRIDGE CROSSING - ISLE TO CAPE

CONSTRUCTION COSTS

A. LONG SPAN SUPERSTRUCTURE (18,500')

STEEL	$(175 \frac{1}{2} \text{ lb/ft}^2) (18,500' (34')) \times \$1.75 =$	\$192,630,000
CONCRETE	$(34') \times \frac{9}{12} (\frac{1}{2} \times 7) (18,500') \times \$5.00 =$	8,740,000
RESTEEL	$(175 \frac{1}{2} \text{ lb/cy}) (17,500 \text{ cy}) \times \$0.80 =$	2,450,000
JOINTS	$18,500 / 600 = 31 \times \$10,000 =$	310,000
RAILING		240,000
DECK PROTECTION	$18,500' (32') \times \frac{1}{4} \times \$15 =$	990,000

\$ 205,360,000

B. LONG SPAN SUBSTRUCTURE

$18,500' / 600' \text{ AVG} = 31 \text{ SPANS } \approx 32 \text{ UNITS}$

SEE SHT 5 $\times \$4,614,000 (32) =$

147,648,000

C. APPROACHES

7,440,000

TOTAL BASIC CONST.

\$ 360,448,000

C. MOBILIZATION @ 1%

3,604,000

D. CONST. ENGR., ADMIN., CONTINGENCIES @ 20%

72,089,000

TOTAL CONST. COST

\$ 436,141,000

PRE-CONST. COSTS

A. R.O.W.

?

B. PRE-ENGR @ 4% OF BASIC CONST. COST =

14,418,000

C. SPECIAL STUDIES (SEE SHT. 7)

7,000,000

\$ 457,559,000

SAY \$ 450,000,000

JANUARY, 1981
DOLLARS

II. CAUSEWAY / SPILLWAY - ISLE TO CAPE

CONCT. COST INDICES FROM 1967 TO 1981 GENERALLY REFLECT AN INCREASE OF 300% FOR THE PERIOD. EARTH ITEMS, IN VOLUMES ESTIMATED, MAY NO LONGER BE AVAILABLE AS CONSULTANT ENVISIONED, SO A FACTOR SOMEWHAT HIGHER IS APPLIED

ESTIMATED CONSTRUCTION COST	<u>1968</u>	<u>ADJ. FACTOR</u>	<u>1981</u>
End-Dumping Section of Causeway to Elev. 25 — Material in Place			
Quarry-run rock	2,133,000 CY @ \$3.65		\$ 7,785,500
Random material	1,510,000 CY @ 1.65		2,491,500
Armor Rock	501,000 CY @ 11.00		5,511,000
Select Grading Rock	332,000 CY @ 4.00		1,328,000
Seepage Provisions	550,000 CY @ 2.00		1,100,000
	Subtotal		\$18,216,000
		x 5.0 =	\$ 91,080
Barge-placed Material (including Island) — Material in Place			
Selected sand and gravel, talus, or quarry fines			
	880,000 CY @ \$4.30		\$ 3,784,000
Quarry-run rock	2,507,000 CY @ 5.30		13,287,000
Random material	1,747,000 CY @ 3.30		5,765,000
	Subtotal		\$22,836,000
		x 5.0 =	114,180
Cableway Placed Closure Section — Material in Place			
Select Quarry Rock	1,400,000 @ \$5.50		\$ 7,700,000
Quarry medium to fine	1,400,000 @ 4.20		5,880,000
	Subtotal		\$13,580,000
		x 5.0 =	67,900
Completion of Causeway — Above Elev. 25 — Material in Place			
Random material	600,000 CY @ \$1.65		\$ 990,000
Armor riprap	262,000 CY @ 11.00		2,882,000
Select filter material	98,000 CY @ 4.00		392,000
	Subtotal		\$ 4,264,000
		x 5.0 =	21,320
Roadway Across Causeway			
Pavement, including subbase			
	19,500 Lin. Ft. @ \$22.80		\$ 445,000
Guard rail — in place	40,000 Lin. Ft. @ 9.50		380,000
	Subtotal		\$ 825,000
		x 3.0 =	2,475
Spillway			
Concrete Control Wall —			
Excavation	1,000 CY @ \$20.00		\$ 20,000
Concrete in Place	1,000 CY @ 100.00		100,000
Special Shaping	Lump Sum		100,000
Fish Ladder	Lump Sum		700,000
Highway Bridge —			
Structural Steel	1,550,000 lb. @ \$ 0.40		520,000
Concrete	1,762 CY @ 200.00		352,000
Re-steel	283,000 lb. @ 0.20		57,000
Bridge rail	2,180 ft. @ 8.00		17,000
Caissons	Lump Sum		51,000
	Subtotal		\$ 1,917,000
		x 3.0 =	5,751
Estimated Construction Cost — Causeway, Roadway & Bridge (without RR bridge)			
	61,638,000		\$ 302,700
Contingencies — 20%	12,328,000	+20%	60,541
	\$73,966,000		
Engineering & Administration — 15%	11,094,000	+15%	\$ 363,301
	\$85,060,000		54,495
TOTAL ESTIMATED COST —			\$ 417,796
	Say \$85,000,000		SAY \$ 420,000