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STATE OF ALASKA

MAR 12 1982

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

DEPUTY COMMISSIONER - DESIGN AND CONSTRUCTION

POUCH Z
JUNEAU, ALASKA 99811

December 16, 1981

RE: Starrigavian Bay to Katlian River

Alaska State Legislature - House
Honorable Representative Ben Grussendorf
Pouch
Juneau, Alaska 99811

Dear Mr. Grussendorf:

As per your request for information concerning the \$51,000,000.00 estimate for the proposed project, Starrigavian Bay to Katlian River, the following is how the Department of Transportation and Public Facilities developed this cost.

During the early 1960's the State conducted a fairly detailed Reconnaissance study for a roadway between Starrigavian Bay and Rodman Bay. Within this report the sections of the subject roadway were described in detail, and preliminary estimates were developed. (See attached portions of report). At that time the estimated construction cost for the portion in question was approximately \$7,000,000.00 (1964). In 1980, the 1964 Reconnaissance estimates were updated to 1980 monies by the DOT/PF Southeast Region Design section. The method in which these estimates were updated was by applying standard inflation factors (See attached calculations) This brought the estimated construction costs to approximately \$24,000,000.00 (1980).

In May of 1981, Senator Richard I. Eliason, requested estimates for the subject project. The 1980 estimate was updated to \$26,000,000.00 (1981 base cost). In addition preliminary engineering, construction engineering and contingencies were calculated. This resulted in a total project cost in 1981 dollars of \$42,233,800.00.

A letter was sent to Senator Eliason transmitting total project cost estimates for program years 1981, 1982 and 1983. (See attached letter Deputy Commissioner Shumway to Senator Eliason)

These cost estimates are as follows:

<u>Program Year</u>	<u>Estimated Cost</u>
1981	\$42,233,800.00
1982	\$46,457,200.00
1983	\$51,102,900.00

If you should have any further questions concerning these costs, please feel free to contact me at your earliest convenience.

Sincerely,


R.D. Shumway
Deputy Commissioner

cc: Charles Matlock

Attachments as Stated

is the largest single structure on the entire project. The bridge will span a gully 80 feet deep and 270 feet across. Costs for grading will be approximately \$1,140,000.00. Drainage including structures will cost approximately \$500,000.00 for a total cost of \$1,640,000.00.

Mile 39.6 to Mile 41.1

This section ties into logging roads which extend to the proposed end of the project. The terrain traversed by this section is hillside mountainous. Foundation materials are sedimentary graywacke bedrock overlain with unconsolidated materials of blue clayey silt and boulders. Volcanic ash is also present, overlaying the silt material. Clearing here will also be heavy, costing about \$7,000.00 per acre including grubbing. Costs for constructing this section are estimated at \$405,000.00.

Mile 41.1 to Mile 46.1 End of Project

As mentioned previously, logging roads comprise this section entirely. Although a present network of over 27 miles of road exists, these five miles of road are the only segment that is utilized on this project. Costs for widening, straightening, topping and replacing drainage structures will cost an average of \$125,000.00 per mile; for a total of \$625,000.00. The end of this project lies at the most desirable location for a ferry terminal.

SUMMARY:

A summary of costs are listed below:

1968

<u>STATION</u>		<u>COST</u>
Mile	0.0 - 1.0	\$ 305,000.00
Mile	1.0 - 2.5	1,455,000.00
Mile	2.5 - 3.75	510,000.00
Mile	3.75 - 7.0	5,055,000.00
Mile	7.0 - 11.0	2,270,000.00
Mile	11.0 - 20.0	2,700,000.00
Mile	20.0 - 30.0	5,200,000.00
Mile	30.0 - 36.0	2,210,000.00
Mile	36.0 - 39.6	1,640,000.00
Mile	39.6 - 41.1	405,000.00
Mile	41.1 - 46.1	625,000.00

Subtotal \$22,315,000.00

10% Contingencies \$ 2,237,500.00

TOTAL \$24,612,500.00

RECONNAISSANCE STUDY REPORT

OLD SITKA TO RODMAN BAY

JANUARY 1964

STATION BY STATION DISCUSSION:

The following paragraphs are a station by station discussion of the project:

Mile 0 to Mile 1.0

Mile 0 is approximately 500 feet before reaching the present end of the North Sitka Highway. It is necessary to start at this point to achieve the grade requirements at station mile 1.9.

A bridge costing approximately \$110,000.00 will be necessary to cross Starrigavan Creek. This bridge will be approximately 110 feet long and will handle a watershed area of 6.48 square miles. In addition to this runoff, there will be

approximately 8,000 square feet of tidal area in back of the proposed bridge site. The bridge will rest above a stream bed elevation of 8.5 feet.

The first one mile has moderate terrain with grades not exceeding six percent. Clearing and grubbing will cost approximately \$6,000.00 per acre for eight acres. Grading and drainage will cost approximately \$300,000.00 with an additional estimated \$5,000.00 for right of way acquisition.

It is pertinent to note that it will not be possible to utilize the Starrigavan Bridge and extension of the North Sitka Highway as proposed for construction in 1964 by the Bureau of Public Roads, the reason being that it is necessary to move the alignment as far west up the Starrigavan Valley as geometrically possible to achieve the 200 foot elevation at station mile 1.9 on maximum allowable grades.

Mile 1 to Mile 2.5

Mile 0.75 to mile 1.0 is on a plus grade of seven percent. From mile 1.0 to mile 1.9 is a plus grade of 10 percent. Terrain throughout this section is very severe. From mile 1.0 to mile 1.8 it will be necessary to cut partial rock benches into the hillside and make hillside fills as high as 75 feet. These high hillside fills will require abutment fills to retain them. Bedrock through mile 0.75 to mile 1.8 is sedimentary of a tough graywacke type. Rock benches are possible, however, the rock planes run parallel to the hillside and care in blasting would, of course, have to be utilized not to overbreak on the downhill side. Consideration would also have to be given not to construct fills that would deteriorate beneath their weight.

Three bridges will be required at mile 1.9 to cross active landslide areas. These bridges will be 210 feet, 150 feet, and 85 feet long. The slide areas are fault zones in the greenstone bedrock. The exposed rock, having a cross sectional shear face of $\frac{1}{2}$ to 1, in addition to being faulted is weathered and broken. The point of crossing these slide areas is at an elevation of 200 feet. Mile 1.9 is the approximate middle ordinate of the vertical curve for the grades leading up

to and from this point. From this point partial rock benches on a minus grade of 10 percent will be necessary to station mile 2.3. Stable rock benches will be difficult here due to the lack of structural soundness of the greenstone rock that prevails throughout the Katlian Bay area. Mile 2.3 to mile 2.5 is of comparatively moderate terrain and would be of normal fill type construction. Earthwork on this section to mile 2.5 will cost approximately \$1,050,000.00, drainage will cost approximately \$15,000.00 and structures are collectively estimated at \$390,000.00. The earthwork includes the costs for clearing and grubbing.

Thorough studies of alternate routes were conducted in the field before arriving at the previously mentioned course. Two alternate routes were eliminated due to higher costs and lower standards. A shoreline route is not possible due to the extreme depths of water that would be necessary to cross. Depths in excess of 100 feet were encountered immediately off shore throughout the Katlian Bay area with the exception, of course, of Katlian River and South Fork River deltas. It is proposed that this section along with the previous section be let as a single contract to obtain the most economical bid.

Mile 2.5 to 3.75

This section of road would traverse across moderately mountainous type terrain. With the exception of 1,000 feet of standing timber, the entire section crosses an area that was logged off during 1961.

Alignment here would be to maximum allowable standards entailing reverse and broken back curves to maintain grades and balance quantities, thereby lowering costs. Grades would be, at best, defined as rolling with maximum grades reaching as high as eight percent. Drainage would best be handled using small bridges, as the debris left by past logging operations is enormous. These bridges would be single span averaging 45 feet in length and high enough to allow a small dozer to clean out the debris that would collect beneath them. There are seven of these bridges costing approximately \$20,000.00 each.

Topping material for this section, as with the previous sections, would come from the Starrigavan Creek area located at mile 0.5. This section is proposed as a single contract due to the enormity of the following section.

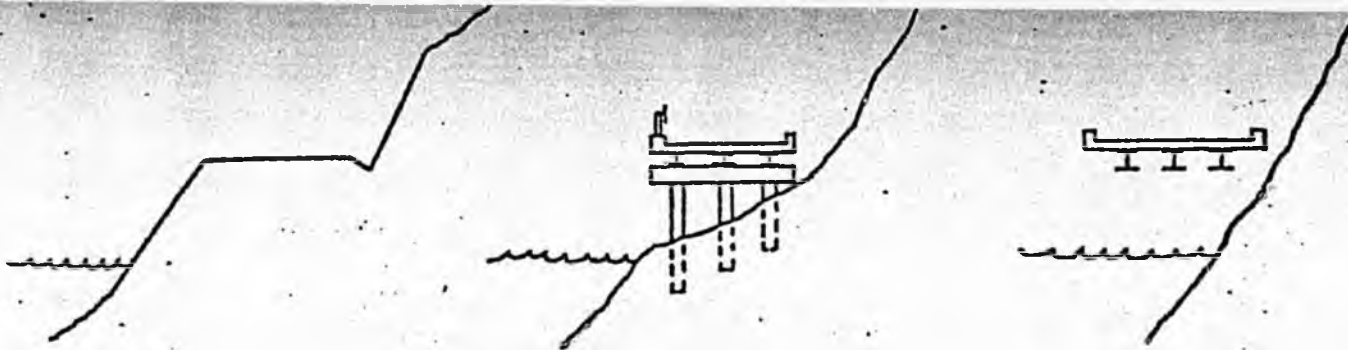
This section will cost approximately \$510,000.00 to construct.. This figure allows \$320,000.00 for grading, \$150,000.00 for drainage, and \$40,000.00 for clearing and grubbing. Miscellaneous items such as guardrail, turnouts, etc., are included in the grading estimate.

Mile 3.75 to Mile 7.0

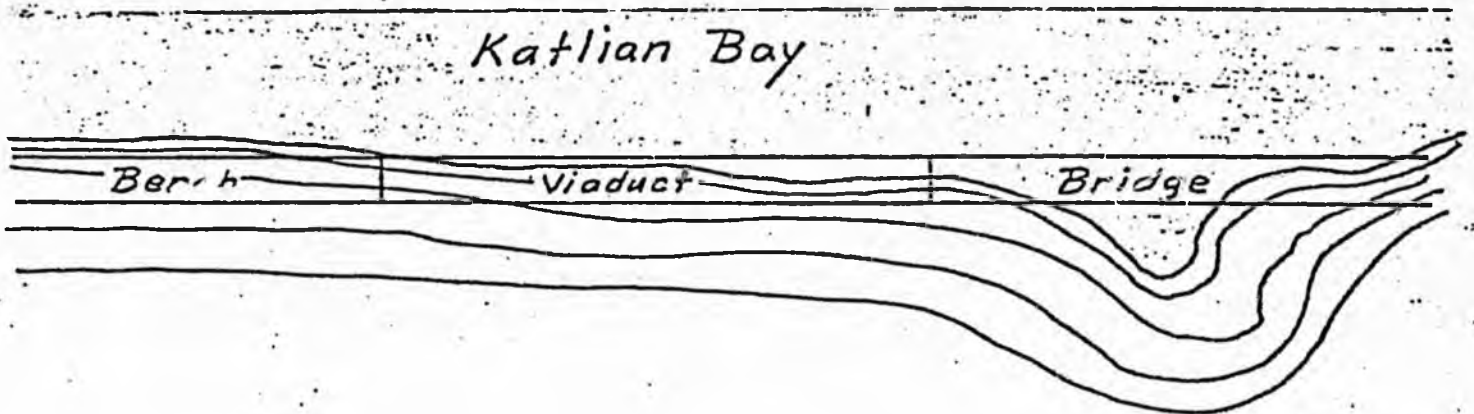
This section is discussed as a unit because it is necessary to extend this section of the project to the South Fork River basin or Katlian River basin areas to obtain the required amounts of select topping materials and concrete aggregate.

Terrain throughout all but the last 4,000 feet is extremely severe. The first 5,000 feet is a sheer rock face rising from the water on a 70-80 degree slope to an average elevation of 425 feet. This rock face is a faulted, weathered, and broken greenstone. The major fault zone extends south into Baranof Island over one mile. Large broken pieces of rock hang and balance on the face of these cliffs and, in some cases, these rock pieces reach the size of a lot size three story building. For reasons of safety, it would be necessary to remove the broken rock prior to the start of grading operations. Immediately offshore the depth of water reaches over 100 feet and rapidly gets deeper. In some places the rock face appears to overhang beneath the water. The next 8,000 feet has an abruptly changing profile with an average elevation of 45 feet. The last 3,000 feet is moderate rolling to flat terrain having foundation materials comprised of glacier gravel of the highest quality.

The first 5,000 feet will require cutting full rock benches where possible and concrete viaduct structure to full single span concrete bridges where only partial foundations are possible. These types of construction are illustrated on page six.



The sketch below illustrates where the different methods of construction would occur:



The above conditions exist for 5,000 feet. The actual construction would entail 950,000 cubic yards of unclassified excavation (rock) and 1,700 feet of concrete viaduct/bridge structure. The rock is priced at \$2.00 per yard and the concrete structures \$1,000.00 per lineal foot. 7,500 cubic yards of type I borrow and 2,500 cubic yards of type II borrow would be required. Both the type I and II borrow would cost about \$1.40 per yard including overhaul. 2,300 feet of guard rail is estimated at \$8.00 per foot. Miscellaneous items such as clearing would cost about \$3,000.00. These items collectively total \$3,635,000.00.

The next 8,000 feet will cost approximately \$760,000.00 including two bridges at mile 4.5 and mile 4.9, which are 100 and 210 feet long respectively. The last portion will cost \$660,000.00. This cost includes a major bridge 235 feet long at South Fork River.

Mile 7.0 to Mile 11.0

The terrain on this portion varies from flat to severe mountainous, as experienced at mile 3.8. The first 10,000 feet includes a major bridge at mile 6.8, the Katlian River. This bridge would be 260 feet long, costing approximately

Sifters to Redwan Bay

①

Proposed Construction Phases

- 1) Old Sifter to Kadhiam River - 16 miles
Approximate length = 16 miles
- 2) Kadhiam River to Alkwasima Passage
Approximate length = 12 miles
- 3) Alkwasima Passage to Fish Bay
Approximate length = 10 miles
- 4) Fish Bay to Redwan Bay (EOP)
Approximate length = 17 miles

Note: All cost are based on the 1964 Reconnaissance Report "Old Sifter to Redwan Bay" and inflated by a factor of 2.75 to reflect 1974 dollars and then by a factor of 1.59 to get into 1980 manies.

Old Sitka to Kattian River

(2)

Proposed project length (approx) = 6 miles

Section No 1 - End of existing to Mile 1.50

$$\begin{aligned} \text{Est. cost (1964)} &= \$1,455,000^{00} \\ \times \text{Inflation factor} &= \underline{2.16} \end{aligned}$$

$$\begin{aligned} \text{Est. cost (1974)} &= \$3,142,800^{00} \\ \times \text{Inflation factor} &= \underline{1.59} \end{aligned}$$

$$\text{Est. Cost (1980)} = \underline{\$4,997,052^{00}}$$

Section No 2 - Mile 1.50 to Mile 2.75

$$\begin{aligned} \text{Est cost (1964)} &= \$510,000^{00} \\ \times \text{Inflation factor} &= \underline{2.16} \end{aligned}$$

$$\begin{aligned} \text{Est. cost (1974)} &= \$1,101,600^{00} \\ \times \text{Inflation factor} &= \underline{1.59} \end{aligned}$$

$$\text{Est. cost (1980)} = \underline{\$1,751,544^{00}}$$

Section No 3 - Mile 2.75 to Mile 6.00

$$\begin{aligned} \text{Est. cost (1964)} &= \$5,055,000^{00} \\ \text{Inflation factor} &= \underline{2.16} \end{aligned}$$

(3)

$$\frac{\text{Est cost (1974)} = \$10,918,800^{00}}{\text{Inflation factor} \quad \underline{1.59}}$$

$$\text{Est cost (1980)} = \underline{\underline{\$17,360,892^{00}}}$$

Summary

$$\text{Section No 1 est cost} = \$4,997,052$$

$$\text{Section No 2 est. cost} = \$1,751,544$$

$$\text{Section No 3 est. cost} = \underline{\underline{\$17,360,892}}$$

$$\text{Total estimated cost (1980)} = \underline{\underline{\$24,109,488^{00}}}$$

$$\text{Cost per mile} = 24,109,488 \div 6 = \underline{\underline{\$4,018,248^{00}}}$$

$$\text{SML} / 5 = 2-80$$

$$\text{Est cost (1980)} = \underline{\underline{\$24,109,488^{00}}}$$

$$\text{Inflation} \quad \underline{\underline{1.10}}$$

$$\text{Est. cost (1981)} = \underline{\underline{\$26,520,437^{00}}}$$

By: SML

PRELIMINARY COST ESTIMATE

Date: 5/20/81

Project Number

Title Old Sitka to Ketchikan River

Location Sitka - Length = 6 miles

Sitka - Length = 6 miles

* Scope of Work New construction - construct a 23' (min) roadway between Stannish Bay and Ketchikan River - Program Yr. 1983

	1981 Base Cost	Percent* Contingency	Total 1981 Cost	Program Year	Estimated** Cost in Program Year
PRELIMINARY ENGINEERING	1,939.01	.30	2,585.7	1983	3,128.7
RIGHT-OF-WAY					
a. Incidentals	—	—	—	—	—
b. Land Acquisition	—	—	—	—	—
UTILITIES	—	—	—	—	—
CONSTRUCTION	26,520.4	.30	34,476.5	1983	41,716.6
CONSTRUCTION ENGINEERING (@ 15% of Construction)	3,918.1	.30	5,171.5	1983	6,257.5
TOTALS	32,437.5		42,233.8		51,102.9

*Contingency factors (See attached)

**Increases for inflation, by phase, in the program year after 1981:

<u>Program Year</u>	<u>Add for Inflation @ 10% Compounded</u>
1 - 1982	10%
2 - 1983	21%
3 - 1984	33%
4 - 1985	46%
5 - 1986	61%
6 - 1987	77%

* Note: Earthwork includes heavy rock work. Extensive causeway structures.

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

JAY S. HAMMOND, GOVERNOR

Phone: 789-0841

May 21, 1981

Re: Starrigavan Bay and
Katlian River

Alaska State Legislature - Senate
Honorable Senator Richard I. Eliason
Pouch V
Juneau, Alaska 98111

Dear Mr. Eliason:

As per your request of May 13, 1981, the following are the estimated costs for a proposed roadway northeast of Sitka between Starrigavan Bay and Katlian River.

Base Year Cost 1981: \$42,233,800.00.

Base Year Cost 1982: \$46,457,200.00.

Base Year Cost 1983: \$51,102,900.00.

These estimated costs not only include the construction costs, but preliminary engineering, and construction engineering also.

If you should have any questions concerning these estimates, please feel free to contract me, at your earliest convenience.

Sincerely;

R. D. Shumway
Deputy Commissioner
Design and Construction
DOT/PF

cc: Charles Matlock

Mort Cook

THE FOLLOWING DOCUMENT(S) MAY NOT FILM
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KATY TEST
465-3824

PRELIMINARY COST ESTIMATE

By: SMC
Date: 5/20/81

Project Number

Title: Old Sifts to Katy River

Location: Sifts - Length - Curves

* Scope of Work: New Construction - Construct a 28' (min) wide roadway between Jammer River and Katy River - Program Yr. 1983

	1981 Base Cost	Percent Contingency	Total 1981 Cost	Program Year	Estimated** Cost in Program Year
PRELIMINARY ENGINEERING	1,939.0	.30	2,585.7	1983	3,128.7
RIGHT-OF-WAY					
a. Incidentals	—	—	—	—	—
b. Land Acquisition	—	—	—	—	—
UTILITIES	—	—	—	—	—
CONSTRUCTION	26,510.4	.30	34,472.5	1983	41,714.6
CONSTRUCTION ENGINEERING (@ 15% of Construction)	3,978.1	.30	5,171.5	1983	6,257.5
TOTALS	32,437.5		42,338		51,102.9

*Contingency factors (See attached)

**Increases for inflation, by phase, in the program year after 1981:

Program Year	Add for Inflation @ 10% Compounded
1 - 1982	10%
2 - 1983	21%
3 - 1984	33%
4 - 1985	46%
5 - 1986	61%
6 - 1987	77%

* Note: Earthwork includes heavy rock work including causeway structures.

Rep. Grossman

Special Appro. of \$1,102,900
for the preliminary engineering
construction engineering and construction
costs for a Roadway NE of Sitka
between Starvigwan Bay and Kallum
River

(Base year cost 1983)

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