CSSB 364 cont. - SB/364/ SB 365

2099

SELDOVIA SMALL BOAT HARBOR - 9-2-70

Offered: 2/9/84
Referred: Rules

Original sponsors: Sackett, Bennett, Ferguson and Moss

Funding Information
General Fund $13,761,700
Other Funds - 0 -
$13,761,700

IN THE SENATE BY THE FINANCE COMMITTEE

CS FOR SENATE BILL NO. 364 (Finance)

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making special appropriations to certain communities and municipalities for erosion control projects; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $13,761,700 is appropriated from the general fund for payment as grants for erosion control projects to the following communities and municipalities and in the following amounts:

Kotlik	$1,008,500	
Togiak	2,192,100	
Port Heiden	340,000	
Bethel	5,000,000	
Egegik	594,400	
Akiak	494,700	
Nunapitchuk	326,700	
Napakiak	100,000	
Shishmaref	1,400,000	
Delta Junction	950,000	
Deering	400,000	
Noatak	6,000	
Circle	240,000	(planning, design and engineering)
Noorvik	63,000	
Angoon	246,300	

* Sec. 2. The sum of $400,000 is appropriated from the general fund for

payment as a grant to the Matanuska-Susitna Borough for stabilization of the old railroad dike at the confluence of the Matanuska River and King River.

* Sec. 3. The appropriations made by sec. 1 of this Act shall be disbursed in accordance with AS 37.05.315 and 37.05.317. The appropriation made by sec. 2 of this Act shall be disbursed in accordance with AS 37.05.315.

* Sec. 4. This Act takes effect immediately in accordance with AS 01.-10.070(c).

Introduced: 1/20/84
Referred: Transportation and Finance

Funding Information
General Fund $30,105,300
Other Funds - 0 -
$30,105,300

BY SACKETT, BENNETT, FERGUSON AND MOSS

IN THE SENATE

SENATE BILL NO. 364

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making special appropriations to the Department of Transportation and Public Facilities and to certain communities and municipalities for erosion control projects and feasibility studies; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $275,000 is appropriated from the general fund for payment as grants for feasibility studies of erosion control projects to the following communities and municipalities and in the following amounts:

Naknek	$100,000
Nenana	100,000
Juneau	75,000

* Sec. 2. The sum of $29,785,300 is appropriated from the general fund for payment as grants for erosion control projects to the following communities and municipalities and in the following amounts:

Kotlik	$1,008,500
Tuntutuliak	570,900
Clark's Point	3,295,200
Kipnuk	431,200
Tegiak	2,192,100
Port Heiden	340,000
Bethel	7,800,000
Aniak	1,445,300

Egegik	594,400
Akiak	494,700
Nunapitchuk	326,700
Napakiak	100,000
Shishmaref	1,400,000
Galena	5,000,000
Delta Junction	96,000
Deering	400,000
Noatak	6,000
Circle	2,000,000
Noorvik	63,000
Koyukuk	400,000
Huslia	345,000
Angoon	246,300
Yakutat	1,230,000

* Sec. 3. The sum of $45,000 is appropriated from the general fund to the Department of Transportation and Public Facilities for costs related to erosion control projects and feasibility studies, including travel expenses, for which grants are made under secs. 1 and 2 of this Act.

* Sec. 4. The appropriations made by secs. 1 and 2 of this Act shall be disbursed in accordance with AS 37.05.315 and 37.05.317.

* Sec. 5. This Act takes effect immediately in accordance with AS 01.-10.070(c).

COMMITTEE REPORT

SENATE

FURTHER:

3/27/84

Date: 3/9/84

Mr. President:

The Committee on FINANCE has had SB 364

special appropriations to the Department of Transportation and Public Facilities and to certain communities and municipalities for erosion control projects and feasibility studies; ofd.

under consideration and (a majority of the committee) (the committee) reports it back with the following recommendations:

[ ] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] same title

[ ] replace with CS for SB 364 (FIN) [ ] new title

and recommends Do Pass

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note

[ ] reports it back without recommendation

[ ] referred to the _____ Committee

MEMBERS SIGNING
DO PASS

MEMBERS HAVING
OTHER RECOMMENDATIONS:

CHAIRMAN

Cook
2/9/84

Original sponsors: Sackett, Bennett, Ferguson and Moss

Funding Information
General Fund ~~$14,161,700~~ 13,761,700
Other Funds - 0 -
~~$14,161,700~~ 13,761,700

IN THE SENATE BY THE FINANCE COMMITTEE

CS FOR SENATE BILL NO. 364 (Finance)

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making special appropriations to certain communities and municipalities for erosion control projects; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $13,761,700 is appropriated from the general fund for payment as grants for erosion control projects to the following communities and municipalities and in the following amounts:

Kotlik	$1,008,500	
Togiak	2,192,100	
Port Heiden	340,000	
Bethel	5,000,000	
Egegik	594,400	
Akiak	494,700	
Nunapitchuk	326,700	
Napakiak	100,000	
Shishmaref	1,400,000	
~~Galena~~	~~400,000~~	Delete
Delta Junction	950,000	
Deering	400,000	
Noatak	6,000	
Circle	240,000	(planning, design and engineering)
Noorvik	63,000	
Angoon	246,300	

* Sec. 2. The sum of $400,000 is appropriated from the general fund for payment as a grant to the Matanuska-Susitna Borough for stabilization of the old railroad dike at the confluence of the Matanuska River and King River.

* Sec. 3. The appropriations made by sec. 1 of this Act shall be disbursed in accordance with AS 37.05.315 and 37.05.317. The appropriation made by sec. 2 of this Act shall be disbursed in accordance with AS 37.05.315.

* Sec. 4. This Act takes effect immediately in accordance with AS 01.-10.070(c).

Introduced: 1/20/84
Referred: Transportation and Finance

Funding Information
General Fund $30,105,300
Other Funds - 0 -
$30,105,300

BY SACKETT, BENNETT, FERGUSON AND MOSS

IN THE SENATE

SENATE BILL NO. 364

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making special appropriations to the Department of Transportation and Public Facilities and to certain communities and municipalities for erosion control projects and feasibility studies; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $275,000 is appropriated from the general fund for payment as grants for feasibil ty studies of erosion control projects to the following communities and municipalities and in the following amounts:

Naknek	$100,000
Nenana	100,000
Juneau	75,000

* Sec. 2. The sum of $29,785,300 is appropriated from the general fund for payment as grants for erosion control projects to the following communities and municipalities and in the following amounts:

Kotlik	$1,008,500
Tuntutuliak	270,900
Clark's Point	3,295,200
Kipnuk	431,200
Togiak	2,192,100
Port Heiden	340,000
Bethel	7,800,000
Aniak	1,445,300

Egegik	594,400
Akiak	494,700
Nunapitchuk	326,700
Napakiak	100,000
Shishmaref	1,400,000
Galena	5,000,000
Delta Junction	96,000
Deering	400,000
Noatak	6,000
Circle	2,000,000
Noorvik	63,000
Koyukuk	400,000
Huslia	345,000
Angoon	246,300
Yakutat	1,230,000

* Sec. 3. The sum of $45,000 is appropriated from the general fund to the Department of Transportation and Public Facilities for costs related to erosion control projects and feasibility studies, including travel expenses, for which grants are made under secs. 1 and 2 of this Act.

* Sec. 4. The appropriations made by secs. 1 and 2 of this Act shall be disbursed in accordance with AS 37.05.315 and 37.05.317.

* Sec. 5. This Act takes effect immediately in accordance with AS 01.-10.070(c).

TASK FORCE ON
EROSION CONTROL

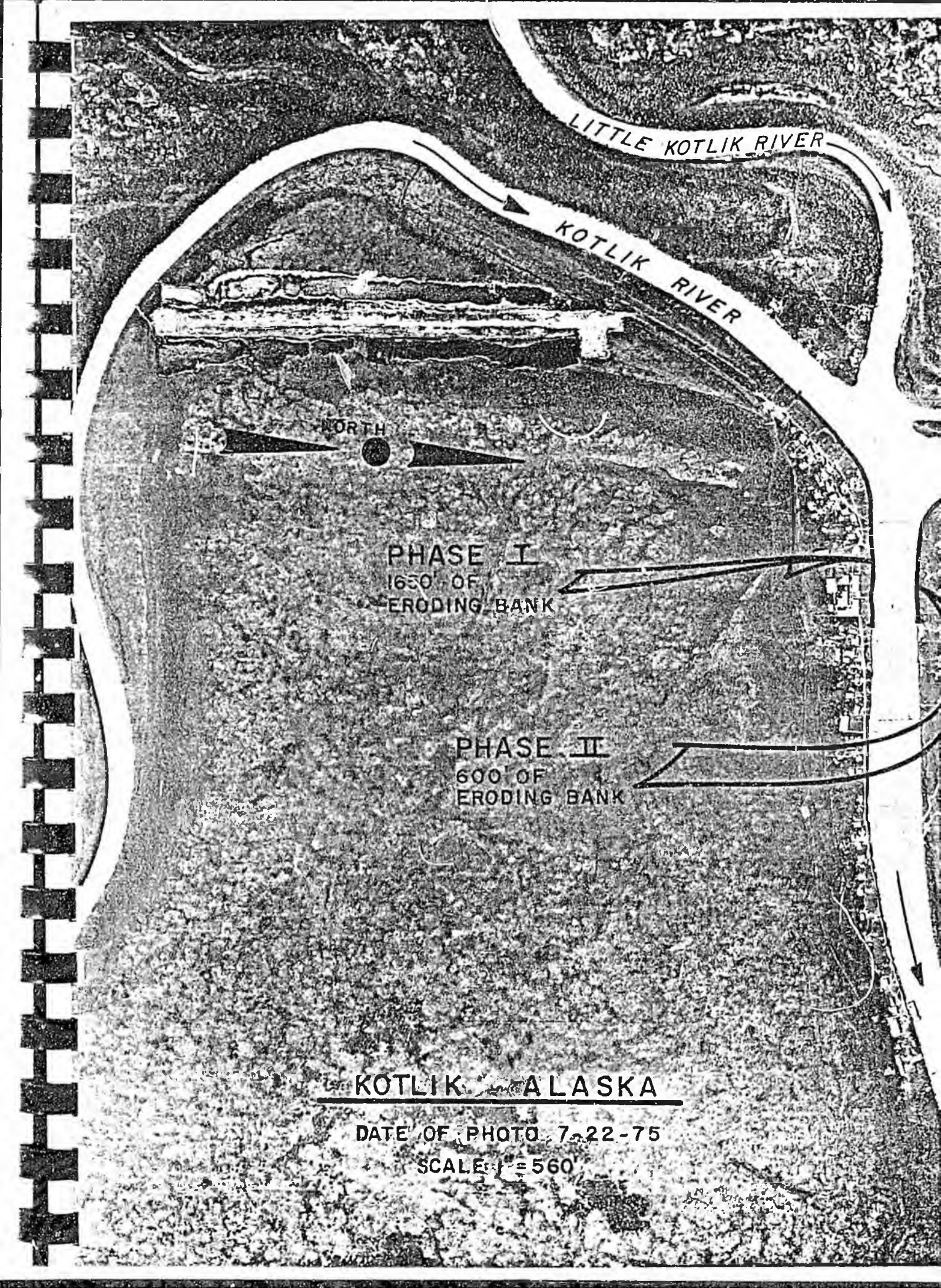
PRELIMINARY DESIGN
AND REPORT FOR
KOTLIK, ALASKA

BY. W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATE OF ALASKA
POUCH 6900
ANCHORAGE, ALASKA
99502

(907) 333-0616
OR
(907) 243-3584

DECEMBER 22, 1983

W. F. BARBER JR.



KOTLIK, ALASKA

DATE OF PHOTO 7-22-75

SCALE 1" = 560'

KOTLIK ALASKA

LAT 63.02'00", NORTH LONG 163.33'00", WEST ELEV. 5' (AT AIRSTRIP)

ON SEPTEMBER 12, 1983 THE INVENTORY TEAM FOR THE CENTRAL REGION'S EROSION CONTROL TASK FORCE VISITED THE COMMUNITY OF KOTLIK WHICH IS LOCATED ON THE EAST BANK OF THE KOTLIK SLOUGH ABOUT 35 MILES NORTHEAST OF EMMONAK ALASKA AND ABOUT 67 MILES NORTH OF ST. MARY'S ALASKA IN THE YUKON KUSKOKWIM DELTA. THIS LOCATION ALLOWS EASY ACCESS BY BARGE AND LARGE RIVER BOATS.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

JOHN FRITZ
MATERIALS SECTION
CENTRAL REGION

E. ALLEN CHURCHILL
FLOOD PLAIN MANAGEMENT
CORPS OF ENGINEERS

UPON ARRIVAL THE TEAM MET WITH KOTLIK'S MAYOR JOSEPH MIKE WHO PROVIDED MUCH OF THE INFORMATION WHICH WE USED. TOGETHER WITH THE REPORT WRITTEN BY NORTHERN TECHNICAL SERVICES OF ANCHORAGE (NORTEC) TITLED KOTLIK EROSION CONTROL STUDY DATED MARCH 1983.

I EXPLAINED TO MR. MIKE THAT THE PURPOSE OF THE TASK FORCE WAS TO INVENTORY, ON A STATEWIDE BASIS, AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS, AND TO MAKE RECOMMENDATIONS TO THE COMMISSIONER ALONG WITH A LIST OF PRIORITIES AS WELL AS POSSIBLE SOLUTIONS TO THOSE AREAS OF CONCERN. I CAUTIONED HIM THAT JUST BECAUSE WE HAD VISITED HIS COMMUNITY AND HAD FOUND A PROBLEM DID NOT MEAN THAT THERE WOULD BE A PROJECT IN THE NEAR FUTURE AS ANY PROJECT WOULD REQUIRE FUNDING THROUGH THE LEGISLATIVE PROCESS. MR. MIKE INDICATED THAT HE UNDERSTOOD AND WANTED TO KNOW IF I WOULD BE ABLE TO SUPPLY HIM WITH A COPY OF MY RECOMMENDATIONS. I TOLD HIM THAT IT WAS THE INTENTION OF THE TASK FORCE TO WORK AS CLOSELY WITH EACH COMMUNITY AS WE COULD, AND THAT WE PLANNED TO INFORM EACH COMMUNITY OF OUR RECOMMENDATIONS AS SOON AS POSSIBLE.

BASED ON THE ON SITE EVALUATION I TEND TO AGREE WITH NORTEC'S SUMMARY OF THE EROSION PROBLEN. THE REPORT SHOWS ABOUT 3,000 FEET OF RIVER BANK BEING EFFECTED BY EROSION AT A RATE OF BETWEEN 3 TO 4 FEET PER YEAR.

THERE ARE A NUMBER OF BUILDINGS WHICH ARE THREATENED BY THIS EROSION. WHILE THE MAJORITY OF THESE BUILDINGS ARE PRIVATELY OWNED HOUSES, PART OF THE BIA SCHOOL COMPLEX, THE BAPTIST CHURCH, AND ONE COMMERCIAL BUILDING WILL BE IMPACTED BY EROSION PROBLEMS IN THE NEAR FUTURE (LESS THAN 10 YEARS).

RIVER EROSION IS CURRENTLY UNDERMINING THE BOARDWALK WHICH RUNS ALONG THE KOTLIK RIVER. BASED ON AN ON SITE EVALUATION OF THE BOARDWALK THERE IS A GOOD CHANCE THAT THE COMMUNITY WILL LOSE 200 TO 300 FEET OF THE WALK WITHIN THE NEXT YEAR.

MR. MIKE INDICATED THAT THE RIVER ICE THICKNESS IS USUALLY 2.5 TO 3 FEET IN THE CHANNEL AND THAT CONSIDERABLE EROSION OF THE BANK IS CAUSED BY BOAT TRAFFIC. WHEN ASKED ABOUT THE SPEED OF THE BOATS, HE INDICATED THAT THE VILLAGE HAD IMPOSED SPEED LIMITS AND THAT, FOR THE MOST PART ALMOST, ALL OF THE BOATS OBEYED THEM.

ACCORDING TO THE NORTEC REPORT A COST OF $1,636,000 IN 1982 DOLLARS WOULD HAVE TO BE SPENT IN ORDER TO REPLACE THE STRUCTURES IF SOME ACTION WAS NOT TAKEN WITHIN THE NEXT THREE YEARS.

THE QUESTION OF POSSIBLE RELOCATION OF MANY OF THESE STRUCTURES IS REALLY NOT VIABLE BECAUSE THE COMMUNITY HAS MARSH LANDS ALL AROUND IT AND THERE IS NO WHERE YOU COULD MOVE THE COMMUNITY, WITHOUT MOVING THE COMPLETE VILLAGE TO ANOTHER LOCATION. THIS MEANS THAT IF THE VILLAGE DOES NOT DO SOMETHING IN THE NEAR FUTURE (LESS THAN 3 YEARS) THAT WE ARE LOOKING AT RECONSTRUCTION OF A VILLAGE AT A NEW SITE SOME DISTANCE AWAY WHICH WOULD PUT THE COST MUCH HIGHER THAN THE ORIGINAL $1,636,000.

ONE QUESTION WHICH THE NORTEC STUDY DOES NOT INVESTIGATE IS THAT IT MIGHT BE IN THE BEST INTEREST OF THE STATE TO ONLY PROTECT THE MAIN TOWN SITE AND RECOMMEND THAT CONSIDERATION BE GIVEN TO A "NO BUILD" OPTION FOR THE OTHER AREAS WHICH ARE LOCATED ON THE ISLAND BETWEEN THE YUKON RIVER AND THE KOTLIK RIVER AND THE AREA WHICH IS LOCATED BETWEEN THE KOTLIK RIVER AND KOTLIK SLOUGH. THIS WOULD SUBTANCIALLY REDUCE THE AMOUNT OF FUNDS WHICH WOULD BE REQUIRED TO PROTECT THE COMMUNITY.

BECAUSE OF THE COMMUNITY'S DEPENDENCE ON ACCESS TO THE RIVER FOR ECONOMIC AND TRANSPORTATION NEEDS IT IS FELT THAT THE DESIGN SHOULD INCORPORATE EASY ACCESS TO THE RIVER BY MEMBERS OF THE COMMUNITY.

THE DESIGN WHICH FOLLOWS ALLOWS FOR TWO PHASES. THE FIRST PHASE WOULD PROTECT THE MAIN PART OF THE COMMUNITY AND THE SECOND PHASE WOULD PROTECT THE PART OF THE COMMUNITY WHICH IS LOCATED ACCROSS THE RIVER.

THE CONCEPTUAL DESIGN WILL HAVE TWO TYPICAL SECTIONS. THE FIRST WHICH WOULD BE USED BY THE COMMUNITY FOR ACCESS TO THE RIVER WOULD BE 500 FEET OF CONCRETE MAT DESIGN WHICH WOULD BE DIVIDED INTO TWO POINTS OF ACCESS 250 FEET EACH LEAVING 1150 FEET OF BANK WHICH WOULD BE PROTECTED USING THE PILE AND FASCINE REVETMENT METHOD.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: KOTLIK, ALASKA

PROJECT NUMBER E30023

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 16, 1983

REMARKS: PHASE I WHICH WILL INCLUDE 500 FEET OF CONCRETE EROSION MAT AND 1150 FEET OF PILE AND FASCINE REVETMENT.

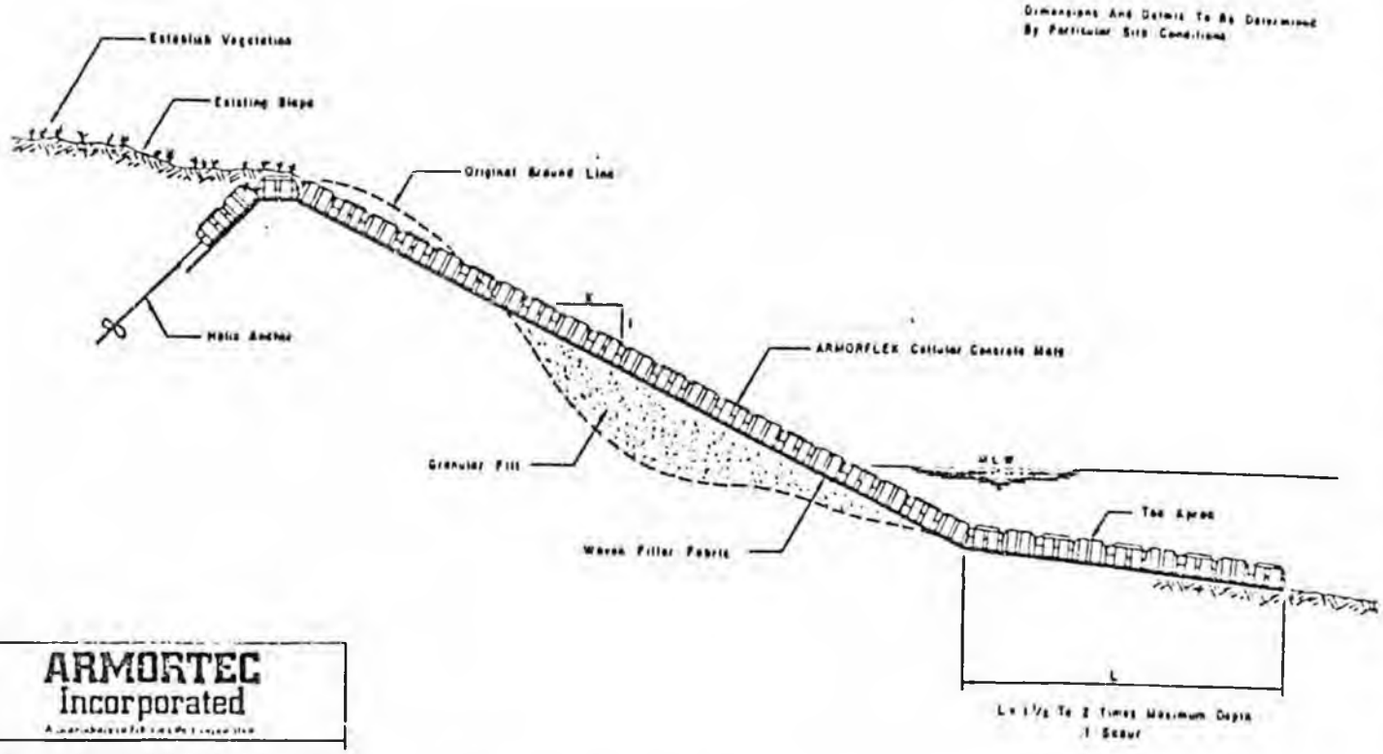
ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110 (1)	MOBILIZATION		LUMP SUM	LUMP SUM	82,687.50
	CONCRETE MAT COMPLETE	500	LINEAR FOOT	700.00	350,000.00
	PILE & FASCINE REVETMENT	1150	LINEAR FOOT	175.00	201,250.00
	SUB TOTAL				633,937.50
	ENGINEERING & CONTINGENCIES				95,090.63
	TOTAL PHASE I				729,028.13

PHASE I COST PER LINEAR FOOT = $441.84

REMARKS: PHASE II WHICH WILL INCLUDE 100 FEET OF CONCRETE TYPE EROSION MAT AND 750 FEET OF PILE AND FASCINE REVETMENT.

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110(1)	MOBILIZATION		LUMP SUM	LUMP SUM	31,696.88
	CONCRETE MAT COMPLETE	100	LINEAR FOOT	735.00	73,500.00
	PILE & FASCINE REVETMENT	750	LINEAR FOOT	183.75	137,812.50
	SUB TOTAL				243,009.38
	ENGINEERING & CONGENCIES				36,451.41
	TOTAL PHASE II				279,460.78
	TOTAL OF PHASE I AND II				1,008,488.91

PHASE I & II COSTS PER LINEAR FOOT = $403.40



ARMORFLEX REVETMENT WITH TOE APRON

ARMORTEC
Incorporated

CONCRETE EROSION CONTROL MAT

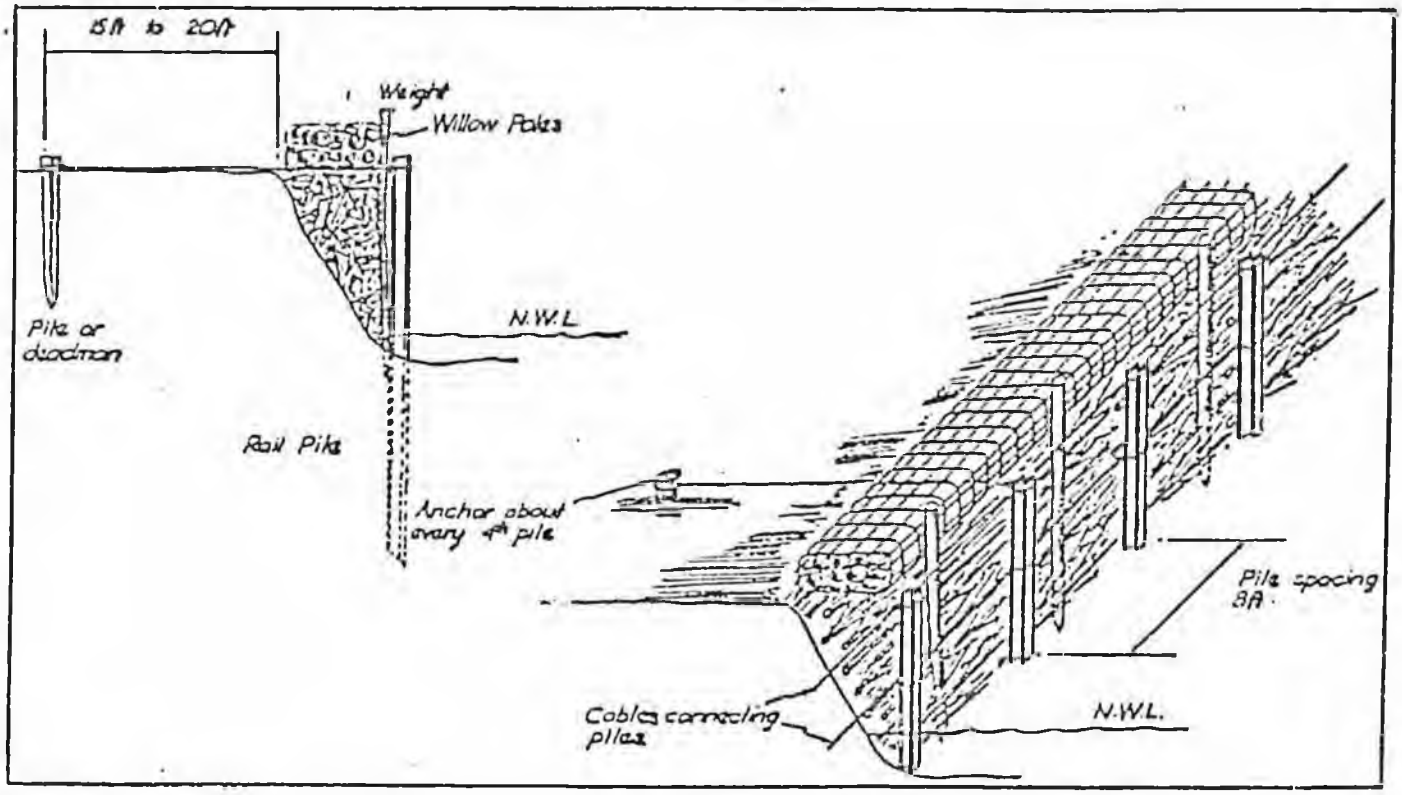
THE ABOVE DRAWING IS ONLY A CONCEPTUAL DRAWING OF ONE OF A NUMBER OF DIFFERENT DESIGNS WHICH ARE CURRENTLY ON THE MARKET. THIS REPORT IN NO WAY IS RECOMMENDENING THIS DESIGN OVER SOME OTHER MANUFACTURERS. THE REPORT IS ONLY USING THIS DESIGN AS AN EXAMPLE OF ONE TYPE WHICH COULD BE USED FOR EROSION CONTROL IN THIS COMMUNITY.

"ARMORFLEX EROSION CONTROL SYSTEM" LIKE A NUMBER OF OTHER SYSTEMS WILL PROVIDE ADEQUATE EROSION PROTECTION FOR THE COMMUNITY AND IT WILL PROVIDE ACCESS TO THE RIVER BY THE COMMUNITY WHICH IS A VERY IMPORTANT FEATURE IN THE DESIGN.

THESE TYPES OF SYSTEMS ARE PLACED BY CONVENTIONAL CONSTRUCTION EQUIPMENT DIRECTLY ON THE PREPARED BANK AS THE SYSTEMS ARE NORMALLY PRE-ASSEMBLED MATS OF INTERLOCKING GRIDS WHICH ARE INTERCONNECTED WITH CABLES OR A FILTER CLOTH. SOME DESIGNS DO OFFER AN OPTIONAL METHOD FOR AREAS WHERE LIMITED ACCESSS IS AVAILABLE TO ALLOWING PLACEMENT BY HAND AND THE INTERLOCKING GRIDS WITH CABLES OR LOCK-PINS ARE ADDED DIRECTLY ON THE SITE.

THIS TYPE OF DESIGN HAS PROVEN VERY EFFECTIVE IN AREAS WHERE THE SOIL CONDITIONS ARE POOR AS WE HAVE IN THIS AREA.

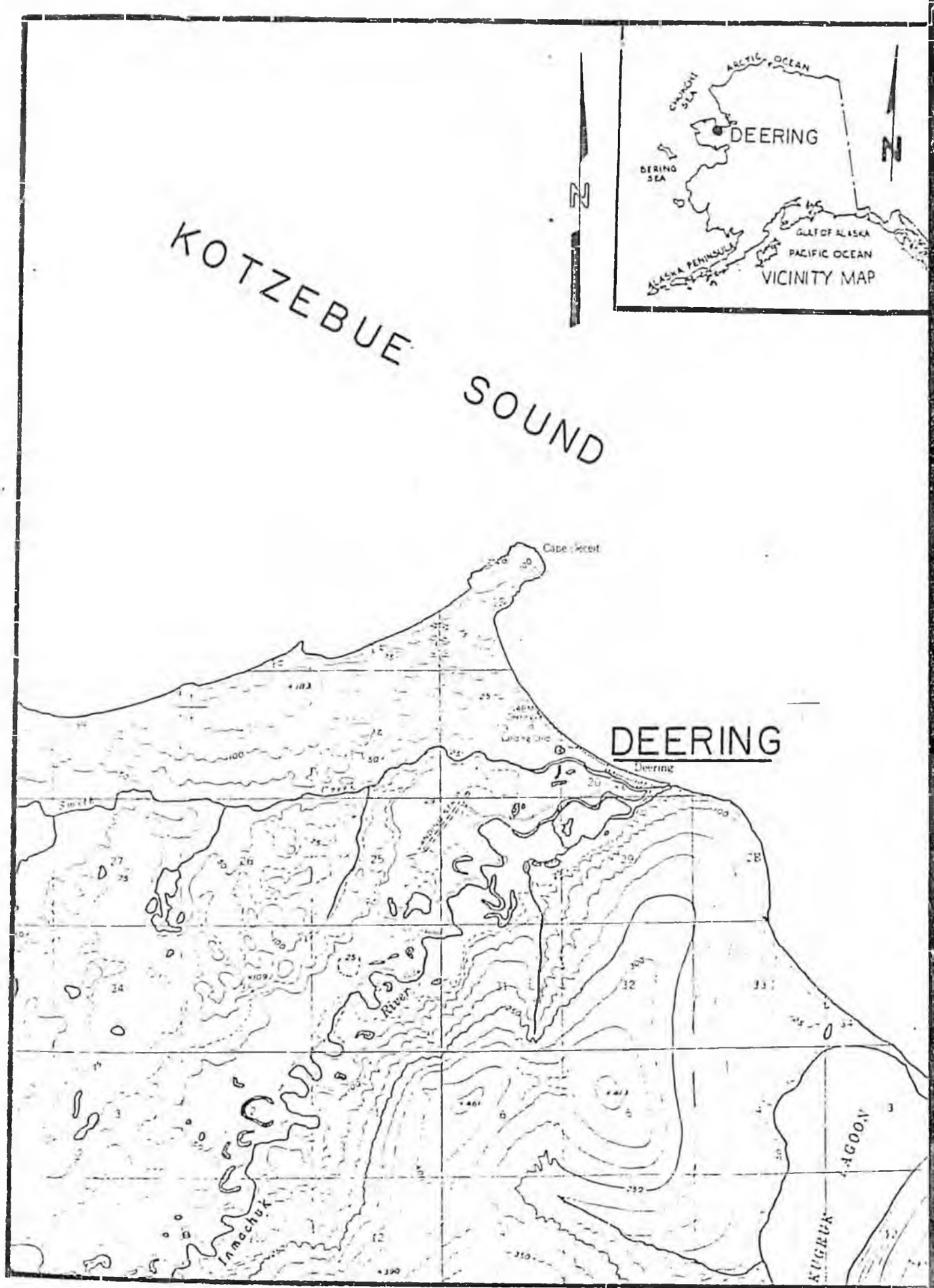
SOME OF THE ADVANTAGES TO THIS TYPE OF DESIGN IS THE FACT THAT THE DESIGN WILL PROVIDE AN EFFECTIVE METHOD OF PROTECTION FROM THE DESTRUCTIVE FORCES OF WATER WHILE AT THE SAME TIME PROVIDING FLEXIBILITY THROUGH THE IT INTERCONNED FLEXIBLE CABLES TO ALLOW THE SYSTEM TO ADJUST IN ALL DIRECTIONS. ANOTHER ADVANTAGE IS THAT THE SYSTEM WILL PROVIDE ACCESS FOR PEDESTRIANS, ANIMALS, VEHICLES, BOATS AND OTHER SMALL CRAFT AT THE RIVERS EDGE.



PILE AND FASCINE REVETMENT

ANOTHER VARIATION OF THE LIVE MATTRESS THEME IN WHICH EITHER TIMBER OR OLD RAIL PILES ARE DRIVEN IN FRONT OF AN ERODING BANK AND SPACED AT 6 FOOT CENTERS. PILES ARE DRIVEN BELOW THE ANTICIPATED SCOUR LEVEL WITH THEIR TOPS AT LEAST UP TO MODERATE FLOOD LEVEL.

FASCINES, BRUSH OR LARGE BRANCHES OF WILLOW, AND OTHER TREES ARE PLACED HORIZONTALLY BETWEEN THE PILES AND THE BANK, AND PUSHED OR WEIGHTED DOWN WITH INDIVIDUAL WEIGHTS, OR SAND BAGS. TOPS OF PILES ARE TIED BACK TO ANCHORAGE WITH WIRE OR LIGHT CABLE, AND THE TOPS OF THE PILES ARE INTERCONNECTED WITH CABLE. A CHAIN MESH NETTING AT THE BACK OF THE PILES CONNECTED TO THE TOP WALING OR WIRE ROPE. BATTERING OF THE BANK IS NOT NECESSARY. THIS TYPE OF WORK HAS NOT BEEN USED EXTENSIVELY AND WHEN IT HAS IT HAS BEEN MAINLY IN SMALL RIVERS WITH ACTIVELY ERODING BANKS. FASCINES AND BRANCHES WILL FOLLOW THE SCOUR DOWN TO A LIMITED EXTENT.


KOTZEBUE SOUND
DEERING
Deering
Cape Deceit
Smith
River
Inmachuk
KUGRUK
AGOOK
ARCTIC OCEAN
CHUKCHI SEA
BERING SEA
GULF OF ALASKA
PACIFIC OCEAN
ALASKA PENINSULA
VICINITY MAP

DEERING

Location

The coastal community of Deering has a population of about 150 people. Travel to and from the village is by airplane or by boat in the summer; snowmachine and three-wheeler travel is possible in the winter. Only about a mile of gravel road is present between the airport and the village. A dirt trail connects Deering with the gold mining camp about 22 miles upstream along the Inmachuk River. The houses, school, community buildings, and water storage tank for the community are located on the narrow strip of land comprising the sand spit between Kotzebue Sound and the estuary of Smith Creek and Inmachuk River to the south.

The Mayor of Deering, Dolores Barr, pointed out the areas of erosion and the rock source of potential riprap. Persistent and strong northeasterly winds blowing across Kotzebue Sound from the Chukchi Sea result in storm surge increase in water level at Deering several feet above the normal one foot to two feet tidal changes. Storm waves superimposed on the higher water levels result in flooding of the sand spit and in wave erosion of the sand and gravel of the beach. Erosion has occurred along virtually all of the beach area in front of the village.

Past efforts at stopping or reducing erosion consisted of sand-filled 50 gallon steel fuel drums placed vertically in a single row parallel to the beach front. This row (occasionally a double row) of filled drums was usually buried at least one half a drum into the beach sand and positioned at the foot of the steep bank on the uppermost part of the beach. This steep bank marked the uneroded part of the beach that was stable because of the presence of beach grass and its protecting root system. (The ground was frozen during the 1973 storm.) The air photos dated July 1962 show a small start of fuel drums in place along the beach and large numbers of empty drums along the other parts of the roadway, ready to be filled and placed. The air photos dated 1974 show remnants of what must have been a continuous row of steel drums along the beach. There are many gaps, large numbers of drums scattered out to sea, and many littering the beach. A major storm took place in November 1973 and extensive erosion is apparent between the two sets of air photos. There was a loss of grass-covered ground about 25 ft. wide generally, but as much as 60 ft. in the last 500 ft. at the east end of the sand spit. Residents say that there has been additional loss of grass covered ground between 1973 and today, 1983. The distance between houses and the edge of water has changed very little between 1962 and 1974.

Equipment

The City of Deering, Ruth Moto, City Manager; has the following equipment on hand:

Road grader
Wheeled front-end loader
Dump truck
Cat with blade

Design Construction Narrative

The analysis by E. Long in Reference 2 concerning the beach processes at work on the sand spit, on which Deering is located, sums up the important factors. The sand spit is built from gravel and sand eroded from the rocky point to the northwest (Cape Deceit) and transported along the shore by litteral drift. Periodic storms are important in moving the transported material from the beach area up onto and over the sand spit, thereby building it higher and wider. Part of the beach material is also moved along the beach to the southeast during these storms. Placing steep-faced obstructions on the beach (fuel drums, gabians, riprap or other objects) that interface in this process has and will continue to result in beach erosion and quite probably erosion of the higher ground on which the houses are located. The presence of 2000 year old artifacts in the sand spit argue that the site was not subject to major erosion during this period, when it surely was devoid of any beach protection devices, except probably beach grass.

Recommendations

Fuel drums, gabian baskets, or coarse rock must not be placed on the beach or the turbulence they create when waves break against them will result in the destruction of the beach on the seaward side.

The most effective method of preventing major storms from attacking the steep bank adjacent to the roadway parallel to the houses at Deering is to replace the eroded material on a slope identical to the natural beach angle of 6 to 8 percent. Rock broken to gravel size (minus 3 inches) or pit-run gravel can be used in this work.

It must be recognized that the natural and essential movement of material, during major storms of about ten year frequency, will be up onto and over the sand spit. The resultant occasional flooding may be an inconvenience but it is not practical to raise the elevation of the entire sand spit above the probable flood level.

Protecting the existing beach grass from destruction by dogs, vehicular traffic, or other means will aid in stabilizing the beach material because the grass roots are very effective in holding the loose sand together. The areas from which the beach grass had been eliminated, by man or dogs, were washed away to a much greater degree than areas protected by grass.

Estimated cost of protecting 3,200 ft. of beach line is $400,000.

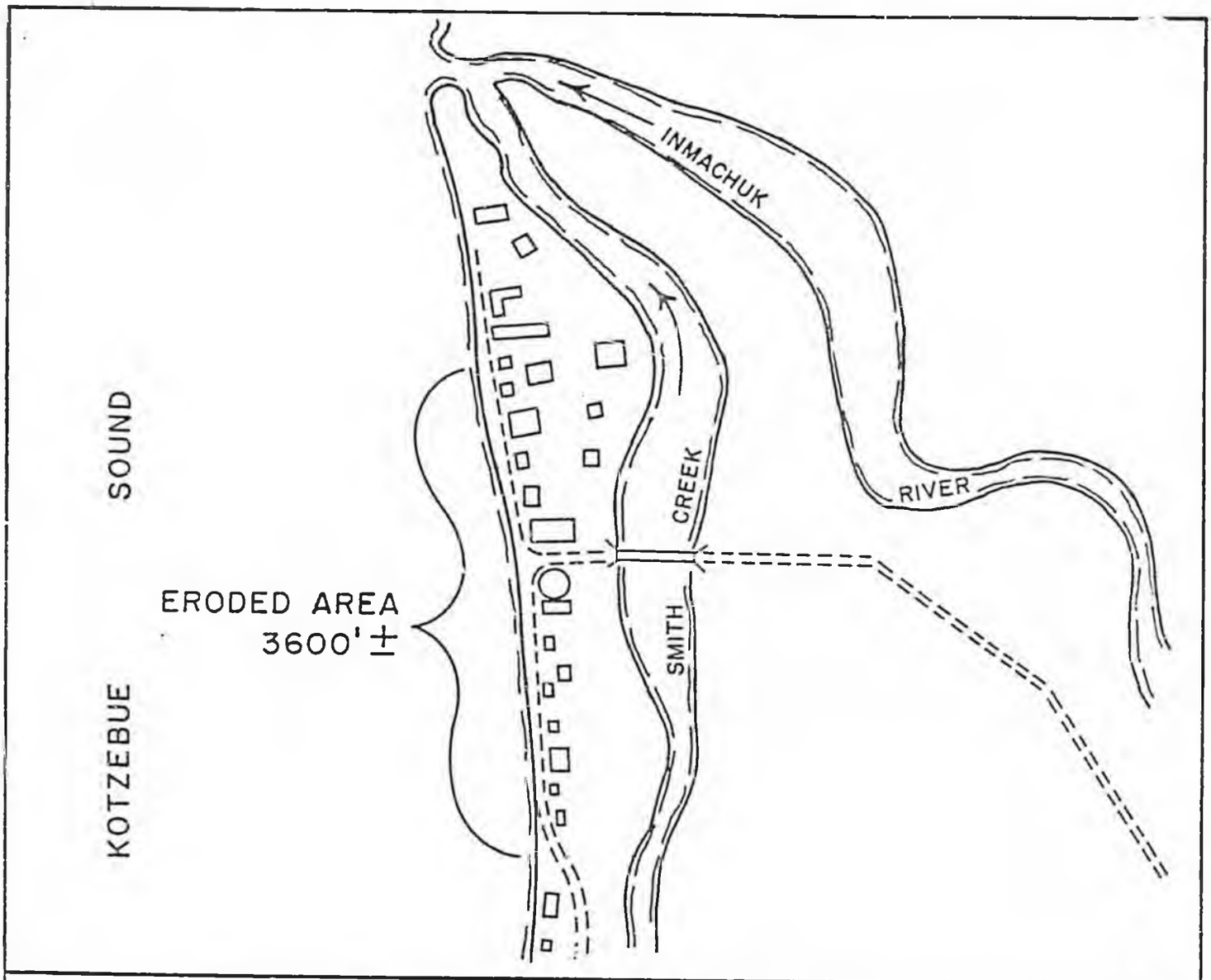
An alternative to beach grass to protect path areas may be the use of expandable, plastic webbing called, "Geoweb". It consists of a series of honey-comb shaped plastic bounded openings into which sand or gravel can be placed. The eight inch high walls of the Geoweb confine the sand and increase its bearing strength. A quantity sufficient for covering ten paths, four ft. wide and 50 ft. long should be obtained and installed to test its effectiveness in resisting foot traffic and erosion. Approximate cost - $2,000.

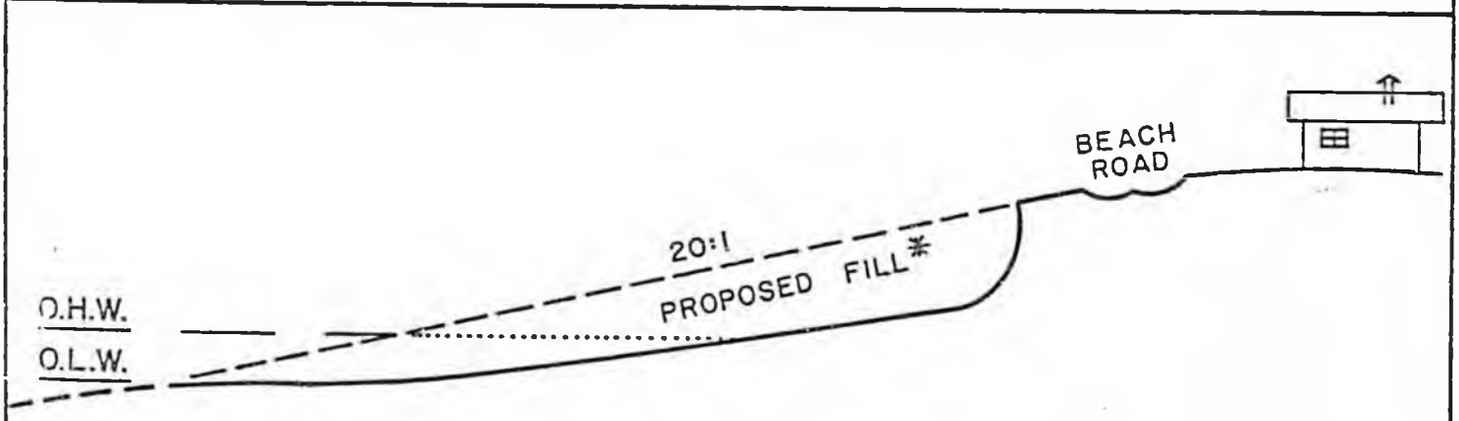
List Of Materials

Gravel is present in the floodplain of the Inmachuk River from the sources developed to supply the needs of the airport construction (see Sample 83-8).

Schist Bedrock is present in the rock bluff southeast of Deering at a distance of 1/4 of a mile. Because it is across the mouth of the Inmachuk River, a winter haul or a temporary bridge would be required. Boats for Deering normally use this channel and are tied up south of the community rather than or the open beach in front. The schist is moderately hard and forms a cliff 70 to 100 ft. high above the beach. Fractures present in the rock result in fragments at the base of the cliff ranging from eight inches to 24 inches in diameter, occasionally larger. (See Sample 83-7)

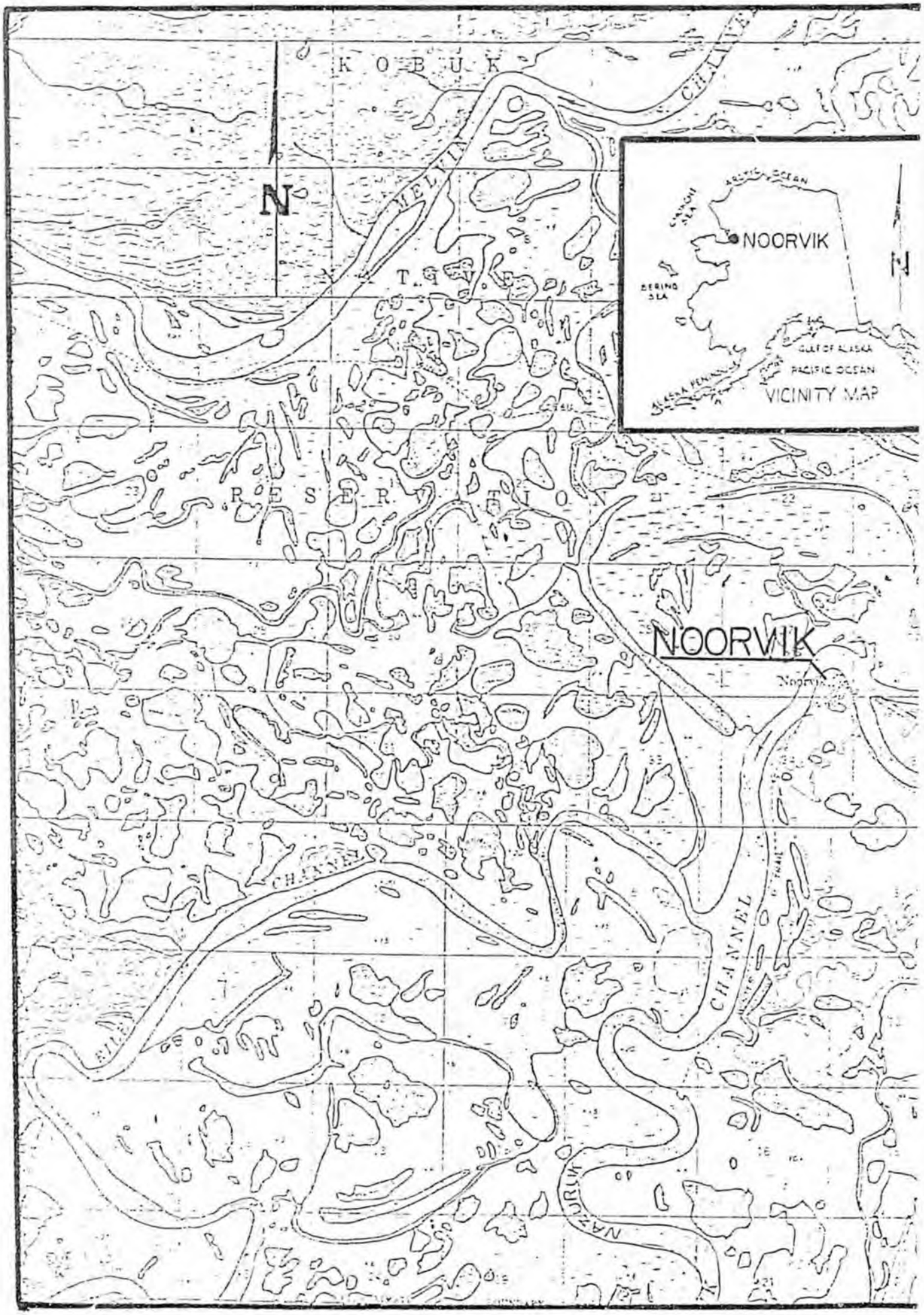
Beach Gravel and Sand are present in the beach and sand spit on which Deering is situated (see Sample 83-5, 6). No attempt should be made to remove any material from the beach in front of or northwest of the village because this will interfere with the natural transport processes of littoral drift and could result in more severe erosion at the village site. Gravel could be removed from the beach area southeast of Deering across the mouth of the Inmachuk River. Here the gravel has already passed the village and is on its way farther southeast.





*FILL.= Sand and Gravel from Inmachuk River, OR
3"minus Rock from the Outcrop SE of Deering.

DEERING - TYPICAL SECTION


K O B U K
N
T. 9 N.
R E S E R V E
NOORVIK
CHANNEL
CHANNEL
NAT
ARCTIC OCEAN
CHUKCHI SEA
NOORVIK
BERING SEA
GULF OF ALASKA
PACIFIC OCEAN
ALASKA PENINSULA
VICINITY MAP

NOORVIK

Location

The village is located on a sharp bend in the Kobuk River (known as the Nazaruk Channel) along one of the branches of the lower river in the delta region. The community is situated about 40 ft. above the river channel and not subject to flooding. Some erosion of the riverbank is taking place in the vicinity of the National Guard Armory but that building is not yet in danger. Of more immediate concern is the west end of the cross-wind runway. Here the river has cut into the ice-rich silt of the bank to the extent that the approach zone at the end of the runway is beginning to fall down the 40 ft. bank and into the river. Air photos dated 1962 and 1968 show little change in the riverbank but photos taken in October 1983 during the erosion study show that there has been a recent increase in the rate of erosion. The main runway parallels the riverbank and recent erosion extends from the end of the cross-wind strip upstream past the end of the runway. The rate of erosion is rapid enough that the frozen materials overhang the water ten to 15 ft. and large blocks break loose, tilt out, then tumble into the river, to be thawed and carried away by the current.

Hank Brown, the City Manager, indicated that the immediate concern was the crosswind strip. Due to prevailing winds this strip is used as much or more than the main, longer runway. Noorvik depends to a great degree upon air transport for supplies, except what can be barged in during the summer.

The erosion along the main runway has progressed to a point about 20 ft. outside the cleared zone. The height and steepness of the bank and kind of material (ice-rich silt) will result in additional caving of the bank even if no further erosion takes place at the riverbank - which is highly unlikely. It appears that a shift is taking place in the meander of the river and that unless extensive work is undertaken further loss of the bank will migrate into the south, one-third of the main runway within the next two years. This is a State-maintained and operated airfield.

No bank protection of either the airport site or the village site has been undertaken, even though the leaders in the community have sought State or Federal aid over a period of several years, going back to 1968.

Equipment Available

1 Front-end Loader
2 Dump truck
2 Cats with blade - John Deere 440 size
A grader has been ordered and is due in next year on the barge.

Design Construction Narrative

The length of bank requiring protection exceeds 4,000 ft. and the 40 to 50 ft. height of ice-rich, perennially frozen bank material cannot be protected by any small village-sized effort, such as hand placed sandbags.

Recommendations

A more detailed fact gathering visit should be made to the site with the necessary equipment to do the required work to provide the information critical to design an adequate bank protection project. Alternatively, it may be that rather than protect this airfield from erosion at great cost, a more economical approach could be reconstruction in a more defensible location. An in-depth stream bank protection study recommended to include the possibility of moving the airfield. Hold public hearings to address village concerns.

List of Material

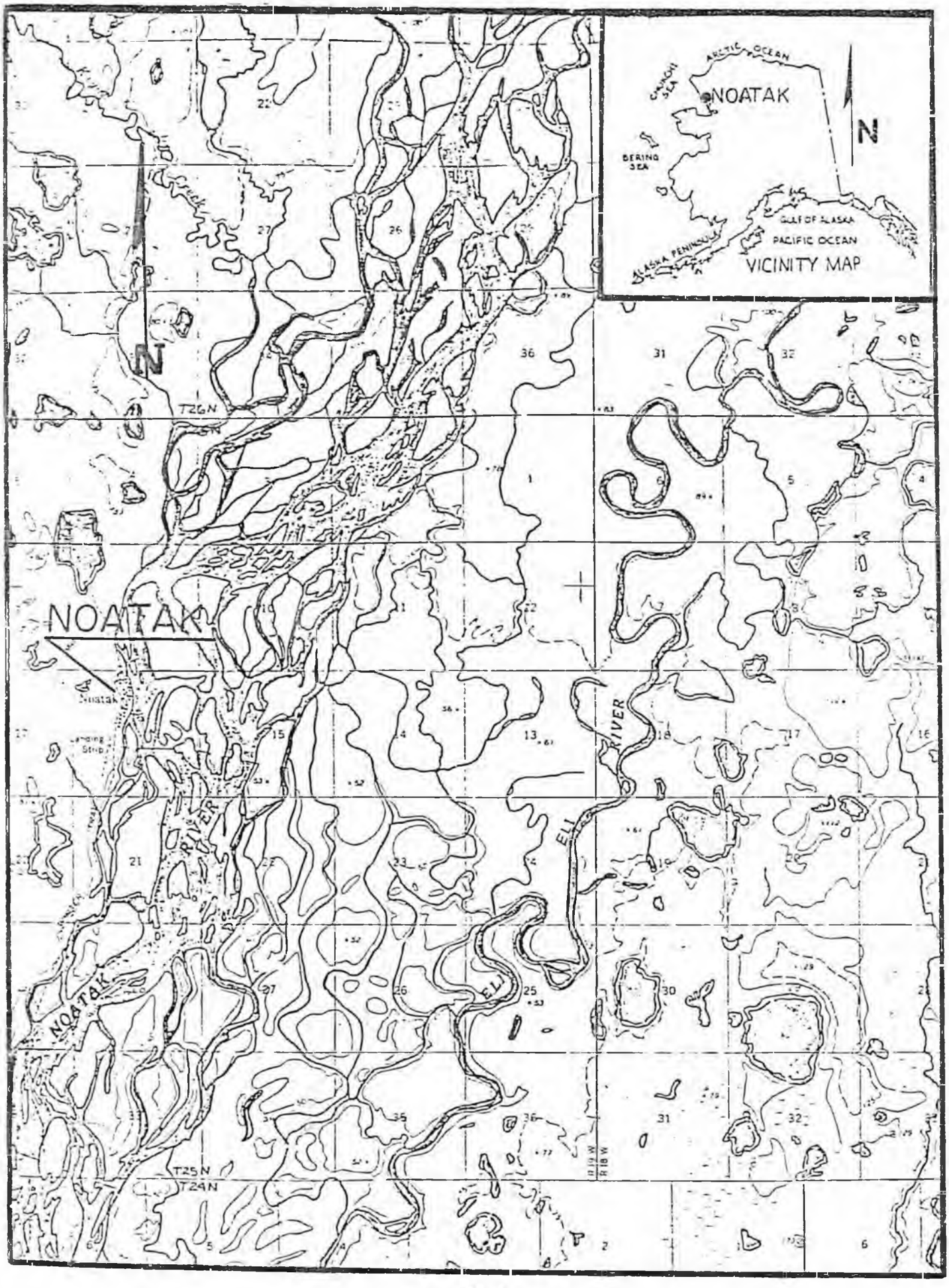
Sandy Silt is present in the point bar at the village boat mooring area (See Sample 83-1516).

Silty Gravel is present in the potential borrow area known as Hotham Peak Gravel Source (Reference 2) about five miles east of Noorvik. This source was used to surface the runway (See Sample 83-1517). A haul road would be required.

Sandy Gravel is present in the beach ridge around Selawik Lake but would require barging long distances (See Reference 2).

No sources of bedrock are known for the area except possibly the hills northwest of Noorvik about five miles, across the Melville Channel of the Kobuk River.

Estimated cost of a reconnaissance drilling program to locate borrow and alternate runway location is $63,000.


ARCTIC OCEAN
CHUKCHI SEA
NOATAK
N
BERING SEA
GULF OF ALASKA
PACIFIC OCEAN
ALASKA PENINSULA
VICINITY MAP
N
T26N
NOATAK
Noatak
Landing Strip
RIVER
ELI
RIVER
NOATAK
ELI
T25N
T24N
R17W
R18W

NOATAK

Location

The Eskimo village of Noatak is located on the west side of the Noatak River about 50 miles north of Kotzebue. The community is situated on high ground ranging from ten to 30 ft. above the level of the river. Westward migration of the river is taking place, chiefly because the west bank is composed of ice rich frozen silt. The Noatak River is a braided stream that has a fairly heavy bedload of medium-sized gravel. The westward migration of the river is made much easier by the presence of the ice-rich silt that can be eroded away far more easily than moving gravel - the river takes the easier course, cutting rapidly into the frozen, ice-rich silt rather than carrying a heavy bedload of gravel.

Travel to and from Noatak was historically only by riverboat but now air travel is probably equally important. During the winter dog team travel is possible, as is snowmachine, or in some snow conditions even three-wheeler travel. Most of the traffic is between Noatak and Kotzebue or points farther south.

The school, powerplant, native store, post office and several houses are on or next to the riverbank that was being eroded. A temporary spruce-pole crib wall was built in the late 1960's by the villagers using local poles. The vertical pole wall served until 1974 when it was undermined and collapsed. The need for the wall was undoubtedly related to the removal of large quantities of gravel from the bars in front of and immediately downstream from the village. The gravel was used to construct the airport and access roads into the community.

The shift of the river to the west, into the exposed ice-rich silt, has continued with more of the bank melting and being washed away.

A temporary gravel and spruce tree dike was built in the fall of 1980 and was intended only to last until a contract could be let the next season for more permanent bank protection. This more permanent protection consisted of 1,500 ft. of Armorform Revetment System (grout-filled polypropylene bags cabled together) placed on a gravel dike. The completed bank protection was observed in October of 1983.

One section of the concrete-filled pillows had pulled loose from the cable connectors and the current had folded it back. The unprotected river bottom had then been scoured out several feet deeper. The upper blanket of pillows had moved down the inclined face of the gravel bank causing wrinkles in the otherwise smooth blanket. It could not be determined if this was because of the anchors failing or the cables stretching or slipping.

Equipment

Several pieces of equipment are present in Noatak, both City owned, Public Health Service owned and State-owned.

2 Backhoes - John Deere
2 Cats - John Deere
1 Dump truck
1 Grader
1 Front-end Loader

Design Construction Narrative Recommendations

The manufacturer was contacted and expressed willingness to provide additional cable, cable sleeves and crimping tools to repair the Armorform Revetment System. The following actions will reduce the erosion problem:

1. Refasten all cable joints that have parted, using the approved method.

2. Using power equipment, stretch the blanket out to remove wrinkles so that all the pillows lie flat.

3. Cut the fabric between all pillows

4. Reposition the section of blanket that has folded back and refasten it.

Note: This work must be done before spring high water in 1984.

5. Do not permit removal of any gravel from the river in front of the village.

Estimated cost is $6,000 for labor and equipment rental. The manufacturer is providing cables and clamps.

BANK STABILIZATION, CONSTRUCTION PHASE II

PROJECT PURPOSE:

For FY'84, the State of Alaska Department of Transportation received 2 million dollars for Galena Bank Stabilization. The FY'84 project budget was to provide reconnaissance, preliminary engineering, and design work for the whole erosion area at Galena, five plus miles along the Yukon, plus provide construction of the initial stage of protective measures.

The current FY'85 budget request of 5 million dollars for Construction Phase II is to provide for a continuation of Construction Phase I. The design work is being done in Phase I, so nearly all of the 5 million dollars will go into construction.

PROJECT RATIONALE:

There are two aspects to the rationale for the Galena Bank Stabilization Project. First, is the rationale for Phase II, and second is the rationale for the overall project.

Phase II Rationale:

The $5,000,000 for Phase II is vital:

(a) The major design work is being completed in Phase I. It is important to expedite construction so that it occurs close to the design period before further erosion changes the bank and negates the design work.

(b) Phase II Construction will be needed to further support and protect the airport bank and existing bank stabilization.

(c) Construction Phase I is expected to occur in the winter of 1984. The allocation of addition funds now might make it possible to tie Phase II

Construction in with Phase I, thereby, involving only one set of bid documents, one set of Administrative Costs, one Contractor mobilization, etc. This increases the cost of effectiveness of both Phases I and II.

Overall Project Rationale: Galena is eroding away. At stake is a growing community of extreme importance to the State of Alaska because it is the home of the Galena Air Force Base, one of two forward operating bases for the defense of the State of Alaska and as top cover for the nation. In addition, the Galena Air Force Base is located on State property and the airport is owned by the State. Galena is also vital as the regional center for six surrounding villages.

All long range predictions are that Galena will increase in value and grow in importance as a regional center. The population is expected to gradually increase. In addition, the Galena Air Force Base has plans for expansion which include a petroleum, oils, and lubricants operations facility; two story building for a communications center and related personnel; a new dormitory to house 179 personnel; a new fire training facility; a new solid state instrument landing system; associated offices and shop facility -- a total of some 50-100 million dollars of construction. US Fish and Wildlife has received funding for $1.5 million for four housing units. City of Galena has 2 million dollars for Phase I of a piped water and sewer project. Of course, there is the current 2 million dollars for Bank Stabilization.

A report done by Ott Water Engineers in July of 1981 summarized the severity of the problem and the importance of erosion control on the Yukon River at Galena. The following is a summary of the more significant findings, recommendations, or conclusions of the Ott Water Report.

* Erosion is progressing inland at 15 to 85 feet per year along a 5+ mile section of the Yukon River upstream of the thermal pile installation that protects the east end of the airport runway. (Thermal pile bank stabilization was completed in 1964-65.)

* Erosion is cutting inland and around the thermal pile installation and threatens to destroy it either this fall or next year. (If thermal pile installation is destroyed, the protection is lost for the runway.)

* An immediate remedial program to secure the thermal pile installation is recommended.

* A complete erosion control program along a 5+ mile bank of the Yukon River is necessary to prevent the river from destroying the airport or short circuiting the present meander loop and flanking the airport, severing it from the new townsite.

* The new townsite, established several years ago, is threatened by the ongoing erosion. Buildings, primary highway, and electrical transmission facilities about 180 feet from the present river bank would be damaged at the present erosion rate in 2 to 10 years.

Attention to erosion is needed now.

Estimation of Current Community Value:

1. Galena Air Force Base	$31,700,000.
2. State Complex (airport and related operations)	31,202,000.
3. City of Galena (City of Galena value other than the Air Force Base and State Complex)	38,998,500.
Total estimated replacement cost	$101,900,500.

As noted under project rationale, value of the community is expected to greatly increase in the next four to seven years.

A more detailed analysis and documentation is given below.

1. Galena Air Force Base:	Actual as-built cost	Estimated Replacement Cost
The information was obtained from the Chief lawyer at Elmendorf, Lt. Col. Scott Silliman, 552-3046. Value of $25,300,000 is the current value. (Date of information 1982)		28,000,000.
Summer of 1983 projects (Information from Commander Beadle)		3,700,000.
Total		31,700,000.

2. State Complex:

This information was given by John Horn, Director, Maintenance and Operations, Interior Regional, State of Alaska, Dept. of Transportation and Public Facilities as follows: (Date of information 1982)

Bituminous Surface Course	31,056 @ 32	993,792.
Base Course (crushed)	84,575 @ 32	2,706,400.
Subbase	346,800 @ 14	4,855,200.
Unclassified Embankment	1,679,959 @ 9	15,119,631.
Prime Coat	210T @ 350	73,500.
Asphalt	3,633,6T @ 700	2,543,520.
Maintenance Bldg.		1,632,300.
Lighting		623,300.
R/W & T/W Marking		110,000.
Clearing	330.6 @ 2000	661,200.
Tie Down Assume 40 aircraft ft, 3 ea.	120 @ 150	18,000.
Pumping System		100,000.

	SUBTOTAL	29,436,543.
"A" Land (lease)		127,527.
	SUBTOTAL	29,564,118.
"B" Land (buy)		765,450.
	SUBTOTAL	30,201,993.
Summer 1983 (Information from John Billings, Galena Airport Manager) Airport paving (approximate value)		1,000,000.
	Total	31,201,993.

DATE	CITY OTHER THAN AIR FORCE/STATE	ACTUAL AS-BUILT COST	ESTIMATED REPLACEMENT COST
1976	City Hall (Information from city files; labor and design was done by the community)	24,180.	500,000.
1972	Community Hall (Information from city files; labor done by the community)	10,000.	500,000.
1975	Clinic (Information from clinic files)	200,000.	
1981	Clinic Addition -- Dental (Information from clinic files)	525,000.	1,000,000.*
1976	Public Safety Building (Information from city files	35,720.	250,000.
1982	City Garage (Information from city files)	510,000.	510,000.
1971	Water Treatment Plant, Lagoon, Water & Sewer Piping	633,000.	1,500,000.
1980	Old Garage	225,000.	350,000.
1980	Modification of WPT for Water & Sewer Haul System		
1980	Sewer & Water Tanks Installation to homes (Information estimated by John Delapp of PHS)	551,000.	750,000.
1981	Waste Heat System - Clinic (Information from city files)	325,000.	325,000.
	Rough estimate to build new roads (7 mi.; information from John Horn, DOT)	168,000.	1,750,000.
1977	School	5,000,000.	6,000,000.
	Office Bldg - School	100,000.	200,000.
	Garage & Storage Building	350,000.	350,000.

(Information from Superintendent,
Harry Purdy)

*Includes both the 1975 building and the 1981 addition.

Other

City Land Value:

City itself has about 1400 acres which it has received as part of our 14(c)3 agreement with the Native Corp. Some has been sold to private individuals. Estimated sale value of land is $3,500 per half acre. Other property consists of Native Allotments, Native Corporation property, and original Bureau of Land Management properties which are owned by individuals under restricted deeds.		9,800,000.
	Subtotal	23,785,000.

City Other:

Dept. of Community and Regional Affairs Assessed Value of community, (based on their last assessment in January of 1983)		15,213,500.
	Total	38,998,500.
GRAND TOTAL (Air Force, State Complex, and Community)		101,900,500.

KOTLIK ALASKA

LAT 63.02'00", NORTH LONG 163.33'00", WEST ELEV. 5' (AT AIRSTRIP)

ON SEPTEMBER 12, 1983 THE INVENTORY TEAM FOR THE CENTRAL REGION'S EROSION CONTROL TASK FORCE VISITED THE COMMUNITY OF KOTLIK WHICH IS LOCATED ON THE EAST BANK OF THE KOTLIK SLOUGH ABOUT 35 MILES NORTHEAST OF EMMONAK ALASKA AND ABOUT 67 MILES NORTH OF ST. MARY'S ALASKA IN THE YUKON KUSKOKWIM DELTA. THIS LOCATION ALLOWS EASY ACCESS BY BARGE AND LARGE RIVER BOATS.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

JOHN FRITZ
MATERIALS SECTION
CENTRAL REGION

E. ALLEN CHURCHILL
FLOOD PLAIN MANAGEMENT
CORPS OF ENGINEERS

UPON ARRIVAL THE TEAM MET WITH KOTLIK'S MAYOR JOSEPH MIKE WHO PROVIDED MUCH OF THE INFORMATION WHICH WE USED, TOGETHER WITH THE REPORT WRITTEN BY NORTHERN TECHNICAL SERVICES OF ANCHORAGE (NORTEC) TITLED KOTLIK EROSION CONTROL STUDY DATED MARCH 1983.

I EXPLAINED TO MR. MIKE THAT THE PURPOSE OF THE TASK FORCE WAS TO INVENTORY, ON A STATEWIDE BASIS, AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS, AND TO MAKE RECOMMENDATIONS TO THE COMMISSIONER ALONG WITH A LIST OF PRIORITIES AS WELL AS POSSIBLE SOLUTIONS TO THOSE AREAS OF CONCERN. I CAUTIONED HIM THAT JUST BECAUSE WE HAD VISITED HIS COMMUNITY AND HAD FOUND A PROBLEM DID NOT MEAN THAT THERE WOULD BE A PROJECT IN THE NEAR FUTURE AS ANY PROJECT WOULD REQUIRE FUNDING THROUGH THE LEGISLATIVE PROCESS. MR. MIKE INDICATED THAT HE UNDERSTOOD AND WANTED TO KNOW IF I WOULD BE ABLE TO SUPPLY HIM WITH A COPY OF MY RECOMMENDATIONS. I TOLD HIM THAT IT WAS THE INTENTION OF THE TASK FORCE TO WORK AS CLOSELY WITH EACH COMMUNITY AS WE COULD, AND THAT WE PLANNED TO INFORM EACH COMMUNITY OF OUR RECOMMENDATIONS AS SOON AS POSSIBLE.

BASED ON THE ON SITE EVALUATION I TEND TO AGREE WITH NORTEC'S SUMMARY OF THE EROSION PROBLEM. THE REPORT SHOWS ABOUT 3,000 FEET OF RIVER BANK BEING EFFECTED BY EROSION AT A RATE OF BETWEEN 3 TO 4 FEET PER YEAR.

THERE ARE A NUMBER OF BUILDINGS WHICH ARE THREATENED BY THIS EROSION. WHILE THE MAJORITY OF THESE BUILDINGS ARE PRIVATELY OWNED HOUSES, PART OF THE BIA SCHOOL COMPLEX, THE BAPTIST CHURCH, AND ONE COMMERCIAL BUILDING WILL BE IMPACTED BY EROSION PROBLEMS IN THE NEAR FUTURE (LESS THAN 10 YEARS).

RIVER EROSION IS CURRENTLY UNDERMINING THE BOARDWALK WHICH RUNS ALONG THE KOTLIK RIVER. BASED ON AN ON SITE EVALUATION OF THE BOARDWALK THERE IS A GOOD CHANCE THAT THE COMMUNITY WILL LOSE 200 TO 300 FEET OF THE WALK WITHIN THE NEXT YEAR.

MR. MIKE INDICATED THAT THE RIVER ICE THICKNESS IS USUALLY 2.5 TO 3 FEET IN THE CHANNEL AND THAT CONSIDERABLE EROSION OF THE BANK IS CAUSED BY BOAT TRAFFIC. WHEN ASKED ABOUT THE SPEED OF THE BOATS, HE INDICATED THAT THE VILLAGE HAD IMPOSED SPEED LIMITS AND THAT, FOR THE MOST PART ALMOST, ALL OF THE BOATS OBEYED THEM.

ACCORDING TO THE NORTEC REPORT A COST OF $1,636,000 IN 1982 DOLLARS WOULD HAVE TO BE SPENT IN ORDER TO REPLACE THE STRUCTURES IF SOME ACTION WAS NOT TAKEN WITHIN THE NEXT THREE YEARS.

THE QUESTION OF POSSIBLE RELOCATION OF MANY OF THESE STRUCTURES IS REALLY NOT VIABLE BECAUSE THE COMMUNITY HAS MARSH LANDS ALL AROUND IT AND THERE IS NO WHERE YOU COULD MOVE THE COMMUNITY. WITHOUT MOVING THE COMPLETE VILLAGE TO ANOTHER LOCATION. THIS MEANS THAT IF THE VILLAGE DOES NOT DO SOMETHING IN THE NEAR FUTURE (LESS THAN 5 YEARS) THAT WE ARE LOOKING AT RECONSTRUCTION OF A VILLAGE AT A NEW SITE SOME DISTANCE AWAY WHICH WOULD PUT THE COST MUCH HIGHER THAN THE ORIGINAL $1,636,000.

ONE QUESTION WHICH THE NORTEC STUDY DOES NOT INVESTIGATE IS THAT IT MIGHT BE IN THE BEST INTEREST OF THE STATE TO ONLY PROTECT THE MAIN TOWN SITE AND RECOMMEND THAT CONSIDERATION BE GIVEN TO A "NO BUILD" OPTION FOR THE OTHER AREAS WHICH ARE LOCATED ON THE ISLAND BETWEEN THE YUKON RIVER AND THE KOTLIK RIVER AND THE AREA WHICH IS LOCATED BETWEEN THE KOTLIK RIVER AND KOTLIK SLOUGH. THIS WOULD SUBTANCIALLY REDUCE THE AMOUNT OF FUNDS WHICH WOULD BE REQUIRED TO PROTECT THE COMMUNITY.

BECAUSE OF THE COMMUNITY'S DEPENDENCE ON ACCESS TO THE RIVER FOR ECONOMIC AND TRANSPORTATION NEEDS IT IS FELT THAT THE DESIGN SHOULD INCORPORATE EASY ACCESS TO THE RIVER BY MEMBERS OF THE COMMUNITY.

THE DESIGN WHICH FOLLOWS ALLOWS FOR TWO PHASES. THE FIRST PHASE WOULD PROTECT THE MAIN PART OF THE COMMUNITY AND THE SECOND PHASE WOULD PROTECT THE PART OF THE COMMUNITY WHICH IS LOCATED ACCROSS THE RIVER.

THE CONCEPTUAL DESIGN WILL HAVE TWO TYPICAL SECTIONS. THE AREA WHICH WOULD BE USED BY THE COMMUNITY FOR ACCESS TO THE RIVER WOULD BE 500 FEET OF CONCRETE MAT DESIGN WHICH WOULD BE DIVIDED INTO TWO POINTS OF ACCESS 250 FEET EACH LEAVING 1150 FEET OF BANK WHICH WOULD BE PROTECTED USING THE PILE AND FASCINE REVETMENT METHOD.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: KOTLIK, ALASKA

PROJECT NUMBER E30223

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 16, 1983

REMARKS: PHASE I WHICH WILL INCLUDE 500 FEET OF CONCRETE EROSION MAT AND 1150 FEET OF PILE AND FASCINE REVETMENT.

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110 (1)	MOBILIZATION		LUMP SUM	LUMP SUM	32,687.50
	CONCRETE MAT COMPLETE	500	LINEAR FOOT	700.00	350,000.00
	PILE & FASCINE REVETMENT	1150	LINEAR FOOT	175.00	201,250.00
	SUB TOTAL				633,937.50
	ENGINEERING & CONTINGENCIES				95,090.63
	TOTAL PHASE I				729,028.13

PHASE I COST PER LINEAR FOOT = $441.84

REMARKS: PHASE II WHICH WILL INCLUDE 100 FEET OF CONCRETE TYPE EROSION MAT AND 750 FEET OF PILE AND FASCINE REVETMENT.

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110(1)	MOBILIZATION		LUMP SUM	LUMP SUM	31,696.93
	CONCRETE MAT COMPLETE	100	LINEAR FOOT	735.00	73,500.00
	PILE & FASCINE REVETMENT	750	LINEAR FOOT	193.75	137,812.50
	SUB TOTAL				243,009.38
	ENGINEERING & CONGENCIES				36,451.41
	TOTAL PHASE II				279,460.78
	TOTAL OF PHASE I AND II				1,008,488.91

TOGIAK, ALASKA

LAT 59.04'00" NORTH, LONG 160.24'00" WEST

ON OCTOBER 6, 1983 I VISITED THE COMMUNITY OF TOGIAK WHICH IS LOCATED AT THE HEAD OF TOGIAK BAY 2 MILES WEST OF THE TOGIAK RIVER, AND 67 MILES WEST OF DILLINGHAM ALASKA. THIS LOCATION ALLOWS EASY ACCESS BY BARGE AND LARGE BOATS TO THE COMMUNITY.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

UPON ARRIVAL I MET WITH MR. ANDREW FRANKLIN WHO PROVIDED MUCH OF THE INFORMATION USED IN THIS REPORT. I ALSO USED THE TOGIAK EROSION CONTROL ASSESSMENT REPORT DATED BY TETRA TECH (DATED NOVEMBER 1982), AS A SOURCE OF INFORMATION.

I EXPLAINED TO MR. FRANKLIN THAT THE PURPOSE OF THE TASK FORCE WAS TO INVENTORY ON A STATEWIDE BASIS AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS AND TO MAKE OUR RECOMMENDATIONS TO THE COMMISSIONER TOGETHER WITH PRELIMINARY PLANS AND COST ESTIMATES WHERE POSSIBLE. I CAUTIONED HIM THAT JUST BECAUSE THE TASK FORCE HAD VISITED HIS COMMUNITY DID NOT MEAN THAT A PROJECT WOULD BE FUNDED.

BASED ON INFORMATION PROVIDED BY MR. FRANKLIN AND THE TETRA TECH STUDY I FOUND THAT TOGIAK IS IN A CLIMATIC TRANSITION ZONE. THE CLIMATE IS MOSTLY MARITME, BUT CONTINENTAL INFLUENCES ARE FELT DURING CERTAIN TIMES OF THE YEAR.

HIGH WIND SPEEDS ARE NOT UNUSUAL AT TOGIAK. AVERAGE WIND SPEEDS RANGE FROM 20 TO 30 KNOTS IN JANUARY. SOMETIMES GUSTS REACHING MUCH HIGHER SPEEDS ARE RECORDED. STRONG SOUTHWESTERLY WINDS COMBINED WITH HIGH ASTRONOMICAL TIDES HAVE PRODUCED FLOODING IN TOGIAK ON SEVERAL OCCASIONS.

PROBLEM EROSION AREAS IN TOGIAK WERE IDENTIFIED THROUGH THIS SITE VISIT AND WITH THE USE OF HISTORICAL PHOTOGRAPHS FROM 1962, 1965, 1968, 1971, 1975, AND 1983.

THERE ARE TWO PERMANENT STRUCTURES PRESENTLY IN DANGER DUE TO EROSION. THE NATIONAL GUARD ARMORY HAS ALREADY BEEN MOVED BECAUSE OF THE RETREATING BLUFF. THE EROSION AT TOGIAK IS SPORADIC IN NATURE. EVEN THOUGH THE AVERAGE LONG TERM EROSION IS APPROXIMATELY ONLY ONE FOOT PER YEAR, MORE THAN SIX FEET OF BLUFF CAN BE LOST DURING A SINGLE STORM. THE OTHER AREA WHICH IS IN DANGER IS THE AREA AROUND THE SCHOOL COMPLEX.

BASED ON MY INITIAL IMPRESSION AND THE TETRA TECH REPORT IT IS RECOMMENDED THAT A THREE GROIN FIELD BE CONSIDERED AS THE BEST AND MOST COST EFFECTIVE METHOD OF EROSION PROTECTION FOR THE COMMUNITY OF TOGIAK.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: TOGIAK, ALASKA

PROJECT NUMBER 830023

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 16, 1983

REMARKS: THREE GROIN FIELD

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110 (1)	MOBILIZATION	LUMP SUM	LUMP SUM	ALL REQUIRED	249,625.00
	"A" STONE	9800	CUBIC YARDS	75.00	735,000.00
	"B" STONE	3400	CUBIC YARDS	75.00	255,000.00
	QUARRY RUN	4900	CUBIC YARDS	75.00	367,500.00
	BEACH FILL	37500	CUBIC YARDS	8.00	300,000.00
	SUB TOTAL				1,906,125.00
	ENGINEERING & CONTENGENCIES				285,918.75
	TOTAL				2,192,043.75

COST PER LINEAR FOOT = $782.87

PORT HEIDEN, ALASKA

LAT 56.55'00" NORTH, LONG 158.41'00"WEST

ON OCTOBER 19, 1983 I VISITED THE COMMUNITY OF PORT HEIDEN WHICH IS LOCATED ON THE ALASKA PENINSULA 160 MILES WEST OF KING SALMON, ALASKA/ PORT HEIDEN IS LOCATED ON BRISTOL BAY WICH ALLOWS FOR EASY ACCESS BY BARGE AND LARGE BOATS.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

UPON ARRIVAL I MET WITH MR. FRED MANFORD WHO PROVIDED MUCH OF THE INFORMATION WHICH WAS USED IN THIS REPORT.

I EXPLAINED TO MR. MANFORD THAT THE PURPOSE OF THE TASK FORCE IS TO INVENTORY ON A STATEWIDE BASIS AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS AND TO MAKE MY RECOMMENDATIONS TO THE COMMISSIONERTOGETHER WITH PRELIMINARY PLANS AND COST ESTIMATES WERE POSSIBLE. I CAUTIONED HIM THAT JUST BECAUSE THE TASK FORCE HAD VISITED THEIR COMMUNITY THAT IT DID NOT MEAN THAT A PROJECT WOULD BE BUILT. I DID HOWEVER INDICATE THAT A COPY OF MY REPORT WOULD BE MADE AVAILABLE TO THE COMMUNITY SHOULD THEY REQUEST IT.

BASED ON INFORMATION GATHERED IT APPEARS THAT AN AREA OF CONSIDERABLE CONCERN IS THE FUEL STORAGE FACILITY WHICH IS OWNED BY THE U. S. AIR FORCE. THE FACILITY IS CURRENTLY LEASED TO THE COMMUNITY FOR STORAGE OF THEIR WINTER FUEL. THE TWO TAKS CAN STORE A TOTAL OF 200,000 GALLIONS OF FUEL FOR THE COMMUNITY.

BASED ON MY INTERVIEW WITH MR. MANFORD IT IS ESTIMATED THAT EROSION TAKES PLACE AT AN ANNUAL RATE OF ABOUT 4 TO 6 FEET PER YEAR.

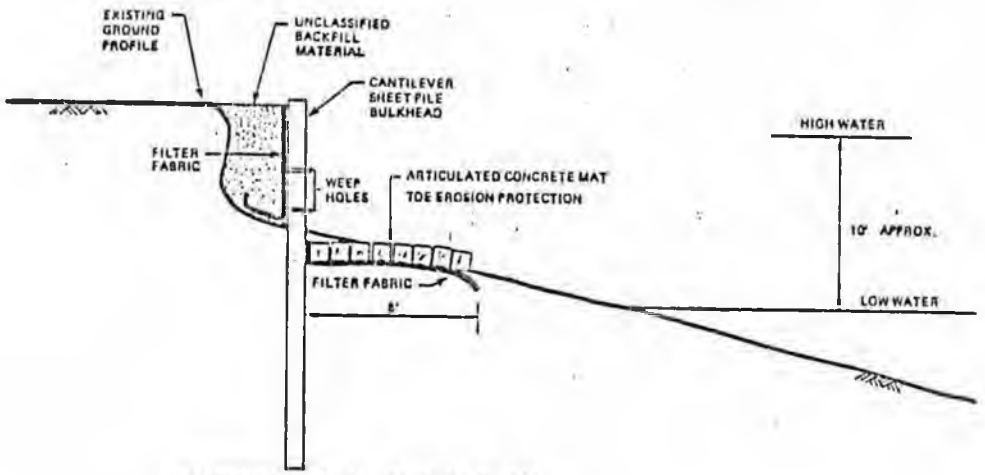
THE COMMUNITY HAS MOVED MANY OF THE HOUSES TO AN AREA ABOUT 1/4 MILE FROM THE BEACH SO THAT THE ONLY FACILITY WHICH IS THREATENED AT THIS TIME IS THE FUEL STORAGE TANKS.

BASED ON THE RATE OF EROSION IT IS ESTIMATED THAT THE ROAD WOULD BEGIN TO WASHOUT WITHIN THE NEXT TWO YEARS AND THE STORAGE TANKS WOULD BE IN DANGER WITHIN 5 YEARS EVEN THOUGH THEY ARE CURRENTLY 102 FEET FROM THE BANK.

THERE IS A SAND BAR WHICH IS BUILDING UP ABOUT 1/4 MILE NORTHWEST OF THE COMMUNITY WHICH WILL POSSIBLY EVENTUALLY HELP TO PROTECT THE REST OF THE COMMUNITY FROM THE EROSION WHICH THEY HAVE BEEN EXPERIENCING IN THE PAST.

THE TASK FORCE HAS CONTACTED THE DEPARTMENT OF THE ARMY CORPS OF ENGINEERS TO CONTACT THE AIR FORCE SO AS TO DETERMINE IF THE DEFENSE DEPARTMENT WOULD BE WILLING TO TAKE PART IN FUNDING THE PROTECTION OF THEIR FACILITY.

BASED ON OUR ON SITE EVALUATION OF THE PROBLEM IT IS ESTIMATED THAT THE AREA WHICH WILL NEED TO BE PROTECTED IS A MINIMUM OF 500 LINEAR FEET OF SHORE. THE METHODS WHICH WERE LOOKED AT WERE REINFORCED WALL, CANTILIVER SHEET PILE WALL.



SHEET PILE BULKHEAD

THE FIRST POSSIBLE DESIGN WHICH WAS LOOKED AT WAS THE POSSIBILITY OF THE CONSTRUCTION OF A SHEET PILE BULKHEAD. THIS TYPE OF DESIGN WOULD PROVIDE VERTICAL FACE AND WOULD REQUIRE CONSIDERABLE FOUNDATION EVALUATION.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: PORT HEIDEN, ALASKA

PROJECT NUMBER R30023

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 28, 1983

REMARKS: 500 LINEAR FEET OF SHEET PILE BULKHEAD.

BETHEL 5,000,000.

The need for this years request for erosion control funding to be appropriated to the City of Bethel cannot be overstated. Over the past 3 years, with the previous appropriations received, the City of Bethel has expanded the Bethel Cargo Dock, constructed a Petroleum Port, and constructed 2,220' of structural erosion control in the form of a multipurpose bulkhead that will not only halt erosion but will lend itself to more efficient and varied use of the Bethel waterfront. All of these have improved the general economic climate of the community and the area, and have all been brought to a successful conclusion. The most recent of these projects has been the 2 sections of bulkhead built, which are still under construction. The placement of the 2 sections of bulkhead were chosen so that we may protect those sections of town that were in imminent danger of falling into the river. Because there are 2 sections it is extremely important that they be connected this construction season and therefore create a bulkhead approximately 5000' long which would cover all the populated areas of Bethel. The materials required to construct are here in Bethel, the plans and specifications have been developed, so we are ready to proceed immediately upon receiving an appropriation. We must build this year in order to insure that Bethel gets a proper protection from the forces of the Kuskokwim River, and to insure that the integrity of the two sections built is not jeopardized.

The overall result of the erosion control effort currently under way is that of enhancing the local economy. Until this effort was undertaken business was leary of locating on the river due simply to the fact that the riverbank was unstable. Once stabilized business can locate along the main transportation corridor and will be encouraged to do so . Details on material supply and construction progress can be found in the Master Plan Report.

EGEGIK, ALASKA

LAT 58°14'00" NORTH, LONG 147.05'00" WEST

ON OCTOBER 18, 1983 I VISITED THE COMMUNITY OF EGEGIK WHICH IS LOCATED ON EGEGIK BAY JUST SOUTH OF BRISTOL BAY 70 MILES SOUTH OF DILLINGHAM.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

UPON ARRIVAL I MET WITH MR. RICHARD DEIGH, WHO IS A MEMBER OF THE VILLAGE COUNCIL. MR. DEIGH PROVIDED MUCH OF THE INFORMATION CONTAINED IN THIS REPORT TOGETHER WITH A TECHNICAL SERVICES REPORT BY THE U. S. ARMY CORPS OF ENGINEERS. ALASKA DISTRICT, DATED SEPTEMBER 1977.

I EXPLAINED TO MR. DEIGH THAT THE PURPOSE OF THE TASK FORCE IS TO INVENTORY ON A STATEWIDE BASIS AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS AND TO MAKE OUR RECOMMENDATIONS TO THE COMMISSSIONER TOGETHER WITH PRELIMINARY PLANS AND COST ESTIMATES WHERE POSSIBLE. I CAUTIONED HIM THAT JUST BECAUSE THE TASK FORCE HAD VISITED HIS COMMUNITY DID NOT MEAN THAT A PROJECT WOULD BE FUNDED. I DID HOWEVER INDICATE THAT THE TASK FORCE WOULD BE PROVIDING THE COMMISSIONER WITH RECOMMENDATIONS ON A STATEWIDE BASIS WITH REGARD TO THE OVERALL ASPECT OF EROSION PROBLEMS.

EGEGIK IS SITUATED ON THE SOUTH BANK OF EGEGIK BAY, AND DIRECTLY DOWNSTREAM OF BOTH THE KING SALMON RIVER AND THE EGEGIK RIVER. THE ELEVATIONS IN EGEGIK RISE TO OF ABOUT 100 FEET ABOVE MEAN SEA LEVEL. THE AIRPORT HAS BLUFF HEIGHTS WHERE EROSION OCCURS AT AN ELEVATION OF ABOUT 70 FEET ABOVE MEAN SEA LEVEL.

THE BEACH IS PREDOMINATELY SANDS AND SILTS WITH SOME GRAVEL AND ROCKS WHICH PROVIDES A SMALL AMOUNT OF NATURAL EROSION PROTECTION.

WESTERLY AND SOUTHWESTERLY WINDS BLOWING ACCROSS BRISTOL BAY CAN PRODUCE WAVE HEIGHTS TO ABOUT 8 FEET. THERE IS ALSO A NATURAL SPIT JUST SOUTH AT THE ENTRANCE TO EGEGIK BAY WHICH PROVIDES SOME PROTECTION TO THE COMMUNITY FROM DIRECT WIND GENERATED WAVES WHILE THE TIDAL FLATS TEND TO REFRACT THE WAVES. DURING THE FALL, A TIDE RANGE OF ABOUT 20 FEET OCCURS AND THAT IS THE SAME TIME OF YEAR THAT THE SOUTHWESTERLY WINDS CAN GENERATE A 6 FOOT SURGE TIDE. THERE IS ALSO SOME EROSION CAUSED BY TIDAL ACTION UNDER THE ICE DURING THE WINTER MONTHS.

THE MAIN PROBLEM IS SITUATED WHERE A HIGH BLUFF, LOCALLY KNOWN AS CHURCH HILL, IS BEING ERODED AWAY. THIS EROSION HAS BEEN GOING ON FOR MANY YEARS BUT IT IS MORE CRITICAL NOW BECAUSE OF THE OLD VILLAGE CEMETERY WHICH IS OWNED BY THE RUSSIAN ORTHODOX CHURCH IS BEING THREATENED. OVER THE YEARS A NUMBER OF GRAVES HAVE BEEN EXPOSED. THE COMMUNITY HAS INITIATED A NEW GRAVE YARD NEAR THE AIRFIELD, BUT THE PROBLEM OF THE EROSION AND EXPOSURE OF GRAVES AT THE OLD SITE STILL REMAINS. IN 1974 THE COMMUNITY RECEIVED A GRANT WHICH WAS UTILIZED TO RELOCATE ABOUT 20 GRAVES AND TO PLACE OIL BARRELS AT THE BASE OF CHURCH HILL. THIS PROJECT HAS NOT BEEN EFFECITVE IN REDUCING THE EROSION PROBLEM IN THIS AREA. THE OIL BARRELS HAVE FALLEN ONTO THE BEACH AND MORE GRAVES HAVE BEEN EXPOSED.

THERE ARE A NUMBER OF STRUCTURES WHICH COULD HAVE FOUNDATION PROBLEMS CAUSED BY THE EROSION IF SOMETHINGS IS NOT DONE IN THE NOT TOO DISTANT FUTURE. THESE STRUCTURE INCLUDE ONE HOME AND THE FUEL STORAGE TANKS FOR THE CANNERY.

AS INDICATED EARLIER IN THIS REPORT. THE PRIMARY CAUSE OF THE EROSION ARE HIGH TIDES THAT OCCUR IN THE FALL ALONG WITH SOUTHEASTERLY WINDS THAT ERODE HOLES IN CHURCH HILL. THE HOLES WILL FREEZE IN THE WINTER AND, DURING THE SPRING THAW, THE BANK CAVES IN AND SLIDES DOWN ONTO THE BEACH. THE TIDES THEN WASH THIS MATERIAL AWAY LEAVING A FAIRLY STEEP BANK. BASED ON INFORMATION GATHERED. THE AVERAGE EROSION RATE IS ABOUT 5 FEET PER YEAR AND A TOTAL OF ABOUT 500 FEET OF BANK IS SUBJECT TO EROSION. OF THIS ABOUT 100 FEET IS BEHIND THE CANNERY. THERE IS AN ADDITIONAL 500 FEET EAST OF THE DIAMOND E. CANNERY WHICH IS ALSO ERODING. HOWEVER THIS EROSION IS NOT EFFECTING ANY STRUCTURES AT THIS TIME.

THERE IS AN URGENT PROBLEM AT THE CHRUCH HILL SITE AND WITHOUT CORRECTIVE MEASURES, EROSION WILL CONTINUE TO EAT AWAY AT THE BLUFF AND CONTINUE TO EXPOSE ADDITIONAL GRAVES.

BASED ON MY PRELIMINARY IMPRESSIONS, A SEAWALL DESIGN WOULD PROBABLY PROVIDE THE BEST POSSIBLE DDESIGN.

AKIAK ALASKA

LAT 60.55'00" NORTH, LONG 161.12'00" WEST

ON SEPTEMBER 26, 1983 THE INVENTORY TEAM FOR THE CENTRAL REGION'S EROSION CONTROL TASK FORCE VISITED THE COMMUNITY OF AKIAK WHICH IS LOCATED 82 MILES NORTHEAST OF BETHEL ON THE RIGHT BANK OF THE KUSKOKWIM RIVER. THIS LOCATION ALLOWS EASY ACCESS BY BARGE AND LARGE RIVER BOATS.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

CHUCK GIBSON
SENATE FINANCE COMMITTEE
STATE OF ALASKA

UPON ARRIVAL THE TEAM MET WITH MR. JOHN RAMOS, CITY MANAGER WHO PROVIDED MUCH OF THE INFORMATION AS WELL AS INTRODUCED THE INVENTORY TEAM TO A NUMBER MEMBERS OF HIS COMMUNITY.

I ELPLAINED TO MR. RAMOS THAT THE PURPOSE OF THE TASK FORCE WAS TO INVENTORY ON A STATEWIDE BASIS AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS AND TO MAKE OUR RECOMMENDATIONS TO THE COMMISSIONER TOGETHER WITH PRELIMINARY PLANS AND COST ESTIMATES WHERE POSSIBLE. I CAUTIONED HIM THAT JUST BECAUSE THE TASK FORCE HAD VISITED HIS COMMUNITY THAT IT DID NOT MEAN THAT A PROJECT WOULD BE FUNDED. I DID HOWEVER INDICATE THAT A COPY OF MY FINAL REPORT WOULD BE SENT TO HIS COMMUNITY FOR THEIR COMMENT AS SOON AS IT AS AVAILABLE.

THE TASK FORCE INTERVIEWED MR. OWEN IVAN, PRESIDENT FOR THE LOCAL "IRA" AS WELL AS HIS OLDER BROTHER MR. JERRY PAUL IVAN. THEY BOTH PROVIDED ADDITIONAL INFORMATION ON THE ACTIVITIES OF THE RIVER OVER THE PAST 40 YEARS.THE ACTIVITIES OF THE RIVER OVER THE PAST 40 YEARS.

BASED ON INFORMATION GATHERED IT APPEARS THAT THE KUSKOKWIM RIVER HAS BEEN WORKING ON THE UPSTREAM BANK TO THE COMMUNITY OVER THE PST 40 YEARS. IT APPEARS THAT THE RIVER HAS MOVED ATLEAST 150 TO 175 FEET INTO WHAT WAS THE OLD VILLAGE. PHOTOGRAPHS WERE TAKEN OF THE OLD CATHOLIC CURCH FOUNDATION WHICH NOW IS ON THE EDGE OF THE RIVER. I WAS TOLD THAT SOME OF THE BUILDINGS IN THE COMMUNITY HAVE BEEN MOVED A NUMBER OF TIMES OVER THE YEARS DUE TO THE ENCROACHMENT OF THE RIVER.

IN MAKING MY GENERAL EVALUATION OF THIS AREA IT IS MY OPPINION THAT THIS PROBLEM WILL REQUIRE SOME RATHER EXTENSIVE STUDY WITH REGARDS TO DESIGNING A SERIES OF "RIVER TRAINING STRUCTURES" SUCH AS GROINS TO ASSIST THE RIVER IN MOVING AWAY FROM THE UP STREAM END OF THE VILLAGE.

I WAS ALSO TOLD THAT MR. GEORGE C. SLIDES PE, (FORMER LEGISLATOR) WAS PREPARED TO DESIGN TIMBER BULKHEADS. MR. SILIDES, PE, ALSO RECOMMENDED DREDING OF A PREVIOUSLY DEEP CHANNEL WHICH THE RIVER HAS ABANDONED OPPOSITE THE COMMUNITY.

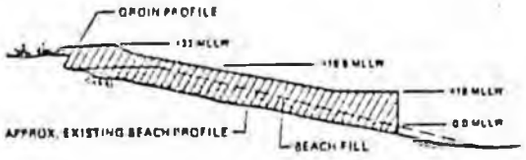
I DO NOT AGREE WITH THIS METHOD OF TRYING TO SOLVE THE BANK STABILIZATION PROBLEM AT AKIAK. BECAUSE IT WILL ONLY TREAT THE EROSION PROBLEM FOR A SHORT PERIOD OF TIME. IT DOES NOT TRY TO CHANGE THE RIVER'S ANGLE OF ATTACK ON THE COMMUNITY ITSELF WHICH IS THE ONLY WAY WE WILL BE ABLE TO AFFECT A PERMENENT SOLUTION.

IT IS RECOMMENDED THAT THE TASK FORCE STUDY AIR PHOTOS FOR AS MANY YEARS AS ARE AVAILABLE. THIS WILL BE HELPFUL IN CREATING A DESIGN THAT WILL MOVE THE RIVER SLOWLY AWAY FROM THE UPSTREAM BANKS OF THE COMMUNITY.

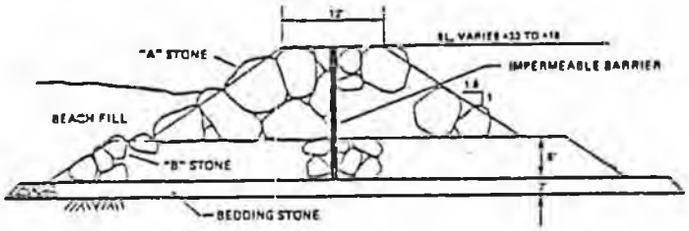
THE TASK FORCE HAS ORDERED CURRENT AIR PHOTOS OF THE AREA FOR JUST THIS PURPOSE.

AFTER MAKING AN INITIAL EVALUATION OF A SERIES OF AIR PHOTOS WHICH WERE TAKEN IN 1983 IT IS RECOMMENDED THAT CONSIDERATION BE GIVEN TO A DESIGN WHICH INCORPORATES A SERIES OF 4 GROINS. THESE STRUCTIRES WOULD HAVE TO BE DESIGNED AT A 30 DEGREE ANGLE FROM THE GENERAL FLOW AND WOULD BE 50 FEET IN LENGTH BY 15 FEET HIGH, WITH A 1 1/2 BY 1 SIDE SLOPE. THE OURTER LAYOR OF ARMOR STONE WILL BE CLASS "B" STONE AND THE INER CORE OF THE GROINS WILL BE CLASS "A" STONE.

IT IS IMPORTANT THAT THE STRUCTURES BE DESINGED SO THAT THEY CAN BE EASILY REPAIRED BY ALLOWING VEHICLES TO BE ABLE TO REPLACE MATERIAL FROM THE TOP OF THE STRUCTURE.



TYPICAL GROIN PROFILE
NO SCALE



TYPICAL GROIN SECTION
NO SCALE

GROIN SYSTEM

A CONSIDERATION MIGHT BE GIVEN TO THE DESIGN OF AN OFF LOADING FACILITY WHICH COULD BE LOCATED DIRECTLY DOWNSTREAM OF THE GROIN SYSTEM. HOWEVER THIS FACILITY WOULD NOT BE PART OF THE EROSION CONTROL PROJECT.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: AKIAK, ALASKA

PROJECT NUMBER R30023

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 16, 1983

REMARKS: GROIN SYSTEM UP STREAM OF THE FUEL STORAGE FACILITIES.

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110 (1)	MOBILIZATION	ALL REQUIRED	LUMP SUM	LUMP SUM	64,974.40
	CLASS "A" STONE	3608	CUBIC YARD	52.00	187,616.00
	CLASS "B" STONE	3440	CUBIC YARD	52.00	178,880.00
	SUB TOTAL				431,470.40
	ENGINEERING & CONTINGENCIES				63,220.56
	TOTAL				494,690.96

NUNAPITCHUK, ALASKA

LAT 60.53'00" WEST, LONG 162.29'00" NORTH

ON OCTOBER 12, 1983 THE INVENTORY TEAM FOR THE CENTRAL REGION'S EROSION CONTROL TASK FORCE VISITED THE COMMUNITY OF NUNAPITCHUK WHICH IS LOCATED 1/2 MILE WEST OF KASIGLUK ON THE NUNAVAKANUKAKSLAK LAKE. THE COMMUNITY IS ABOUT 20 MILES EAST OF BETHEL.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

CHUCH GIBSON
SPECIAL ASSISTANT
SENATE FINANCE COMMITTEE

UPON ARRIVAL THE TEAM MET WITH NUNAPITCHUK'S MAYOR ROBERT NICK WHO PROVIDED MUCH OF THE INFORMATION WHICH WE USED, TOGETHER WITH AIR PHOTOS WHICH WERE TAKEN IN 1975.

I EXPLAINED TO THE MAYOR THE PURPOSE OF THE TASK FOCE WAS TO INVENTORY, ON A STATEWIDE BASIS, AREAS WHERE THE DEPARTMENT SUSPECTED EROSION PROBLEMS, AND TO MAKE RECOMMENDATIONS TO THE COMMISSIONER ALONG WITH A LIST OF PRIORITIES AS WELL AS POSSIBLE SOLUTIONS TO THESE AREAS OF CONCERN. I CAUTIONED THE MAYOR THAT JUST BECAUSE WE HAD VISITED THEIR COMMUNITY AND HAD FOUND A PROBLEM DID NOT MEAN THAT THERE WOULD BE A PROJECT IN THE NEAR FUTURE AS ANY PROJECT WOULD REQUIRE FUNDING THROUGH THE LEGISLATIVE PROCESS. THE MAYOR INDICATED THAT HE UNDERSTOOD. HE SAID HIS COMMUNITY'S NUMBER TWO PRIORITY WAS A SEAWALL AND DREDGING PROJECT. I TOLD HIM THAT IT WAS THE INTENTION OF THE TASK FORCE TO WORK AS CLOSELY WITH EACH COMMUNITY AS WE COULD.

BASED ON MY ON SITE INVESTIGATION AND REVIEW OF THE LIMITED INFORMATION AVAILABLE AT THIS TIME I FOUND THAT THERE IS ABOUT 700 FEET OF AREA AT THE VILLAGE SITE WHICH IS ACTIVELY BEING ERODED. I ALSO NOTED THAT ALMOST ALL OF THIS AREA WAS USED BY THE COMMUNITY AS A MEANS OF TRANSPORTATION TO THE NEIGHBORING VILLAGES.

BASED ON THE ON SITE TOPOGRAPHY OF THE AREA IT IS FELT THAT 300 FEET OF BANK SHOULD PROVIDE ACCESS AND THE REMAINDER OF THE BANK COULD BE PROTECTED WITH A MATTRESS OF WILLOWS ANCHORED DOWN TO THE BANK. THE COMMUNITY WOULD NOT HAVE ACCESS TO THE RIVER IN THE AREAS WHERE THE MATTRESS WAS USED BUT IT IS FELT THEY WOULD HAVE ADEQUATE ACCESS IF THE CONCRETE MAT WAS DIVIDED IN 100 FOOT SECTIONS.

CONSTRUCTION ESTIMATE

NAME OF COMMUNITY: NUNAPITCHUK, ALASKA

PROJECT NUMBER R30023

BY: W. F. BARBER JR., REGIONAL HYDROLOGIST

DATE: DECEMBER 16, 1983

REMARKS: INCLUDES 300 FEET OF CONCRETE EROSION MAT AND 400 FEET OF WILLOW MATTRAS PROTECTION.

ITEM NUMBER	DESCRIPTION	QUANITY	UNIT	UNIT PRICE	AMOUNT
110 (1)	MOBILIZATION	LUMP SUM	LUMP SUM	LUMP SUM	37,050.00
	CONCRETE MAT COMPLETE	300	LINEAR FOOT	710.00	213,000.00
	WILLOW MATTRAS PROTECTION	400	LINEAR FOOT	95.00	34,000.00
	SUB TOTAL				284,050.00
	ENGINEERING & CONTENCENCIES				42,607.50
	TOTAL				326,657.50

NAPAKIAK ALASKA

LAT 60.42'00" NORTH. LONG 162.07'00" WEST

ON SEPTEMBER 26, 1983 THE INVENTORY TEAM FOR THE CENTRAL REGION'S TASK FORCE ON EROSION CONTROL VISITED THE COMMUNITY OF NAPAKIAK WHICH IS LOCATED 10 MILES SOUTHEAST OF BETHEL ON THE LEFT BANK OF THE KUSKOKWIM RIVER IN THE YUKONG KUSKOKWIM DELTA. THIS LOCATION ALLOWS EASY ACCESS BY BARGE AND LARGER RIVER BOATS.

THOSE WHO WERE PRESENT ON THE INVENTORY TEAM WERE:

W. F. BARBER JR.
REGIONAL HYDROLOGIST
CENTRAL REGION

CHUCK GIBSON
SENATE FINANCE COMMITTEE
STATE OF ALASKA

UPON ARRIVAL THE TEAM MEET WITH MR. CARL MOTGIN, MAYOR AND MR. GEORGE BERRY CITY MANAGER FOR NAPAKIAK AT THE CITY OFFICES.

I EXPLAINED TO MR. MOTGIN AND MR. BERRY THAT THE TASK FORCE WAS CHARGED WITH THE RESPONSIBILITY OF TAKING AN INVENTORY OF ALL AREAS WHERE THERE WAS A SUSPECTED EROSION PROBLEM ON A STATEWIDE BASIS AND THAT AFTER THAT THE TASK FORCE WOULD MAKE RECOMMENDATIONS WITH REGARDS TO PRIORITIES AS WELL AS POSSIBLE SOLUTIONS FOR THOSE AREAS WHERE THE TASK FORCE FELT THAT IT COULD DO PRELIMINARY DESIGN AS WELL AS A PLEMINARY ESTIMATE.

MR. MOTGIN SAID THAT HE UNDERSTOOD BUT THEN ASKED IF THE DEPARTMENT HAD PLANS TO DESIGN A PROJECT FOR HIS COMMUNITY.

I RESPONDED THAT IT WAS IMPORTANT THAT HE UNDERSTAND THAT JUST BECAUSE THE TASK FORCE HAD VISITED HIS COMMUNITY AND THAT THEY HAD FOUND THAT THERE WAS INFACT A PROBLEM WITH EROSION THAT IT DID NOT MEAN THAT THERE WAS A PROJECT ON THE DRAWING BOARDS OR THAT THERE WOULD EVER BE A PROJECT AS THE DEPARTMENT COULD ONLY DESIGN AND BUILD A PROJECT IF THEY WERE FUNDED BY THE LEGISLATURE AND AS OF THIS DATE THAT HAD NOT HAPPENED.

THE MAYOR THEN ASK ABOUT THE FEASIBILITY STUDY WHICH THE CITY HAD REQUESTED IN THEIR RESOLUTION #830315 DATED MARCH 15, 1983.

I INDICATED THAT I HAD THIS INFORMATION IN MY FILES AND THAT I WOULD MAKE SURE THAT THE COMMISSIONER WAS MADE AWARE OF THE FACT THAT HIS EROSION PROBLEM WAS A VERY HIGH PRIORITY IN THEIR COMMUNITY.

I THEN ASK IF IT WOULD BE OK IF WE WENT OUT TO LOOK AT THE AREA WHERE THE EROSION WAS A PROBLEM.

BASED ON OUR ON SITE EVALUATION AS WELL AS OLD AIR PHOTOS WHICH WERE PROVIDED INDICATING SUBSTANCIAL RATE OF EROSION.

WHILE THE ACUTAL AREA IS ONLY ABOUT 2000 FEET IN LENGTH I HAVE SOME REAL CONCERNS WITH REGARDS TO WHAT WILL HAPPEN IF WE JUST PROTECT THIS AREA AND FAIL TO EVALUATE WHAT ACTION THE RIVER WILL TAKE IN FUTURE YEARS.

I HAVE ORDERED CURRENT AIRPHOTOS OF THIS AREA AS WELL AS OLDER AIR PHOTOS SO AS TO HAVE A BETTER IDEA OF WHAT HAS BEEN HAPPENING OVER THE PAST NUMBER OF YEARS.

BASED ON MY ON SITE EVALUATION IT IS FELT THAT THIS PROJECT WILL REQUIRE EXTENSIVE HYDRAULIC DESIGN AS WELL AS EVALUATION WITH REGARDS TO THE TYPE OF TRAINING STRUCTURES WHICH WILL BE RECOMMENDED TO KEEP THE RIVER FROM CONTINUING TO MOVE BEHIND THE VILLAGE AND THEREFORE CREATING OTHER POSSIBLE PROBLEMS.

IT IS MY RECOMENDATION THAT THE DEPARTMENT CONSIDER MAKING AN EXTENSIVE ENGINEERING STUDY WITH REGARDS TO DESIGN AND THEN PROCEED WITH THE DESIGN WITHIN THE NEXT FISCAL YEAR AS THE COMMUNITY HAS ALREADY LOST A CONSIDERABLE AMOUNT OF IT'S PROPERTY. PLUSS AT THE RATE OF EROSION WE HAVE LESS THAN 5 YEAR BEFORE THE STATE SCHOOL COMPLEX WILL BE THREATENED.

WITH REGARDS THE FEASIBILITY OF PROVIDING THE NEEDED PROTECTION TO THE COMMUNITY IT IS MY INITIAL JUDGEMENT THAT WE SHOULD BE ABLE TO DESIGN A FINANCIALLY FEASIBLE STRUCTURE WHICH WILL PROTECT THE COMMUNITY AS WELL AS INSURE THAT THE RIVER WILL NOT CUT AROUND INBACK OF THE VILLAGE AND EVENTUALLY CREATE ADDITIONAL PROBLEMS.

I INFORMED MR. MOTGIN THAT I WOULD BE SENDING HIM MY REPORT FOR HIS COMMENT AS SOON AS I WAS ABLE TO EVALUATE THE AIR PHOTOS AND OTHER INFORMATION WHICH WAS AVAILABLE. I TOLD HIM THAT IF HE HAD ANY QUESTIONS TO PLEASE FEEL FREE TO EITHER CALL OR ASK AS I WOULD BE DEPENDING ON HIM AS WELL AS THE REST OF THE COMMUNITY FOR ADDITIONAL INFORMATION IN THE FUTURE.

AS INDICATED ABOVE BECAUSE OF THE COMPLEX NATURE OF THE RIVERS MEANDER PATTERN PLUSS THE EFFECTS THAT NAPAKIAK SLOUGH HAS ON THE COMMUNITY AN INDEPTH MODELING STUDY WILL BE REQUIRED TO INSURE THAT OUR DESIGN DOES NO CONTRIBUTE TO THE FURTURE PROBLEMS OF THIS COMMUNITY. IT IS ESTIMATED THAT INFORDER TO PROVIDE A COMPLETE DESIGN FOR THIS COMMUNITY WILL REQURIE $100,000.00 AND THE ESTIMATED COST OF THE FINAL PROJECT WILL PROBABLY BE $1,500,000.00.

SHISHMAREF

Shishmaref is located on Sarichef Island between the Chukchi Sea and Shishmaref Inlet. It is 126 miles north of Nome and 100 miles southwest of Kotzebue. The island is barrier island primarily composed of fine grain sands. Rock or gravels are not available on the island. A preliminary 1980 census set the population at 393. Archaeological excavation has exposed evidence of Eskimo habitation going back several centuries.

Shishmaref is subject to erosion from the forces of the Chukchi Sea. Most of the erosion occurs during storms during the autumn season. Storm surge build up combined with high tides increases the water level and wave run up undercuts the existing banks. The bank composed of fine sands washes back into the sea and is carried away by littoral drift.

In 1981 State funds in the amount of $900,000 were appropriated for erosion control at Shishmaref. A public hearing was held in January, 1982 to discuss the erosion problem and select from a series of alternative solutions. Based on the public hearing it was decided to bid the erosion control project with three alternate solutions and select the most cost effective solution within the project budget. The choice based on bids submitted was for the installation of wire gabions filled with sand bags. Installation of the gabions began in July, 1983; it was completed in September, 1983. During October, 1983 two storms occurred at Shishmaref which caused sufficient erosion on the seaward side of the island. Substantial erosion occurred at either end of the 1983 erosion protection project but not within the project boundaries. In order to protect the remainder of the area of critical concern it will be necessary to construct additional erosion protection. Wire gabions filled with sand bags is a method of erosion protection that has not been used previously by the Department of Transportation and Public Facilities. This method has some problems and may necessitate high maintenance costs. It is therefore recommended that some other method or methods be used so that various methods could be evaluated at this site. Rip rap or grout filled fabric bags would be likely choices. Approximately 1,000 linear ft. of additional protection is required. Based on 1984 construction the cost estimate would be $1,400,000.

DELTA JUNCTION

Delta Junction (population 925) is at the junction of the Alaska and Richardson Highways, about 90 miles southeast of Fairbanks. The Delta River flows by the south edge of town.

The Delta River is glacial and braided. Its channel wanders randomly within the floodplain. The river picks up material in the Alaska Range to the south, and deposits it in its lower reaches, north of the mountains. Delta Junction is along the lower reaches of the river in an area where the riverbed is accreting. The erosion problem is a result of riverbed accretion forcing the channel to seek a new location. In this case, it is trying to shift into the town. With the exception of some areas where individuals have constructed groins out into the river, it is eroding steadily into the bank, taking property, and threatening buildings. Left unchecked it could be expected to, within a few years, displace the community. During the high water period (late summer) of 1983 the riverbank was eroding several feet a day toward the Richardson Highway. DOT/PF maintenance people dumped enough rock into a groin at that point to decrease the erosion, at least for the time being. DOT/PF is now in the process of developing a project to protect the highway in that area.

The City of Delta currently has a $100,000 appropriation to combat the erosion and is seeking additional money to study a long term solution. Also, the Soil Conservation Service is doing an areawide erosion study at Delta. They have included the riverbank as a specific area to be studied. DOT/PF has been in contract with both entities. Whatever study is initiated will be coordinated between those agencies, and several others.

A solution to the problem will entail protecting the bank so the river can't encroach further and/or removing enough material from the riverbed to allow relocation of the channel. It is recommended that, until a decision is made on a long term solution, that a combination of channelization and bank construction be undertaken out in the floodplain some distance away from town. Excavating eight cu.yds. of material per lineal foot and placing it in a berm would cost an estimated eight dollars per lineal foot. 12,000 lineal ft., the approximate length needed to protect the town would cost approximately $96,000. The work would have to be done during the winter months when little, if any, surface water is flowing. Such a project would probably have a short service life and could require frequent maintenance. It may have to be done on an annual basis. A side benefit would be the construction material that could be extracted for other local projects. Resource agency coordination toward obtaining a Corps permit for such a project could be extensive. Also, care would have to be taken to not cause an increase in the rate of bank erosion below town. The study effort sought by the City of Delta should be undertaken to find a long term solution to the problem.

DEERING

Location

The coastal community of Deering has a population of about 150 people. Travel to and from the village is by airplane or by boat in the summer; snowmachine and three-wheeler travel is possible in the winter. Only about a mile of gravel road is present between the airport and the village. A dirt trail connects Deering with the gold mining camp about 22 miles upstream along the Inmachuk River. The houses, school, community buildings, and water storage tank for the community are located on the narrow strip of land comprising the sand spit between Kotzebue Sound and the estuary of Smith Creek and Inmachuk River to the south.

The Mayor of Deering, Dolores Barr, pointed out the areas of erosion and the rock source of potential riprap. Persistent and strong northeasterly winds blowing across Kotzebue Sound from the Chukchi Sea result in storm surge increase in water level at Deering several feet above the normal one foot to two feet tidal changes. Storm waves superimposed on the higher water levels result in flooding of the sand spit and in wave erosion of the sand and gravel of the beach. Erosion has occurred along virtually all of the beach area in front of the village.

Past efforts at stopping or reducing erosion consisted of sand-filled 50 gallon steel fuel drums placed vertically in a single row parallel to the beach front. This row (occasionally a double row) of filled drums was usually buried at least one half a drum into the beach sand and positioned at the foot of the steep bank on the uppermost part of the beach. This steep bank marked the uneroded part of the beach that was stable because of the presence of beach grass and its protecting root system. (The ground was frozen during the 1973 storm.) The air photos dated July 1962 show a small start of fuel drums in place along the beach and large numbers of empty drums along the other parts of the roadway, ready to be filled and placed. The air photos dated 1974 show remnants of what must have been a continuous row of steel drums along the beach. There are many gaps, large numbers of drums scattered out to sea, and many littering the beach. A major storm took place in November 1973 and extensive erosion is apparent between the two sets of air photos. There was a loss of grass-covered ground about 25 ft. wide generally, but as much as 60 ft. in the last 500 ft. at the east end of the sand spit. Residents say that there has been additional loss of grass covered ground between 1973 and today, 1983. The distance between houses and the edge of water has changed very little between 1962 and 1974.

Equipment

The City of Deering, Ruth Moto, City Manager; has the following equipment on hand:

Road grader
Wheeled front-end loader
Dump truck
Cat with blade

Design Construction Narrative

The analysis by E. Long in Reference 2 concerning the beach processes at work on the sand spit, on which Deering is located, sums up the important factors. The sand spit is built from gravel and sand eroded from the rocky point to the northwest (Cape Deceit) and transported along the shore by littoral drift. Periodic storms are important in moving the transported material from the beach area up onto and over the sand spit, thereby building it higher and wider. Part of the beach material is also moved along the beach to the southeast during these storms. Placing steep-faced obstructions on the beach (fuel drums, gabians, riprap or other objects) that interface in this process has and will continue to result in beach erosion and quite probably erosion of the higher ground on which the houses are located. The presence of 2000 year old artifacts in the sand spit argue that the site was not subject to major erosion during this period, when it surely was devoid of any beach protection devices, except probably beach grass.

Recommendations

Fuel drums, gabian baskets, or coarse rock must not be placed on the beach or the turbulence they create when waves break against them will result in the destruction of the beach on the seaward side.

The most effective method of preventing major storms from attacking the steep bank adjacent to the roadway parallel to the houses at Deering is to replace the eroded material on a slope identical to the natural beach angle of 6 to 8 percent. Rock broken to gravel size (minus 3 inches) or pit-run gravel can be used in this work.

It must be recognized that the natural and essential movement of material, during major storms of about ten year frequency, will be up onto and over the sand spit. The resultant occasional flooding may be an inconvenience but it is not practical to raise the elevation of the entire sand spit above the probable flood level.

Protecting the existing beach grass from destruction by dogs, vehicular traffic, or other means will aid in stabilizing the beach material because the grass roots are very effective in holding the loose sand together. The areas from which the beach grass had been eliminated, by man or dogs, were washed away to a much greater degree than areas protected by grass.

Estimated cost of protecting 3,200 ft. of beach line is $400,000.

An alternative to beach grass to protect path areas may be the use of expandable, plastic webbing called, "Geoweb". It consists of a series of honey-comb shaped plastic bounded openings into which sand or gravel can be placed. The eight inch high walls of the Geoweb confine the sand and increase its bearing strength. A quantity sufficient for covering ten paths, four ft. wide and 50 ft. long should be obtained and installed to test its effectiveness in resisting foot traffic and erosion. Approximate cost - $2,000.

List Of Materials

Gravel is present in the floodplain of the Inmachuk River from the sources developed to supply the needs of the airport construction (see Sample 83-8).

Schist Bedrock is present in the rock bluff southeast of Deering at a distance of 1/4 of a mile. Because it is across the mouth of the Inmachuk River, a winter haul or a temporary bridge would be required. Boats for Deering normally use this channel and are tied up south of the community rather than on the open beach in front. The schist is moderately hard and forms a cliff 70 to 100 ft. high above the beach. Fractures present in the rock result in fragments at the base of the cliff ranging from eight inches to 24 inches in diameter, occasionally larger. (See Sample 83-7)

Beach Gravel and Sand are present in the beach and sand spit on which Deering is situated (see Sample 83-5, 6). No attempt should be made to remove any material from the beach in front of or northwest of the village because this will interfere with the natural transport processes of littoral drift and could result in more severe erosion at the village site. Gravel could be removed from the beach area southeast of Deering across the mouth of the Inmachuk River. Here the gravel has already passed the village and is on its way farther southeast.

NOATAK

Location

The Eskimo village of Noatak is located on the west side of the Noatak River about 50 miles north of Kotzebue. The community is situated on high ground ranging from ten to 30 ft. above the level of the river. Westward migration of the river is taking place, chiefly because the west bank is composed of ice rich frozen silt. The Noatak River is a braided stream that has a fairly heavy bedload of medium-sized gravel. The westward migration of the river is made much easier by the presence of the ice-rich silt that can be eroded away far more easily than moving gravel - the river takes the easier course, cutting rapidly into the frozen, ice-rich silt rather than carrying a heavy bedload of gravel.

Travel to and from Noatak was historically only by riverboat but now air travel is probably equally important. During the winter dog team travel is possible, as is snowmachine, or in some snow conditions even three-wheeler travel. Most of the traffic is between Noatak and Kotzebue or points farther south.

The school, powerplant, native store, post office and several houses are on or next to the riverbank that was being eroded. A temporary spruce-pole crib wall was built in the late 1960's by the villagers using local poles. The vertical pole wall served until 1974 when it was undermined and collapsed. The need for the wall was undoubtedly related to the removal of large quantities of gravel from the bars in front of and immediately downstream from the village. The gravel was used to construct the airport and access roads into the community.

The shift of the river to the west, into the exposed ice-rich silt, has continued with more of the bank melting and being washed away.

A temporary gravel and spruce tree dike was built in the fall of 1980 and was intended only to last until a contract could be let the next season for more permanent bank protection. This more permanent protection consisted of 1,500 ft. of Armorform Revetment System (grout-filled polypropylene bags cabled together) placed on a gravel dike. The completed bank protection was observed in October of 1983.

One section of the concrete-filled pillows had pulled loose from the cable connectors and the current had folded it back. The unprotected river bottom had then been scoured out several feet deeper. The upper blanket of pillows had moved down the inclined face of the gravel bank causing wrinkles in the otherwise smooth blanket. It could not be determined if this was because of the anchors failing or the cables stretching or slipping.

Equipment

Several pieces of equipment are present in Noatak, both City owned, Public Health Service owned and State-owned.

2 Backhoes - John Deere
2 Cats - John Deere
1 Dump truck
1 Grader
1 Front-end Loader

Design Construction Narrative Recommendations

The manufacturer was contacted and expressed willingness to provide additional cable, cable sleeves and crimping tools to repair the Armorform Revetment System. The following actions will reduce the erosion problem:

1. Refasten all cable joints that have parted, using the approved method.

2. Using power equipment, stretch the blanket out to remove wrinkles so that all the pillows lie flat.

3. Cut the fabric between all pillows

4. Reposition the section of blanket that has folded back and refasten it.

Note: This work must be done before spring high water in 1984.

5. Do not permit removal of any gravel from the river in front of the village.

Estimated cost is $6,000 for labor and equipment rental. The manufacturer is providing cables and clamps.

NOORVIK

Location

The village is located on a sharp bend in the Kobuk River (known as the Nazaruk Channel) along one of the branches of the lower river in the delta region. The community is situated about 40 ft. above the river channel and not subject to flooding. Some erosion of the riverbank is taking place in the vicinity of the National Guard Armory but that building is not yet in danger. Of more immediate concern is the west end of the cross-wind runway. Here the river has cut into the ice-rich silt of the bank to the extent that the approach zone at the end of the runway is beginning to fall down the 40 ft. bank and into the river. Air photos dated 1962 and 1968 show little change in the riverbank but photos taken in October 1983 during the erosion study show that there has been a recent increase in the rate of erosion. The main runway parallels the riverbank and recent erosion extends from the end of the cross-wind strip upstream past the end of the runway. The rate of erosion is rapid enough that the frozen materials overhang the water ten to 15 ft. and large blocks break loose, tilt out, then tumble into the river, to be thawed and carried away by the current.

Hank Brown, the City Manager, indicated that the immediate concern was the crosswind strip. Due to prevailing winds this strip is used as much or more than the main, longer runway. Noorvik depends to a great degree upon air transport for supplies, except what can be barged in during the summer.

The erosion along the main runway has progressed to a point about 20 ft. outside the cleared zone. The height and steepness of the bank and kind of material (ice-rich silt) will result in additional caving of the bank even if no further erosion takes place at the riverbank - which is highly unlikely. It appears that a shift is taking place in the meander of the river and that unless extensive work is undertaker further loss of the bank will migrate into the south, one-third of the main runway within the next two years. This is a State-maintained and operated airfield.

No bank protection of either the airport site or the village site has been undertaken, even though the leaders in the community have sought State or Federal aid over a period of several years, going back to 1968.

Equipment Available

1 Front-end Loader
2 Dump truck
2 Cats with blade - John Deere 440 size
A grader has been ordered and is due in next year on the barge.

Design Construction Narrative

The length of bank requiring protection exceeds 4,000 ft. and the 40 to 50 ft. height of ice-rich, perennially frozen bank material cannot be protected by any small village-sized effort, such as hand placed sandbags.

Recommendations

A more detailed fact gathering visit should be made to the site with the necessary equipment to do the required work to provide the information critical to design an adequate bank protection project. Alternatively, it may be that rather than protect this airfield from erosion at great cost, a more economical approach could be reconstruction in a more defensible location. An in-depth stream bank protection study recommended to include the possibility of moving the airfield. Hold public hearings to address village concerns.

List of Material

Sandy Silt is present in the point bar at the village boat mooring area (See Sample 83-1516).

Silty Gravel is present in the potential borrow area known as Hotham Peak Gravel Source (Reference 2) about five miles east of Noorvik. This source was used to surface the runway (See Sample 83-1517). A haul road would be required.

Sandy Gravel is present in the beach ridge around Selawik Lake but would require barging long distances (See Reference 2).

No sources of bedrock are known for the area except possibly the hills northwest of Noorvik about five miles, across the Melville Channel of the Kobuk River.

Estimated cost of a reconnaissance drilling program to locate borrow and alternate runway location is $63,000.

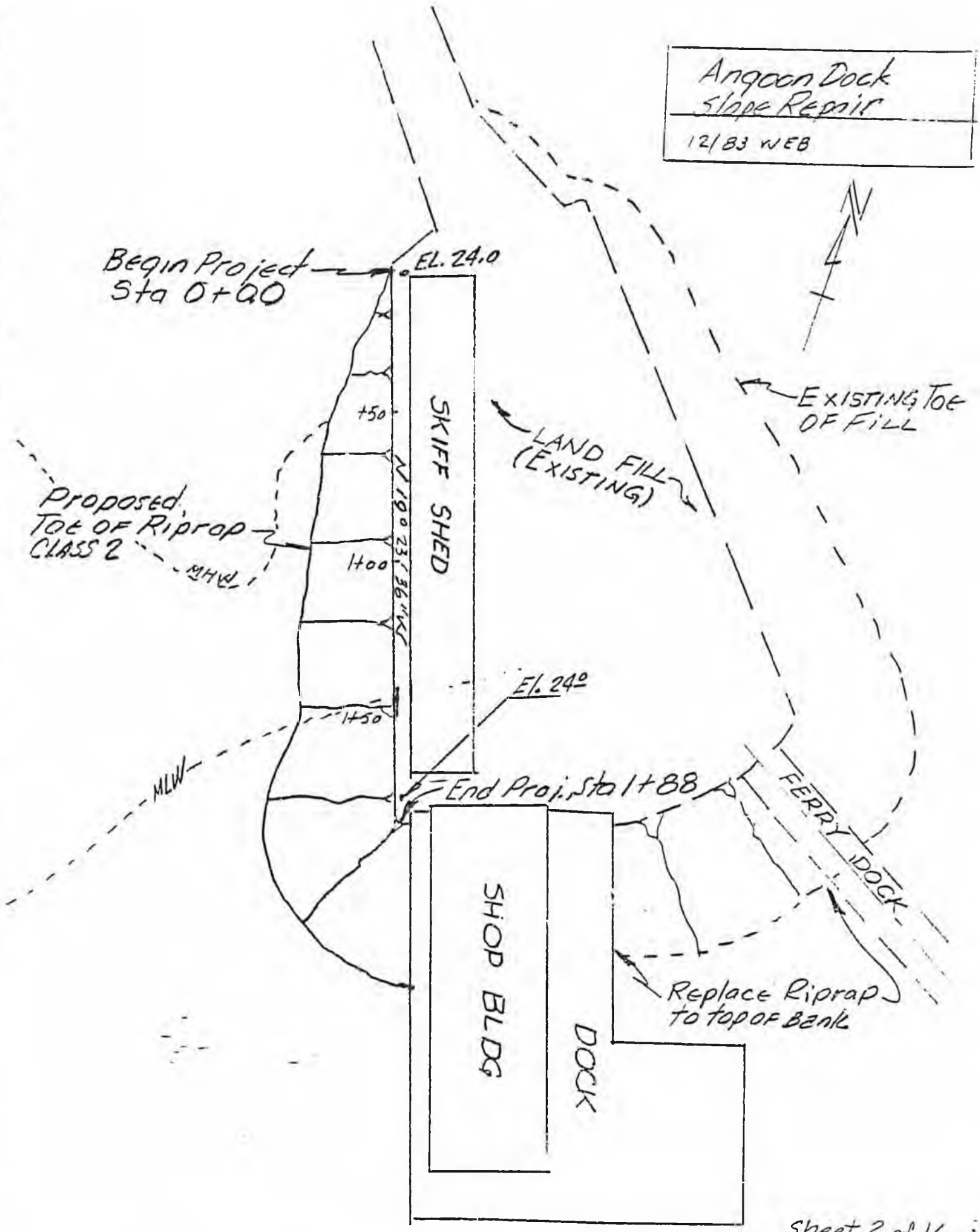
Angoon Dock and
Marine Facility

12/83 W.E.B.

DESIGNER'S NOTES

From photos, deterioration of the fill is evident. Assume the fill is standing at 1:1. Design a template to 2:1 slope, protect with filter cloth and riprap. Use 3 inch granular material to bed the fabric in. Assumed hinge point at top of fill is Elev. 24.0. Use TRYCK NYMAN & HAYES SITE PLAN & TOPOGRAPHIC CONTROL map for contours to calculate quantities.

Consideration was given to protect the shop building on the south end. This could be done by using the existing dock piling and attaching wave attenuators and cresting the wave prior to breaking on the rock under the building. However, ownership of the dock is not vested to the State, and there is a risk of uplift on the piling due to the surge fence. To place piling in front of the dock to attach a fence would constitute a navigational problem. Therefore no attempt to control wave breaking under the dock will be made. However, the erosion between the City Dock and the Ferry Terminal has been considered.


Angoon Dock
Slope Repair
12/83 WEB
N
Begin Project
Sta 0+00
EL. 24.0
+50
SKIFF SHED
LAND FILL
(EXISTING)
EXISTING TOE
OF FILL
Proposed
Toe of Riprap
CLASS 2
MHW
1+00
N 180° 23' 36" W
EL. 24°
1+50
MLW
End Proj. Sta 1+88
FERRY DOCK
SHOP BLDG
DOCK
Replace Riprap
to top of Bank

25-D-49

STATE OF ALASKA
SOUTHEAST REGION

ESTIMATE OF COST

Sheet 6 of 16

Project ANGCON

Project No. P30023

Item No.	Item	Unit	Unit Price	Quantity	Amount
	Gravel - 3 inch for fabric bedding	C.Y.	20.00	192	3,480.00
	Geotextile Fabric	Sq.Yd.	5.00	843	4,215.00
	Riprap	C.Y.	30.00	766	22,980.00
	Borrow	C.Y.	10.00	756	7.560.00
					38,235.00
				+10% E&C	3,823.50
				TOTAL	42,058.50
	Area that is sloughed between				
	Ferry terminal and City dock.				
	Fabric	Sq.YD.	5.00	366	1,830.00
	Borrow	C.Y.	10.00	660	6,600.00
	Rock	C.Y.	30.00	258	7,740.00
	Bedding gravel	C.Y.	20.00	90	1,800.00
					17,970.00
				+10%	1,797.00
					19,767.00
	Project Total				[illegible]
				+15% CE	[illegible]

Total Budget = [illegible]

Prepared By _____ Date _____ Checked By _____ Date _____

ANCOON BEACH FRONT

Beach Erosion

Problem

Ocean storm waves generated in Chatham Straight are causing erosion to the road along the beach front in the community of Angoon. Approximately four or five private structures are located on the beach side of the road and are also subject to attack by the wave action. In addition, the community oil service line is located under the road and would be in danger of destruction if the road is not protected.

Assumed

A three foot (reported) refracted shallow water wave developed by a northerly wind in Chatham Straight impinges on the beach in front of the community. The Mayor, Edward Gamble, Sr., reports that a 20 foot tide (Juneau tide tables) gets up to the top of the road.

Solution

The Mayor reports that the City has stockpiled riprap and that the community has the equipment available to perform the work. Both the equipment and riprap have been offered at no cost.

Design

Provide armored slope protection along beach and 100 foot long breakwaters in front of the structures with 2:1 slopes, utilizing a 4 foot layer of Class III riprap rock (average weight 700 pounds per piece). For the beach protection: bed on sand cushion, use geotextile filter fiber, use sand layer under bed and cushion, fill embankment prism as necessary to replace lost material, place rock two stones deep. For the breakwaters: build unclassified broken rock mound and armor as above. See attached sketches.

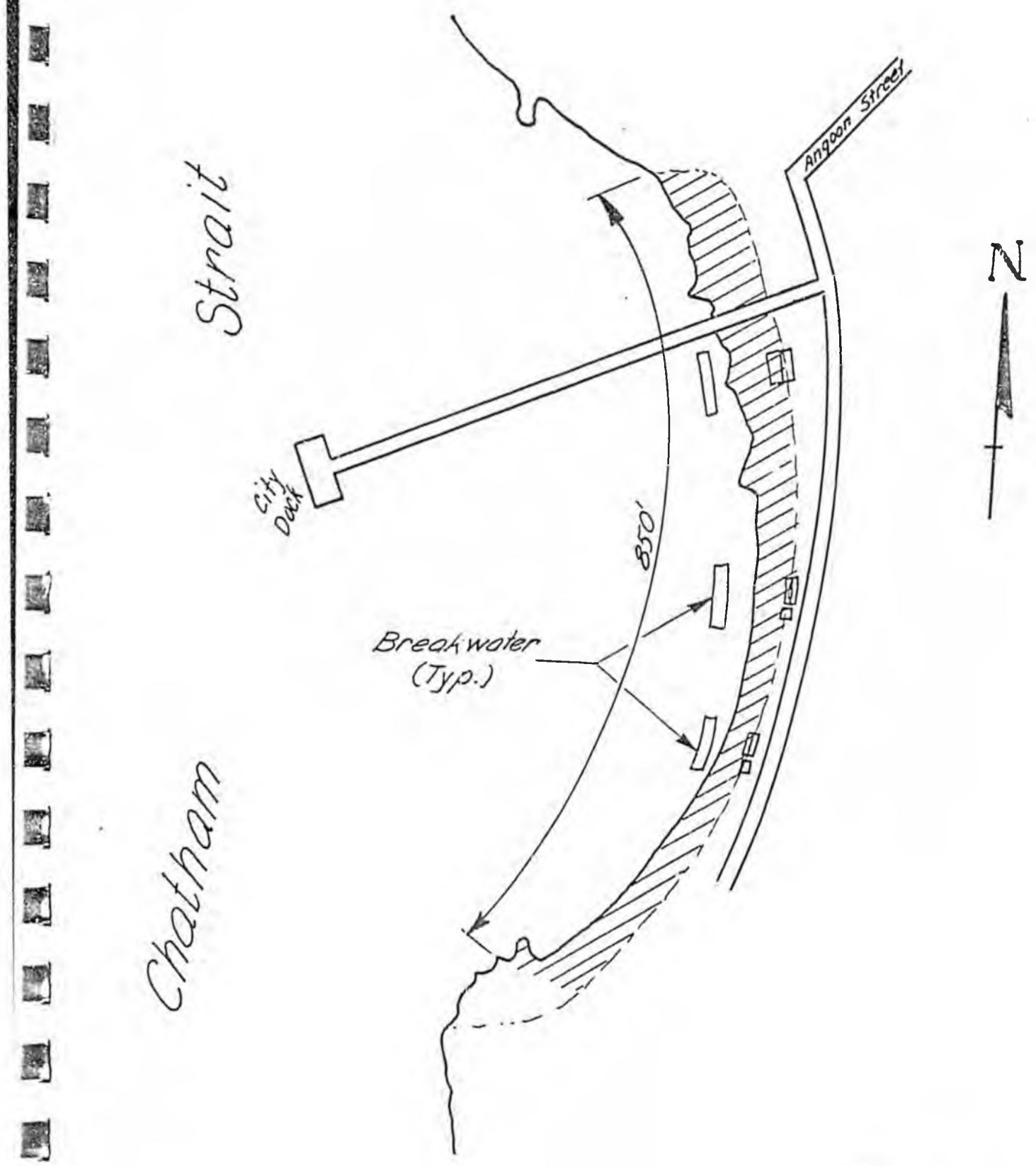
Cost

See estimate sheet attached - total project budget = $ 169,500.

Class III Specification

No more than 10% of the stones by total weight shall weigh more than 1400 pounds per piece and no more than 15% of the stones shall weigh less than 300 pounds per piece. The stones shall be evenly graded and a minimum of 50% by weight of the stones shall weigh 700 pounds or more per piece.

Angoon Beach Front



ANGOON BEACH FRONT

PROJECT ESTIMATE

Riprap (Operators & Labor Only)

4' X 18' X 550'/27 @ \$10/yd^3 = \$15,000.00

4' X 62' X 300'/27 @ \$20/yd^3 = \$55,000.00

Unclassified Rock (Operators & Labor Only)

10' X 17.5' X 300'/27 @ \$20/yd^3 = \$39,000.00

Geotextile Fabric

30' X 600'/9 @ \$5/yd^2 = \$10,000.00

Graded Bedding

1' X 30 X 550/27 @ \$15/yd^3 = \$ 9,200.00

Common Fill

2' X 18' X 550'/27 @ \$10/yd^3 = \$ 7,300.00

\$135,500.00

Design Engr. and Const. Engr. = \$ 34,000.00
+ Contingencies @ 25%

Total Project \$169,500.00

Note: Material for the breakwaters will have to be handled twice.

CIRCLE

Circle (population 81) is located on the south bank of the Yukon River approximately 160 Steese Highway miles northeast of Fairbanks. It is on the outside bank of a bend in the river.

At Circle, the riverbank is eroding into town. The erosion rate is apparently slow over a period of years, but the erosion reportedly occurs at accelerated rates during years of high river levels. One resident, whose house is within ten ft. of the top of the bank, reported that he has lost 24 ft. of property since 1956 and that most of it went during two especially bad years. At that rate, a half dozen residences would be jeopardized during a year of high river levels. At least the visible component of the erosion reportedly occurs at breakup and is in conjunction with ice that tends to pile into the lower parts of town. The west end of the existing runway is within 20 ft. of the riverbank but since it would take a substantial amount of erosion to significantly shorten it, and because plans are being developed to relocate the airfield, it doesn't contribute significantly to the need for erosion protection.

In order to protect the developed portion of the community approximately 1,800 lineal ft. of bank would have to be protected. Since there is no known rock available in the Circle area, protection would entail installation of a concrete bag or block blanket extending from above the ordinary high water line to a point deep enough to prevent continuous scour. Engineering and construction of such a project would cost an estimated $2 million.

One local suggestion was to drive log pilings in at an angle to form a wall and deadman them into the bank. That would require approximately 2,400 logs. That type of installation would probably be cheaper but would have a shorter service life, would be more prone to ice damage and would probably preclude boat and pedestrian access to the beach.

Matanuska / King River Confluence, Old Railroad Dike Stabilization

$400,000

A shift in the flow of the Matanuska River four years ago caused rapid erosion and undercutting of the Glenn Highway at the confluence of the King River. This continues today during periods of high water. The presence of an old railroad dike prevents more radical erosion and damage to the Glenn Highway. This appropriation is needed to fund a hydraulic assessment, and design and construction of stabilization measures for the dike and potential channelization on the south side of the Matanuska River at King River.

COMMITTEE REPORT

HOUSE

(LI) FURTHER:

Date: 3/21/84

The Committee on FINANCE has had SB 163

"An Act making a supplemental appropriation for legislators' salaries; and providing for an effective date."

under consideration and recommends:

[ ] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[X] replace with H CS for SB 163 [X] same title [ ] new title

and recommends [illegible]

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note

[ ] Zero Fiscal Note Attached

[ ] reports it back without recommendation

[ ] referred to the _____ Committee

MEMBERS SIGNING
DO PASS

MEMBERS HAVING
OTHER RECOMMENDATIONS:

T. M. Hunter Sr.

CHAIRMAN

Original sponsor: Rules/Legislative Council

Funding Information	
General Fund	$1,208,549
Other Funds	-0-
	$1,208,549

IN THE SENATE BY THE FINANCE COMMITTEE

HOUSE CS FOR SENATE BILL NO. 365 (Finance)

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making a supplemental appropriation for legislators' salaries; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $1,208,549 is appropriated from the general fund to the Legislative Affairs Agency to pay legislators' salaries.

* Sec. 2. The unexpended and unobligated portion of the appropriation made by this Act lapses into the general fund July 1, 1984.

* Sec. 3. This Act takes effect immediately in accordance with AS 01.-10.070(c).

SENATE BILL NO. 365

Legislators' Salaries

Salaries:

July	20/30	@$1,757 - 60 legislators	$ 70,280
	10/30	@$3,900 - 60 legislators	78,000

August through June

11 months	@$3,900 - 60 legislators	$2,574,000
Speaker and President	- @$500 each	1,000
	TOTAL GROSS SALARIES	$2,723,280

Benefits:

SBS	@$2,240 - 60 legislators	$ 134,400
Variable	.1527 x $2,723,280	415,845
Fixed	$219.20 x 60 legislators x 12 months	157,824
	TOTAL SALARIES & BENEFITS	$3,431,349

Funding Available:

Budget Appropriation	$1,627,800	
Salary Supplemental Appropriation	26,200	
Council transfer	568,800	
TOTAL Available Funds		$2,222,800

Required Supplemental Funding $1,208,549

LAA/Admin Svcs
Accounting
03/22/84

Introduced: 1/20/84
Referred: Finance

Funding Information
General Fund $1,223,502
Other Funds -0-
$1,223,502

BY THE RULES COMMITTEE
BY REQUEST OF
THE LEGISLATIVE COUNCIL

IN THE SENATE

SENATE BILL NO. 365

IN THE LEGISLATURE OF THE STATE OF ALASKA

THIRTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act making a supplemental appropriation for legislators' salaries; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. The sum of $1,223,502 is appropriated from the general fund to the Legislative Affairs Agency to pay legislators' salaries.

* Sec. 2. The unexpended and unobligated portion of the appropriation made by this Act lapses into the general fund July 1, 1984.

* Sec. 3. This Act takes effect immediately in accordance with AS 01.-10.070(c).