KIEWIT/ACZ

# BEAUFORT QUARRY DEVELOPMENT

7/12/83

# PROPOSED BEAUFORT QUARRY DEVELOPMENT

## EXECUTIVE SUMMARY

We propose to develop a rock quarry in the northern Yukon, about 9 miles south of Sabine Point on the Beaufort Sea. The physical development would consist of a rock quarry, nine miles of haulroad to the sea, a dock and loading facility for loading the rock onto vessels, plus the necessary supporting camp and airstrip.

The initial market is sales to the U.S. Beaufort to build artificial islands for exploration. We are optimistic that a sales volume of $80 million per year can be achieved if we can receive a permit before the U.S. oil companies are forced to adopt other construction techniques owing to the absence of rock. The rock would also be available to Canadian oil companies as they need it.

The economic benefits are great as most of the money received from these export sales will be spent in Canada, much of it in the north, including wages of approximately 25% of the revenue. Employment at the site might be between 150 and 400 people, depending on sales.

Quarry work provides very suitable work for northern and native people. Our company has an excellent track record of hiring and training native people on similar projects in the past. We are experienced at working in the north.

With regard to the environment, our site is located outside areas used by the Porcupine Cariboo Herd. Rock is a clean inert product, and we believe the project would have minimal negative effects.

The project would benefit the people of the north, as well as Canada.

# BEAUFORT QUARRY DEVELOPMENT

## INTRODUCTION

We propose to develop a quarry in the Northern Yukon to produce various types of rock products for market both in the Canadian Beaufort and the U.S. Beaufort. We intend during the fall of 1983 and the winter of 1984 to plan, engineer, design, and actually develop the quarry, build a road to the seashore, and to build a load-out facility at the seashore, to have rock products available to ship out during the 1984 construction season.

We have identified an immediate market for these rock products in the U.S. Beaufort, for building artificial islands for exploration. The market will expand when the U.S. oil companies start building permanent production facilities. Our products will also, of course, be available to the Canadian market as demand arises.

## OUTLINE

We shall describe our venture under the following headings:

- Economic Benefits
  - Export sales
  - Where the money will be spent
- Employment and Training Opportunities
- Our Experience and Familiarity with Northern Requirements
- Environmental concerns
- Scope of Development
  - The Quarry
  - Haul to the dock
  - Loading the vessels
  - Camp
  - Mobilization
  - Schedules
- Types of Equipment and Vessels
- Assistance we Request from DIAND
  - A written indication
  - Exclusivity

## ECONOMIC BENEFITS

### Export Sales

If we receive a Land Use Permit by October, we are optimistic about obtaining orders in excess of $100 million this year. For subsequent years, $80 million per year is a reasonable target. Since the initial orders will be for export to Alaska, this will represent foreign exchange to Canada.

### Where the money will be spent

The largest single component of expenditure will be wages, which represent approximately 25% of the sales volume. Much of that will be to Northerners. Fuel, bought locally, will be about 10% of sales. Explosives, made in Canada will be about 5% of sales. Virtually all our materials and supplies will be bought in Canada. Until such time as it becomes economically feasible to bring in equipment which is owned by our joint venture, we will rent, lease or charter locally owned tugs and barges to haul the material to its intended destination.

## EMPLOYMENT AND TRAINING OPPORTUNITIES

Employment for Canadians, northern people in particular, will result from this development. Our years of experience in the north have shown us that our work is more efficient and employee turnover is lower when we work with people already resident in the north, resulting in important cost savings. These savings have motivated us to train northern people when none were available with the skills we needed. The results have been excellent.

Our track record of working with native people is also proven. On our Duncan Project in Northern Quebec, an average of 22 native people were part of our project team for its entire 4-year duration. It was a continuous, productive, satisfactory association. On our current project at Nipawin, Saskatchewan, there are now 44 native people on the team in a variety of trades from rodbuster, truckdriver, and carpenter, to mechanic foreman.

## OUR EXPERIENCE AND FAMILIARITY WITH NORTHERN REQUIREMENTS

We have had many years of experience working in the north on this type of project. The photos attached show northern quarries we have operated which would be similar to that which we are proposing. We are familiar with the need for a land use permit, a quarry permit, water use permit and explosive permit and we are aware of the sensitive land use problems such as a fragile environment, land claims, and the proposed park. We are aware of the requirements for

construction on permafrost. We are experienced at operating quarries and isolated northern camps, and we have successfully owned and operated mechanical sewage treatment plants producing clean effluent.

## ENVIRONMENTAL CONCERNS

It appears that the wellbeing of the Porcupine Caribou herd is not affected by our proposal, based on three sources of information. First, the helicopter pilot who has flown over this area frequently for the last ten years has never seen caribou in the proposed locations. Second, the proposed quarry location is outside the caribou migration routes shown on the Land Use Maps published by Indian and Northern Affairs. And third, the proposed quarry is outside the caribou areas shown on the maps in the Berger Report "Northern Frontier Northern Homeland", volume one, page 32.

With reference to geese, our own company pilot sees no problem in landing and taking off from the seaward direction during any critical periods that you might wish to specify in order to minimize the aircraft disturbance to wildfowl that might be feeding on the coastal plain. The flight frequency will of course depend on the volume of rock we will succeed in selling, but will probably vary from one flight per day to five flights per day.

Unauthorized hunting is easy to prevent in a small camp with limited access.

In case of a blowout of an oil well, if an island is needed in a hurry to drill a relief well, the availability of rock can cut the volume of fill and the construction time in half, thereby minimizing any environmental damage.

## SCOPE OF DEVELOPMENT FOR QUARRY AND LOAD-OUT FACILITIES

The islands built to date in the Beaufort Sea (U.S. & Canadian) have all been built with a base of sand and gravel. These islands are temporary islands and have to withstand the environmental conditions for only one or two seasons. Production islands, with an expected lifetime of approximately 25 years, need proper scour protection against ice, wind, and wave conditions. Quarried rock products will provide proper scour protection for the islands when used as slope protection. Furthermore the quarried rock products can be used as a construction material for the islands in the form of retaining walls which will reduce the required sandfill considerably due to the steep slopes which can be built. See sketch 1 for island concepts. The products produced by our quarry will provide a technically competent and a financially competitive construction material for both exploration and production islands.

## Quarry Operation

The proposed quarry site is approximately 9 miles inland from the coastline between Shingle Point and King Point. We expect the rock at the proposed location to be competent for rip-rap or quarry stone. Even though our actual initial application for a quarry permit will be for one year's production only, we eventually expect to develop up to 14 million cu. yds. of rock at this site. The quarry will be developed with preliminary blasts to expose a face about 10m high. Once this is accomplished, drilling and shooting will proceed with an approximate pattern of 3.5m x 4.0m. Sketches 2 and 3 show a typical plan and section for the quarry.

## Haul To The Dock

The rock product will be loaded onto trucks with a front end loader and transported via a haul road to the load-out facility at the shore. The haul road will be built to existing DIAND standards but we contemplate that the road will have a top width of 50 to 70 feet and the foundation will be constructed with a minimum four foot thickness of quarry rock laid on the permafrost, as shown on sketch no. 4. The surface of the road will then receive a layer of granular material to allow proper maintenance. We propose to use granular material from deposits indicated by air photo interpretation close to the route of the access road. Construction of the road will be done before the thaw so that the original access to the quarry to obtain the rock fill will be available along the frozen subgrade. It is planned to approach the sea at a natural break in the cliffs along the shore.

## Loading the Vessels

Our proposed loadout facility has to be near deep water to allow the use of deep draft vessels and to reduce the requirement for the dredging necessary for the approach to the sheltered loadout facility. Such a sheltered area will require some type of breakwater for protection against waves and floating ice. The physical make-up of the load-out facility could take many forms, such as sheet pile cells, sheet pile bulkheads or a rock causeway. Sketch no. 5 shows possible layouts of the harbour and breakwater. A more detailed and optimum design will be made knowing the exact local circumstances.

Depending on the quantities required and the capacities of the available vessels, we anticipate a frequency of 2 to 4 vessels per week entering the harbour.

## Camp

We propose a prefabricated camp to house our crew, and as our sales expand we will expand the camp accordingly. For a proposed layout see sketch 6. The camp units are to be set on a pad of fill, and air will be allowed to circulate under each unit. The bottom of each unit is insulated.

Nearby is a landing strip for light planes, a garage, and a fuel tank farm. The fuel tank farm is contained in a dyke with a sturdy plastic liner. Sewage is to be treated in a mechanical treatment plant housed in a heated building. Garbage is burned and the residue is buried.

Water for the camp is to be hauled from a lake that does not freeze to the bottom in winter, near the access road.

## Mobilization

It is planned to reach our campsite initially by travelling along the ice adjacent to the shore of the Beaufort Sea, starting from Inuvik. The initial construction will be made from temporary accommodations. A road will be pioneered along the proposed right-of-way to the quarry site and quarry rock will be hauled back out to construct a pad for the permanent camp. The fill for roads and for the camp will be complete before the thaw. Most of our quarry equipment will be hauled in over the Dempster Highway before the Spring Thaw.

The marine equipment initially will be rented locally until proper vessels can be brought in by sea around Point Barrow.

## Schedules

There are two schedules included with our proposal. The first is the Schedule for the development work of 1983, the second is a Schedule which shows yearly production times. The first schedule indicates that if we are to have the quarry ready to produce product by the beginning of the construction season which would be late June 1984, we need issuance of our Land Use Permit by September 15, 1983.

The second schedule shows the potential operating periods we have for the quarry. The most viable operating period for the quarry would be May until October.

## ASSISTANCE WE REQUEST FROM DIAND

### A Written Indication

For our proposal to become a reality, we need a firm order from one of the oil companies. They in turn need sufficient assurance that a Land Use Permit can be granted, so that they can plan on using rock. A definite written indication from you that a Land Use Permit can be granted would enable us to start selling rock, and would be much appreciated. This definite written indication might just be the key to help us achieve the goal of delivering rock in 1984.

### Exclusivity

We request that we have exclusive use of whatever facilities we construct under this proposal, owing to the large up-front investment of private capital.

# KIEWIT PERFORMANCE REFERENCES

The following is a list of references who are familiar with our Company.

PORTS CANADA
320 Queen Street
Ottawa, Ontario
K1A ON6

Mr. Francis McNaughton
Vice President - Technical Services
(613) 995-4028

B.C. HYDRO
970 Burrard Street
Vancouver, B.C.
V6Z 1Y3

Mr. Norm Olson
President
(604) 663-2212

SASKATCHEWAN POWER CORPORATION
2025 Victoria Avenue
Regina, Saskatchewan
S4P OS1

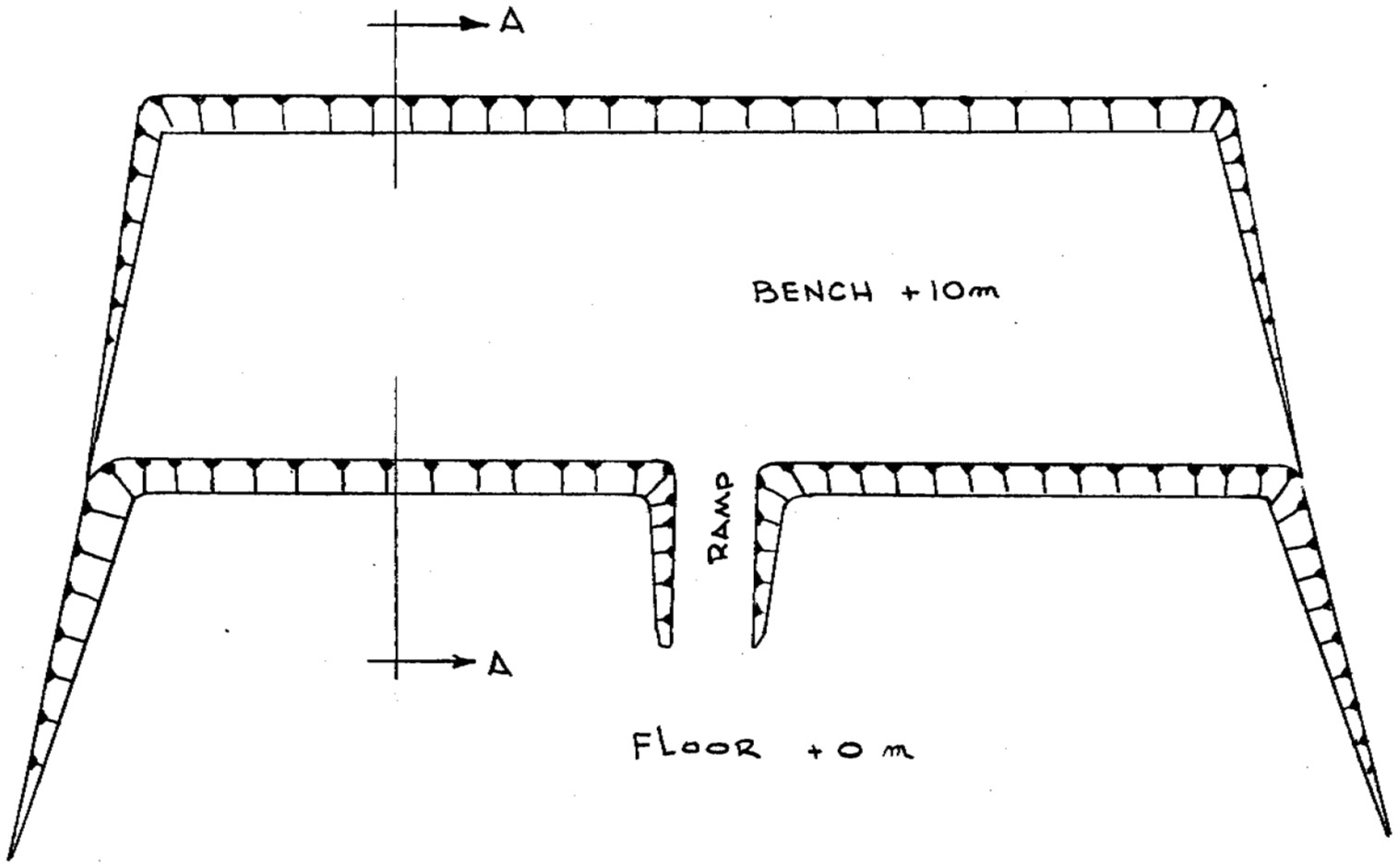
Mr. Bruce Campbell
President
(306) 566-2121

QUEBEC HYDRO
Place Dupuis
855 East St. Catharine Street
Montreal, Quebec
H2L 4P5

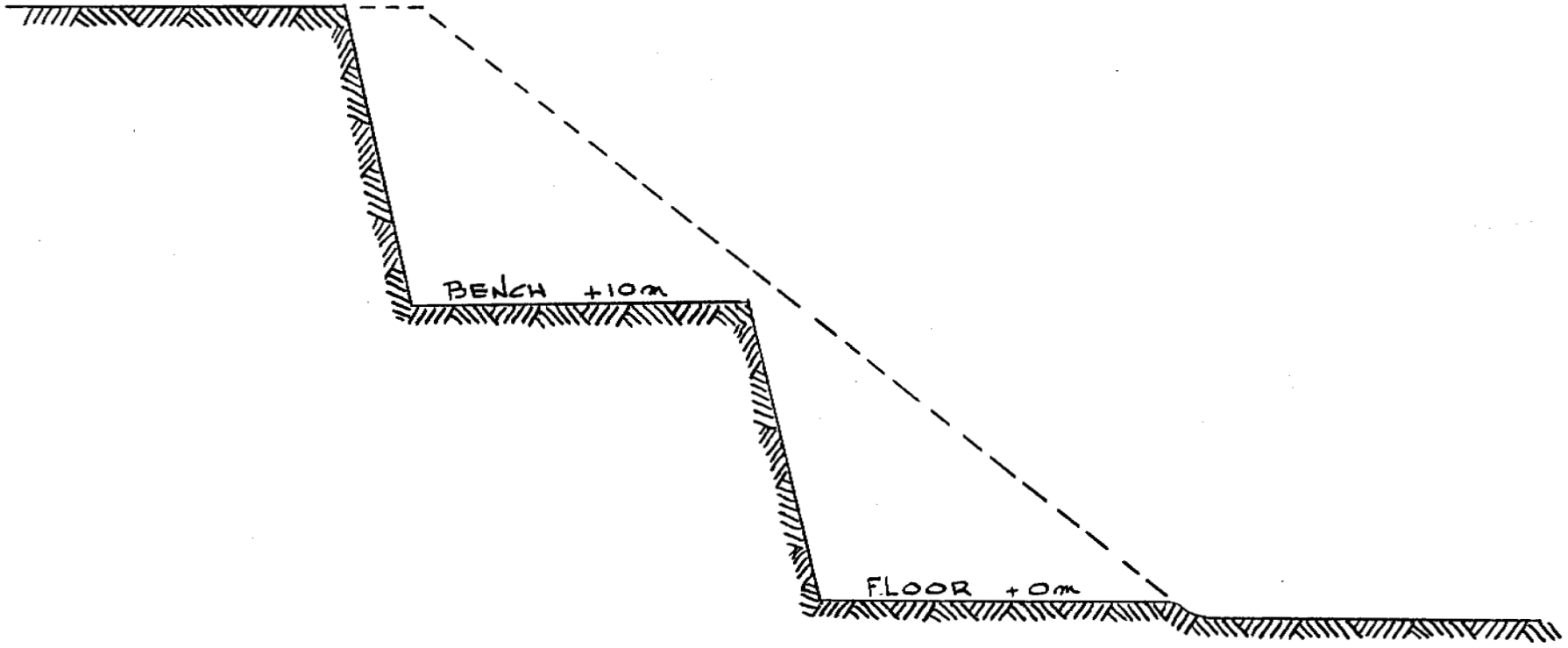
Mr. Laurent Hamel
Vice-President
(514) 285-1711

ST. LAWRENCE SEAWAY AUTHORITY
508 Glendale Avenue
St. Catharines, Ontario
L2R 6V8

Mr. W.A. (William) O'Neill
President
(416) 684-6571

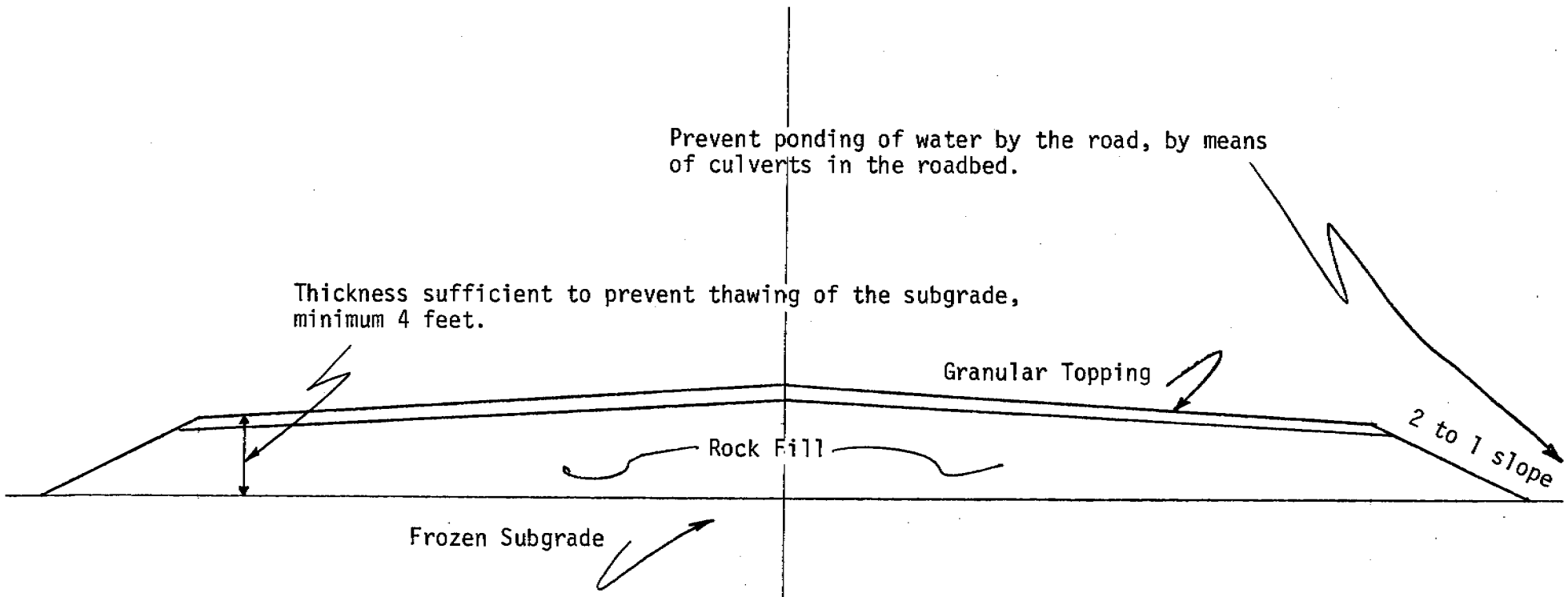



| PLAN OF QUARRY | | |
|---|---|---|
| KIEWIT/ACZ | JULY 11, 1983 | SKETCH NO. |
| Scale: NTS | Drawn by: BD | 2 |

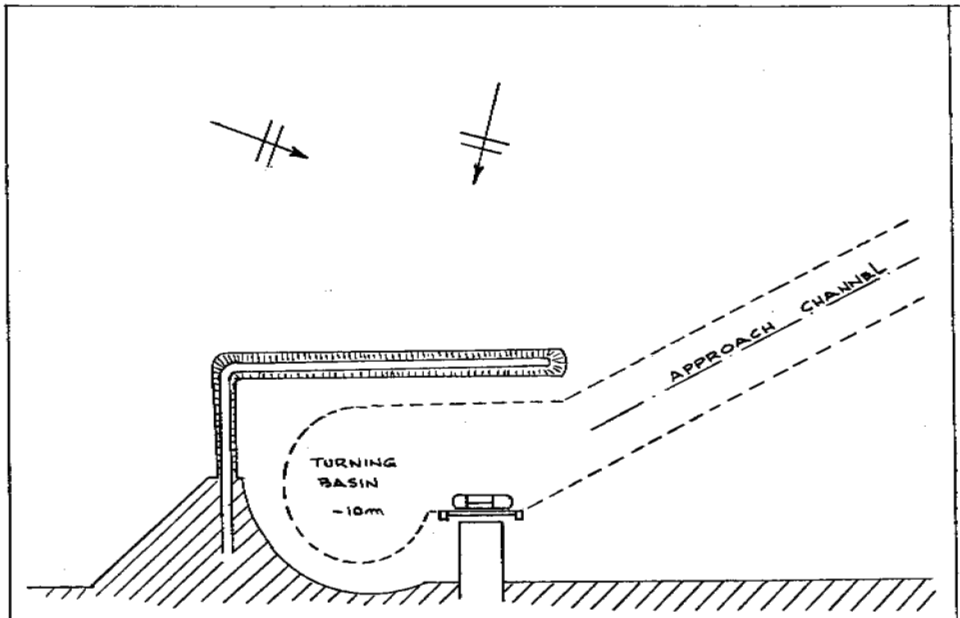


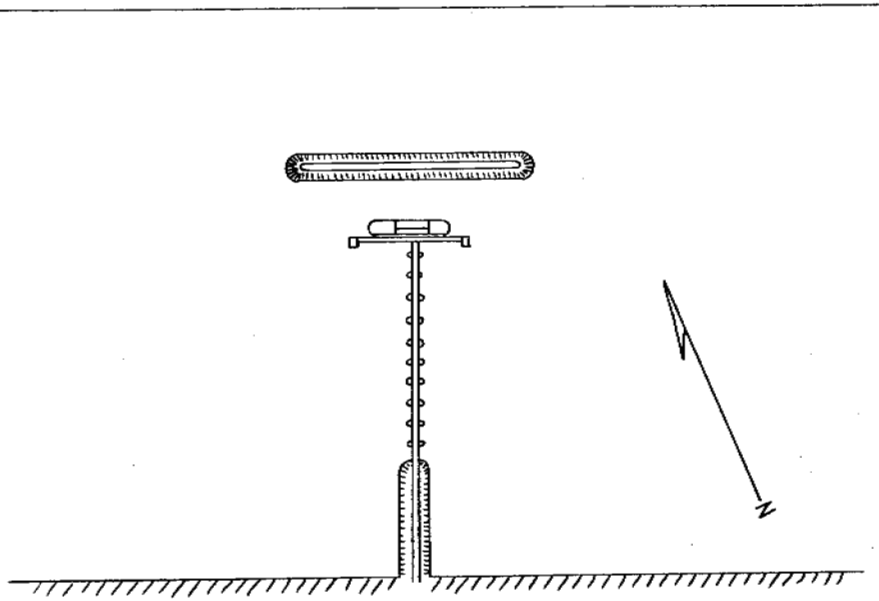

SECTION A-A

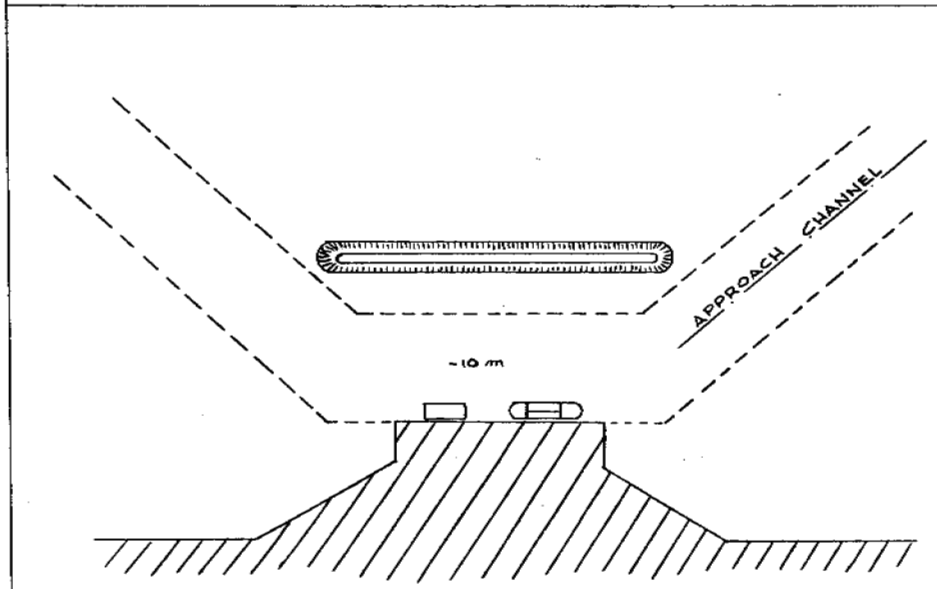
| CROSS SECTION OF QUARRY | | |
|---|---|---|
| KIEWIT/ACZ | JULY 11, 1983 | SKETCH NO. |
| Scale: NTS | Drawn: | 3 |

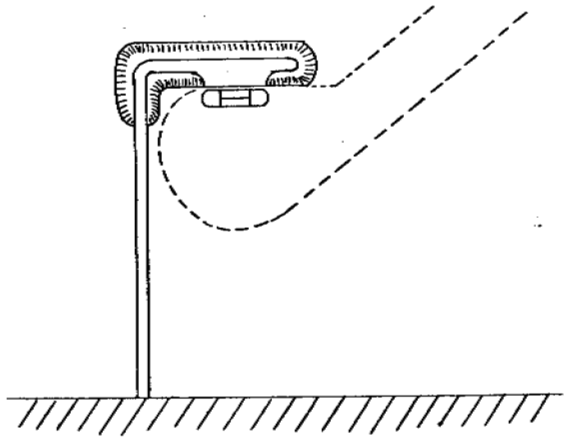



| PROPOSED HAUL ROAD CROSS SECTION | | |
|---|---|---|
| KIEWIT/ACZ | JULY 11, 1983 | SKETCH NO. |
| Scale: 1/8" = 1'-0" | Drawn by: B.D | 4 |

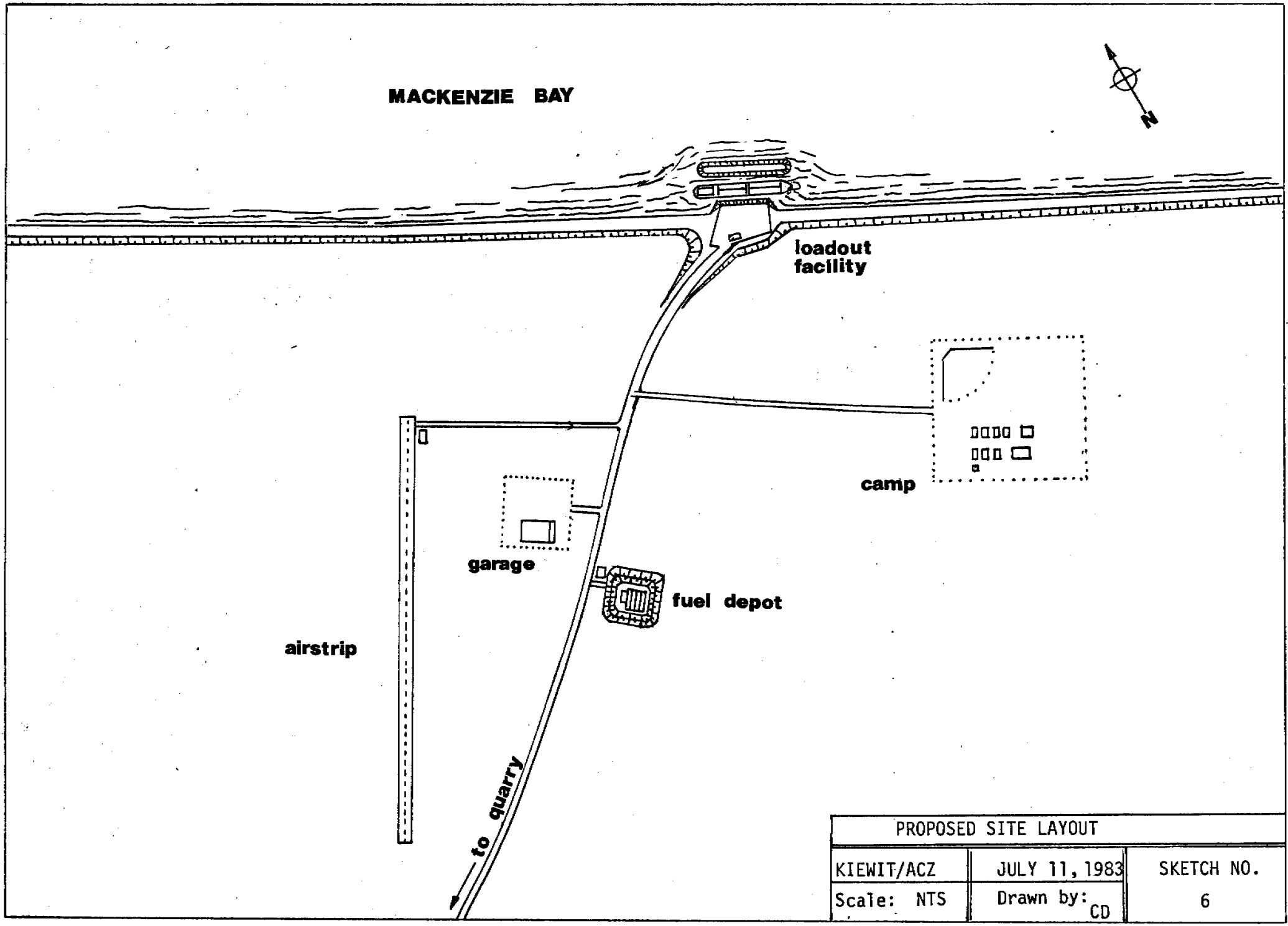


| PROTECTION LOADOUT FACILITY | | |
|---|---|---|
| KIEWIT/ACZ | JULY 11, 1983 | SKETCH NO. |
| Scale: N.T.S | Drawn by: D.D | 5 |




| PROPOSED SITE LAYOUT | | |
|---|---|---|
| KIEWIT/ACZ | JULY 11, 1983 | SKETCH NO. |
| Scale: NTS | Drawn by: CD | 6 |

Form 421A—Printed U.S.A. 5-72

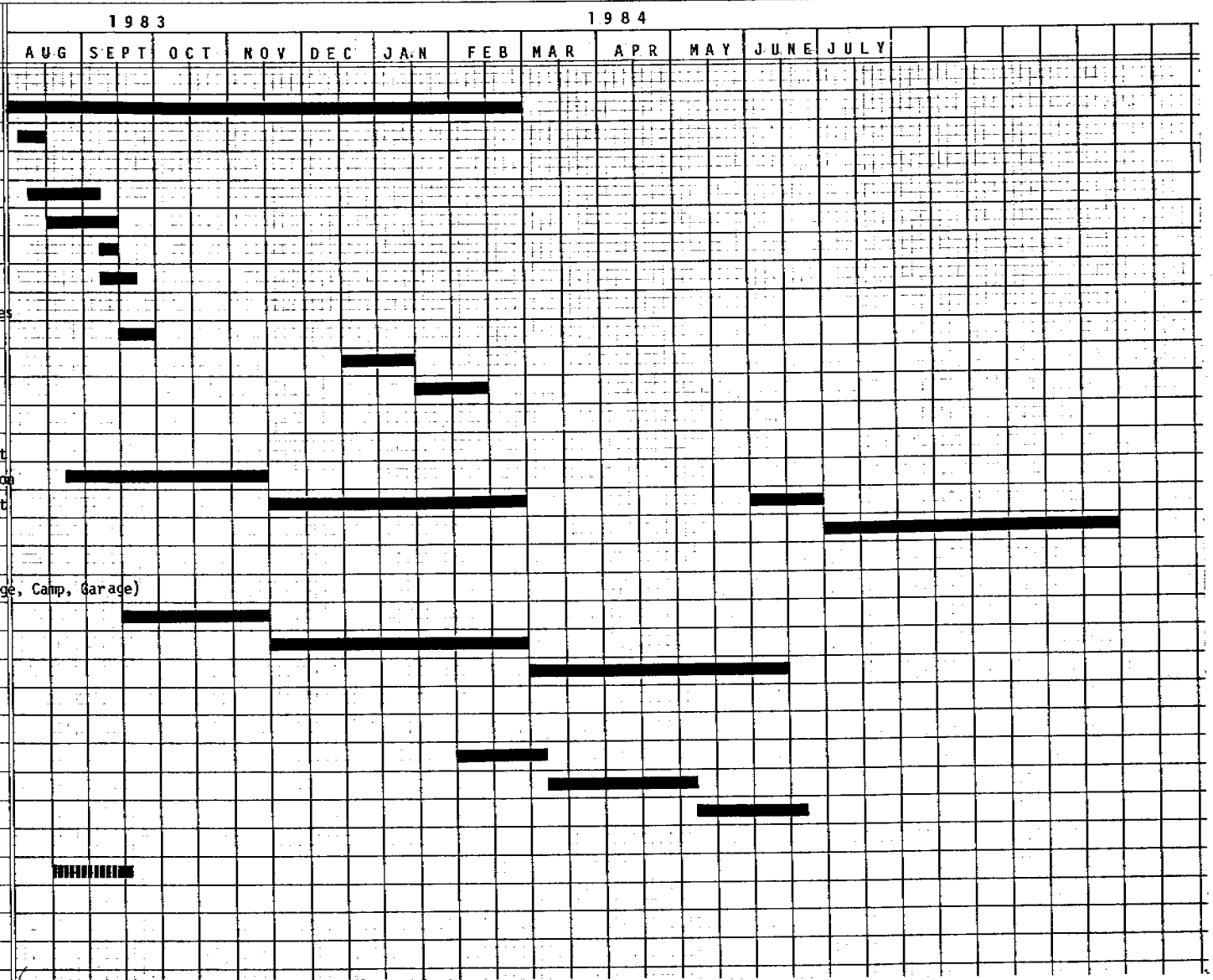
# SCHEDULE 1

Project Quarry | Location Northern Yukon | Sheet No.

Description Development work for 1983 | Estimator J.L. | Date July 11, 1983

Starting Date | Completion Date | Time Limit

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| | Studies, Planning, Market | |
| | Development | |
| | Rock Testing at Quarry Site | |
| | Engineering Studies for Choice of Harbour | |
| | Detailed Mapping (from Air Photos) | |
| | Exploration Pits for Granular Borrow | |
| | Soundings for Harbour | |
| | Field Reconnaissance for base facilities water supply, stream crossings | |
| | Build Ice Road to Docksite | |
| | Soil Tests for Dock, Drilling off Ice | |
| | | |
| | Quarrying, Rock Loading, Rock Transport | |
| | a. Methods Studies and Equip. Selection | |
| | b. Equipment Procurement and Transport | |
| | c. Production | |
| | | |
| | Facilities (Road, Airstrip, Fuel Storage, Camp, Garage) | |
| | a. Design and Planning | |
| | b. Procurement and Transport | |
| | c. Field Construction | |
| | | |
| | Dock: | |
| | a. Design | |
| | b. Procurement and Transport | |
| | c. Field Construction | |
| | | |
| | Issuance of Land Use Permit | |



Form 429A—Printed U.S.A. 5-72

**SCHEDULE** 2

Project Quarry
Description Yearly Production
Starting Date March

Location Northern Yukon
Estimator J.L.
Completion Date October

Sheet No.
Date July 11, 1983
Time Limit

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| | Dewinter, Start Up | |
| | Operate Quarry | |
| | Offshore Constr. Season | |
| | Shut-down, Winterize | |
| | Winter Over | |

J F M A M J J A S O N D J F M A

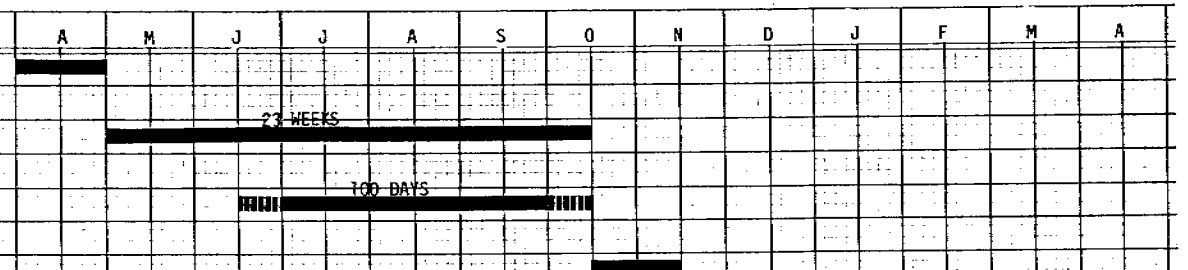
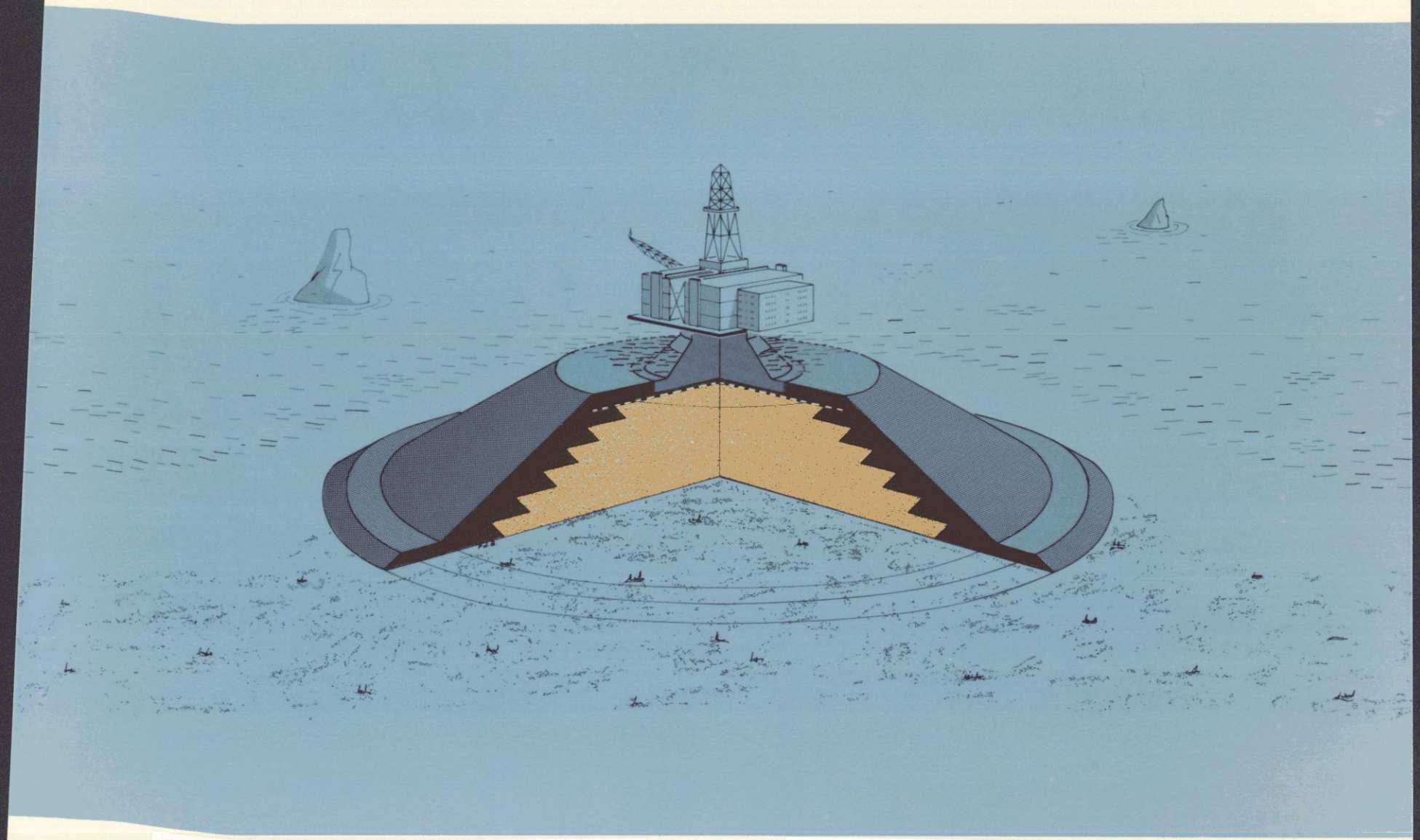


Photo 1 - A Northern Quarry

Photo 2 - Airtrack Drilling

Photo 3 - Loading 85 Ton Trucks



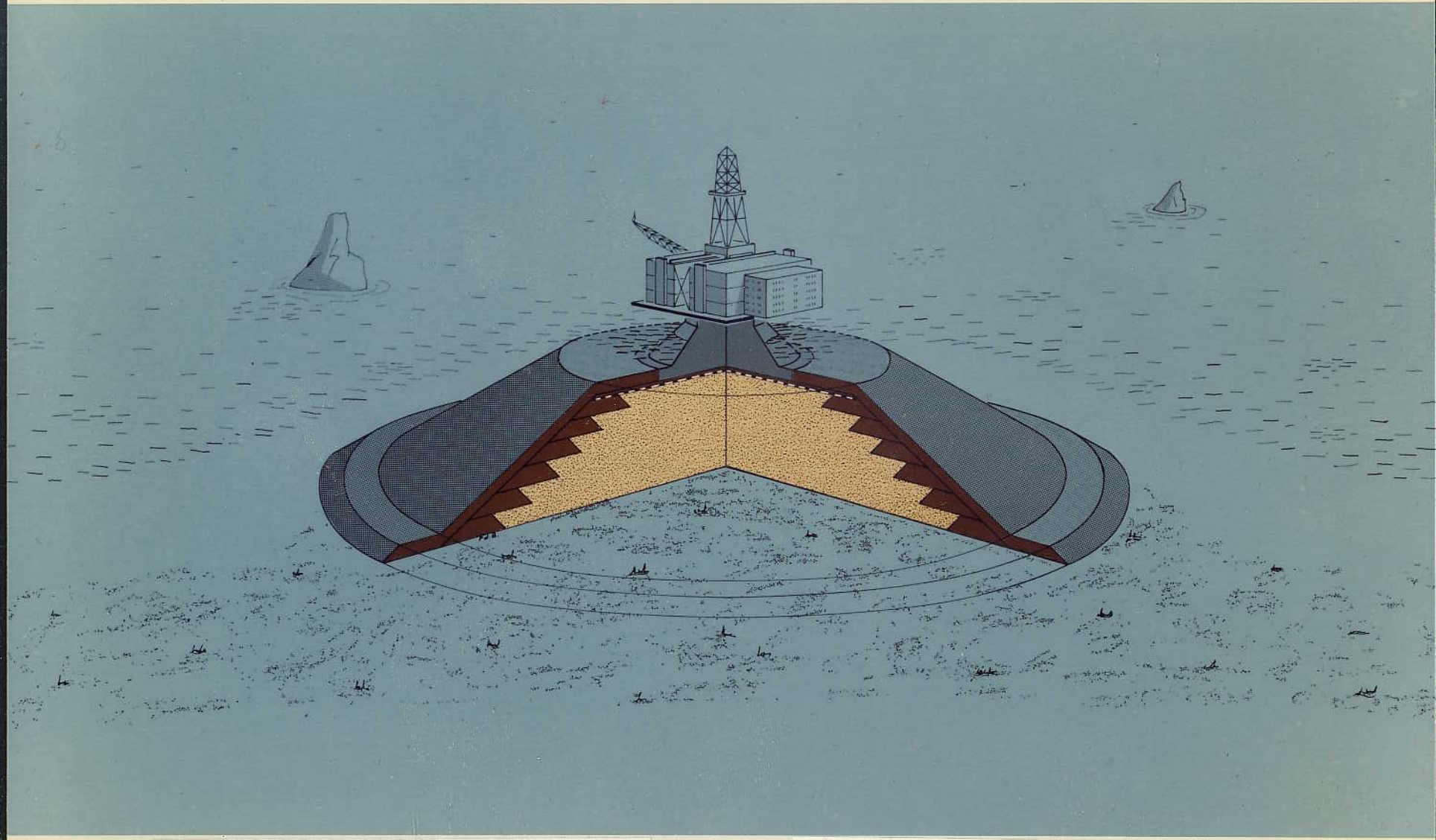
Steep Sloped Island Concepts
KIEWIT/ACZ

Sketch No. 1

Photo 1 - A Northern Quarry

Photo 2 - Airtrack Drilling

Photo 3 - Loading 85 Ton Trucks



Steep Sloped Island Concepts
KIEWIT/ACZ

Sketch No. 1