Corps Report
Scott 85

SAND POINT DETAIL PROJECT REPORT

FOUNDATION AND MATERIALS

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1.0 REGIONAL GEOLOGY

Dome Quarry is located near Sand Point on Popof Island at the southern tip of the Alaska Peninsula north of the beginning of the Aleutian Chain. It is a member of the Shumagin Island Group. The island has an approximate diameter of nine miles with a maximum elevation of 1520 feet above sea level.

The Shumagin Islands are bounded to the north by the Alaska Peninsula and to the south by the Aleutian Trench. Subduction of the Aleutian Trench is the major force affecting the geology of the region. The area is one of the most seismically active in the world.

A string of active volcanoes occupy the Alaska Peninsula and these are aligned parallel to the Aleutian Trench.

Popof Island has varied terrain, with rugged mountains to the east and a broad lowland valley to the west. Most lowland slopes are covered with unconsolidated sediments, brush and tundra; however, bedrock is generally well exposed at higher elevations along the sea cliffs, which bounds much of the island. Although Tertiary sedimentary rocks of the Stepovak formation crop out on the north west portion of Popof Island, the island is composed primarily of Tertiary volcanic rocks. The majority of the volcanic rock units are intermediate to mafic andesite flows and flow breccias which dip southwesterly and overlie a sequence of welded tuff - breccias. Some volcanic rock units are significantly altered. Occasional small domes and other intrusive structures composed of andesite basalt or dacite have intruded the slightly older volcanic rock units. (Gallagher, 1984).

2.0 GEOLOGY OF DOME QUARRY

Dome Quarry occurs as an elliptical outcrop of mafic intrusive rock that originally was projected about 60 to 100 feet above the surrounding terrain prior to its development as a quarry. The rock is a fresh gray to black porphyritic basalt, bounded by altered volcanic rocks and sediments. The altered volcanic rocks appear to be unsuitable for the production of large high quality riprap. Joints and seams are filled with hard crystalline materials with strengths near that of the basalt itself, but also contain weaker calcite.

3.0 SITE INVESTIGATIONS:

DETAILED PROJECT REPORT FOR SAND POINT HARBOR

SOILS SECTION

3.1 HARBOR SITE INVESTIGATIONS

a. PREVIOUS INVESTIGATIONS: Subsurface investigations for the original harbor construction were performed in years 1967, 1973 and 1974 by the Alaska District Corps of Engineers. These initial investigations included 2 drive samples, 4 pile probe holes and 127 jet probe holes. A limited number of these holes fall within the area of Alternative "A". Because the original harbor depth was minus 18 feet MLLW, most of these holes do not reach the proposed new depth of minus 20 feet MLLW.

Since no samples were taken from the jet probe holes, it is difficult to determine the depths at which the materials change size. Soils gradations were determined by the relative difficulty of maneuvring the jet probe down through the material. Drillers logs stated that the material graded from sand up to and including boulders. Often, the bottom of hole did not signify refusal. In instances where refusal was encountered, it was judged to be refusal on cobble or boulders.

In one hole split-spoon samples were taken. Analysis of the samples indicate that the material was a gravelly, silty sand of a medium density. Bottom of the hole was at minus 26-feet, with no indication of refusal.

The probe holes were jetted down with a 25 gpm (100 psi) gear type water pump and a 3/4-inch pipe probe. The drive samples were taken with a 2" O.D. by 1-3/8" I.D. split-spoon sampler. The sampler was driven with a 140 lb. hammer falling 30". A location map and boring logs are included in this report.

b. RECENT INVESTIGATIONS

In May 1985, Woodward-Clyde Consultants performed additional subsurface investigations for the proposed harbor expansion, Alternatives "B" and "C". Their field work included six test borings and a geophysical survey for the subsurface conditions, coupled with geologic reconnaissance of bedrock outcrops and beach deposits. A location map and boring logs are attached.

A barge mounted drill rig and tug were used for the test borings. Soils samples were obtained with the use of a 2.5" I.D., 18" long split-spoon sampler. A 340 lb. hammer with a 36" drop was used to drive the sampler. When resistant material was encountered, a double-tube Christiansen NX diamond corebarrel was used. Samples and blow counts were obtained on the sea floor, at 2.5 feet below sea floor, at 5 feet below sea floor and every 5-foot interval thereafter.

Holes SBH-1 through SBH-3 were drilled close to shore in water depths ranging from minus 7'MLLW to minus 20'MLLW at top of hole. These are in the area which will require dredging to the project depth of minus 20'MLLW.

Top of hole elevation for auger hole SBH-1 was at minus

13'MLLW. Six feet of silty sand with organics was encountered. Blow counts for this material indicated that it has a medium density. The remaining one foot of material was a silty clay with some sand and gravel.

Auger hole SBH-2 started at a depth of minus 20'MLLW and as such, there will be no dredging required in this immediate area. However, the log shows that 15.25 feet of silty sand with organics was encountered in this hole.

Auger hole SBH-3 started at a depth of minus 7'MLLW. Only 1/2-foot of sand with organics was encountered. The remaining 10 feet of hole was determined to be highly altered and weathered volcanic bedrock. Core samples were taken from minus 13.5'MLLW to minus 17.5'MLLW.

Auger holes SBH-4 through SBH-6 were drilled on the alignment of the proposed breakwater. Top of hole elevations varied from minus 23'MLLW minus 30'MLLW.

Auger Hole SBH-4 had a mixture of sand with a trace of clay and gravel down to a depth of minus 47.5'MLLW. The Log indicates that a highly altered and highly to completely weathered volcanic bedrock existed from this elevation to the bottom of hole at minus 88.5'MLLW. This material exhibits the character of a sandy-clay soil. Results of the penetration tests had an erratic pattern and ranged from medium dense to very dense. Bottom of Hole in this instance did not signify refusal.

A sandy gravel mixture was encountered in SBH-5 down to a depth of minus 32.5'MLLW. Below this depth a silt with some sand existed down to minus 35'MLLW. The remainder of the hole was determined to be a highly to completely altered and weathered andesitic bedrock with closely space joints. Density for the materials encountered ranged from loose to refusal (in a number of instances). Bottom of the hole was reached at minus 59.5'MLLW.

Auger Hole SBH-6 had a sandy material down to minus 41.5'MLLW. At this elevation the characteristics of the material changed to a silty clay which extended down to minus 64.5'MLLW. At minus 64.5'MLLW the material changed to a highly altered and weathered bedrock which resembled a dense silt with some clay. Densities for the material in this hole ranged from medium to dense, becoming more dense with depth. As experienced in other holes, the density values were erratic.

The geophysical survey of the proposed harbor site was performed with the use of both a side scan sonar and a tuned transducer system. Each of these was towed behind a 24-foot commercial fishing vessel.

The side scan sonar record presents a continuous sonic picture of the sea floor and may be used for identifying changes in bottom characteristics. The record has the ability to locate bedrock outcrops as well as man-made objects lying on the seafloor. The tuned transducer system was used to create a subbottom profile for vertical location of the sediment/bedrock interface.

DISCUSSION AND RECOMMENDATIONS

a. Harbor Dredging - Alternative "A": Cross sections were plotted for this area based on the October, 1984 Condition Survey. The jet probe hole information was then plotted on these cross sections. It was determined that the majority of the probe holes for the original harbor do not extend down deep enough to delineate the sediment/rock interface with a reasonable degree of accuracy. Therefore, it is recommended that additional exploration be performed here prior to determination of the dredging quantities.

Harbor Dredging - Alternatives "B" and "C": A review of auger holes SBH-1 through SBH-3 indicates that the dredging of the harbor will include both removal of a silty sand mixture and a highly weathered bedrock. It was found that the quantities of these materials were highly variable throughout the harbor. Additionally, the holes were widely spaced and distant from the harbor limits due to limited funding and the use of a large but available barge. Therefore, an accurate estimate of the relative quantities of bedrock and soil to be removed can not be made until more field information is gathered. Additional exploration wwill be needed.

Recommended side slopes for the harbor limits are the same as were for initial construction. The following should be used:

1 V on 6 H in silt, sands and loose gravels;
1 V on 2 H in coarse gravel or boulders;
1 V on 0.5 H in bedrock.

b. Breakwater Foundation: Auger holes SBH-4, SBH-5 and SBH-6 were reviewed in the anaysis of the breakwater foundation. As mentioned earlier, these are on the alignment of the breakwater extention for Alternates "B" and "C". Of the three, SBH-6 was the most critical from an analysis standpoint. This area of the breakwater is underlain by a 23-foot thick layer of medium density silty clay. Reference to the plan map of the area shows that this auger hole is in close proximity to the existing south breakwater. It can reasonably be assumed that this silty clay layer extends below the breakwater. Since there is no record of any excessive settlement following construction, it is felt that the new breakwater extention will perform in a similar manner. Therefore, foundation materials underlying the alignment of the proposed breakwater are capable of supporting the additional load.

c. Slope Stability Analysis: The stability of the breakwater section was analysed for a 1V on 1.5H slope in the original General Design Memorandum. The analysis was computed by the use of the modified Swedish Method - Finite Slice Procedure. Assumed strengths were as follows:

Embankment: Assumed to be a free draining granular fill. Shot rock and angular basalt rubble. Assumed $\phi = 40$; $\tan \phi = 0.839$.

Foundation: Firm silty sand, overlying gravelly sand. Assumed $\phi = 20$ degrees, $\tan \phi = 0.364$.

Earthquake: Zone III.

The resultant safety factor for the foundation with this condition is 1.0 including the earthquake. Without the inclusion of earthquake loading the safety factor of the foundation is 2.5.

Inclosures:

1. Plan views showing breakwater alignment and exploratory hole locations for Alternatives "A", "B" and "C".
2. Soils logs.

3.2 Quarry Investigation

Initial core drilling at Dome Quarry consists of three core borings drilled 20 Jun 84 through 23 Jun 84. The second core drilling program began on 20 Mar 85 and was completed 10 Apr 85. Dome Quarry location map is shown on Plate 1. Location of all borings drilled are shown on Plate 2. Interpreted geologic cross-sections are shown on Plates 3 through 6. Logs of the borings are presented in Appendix A.

3.3 Laboratory Test

Test results for specific gravity and density on altered and fresh rock ranged from sp gr. 2.49 (density 145 lbs. (ft^3) for altered rock to sp gr. 2.77 (density 173 lb (ft^3) for fresh rock. Tests for expansion breakdown (ethylene glycol) for means of detecting the susceptibility to weathering was negligible. The petrographic analysis determined the degree of alteration potential of individual grains to be moderate (25-74% of mineral altered).

4.0 DISCUSSION AND RECOMMENDATIONS

Previous successful use of rock as armor material from Dome Quarry and the results from drilling the massive intrusive basalt indicate large, high quality stone, can be obtained from Dome Quarry. This intrusive basalt structure is bounded by moderately to highly altered volcanic rocks that are unsuitable for the production of large, high quality riprap.

Based on the evaluation of Popof Island, several sources of rock were identified as containing suitable material. Based on geologic criteria alone, the best sites likely to produce armor stone (3 ft+) are Dome Quarry, Danger Point, Popof Head and Buffalo Bay. A field site description summary for these sites are presented in Appendix B, and site locations are shown on Plate 7. Considering that Popof Head and Buffalo Bay would be more costly to develop since they are accessible by sea, it appears that Danger Point is the most practical site to develop, once Dome Quarry is exhausted. Danger Point appears to be the best alternate source for armor size stone. Gold Creek and East Quarry sites, due to their good accessibility (see Plate 7) are promising sites, where smaller rock is proposed.

The harbor expansion requires 293,250 cubic yards of rock. The estimated volume of the basalt intrusive in Dome Quarry calculated for depths below an estimated ground surface elevation of 240 MSL to 10 feet MSL is 1.03 million cubic yards. Total estimated volumes are divided into proven and unproven reserves. The airport expansion is estimated to require all material above 90 MSL. Below elevation 90, proven reserves amount to 130,000 cubic yards and unproven reserves to 210,000 cubic yards. The total estimate of 340,000 cubic yards (proven and unproven) below elevation 90 MSL is barely sufficient to build the

NOW AT ABOUT EL +/- 180

harbor expansion. If the airport project is constructed before the harbor, then an additional drilling program will be required to provide a suitable rock source, expecially the large armor size stone.

NPAEN-FM-G

Dome Quarry Investigation, Sand Point, Alaska

NPAEN-PL-P (Legare)

NPAEN-FM

10 Jul 85

Galbraith/jah/3-2690

CONCUR:

Williamson

1. References:

a. NPAEN-PL-P DF, same subject, dated 13 Jun 85.

b. Woodward-Clyde Consultants report, Dome Quarry Investigation, dated May 1985.

2. A quick review of the report, and discussions with Mr. Wm. Pyle of WCC, indicates the dome has marginal reserves. The rock quality-in the massive basalt-is excellent. The peripheral, altered basalt, should not be used.

3. The harbor expansion requires 293,250 cubic yards of rock. The airport expansion is estimated to require all material above elevation 90 MSL. Below elevation 90, proven reserves amount to 130,000 cubic yards and unproven reserves to 210,000 cubic yards. Maximum possible material (proven and unproven) available, below elevation 90, amounts to 340,000 cubic yards. For the most part, this basalt is quite massive.

4. If the airport expansion takes all massive basalt to elevation 90, remaining proven reserves will not be sufficient to construct the harbor. If all unproven reserves are available below elevation 90 MSL, there is barely sufficient rock to build the project if the quarry breaks to the job size curve. This is a virtual impossibility.

5. This dome is the only known source of quality armor on Popov Island.

6. Foundations and Materials Branch makes the following recommendations:

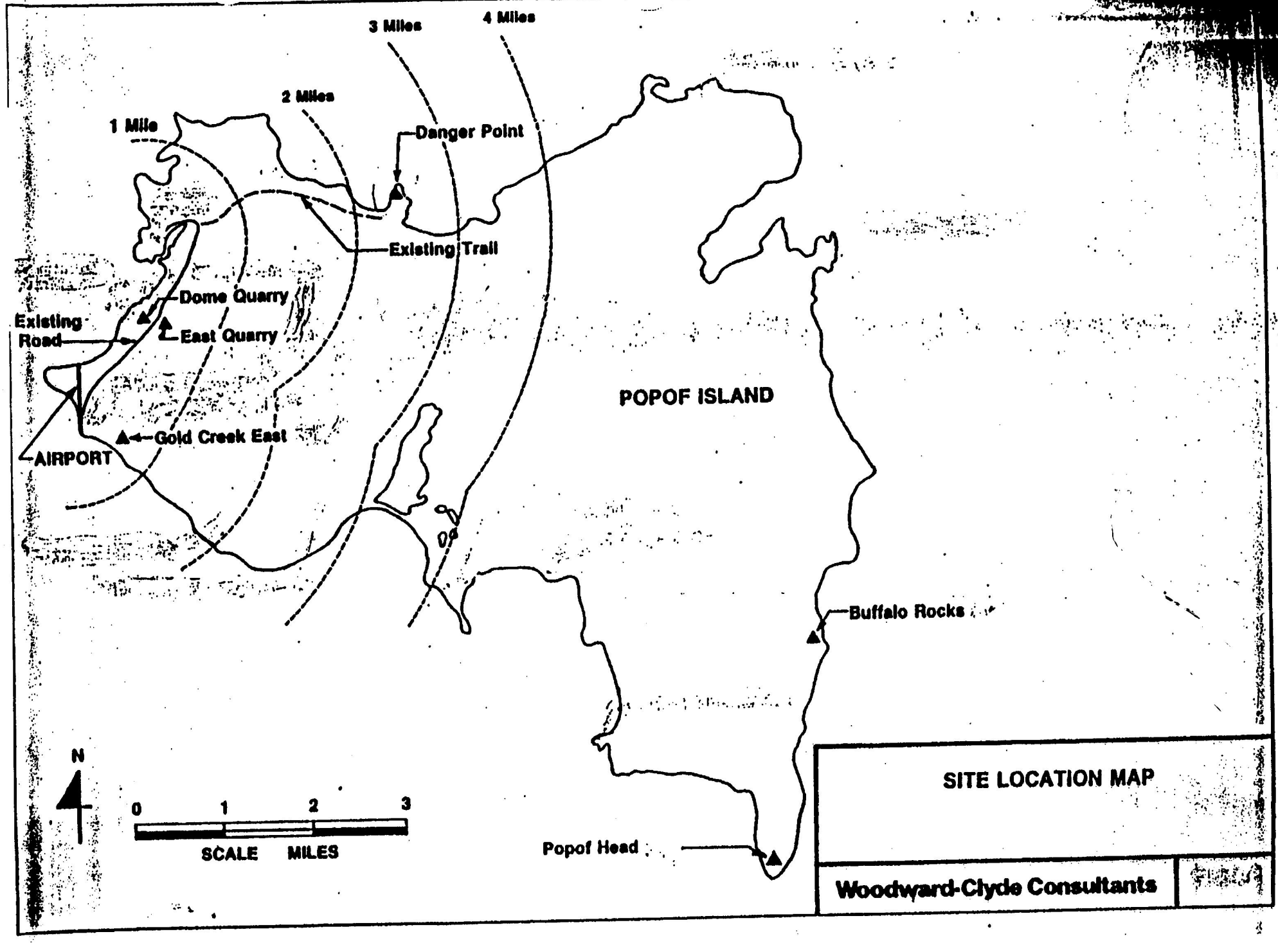
a. Airport and harbor construction be coordinated. The airport can use a significant amount of smaller material.

b. If "a", above, is impossible, have the City and State DOT restrict the dome to armor production only.

c. If the airport is expanded before the harbor, be prepared for additional drilling in the dome and the possibility of re-designing the harbor to accommodate available material.

d. Be prepared to locate off-island sources.

DELWYN F. THOMAS
Chief, F & M Branch


3 Miles
4 Miles
2 Miles
1 Mile
Danger Point
Existing Trail
Dome Quarry
East Quarry
Existing Road
Gold Creek East
AIRPORT
POPOF ISLAND
Buffalo Rocks
Popof Head
N
0
1
2
3
SCALE MILES
SITE LOCATION MAP
Woodward-Clyde Consultants

701 Sesame Street
Anchorage, Alaska 99503
907-561-1020

Woodward-Clyde Consultants

February 20, 1985

Alaska District
U.S. Army Corps of Engineers
Pouch 898
Anchorage, AK 99506-0898

Attn: Harlan Legare

Gentlemen:

Confirming recent conversations, as a geotechnical subcontractor to USKH, the prime contractor to the City of Sand Point, WCC is planning on conducting an investigation of Dome Quarry this Spring as part of the final design for the Sand Point Runway Realignment/Extension.

Our presently-planned investigation will include six NX Wireline diamond core borings drilled to 140 ft and 90 ft elevation in the quarry. We understand that the Alaska District COE is interested in further investigating the quarry for a proposed small boat harbor project. We would be pleased to conduct this as an add-on to our presently-planned effort.

We suggest that the COE consider extending the planned borings to 10 ft above sea level as a cost-effective means of identifying the extent of the basalt to its mineable depth. This would involve 680 linear feet of drilling for the COE in the six holes, roughly equivalent in footage to the anticipated program for the runway project.

Approximate locations of the planned boreholes are identified on Figure 1 attached. Final borehole locations will be determined in the field depending on ground conditions and access. Additional borings could be cored for the COE if required.

Suggested scope of work:

1. Continued NX wireline diamond-core drilling of six borings at Dome Quarry (Figure 1) beyond their current anticipated bottom-of-hole elevations as follows:

   A) 2 holes to be drilled to elevation +90 ft will be continued to elevation +10 ft.

   B) 4 holes to be drilled to elevation +140 ft will be continued to elevation +10 ft.

2. Provide an experienced geologist to supervise drilling operations and prepare detailed core logs of drilling operations and the geologic type and character of recovered core.

3. Ship all recovered core from above-mentioned zones to COE in Anchorage.

4. Provide a report with core logs of the drilling and including a geologic evaluation of the estimated volume, character, and extent of quality rip rap and armor stone based on surficial evidence and information derived from the drilling.

We expect that an equitable sharing of mob-demob costs could be arrived at. We have discussed the above program briefly with Mr. Earl Korynta of USKH and he sees no problem with it.

We would be pleased to discuss the scope, time and cost of the proposed program with you at your convenience. Please do not hesitate to call us if you have any questions.

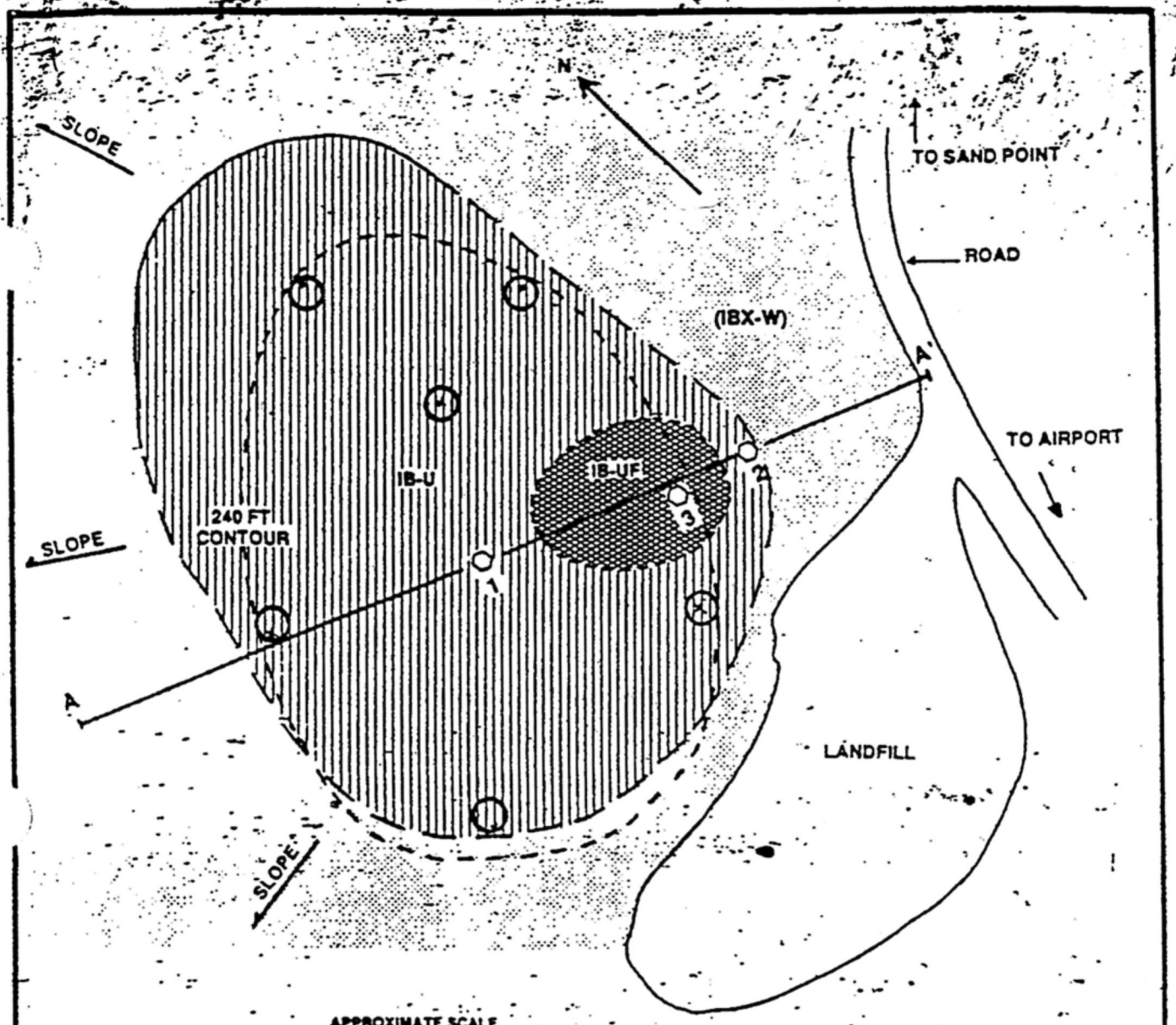
Very truly yours,

Robert G. Dugan
Project Geologist

Howard P. Thomas, P.E.
Manager, Anchorage Office

Attachment

cc: Earl Korynta



APPROXIMATE SCALE

0 100 200 FT

LEGEND

- WCC BORING (1984)
- FRESH TO SLIGHTLY WEATHERED BASALT (IB-U)
- FRACTURED OR RUBBLE-LIKE BASALT (IB-UF)
- MODERATELY TO HIGHLY WEATHERED VOLCANIC ROCKS AND/OR SEDIMENTS (IBX-W)
- GEOLOGIC CONTACT, DASHED WHERE INFERRED

○ APPROXIMATE BORING LOCATIONS FOR FUTURE QUARRY INVESTIGATION.

INTERPRETED GEOLOGIC MAP OF DOME QUARRY

Woodward-Clyde Consultants | FIG. 1

Dean Parks
(Construction)

Project engineer who
finished Sand Point
road project.

Phone 561-1148

Pete — 4/23/82

Dean may be able to
help you more.
We used the site for
crushed material. Not rip-rap
Jean

GENE HARP
CENTRAL REGION GEOLOGIST

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

POUCH 6900
ANCHORAGE, ALASKA 99502
(907) 338-4200
TELEX 25-189

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

LAB REPORT

PRECONSTRUCTION X

TEST OF Metamorphic Rock ITEM NO.
PROJECT NO. 026312 PROJECT NAME Sand Point Runway
SAMPLED FROM Quarry Site #2 SUBMITTED BY Ottley
SOURCE QUANTITY REPRESENTED
LOCATION (ROW) Sta. 64+00+ - 68+00+ Lt. Road DEPTH Surface
EXAMINED FOR Sulfate soundness, L.A., & Degrad SPECIFICATION

LABORATORY NO. 79A-861
FIELD NO. S.P. Quarry Site #2
DATE 7/27/79
DATE SAMPLED 5/21/79
DATE RECEIVED 7/11/79

% PASSING SIEVE	AS RECEIVED		SPEC
6			
4			
3"			
2			
1 1/2			
1"			
3/4			
1/2"			
3/8"			
#4			
#8			
#10			
#16			
#20			
#30			
#40			
#50			
#80			
#100			
#200			
02MM			
.005MM			
DUST RATIO			

OPTIMUM MOISTURE
MAX DRY DENSITY
MAX DENSITY NUMBER
CORR MAX DRY DENSITY
FIELD DENSITY
FIELD MOISTURE
% COMPACTION
% - 3/4"
% - NO 4
AASHO T180 ... ALASKA T 12 ...
% FRACTURE
DEGRADATION VALUE 44
NATURAL DENSITY
NATURAL MOISTURE
WEIGHT LOOSE
WEIGHT RODDED
MISCELLANEOUS

STATIC IMMERSION
BRAND ___ 2% ___ 5% ___
1% ___ 1½% ___ 2% ___

% + 10
% + 3"
% GRAVEL
% SAND
% SILT
% CLAY
FSV
LL
PL
PI
SOIL CLASS

DRY DENSITY - POUNDS / FT.³

MOISTURE PERCENT

DELETERIOUS MATERIALS:

	COMPM	SPEC	FINE	SPEC
MINUS #200 MESH				
SOFT FRAGMENTS				
COAL & LIG OR LT WT PART				
CLAY LUMPS				
STICKS & ROOTS				
FRIABLE PARTICLES				
SPECIFIC GRAVITY				
ABSORPTION				
FINENESS MODULUS				
SULFATE SOUNDNESS	5			
FREEZE THAW RATIO				

LA ABRASION LOSS 21 GRADE A
THIN ELONGATED
ORGANIC COLOR ___ THAN 500 PPM

MORTAR COMPRESSION STRENGTH:

	STANDARD	SAMPLE	RATIO	SPEC
___ DAY PSI				
___ DAY PSI				

FOR ROAD MATERIALS LABORATORY USE ONLY

CONFORM TO SPECIFICATIONS
YES ... NO ... N A ...

SIGNATURE Dan W. Homan, ...
by ...

NPAEN-FM-G

Humboldt Harbor Expansion

NPAEN-PL

NPAEN-FM

26 August 1983
Williamson/jah/2-2718

Attached is a write-up of the general geology for Humboldt Harbor as verbally requested by Mr. Legare.

1 Incl
as

EARL C. CHANDLER
Chief, Foundations & Materials Branch

8-12-83

Sandpoint SBH Expansion

try this one for size.

A rock. 1400 - 2300

w/ 15% > 1600# (medium)

med w/ 25 # range

B rock. 290 - 1400 well graded

minimum
+ 15% < 300#

does 99% < 300# (not 241#) make it?

Core 3# - 240

minimum 50% < 10#

max. 5% < 3#

sizes

pit can make it. but we have to drill for volume

core - really use 96% > 4# + 4% < 3#

P. Galbraith

NPAEN-FM-G

Humboldt Harbor Expansion

NPAEN-FM

4 August 1983
Galbraith/kg/2-2718

NPAEN-PL-N
ATTN: Mr. Legare

Trip report for quarry reconnaissance is inclosed. Any questions concerning this report should be addressed to Mr. Galbraith at 552-2718.

James L. Williamson
James L. Williamson
Acting Chief, Foundations & Materials Branch

1 Incl
as

NPAEN-FM-G 4 August 1983

MEMORANDUM FOR RECORD

SUBJECT: Investigation of Sand Point Rock Quarry Sources

1. On 25 - 26 July 1983 geologists from Foundations and Materials Branch travelled to Sand Point for a quarry reconnaissance on the proposed small boat harbor expansion.

2. Humboldt Harbor was built during the 1975 - 1976 construction season utilizing a basalt pipe as a materials source. The pipe is located adjacent to the existing harbor. There is between 10,000 and 12,000 cubic yards of shot material in and around the pipe. This material ranges in size from core to armor weighing several tons and should be used before further development of the pipe.

3. There is an estimated 175,000 cubic yards of material remaining in the pipe. An accurate survey will be required to find the exact amount. Although the pipe likely extends below the general "lay of the land," drilling would be required to confirm any reserves over the estimated 175,000 cubic yards.

4. Planning Branch wishes to use Black Point as a materials source for the harbor expansion. Black Point is located approximately ¼ mile south of the existing south breakwater. Limited outcrops show a massive basalt which may be related to the pipe. This relationship is uncertain since the area of possible connection has been eroded. Aerial photographs show one definite bed or flow. Competent, armor class rock may be restricted to this flow. Drilling and testing would be required to determine quantity and quality of reserves.

5. Recommendations:

a. Use the existing pipe quarry. This is a proven source which has produced blocky, competent basalt armor in the past. Production should be restricted to the pipe since peripheral flows tend to be poor quality and broken.

b. If a staging area is required, use fill from access road cuts and armor if required.

6. If the project is authorized for plans and specifications, quality samples will be taken for confirming tests.

Pat

Patrick J. Galbraith
Geologist

ADDRESS REPLY TO
DIRECTOR
(NOT TO INDIVIDUALS)

U.S. ARMY ENGINEER DIVISION, NORTH PACIFIC
CORPS OF ENGINEERS
NORTH PACIFIC DIVISION MATERIALS LABORATORY
RT. 2, BOX 12A
TROUTDALE, OREGON 97060

NPDEN-GS-L (76-C-894) 13 February 1976

SUBJECT: Humbolt Harbor, Sand Point Alaska, Report of Tests on Dome and East Quarry Rock

District Engineer, Alaska
ATTN: NPAEN-FM

1. Please reference:

a. Your DA Form 2544 request No. E-86-76-0029 dated 9 Dec 75.

b. Letters dated 9 and 12 Dec 75 from your Mr. Anderson covering transmittal of rock samples from Dome and East quarries (Rec. 11 & 15 Dec '75 respectively).

c. Interim report on this subject dated 8 January 1976.

2. Attached confirming information phoned your office and completing all work requested is report of tests on the two rock samples. Included are:

a. Report of Tests on Quarry Rock.

b. SPD Form 40 "Report of Petrographic Examination for East Quarry".

3. The petrographic sample was mislabled during shipment to SPD Laboratory. Please note the report has been corrected to cover East quarry. The sandstone sample is for another District and results should be disregarded.

O. E. BORGE
Director

Incl (dupe)
as

Copy furnished:
NPDEN-GS

NPDEN-GS-L (76-C-894) 13 February 1976

HUMBOLT HARBOR
Sand Point Alaska

Report of Tests on Quarry Rock

	Source	
	Dome Quarry	East Quarry
1. Specific Gravity, BSSD	2.73	2.31
2. Absorption, %	1.6	6.1
3. Loss by Exposure to Accelerated Freeze-Thaw		
% Wt. Loss		
100 cycles	-	19
200 "	-	69
300 "	-	93
400 "	-	100
500 "	0.4	100
Visual Examination		
100 cycles	½-inch piece spalled	Agglomerate disintegrating to sand
200 "	No further action	Andesite fracturing
300 "	"	"
400 "	"	All rock disintergrated into sand and minus 3/4-inch sizes
500 "	"	"

Incl 1

GENERAL TEST REPORT	Date January 1976 District	South Pacific Division Laboratory Corps of Engineers, U.S. Army Sausalito, California 94965
Project 1. Eugene, Oregon 2. Humboldt Harbor Project	Contract No.	Work Order No. & Date
Base Unit Cost	Date Sample Received	Laboratory No.

Description	Source
1. Sandstone - NPDL w/o 76-C-893 2. Quarry Rock - NPDL w/o 76-C-894	1. Eugene, Oregon 2. ~~Dome Quarry, Alaska~~ East Quarry, Alaska*

Tested for 1. Cement
2. Composition and Name by Petrographic Examination CRD-C127

1. Sandstone

There was very little cementing material present. The material was montmorillonite type clay.

2. ~~Dome Quarry~~ East Quarry *

A. Light-colored rock - this rock was a volcanic agglomerate in which the glassy matrix has been partially altered to montmorillonite type clay. This causes it to break down when soaked in ethelene glycol.

B. Dark-colored rock - this rock was a pyroxene andesite composed principally of andesine with minor volcanic glass and pyroxene. The rock was hard and fresh.

*Corrected
NPD Lab 13 Feb 76

Date Reported	Tested by	Sampled by
January 1976	PDH	--

SPD Form
10 Jun 70 40
I. incl 2

DISTRICT ENGINEERS LABORATORY
REPORT ON ROCK SAMPLES FOR
F & M BRANCH - SOILS SECTION

DE Lab Report No. 98-74 ✓ 23 Oct 1973

Project: Humbolt Harbor, Sand Point, Alaska.

Samples Submitted for Testing: Received 17 Oct. 1973, four job-site rock samples from Fred Anderson, Soils Sec. - F&M Branch. Field I.D. locations were designated:

A & B. Weathered material from borrow area east of rock quarry. (talus).
C & D. Rock quarry proper (quarry).

Test Requested: Specific gravity and absorption percent/moisture content.

Test Equipment Used: Balance, wire basket container and drying oven.

Test Procedure: Tests were accomplished in accordance with the following:

1. ASTM-C-127-68, Specific Gravity and Absorption of Coarse Aggregate.

Test Results

Test	Description	Samples A	B	C	D
1.	Specific Gravity (SSD)	2.262	2.500	2.693	2.723
2.	Absorption M/C (%)	5.5	1.9	0.8	0.8

If Additional information is required, please specify by letter or call the DE Lab at 753-5124.

EDMUND J. McMAHON
Ch, Materials Section