

MANUFACTURER'S CERTIFICATE OF COMPLIANCE

02270-3

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS

TO:

RICHARDSON RESIDENT OFFICE
U.S. ARMY ENGINEER DIST., AK
P.O. BOX 0898
ANCHORAGE, AK 99506-0898

FROM: **CONTRACTOR**
RED SAND CONSTRUCTION
PO BOX 3097
BELLEVUE, WA 98009

CHECK ONE:

THIS IS A NEW TRANSMITTAL
 THIS IS A RESUBMITTAL OF
TRANSMITTAL _____

SPECIFICATION SEC. NO. (Cover only one section with each transmittal)

02270

PROJECT TITLE AND LOCATION
HARBOR IMPROVEMENTS, KING COVE

ITEM NO.

DESCRIPTION OF ITEM SUBMITTED
(Type size, model number/etc.)

MFG. OR CONTR. CAT.,
CURVE DRAWING OR
BROCHURE NO.

NO. OF
COPIES

CONTRACT REFERENCE
DOCUMENT

SPEC.
PARA. NO. e.

DRAWING
SHEET NO. f.

FOR
CONTRACTOR
USE CODE 9.

VARIATION
CODE h.

FOR CE
USE
CODE 1.

a.

ROCK QUALITY - DATA

DATA

5

2.2

F

b.

ROCK QUALITY - REPORTS

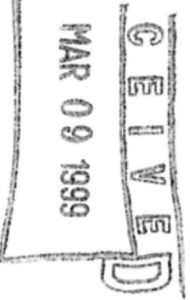
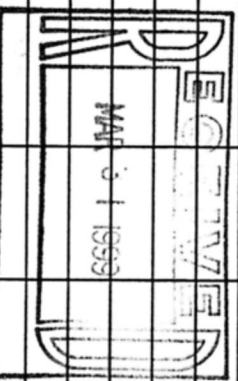
REPORTS

5

2.2

F

REMARKS



I certify that the above submitted items have even reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

Clayton W. Arterburn
NAME AND SIGNATURE OF CONTRACTOR
CLAYTON W. ARTERBURN

ENCLOSURES RETURNED (List by Item No.)

SECTION II - APPROVAL ACTION

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

DATE

WALTER D. WOOD
Authorized Representative
of the Contracting Office

MAR 26 1999

RED SAMM CONSTRUCTION, INC.

P.O. BOX 3097
BELLEVUE, WASHINGTON 98009

BELLEVUE (425) 827-29
FAX (425) 827-02

March 5, 1999

Administrative Contracting Officer
US Army Engineer District, Alaska
Richardson Resident Office
PO Box 898
Anchorage, Alaska 99506-0898

CONTRACTOR SUBMITTAL
RED SAMM CONSTRUCTION, INC.
This Document is prepared for a Submittal as follows:
 Approved without correction by RSC
 Approved with corrections as noted by RSC
Reviewed by: *CWA*
Title: *PROJ MGR*
Date: *3/3/99*
Signature: *Clayton W. Arterburn*
Submittal for: *Submittal*
Submittal may require Submittal for any items not
in compliance with the contract. All materials must
conform to the plans and specifications regardless
of the submittal review by the contractor.

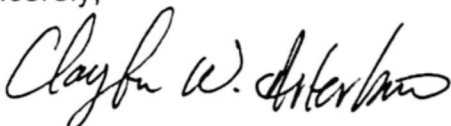
Re: DACW85-99-C-0003, Harbor Improvements, King Cove, AK; Quarry Data and Reports for Dome Quarry

Gentlemen:

Red Samm will be mining rock from Dome Quarry at Sand Point, Alaska. The quarry has been tested and approved for quality by the Corps of Engineers. Red Samm will only be mining rock in the Dome Quarry "plug" of fresh to slightly altered basalt. According to Woodward Clyde's report (see enclosures) this plug of basalt runs from the surface of the quarry to nearly sea level. If the rock changes from what was previously tested and approved by the Corps, then Red Samm will halt mining operations and move to another area of the quarry which does not differ from the approved rock.

If there are any questions regarding the above subject, please do not hesitate to contact me at (425) 827-2955.

Sincerely,



Clayton W. Arterburn
Project Manager

3.1 Dome Quarry Geology

Dome Quarry is the proposed source of armor stone for the runway project. The quarry is located in a Tertiary basalt intrusive structure forming a prominent knob one mile north of the airport. The basalt is a fresh to slightly altered pipe- or mushroom-shaped body bounded by less competent andesitic volcanic rocks. The rock outside the fresh basalt intrusive has been moderately to highly altered and weathered. The basalt intrusive in Dome Quarry dips steeply to the southwest.

4.4.5 Quarry Investigation

Subsurface investigation of Dome Quarry was accomplished between March 20 and April 9 using the same drill rig and techniques described in Section 4.4.4. The quarry investigation consisted of drilling six borings, two to 150 ft depth and four to 100 ft depth. The borings were ultimately extended to 235 ft depth under a separate contract between WCC and the U.S. Army Corps of Engineers, with the permission of the City of Sand Point and USKH. The purpose of the additional footage was to determine the extent of competent basalt available for subsequent use in the proposed expansion of the Sand Point small boat harbor. The complete core logs to full depth are presented in this report.

Six drill sites were located near accessible portions of the perimeter of the Dome Quarry basalt outcrop. The borings were cored continuously with an NQ wireline system using 1.875-in.-ID diamond bits, and single-tube corebarrels.

Drill sites were prepared and the rig was moved hole-to-hole with City of Sand Point bulldozers. A water supply was established near sea level and pumped over 1,000 ft up to the drill. However, this source was subsequently abandoned due to severe cold weather which froze up both the water lines and eventually the source itself. Water was then supplied to the drill from a 1,000-gal-capacity water truck and Bean 35 pump.

Joint spacing, joint angle of dip, and weathering in the joints were carefully recorded during coring operations. Percent core recovery and RQD values were determined for each run. The condition of each joint was classified. The length of the longest intact piece of core recovered from each run was also logged.

Examination of rock cores recovered from investigation of Dome Quarry indicates that fresh basalt is present in a restricted formation beneath the existing quarry area. Test borings Q-1 through Q-6 encountered fresh basalt throughout most of the depth cored. Boring locations within Dome Quarry are shown in Figure 6 and logs of Borings Q-1 through Q-6 are presented in Appendix C, Figures C-1 through C-6.

5.3.1 Rock Types

An interpretive geologic map of Dome Quarry is shown on Figure 6 and cross-sections are shown in Figures 7 through 10. The cross-sections are interpreted from the core logs (Appendix C, Figures C-1 through C-6) and from surficial evidence. The basalt intrusive that forms Dome Quarry dips steeply toward the southwest. It appears to be a pipe- or mushroom-shaped structure bounded by altered volcanic rocks and sediments. The altered volcanic rocks appear to be unsuitable for the production of large, high quality armor stone.

5.3.2 Rock Quality

Boring Q-1 encountered competent fresh basalt of high strength to 100 ft below the ground surface. The basalt was moderately altered with moderate strength between 100 to 138.5 ft depth. Boring Q-2 encountered fresh basalt to 173 ft, and was altered and weathered below that depth. Borings Q-3 through Q-6 encountered relatively fresh to slightly altered dark grey basalt to a depth of 230 ft. The competent basalt generally had widespread joints, typically cemented with calcite or a combination of calcite and hard white siliceous material.

5.3.3 RQD/Core Lengths

Core recovery from the borings was high, generally about 98 percent. Rock Quality Designation (RQD)^a values in the competent basalt were consistently above 90 and generally 100, below the 100 ft depth. However, RQD values were generally lower in Boring Q-1 below 138.5 ft and in Boring Q-2 below 173 ft.

Core runs were generally 120 in. long except in the upper portions of each borehole. Intact pieces of competent basalt core were measured and the average of the longest pieces in each core run were as

<u>Boring</u>	<u>Length</u>
Q-1,	20 in.
Q-2,	30 in.
Q-3,	32 in.
Q-4,	66 in.
Q-5,	64 in.
Q-6,	60 in.

The characteristics of igneous intrusives are typically somewhat unpredictable. However, examination of cores from the six borings at Dome Quarry and an extensive investigation of local bedrock outcrops indicates no continuous geologic features which would limit the size of stone that could be quarried. The borings encountered widely-spaced joints and the recovered cores had high RQD's which indicate a massive formation. Joints and seams are generally filled with hard crystalline materials with strengths near that of the basalt itself but occasionally also contain weaker calcite. Some joints were broken during drilling but some remained intact, even when the core was broken across a joint.

Joint spacing, angle of dip, and weathering in the joints were recorded during the coring operations. Percent core recovery and RQD values were determined for each core run. Joints or non-mechanical breaks in the core were recorded with their measured angle of dip. The condition of the joints was classified as follows:

- A - Fresh basalt, unweathered
- B - Slightly weathered or cemented
- C - Moderately weathered, discolored material or iron staining
- D - Highly weathered, loose filling material
- E - Completely weathered surface, friable

Joint location classifications and lengths of core recovered are shown on the detailed logs presented in Appendix C.

consolidation test was also performed on the soft silts sampled in Whiskey Bill Creek.

Results of the laboratory tests on soil samples are presented in Appendices A and B.

6.2 Quarry Stone

Selected rock cores recovered from the six test borings in Dome Quarry were subjected to laboratory testing. The testing was to determine the rock's potential for producing armor stone of appropriate size and quality for use in the offshore embankments. Tests carried out on the rock cores were conducted by Pittsburg Testing Laboratory and included:

- Specific Gravity and Absorption ASTM C-128
- Unconfined Compression ASTM D-2938
- Freeze-Thaw CRD C-144
- Los Angeles Abrasion ASTM C-535
- Ethylene Glycol Soak CRD-C-148 (modified)

The testing program was designed to evaluate the resistance of the rock to three common types of armor stone failure or alteration: abrasion, spalling of the surface, and breaking of the stones. Petrographic analyses were also made on selected thin sections of the rock. Results of the laboratory tests and petrographic analyses on rock core samples from Dome Quarry are presented in Appendix E.

6.2.1 Specific Gravity and Absorption

Specific gravity is a key property of basalt since this type of rock can have a wide range of values of specific gravity depending on the environment in which the rock formed. Our test results show that this particular formation of basalt is relatively uniform with an average specific gravity of 2.72, ranging from 2.64 to 2.78. Both our minimum

and the average values are higher than the 2.6 minimum value specified by the Alaska District Corps of Engineers.

Damage to armor stone can occur through spalling of the surface which may result from salt attack, freeze/thaw, and/or clay mineral expansion. Since this type of damage results when chemicals or water get into the rock, more absorptive rocks tend to be more susceptible to this type of damage. The results of our absorption testing indicate that this rock is not very absorptive, in all cases tests indicate an absorption of about 0.1 percent.

6.2.2 Unconfined Compression

Armor stone can be damaged with resulting failure of individual stones as a result of improper transportation, placement, or storm wave impacts. Compressive strength of the rock was determined by unconfined compression testing to determine the rock's potential for failure due to shear. The test results indicate that the rock has high compressive strength (16 to 41 ksi) but is moderately to highly brittle. Application of rapid or instantaneous loads (impact) causes failure where slowly applied loads do not.

6.2.3 Freeze-Thaw

Where water is able to penetrate into individual stones, the alternate freeze/thaw cycles tend to split the stones which may reduce their effective size. The cyclic freezing and thawing test is used to determine the rock's resistance to disintegration or surface spalling due to expansion of ice during freezing in surface irregularities or cracks. Selected core samples were subjected to 20 cycles of freezing and thawing. Volume loss observed was very slight (0.5 to 1.4%).

6.2.4 Los Angeles Abrasion

Abrasion is usually caused by the sand in the surf as it washes over the surface of the armor stone. Estimation of the rock's resistance

