DOME QUARRY INVESTIGATION

SMALL BOAT HARBOR

SAND POINT, ALASKA

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May 31, 1985
P.N. 85006C

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

Attention: Mr. Harlan Legare

Subject: Dome Quarry Investigation
Small Boat Harbor
Sand Point, Alaska

Mr. Legare:

Enclosed are three copies of the Dome Quarry investigation for a small boat harbor at Sand Point, Alaska. Rock cores recovered during our investigation were delivered to the Corps of Engineers District, Alaska upon completion of field operations.

The results of the investigation include data from a concurrent investigation of the quarry for USKH, Inc. All information from the concurrent investigation is presented with prior approval by USKH, Inc.

Should you have any questions, please give me a call.

Sincerely,

William D. Pyle

William D. Pyle
Manager, Earth Sciences

WDP/bc

Enclosure

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers District, Alaska is investigating a proposed small boat harbor at Sand Point, Alaska. The project would include construction of a breakwater which will require both granular core materials and armor stone. Woodward-Clyde Consultants was contracted to investigate the quantity and quality of potential armor stone available from Dome Quarry. The quarry is located approximately 1,000 feet southeast of the proposed small boat harbor site (Figure 1, Project Location Map). The results of the investigation of Dome Quarry are presented in this report.

1.1 Scope

The scope of our investigation was limited to obtaining rock core samples from six locations within Dome Quarry. Four of the cores were obtained through the interval between 140 feet down to 10 feet, mean sea level (MSL). The remaining two cores were obtained through the interval from 90 feet down to 10 feet, MSL. A total of 680 linear feet of rock core was obtained.

Coring in each of the six locations was accomplished by continuation of coring operations in holes previously cored from the ground surface to elevations of either 140 or 90 feet, MSL. Coring from the ground surface at the six locations was done by Woodward-Clyde Consultants under contract to USKH, Inc. of Anchorage, Alaska. Information presented in Appendix A, Drilling Logs, includes core log data from the USKH, Inc. portion of each coring location, with the permission of USKH, Inc.

Estimates were made of the quantity and quality of armor stone potentially available from the intervals cored for the Corps of Engineers. The estimates are based on core analysis and a geologic evaluation of the quarry site. Upper portions of the quarry may be mined to obtain material for construction of an airport runway prior to construction of the proposed small boat harbor. A preliminary

mining plan which may be implemented in removal of stone from the upper portion of the quarry is included in this report.

1.2 Purpose

The purpose of our investigation was to determine the extent of basalt available for quarrying to elevation 10 MSL beneath Dome Quarry. Since the quarry may be used to produce armor stone for other projects, it was necessary to estimate quarry conditions that may exist at the time construction of the small boat harbor is scheduled to begin.

2.0 GEOLOGIC SETTING

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. Popof Island is a member of the Shumigan Island group at 55°20' north latitude and 160°30' west longitude. The island has an approximate diameter of 9 miles with a maximum elevation of 1,520 ft above sea level.

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

Active volcanoes occupy the Alaska Peninsula and are aligned parallel to the Aleutian Trench. Some of the volcanoes are visible from Popof Island. Older intrusives, the nearest being the Shumigan batholith (Tertiary), form a belt of plutonism midway between the trench and the peninsula (Burk, 1965). The region was glaciated during the Pleistocene Epoch which modified the uplifted land mass to its present configuration.

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 and along the sea cliffs which bound much of the island.

Although Tertiary sedimentary rocks of the Stepovak formation crop out on the northwest 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).

3.0 FIELD INVESTIGATION

Coring operations began on March 20, 1985 and were completed April 10, 1985. A 43 hp BBS-25 direct drive rotary drill rig operated with a Bean 35 pump and NQ wireline system were used with 5 ft and 10 ft corebarrels. Water and a limited amount of mud was used as the drilling fluid.

The drill was mounted on a large timber-decked skid which was moved between holes with a bulldozer. Water was supplied to the drill from a 1,000 gal. capacity water truck and, when possible, was pumped about 1,000 ft from the mouth of a small ravine near sea level. The latter source was eventually abandoned due to freezing temperatures and high winds which caused periodic freezing of water in the ravine and in the waterlines.

Joint spacing, angle of dip, and weathering in the joints were recorded during coring operations. Percent core recovery and Rock

Quality designation (RQD)[a] 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
E - Completely weathered

The length of the longest intact piece of core recovered from each run also was logged.

4.0 CORE DRILLING RESULTS

The location of the six borings is shown on Figure 2. Results of the core drilling are detailed in the field core logs (Appendix). 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 100-138.5 ft and was highly altered and weathered with low strength below 138.5 ft. Boring Q-2 encountered fresh basalt to 173 ft. The basalt was altered and weathered below 173 ft. Borings Q-3 through Q-6 encountered relatively fresh to slightly altered dark gray 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.

Core recovery from the borings was high, generally about 98%. RQD values in the competent basalt were consistently above 90 and generally 100 below the 100 ft depth. RQD values were generally lower in boring Q-1 below 138.5 ft and below 173 ft in Q-2.

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[a] RQD is the ratio of the accumulated length of intact rock core in sections longer than 4 inches to the total distance drilled.

The average of the longest intact pieces of core recovered in the borings was as follows:

Boring	Length
Q-1,	20 in
Q-2,	30 in
Q-3,	32 in
Q-4,	66 in
Q-5,	64 in
Q-6,	60 in

5.0 GEOLOGY OF DOME QUARRY

Cross-sections through Dome Quarry are shown in Figure 2. The cross sections are interpreted from the core logs and from surficial evidence (Figure 3 through Figure 6). The basalt intrusive that forms Dome Quarry dips steeply toward the southwest. The basalt appears to be a pipe or mushroom shaped intrusive structure bounded by altered volcanic rocks and sediments. The altered volcanic rocks appear to be unsuitable for the production of large, high quality riprap.

5.1 Preliminary Volume Estimate

The estimated volume of the basalt intrusive in Dome Quarry calculated for depths below an estimated ground surface elevation of 240 feet MSL to 10 feet MSL is 1.03 million cubic yards. Total estimated volumes were divided into proven and unproven reserves. Proven reserves are based upon depth of competent basalt encountered within the perimeter outlined by borings Q-1 through Q-6. Unproven reserves are estimated from geologic maps and cross-sections delineating the extent of competent basalt outside the perimeter of proven reserves. The portion available for use in constructing a breakwater for the proposed small boat harbor would be obtained from elevation 90 MSL down to 10 MSL. The estimated volume of competent, fresh basalt in this interval is 340,000 cubic yards. Additional armor stone may be available from quarry operations above elevation 90

MSL, dependent upon requirements of preceeding projects. The following table shows estimated volumes of rock available from Dome Quarry.

Interval as	Estimated Rock Volume Reserves in Cubic Yards		
MSL Elevation	Proven	Unproven	Total
240 ft to 10 ft	370,000	660,000	1,030,000
90 ft to 10 ft	130,000	210,000	340,000

5.2 Rock Jointing

The characteristics of igneous intrusives are somewhat unpredictable. However, examination of cores from the 6 borings and an extensive investigation of 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 recovered cores had high RQD's which indicates a massive formation. Joints and seams are filled with hard crystalline materials with strengths near that of the basalt itself but also contain weaker calcite. Some joints were broken during drilling but some remained intact, even when the core was broken across a joint.

5.3 Preliminary Mining Plan

The following mining plan represents the anticipated procedure for quarrying armor stone from the present ground surface at elevation 240 feet MSL down to approximately elevation 90 MSL. The stone quarried in this interval would be used in construction of the proposed airport runway. The runway is scheduled for construction prior to the small boat harbor. Therefore, the mining plan for the airport quarrying is included here as a means of describing probable quarry site conditions that may exist when construction of the small boat harbor begins.

Preliminary Mining Plan for Airport Runway Project

It may be necessary to excavate Dome Quarry from present ground

level at 240 feet MSL down to an approximate elevation of 90 MSL. We anticipate that the first step in opening the quarry will be to remove all material to an elevation of 230 ft establishing a flat top for the quarry. A face would be started on the south side so that an existing land fill (city dump) road could be used to haul out stone mined during initial quarry operations. Faces of 10 feet in height or less would be used in sequential removal of stone.

ouch — if so — Harbor gets bottom 90 ft

A quarry haul road with a series of switchbacks parallel to the existing airport road would allow maintaining maximum grades of 6 percent grade from the excavation level to the airport road. It is anticipated that five switchbacks may as quarry operations reach 90 MSL be required (Figures 7 and 8). Some elevation gain from the excavation level may be accomplished by constructing the haul road around the circumference of the excavation. This would reduce the number of switchbacks required.

6.0 CONCLUSIONS

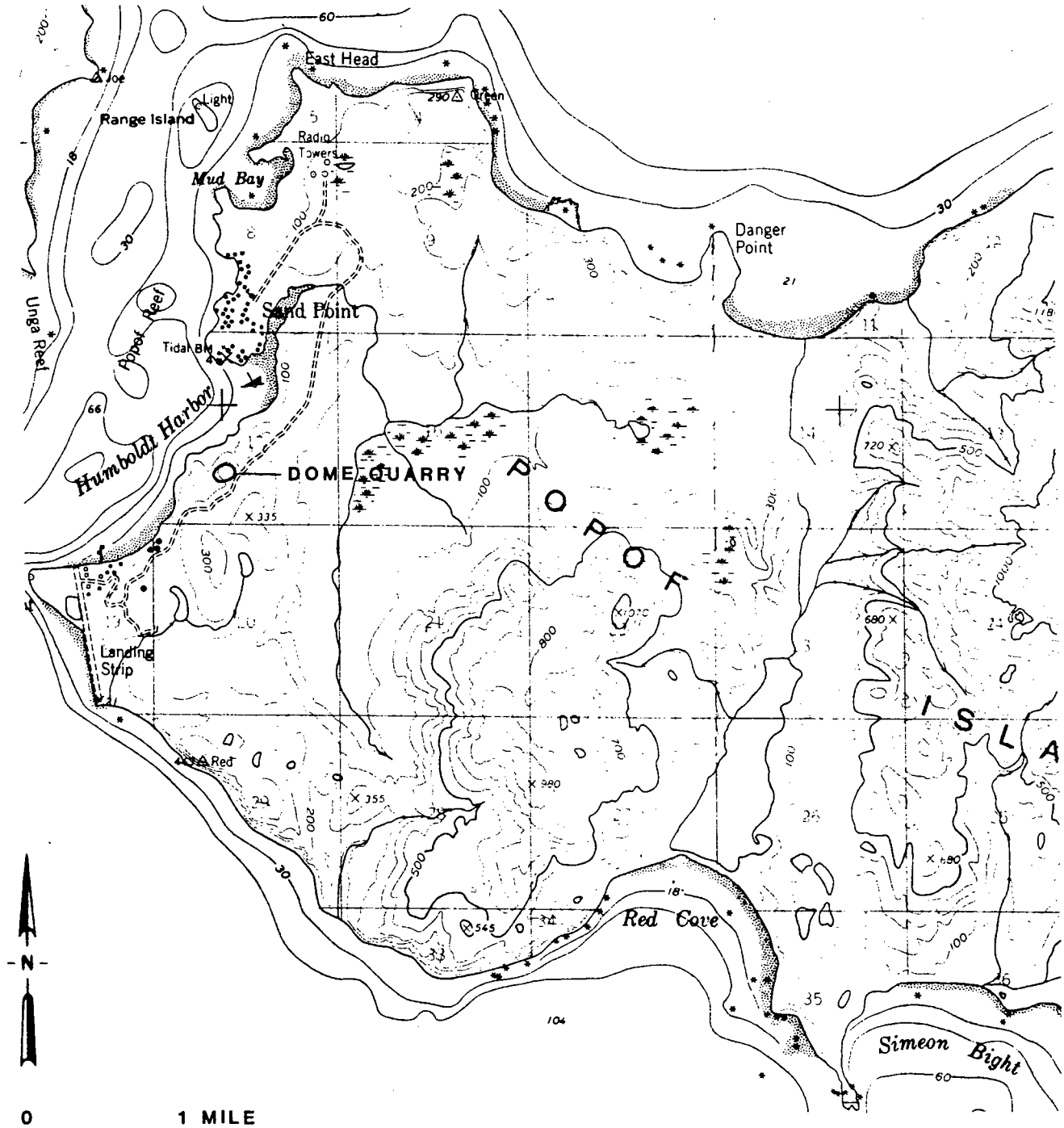
Currently stones up to 6 ft diam. are stockpiled at the quarry. In the harbor, most of the armor stone previously produced from Dome Quarry is 3 ft across or smaller. Based on this, we believe that a contractor will be able to produce 3 ft diam. and smaller stones from this quarry. With the proper techniques, we believe stones up to 6 ft diam. can be obtained. Blasting technique used in quarrying operations will have a major impact on the size of stone that can be obtained from Dome Quarry.

The rock is brittle and will be subject to breakage if dropped or handled roughly. Also, it may be necessary to use special care in placing the stones to avoid breaking them.

7.0 REFERENCES

Burk, C.A. 1965. Geology of the Alaska Peninsula--island arc and continental margin; Geol. Soc. America Mem. 99, pt. 1, 250 p.

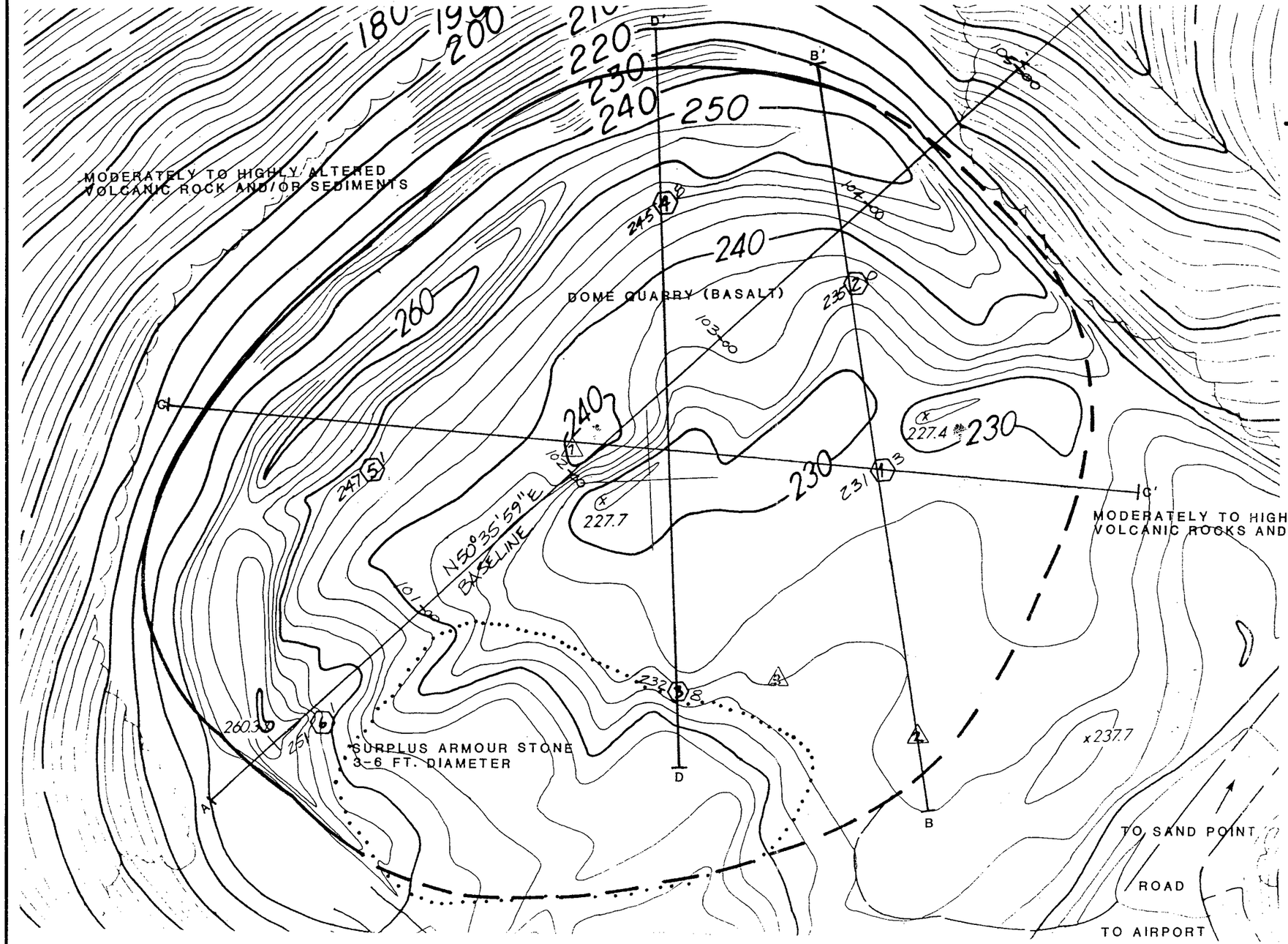
Gallagher, J., former Resource Associates of Alaska geologist, personal communication, May 1984.



USGS PORT MOLLER (B-2)
1983

PROJECT LOCATION MAP
DOME QUARRY

Woodward-Clyde Consultants | FIGURE 1



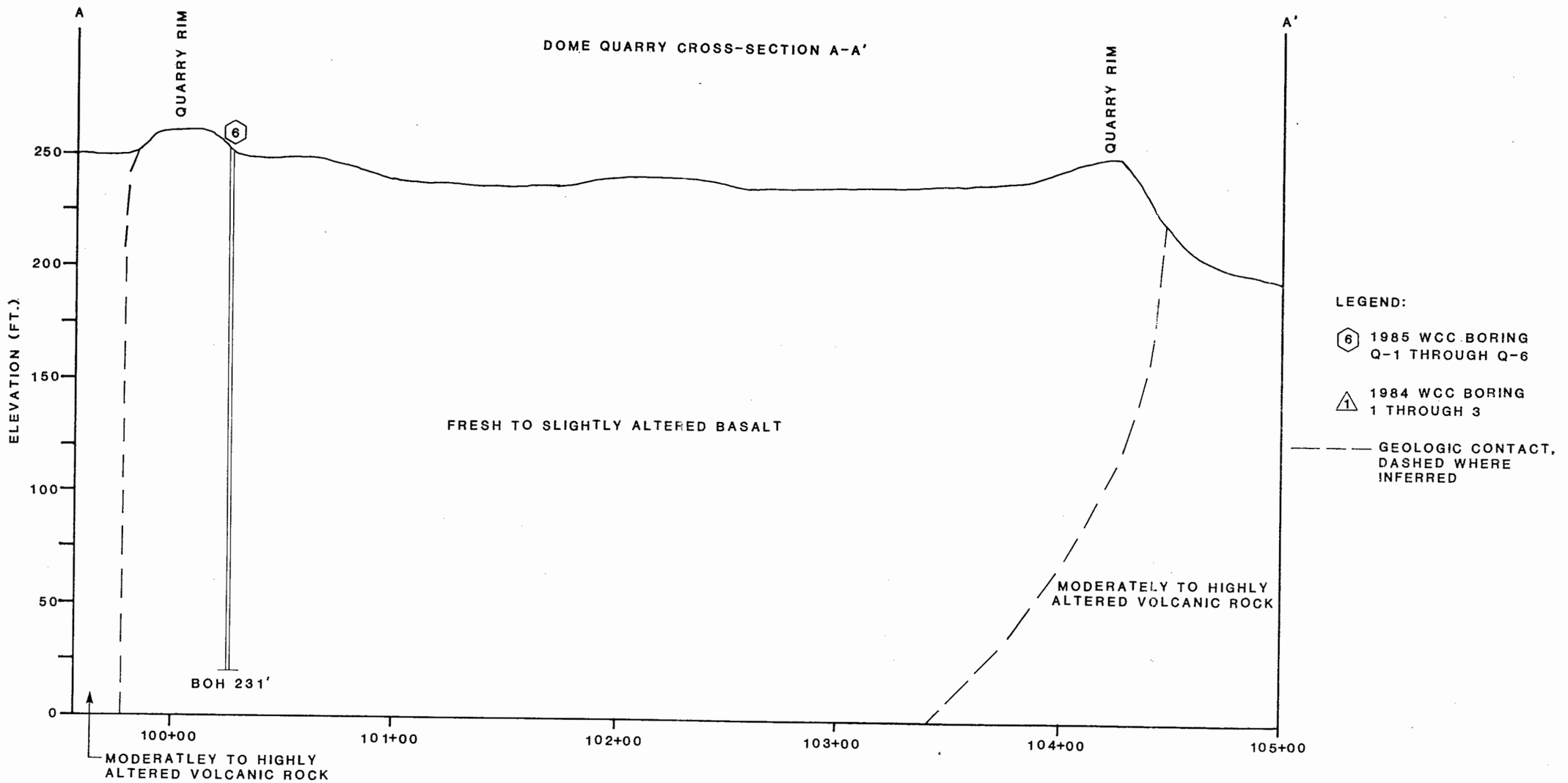
TOPO MAP: USKH SANDPOINT QUARRY SITE TOPO

INTERPRETED GEOLOGIC MAP OF DOME QUARRY

Woodward-Clyde Consultants

FIGURE 2

DOME QUARRY CROSS-SECTION A-A'

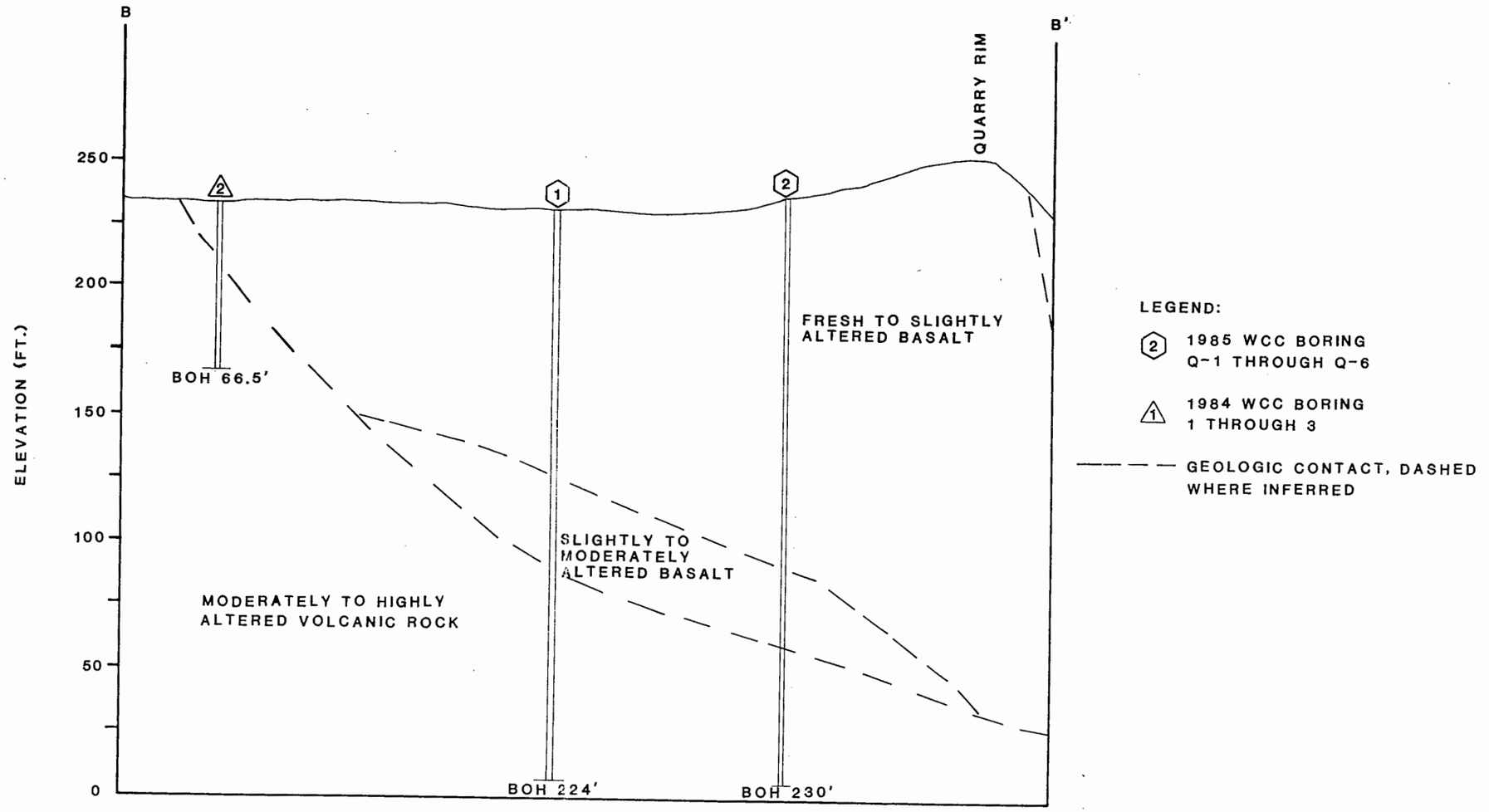


INTERPRETED GEOLOGIC CROSS-SECTION OF DOME QUARRY

Woodward-Clyde Consultants

FIGURE 3

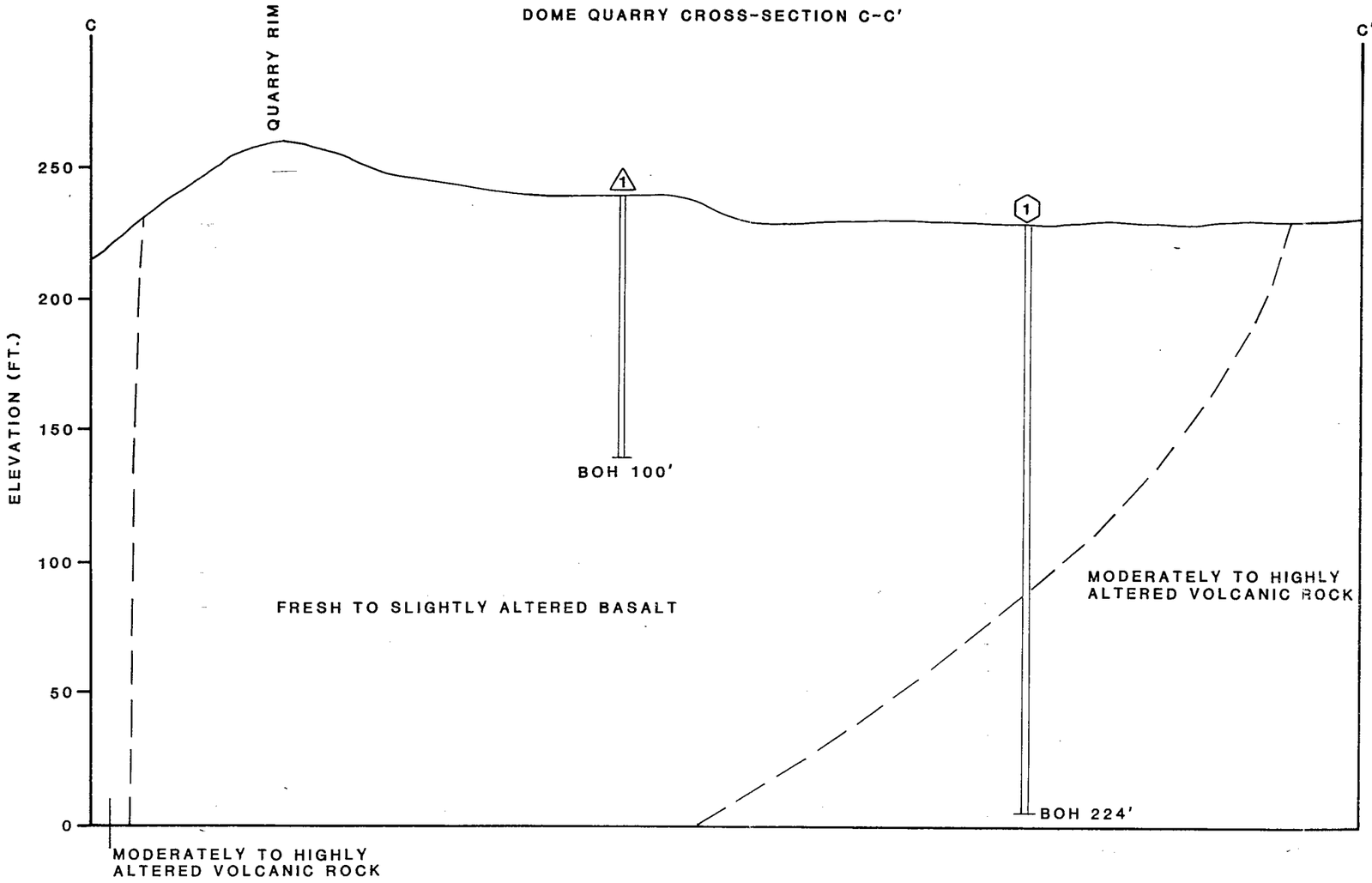
DOME QUARRY CROSS-SECTION B-B'



INTERPRETED GEOLOGIC
CROSS-SECTION OF DOME QUARRY

Woodward-Clyde Consultants | FIGURE 4

DOME QUARRY CROSS-SECTION C-C'



LEGEND:

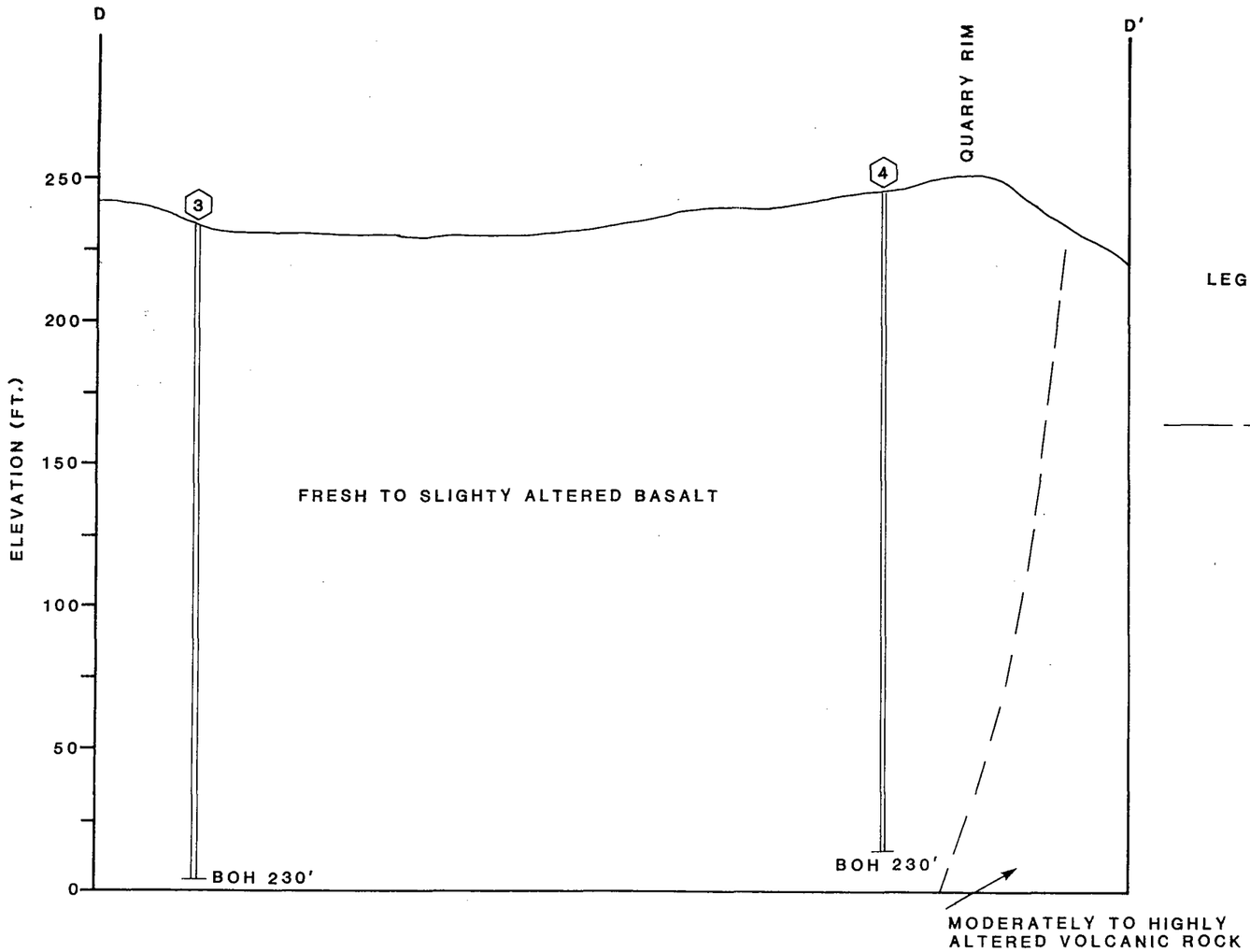
- (1) 1985 WCC BORING Q-1 THROUGH Q-6
- △1 1984 WCC BORING 1 THROUGH 3
- —— —— GEOLOGIC CONTACT, DASHED WHERE INFERRED

INTERPRETED GEOLOGIC CROSS-SECTION OF DOME QUARRY

Woodward-Clyde Consultants

FIGURE 5

DOME QUARRY CROSS-SECTION D-D'

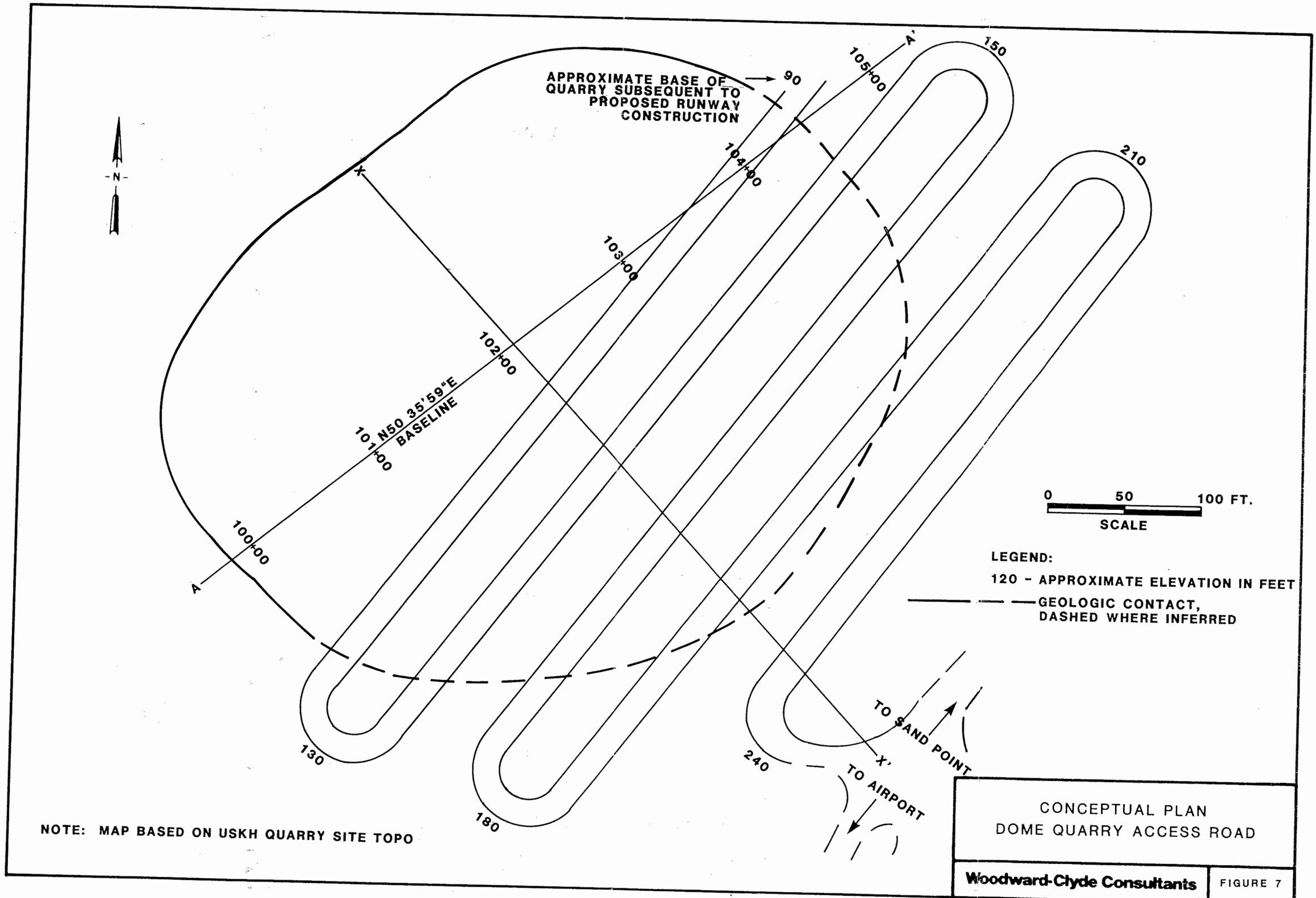


LEGEND:

- 3 — 1935 WCC BORING Q-1 THROUGH Q-6
- 1 — 1934 WCC BORING 1 THROUGH 3
- ——— GEOLOGIC CONTACT, DASHED WHERE INFERRED

INTERPRETED GEOLOGIC
CROSS-SECTION OF DOME QUARRY

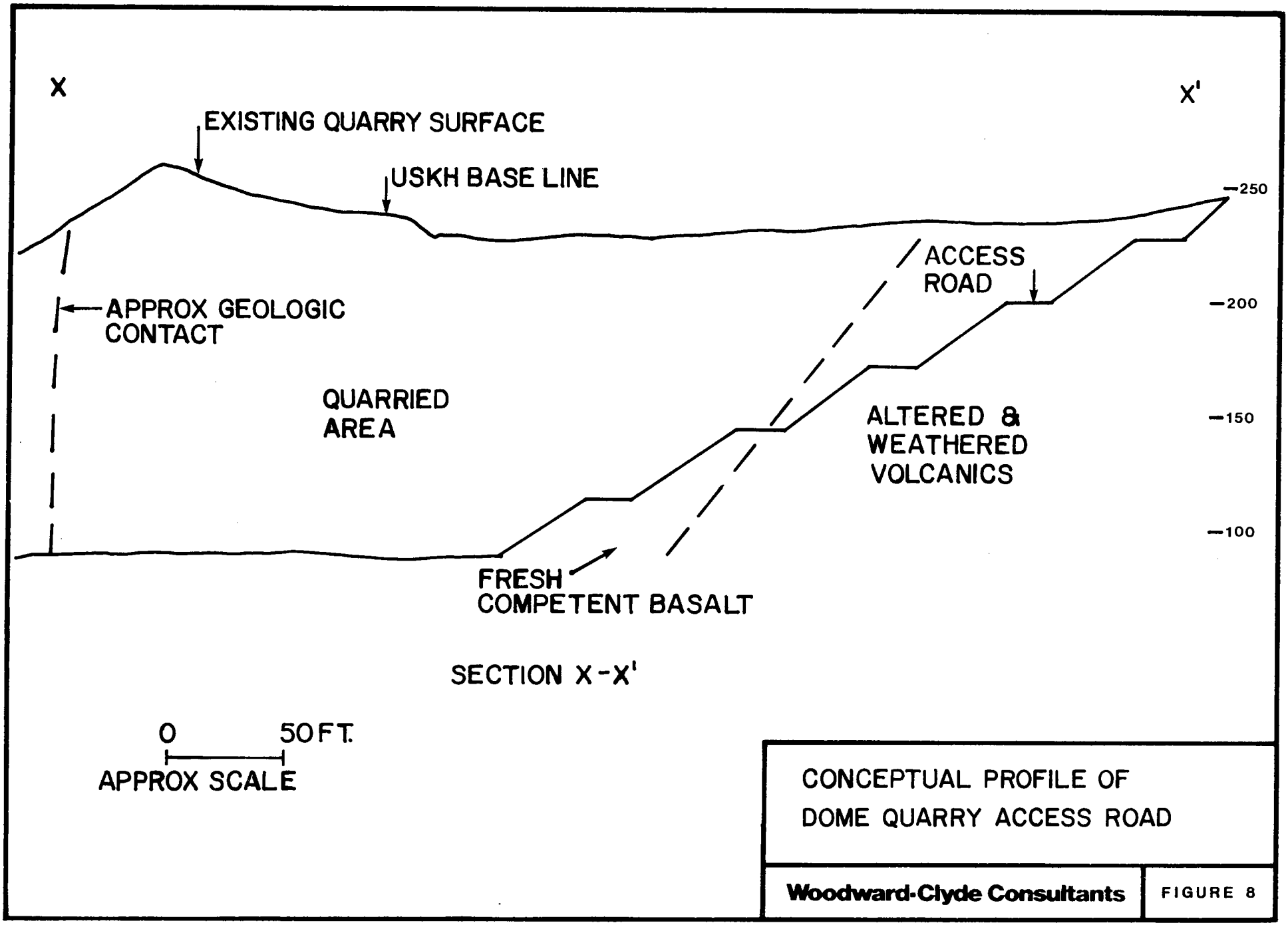
Woodward-Clyde Consultants | FIGURE 6



NOTE: MAP BASED ON USKH QUARRY SITE TOPO

CONCEPTUAL PLAN
DOME QUARRY ACCESS ROAD

Woodward-Clyde Consultants | FIGURE 7



CONCEPTUAL PROFILE OF
DOME QUARRY ACCESS ROAD

Woodward-Clyde Consultants

FIGURE 8

APPENDIX

FIELD CORE LOGS

Hole No. Q-1

DRILLING LOG

DIVISION	INSTALLATION	SHEET 1 OF 12 SHEETS

1. PROJECT: Sand Point Runway - Dome Quarry
2. LOCATION (Coordinates or Station): Dome Quarry
3. DRILLING AGENCY: Woodward-Clyde Consultants
4. HOLE NO. (As shown on drawing title and file number): Q-1
5. NAME OF DRILLER: Bart Hansen / Boyles Bros. Drilling
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK: 230 ft
9. TOTAL DEPTH OF HOLE: 230 ft
10. SIZE AND TYPE OF BIT: NQ · Diamond, 1.875 in ID
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: BBS-25
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 26
15. ELEVATION GROUND WATER: —
16. DATE HOLE: STARTED 1330 hrs 20 Mar 85 | COMPLETED 1930 23 Mar 85
17. ELEVATION TOP OF HOLE: ~231.3 ft
18. TOTAL CORE RECOVERY FOR BORING: 98 %
19. SIGNATURE OF INSPECTOR: Robert D Dwyer

Recovered Longest Piece (inches)	ELEVATION a	DEPTH b	LEGEND c	Joint Condition	Joint Dip	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. f (Run)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		0				0-2 ft Basalt Boulder		57	1	B 1330
		1								- Water = 8 gal/min
		2				2-4 ft Basalt Rubble (Shot Rock)				• No Returns
		3.5					15	87	2	E; B 1315
		4		B	75	4-100 ft, dark gray porphyritic basalt with phenocrysts of olivine & pyroxene to 1/4 in., Competent, HARD, FRESH with generally wide spaced cemented joints to 3/16 in. Joint cementing material is calcic to siliceous in composition.				
				B	85					
		5		B	35					
				B	60					
13				C	55					
				C	20					
		6.5		B	40					
				B	35					
				B	70					
				B	75					
		7.5					37	100	3	E 1236; B 1300
				B	80					
		8		A	60					
				B	40					
				B	50					
10.5		9		B	50					
				A	10					
		10					93	100	4	E 1325; B 1330
		11.5		A	85					
				B	35					
		12		C	60					
		12.5		C	45					
34		14								
		15					92	100	5	E 1400; Decide to Ream to 5 ft and case off Rubble to change to 10 ft new Core barrel.
		15.5		C	30					
		16		B	50					
				B	10					
				A	30					
18 1/2		17.5				17.5 unbroken joint				
		18		A	20					
		19		A	50					
		20		B	30					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: Sand Point Runway Dome Quarry | HOLE NO. Q-1

Hole No.

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY
2. LOCATION (Coordinates or Station): Dome Quarry
3. DRILLING AGENCY: WOODWARD-Clyde Consultants
4. HOLE NO. (As shown on drawing title and file number): Q-1
5. NAME OF DRILLER: Bart HANSEN
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT:
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED / COMPLETED
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR:

Longest piece Recovered	ELEVATION a	DEPTH b	LEGEND c	Joint Comp Incl	Joint Dip L	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20						100	6	
		21					100			
30		22								
		23		B	70					
				B	5					
		24		B	35					
		25						100	7	
				B	40					
		26		C	45					
		27		C	0		95			
		28		B	20					
		29								
				A	75					
20		30								
				B	60					
		31								
				C	60					
		32		C	75					
				B	25					
		33								
				B	20					
		34								
		35		B	70					END 1800 21 MAR 85
32									8	Begin 0950 22 March
		36		B	50		83	100		
				B	50					
				C	Safe	- opposite				
		37								
				B	47					
		38		B	15					
				A	60					
				C	60					
		39								
		40								

Hole No. Q-1

DRILLING LOG | DIVISION | INSTALLATION | SHEET 3 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number): Q-1
5. NAME OF DRILLER
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

Longest Piece	ELEVATION a	DEPTH b	LEGEND c	Joint Conditions	Joint Angle ∠	CLASSIFICATION OF MATERIALS (Description) d	RQD e	% CORE RECOVERY f	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		40		C	60				8 (CONT.)	
				C	40					
		41		C	60					
										Penetration Rate of bit 20 ft/hour
		42								
										Fluid = water 8 gal/minute 20% return (lost in rubble 0-5 ft)
		43		B	35					
				B	65					
		44				- mini joint w/ calcite did not break, 1 mm				
		45								E 1020 B 1030
22				C	70	weathering in joint but not into basalt	97	100	9	
		46				- mini joint (calcite & silica?) 3 mm				
		47		B	3	- calcite, 1 mm				
		48				- calcite & silica, 4 mm				Bit Penetration Rate 20 ft/hour
		49		A	45					
				B	60					
		50								
				B	3	- calcite 1 mm & silica				
		51								
		52		C	35					- 52 ft, 1037 all interval
				C	55					
		53								
		54		B	67	- calcite 3 mm & silica				
		55		B	60					End 1100
				B	15					Begin 1110
							100	100	10	
		56								
		57		B	40					
		58		B	50					
				B	75					
		59								
		60								

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 4 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

Longest pile in last

ELEVATION a	DEPTH b	LEGEND c	Joint Cond. Index	Dip of Joints	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	60		B	40				10	
								COMMENCED	
35	61								
	62								
	63		B	35					
	64								
	65		B	30					END 1140
			B	70		99	100	11	
	66								
	67		B	45					
28	68								
	69								
	70		B	60					
	71								
	72		B	60	- NOT aligned w joint @ 69.6'				
	73		B	70					
			B	25					
	74								
	75								
						100	100	12	
	76		B	65					
	77								
	78								
32	79		B	45					
	80							CONT.	

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

Lowest point Recovered

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	80							12 CONT.	
	81	—	B	30					
	82								
	83	—	B	30					
	84	—	B	60					
	85					96	100	13	
31	86	—	B	45					
		—	B	75	SILICA & CALCITE 4 mm				
	87								
	88	—	B	65					
			B	75					
	89	—	B	85					
	90	—	B	20					
	91	—	B	20					
	92								
	93								
	94	—	B	25					
	95					100	100	14	
	96	—	B	35					
	97								
	98	—	B	20					
29	99								
	100								

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 6 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY
2. LOCATION (Coordinates or Station): Dome Quarry
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number): Q-1
5. NAME OF DRILLER
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE: STARTED / COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

Longest recovered piece

ELEVATION a	DEPTH b	LEGEND c	Joint Cond'tion	Cl. of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	100		B	60	100 - 138.5 moderately altered dark gray basalt of moderate strength with wide spaced joints cemented with silica, calcite and containing some pyrite.			14 Cont	- Pyrite in joint, dessert rose as well - slightly altered below 100 ft, contact is gradational
	101								
	102		B	30					
	103								
			B	70					
	104		A	40					
	105					94	100	15	
	106		B	55					
			B	40					
	107		A	80					- did not break in joint but maybe because of it
	108		B	50					- trace pyrite
	109		B	50					- not oriented as at 108 ft, contains pyrite
	110		B	10					
	111		B	90					- wavy joint, calcite >mm Pyrite to 3 mm between calcite seam and slightly altered basalt
	112		B	15					
19	113		B	25					- pyrite w/ calcite in joint
	114								
			A	40					23 Mar 85
	115		B	30					Eng 1450 hrs
28.5	116					100	100	16	
	117								
			B	30					- pyrite & calcite in joints
	118								
	119		B	40					
	120							Cont	

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 7 OF 12 SHEETS

1. PROJECT: Sand Point Runway	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint Cont. Type	Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		120	—	A	55				16 cont	
		121								- horizontal break
		122	—	B	35	- pyrite in joint				
		123								
		124	—	B	30					
		125	—	B	45		93	100	17	- break due to core barrel extraction, 80° joint
			—	B	45					
		126	—	B	40					- wavy joint
		127	—	B	35					- no joints w/ breaks
15			—	A	10					
		128	—	A	55					
			—	B	55					- NOT ALIGNED with break at 128 ft
		129	—	B	40					
		130	—	B	60					- not joint controlled
		131	—	B	40					- NOT Aligned w/ joint @ 131
		132	—	B	40					
		133	—	B	50					
		134	—	B	80					- joint likely controls break
			—	B	80					22 March 1700 hrs
		135	—	B	50		17	100	18	1200 hrs 23 March
14		136								- horizontal Break
		137	—	B	80					- TRACE PYRITE
										- horizontal break
		138	—	C	75	138.5 - 179 ft highly altered and moderately weathered black basalt of low strength				- brown staining penetrates 3/4 inch
		139								- Rock becomes significantly weaker due to alteration, weathering & calcite inclusions
		140								- FRIABLE

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PROJECT CONT — HOLE NO. Q-1

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 8 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

Longest intact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT Core Trim	Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	140							18 (CONT.)	
	141		D						141-142 - broken up core, very weak and weathered - NOT clearly broken on joints,
	142		E						142-143- CORE intact but lined with cracks, clay filled
	143								143-145 - Broken & punky
	144								
	145		A	10					E 1240 B 1250
24	146		E			67	100	19	146-148 weathered to brown, large calcare pods to 1½ in with vugs (
	147		E						
	148		A						148- Rock become clear gray again, not fresh crystalline.
	149		A						
	150		A						
	151		D	50					
	152		A	70					- 1 in calcite (SILICA?) pod with vugs
	153		A	60					
	154		C	75					
	155		A	25					
	156		D	50					E 1325 B 1335
18.5			C	30		74	100	20	
			C	65					
	157		A	85					
	158		A	10					
			E	20					
	159		C	40					
			C	15					
	160		E					CONT	

Hole No. Q-1

DRILLING LOG

DIVISION	
INSTALLATION	
SHEET 9 OF 12 SHEETS	
1. PROJECT	
2. LOCATION (Coordinates or Station)	
3. DRILLING AGENCY	
4. HOLE NO. (As shown on drawing title and file number)	
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: / UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED: / COMPLETED:
17. ELEVATION TOP OF HOLE	
18. TOTAL CORE RECOVERY FOR BORING	%
19. SIGNATURE OF INSPECTOR	

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint Condition	Dip Angle	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. (Run) f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		160	—	E					20 continued	
		161								
		162								
		163	—	D	40					
			—	D	20					
			—	D						
		164								
		165					82	100	21	E 1400 / B 1415
22		166	—	D D D						
		167	—	D D						
		168								
		169	—	D D D						
		170	—	D D D D						
		171								
		172								
		173	—	D D						
		174	—	D D D						
		175					34	65	22	E 1500 / B 1515
19		176	—	C						
		177	—	C	60					
		178	—	D	70					
			—	D	70					
		179	—	D	7?	179'-185' - TOTALLY WEATHERED Brown volcanic Rock, like very dense silty sand				- 179 - core becoming brown & very deteriorated TOTALLY WEATHERED
		180		E					CONT.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT | HOLE NO. Q-1

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint condition	Dip of joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		180							22 cont	
		181								
		182								182' - void, drill drops 4 in
		183								
		184								
		185				185 - 230 ft highly altered & weathered gray volcanic rock, resembles punky sandstone	55	85	23	E 1550 185 - core becomes more competent and gray. remoldable to sand by finger pressure
		186								
		187		D	45					- weathered brown to 2 in from joint plane
		188		D	60					
		188		D	60					
		189		D	55					
		189		D	70					
		190		D	45					
4.9		191		D	40					
		192		D	60					
		193		C	30					
		194								
		195					76	100	24	E 1615 B 1630
		196								
		197		E	20					- brown weathering penetrates 3 inches
		198								
		199								
		200							cont	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) | PROJECT | HOLE NO. Q-1

Hole No. Q-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	Joint Conditions	Deg. of Joints	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	200								
	201								
	202	—	C	-					-202-203 broken during extra
	203	—	C	-					- Run stopped @ 203 due to 25t core recovered from previous run E 1700 B 1715
	204					97	100	25	
	205								
21	206	—	C	55					
		—	C	80					
			C	50					
	207	—	C	60					
	208								
	209	—	D	85					
	210								
	211	—	C	40					
	212								
	213								E 1800
	214					97	100	21	
	215	—	C	25					
25	216								
	217	—	C	55					
	218	—	C	70					
	219								
	220							CONT	

Hole No. O-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 12 OF 12 SHEETS

1. PROJECT
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE — STARTED — COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d		% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	220		C	50				26 Cont.	
	221		C	85					
	222		C	20					
	223		C	30		92	100	27	
			C	10					
	224		C	45					
	225		C	45					
	226		C	30					
	227		C	30					
	228								
	229		C	25					
	230								BOH 230 Ft. @ 1930 hrs. 23 March 85

Hole No. Q-2

DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY - DOME QUARRY
2. LOCATION (Coordinates or Station): Dome Quarry
3. DRILLING AGENCY: WOODWARD-CLYDE CONSULTANTS
4. HOLE NO. (As shown on drawing title and file number): Q-2
5. NAME OF DRILLER: BART HANSEN / BOYLES BROS. DRILLING
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK: 224 ft
9. TOTAL DEPTH OF HOLE: 224 ft
10. SIZE AND TYPE OF BIT: NQ - diamond impregnated
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: BBS-25
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 26
15. ELEVATION GROUND WATER: UNKNOWN
16. DATE HOLE: STARTED 24 March 85; COMPLETED 28 Mar 85
17. ELEVATION TOP OF HOLE: -235.0 ft
18. TOTAL CORE RECOVERY FOR BORING: 97%
19. SIGNATURE OF INSPECTOR: Robert D Dugan

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint Conditions	Joint Angle	CLASSIFICATION OF MATERIALS (Description) d	Rq D	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		0				0-173 ft Dark gray porphyritic basalt with phenocrysts of olivine and pyroxene to 1/4 in. Competent, hard, fresh with generally wide spaced cemented joints to 3/16 in. Joint cementing material is calcic to siliceous in composition.	50	100	1	B 1400 8 gal/minute water 100% return
24		1		B	25					
		2								
		3		B	20					
				B	20					
				C	20					
		4		C	20					
				C	80					
				C	35					
		5		B	25					
				B	25					
		6		C	60		81	78	2	E 1500 B 1510
		7								
36		8								
				C	40					
		9								Bit 800 RPM Penetration rate 25 ft/hour
		10								
		11		C	30					
		12								
		13								
		14								Not Recovered ?
		15								E 1535 B 1545
		16						100	3	
24		17		C	50					50% water return
				C	55					
				C	50					
		18		C	5					
		19		C	10					
				C	25			CONT	CONT	
		20								

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Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT HQ Diamond, 1.875 in ID
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	15. ELEVATION GROUND WATER
	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint type	Dip of joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	~~BOX OR SAMPLE~~ RUN NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20	—	B	50				3 cont	
			—	B	35					
		21								
		22	—	B	40					
		23	—	B	10					
		24	—	B	45					
			—	B	45					
			—	B	20					
		25	—	B	30		100	100	4	E 1610 / B 1626
		26	—	B	30					
36		27								
		28								
		29	—	A	5					Penetration rate 30 ft/hour
		30								
		31	—	B	40					
		32								
		33	—	A	70					
		34								
		35	—	B	45		85	95	5	E 1640 / B 1650
		36	—	B	50					
		37								
36		38								
		39	—	B	20					
			—	B	35					
		40								

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PROJECT | HOLE NO. Q-2

Hole No. Q-2

DRILLING LOG | DIVISION | INSTALLATION | SHEET 3 OF SHEETS

1. PROJECT: SAND POINT RUNWAY
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

Loosest intact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	40							5 CONT.	
	41								
	42		B	45	42 - 43.5 ft broken zone, brown stained				
	43		C	60			LOST wash water		- drill string dropped 4 in - weathered joint to 1/4 in
	44		B	45					
	45		A	20		97	100	6	45 - 48.5 - long unjointed section E 1725
41	46								
	47								
	48		A	35					
	49								
	50								
	51		A	45					
	52								
	53		B	55					
	54		B	45					
			B	35					
	55					100	100	7	
	56		C	45					
			C	20					
28	57								
			A	20					
	58		C	25					
	59								
	60		B	65			CONT	CONT	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT | HOLE NO. Q-2

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 4 OF SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

Lowest point in hole	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		60							CONT.	
		61		C	60					
		62								
		63		C	40					
		64								
				B	30					
		65					92	100	8	
34		66		A	35					
		67								
		68								
		69		A	45					
				C	50					
		70		C	80					
				C	45					
		71		C	75					
		72		C	75					
		73		C	30					
		74								
		75					99	100	9	
38		76		A	50					
		77								
		78		B	30					
		79								
		80							CONT	

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	80					9 CONT.	
	81	B	45				
	82	A	35				
	83	E	20 / 20				
	84						
	85	B	35				24 May 85 E 2000 B 1300 25 May 85
	86			100	100	10	
	87	A	45				
	88						
	89	A	45				
	90	C	45				
	91						
	92						
	93	A	25				
	94	B	60				
	95			99	100	11	
	96	B	35				
	97						
	98	B	50				
	99						
	100					CONT.	

38

44

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 6 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

Coupled w/ last piece

ELEVATION a	DEPTH b	LEGEND c	COUNT COLOR/TEXT	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	100					100		11 CONT	Solid strong core wavy vertical joint all joint calcite cemented calcite 1-3 mm SILICA?
	101								
	102		B	70					
	103								
	104		B	90					
			B	45					
	105								
30	106					98	100	12	
	107		B	60					
	108								Penetration RATE 20. ft/hour @ 800 RPM 8 gal/min water use with 80% return (GRA)
	109		C	45					
			C	40					
	110								
	111		B	45					
	112								
	113		B	45					
	114		A	35					
36	115					100	100	13	
	116								
	117								
	118								
	119		B	50					
	120		C	55				CONT	

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 7 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint Condition	Cl Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		130							B Cont'd	
		131		B	25					
		132								
		133		B	35					
		134								
		135		B	45					
				B	35					
365				B	35		98	100	14	
		136								
		137								
		138								
				B	65					
		139		C	80					
		140		C	35					
		141								
				B	35					
		142								
		143		B	60					
		144		B	45					
		145		B	35					
29							95	100	15	
		146								
		147		B	15					
		148								
				B	20					
		149		A	30					
				B	40	- pyrite lines joint between calcite & basalt			Cont	
		150								

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 8 OF SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE.	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

Compact 1 short piece

ELEVATION a	DEPTH b	LEGEND c	Con Di Tion	Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	140							15	
	141		B	45				CONT	
	142		B	20					
	143		B	35					
	144		B	35					
			B	86					
	145		B	40					
26	146					97	100	16	
	147		B	25					
	148								
	149		A	45	14'				149.5 - Becomes slightly altered
			B	35					
	150		B	15					
			B	55					- trace pyrite in joint
	151		B	75					
	152		B	5					
	153		B	40					153 FT - becomes fresh again
	154								
			A	35					
225	155					95	160	17	
			B	30					
	156		B	30					
	157								
	158								
	159		A	65					
			B	40					
	160							CONT	

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 9 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		160		B	75			100	17 (CONT.)	
		161		B	3					
		162		B	55					
		163		A	0					
		164		B	15					
		165		B	15					
				B	45		90	100	18	
17				B	35					
		166								
		167		B	15					
		168		A	10					
				B	80					
		169		B	5					
		170		B	55					
		171		A	20					
				B	50					
		172		A	45					
				B	65					
		173		B	75	173-224 ft Moderately to highly altered dark gray basalt (?) with joints cemented with calcite, SILICA ? moderate to low strength, moderately weathered with moderate to close-spaced joints				173' - BECOMES ALTERED
		174		B	20					
				B	30					
				C	30					
		175		C	25		42	90	19	
15		176		B	75					- LOST CORE likely washed out
				B	60					
		177								
				C	90					177.75 to 179.75 - brown weathering penetrating Rock, recovered CORE broken up, highly weathered and friable
		178								
		179		D						
		180		D	45				CONT	

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF SHEETS

1. PROJECT
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Con Di Man	Dip	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		180		D					19 CONT.	Joint location, condition and angle of dip not logged below 180 ft due to poor quality of the rock, ie. close spaced joints, low strength of rock & weathering
		182								- CALCITE vug, 3/4 in SILICA?
8.5		185					50	99	20	
		188								Penetration rate 20 ft/hour
		193				no joints or fracs				
13		195					76	100	21	
		200							CONT	

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PROJECT | HOLE NO. Q-2

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN / DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE / STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	RQD e	% CORE RECOVERY f	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		200					21 Cont.	
		201						
		202						
		203						
		204						
		205						
5		206			8	70	22	205.5 - 207 ft Massive calcite, silica? in brecciated joint
		207						
		208						208 ft - water return goes to brown from gray. - poor recovery due to inclusion in brown broken weathered zone between 208 ft
		209						
		210						208 - 214 - brown highly weathered, highly altered basalt.
		211						
		212						
		213						
		214						
21		215			68	95	23	Blocked at 9 ft & 10 ft run 1740/1800
		216						
		217						
		218						
		219						
		220					Cont	

Hole No. Q-2

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	220					23 CONT.	Some washout to account for lost core
	221						
	222						
	223						
	224		HOLE TERMINATED AT 224 due to loss of WATER Supply. 50 mph winds and 25° temperature Froze water lines even while water was moving through them.				

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY – DOME QUARRY
2. LOCATION (Coordinates or Station): DOME QUARRY
3. DRILLING AGENCY: WOODWARD-CLYDE CONSULTANTS
4. HOLE NO. (As shown on drawing title and file number): Q-3
5. NAME OF DRILLER: BART HANSEN/BOYLES BROS DRILLING
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK: 230 ft
9. TOTAL DEPTH OF HOLE: 230'
10. SIZE AND TYPE OF BIT: NQ WIRELINE 1.875 IN ID
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: BBS-25
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: NONE; UNDISTURBED: NONE
14. TOTAL NUMBER CORE BOXES: 26
15. ELEVATION GROUND WATER: UNKNOWN; HOLE CAVE IN
16. DATE HOLE: STARTED 1200 28 March 85; COMPLETED 1800 30 MARCH 85
17. ELEVATION TOP OF HOLE: 232.8
18. TOTAL CORE RECOVERY FOR BORING: 98 %
19. SIGNATURE OF INSPECTOR: S. Metcalf / Robert D [illegible]

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Cem or Tem	Joint Dip	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. f RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
3		0–1				0 - 4.25 ft BASALT Rubble (SHOT ROCK)	0	30	1	
6		2		C	15	4.25 - 230 ft. DARK GRAY PORPHYRITIC BASALT WITH PHENOCRYSTS OF OLIVINE AND PYROXENE TO 1/4 IN.. COMPETENT, HARD, FRESH WITH GENERALLY WIDE SPACED CEMENTED JOINTS TO 3/16 IN.. JOINT CEMENTING MATERIAL IS CALCIC TO SILICEOUS IN COMPOSITION.	37	90	2	
				B	60					
		3		B	0					
22		4		C	15		66	93	3	
		5		C C	55 30	4.25' SLIGHTLY ALTERED				- CASING TO 5 ft
		6		C C C C	75 25 30 30					- horizontal break?
		7		B	0					
		8								Core deeply scored by core retainer
		9		C C	0 0					
		10		C	35					- joint filled with clay
		11		B	60		17	90	4	11-15 all horizontal breaks about 3 in possibly due to VIBRATION?
		12–14								LOST Recovery due to washout @ 13 ft?
41		15					95	100	5	F 1[illegible] / B 16/0
		16–17								
		18		C C	65 15					
		19–20							CONT	

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PROJECT: SAND POINT RUNWAY | HOLE NO. Q-3

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF 12 SHEETS

1. PROJECT
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

Corrected Intact Rock	ELEVATION a	DEPTH b	LEGEND c	Joint Condition	Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20		B	50				5	
				B	40				CONT	
		21		C	55					
		22		B	70					
		23		B	35					
				C	35					
		24		B	45					
		25								E 1682
28							94	100	6	B 1642
		26		B	30					
		27		B	35					
				B	75					
		28								Penetration Rate 27 ft/hour
		29		B	30					
		30		B	70					
				B	40					
				B	75					
		31								
		32								
		33		B	20					
		34		B	20					
		35								E 1704
22.5							100	100	7	B 1714
		36		B	30					
		37		B	20					
		38								
		39		C	20					- weathered to 1 cm brown
		40						CONT	CONT	

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PROJECT SAND POINT RUNWAY | HOLE NO. Q-3

Hole No. D-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 3 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT ROUGHNESS	CHARACTER OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		40							7 Cont	
		41								
		42								
			—	B	40					
		43								
			—	B	40					
		44								
		45								
93							100	100	8	
		46								
		47								
		48								
		49								
		50								
		51								
		52								
			—	B	40					
		53								
		54								
			—	B	35					
		55		B	35					
48			—	C	35		88	93	9	
		56								
		57								
		58								
		59								
		60	—	B	35			CONT.	CONT.	

Hole No. P-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	FIT OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	60							9 CONT	
	61		B	45					
	62		A	15					
	63								
	64								
			A	5					
			C	75					
79	65		A	20		97	100	10	
	66								
	67								
	68								
	69								
	70								
	71								
			B	50					some chlorite secondary alteration along joint surface
	72								" " " " "
	73		C	40					
			C	30					
			C	20					
	74		C	70					
			B	20					
			B	5					
70	75		B	5		96	98	11	
	76		B	25					
	77								
	78								
	79								
	80						CONT.	CONT.	

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint condition	Dip of joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. (RUN) f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		80							11 CONT	
		81								
		82	—	B	20					
		83								
		84								
			—	B	15					
39		85					83	100	12	
		86								
			—	C	50					
			—	B	30					
		87								
			—	B	35					
		88								
		89	—	B	30					
			—	C	50					
			—	C	20					
		90	—	B	10					
			—	B	40					
			—	B	35					
		91								
			—	B	30					
			—	B	35					
		92								
		93								
		94								
			—	A	35					
26		95	—	B	30		98	100	13	
			—	B	30					
			—	B	30					
		96								
			—	B	30					
		97								
			—	B	20					
		98								
		99								
			—	B	40					
		100						CONT.	CONT.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT HOLE NO. Q-3

(TRANSLUCENT)

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 6 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LARGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASS OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		100							13	
		101							Cont	
		102								
		103		B	65					
		104		B	25					
35½		105					100	100	14	
		106								
		107								
		108		B	30					1mm calcite
		109								
		110								
31		111					100	100	15	
		112								
		113		B	70					MISSING 1.4ft OF CORE AFTER EXTRACTION
		114								
		115		B	25		100	100	16	B 1440
34½				B	35					
		116								
		117		B	10	coal				
		118								
		119								
		120						CONT.	CONT.	

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 7 OF 17 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LARGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		120		3	0				16 cont	MACHINE BREAK?
		121								
		122		B	40					
				B	35					MINOR SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
		123		B	40					
				B	40					
		124								
		125		B	70					E 1502
56							100	100	17	
		126		B	20					
		127								
		128								
		129								
		130		B	25					
		131								
		132								
		133								
		134		C	20					
32				C	55		87	95	18	
		135		D	65					HIGHLY ALTERED AND FRACTURED ROCK, IRON STAINING (?)
		136								
				C	30					
		137		C	40					HIGHLY ALTERED, FRACTURED ROCK, ALTERED SIGNIFICANTLY BEYOND JOINT ZONES, 1-2 cm
		138		D	40					
		139								
		140						CONT.	CONT.	

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 8 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LARGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	BIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		140		B	45				18 Cont	
		141		B	5					
		142								
		143		B	20					
		144		B	10					144½ ft. START OF RUN #19
33		145					100	100	19	
		146		B	15					
		147		B	30					
				B	35					
		148		B	30					
		149								
		150		B	30					
		151								
		152		B	15					
		153								
		154		B	65					SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACES
14				B	40		94	98	20	154½ ft. START OF RUN #20
		155								
		156		B	0					MACHINE BREAK(?)
		157		B	60					
		158		B	40					
		159								
		160		B	55					
				A	20			CONT.	CONT	

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 9 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

Longest intact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	JOINT DIP	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	160							20 CONT.	
	161		B	50					
			B	20					
	162		B	50					
			B	0					
	163		C	55					HIGHLY ALTERED ZONE, 1-2 cm
			C	30					
	164		B	25					
	165		B	55		93	100	21	
34									
	166								
			B	30					
	167		B	35					
	168								
	169								
			B	50					
	170		B	50					
	171								
			B	45					
	172								
			A	15					
	173		A	20					
	174								
			B	10					
	175		C	40					
37									
			C	60		97	100	22	IRON STAINING ALONG JOINT SURFACES
			C	65					
	176		B	30					
			A	50					
	177								
	178								
	179		B	35					
	180						CONT	CONT.	

Hole No. P-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF 12 SHEETS

1. PROJECT
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP CLASSIFICATION OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		180							22 Cont.	
		181								
		182	—	B	30					
		183								
		184	—	B	25					
		185								
34							97	97	23	
		186	—	B	50					
		187								
		188	—	B	20					
		189								
		190								
		191	—	B	15					SILICA & CALCITE FILLED
		192								
			—	B	15					
		193								
			—	B	35					
		194								
			—	B	45					
29		195					97	100	24	
			—	B	60					
		196								
		197	—	B	15					MACHINE BREAK (?)
		198								
			—	B	35					SILICA & CALLITE FILLED, 1mm
		199								
		200						CONT	CONT.	

Hole No. Q-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

Longest intact piece	ELEVATION a	DEPTH b	LEGEND c	Joint Condition	Classification of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		200							24 Cont	
		201	—	B	30					
		202								
		203	—	B	30					
		204	—	B	30					SILICA & CALCITE FILLED 1mm
			—	B	60					
		205	—	A	0					MACHINE BREAK
29							97	97	25	
		206								
		207	—	B	10					
		208								
		209	—	B	20					
		210								
		211	—	B	25					
		212	—	B	0					MACHINE BREAK (?)
		213								
		214	—	B	30					
21		215	—	B	20		98	100	26	B 1518
		216								
		217	—	B	30					
		218								
		219	—	B	20					
			—	B	15			CONT.	CONT.	
		220	—	A	30					

Hole No. P-3

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP CLASSIFICATION OF JOINT	DESCRIPTION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		220							26 Cont	
		221	—	A	15					
		222	—	B	30					
		223	—	B	30					
		224	—	B	50					
			—	B/A	80/5					
27		225	—	B	20					MACHINE BREAK E 1544
		226					100	100	27	MINOR SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE.
		227	—	B	20					
		228								
		229	—	B	40					
		230	—	B	25					BOH 230'
		231								
		232								
		233								
		234								
		235								
		236								
		237								
		238								
		239								
		240								

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY - DOME QUARRY	10. SIZE AND TYPE OF BIT: NQ WIRELINE 1.875" I.D.
2. LOCATION (Coordinates or Station): DOME QUARRY	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
3. DRILLING AGENCY: WOODWARD-CLYDE CONSULTANTS	12. MANUFACTURER'S DESIGNATION OF DRILL: BBS-25
4. HOLE NO. (As shown on drawing title and file number): Q-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER: BART HANSEN/BOYLES BROS. DRILLING	14. TOTAL NUMBER CORE BOXES: 24
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: UNKNOWN; HOLE CAVE IN
	16. DATE HOLE: STARTED 3/31/85 12:30; COMPLETED 4/2/85 1600
7. THICKNESS OF OVERBURDEN: 0	17. ELEVATION TOP OF HOLE: 245.8
8. DEPTH DRILLED INTO ROCK: 230 ft	18. TOTAL CORE RECOVERY FOR BORING: 98 %
9. TOTAL DEPTH OF HOLE: 230 ft	19. SIGNATURE OF INSPECTOR: C.S. Metzger

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. / RUN f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
2		0				0 - 3.5 ft BASALT RUBBLE (SHOT ROCK)	0	40	1	("CLEAR MUD" POLYMER DRILLING FLUID USED)
		2				3.5 - 230.4 ft.				• WATER FLOW 8 GAL/MIN
8				B	45	DARK, GREY PORPHYRITIC BASALT	35	63	2	
		3		B	30	WITH PHENOCRYSTS OF OLIVINE & PYROXENE				
		4		B, B, B, B	30, 60, 50, 35	TO 1/4 IN. COMPETENT, HARD, FRESH WITH				• ALTERED ROCK
		5		B, B, B	20, 20, 20	GENERALLY WIDE SPACED CEMENTED JOINTS ≤3/16 IN.				
15		6		B, C, B	30, 40, 40	JOINT CEMENTING MATERIAL IS CALCIC TO SILICEOUS IN COMPOSITION.	78	87	3	
		7		A, A	30, 35					
		8		B, A	50, 75					• 1mm CALCITE FILLED SILICA?
		9		B, B, C, B	0, 30, 30, 25					• SOME SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
		10		B	30					• CORE SCARRED BY CORE RETAINER
		11		B	10					
		12		A, C	55, 25					• IRON STAINING ALONG JOINT SURFACES
		13		B, B	35, 15					
		14		C	40					
28		15		B	30		95	100	4	
		16		B	0					• MACHINE BREAK
		17		B, C, C	40, 70, 20					
		18								• HIGHLY ALTERED JOINT ZONE (2CM), IRON STAINING
		19		B	20					• MACHINE BREAK (?)
		20						CONT.	CONT.	

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PROJECT: SAND POINT RUNWAY DOME QUARRY | HOLE NO. Q-4

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF 2 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LOWER IMPACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) JOINT DIP d	ROD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20						4 Cont	
		21		B	10				○ MACHINE BREAK ?
		22		B	10				
		23		B	5				
		24		A	35				
30		25		B	20	100	100	5	○ SILICA & CALCITE FILLED IRON STAINING
				B	55				
		26		B	40				
				C	20				
		27		B	30				
		28		B	25				
		29		B	25				○ SILICA & CALCITE FILLED
		30							
		31							PENETRATION RATE 35 FT/HOUR
		32		B	40				
		33							
		34		B	15				
				B	40				
22		35				93	96	6	
		36							
		37		B	35				
				C	20				
		38		B	15				
				C	15				
		39		B	10				
		40					CONT.	CONT	

Hole No. P-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 3 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

LENGTH INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) d	JOINT DIP	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		40		B		5			6 Cont.	• MACHINE BREAK(?)
		41		B		10				
		42		B		55				• SILICA? & CALCITE FILLED 1mm
		43		B		10				
		44								
24		45		B		20	98	98	7	
		46								
		47		B		40				
		48		A		0				• MACHINE BREAK (?)
		49								• SILICA? & CALCITE FILLED
		50		B		35				• 50'-90' DRILL BIT SUFFICIENTLY WORN TO CAUSE CORE TO BECOME WAVY ON CORE SURFACE
		51								
		52		B		20				
		53		C		25				• IRON STAINING
		54		B		30				
		55				45				
41		56		B		40	100	100	8	
		57		B		20				
		58								
		59		B		30				• SILICA? & CALCITE FILLED 1mm
		60						CONT	CONT	

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 4 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

LONGEST INTACT PIECE

ELEVATION a	DEPTH b	LEGEND c	JOINT COND'N TION	CLASSIFICATION OF MATERIALS (Description) JOINT DIP	d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	60							8 cont	
	61								
	62		B	15					
			B	70					
	63		B	5					• MACHINE BREAK (?)
	64								
39	65		B	25		94	97	9	
	66								
	67								
	68		B	20					• SILICA & CALCITE FILLED
	69								
	70								
	71								
			A	40			•		• IRON STAINING
	72		C	90					
			C	50					
	73		B	10					
	74								
19	75		B	10		99	99	10	B 14/6
			B	40					
	76		B	5					
	77		B	40					
	78		B	0					• MACHINE BREAKS (?)
	79		B	0					
	80						CONT	CONT	

Hole No. P-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING %
9. TOTAL DEPTH OF HOLE	19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		80	—	B	5				10 cont.	
		81								
		82	—	B	0					• MACHINE BREAKS (?)
		83	—	B	10					
		84	—	B	0					
36.5		85					100	100	11	E 1500 B 1509
		86	—	B	35					
		87								
		88								
		89	—	B	25					
		90								
		91								
		92	—	B	10					
		93								
		94								
		95	—	B	15					E 1551
86			—	B	10		97	100	12	• DRILL BIT CHANGED AT 97.4 ft. ~3 in. OF RUBBLE IN CORE BARRELL IS DUE TO CAVE IN INSIDE BOREHOLE, AND NOT A RESULT OF HIGHLY JOINTED & POOR QUALITY ROCK.
		96								
		97	—	B	20					
		98								
		99								
		100						CONT.	CONT.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) PROJECT | HOLE NO. P-6

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 6 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	%
		19. SIGNATURE OF INSPECTOR	

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD e	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		100						12 cont.	• CORE APPEARS "DIRTY" IN SECTIONS DUE TO HANDLING WITH GREASY GLOVES
		101							
		102							
		103							
		104							
91		105		B B	5 5	94	100	13	B 1742 • NEW DRILL BIT
		106		B	35				
		107							
		108							
		109							
		110							
		111							
		112							
		113							
		114		C C B	40 35 55 35				E 1801
37		115				97	98	14	
		116							
		117		B	15				
		118							
		119							
		120		B	55		CONT.	CONT.	

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 7 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD e	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	120						14 Cont.	
	121		B	15				
			C	35				
	122							
	123							
			B	30				
	124		B	40				
			A	15				
46	125				100	100	15	
	126							
			B	35				
	127							
	128							
	129							
	130		B	30				
	131							
	132							
	133		B	35				
	134							
88	135				100	100	16	B1902
	136							
	137							
	138							
	139							
	140						CONT.	CONT

Hole No. Q-4

DRILLING LOG

DIVISION	INSTALLATION	SHEET 8 OF 12 SHEETS

1. PROJECT
2. LOCATION *(Coordinates or Station)*
3. DRILLING AGENCY
4. HOLE NO. *(As shown on drawing title and file number)*
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ______ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDIT. 10	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		140						↓	16 ↓	
		141								
		142	—	B	35					
			—	B	35					
		143								
		144								
		145								E 1924
73							99	99	17	
		146								
		147								
		148								
		149								
		150								
		151	—	B	20					
		152	—	B	15					
		153								
		154								
		155	—	B	30					SMALL & CALCITE FILLED
60							100	100	18	B 1230
		156								
		157	—	B	15					
		158								
		159								
		160						CONT	CONT	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) | PROJECT | HOLE NO. Q-4

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 9 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		160						18 Cont.	
		161							
		162	—	B	15				
		163	—	B	25				
		164	—	B	30				SILICA ? & CALCITE FILLED 1mm
			—	B	30				
54		165	—	B	35				E 1247
			—	C	35	99	100	19	B 1304
		166	—	B	20				
		167							
		168							
		169							
		170							SILICA ? & CALCITE FILLED 1mm
			—	B	40				
		171							
		172							
		173							
		174							
60		175							E 1322 B 1332
						60	100	20	
		176							
		177							
		178	—	A	5				
		179							
		180					CONT.	CONT.	

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINTS Condition	JOINTS Dip of Joint	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	180							20 Cont.	
	181								
	182								
	183	—	B	25					
	184	—	B	35					184'-192' LARGER, SILICA & CALCITE STRINGERS, 1-3mm
58	185					99	99	21	E 1349
	186								
	187								
	188								
	189								
	190	—	B	25					• SILICA & CALCITE FILLED
	191								
	192	—	B	30					
	193	—	B	30					
	194	—	A	0					• MACHINE BREAK?
58	195	—	B	30		100	100	22	B 1428
	196								
	197								
	198	—	B	50					• SILICA & CALCITE FILLED
	199	—	B	55					• SILICA & CALCITE FILLED
	200						CONT	CONT.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. Q-4

Hole No. Q-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

SURFACE INPUT PIECE

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	200							22 cont.	
	201								
	202								
	203								
	204	—	B	45					
	205					100	100	23	E 1445 B 1454
	206	—	B	40					
	207								
	208								
	209								
	210								
	211								
	212								
	213	—	A	10					
		—	A	5					
	214								
	215	—	B	10					E 1512 B 1521
	216	—	A	10		100	100	24	
	217								
		—	B	20					
	218								
	219								
	220						CONT.	CONT.	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT

HOLE NO. Q-4

Hole No. D-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 12 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE STARTED / COMPLETED	
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

Lowest impact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT'S CONDITION	CLASS DIP OF JOINT	FICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	220							24 CONT.	
	221								
	222								
	223								
	224								
64	225					100	10.0	25	E 1540
	226								
	227								
	228								
	229								
	230								BOH 230 ft
	231								

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

(TRANSLUCENT)

PROJECT

HOLE NO. D-4

Hole No. Q-5

DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY - DOME QUARRY
2. LOCATION (Coordinates or Station): DOME QUARRY
3. DRILLING AGENCY: WOODWARD-CLYDE CONSOLTANTS
4. HOLE NO. (As shown on drawing title and file number): Q-5
5. NAME OF DRILLER: BART HANSEN / BOYLES BROS. DRILLING
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK: 235 ft.
9. TOTAL DEPTH OF HOLE: 235 ft.
10. SIZE AND TYPE OF BIT: NQ WIRELINE 1.875 IN. I.D.
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: BBS-25
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 25
15. ELEVATION GROUND WATER: UNKNOWN, HOLE CAVE IN
16. DATE HOLE: STARTED 4/4/85 12:30 | COMPLETED 7/16/35 2030
17. ELEVATION TOP OF HOLE: 247 ±
18. TOTAL CORE RECOVERY FOR BORING: 98 %
19. SIGNATURE OF INSPECTOR: C.S. Watson

CONCRETE INTAKE PIECE

ELEVATION a	DEPTH b	LEGEND c	JOINTS (Number)	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. f RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
6	0		B 5 B 3	35 80 20 20	0 - ~5ft? BASALT RUBBLE (HOT ROCK)	10	37	1	("CLEAR MUD" POLYMER DRILLING FLUID USED) NO CASING REAMING DONE TO START BORE HOLE
	1								
	2				5-235 ft. DARK GREY PORPHYRITIC BASALT WITH PHENOCRYSTS OF OLIVINE AND PYROXENE TO 1/4 IN. COMPETENT, HARD, FRESH WITH GENERALLY WIDE SPACED CEMENTED JOINTS TO 3/16 IN. JOINT CEMENTING MATERIAL IS CALCIC TO SILICEOUS IN COMPOSITION.				
	3		B	30					LOST RECOVERY DUE TO WASHOUT @ 3ft(?)
	4		B	35					FLUID → 8-10 gal/min.
15	5		B	40		58	88	2	
	6		B B	10 20					
	7		B B B	45 35 40					
	8		B B	40 25					
	9								
	10								
10			B	35		58	85	3	
	11		B	55					
	12		B B B	60 50 40					
	13		B B B	70 70 70					
	14		B	70					
	15		B	30					
52						96	100	4	
	16								
	17								
	18								
	19		B B	30 15			CONT	CONT	
	20								

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINTS CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20						4 cont	CORE MAY APPEAR "DIRTY" ON SURFACE DUE TO HANDLING WITH GREASY GLOVES.
		21							
		22							
		23		C	45				
		24							
		25		CDC	25 to 35				ALTERED ZONE
40						97	99	5	
		26							
		27							
		28		B	30				
		29							
		30		B	15				
		31							
		32							
		33		B	20				
		34		B	15				
63		35				98	100	6	
		36							
		37							
		38							
		39							
		40					CONT	CONT	

Hole No. Q-5

DIVISION	INSTALLATION	SHEET 3 OF 12 SHEETS

1. PROJECT (Coordinates or Station)
2. LOCATION (Coordinates or Station)
3. AGENCY
4. HOLE NO. (As shown on drawing title or file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE — STARTED — COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

CORRECT INTACT PIECE

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	40		B	40				6 Cont	
	41								
	42								42'-44' GROUNDMASS HAS A DISTINCT PINKISH TINT WHEN WET DUE TO DISCOLORED PLAGIOCLASE CRYSTALS, PROBABLY RESULTING FROM THE INFILTRATION OF IRON OXIDES. OVERALL ROCK HARDNESS & STRENGTH APPEARS TO BE SIMILAR TO NON-DISCOLORED BASALT.
	43		B	35					
			C	50					
	44		B	35					
71	45					98	100	7	
	46		B	45					
	47								
	48								
	49								49.7'-50.7' FRESH SURFACE APPEARS DULL, SLIGHTLY PUNKY.
	50								50.7' BREAK DONE BY HAND.
	51								
	52								
	53		C	55					
			B	15					
	54		B	30					
46	55					99	99	8	56.5'-58.5' AGAIN, PINKISH DISCOLORED GROUNDMASS.
	56								
	57								57'-58' 1FT LONG VERTICAL JOINT OPENED WHILE SPLITTING CORE UP.
	58		B	65					
	59								
	60						CONT	CONT	

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 4 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) d	CLASS DIP OF JOINT	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	60							8 Cont.	60'-62' GROUNDMASS DISCOLORED PINK WHEN WET.
	61								
	62	—	B		0				MACHINE BREAK
	63								
	64								
63	65					100	100	9	B 1618
	66								
	67								PENETRATION RATE: 35 ft/HOUR.
	68								
	69								
	70	—	B		35				SILICA? & CALCITE FILLED 1mm
	71								
	72	—	B		30				
	73								
	74								
		—	B		10				
	75	—	C		65				E1635
32						100	100	10	B 1640
	76	—	C		40				75,5 NARROW ZONE (SIM) OF PINKISH DISCOLORATION.
		—	D		80				
	77								
	78	—	C		75				
	79								
	80						CONT	CONT.	

Hole No. Q-5

LOG | DIVISION | INSTALLATION | SHEET 5 OF 12 SHEETS

TION (Coordinates or Station)	10. SIZE AND TYPE OF BIT
	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
	15. ELEVATION GROUND WATER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	16. DATE HOLE — STARTED — COMPLETED
	17. ELEVATION TOP OF HOLE
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING %
8. DEPTH DRILLED INTO ROCK	19. SIGNATURE OF INSPECTOR
9. TOTAL DEPTH OF HOLE	

ELEVATION a	DEPTH b	LEGEND c	JOINT QUANTITY	CLASSIFICATION OF JOINT DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	80							10 cont.	
	81		C	60					
	82		B	20					
	83								
	84		C	45					
	85		B	45					
59						100	100	11	E 1657 B 1704
	86								
	87		B	40					
	88								
	89								
	90								
	91								
	92		C	30					
	93								
	94								
	95								E 1721 B 1727
58						100	100	12	
	96								
	97		B	55					
			B	40					
	98		B	55					
	99								
	100						CONT	CONT	

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PROJECT | HOLE NO. Q-5

Hole No. Q-5

DRILLING LOG | DIVISION | INSTALLATION | SHEET 6 OF 12 SHEETS

1. PROJECT
2. LOCATION (Coordinates or Station)
3. DRILLING AGENCY
4. HOLE NO. (As shown on drawing title and file number)
5. NAME OF DRILLER
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE
10. SIZE AND TYPE OF BIT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
12. MANUFACTURER'S DESIGNATION OF DRILL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN | DISTURBED | UNDISTURBED
14. TOTAL NUMBER CORE BOXES
15. ELEVATION GROUND WATER
16. DATE HOLE | STARTED | COMPLETED
17. ELEVATION TOP OF HOLE
18. TOTAL CORE RECOVERY FOR BORING %
19. SIGNATURE OF INSPECTOR

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		100						12 cont	
		101							
		102							
		103		B	40				SILICA ½ CALCITE FILLED
		104							
		105							E 1742 B 1748
33		106				100	100	13	
		107		B	40				SILICA ½ CALCITE FILLED
		108							
		109							
		110		B	40				
		111							
		112		B	50				SILICA ½ CALCITE FILLED, 2mm
		113		B	70				SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
		114		B	40				
		115							E 1804
35		116		C	80	97	97	14	
		117		B	25				
				C	55				
		118							
				B	15				
				C	35				
		119							ROCK LESS BRITTLE
		120		C	25		CONT	CONT	ALTERED ZONE, 1cm

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 8 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	140							16 cont	
	141	—	B	5					
	142	—	B	0					
	143								
	144	—	A	0					
71	145					100	100	17	
	146								
	147								
	148	—	B	45					SILICA & CALCITE FILLED, 1/4"
	149	—	B	45					
	150								
	151								
	152								
	153								
	154								
120	155					100	100	18	
	156								
	157								
	158								
	159								
	160						CONT	CONT	

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 9 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

LOWEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		160						18 Cont.	
		161							
		162							
		163							
		164							
41		165		A	0	99	100	19	MACHINE BREAK? RUBBLE POSSIBLY DUE TO DAMAGED DRILL BIT?
		166							
		167		A	0				
		168		B	30				SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
		169							
		170							
		171		A	0				BIT BINDING DRILL ROD SEIZED UP IN HOLE AT ~171', DRILLING CONTINUES AT MUCH SLOWER RATE. POSSIBLE DAMAGED BIT.
		172							
		173							
65		174				99	99	20	173.4' START RUN # 20
		175		A	0				
		176		A	0				MACHINE BREAKS ?
		177		A	0				
		178		B	5				
		179							
		180					CONT	CONT	

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PROJECT

HOLE NO. Q-5

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE — STARTED — COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION d	CLASS DIP OF JOINT d	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	180							20 CONT.	
	181								
	182								
	183								
80	184					99	100	21	183.8' START RUN #21
	185		A	0					SILICA & CALCITE FILLED INTERMEDIARY CHLORITE ALONG JOINT SURFACES
			C	65					
	186								
	187		B	20					
	188								
	189								
	190								
	191								
	192								
	193								
82	194					100	100	22	194' START RUN #22
	195								
	196								
	197								
	198								
	199								
	200						CONT	CONT	

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	%
		19. SIGNATURE OF INSPECTOR	

Loss of Intact Piece	ELEVATION a	DEPTH b	LEGEND c	JOINT Condition	CLASSIFICATION OF JOINT Dip	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		200		B	35				22 cont.	
		201								
		202								
		203								203-204.5' LARGE FILLED VEIN AND CAVITY, ½"-1½" CALCITE & QUARTZ, ~~EPIDOTE~~(?) FILLED
51		204					100	100	23	
		205								
		206								
		207								
		208		B	40					
				B	50					
		209								
		210								
		211								
		212								SILICA? CALCITE FILLED
		213		B	70					
		214		B	50					"
94							100	100	24	214.5' START RUN #24
		215								
		216								
		217		A	0					MACHINE BREAK?
		218								
		219								
		220						CONT	CONT	

Hole No. Q-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 12 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE STARTED / COMPLETED	
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

Longest intact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	220						22 Cont.	
	221							
	222							
	223							
	224							
80	225					100	23	224.8' START RUN # 23
	226							
	227							
	228							SILICA & ? CALCITE FILLED, 1mm
	229		6	35				
	230							
	231							
	232							
	233							
	234							
	235							235 BOH
	236							
	237							
	238							
	239							
	240							

Hole No. Q-6

DRILLING LOG | DIVISION | INSTALLATION | SHEET 1 OF 12 SHEETS

1. PROJECT: SAND POINT RUNWAY - DOME QUARRY
2. LOCATION (Coordinates or Station): DOME QUARRY
3. DRILLING AGENCY: WOODWARD-CLYDE CONSULTANTS
4. HOLE NO. (As shown on drawing title and file number): Q-6
5. NAME OF DRILLER: BART HANSEN / BOYLES BROS. DRILLING
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 0
8. DEPTH DRILLED INTO ROCK: 231 ft
9. TOTAL DEPTH OF HOLE: 231 ft.
10. SIZE AND TYPE OF BIT: NQ WIRELINE 1.875 IN. I.D.
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: BBS - 25
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: 25
15. ELEVATION GROUND WATER 4/12/85: 67.8 ft. BELOW GROUND SURFACE
16. DATE HOLE: STARTED 4/7/85 1330 | COMPLETED 4/9/85 11:00
17. ELEVATION TOP OF HOLE: 251 ±
18. TOTAL CORE RECOVERY FOR BORING: 99 %
19. SIGNATURE OF INSPECTOR: C.S. Hall

LONGEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	JOINT DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. CORE RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
9		0		B	70		57	88	1	NO CASING REAMING DONE TO START BOREHOLE
				B	25					
				B	30					
				B	35					
		1		B	65	0 - 231 ft.				SURFACE INSPECTION OF Q-6 LOCATION APPEARS TO BE BEDROCK. PREVIOUS BLASTING IN THIS FRESH BATTLE BASALT & VIBRATION OF DRILLING ROD RESPONSIBLE FOR MANY FRACTURES 0'-15'.
		2		B	0	DARK GREY				
				B	35	PORPHYRITIC BASALT				
				B	0	WITH PHENOCRYSTS				
		3		B	30	OF OLIVINE AND				
				B	40	PYROXENE TO 1/8 IN..				
				B	55	COMPETENT, HARD,				
		4		B	65	FRESH WITH GENERALLY				
				B	60	WIDE SPACED CEMENTED				VOID OR LOST RECOVERY DUE TO WASHOUT MACHINE BREAK
11		5		B	0	JOINTS TO 3/16 IN..	42	90	2	(CLEARAID POLYMER DRILLING FLUID USED)
				B	75	JOINT CEMENTING				
		6				MATERIAL IS CALCITE				
				B	25	TO SILICEOUS IN				
		7		B	0	COMPOSITION.				MACHINE BREAK
										FLUID → 8 gpm/min
		8		B	25					
				B	60					
				B	0					
		9		B	20					
				B	35					
				B	15					
		10		B	0					
				B	20					
				B	70					
				C	40					
		11		B	0					
				B	50					
				C	40					
		12								
		13								
										LOST RECOVERY DUE TO WASHOUT @ 13'
		14		C	70					
				C	20					
29		15		C	50		96	100	3	
				B	60					
		16		D	60					
				C	15					
				C	0					
		17								
		18		B	45					
		19								
		20		B	25			CONT	CONT	

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PROJECT: SAND POINT RUNWAY DOME QUARRY | HOLE NO. Q-6

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 2 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

LOWEST INTAKE POINT	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) d	DIP OF JOINT	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. (Core Run)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		20							3 Cont.	
		21		C		25				
				B		25				
		22		A		0				
		23		A		0				
				B		25				CALCITE FILLED, 2mm & SILICA FILLED
		24		A		0				
48		25					100	100	4	
		26								
		27		B		0				
				B		80				
		28		A		60				
		29								
				B		15				
		30								
		31		B		0				
		32								
		33								
		34								
39		35		B		30	100	100	5	
		36								
		37								
		38		B		0				
		39		A		0				
		40						CONT	CONT	

Hole No. D-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 3 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN / DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE / STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

ELEVATION a	DEPTH b	LEGEND c	JOINT DESCRIPTION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. CORE RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	40							5 Cont.	
	41		B	30					
	42		B	60					SECONDARY CALCARITE ALTERATION CALCITE FILLED, .2 mm & SILICA FILLED
	43		B	0					
	44		B	20					
			B	50					
31	45					98	99	6	
	46								
	47		B	60					
	48								
	49								
	50		B	30					
			B	30					
	51		C (xtl)	35					
				35					
				55					
				25					
	52								
	53		C	40					
	54								
	55		A	10					
			B	30					
47						100	100	7	55.5'
	56								
	57								
	58		B	70					
	59								
	60						CONT	CONT	

Hole No. Q-6

DRILLING LOG | DIVISION | INSTALLATION | SHEET 4 OF 12 SHEETS

1. PROJECT	10. SIZE AND TYPE OF BIT
2. LOCATION (Coordinates or Station)	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)
3. DRILLING AGENCY	12. MANUFACTURER'S DESIGNATION OF DRILL
4. HOLE NO. (As shown on drawing title and file number)	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN / DISTURBED / UNDISTURBED
5. NAME OF DRILLER	14. TOTAL NUMBER CORE BOXES
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN	16. DATE HOLE / STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE
9. TOTAL DEPTH OF HOLE	18. TOTAL CORE RECOVERY FOR BORING %
	19. SIGNATURE OF INSPECTOR

LOWEST INTACT PIECE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. (Core Run)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		60						7 Cont	
		61							
				B	30				
		62							
		63							
		64							
59		65				100	100	8	
		66							
		67							
				B	20				
		68							
		69							
		70							
		71							
		72							
				B	40				
		73							
		74							
60		75		B	40	98	100	9	
		76		C	60				ALTERED TO 1cm BEYOND JOINT SURFACE
				C	50				
		77							
				B	0				
		78							
		79							
		80					CONT	CONT.	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 5 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

CORRECT INVERT PIPE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. CORE RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		80						9 cont.	
		81							
		82	—	C	30				
		83							
		84	—	C	50				
			—	C	65				
71		85	—	C	70				
						RUN	RUN	10	
		86							
		87							
			—	C	25				ALTERED TO 1cm BEYOND JOINT SURFACE
		88							
		89	—	B	5				
		90							
		91							
		92							
		93							
		94							
									CORE SCARRED BY CORE BARREL RETAINER
74		95							
						100	100	11	
		96							
		97	—	C	45				
		98							
		99							
		100					CONT	CONT	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 6 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	%
		19. SIGNATURE OF INSPECTOR	

Longest intact piece

ELEVATION a	DEPTH b	LEGEND c	JOINT ORIENTATION	CLASSIFICATION OF MATERIALS (Description) BTM OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. CORE f RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	100						11 Cont	
	101							
	102							
	103							
	104	—	B	30				
	105	—	B	15				
33					100	100	12	
	106	—	B	30				
	107							
	108							
	109	—	B	10				
		—	C	65				
	110							
	111							
	112	—	B	30				
		—	C	65				SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
	113							
	114							
	115							
48					99	99	13	
	116							
		—	C	50				
	117							
		—	B	0				
	118							
	119							
	120					Cont	Cont	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 7 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CHARACTER	CLASSIFICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. Core Run	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	120						13 cont	
	121							
	122	—	B	35				
	123	—	B	30				
	124							
58	125				100	100	14	
	126							
	127	—	B	50				
	128	—	B	40				
	129							
	130							
	131							
	132	—	B	20				
	133							
	134	—	B	10				
44	135				100	100	15	
	136							
	137							
	138							
	139	—	B	40				
	140					CONT	CONT.	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 8 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

LOWEST INTACT CORE	ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) d	DIP OF JOINT	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. CORE RUN	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		140							15 cont.	
		141		B		40				
		142		B		65				SILICA FILLED, CALCITE FILLED, 2mm
		143								
		144								
		145								
78.5		145		B		5	100	100	16	
		146								
		147								
		148								
		149								
		150								
		151								
		152		B		2				
		153								
		154		B		70				
54		155		B		20				
				B		50	100	100	17	
		156		B		45				SILICA FILLED, CALCITE FILLED & SECONDARY CHLORITE ALONG JOINT SURFACE
		157		B		35				
		158								
		159								
		160						CONT	CONT	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 9 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING %	
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASSIFICATION OF MATERIALS (Description) DIP OF JOINT d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. Core Run	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	160						17 Cont.	
	161		B	20				MACHINE BREAK?
			B	40				
	162							
	163							
	164							
			B	30				
91	165				100	100	18	
	166							
	167							
	168							
	169							
	170							
	171							
	172							
			B	35				
	173							
	174							
83	175				100	100	19	
	176		B	50				
			B	45				
	177							
	178							
	179							
	180					CONT	CONT	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 10 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING %	
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINTS Coating	CLASSIFICATION OF MATERIALS (Description) Dip of Joint d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO. (Core Run)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	180						19 Cont	
	181							
	182							
	183							
	184		B	30				
66	185		B	35	99	100	20	
			B	0				MACHINE BREAK
	186		B	35				
	187							
	188							
	189							
	190							
	191		B	35				
	192							
			B	0				MACHINE BREAK
	193							
	194							
87	195				100	100	21	
	196							
	197							
	198							
	199							
	200					CONT	CONT	

Hole No. Q-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 11 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
7. THICKNESS OF OVERBURDEN		16. DATE HOLE	STARTED / COMPLETED
8. DEPTH DRILLED INTO ROCK		17. ELEVATION TOP OF HOLE	
9. TOTAL DEPTH OF HOLE		18. TOTAL CORE RECOVERY FOR BORING	%
		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	DIP OF JOINT	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. (Core Run) f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	200						21 cont.	
	201							
	202	—	B	70				SECONDARY CHLORITE & CALCITE, SILICA? ALONG JOINT SURFACE
	203							
	204							
81	205					100	22	
	206							
	207							
	208	—	B	40				
	209							
	210							
	211							
	212							
	213							
	214							
51	215					100	23	
	216							
	217							
	218	—	B	50				
	219							
	220					CONT	CONT	

Hole No. D-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 12 OF 12 SHEETS

1. PROJECT		10. SIZE AND TYPE OF BIT	
2. LOCATION (Coordinates or Station)		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
3. DRILLING AGENCY		12. MANUFACTURER'S DESIGNATION OF DRILL	
4. HOLE NO. (As shown on drawing title and file number)		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
5. NAME OF DRILLER		14. TOTAL NUMBER CORE BOXES	
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER	
		16. DATE HOLE	STARTED / COMPLETED 4/9 11.00
7. THICKNESS OF OVERBURDEN		17. ELEVATION TOP OF HOLE	
8. DEPTH DRILLED INTO ROCK		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE		19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	JOINT CONDITION	CLASS DIP OF JOINT	FICATION OF MATERIALS (Description) d	RQD	% CORE RECOVERY e	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	220							23 cont.	
	221								
			B	50					SECONDARY CHLORITE ALTERATION ALONG JOINT SURFACE
	222								
			B	50					
	223								
	224								
	225								
36						100	100	24	
	226								
	227								
	228		B	45					
	229								
	230								
	231								231' BOH
	232								
	233								
	234								
	235								
	236								
	237								
	238								
	239								
	240								