Appendix M - Photograph at the site

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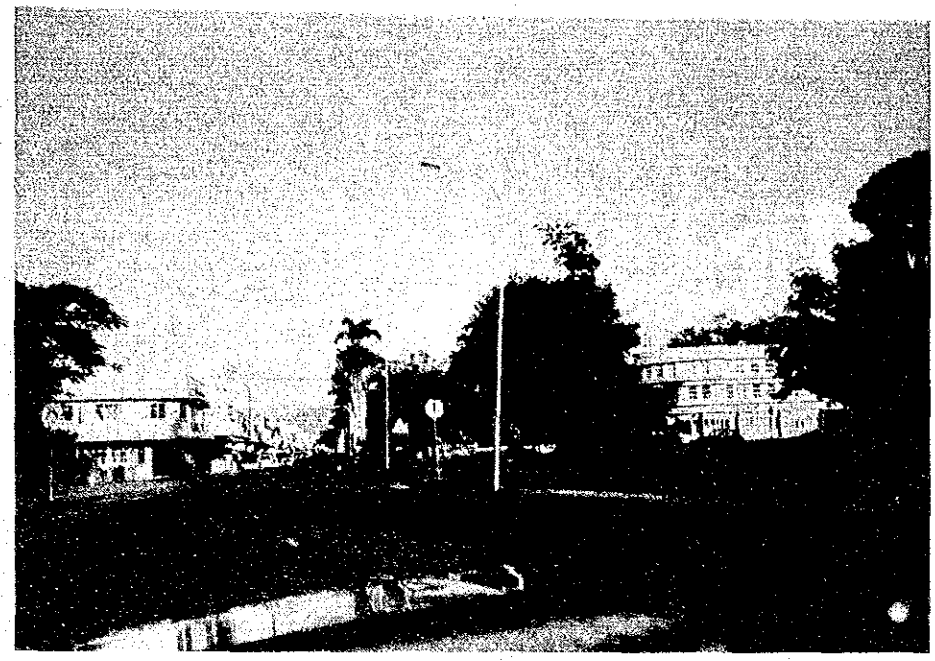

Photo 1-1 Western Division Office (Fisheries Division) and Lautoka City

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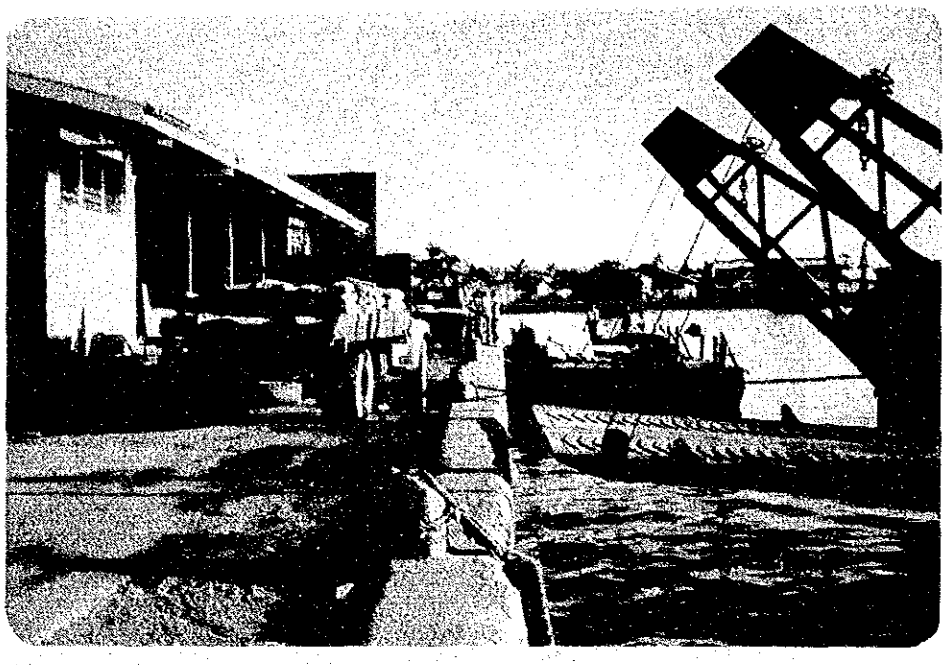

Photo 2-1 Loading the materials on the barge to remote islands (King's Wharf)

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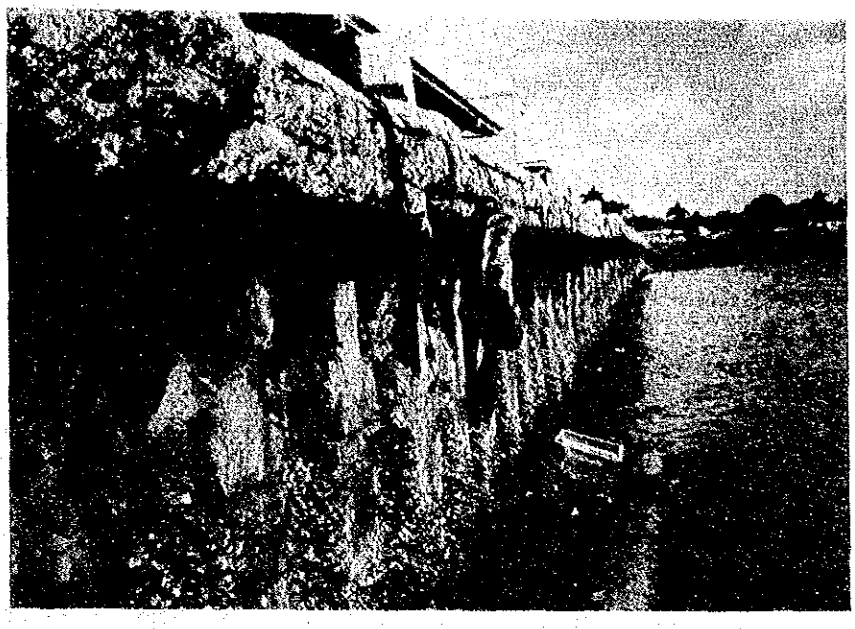

Photo 3-1 Present Condition of Steel Sheetpile Wall (King's Wharf) under heavy damages

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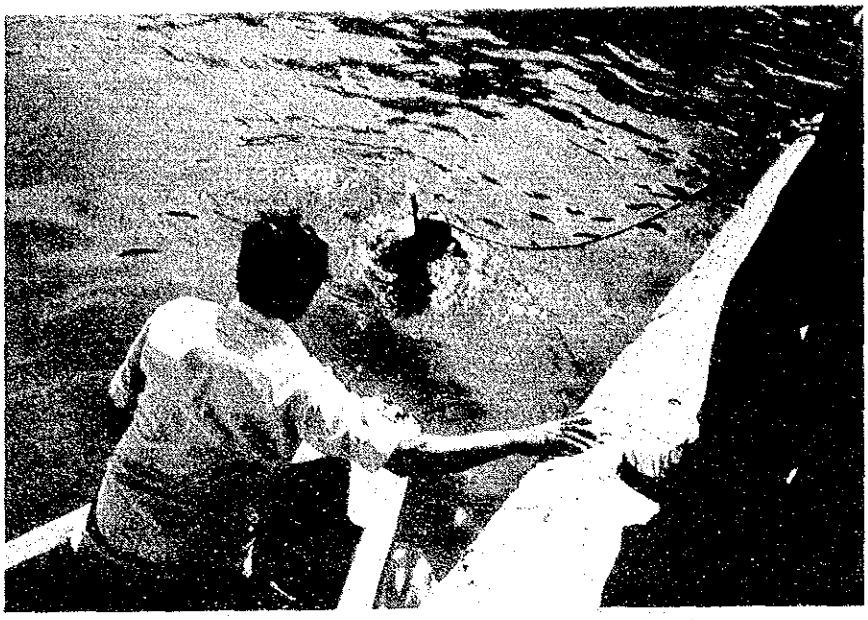

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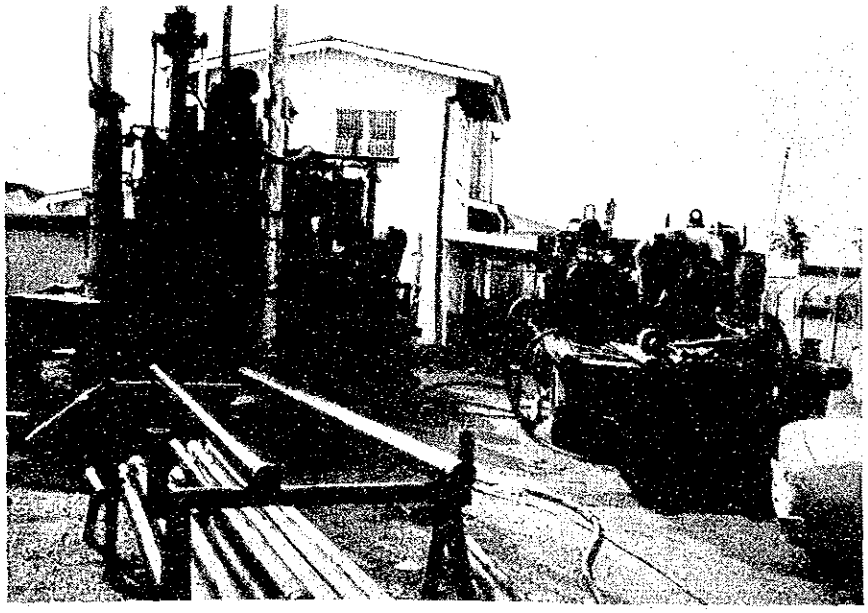


4-2 Geotechnical Investigation at the site by a local company employed by the Study Team

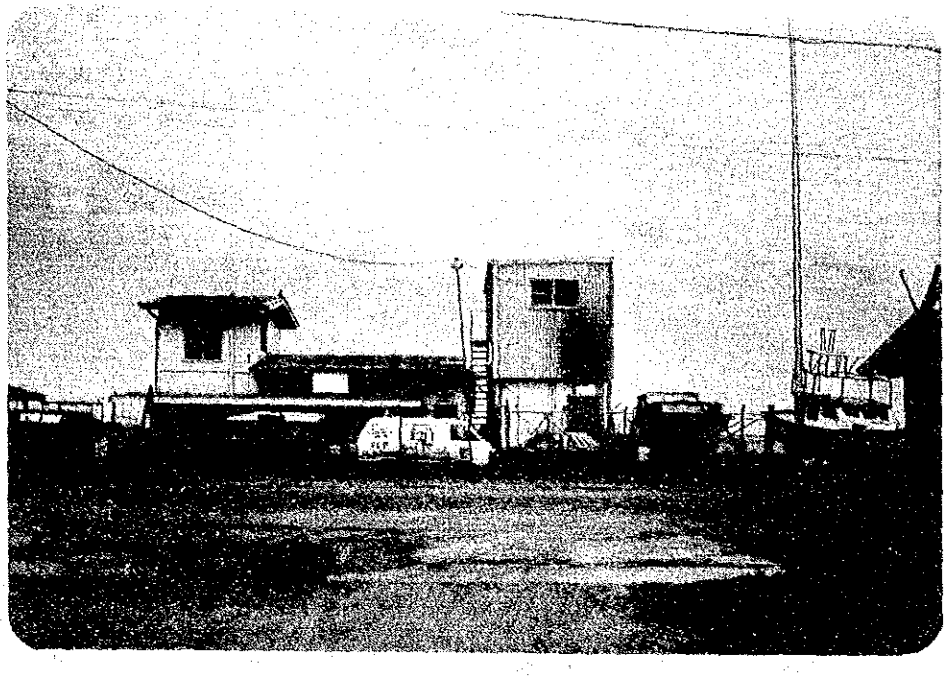


Photo 5-1 Existing office and ice plant at King's Wharf

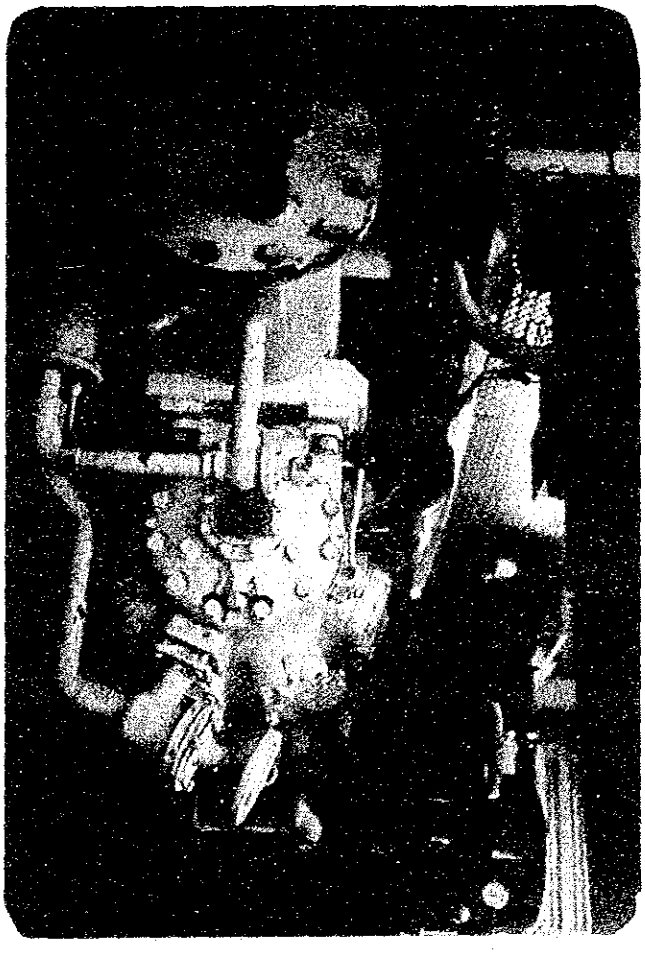
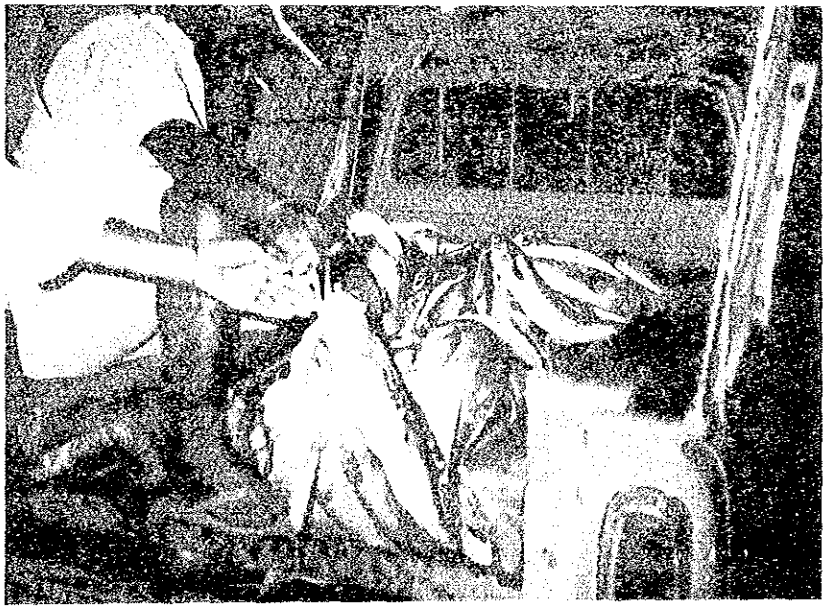


Photo 5-2 Ice plant at King's Wharf

Photo 6-1 Ice stuffing into sacks by fisherman (King's Wharf)

Photo 6-2 Ice stuffing by fishermen (King's Wharf)

Photo 7-1 Weight measurement of ice by an officer of Fisheries Division (King's Wharf)



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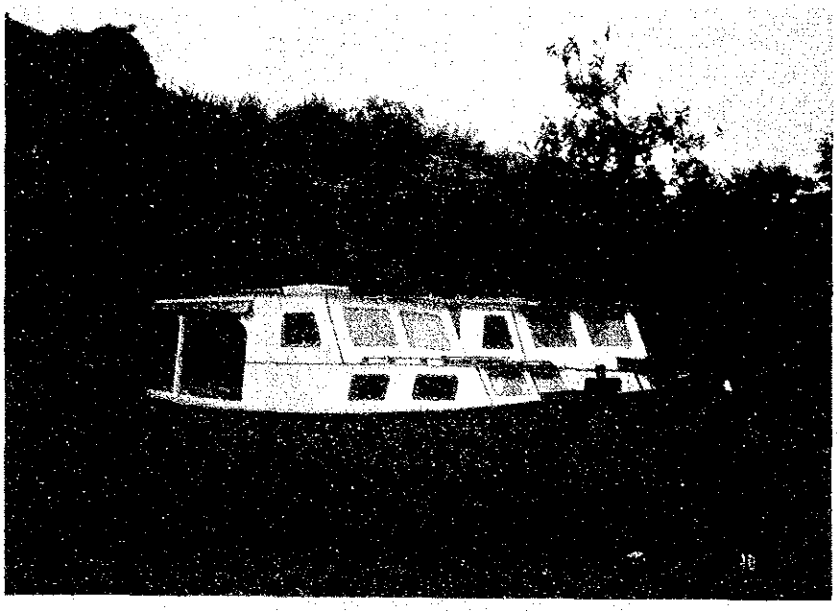

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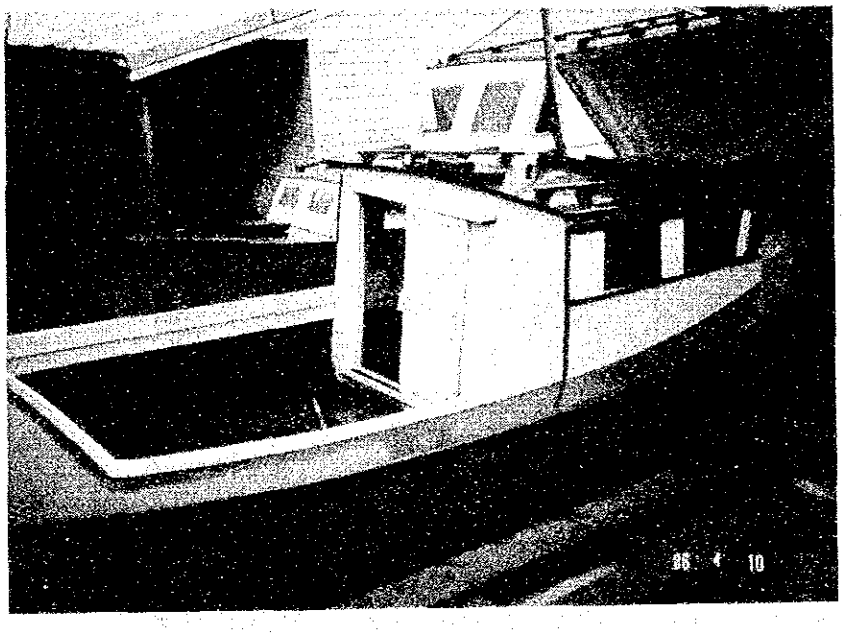

Photo 13-1 21 Footer Fishing Boat, Design by F.A.D

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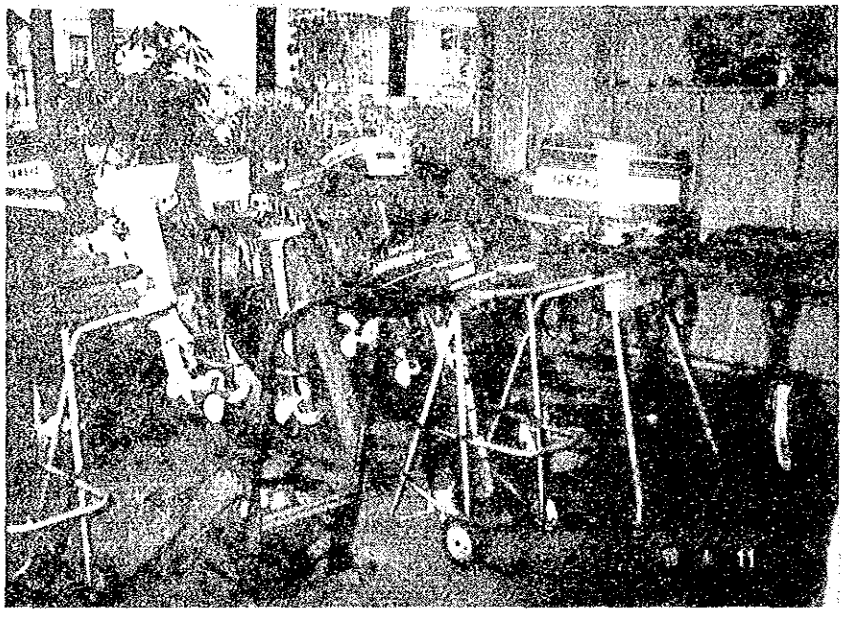

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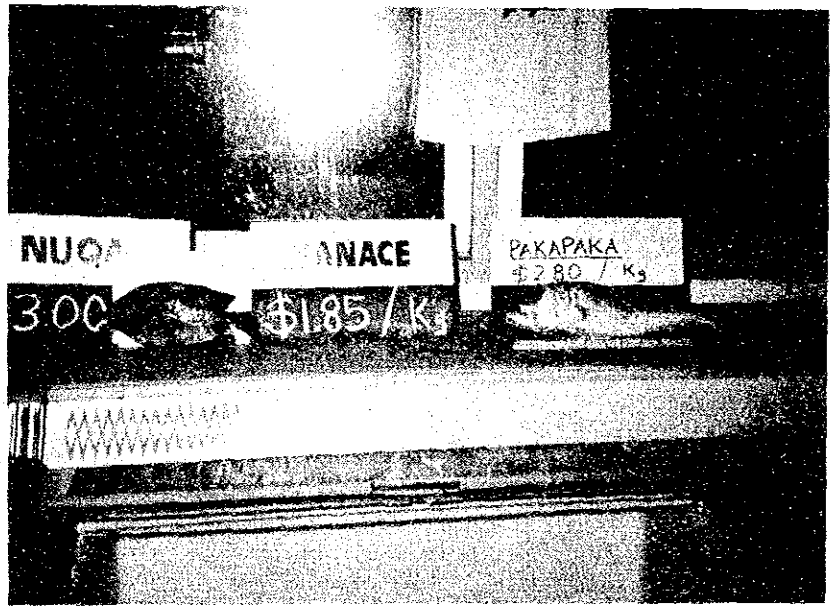

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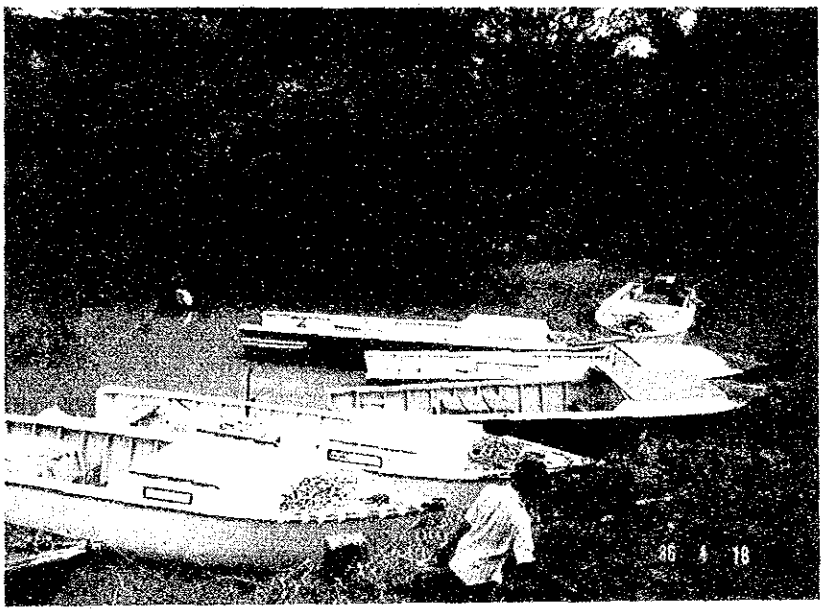

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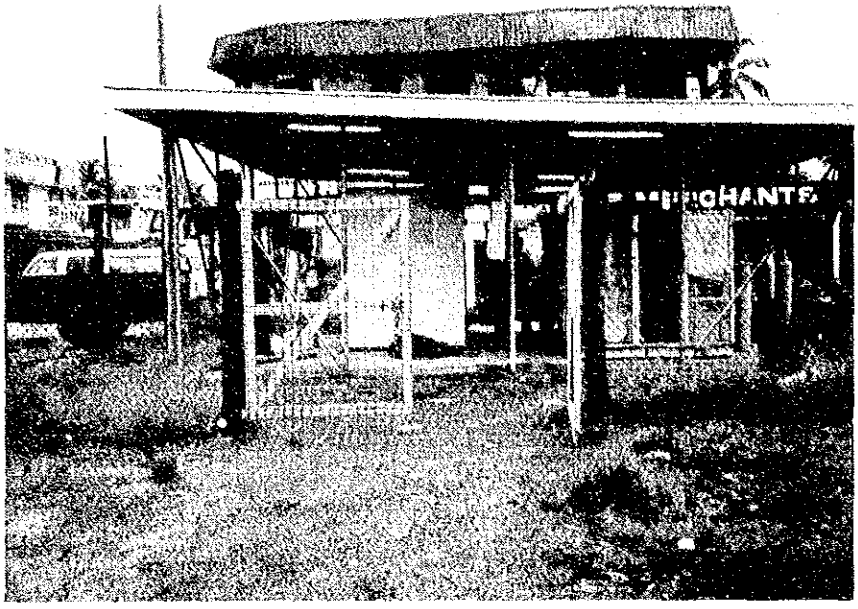

Photo 18-1 Existing ice plant at Navua

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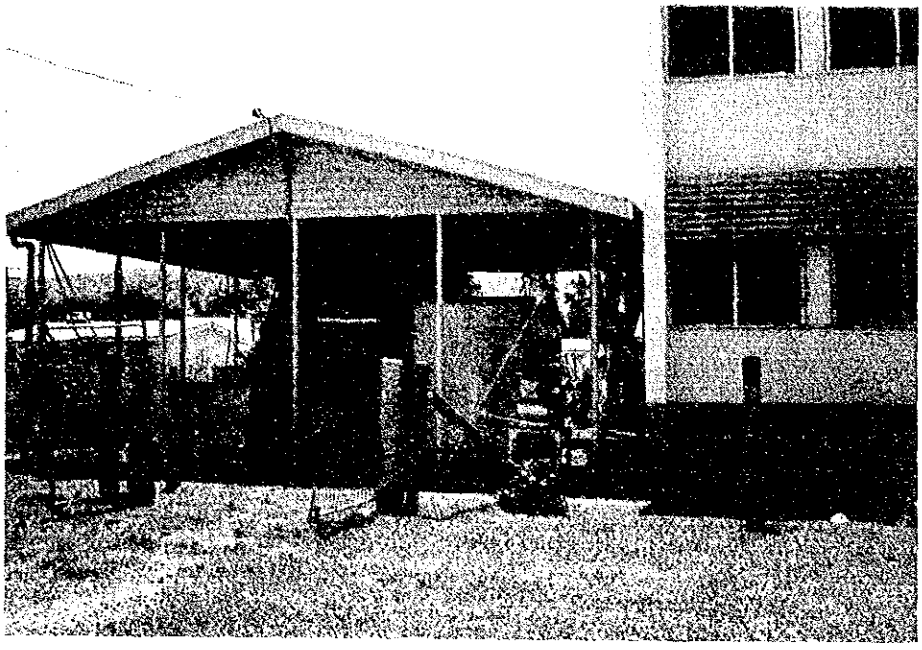

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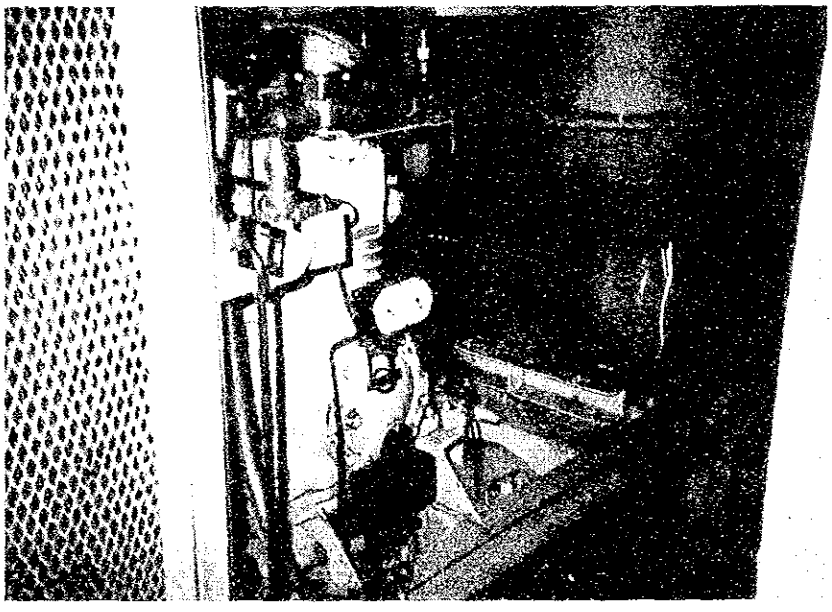
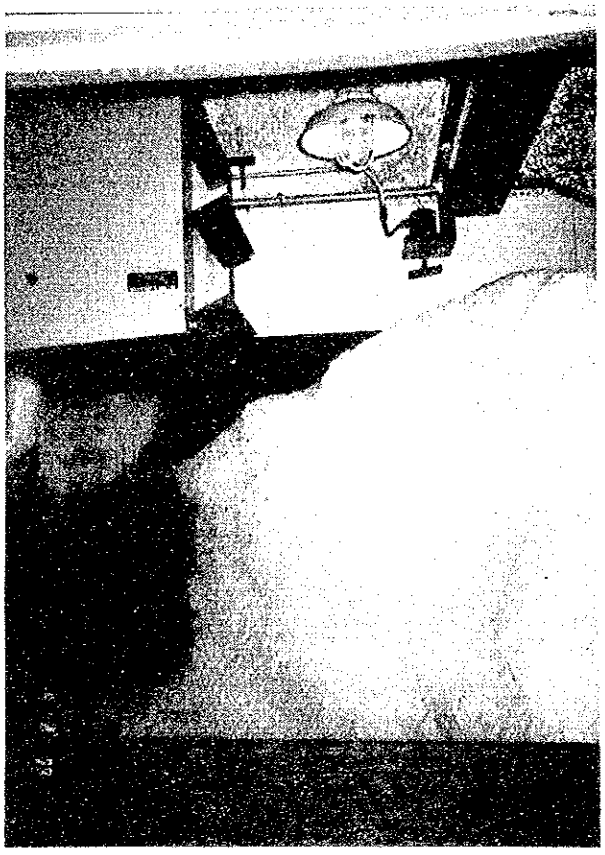


Photo 19-2 Ice plant at Sigatoka

Photo 20-1 Ice plant at Wainibokasi



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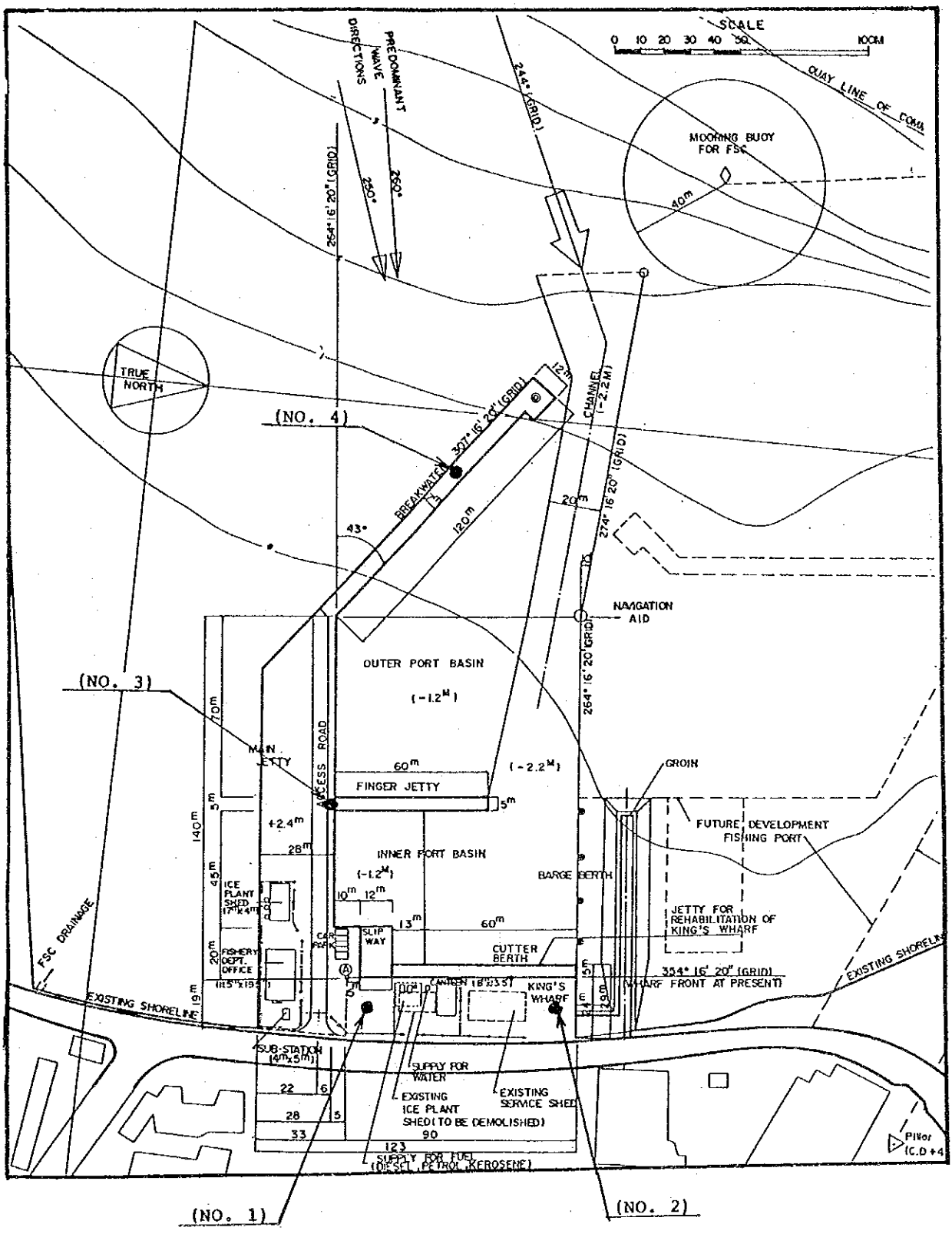
APPENDIX N SOIL INVESTIGATION

SITE OF SOIL INVESTIGATION



SOIL PROFILES (NO. 1)

LOCATION: SEE SITE PLAN		BORE HOLE No. 1	FIGURE 2A SHEET 1 OF 2
SURFACE ELEVATION	DATUM		
INCLINATION: VERTICAL	AZIMUTH		
DRILL TYPE: MINDRILL KK3	DATE: 29/4 - 2/5/86	PROJECT: FISHERIES WHARF, LAUTOKA.	

STRATIGRAPHY (depth in metres, 0–20)

- BASE GRAVEL.
- CLAYEY SILT. Red, brown, grey. Some rock fragments. (firm)
- CLAYEY SILT. Grey (v. soft). Slightly sandy (fine sand). Slightly organic
- Shell, coral fragments and sand in a matrix of silty clay. Grey (loose)
- SANDY SILT. Clayey. Occasional shell & coral frag's. (firm)
- SANDY CLAY. (Stiff) Silty. Brown, grey (Residual). Brown.
- SILTY CLAY (Stiff). Sandy (Extremely weathered rock) (v. stiff)

Sample type	Sample no.	Blows/300 mm	Dry density (Mg/m^3)	Natural moisture content (%)	Liquid limit	Plasticity index	Linear shrinkage	% fines (< No. 200)	Type of test	S_u (kPa)	Specific gravity
SP	1	5		51.5	67	29	12.0	85.0			2.75
SP	2	1		70.5	79	34	17.0	96.5			2.68
TO	3			50.4				32.0			
SP	4	4		47.4							
SP	5	7									
TO	6		1.12	56.0				11.0			2.41
SP	7	6		47.5				67.0			2.95
TO	8		1.02	60.5	71	35	14.5	61.7	U	46.4	2.68
SP	9	15		72.0							
SP	10	10									
TO	11		0.97	69.0	94	58	19.0	80.7	U	110	2.65
SP	12	24		66.5							
TO	13		1.00	62.5	89	60	21.5	84.0	U	780	
SP	14	32		58.5							

WATER LEVELS RECORDED DURING FIELDWORK (while drilling BH #2) – HIGHEST LEVEL – 1.15 m, LOWEST LEVEL – 0.80 m.
LEVELS TAKEN AT START & END OF DAY SHIFT

GOLDER ASSOCIATES

LOCATION SEE SITE PLAN
SURFACE ELEVATION — DATUM
INCLINATION VERTICAL — AZIMUTH
DRILL TYPE MINORIL RIG — DATE 29/4 - 2/5/86

BORE HOLE No. 1

PROJECT FISHERIES WHARF, LAUTOKA

FIGURE
SHEET 2 OF 2

STRATIGRAPHY	GRAPHIC LOG	ELEVN / DEPTH (metres)	SAMPLE TYPE / NUMBER	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kN/m³)	NATURAL MOISTURE CONTENT (%)	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE (%)	% FINES (< no. 200)	STRENGTH DATA: TYPE OF TEST	PARAMETER q_u (kPa)	OTHER: SPECIFIC GRAVITY
SANDY SILT. (V. Stiff)			SP 15	17		65.5							
clayey (Stiff)			TO 16		1.16	51.0	59	15	5.5	53.4	U	176	2.61
Brown (Hard)		22	RC								U	594	2.69
(Extremely weathered rock)													
		24	SP 17	25		46.0							
(V. stiff)			SP 18	28		54.0							
		26											
			SP 19	31		68.1							
		28											
CLAYEY SILT													
Slightly sandy (Hard)			SP 20	39		65.3	94	43	17.0	87.4			
		30											
			SP 21	41		65.0							
		32											
			SP 22	>50		54.5				91.0			2.69
				(16/1" 150mm			25/2½" 150mm)						
		34											
Highly weathered siltstone													
Moderately - Slightly weathered Basalt			SP 23	>50		45.8							
				(25/1" 120mm)									
END OF BORING - 35.3m.		36											

GOLDER ASSOCIATES

LOCATION SEE SITE PLAN
SURFACE ELEVATION DATUM
INCLINATION VERTICAL AZIMUTH
DRILL TYPE MINORIL RIG DATE 2/5 - 4/5/86

BORE HOLE No. 2.

PROJECT FISHERIES WHARF LAUTOKA.

FIGURE 2.B
SHEET 1 OF 2

STRATIGRAPHY	GRAPHIC LOG	ELEVATION / DEPTH (metres)	SAMPLE TYPE	SAMPLE NO.	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kg/m³)	NATURAL MOISTURE CONTENT (%)	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE (%)	% FINES (-#200)	STRENGTH DATA: TYPE OF TEST	PERMEABILITY q_u (kPa)	OTHER: SPECIFIC GRAVITY
BASE GRAVEL.														
SILTY CLAY. Brown. (Soft - firm) Some rock fragments														
		2	SP	1	2		64·7	87·0	52·0	18·5	70·0			
SILTY CLAY: Sandy (Some peat) (fine sand) (V. soft - soft) Brown, grey.			TO	2		1·02	62·1	88·0	41	17	77·4	U	7·4	2·70
		4	SP	3	2		71·7	83	44	17	95·0			
		6	TO	4		0·94	80·0	92	48	16	93·0	U	10·1	2·75
(Soft)			SP	5	3		66·0							
		8	SP	6	3		66·2	87	49	17·5	98·0			2·68
			TO	7		0·94	76·0	93	54	15	95·0	U	25·7	2·75
Shells, Sand, coral fragments in a matrix of silty clay Grey (V. loose)		10	SP	8	3		52·5	58	32	8·0	51·0			2·95
SANDY SILT. Clayey Grey (Soft - firm) Occasional shell fragments		12	TO	9		1·09	57·5	71	33	10	62·0	U	8·8	2·67
			SP	10	4		61·7							
CLAYEY SILT. (firm) Brown, grey		14	SP	11	6		63·5							
			TO	12		0·79	81·0	83	27	24	96·9	U	36·7	2·69
Extremely weathered rock (Stiff)		16	SP	13	9									
Brown. (V. Stiff)		18	SP	14	31		52·8	85	42	14·5	95·8			2·65
		20												

WATER LEVEL RECORDED AT END OF BORE - 1·35 m.

GOLDER ASSOCIATES

LOCATION SEE SITE PLAN.

SURFACE ELEVATION — DATUM

INCLINATION VERTICAL — AZIMUTH

DRILL TYPE MINORILL RIG — DATE 2/5 - 4/5/86

BORE HOLE No. 2

PROJECT FISHERIES WHARF, LAUTOKA.

FIGURE — SHEET 2 OF 2

STRATIGRAPHY	GRAPHIC LOG	ELEVN / DEPTH (metres)	SAMPLE TYPE	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kN/m³)	NATURAL MOISTURE CONTENT (%)	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (< No 200)	STRENGTH DATA: TYPE OF TEST	PENETROMETER q_u (kPa)	OTHER: SPECIFIC GRAVITY
(Hard) CLAYEY SILT. Brown. Extremely weathered rock. (V. Stiff) (hard)		22	SP 16	32		50·0	93	42					
		24	SP 17	26		52·7							
		26	SP 18	38		64·0							
		28	SP 19	35		54·0							
		30	SP 20	>50 (21/150mm;		60·0	88	36	21·5				2·58
		32	SP 21	34		72·0							
		34	SP 22	41		67·0							
		36	SP 23	>50 (23/150mm;		43·0	74	31	17·0				2·69
		38	SP 24	>50 (21/150mm;		48·0							
		40	SP 25	>50 (23/150mm;		49·0							

END OF BORING - 40·3m.

GOLDER ASSOCIATES

SOIL PROFILES (NO. 3)

LOCATION SEE SITE PLAN
SURFACE ELEVATION From seabed level DATUM
INCLINATION VERTICAL AZIMUTH
DRILL TYPE HINDRILL RIG DATE 8/8 to 5/8/86

BORE HOLE No. 3

PROJECT FISHERIES WHARF - LAUTOKA

FIGURE 2A
SHEET OF

STRATIGRAPHY	GRAPHIC LOG	ELEVN / DEPTH metres	SAMPLE TYPE	SAMPLE (DIST. DISTURBED)	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kg/m³)	NATURAL MOISTURE (%) CONTENT	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE %	% FINES (- No 200)	STRENGTH DATA: TYPE OF TEST	PARAMETERS	OTHER
SILTY CLAY Dark brown Slightly Sandy (V. Soft)		2	SP	1	1		69.5	91	49	19	86.0			
(Soft)		4	SP	2	3		71.0	94	52	22	78			
(Soft)		6	SP	3	3		77.5	91	46	22	93			
Sand, shell and coral fragments Silty (V. loose)		8	SP	4	3		46.0				26.0			
SILTY CLAY Grey, brown (Firm)		10	SP	5	4		60.0	65	31	12	72			
		12	SP	6	7		73.5	119	68	23	82			
CLAYEY SILT Light brown Extremely weathered rock (V. stiff)		14	SP	7	14		69.0	98	40	22	94			
		16	SP	8	25		59.0	89	35	18	82			
		18	SP	9	24		63.5	89	37	18	94			
		20												

Water levels (from seabed) - High 1.65m
Low 0.20m

GOLDER ASSOCIATES

LOCATION	SEE SITE PLAN
SURFACE ELEVATION	From seabed level — DATUM
INCLINATION	VERTICAL — AZIMUTH
DRILL TYPE	HINDRILL RIG — DATE

BORE HOLE No. 3 (cont.)

PROJECT FISHERIES WHARF - LAUTOKA

FIGURE 2A
SHEET OF

STRATIGRAPHY	ELEVN / DEPTH metres	SAMPLE TYPE	SAMPLE LOSS / DISTURBED	BLOWS / 300 DISTANCE (mm)	DRY DENSITY (kg/m³)	NATURAL MOISTURE CONTENT (%)	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE %	% FINES (- No. 200)	STRENGTH DATA: TYPE OF TEST	PARAMETERS	OTHER
CLAYEY SILT Light brown Extremely weathered rock (V. Stiff)	22	SP	10	15		75.5	105	37	20	91			
		SP	11	24		49.0	68	21	11	82			
(Hard)	24	SP	12	32		58.5	84	33	15	94			
(V. stiff)	26	SP	13	28		76.5	111	57	20	98			
CLAYEY SILT (Hard) Dark grey Extremely weathered rock	28	SP	14	33		64.5	91	46	13	70			
(Hard)	30	SP	15	>50		58.0	88	30	16	78			
CLAYEY SILT (Hard) Light brown Extremely weathered rock	32	SP	16	44		54.0	71	23	13	89			
	34	SP	17	32		57.0	92	45	18	70			
(Hard)	36	SP	18	37		63.5	Insufficient samples for limits			94			
BASALTIC ROCK Blacky grey Beds of basalt and basaltic sandstone Moderately weathered	38	Rock Core (90% Recov.)											
	40.0												

End to Borehole - 40.3m

Water levels (from seabed) - High - 1.65m
Low - 0.20m

GOLDER ASSOCIATES

LOCATION	SEE SITE PLAN	BORE HOLE No. 4	FIGURE 28
SURFACE ELEVATION	From seabed level DATUM		SHEET OF
INCLINATION	VERTICAL AZIMUTH		
DRILL TYPE	MINDRILL RIG DATE 1/8 to 5/8/86	PROJECT FISHERIES WHARF - LAUTOKA	

STRATIGRAPHY	ELEVN / DEPTH metres	SAMPLE TYPE	SAMPLE LOSS; DISTURBED	BLOWS/300 DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE (%) CONTENT	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE %	% FINES (< No. 200)	STRENGTH DATA: TYPE OF TEST	PARAMETERS	OTHER
CLAY SILT Dark brown Sandy (V. soft)	2	SP	1			68.0	96	50	20	75			
(Soft)	4	SP	2	3		60.0	80	36	12	75			
SILTY CLAY Dark brown Slightly sandy (Soft)	6	SP	3	3		71.0	84	43	16	79			
Sand, shell and coral fragments Silty (V. loose)	8	SP	4	4		77.0				34			
CLAYEY SILT Grey Sandy Some shell fragments (V. loose, soft)	10	SP	5	4		51.0	Insufficient sample for limit			53			
	12	SP	6	3		60.0	74	37	12	52			
SILTY CLAY Dark grey (Soft)	14	SP	7	3		80.5	116	73	14	90			
Some Organics (Firm)	16	SP	8	7		65.0	80	39	16	64			
CLAYEY SILT Light brown Extremely weathered rock (V. Stiff)	18	SP	9	20		69.0	110	53	23	72			
	20												

Water levels (from seabed) - High - 2.4m
Low - 1.1m

GOLDER ASSOCIATES

LOCATION	SEE SITE PLAN	BORE HOLE No. 4 (cont.)	FIGURE 28
SURFACE ELEVATION	From seabed level DATUM		SHEET OF
INCLINATION	VERTICAL AZIMUTH		
DRILL TYPE	MINDRILL RIG DATE 1/8 to 5/8/86	PROJECT FISHERIES WHARF - LAUTOKA	

STRATIGRAPHY	GRAPHIC LOG	ELEV'N / DEPTH (metres)	SAMPLE TYPE	SAMPLE (DIST. DISTURBED)	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kg/m³)	NATURAL MOISTURE (%) CONTENT	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE %	% FINES (< No 200)	STRENGTH DATA: TYPE OF TEST	PARAMETERS Su (kPa) C' (kPa) Ø' (degrees)	OTHER
CLAYEY SILT Light brown Extremely weathered rock			SP	10	22		76.0							
(V. Stiff)		-22	SP	11	28		61.0	94	45	17	71			
		-24	SP	12	35		40.5							
(Hard)														
		-26	SP	13	32		60.5	100	48	25	69			
		-28	SP	14	29		52.0							
Some rock fragments noted		-30												
(V. stiff)			SP	15	22		77.0	93	39		69			
ROCK Black Highly weathered (Dense)		-32	SP	16	35									
CLAYEY SILT Grey brown Extremely weathered rock (V. stiff)		-34	SP	17	28		64.0	105	62	25	95			
(Hard)		-36	SP	18	32		47.5							
(Hard)		-38	SP	19	40		49.0	95	40	22				
		-40												

Water levels (from seabed) - High - 2.4m
Low - 1.1m

LOCATION SEE SITE PLAN

SURFACE ELEVATION From seabed level DATUM

INCLINATION VERTICAL AZIMUTH

DRILL TYPE HINDRILL RIG DATE 1/8 to 5/8/86

BORE HOLE No. 4 (cont.)

PROJECT FISHERIES WHARF - LAUTOKA

FIGURE 2B

SHEET OF

STRATIGRAPHY	GRAPHIC LOG	ELEVN / DEPTH metres	SAMPLE TYPE	SAMPLE DIST. DISTURBED	BLOWS/300 DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE (%)	CLASSIFICATION DATA: LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (- No. 200)	STRENGTH DATA: TYPE OF TEST	PARAMETERS	OTHER
CLAYEY SILT (V. stiff)			SP	20	16		65							
BASALTIC SANDSTONE Grey Extremely weathered with highly weathered rock frags.		42	SP	21	22		43							
			SP	22	>50									
BASALTIC ROCK Black, grey Beds of basalt and basaltic sandstone Moderately weathered		44	ROCK CORE Recovery 69%											
		46												
End of Borehole - 46.2 metre		48												

Water levels (from seabed) - High - 2.4m

Low - 1.1m

GOLDER ASSOCIATES