

M. Photograph of the Site

Appendix M - Photograph at the site

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

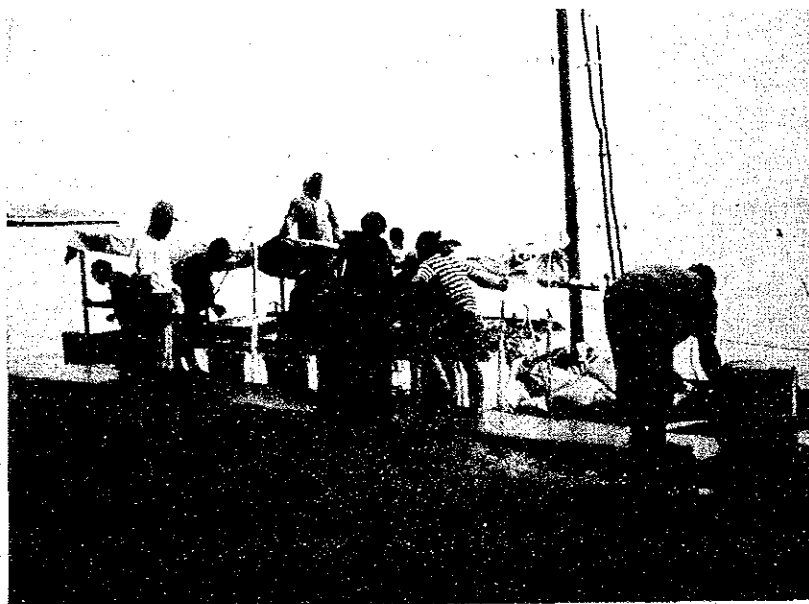


Photo 1-2 Cutter Boat at the King's Wharf (Project Site)

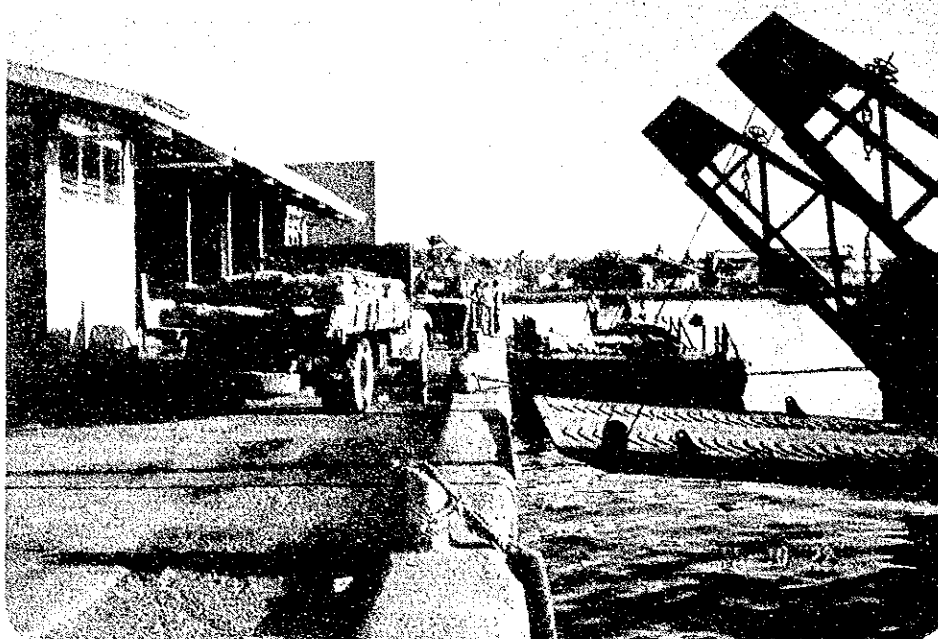


Photo 2-1 Loading the materials on the barge
to remote islands (King's Wharf)



Photo 2-2 Surveyors employed by the Study Team
(King's Wharf)

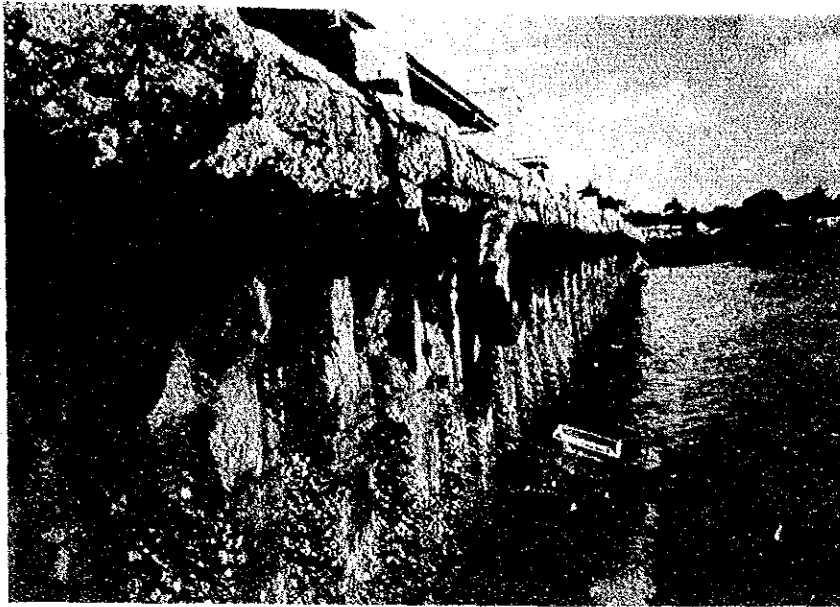


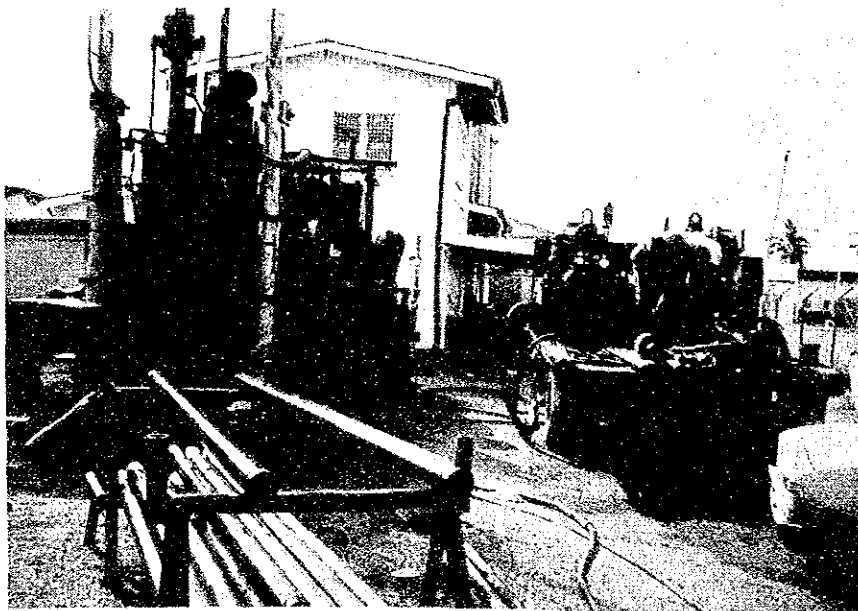
Photo 3-1 Present Condition of Steel Sheetpile Wall
(King's Wharf) under heavy damages



Photo 3-2 Effluent of industrial waste water
at the south coast to King's Wharf



Photo 4-1 Under-water investigation by a diver employed by the Study Team



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

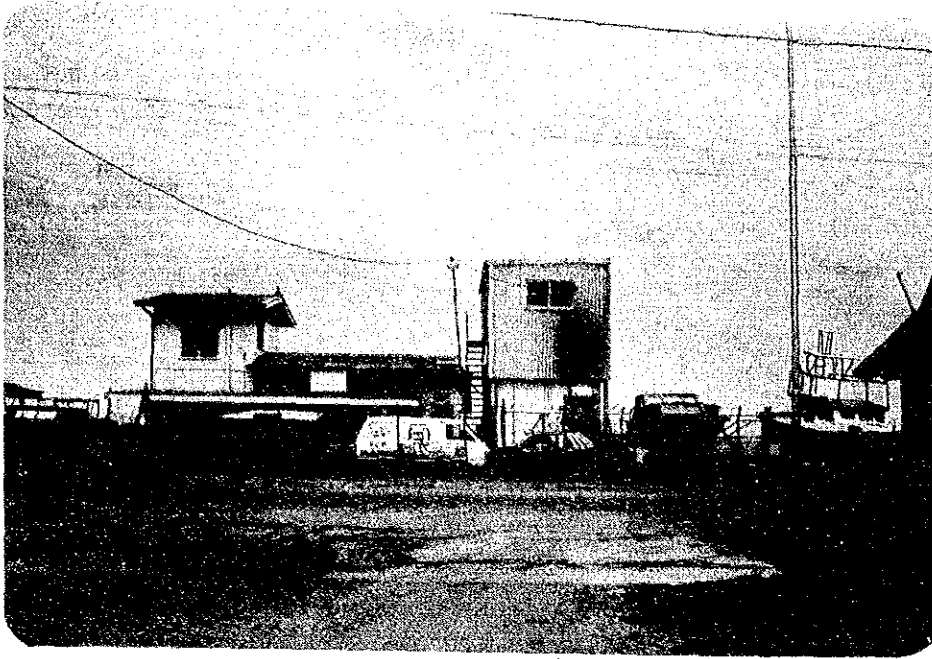


Photo 5-1 Existing office and ice plant
at King's Wharf

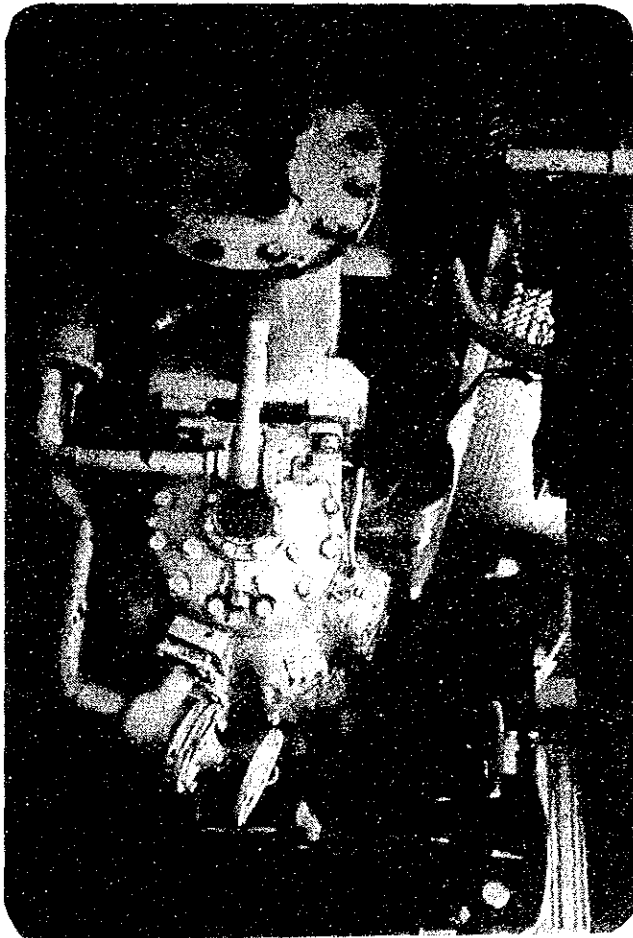


Photo 5-2 Ice plant at
King's Wharf



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)



Photo 7-2 A middleman transports fish buying from
fisherman to the Lautoka Municipal Market



Photo 8-1 Weight measurement at the Municipal Market
in Lautoka City

PHOTOGRAPH IN SUVA



Photo 9-1 "Road-side market" in Suva City



Photo 9-2 Trading fish
between fishermer

Photo 9-2 Trading fish between fishermen
and consumers in Suva City



Photo 10-1 Type of fish at "the floating market"
Suva City



Photo 10-2 Typical fish sales on the boat,
making groups of fish in 2-3 kg.



Photo 11-1 Sales of shell on the walkway of
Suva Municipal Market

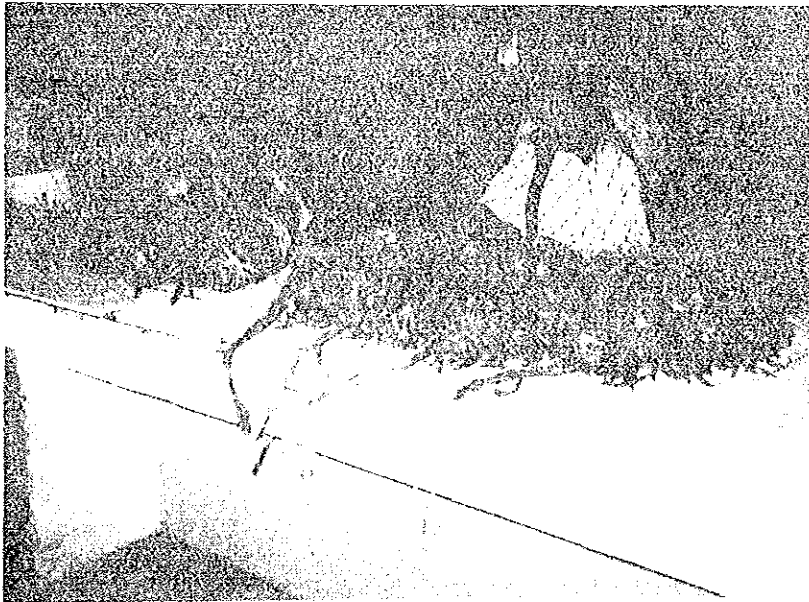


Photo 11-2 Sales of Crustacea in the Suva Municipal
Market



Photo 12-1 Fish sales in the Suva Municipal
Market

PHOTOGRAPH IN LAMI



Photo 13-1 28 Footer Fishing Boat, Design by F.A.D

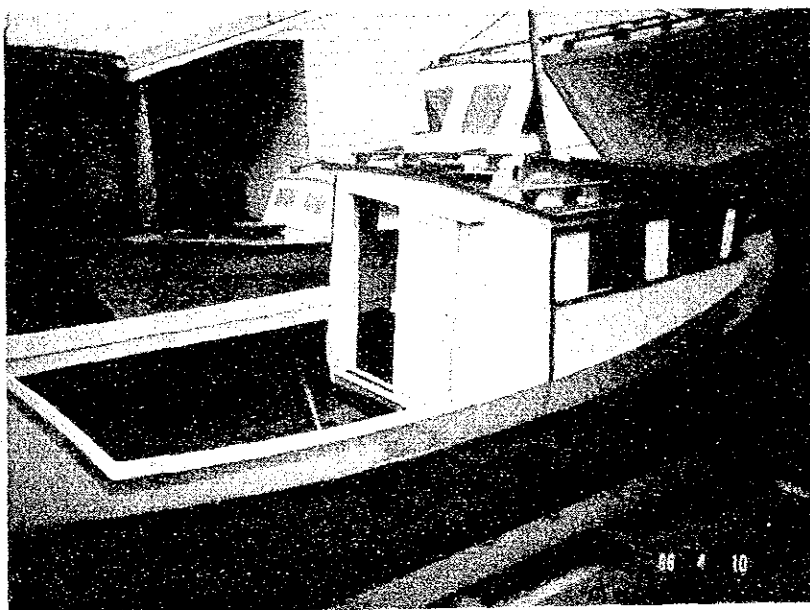


Photo 13-1 21 Footer Fishing Boat, Design by F.A.D



Photo 14-1 Ice box and catches on
the fishing boat

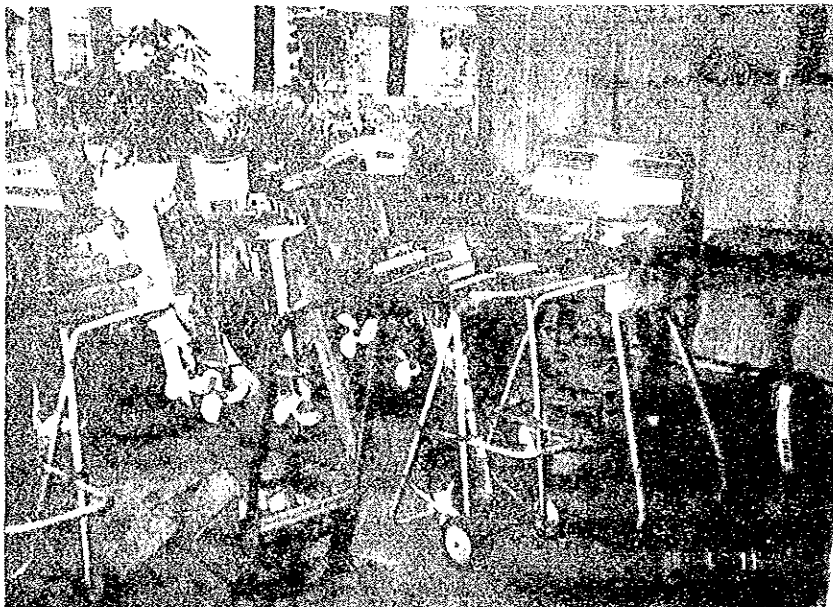


Photo 14-1 Workshop for boat's engines
in Lami

PHOTOGRAPH OF OTHER PLACE

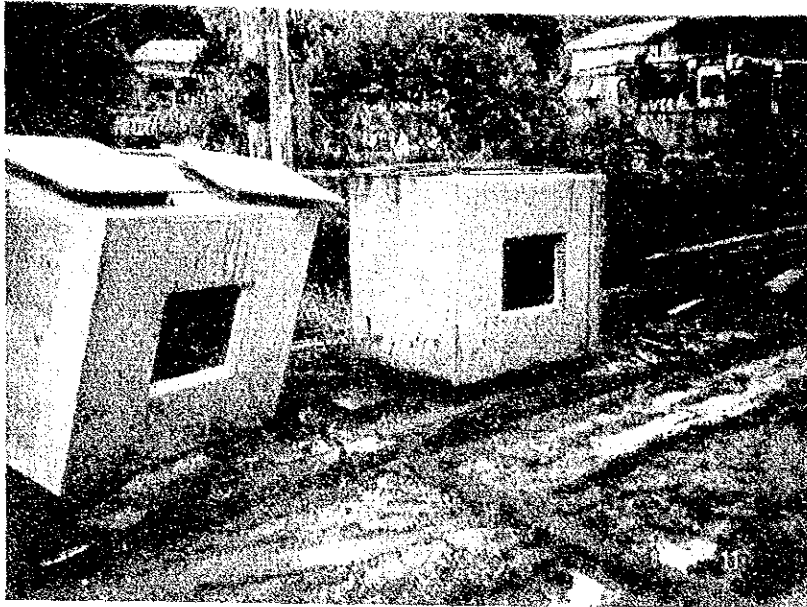


Photo 15-1 Ice box producing by
Fishereis Division (F.\$300.-)



Photo 15-2 National Market Authority's
Market (NMA) - 1



Photo 16-1 Cold storage of
N.M.A



Photo 16-2 Band-saw in
N.M.A



Photo 17-1 "Road Site Market" on the way
to Ba from Lautoka

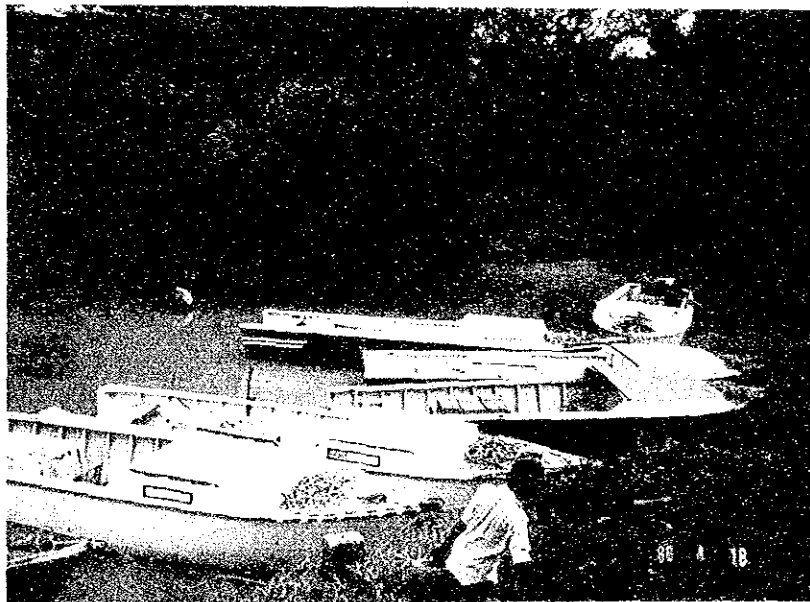


Photo 17-2 Fishing boats and temporary
berth in Ba River

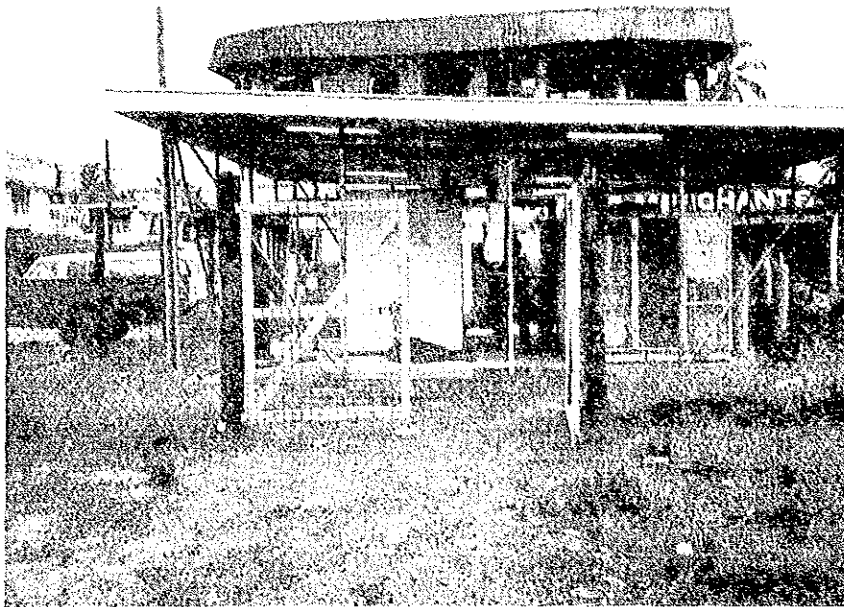


Photo 18-1 Existing ice plant at Navua



Photo 18-2 Ice sales at Navua plant

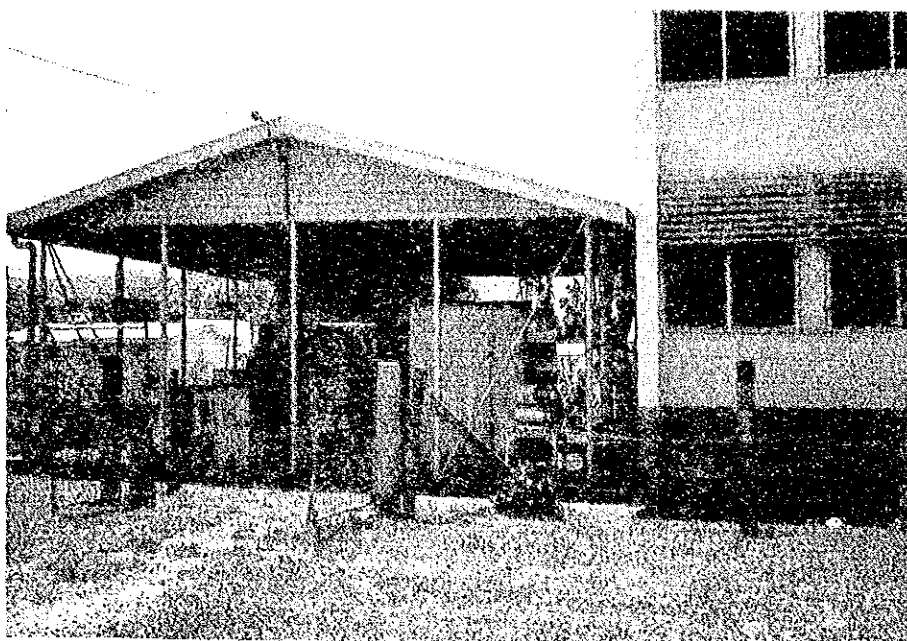


Photo 19-1 Ice plant at Sigatoka

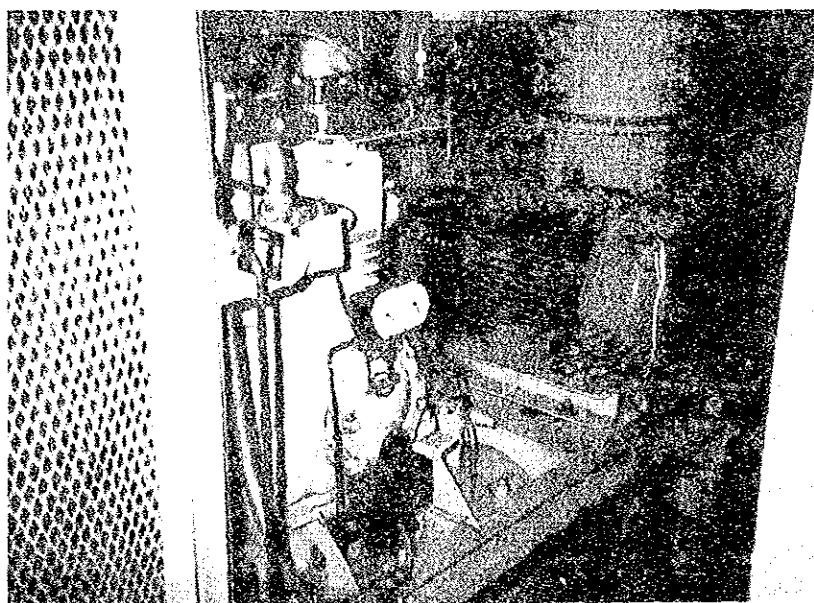


Photo 19-2 Ice plant at Sigatoka



Photo 20-1 Ice plant at Wainibokasi

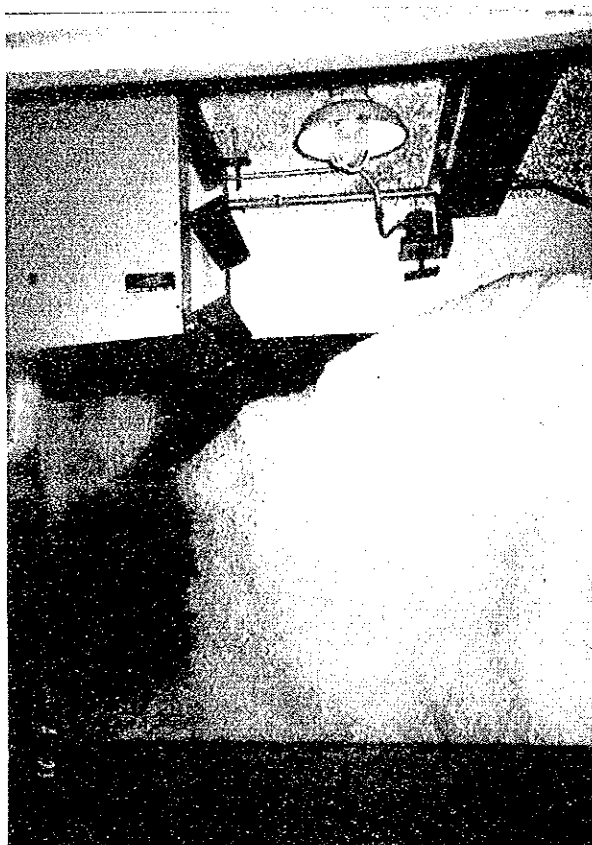
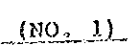


Photo 20-2 Ice storage at Wainibokasi
plant (plate type)

SOIL INVESTIGATION

SITE OF SOIL INVESTIGATION



SOIL PROFILES (NO. 1)

LOCATION <u>SEA SIDE ROAD</u>		BORE HOLE No. 1										FIGURE 2A SHEET 1 OF 2	
SURFACE ELEVATION <u> </u> DATUM <u> </u>													
INCLINATION <u>VERTICAL</u> AZIMUTH <u> </u>													
DRILL TYPE <u>MANHOLE RIG</u> DATE <u>29/11/86</u>		PROJECT <u>FISHERIES WHARF LAUTOKA</u>											
STRATIGRAPHY		DEPTH meters	FLYNN DEPTH meters	SAMPLE TYPE	WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	LINEAR SHRINKAGE %	FLYNN SPL. NO.	FLYNN SPL. NO.	FLYNN SPL. NO.	FLYNN SPL. NO.	SPECIFIC GRAVITY
BASE GRAVEL.													
CLAYEY SILT. Red, brown, grey Some rock fragments. (firm)		2		SP 1 5	59.5	67	29	12.0	85.0				2.75
CLAYEY SILT. Grey (v. soft) Slightly sandy (fine sand) Slightly organic		4		SP 2 1	70.5	79	34	17.0	96.5				2.68
Shell, coral fragments and sand in a matrix of silty clay Grey (loose)		6		TD 3	50.4				32.0				
				SP 4 4	47.4								
		8		SP 5 7									
				TD 6	112	56.0			16.0				2.41
SANDY SILT. Clayey Occasional shell & coral frags. (firm)		10		SP 7 6	47.5				67.0				2.95
SANDY CLAY. (Stiff) Silty Brown, grey (Residual)		12		TD 8	102	60.5	71	35	14.5	61.7	11	46.4	2.68
				SP 9 15	72.0								
Brown.		14		SP 10 10									
SILTY CLAY (Stiff) Sandy (Extremely weathered) rock (v. stiff)				TD 11	0.97	69.0	94	58	19.0	80.7	11	11.0	2.65
		16											
				SP 12 24	66.5								
		18		TD 13	1.00	62.5	89	60	21.5	84.0	11	78.0	
				SP 14 32	58.5								
		20											
WATER LEVELS RECORDED DURING FIELDWORK - HIGHEST LEVEL - 1.15 m (while drilling BH 42) LOWEST LEVEL - 0.80 m. TESTS TAKEN AT START & END OF DAY SHIFT													

GOLDER ASSOCIATES

LOCATION <u>SEASIDE PLAN</u>		BORE HOLE No. 1										FIGURE: SHEET 2 OF 2	
SURFACE ELEVATION		DATUM											
INCLINATION <u>VERTICAL</u>		AZIMUTH											
DRILL TYPE <u>MINORILL RIG</u>		DATE <u>29/4-2/5/85</u>		PROJECT <u>FISHERIES WHARF, LAUTOKA</u>									
STRATIGRAPHY	DEPTH M	SAMPLE TYPE	SAMPLE NO.	SLUG NO.	WATER CONTENT (%)	LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	PERMEABILITY (cm/sec)	S _u (kN/m ²)	OTHER		
<u>SANDY SILT.</u> (V. Stiff) clayey (stiff) Brown (Hard) (Extremely weathered) rock (V. Stiff)	15	SP 15	17		65.5								
	16	TO 16			1.16	51.0	59	15	5.5	53.1	176		
	22	RC								U	594		
	24	SP 17	25		46.0								
	26	SP 18	28		54.0								
	28	SP 19	31		68.1								
	30	SP 20	39		65.3	94	43	17.0	87.4				
	32	SP 21	41		65.0								
	34	SP 22	50		54.5				71.0		2.69		
					(16/1" 150mm ; 25/2" 150mm)								
Highly weathered siltstone Moderately - Slightly weathered Basalt.	36	SP 23	50		45.8								
					(25/1" 120mm)								
END OF BORING - 35.3m.													

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SOIL PROFILES (NO. 2)

LOCATION <u>SEI SID PLAN</u>				BORE HOLE No. 2.										FIGURE 2.B SHEET 1 OF 2	
SURFACE ELEVATION		DATUM													
INCLINATION		AZIMUTH													
DRILL TYPE <u>MINORILL RIG</u>		DATE <u>2/5-4/5/84</u>		PROJECT <u>FISHERIES WHARF LAUTOKA</u>											
STRATIGRAPHY				DEPTH m	DEPTH ft	CLASSIFICATION DATA				STRENGTH DATA				OTHER	
				WATER LEVEL m	WATER LEVEL ft	WATER TEMP °C	WATER TEMP °F	WATER PRESS kPa	WATER PRESS psi	WATER SALINITY ppt	WATER SALINITY ‰	WATER SALINITY ‰	WATER SALINITY ‰	SPECIFIC GRAVITY.	
				SP	LP	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
				W	W	W	W	W	W	W	W	W	W		
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				W	W	W	W	W	W	W	W	W	W		
				W	W	W									

GOLDER ASSOCIATES

LOCATION <u>SEE SITE PLAN.</u>		BORE HOLE No. 2		FIGURE	
SURFACE ELEVATION		DATE		SHEET 2 OF 2	
INCLINATION <u>VERTICAL</u>		AZIMUTH			
DRILL TYPE <u>MINDRILL RIG</u>		DATE <u>245 - 4/5/89</u>		PROJECT <u>FISHMARKS WHARF, LAUTOKA.</u>	

STRATIGRAPHY	DEPTH (m)	SAMPLE NO.	ELEV. (m)	WATER CONTENT (%)	SHRINKAGE (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	UNIFORMITY COEFF.	CLASSIFICATION	STRENGTH DATA		S.W.
										UNCONSOLIDATED	CONSOLIDATED	
<u>CLAYEY SILT.</u> <u>Brown.</u> <u>Extremely weathered rock.</u>		SP 15	35			51.3						
	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			60.0	88	36	215			2.58
						(21/150mm; 25/150mm)						
	32	SP 21	34			72.0						
	34	SP 22	41			67.0						
	36	SP 23	>50			43.0	74	31	17.0			2.69
					(23/150mm; 25/100mm)							
38	SP 24	>50			48.0							
					(21/150mm; 27/110mm)							
40	SP 25	>50			49.0							
					(23/150mm; 25/80mm)							

END OF BORING - 40.3m.

GOLDER ASSOCIATES

SOIL PROFILES (NO. 3)

LOCATION		SEE SITE PLAN		BORE HOLE No. 3								FIGURE 2A			
SURFACE ELEVATION		From seabed level		DATUM										SHEET OF	
INCLINATION		VERTICAL		AZIMUTH											
DRILL TYPE		HINDRILL RIG		DATE 8/8 to 5/8/86		PROJECT FISHERIES WHARF - LAUTOKA									
STRATIGRAPHY		GRAPHIC LOG	ELEV. DEPTH metres	SAMPLE TYPE	WATER CONTENT (%)	BLOWS/300 DISTANCE (mm)	DRY DENSITY (kg/m ³)	NATURAL MOISTURE (%) CONTENT	LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE (%)	% FINES (No. 200)	STRENGTH DATA TYPE OF TEST	OTHER	
<u>SILTY CLAY</u> 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	2			46.0				26.0				
<u>SILTY CLAY</u> Grey, brown (Firm)															
		10	SP 5	4			60.0	65	31	12	72				
(Firm)															
		12	SP 6	7			73.5	119	68	21	82				
<u>CLAYEY SILT</u> Light brown Extremely weathered rock (V. stiff)															
		14	SP 7	14			69.0	98	40	22	94				
		16	SP 8	25			59.0	89	32	18	82				
		18	SP 9	24			61.5	89	37	18	94				

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

GOLDER ASSOCIATES

LOCATION		SEE SITE PLAN		BORE HOLE No. 3 (cont.)										FIGURE 2A	
SURFACE ELEVATION		From seabed level DAYUU												SHEET OF	
INCLINATION		VERTICAL		AZIMUTH		PROJECT FISHERIES WHARF - LAUTOKA									
DRILL TYPE		HINDRILL RIG		DATE											

STRATIGRAPHY	GRAPHIC LOG	ELEVATION DEPTH metres	SAMPLE TYPE	BLOWS / 300 DISTANCE (mm)	DRY DENSITY (Mg/m^3)	NATURAL MOISTURE (%)	CLASSIFICATION DATA				STRENGTH DATA		OTHER
							LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (No. 200)	TYPE OF TEST	PARAMETERS S_u (kPa) C_u (kPa) ϕ (degrees)	
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			
		24	SP 12	32		58.5	84	33	15	94			
			SP 13	28		76.5	111	57	20	98			
CLAYEY SILT Dark grey Extremely weathered rock (Hard)		28	SP 14	33		64.5	91	46	13	70			
		30	SP 15	>50		58.0	88	30	16	78			
CLAYEY SILT Light brown Extremely weathered rock (Hard)		32	SP 16	44		54.0	71	23	13	89			
		34	SP 17	32		57.0	92	45	18	70			
		36	SP 18	37		63.5	Inadequate samples for tests			94			
BASALTIC ROCK Blackish grey Beds of basaltic and basaltic sandstone Moderately weathered		38											
		40.0											

End to Borehole - 40.3m
 Water levels (from seabed) - High - 1.65m
 Low - 0.20m

SOIL PROFILES (NO. 4)

LOCATION SEE SITE PLAN		BORE HOLE No. 4										FIGURE 2B SHEET OF	
SURFACE ELEVATION From seabed level DATUM													
INCLINATION VERTICAL AZIMUTH													
DRILL TYPE HINDRILL RIG DATE 1/8 to 5/8/86		PROJECT FISHERIES WHARF - LAUTOKA											
STRATIGRAPHY		GRAPHIC LOG	ELEVATION DEPTH metres	SAMPLE TYPE SAMPLE NO. DISTURBED BLOWS / 300 DISTANCE (mm)	DRY DENSITY kg/m ³	NATURAL MOISTURE (%) CONTENT	LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE %	% FINES (No. 200)	STRENGTH DATA TYPE OF TEST	PARAMETERS Su, (kPa) C, (kPa) φ, (degrees)	OTHER
CLAY SILT Dark brown Sandy (V. soft)	2			SP 1		58.0	96	30	20	75			
	4			SP 2	3	60.0	80	36	12	75			
SILTY CLAY Dark brown (Soft) Slightly sandy	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 samples for limit			53			
	12			SP 6	3	60.0	74	37	12	52			
SILTY CLAY Dark grey (Soft) Some Organics (Firm)	14			SP 7	3	80.5	116	73	14	90			
	16			SP 8	7	65.0	80	39	16	64			
CLAYEY SILT Light brown Extremely weathered (V. Stiff) rock	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 2b SHEET OF			
SURFACE ELEVATION		From seabed level		DATUM													
INCLINATION		VERTICAL		AZIMUTH													
DRILL TYPE		HINDRILL RIG		DATE 1/8 to 5/8/86		PROJECT FISHERIES WHARF - LAUTOKA											
STRATIGRAPHY		GRAPHIC LOG	ELEVATION DEPTH	SAMPLE TYPE	TYPE OF DISTURBED	BLOWS/300 DISTANCE (mm)	DRY DENSITY (Mg/m ³)	NATURAL MOISTURE (%) CONTENT	CLASSIFICATION DATA				STRENGTH DATA PARAMETERS		OTHER		
		metres							LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES ($\leq 75 \mu m$)	TYPE OF TEST	S_u (kPa) C_u (kPa) ϕ_u (degrees)			
CLAYEY SILT Light brown Extremely weathered rock				SP 10		22		74.0									
(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	SP 15		27		77.0	93	49	1	69					
(V. stiff)																	
ROCK Black Highly weathered			32	SP 16		35											
(Dense)																	
CLAYEY SILT Grey brown Extremely weathered rock			34	SP 17		26		64.0	105	62	25	95					
(V. stiff)																	
			36	SP 18		32		47.5									
(Hard)																	
			38	SP 19		40		49.0	95	40	22						
(Hard)																	
			40														
Water levels (from seabed) - High - 2.4m Low - 1.1m																	

LOCATION	SEE SITE PLAN		BORE HOLE No. 4 (cont.)	FIGURE 2B SHEET OF
SURFACE ELEVATION	From seabed level	DATUM		
INCLINATION	VERTICAL	AZIMUTH		
DRILL TYPE	HINDRILL RIG	DATE 1/8 to 5/8/86	PROJECT FISHERIES WILARE - LAUTOKA	

STRATIGRAPHY	GRAPHIC LOG	ELEVATION DEPTH metres	SAMPLE TYPE	SAMPLE NO.	BLOWS/100 DISTANCE (mm)	DRY DENSITY (Mg/m ³)	NATURAL MOISTURE CONTENT (%)	CLASSIFICATION DATA				STRENGTH DATA		OTHER
								LIQUID LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE (%)	% FINES (No. 200)	TYPE OF TEST	PARAMETERS Su (kPa) C (kPa) φ (degrees)	
CLAYEY SILT (v. stiff)			SP	20	16		65							
BASALTIC SANDSTONE Grey Extremely weathered with highly weathered rock frags.		42	SP	21	22		43							
BASALTIC ROCK Black, grey Beds of basalt and basaltic sandstone Moderately weathered		44	SP	22	>50									
End of Borehole - 46.2 metre		46												
		48												

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

GOLDER ASSOCIATES

JICA