5. 事業事前計画表(基本設計時)

1．案件名
ソロモン諸島アウキ市場及び桟橋建設計画
2．要請の背景
ソロモン諸島（以下「ソ」国）の一人当たり GNI(2004 年)は US$560 とされ、国内資源は他の太平洋島嶼国に比較して豊富ではあるが、開発は遅れている。自給自足目的の食料生産が「ソ」国村落部の主たる経済活動であり、世銀で自給自足目的の食料生産が GDP の 40%を占めると推定している。「ソ」国経済は 1999 年に始まった部族抗争の影響により低迷しており、国内生産が落ち込んだだけでなく、インフラや流通基盤の維持管理が十分に行われなかったため、GDP は未だに 1990 年代後半抗争前の水準には届いていない。 「ソ」国政府は、経済回復のために全国経済回復・改革・開発計画を策定し、生産セクターの再活性化、インフラの再建、基本的な社会サービスの回復等により、社会開発を促進することを国家開発計画の主要戦略としている。 首都ホニアラがあるガダルカナル島の北東に位置するマライタ州は、人口 140 千人（2005 年推定)、陸地面積 4,225 ㎢を有している。マライタ州でも自供自足目的の食料生産が経済の中心であり、住民は余剰生産物を市場で販売し、現金収入を得ている。よって、アウキ市場はマライタ州の自給経済社会に生きる村落住民にとって余剰生産物を販売し、現金を得る唯一の場であり、経済の中心である。しかしながら、施設は劣悪で、直射日光の下で、販売品の鮮度低下や劣化が進んでおり、商品の多くが雨ざらしになる等、劣悪な衛生状態になっている。また、既存市場に隣接する桟橋は建設後 30 年以上が経過し老朽化が激しく、特に下部工の崩壊の危険性が高い。 「ソ」国にとって部族抗争で破壊された経済の回復を図ることが最大の課題であり、そのためには、部族抗争の原因となったマライタ住民のマライタ州からの移動を防ぐために、マライタ州の村落住民の現金収入機会を拡大すること、マライタ州とホニアラとの間の人と物資の効率的な流通を確保することが緊急の課題となっている。
3．プロジェクト全体計画概要
(1) プロジェクト全体計画の目標（裨益対象の範囲及び規模） アウキ町とマライタ州における人と物資の流通が改善される。 裨益対象（アウキ町及びマライタ州住民、14 万人）(2005 年家計調査推定値) (2) プロジェクト全体計画の成果 アウキ市場及びアウキ桟橋が整備される。 (3) プロジェクト全体計画の主要活動 ア. 市場及び桟橋の運営維持管理のための人員を配置する。 イ. アウキ市場及びアウキ桟橋を整備する。 ウ. 市場施設を使用して、住民へ生産物販売、食料、必需品購入の場を提供する。 エ. 桟橋施設を使用して、ホニアラや他島への海上交通を確保する。 (4) 投入（インプット） ア． 日本側（本案件）：無償資金協力 8.47 億円 イ． 相手国側： （ア） 必要な人員 （イ） 電気水道の引き込み （ウ） 施設の運営/維持管理に係る経費

(5) 実施体制
主管官庁　：インフラ開発省
実施機関　：インフラ開発省及びマライタ州政府

4．無償資金協力案件の内容

(1) サイト
ソロモン諸島マライタ州アウキ町
(2) 概要
① アウキ町内における市場施設の建設
② アウキ湾内における桟橋施設の建設
(3) 相手国負担事項
電気水道の引き込み工事
(4) 概算事業費
概算事業費 8.49 億円（無償資金協力 8.47 億円、「ソ」国側負担 0.02 億円）
(5) 工期
詳細設計・入札期間を含め、約 24 ヶ月（予定）
(6) 貧困、ジェンダー、環境及び社会面の配慮
外灯の設置、便所や販売区画の適切な配置、景観に配慮しての施設設計、適切な水供給・汚水処理計画、ゴミ収集処理計画を計画に組み入れた。

5．外部要因リスク

(1) 地震や津波等の大規模な自然災害が発生しない。
(2) 「ソ」国内の政情、治安が悪化しない。

6．過去の類似案件からの教訓の活用

公衆便所の便器数男女比を実情に反映させ、女性用を増やした。

7．プロジェクト全体計画の事後評価に係る提案

(1) プロジェクト全体計画の目標達成を示す成果指標

成果指標	現状の数値	目標年における計画値
①出店者一人当たり売り場面積	1.8 ㎡/人	2.4 ㎡/人
②年間延べ出品者数	86,505 人	89,025 人
③乗客下船及び貨物積下し時間	(乗客下船)　平均 160 分 (貨物積下し)平均 240 分	(乗客下船)　平均 122 分 (貨物積下し)平均 222 分

(2) その他の成果指標
特になし
(3) 評価のタイミング
2011 年以降(施設完工後 1 年経過後)

6. 参考資料／入手資料リスト

番号	名称	形態	ｵﾘｼﾞﾅﾙ・ｺﾋﾟｰ	発行機関	発行年
1	Bidding Document for Post Conflict Emergency Rehabilitation Project, Procurement of Works	図書	コピー	Ministry of Finance, Government of Solomon Islands	2004.9
2	Technical Specifications and Drawings for Marine Infrastructure Development Plan (Phase 1)	図書	コピー	Ministry of Infrastructure Development	2004
3	Technical Specifications and Drawings for Marine Infrastructure Development Plan (Phase 2)	図書	コピー	Ministry of Infrastructure Development	2005
4	Ships Registration in the Solomon Islands	図書	コピー	Ministry of Infrastructure Development , Marine Division	2006
5	Aerial Photograph (Auki Bay)	写真	ｵﾘｼﾞﾅﾙ	Dept. of Lands and Survey	2006.8
6	Cadastral map (Auki)	地図	ｵﾘｼﾞﾅﾙ	Dept. of Lands and Survey	2005
7	Solomon Islands Cyclone Tracks (1966-1988)	地図	ｵﾘｼﾞﾅﾙ	Dept. of Lands and Survey	1988
8	Bathymetric Plan (Auki Bay)	海図	ｵﾘｼﾞﾅﾙ	Dept. of Lands and Survey	1974
9	Coordinates List (Auki)	図書	コピー	Lands and Survey Service, Malaita	1966
10	Earthquake Epicenter Distribution in the Solomon Islands	地図	ｵﾘｼﾞﾅﾙ	Ministry of Natural Resources	
11	Meteorological Data	図書	コピー	Solomon Is. Meteorological Service	2007
12	Market bylaw	図書	コピー	Honiara Municipal Office	1966
13	Household Income & Expenditure 2005/06	図書	コピー	Ministry of Finance	2006

7. その他の資料･情報

7-1. 既存桟橋の劣化度調査結果

7-2. 自然条件調査結果

7-2-1. 自然条件調査位置図

7-2-2. 地形測量図

7-2-3. 地盤調査結果

7-2-4. 流況調査結果

7-2-5. 水質調査結果

7-3. アウキ市場及び桟橋利用者インタビュー調査の概要

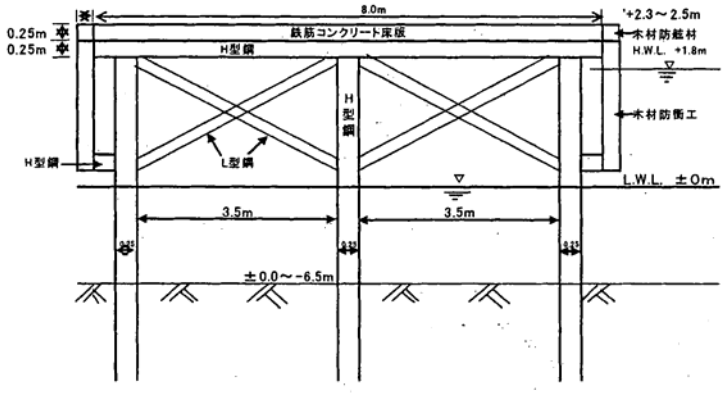
ソロモン諸島国
アウキ既設桟橋の劣化度調査結果

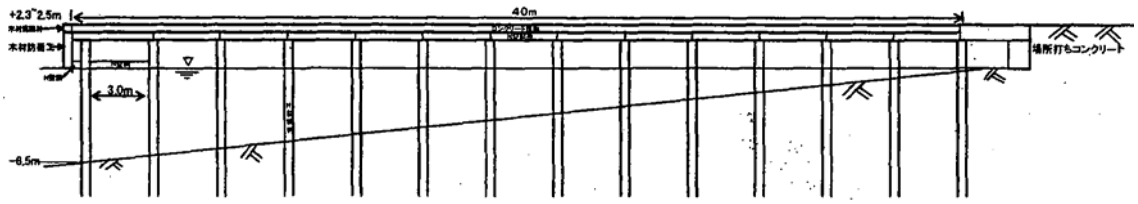
1. 既設桟橋の劣化度調査

- 既存桟橋を目視観察・コンクリート打検調査等により劣化度を調査した。
- 上部工の劣化が激しく、特に渡版コンクリートは、添付資料－Ａに赤色で示した部分が鉄筋の露出、腐食による爆裂、コンクリートの剥落が著しく最悪の劣化度判定標準 Ⅴ 度に相当し、火急に補修あるいは建替えが必要である。
  （資料－Ａ：　既設桟橋渡版コンクリートの劣化度診断結果　参照）
- 下部工は詳細調査及び補修が必要であり、劣化度判定標準Ⅱ～Ⅲ度（必要に応じて調査・補修）程度に相当する。
- 結論として、上部工は全改修が必要であり、下部工はすぐ崩壊する危険性は少ないものの建設後 50 年弱という経過を考慮すると、耐久年数も長くは期待できない。このため桟橋は新規に建替える方が妥当と考えられる。

(1)　既設桟橋の構造

- 予備調査でも報告されているとおり、桟橋の建設は 1960 年代であり、その後、1990 年頃に鉄筋コンクリート製の渡版の補修工事が行われたとのことである。
- 既存桟橋の構造を図－１に示す。





図－１　既存桟橋の構造

- 幅員は８ｍ、天端高は約＋2.7m である。下部工は、H型鋼杭（H-250x250x15x18mm）を杭間隔 3.5m で打設され、それぞれをＬ形鋼（L-130x75mm）のブレース材を溶接により結合した構造である。
- 1960 年代に建設されているので築約 50 年弱と考えられ下部工の鋼材腐食の状態は経年数相応に進行しており、当時の施工方法から考えると錆代によって経年後の必要鋼材肉厚を確保した設計と考えられる。

(2) 劣化度診断

既存桟橋のH型鋼杭、鉄筋コンクリート製の渡版の上面、底面の劣化度の調査を行った。

目視観察とコンクリート打検等により、コンクリート強度、コンクリート材料、鋼材部調査等により、現在の劣化度、安全度を判定し、今後の利用安全性を考察した。

劣化度の診断は、「港湾構造物の維持補修マニュアル」（財）沿岸開発技術センター､H.16 年 6 月）に準じて行った。同マニュアルは、桟橋式係船岸の点検項目および桟橋上部工の劣化度判定として次のように判定基準を示している。

表－1 桟橋式係船岸の点検項目

点検の対象変状	位　置	点検項目
杭の腐食	杭	腐食状況、杭肉厚
上部工のひび割れ	上部工	ひび割れ状況（剥離・損傷）
渡板の破損・沈下	渡板	沈下、移動、損傷状況

出所：『港湾構造物の維持補修マニュアル』（(財) 沿岸開発技術センター、平成 11 年 6 月）

表－2 桟橋上部工の劣化度判定標準

劣化度 部材/項目	0	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ
鉄筋の腐食	なし	コンクリート表面に点錆がみられる	一部に錆汁がみられる	錆汁多し	浮き錆多し	浮き錆著しい
ひび割れ	なし	一部にひび割れがみられる	ひび割れやや多し	ひび割れ多し(ひび割れ幅数 mm 以上のひび割れ含む)	ひび割れ幅数 mm 以上のひび割多数	
かぶりコンクリートの剥離･剥落	なし	なし	一部に浮きがみられる	一部に剥離･剥落がみられる	剥離･剥落多し	剥離･剥落が著しい
		↓		↓	↓	
点検による調査要否の判定	調査、補修の必要なし (点検継続)		必要に応じ調査、補修		要補修	

(3) 目視観察調査

両施設の破損や損傷による劣化状況を目視観察した。各部位毎に鉄筋・鋼杭の腐食・ひび割れ・かぶりコンクリートの剥離・剥脱等について評価を実施した。

＜下部工＞

- 下部構造のH型鋼杭（H-250x250x15x18mm）の劣化は直ぐに利用に危険を伴うという程ではないが、経年相応の劣化が認められた。タールエポキシ塗装による重防食塗装が施されていた様だが、すべて剥離しており、浮き錆も多々認められ、H鋼のウェブに腐食により孔が空いていたものが数カ所あった。水中部の杭の状態は水中ビデオ・カメラで調査したがカキなどの付着生物が認められたが、目視の限りではH型鋼杭の折損は認められなかった。
- Ｌ形鋼（L-130x75mm）のブレース材は、タールエポキシ塗装による重防食塗装が施されていた様だが、すべて剥離しており、浮き錆が多々認められた。部材の切断、孔食は観られなかった。

＜上部工＞

- 上部の渡版はプレキャストの鉄筋コンクリート版（3m 長ｘ60～70cm 幅ｘ25cm 厚）を敷き並べたものである。鉄筋コンクリート版の配筋は 150mm～200mm ピッチで長手方向に推定 D16 程度、短手方向には D12 程度と思われる鉄筋が配筋されていた。
- 上部の鉄筋コンクリート製の渡版は、もはや補修方法の検討を要しない程に劣化が進んでいた
- 特に渡版底面は、1990 年代に補修された先端スパンを除いて全 154 ブロック中 141 ブロック(＝91.6%)において鉄筋爆裂によりコンクリートが剥落しており、最悪の劣化度と判定される。渡版上面も全 154 ブロック中 124 ブロック(＝80.5%%)が鉄筋が露出したり、すり減りにより摩耗が進んでいる。特に最も船の荷役に使用される桟橋中央部、陸上部との付け根周辺のブロックは既に鉄筋が露出する程に進行している。
  （※資料－Ａ；　既設桟橋渡版コンクリートの劣化度診断結果　参照）
- その他の場所も全面に渡って傷による部材欠損や、磨り減りによる凸凹、亀裂が観られる。コンクリート表面を注視すると石灰岩の骨材を使用した部分は骨材そのものも周囲のモルタル分と一様に磨り減っており、現地で産する石灰岩骨材のすり減り強度不足を疑わせる。
- フェノールフタレインによる中性化試験を実施した結果、桟橋底面のコンクリート部は、本来アルカリ性を保っていなければならないが、著しい中性化が認められた。
- アルカリ骨材反応と考えられる様なクラックなどは観られなかった。
- 底板の鉄筋カブリ(コンクリート表面から鉄筋までの距離)は、約５ｃｍ程度であり、現在の海洋構造物の鉄筋コンクリート基準（７ｃｍ）からすると若干カブリが少ないが、施工時の鉄筋位置の不正と思われるような著しいカブリ不足、配筋不正部位は認められなかった。

(4) コンクリート打検調査

- 人力によるハンマー打検時の反射音等の把握により既設コンクリートの一体性等を推定した。また、既存コンクリートが有する圧縮強度について、シュミットハンマーを用いて圧縮強度を推定した。
- 渡版底面のコンクリートは先端部を除いて、ほぼ全域が鉄筋爆裂により被りコンクリートが剥落するか浮いていた。
- シュミットハンマーにより、プレキャスト・コンクリート渡版を桟橋上 14 箇所について、各箇所９回試験を行い平均値を求めた。　推定圧縮強度は、平均で 31.6 N/mm2（最大 43.5 N/mm2、最小 21.1 N/mm2）とほぼ適正な値を示した。（※明らかにコンクリート躯体が浮き、剥がれている部位は除き、健全と思われる部位を選んで行った試験値）
（※資料－Ｂ：　シュミットハンマーによる既存桟橋上部コンクリート渡版の推定圧縮強度　参照）

写真－1　既存桟橋の劣化状況

資料－A 既設桟橋渡版コンクリートの劣化度診断結果

Deterioration Grade of Existing Auki Jetty

Date: Feb.15-18, 2007

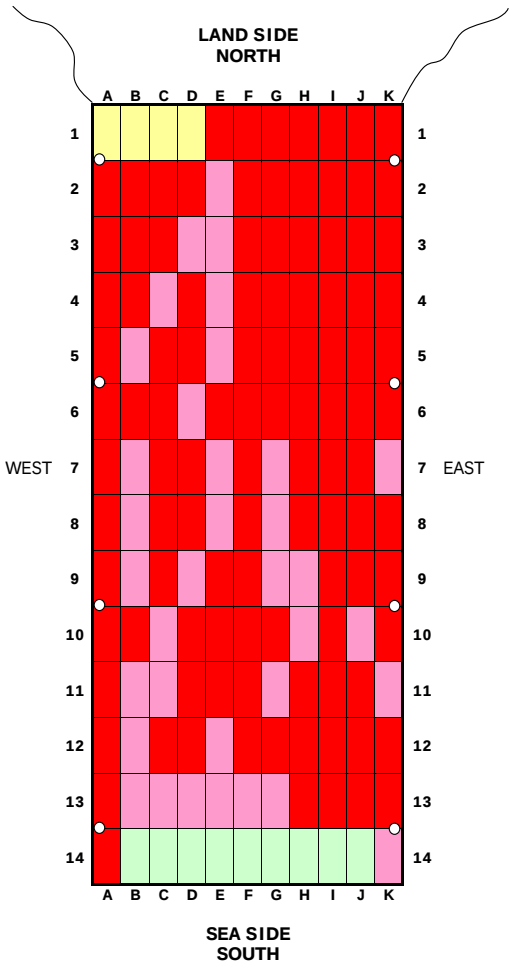
Inspector: T. Inki, T.Ogawa / Fisheries Engineering Co., Ltd.

既設桟橋渡版コンクリートの劣化度診断結果

検査日： 2007年2月15日～18日

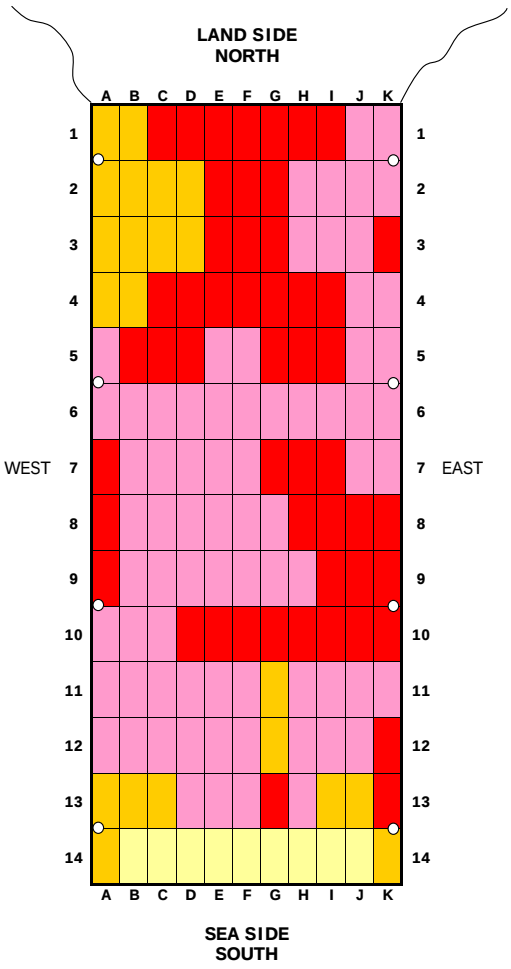
検査者： 隠木、小川 ／ 水産エンジニアリング株式会社

BOTTOM
底面



０度～Ⅰ度　5.8%
Ⅱ度～Ⅲ度　2.6%
Ⅳ度～Ⅴ度　91.6%

UPPER
上面



０度～Ⅰ度　0.0%
Ⅱ度～Ⅲ度　19.5%
Ⅳ度～Ⅴ度　80.5%

凡例：　劣化度判定　　Legend: Result of Inspection

０度	調査・補修の必要無し。（点検継続）	Further survey, repair is unnecessary. (monitoring should be continued)
Ⅰ度		
Ⅱ度	必要に応じ調査・補修	Survey, repair is required depending on the part.
Ⅲ度		
Ⅳ度	要補修（建替えを含む）	Immediate repair is required. (incl. re-construction of the jetty)
Ⅴ度		

※「港湾構造物の維持補修マニュアル」（財）沿岸開発技術センター、H.16年6月）による。

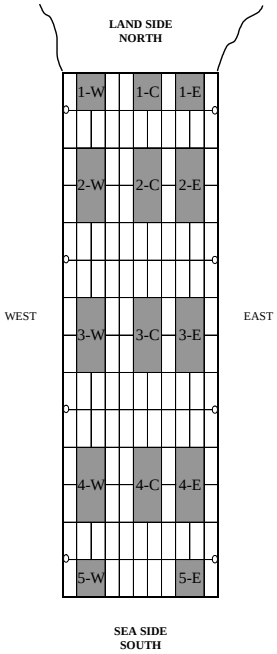
資料－Ｂ　シュミットハンマーによる既設桟橋上部コンクリート渡版の推定圧縮強度

Schmidt-Hammer Test Result for Existing Auki Jetty Deck Slab Concrete

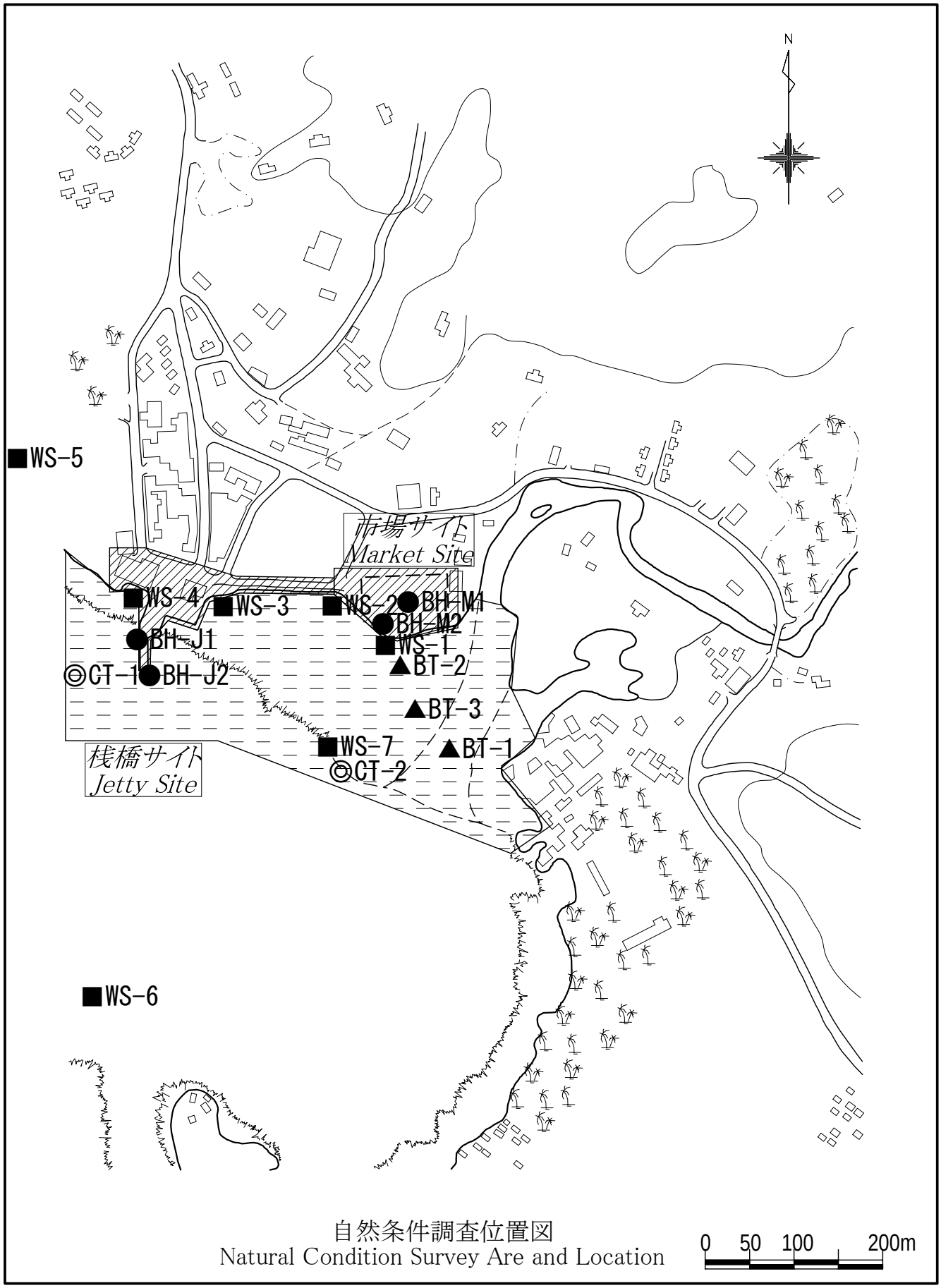
Date: **Feb.11, 2007**

Inspector: **T. Inki, T.Ogawa / Fisheries Engineering Co., Ltd.**

	Reading Value										Strength (Cylinder)
Location	1	2	3	4	5	6	7	8	9	Average	N/mm2
1-E	32	32	32	30	33	27	23	29	26	29	21.1
1-C	42	32	33	34	32	33	43	33	28	34	28.2
1-W	40	32	35	34	35	39	37	42	44	38	32.6
2-E	44	47	50	43	44	47	43	45	45	45	43.5
2-C	30	38	35	32	37	31	30	40	30	34	27.1
2-W	44	40	43	42	44	42	44	42	44	43	39.9
3-E	32	40	28	40	30	32	31	40	32	34	27.4
3-C	40	41	32	39	43	38	41	35	35	38	33.5
3-W	33	33	38	33	40	40	38	35	37	36	30.9
4-E	45	49	46	32	39	42	46	42	41	42	39.4
4-C	38	32	42	27	33	40	26	39	34	35	28.4
4-W	33	33	38	33	40	40	38	35	37	36	30.9
5-W	32	35	30	36	34	37	34	30	33	33	26.8
5-E	33	40	40	32	38	46	38	34	38	38	32.7
										Avg.	31.6
										Max.	43.5
										Min.	21.1



TEST LOCATION (試験位置図)

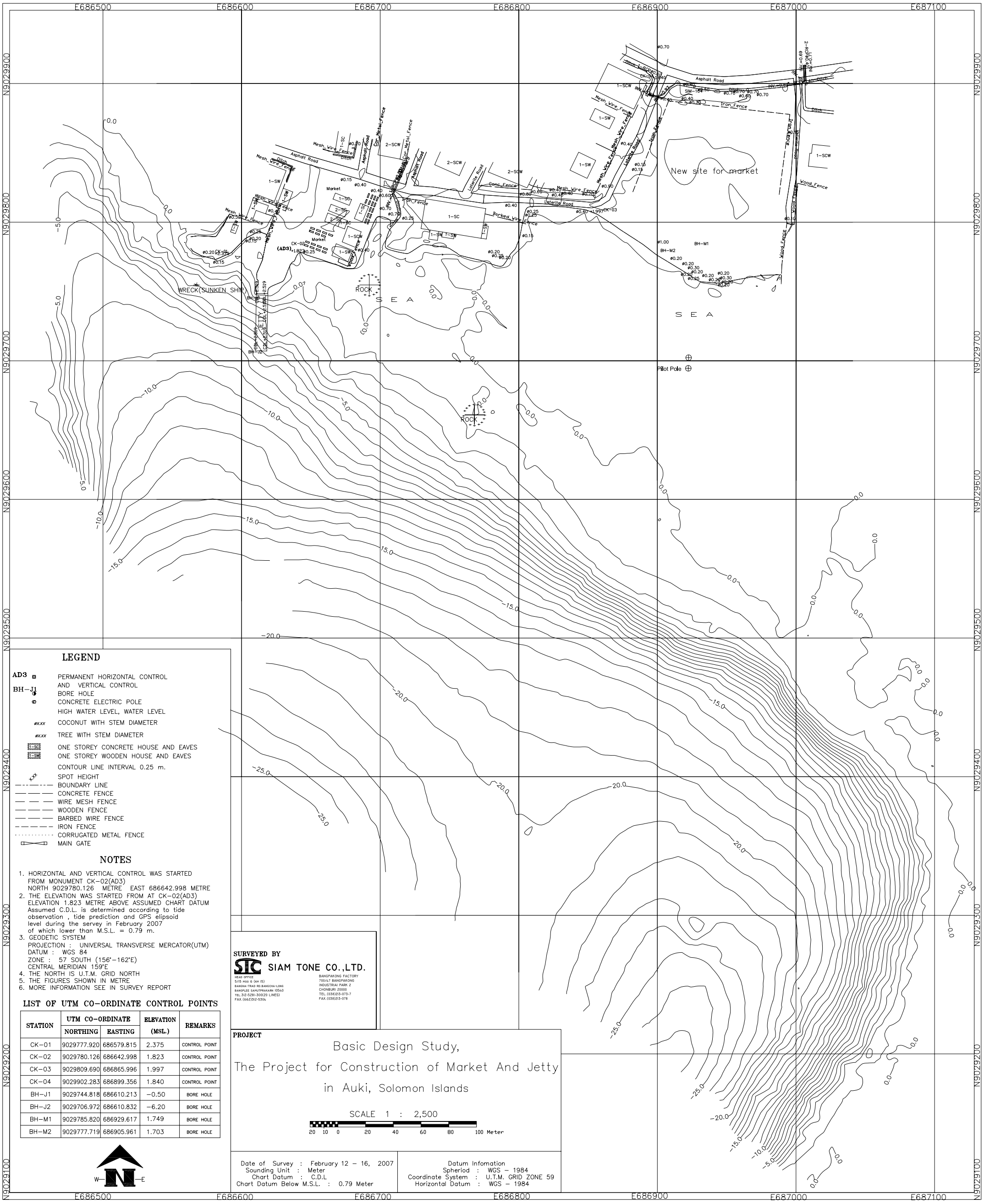


自然条件調査位置図
Natural Condition Survey Are and Location

▨ 陸上地形測量範囲 Topographic Survey Area　●BH ボーリング位置 Borehole Position

□ 海底地形測量範囲 Bathymetric Survey Area　▲BT 底質調査位置 Sediment Survey Station

◎CT 流況観測位置 Current Measurment Station　■WS 水質調査位置 Water Survey



LEGEND

AD3	PERMANENT HORIZONTAL CONTROL AND VERTICAL CONTROL
BH−J1	BORE HOLE
	CONCRETE ELECTRIC POLE
	HIGH WATER LEVEL, WATER LEVEL
ø*x.xx*	COCONUT WITH STEM DIAMETER
ø*x.xx*	TREE WITH STEM DIAMETER
1−SC	ONE STOREY CONCRETE HOUSE AND EAVES
1−SW	ONE STOREY WOODEN HOUSE AND EAVES
	CONTOUR LINE INTERVAL 0.25 m.
x.xx	SPOT HEIGHT
	BOUNDARY LINE
	CONCRETE FENCE
	WIRE MESH FENCE
	WOODEN FENCE
	BARBED WIRE FENCE
	IRON FENCE
	CORRUGATED METAL FENCE
	MAIN GATE

NOTES

1. HORIZONTAL AND VERTICAL CONTROL WAS STARTED FROM MONUMENT CK−02(AD3)
   NORTH 9029780.126 METRE EAST 686642.998 METRE
2. THE ELEVATION WAS STARTED FROM AT CK−02(AD3)
   ELEVATION 1.823 METRE ABOVE ASSUMED CHART DATUM
   Assumed C.D.L. is determined according to tide observation , tide prediction and GPS elipsoid level during the servey in February 2007 of which lower than M.S.L. = 0.79 m.
3. GEODETIC SYSTEM
   PROJECTION : UNIVERSAL TRANSVERSE MERCATOR(UTM)
   DATUM : WGS 84
   ZONE : 57 SOUTH (156°−162°E)
   CENTRAL MERIDIAN 159°E
4. THE NORTH IS U.T.M. GRID NORTH
5. THE FIGURES SHOWN IN METRE
6. MORE INFORMATION SEE IN SURVEY REPORT

LIST OF UTM CO−ORDINATE CONTROL POINTS

STATION	UTM CO−ORDINATE		ELEVATION (MSL.)	REMARKS
	NORTHING	EASTING		
CK−01	9029777.920	686579.815	2.375	CONTROL POINT
CK−02	9029780.126	686642.998	1.823	CONTROL POINT
CK−03	9029809.690	686865.996	1.997	CONTROL POINT
CK−04	9029902.283	686899.356	1.840	CONTROL POINT
BH−J1	9029744.818	686610.213	−0.50	BORE HOLE
BH−J2	9029706.972	686610.832	−6.20	BORE HOLE
BH−M1	9029785.820	686929.617	1.749	BORE HOLE
BH−M2	9029777.719	686905.961	1.703	BORE HOLE

W — N — E

SURVEYED BY

SIAM TONE CO.,LTD.

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PROJECT

Basic Design Study,

The Project for Construction of Market And Jetty in Auki, Solomon Islands

SCALE 1 : 2,500

20 10 0 20 40 60 80 100 Meter

Date of Survey : February 12 − 16, 2007
Sounding Unit : Meter
Chart Datum : C.D.L
Chart Datum Below M.S.L. : 0.79 Meter

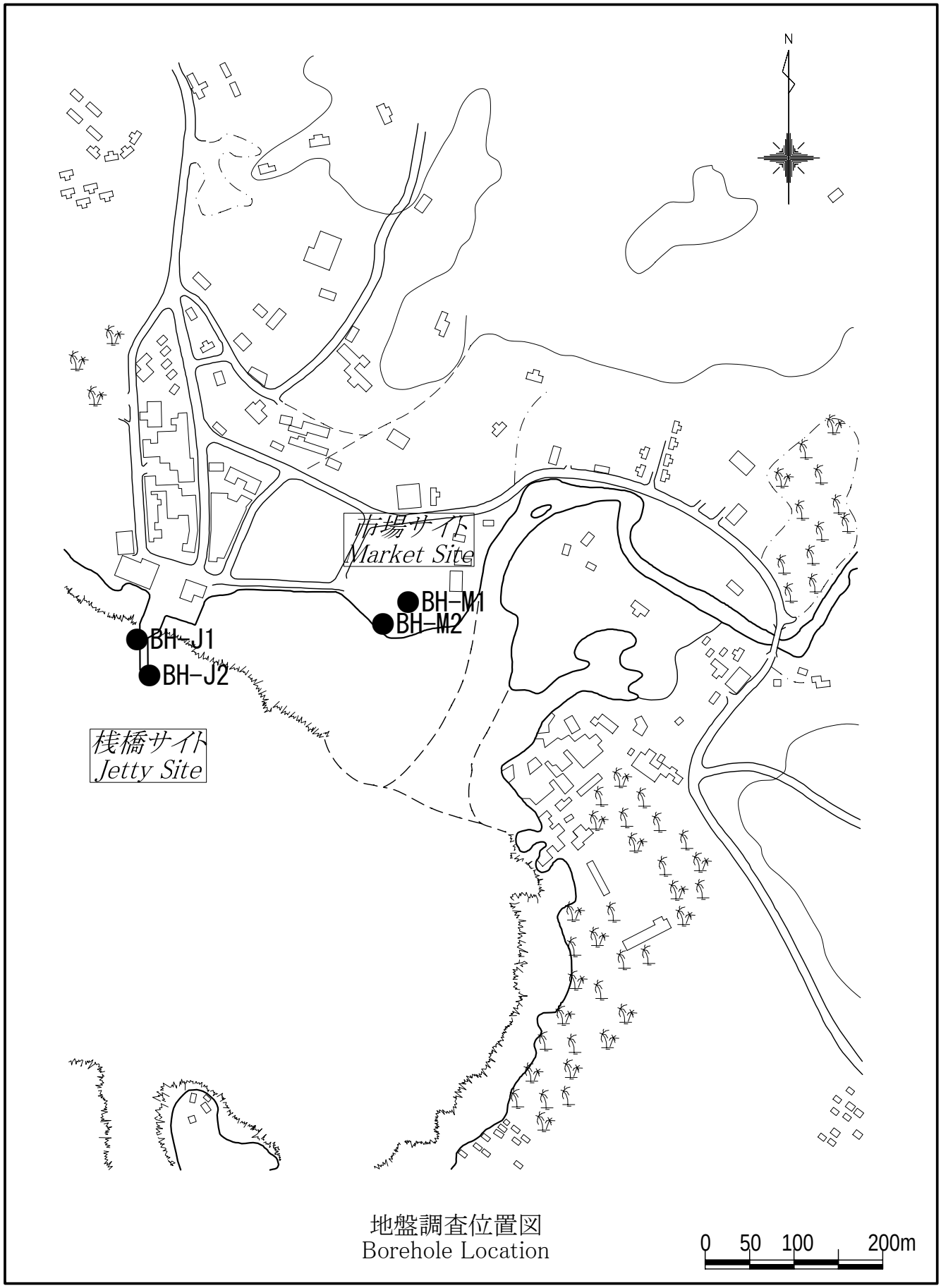
Datum Infomation
Spheriod : WGS − 1984
Coordinate System : U.T.M. GRID ZONE 59
Horizontal Datum : WGS − 1984

ソロモン諸島国
アウキ市場建設･埠頭修復計画
地盤調査結果

The Project for
Construction of Market and Jetty
in Auki, Solomon Islands
Geotechnical Survey Result

ボーリング位置図
土質試料写真

Borehole Location
Photographs of Soil Samples



地盤調査位置図
Borehole Location

BH-J1, 26.0 m depth, Sea Water Depth 2.1 m, Feb 14-18, 07

BH-J2, 23.0 m depth, Sea Water Depth 6.5 m, Feb 19-20, 07

BH-M1, 27.5 m depth, Water Level -1.05 m, Feb 11-14, 07

BH-M2, 27.5 m depth, Water Level -1.10 m, Feb 21-23, 07

ボーリング No.BH-J1
（桟橋サイト／既設桟橋汀線側）

Borehole No.BH-J1
(Jetty Site / Foot of the Existing Jetty)

BH-J1 (1/1)

SIAM TONE CO., LTD.

BORING LOG

BORING NO. BH-J1

SHEET 1 OF 1

PROJECT: Basic Design, Auki New Market and Jetty Renovation

LOCATION: West Side of Jetty at Shoreline Abutment

CLIENT: Fisheries Engineering Co., Ltd.

Coordinates: N: 9029744.82 E: 686610.21

Ground Elevation (m-CDL): -2.1 m

Max.Drilling Depth: 26.00 m

Seawater Depth: 2.10 m

Starting Date: 14/2/2007

Finishing Date: 18/2/2007

DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)
1		0.0-4.0 m, BACKFILL, no sample retreived, probably wash out materials from backfilled stone at shoreline abutment and backfilled river gravel at shoreline			
2					
			Sample Loss		
3					
4		4.0-7.0 m, SP, silty SAND, silt-very fine sand, with<10% clay, poorly graded, loose, non-plasticity, greenish brown	SS	2	45
5			SS	3	45
6			SS	4	45
7		7.0-15.5 m, CL, silty CLAY, with 30% silt , soft, low-medium plasticity, blackish brown	SS	5	45
8					
9			SS	6	45
10			SS	7	45
11					
12			SS	8	45
13			SS	9	45
14					
15			UD	1	100
16		15.5-17.5 m, SP, SAND with gravel and clay, poorly graded, silt-fine grained subangular sand, with 20% fine gravel of subangular reef limestone and shell with max ~1 cm ϕ and 10% clay, loose-medium dense, very low-non-plasticity,	SS	10	45
17		greenish brown	Sample Loss		
18		17.5-21.0 m, SW, SAND with gravel and clay, well graded,medium-coarse grained subangular sand , with 30% fine gravel of subangular reef limestone and shell with max	SS	11	45
19		~3 cm ϕ and <10% clay, dense, non-plasticity, coarser down depth, greenish brown	SS	12	45
20			Sample Loss		
21			SS	13	45
22		21.0-24.5 m, CL, silty CLAY, with 30% silt , soft, medium plasticity, blackish brown	SS	14	45
23			SS	15	45
24					
25		24.5-26.0 m, REEF LIMESTONE, hard but brittle, pale yellowish white, moderately-highly weathered, can not acchieved by rock coring, when SPT - crushed rock sample obtained	SS	16	45

Total Unit Weight (Ton/m^3): 1.6 1.8 2.0

Plastic Limit / Natural Water Content / Liquid Limit (%): 30 60 90 120

Unconfined Compressive Strength (Ton/m^2): 2 4 6

SPT Blow Count (Blow/ft): 10 20 30 40

SPT values: 7, 7, 5, 6, 4, 4, 5, 5, 4, 2, 3, 9, 11, 5, 4, 9, 42

Table 3 Summary of Soil Properties Test Results

Borehole No.	sample No.	Depth (m)		Water Content (%)	Total Unit Weight (ton/m^3)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	Specific Gravity, Gs	Grain Size Analysis (%)					Undrained Shear Strength, c_u (ton/m^2)	Modulus @50% Stress, E50	Colour	USCS	Soil Description
									Gravel	Sand			Silt+Clay					
		From	To							Coarse	Medium	Fine						
BH-J1	SS-3	5.00	5.45	63.9	-	NP	NP	2.59	0	0	2	34	63			Greenish Brown	-	Sandy SILT
BH-J1	SS-7	10.00	10.45	65.9	1.59	NP	NP	2.61	0	0	1	14	84			Blackish Brown	-	SILT with sand
BH-J1	UD-1	14.50	15.50	48.6	1.69	NP	NP	2.66	0	1	8	20	71	4.6	238	Blackish Brown	-	SILT with sand
BH-J1	SS-10	15.50	15.95	39.1	-	NP	NP	2.70	22	9	12	14	42			Greenish Brown	SM	Silty SAND with gravel
BH-J1	UD-2	16.00	17.00	46.8	1.69	61.3	23.5	2.70	1	0	1	5	93	4.6	294	Greenish Brown	MH	SILT with sand
BH-J1	SS-12	18.50	18.95	24.9	-	NP	NP	2.69	46	18	10	5	20			Greenish Brown	GM	Silty GRAVEL with sand
BH-J1	SS-15	23.00	23.45	38.1	1.77	44.7	17.4	2.62	0	0	0	9	91			Blackish Brown	MH	SILT

Note : UD denotes Shelby Tube Sample, D denotes Split Spoon Sample and NP denotes Nonplastic

*** denotes insufficient soil for testing**

SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	SS-3	5.00-5.45	Sandy SILT	63.9	-	NP	NP	NP	2.59	0	0	2	34	63

UNIT WEIGHT DETERMINATION

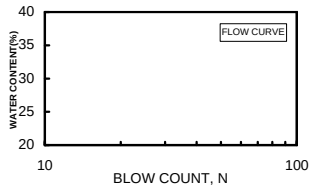
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.19	19.57
Wt. of Wet Soil + Can (g)	116.25	78.08
Wt. of Dry Soil + Can (g)	78.61	55.16
Water Content, w_c (%)	**63.3**	**64.4**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	G
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	33.06
Temperature (deg. C)	21.8
Wt. of Water+Soil+Flask (g)	681.21
Wt. of Water + Flask (g)	660.88
Specific Gravity, Gs	**2.59**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 23.69

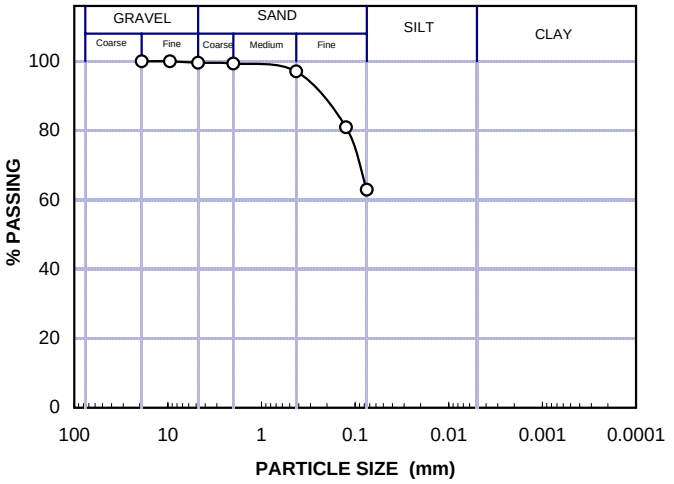
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.10	**99.6**
2.00	0.05	**99.4**
0.425	0.54	**97.1**
0.125	3.82	**81.0**
0.075	4.27	**62.9**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	SS-7	10.00-10.45	SILT with sand	65.9	1.59	NP	NP	NP	2.61	0	0	1	14	84

UNIT WEIGHT DETERMINATION

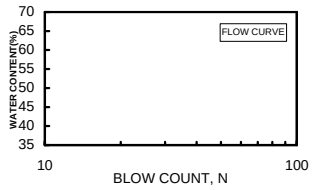
Sample Height (cm)	6.72
Sample Diameter (cm)	3.51
Wt. of Tube (g)	19.20
Wt. of Wet Soil +Tube (g)	122.79
Total Unit Weight (g/cc)	**1.59**
Dry Unit Weight (g/cc)	**0.96**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.20	19.23
Wt. of Wet Soil + Can (g)	122.79	105.21
Wt. of Dry Soil + Can (g)	81.93	70.81
Water Content, w_c (%)	**65.1**	**66.7**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	51.43
Temperature (deg. C)	21.8
Wt. of Water+Soil+Flask (g)	696.70
Wt. of Water + Flask (g)	664.96
Specific Gravity, Gs	**2.61**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 27.36

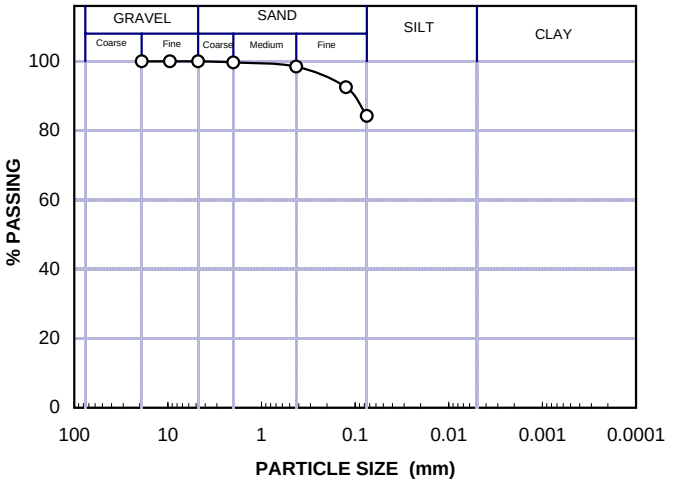
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.08	**99.7**
0.425	0.34	**98.5**
0.125	1.62	**92.5**
0.075	2.27	**84.2**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	UD-1	14.50-15.50	SILT with sand	48.6	1.69	NP	NP	NP	2.66	0	1	8	20	71

UNIT WEIGHT DETERMINATION

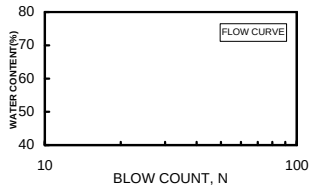
Sample Height (cm)	7.10
Sample Diameter (cm)	3.53
Wt. of Tube (g)	19.23
Wt. of Wet Soil +Tube (g)	136.91
Total Unit Weight (g/cc)	**1.69**
Dry Unit Weight (g/cc)	**1.14**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.23	19.28
Wt. of Wet Soil + Can (g)	136.91	135.09
Wt. of Dry Soil + Can (g)	98.49	97.12
Water Content, w_c (%)	**48.5**	**48.8**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	G
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	133.32
Temperature (deg. C)	20.5
Wt. of Water+Soil+Flask (g)	744.47
Wt. of Water + Flask (g)	661.11
Specific Gravity, Gs	**2.66**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 128.90

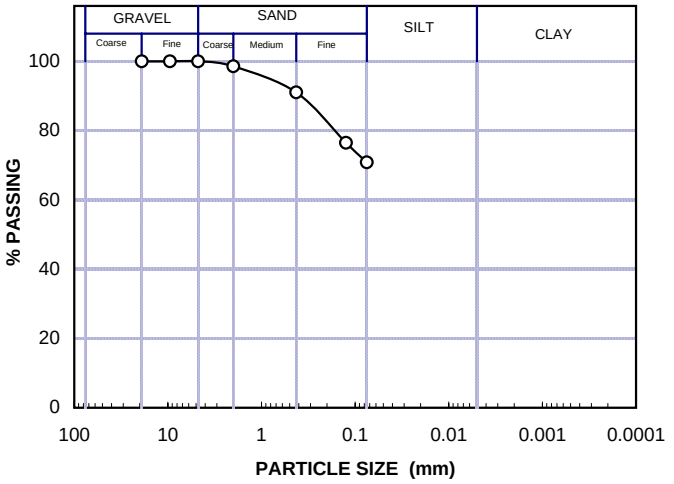
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	1.85	**98.6**
0.425	9.69	**91.0**
0.125	18.78	**76.5**
0.075	7.23	**70.9**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

CONSOLIDATION TEST

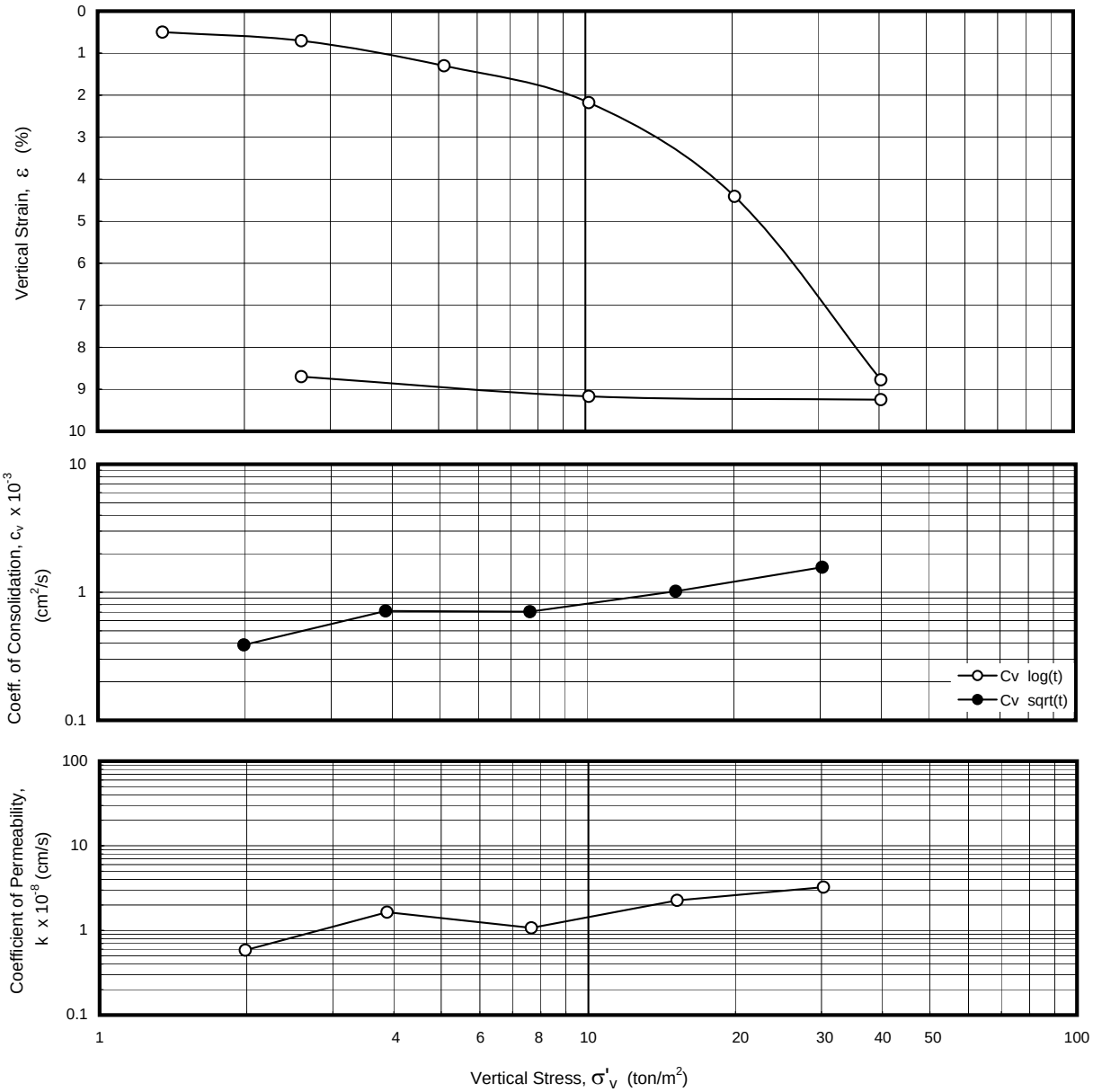
Project: New Auki Market & Jetty Renovation Location: W of Jetty @ Shoreline Tested by: MAAG

Borehole: BH-J1 Sample No: UD-1 Depth (m.): 14.50 - 15.50

Soil Description:	SILT with sand				
Water Content, w_n	51.7	%	Liquid Limit, LL	NP	%
Initial Void Ratio, e_0	1.400		Plasticity Index, PI	NP	%
Total Unit Weight, γ_t	1.68	ton/m^3	Height of Solid, H_s	0.833	cm.
Specific Gravity, G_s	2.66		Preconsolidation Pressure, $\sigma_{c'}$	14.3	ton/m^2

Vertical Stress (ton/m^2)	Vertical Strain ε_{100} (%)	Vertical Strain ε_f (%)	Void ratio e_{100}	Void ratio e_f	Time t_{90} (min.)	Time t_{50} (min.)	Coefficient of Consolidation c_v x 10^{-3} (cm^2/sec) sqrt(t)	log(t)	Average	Permea. k x 10^{-8} (cm/sec)	Compres. Ratio CR
1.4	0.5	0.6	1.388	1.387							
2.6	0.7	0.8	1.383	1.380	36.0	10.0	0.4	0.3	0.4	0.6	0.007
5.1	1.3	1.3	1.369	1.368	19.4	4.8	0.7	0.7	0.7	1.6	0.020
10.2	2.2	2.3	1.348	1.345	19.4	6.0	0.7	0.5	0.6	1.1	0.030
20.2	4.4	4.8	1.294	1.285	13.0	3.0	1.0	1.0	1.0	2.3	0.075
40.4	8.8	9.2	1.189	1.178	7.8	2.0	1.6	1.4	1.5	3.2	0.145
10.2	9.2	9.1	1.180	1.182							-0.007
2.6	8.7	8.6	1.191	1.194							0.008

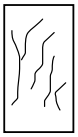
Note: Compression Ratio = $\frac{\Delta\varepsilon}{\log(\sigma_2/\sigma_1)}$

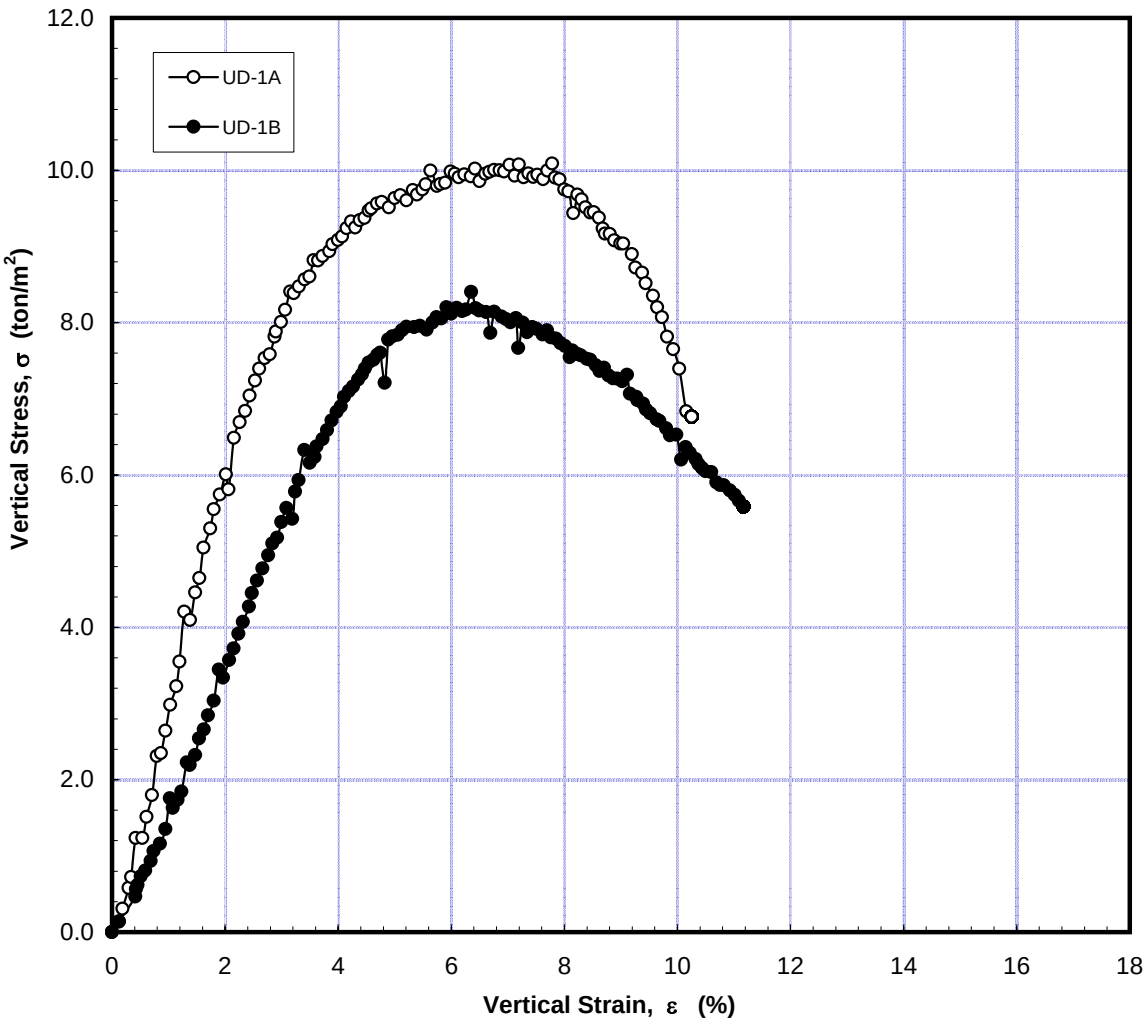


SIAM TONE

UNCONFINED COMPRESSION TEST

Project	New Auki Market and Jetty Renovation			Borehole No :	BH-J1
Location:	Jetty Shoreline Abutment			Sample No :	UD-1
Tested by:	MAAG	Date :	Mar 2007	Depth (m) :	14.50-15.50

Test Summary			
Soil Description:	SILT with sand		
Test No.	UD-1A	UD-1B	
Water Content, w_n	51.4	47.7	%
Total Unit Weight, γ_t	1.63	1.66	ton/m^3
Unconfined Compressive Strength, q_u	10.1	8.4	ton/m^2
Undrained Shear Strength, c_u	5.0	4.2	ton/m^2
Strain at Failure, ε_f	7.8	6.4	%
Modulus at 50% Stress Level, E_{50}	301	176	ton/m^2
Failure Mode			



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	SS-10	15.50-15.95	Silty SAND with gravel (SM)	39.1	-	NP	NP	NP	2.70	22	9	12	14	42

UNIT WEIGHT DETERMINATION

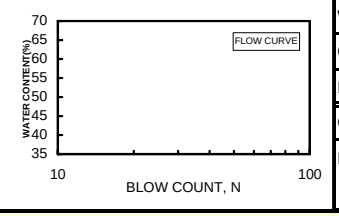
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.62	19.14
Wt. of Wet Soil + Can (g)	115.99	157.71
Wt. of Dry Soil + Can (g)	89.21	118.25
Water Content, w_c (%)	**38.5**	**39.8**

ATTERBERG LIMITS

w_p		w_l			
Test 1	Test 2				



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	90.59
Temperature (deg. C)	21.3
Wt. of Water+Soil+Flask (g)	719.02
Wt. of Water + Flask (g)	661.87
Specific Gravity, Gs	**2.70**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 35.49

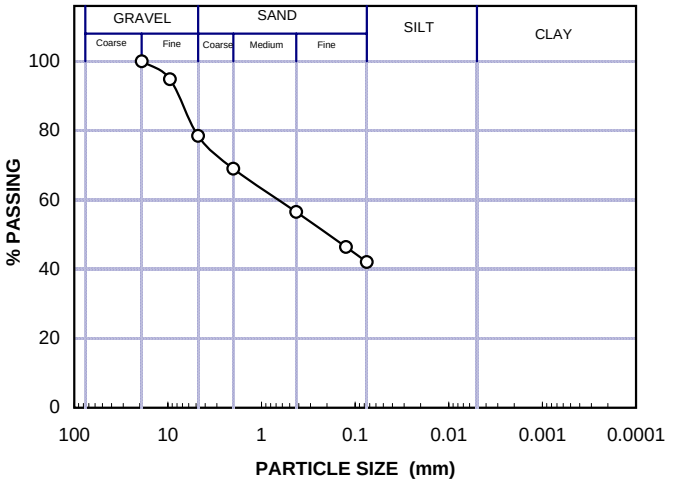
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	1.83	**94.8**
4.75	5.81	**78.5**
2.00	3.36	**69.0**
0.425	4.43	**56.5**
0.125	3.60	**46.4**
0.075	1.53	**42.1**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	UD-2	16.00-17.00	SILT (MH)	46.8	1.69	61.3	37.8	23.5	2.70	1	0	1	5	93

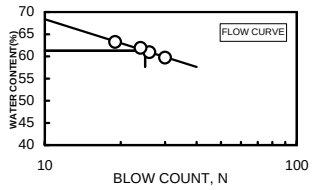
UNIT WEIGHT DETERMINATION

Sample Height (cm)	7.14
Sample Diameter (cm)	3.48
Wt. of Tube (g)	15.68
Wt. of Wet Soil +Tube (g)	130.58
Total Unit Weight (g/cc)	**1.69**
Dry Unit Weight (g/cc)	**1.15**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	30	26	24	19
Wt. of Can (g)	15.68	19.14	14.22	14.58	27.46	28.51	30.39	27.50
Wt. of Wet Soil + Can (g)	130.58	157.71	24.35	25.13	32.35	33.39	35.27	32.17
Wt. of Dry Soil + Can (g)	90.42	118.25	21.50	22.31	30.53	31.54	33.41	30.36
Water Content, w_c (%)	**53.7**	**39.8**	39.27	36.35	59.70	60.94	61.92	63.23

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	118.23
Temperature (deg. C)	22.5
Wt. of Water+Soil+Flask (g)	739.30
Wt. of Water + Flask (g)	664.83
Specific Gravity, Gs	**2.70**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 74.74

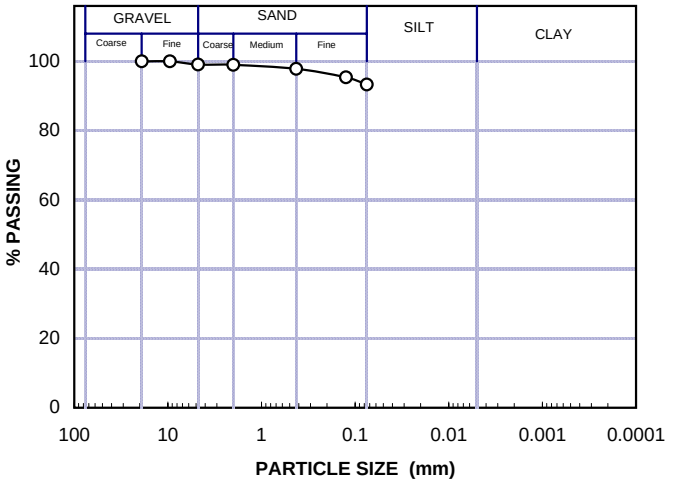
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.70	**99.1**
2.00	0.06	**99.0**
0.425	0.85	**97.8**
0.125	1.85	**95.4**
0.075	1.53	**93.3**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

CONSOLIDATION TEST

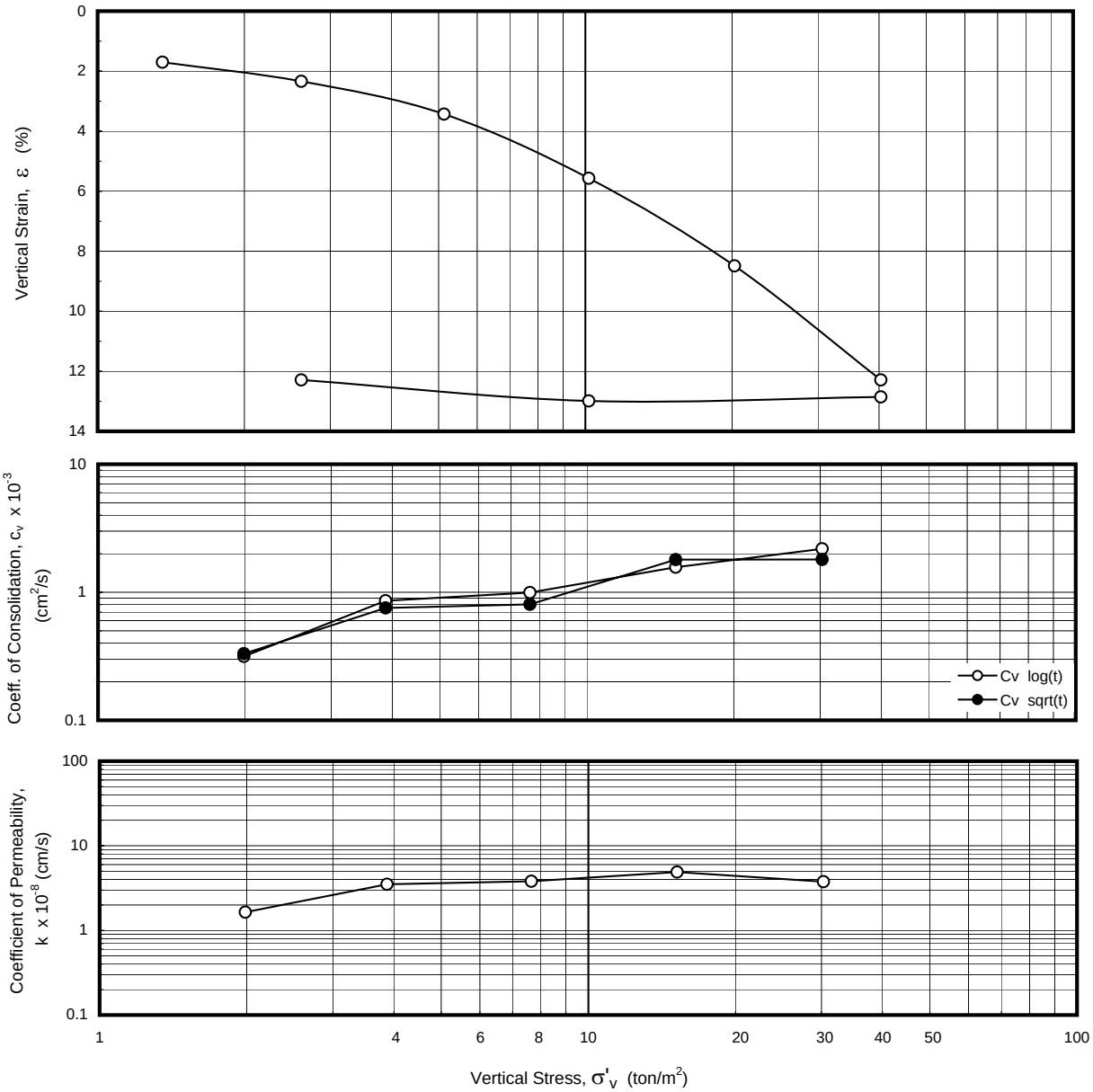
Project: New Auki Market & Jetty Renovation Location: Jetty Abutment Tested by: MAAG

Borehole: BH-J1 Sample No: UD-2 Depth (m.): 16.00 - 17.00

Soil Description:			SILT with sand			
Water Content, w_n	49.1	%	Liquid Limit, LL	61.27	%	
Initial Void Ratio, e_0	1.401		Plasticity Index, PI	23.46	%	
Total Unit Weight, γ_t	1.68	ton/m^3	Height of Solid, H_s	0.833	cm.	
Specific Gravity, G_s	2.70		Preconsolidation Pressure, $\sigma_{c'}$	10.3	ton/m^2	

Vertical Stress (ton/m^2)	Vertical Strain ε_{100} (%)	Vertical Strain ε_f (%)	Void ratio e_{100}	Void ratio e_f	Time t_{90} (min.)	Time t_{50} (min.)	Coefficient of Consolidation c_v x 10^{-3} (cm^2/sec) sqrt(t)	log(t)	Average	Permea. k x 10^{-8} (cm/sec)	Compres. Ratio CR
1.4	1.7	1.7	1.360	1.359							
2.6	2.3	2.5	1.344	1.340	41.0	10.0	0.3	0.3	0.3	1.6	0.022
5.1	3.4	3.7	1.318	1.312	17.6	3.6	0.8	0.9	0.8	3.5	0.037
10.2	5.6	5.9	1.267	1.258	16.0	3.0	0.8	1.0	0.9	3.8	0.072
20.2	8.5	9.0	1.197	1.185	6.8	1.8	1.8	1.6	1.7	4.9	0.098
40.4	12.3	12.9	1.106	1.092	6.3	1.2	1.8	2.2	2.0	3.8	0.127
10.2	13.0	12.7	1.089	1.096							-0.012
2.6	12.3	12.2	1.106	1.107							0.012

Note: Compression Ratio = $\frac{\Delta\varepsilon}{\log(\sigma_2/\sigma_1)}$

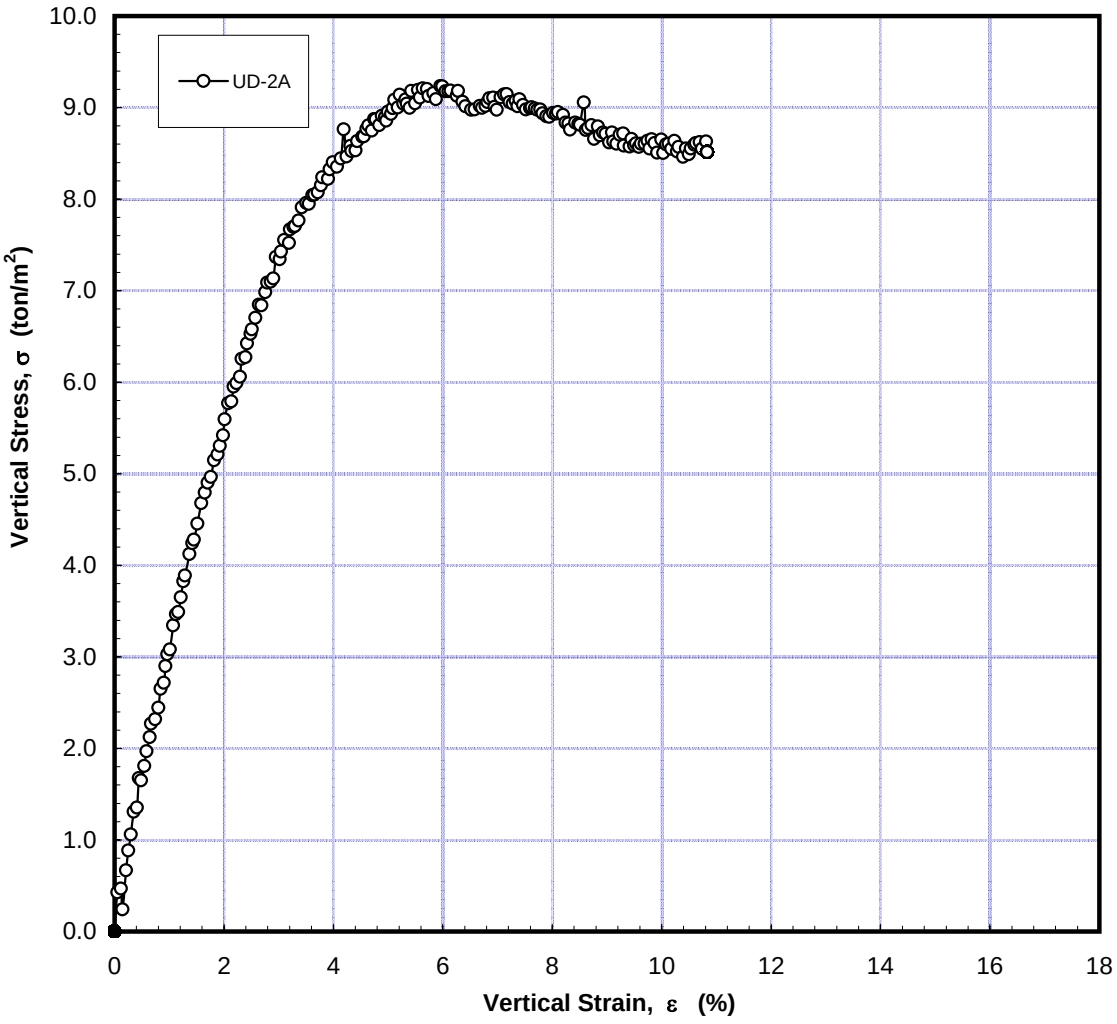


SIAM TONE

UNCONFINED COMPRESSION TEST

Project	New Auki Market and Jetty Renovation			Borehole No :	BH-J1
Location:	Jetty End (Offshore Side)			Sample No :	UD-2
Tested by:	MAAG	Date :	Mar 2007	Depth (m) :	16.00-17.00

Test Summary			
Soil Description:	SILT with sand		
Test No.	UD-2A	UD-2B	
Water Content, w_n	67.6	Insufficient Soil for Testing	%
Total Unit Weight, γ_t	1.69		ton/m^3
Unconfined Compressive Strength, q_u	9.2		ton/m^2
Undrained Shear Strength, c_u	4.6		ton/m^2
Strain at Failure, ε_f	6.0		%
Modulus at 50% Stress Level, E_{50}	294		ton/m^2
Failure Mode			



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	SS-12	18.50-18.95	Silty GRAVEL with sand (GM)	24.9	-	NP	NP	NP	2.69	46	18	10	5	20

UNIT WEIGHT DETERMINATION

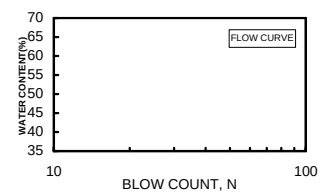
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	18.62	19.45
Wt. of Wet Soil + Can (g)	101.88	100.66
Wt. of Dry Soil + Can (g)	86.45	83.36
Water Content, w_c (%)	**22.7**	**27.1**

ATTERBERG LIMITS

w_p		w_l			
Test 1	Test 2				



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	84.60
Temperature (deg. C)	21.2
Wt. of Water+Soil+Flask (g)	717.28
Wt. of Water + Flask (g)	664.09
Specific Gravity, Gs	**2.69**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 53.64

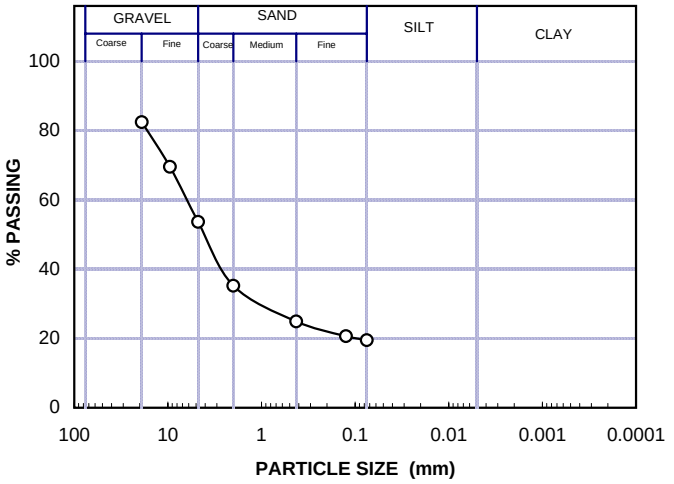
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	9.42	**82.4**
9.5	6.91	**69.6**
4.75	8.54	**53.6**
2.00	9.89	**35.2**
0.425	5.53	**24.9**
0.125	2.27	**20.7**
0.075	0.62	**19.5**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty Shoreline Abutment	BH-J1	SS-15	23.00-23.45	SILT (MH)	38.1	1.77	44.7	27.4	17.4	2.62	0	0	0	9	91

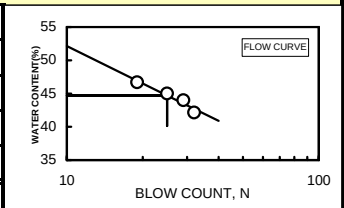
UNIT WEIGHT DETERMINATION

Sample Height (cm)	6.78
Sample Diameter (cm)	3.40
Wt. of Tube (g)	14.46
Wt. of Wet Soil +Tube (g)	123.51
Total Unit Weight (g/cc)	**1.77**
Dry Unit Weight (g/cc)	**1.28**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	32	29	25	19
Wt. of Can (g)	14.46	18.66	11.02	14.02	28.28	28.14	27.47	26.95
Wt. of Wet Soil + Can (g)	123.51	141.56	21.17	24.43	33.58	33.40	31.14	32.10
Wt. of Dry Soil + Can (g)	94.02	107.03	19.01	22.18	32.01	31.79	30.00	30.46
Water Content, w_c (%)	**37.1**	**39.1**	27.16	27.54	42.14	44.01	45.00	46.70

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	G
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	98.87
Temperature (deg. C)	20.8
Wt. of Water+Soil+Flask (g)	722.21
Wt. of Water + Flask (g)	661.06
Specific Gravity, Gs	**2.62**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 35.50

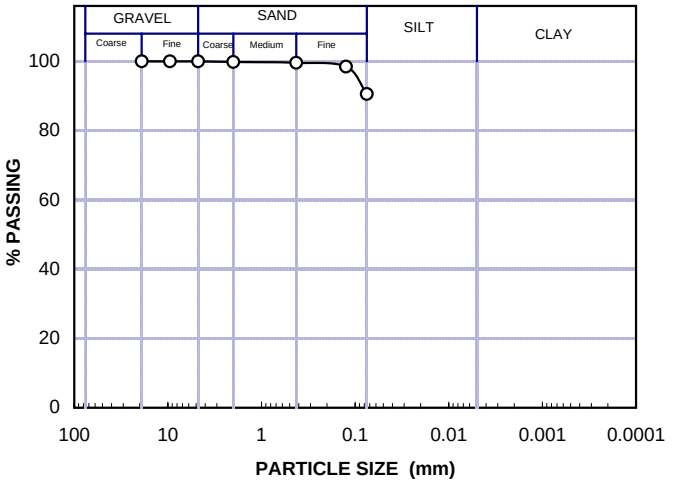
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.06	**99.8**
0.425	0.09	**99.6**
0.125	0.38	**98.5**
0.075	2.81	**90.6**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



ボーリング No.BH-J2
（桟橋サイト／既設桟橋先端）

Borehole No.BH-J2
(Jetty Site / Existing Jetty Head)

BH-J2 (1/1)

SIAM TONE CO., LTD.

BORING LOG

BORING NO. BH-J2

SHEET 1 OF 1

PROJECT: Basic Design, Auki New Market and Jetty Renovation

LOCATION: Jetty End (Offshore Side)

CLIENT: Fisheries Engineering Co., Ltd.

Coordinates: N: 9029706.97 E: 686610.83

Ground Elevation (m-CDL): -6.5 m

Max.Drilling Depth: 23.00 m

Seawater Depth: 6.50 m

Starting Date: 19/2/2007

Finishing Date: 20/2/2007

DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)	Total Unit Weight (Ton/m^3) 1.6 1.8 2.0	Plastic Limit / Natural Water Content / Liquid Limit (%) 30 60 90 120	Unconfined Compressive Strength (Ton/m^2) 2 4 6	SPT Blow Count (Blow/ft) 10 20 30 40
1		0.0-3.0 m, BACKFILL, no sample retreived, probably wash out materials from backfilled stone at shoreline abutment							
2									
3		3.0-7.5 m, CL, silty-sandy CLAY, with 30% silt-fine sand, and some very minor random shell and coral reef of fine gravel sized with max ~2 mm, soft, low plasticity, blackish brown	SS	1	45				2
4									
5			SS	2	45				3
6			SS	3	45				2
7									
8		7.5-15.0 m, CL, silty CLAY, with 20% silt , soft, medium plasticity, blackish brown	SS	4	45				4
9			SS	5	45				2
10									
11			SS	6	45				4
			UD	1	100				
12			SS	7	45				6
13									
14			SS	8	45				6
15		15.0-19.0 m, CL, silty-sandy CLAY with gravel, with 30% silt-sand, majority sand of fine-coarse grained, subangular-subround, with <10% fine gravel of reef limestone and shell, max ~ 3 cm ϕ, soft, low-medium plasticity, greenish brown	SS	9	45				3
16			UD	2	100				
17			SS	10	45				3
18									
19			SS	11	45				2
		19.0-21.5 m, CL, silty CLAY, with 20% silt, soft, medium plasticity, blackish brown							
20			SS	12	45				4 6 7
21			SS	13	45				9
22		21.5-23.0 m, CL (?), silty CLAY, should be the same formation as 19.0-21.5 m	RC		Loss				
			RC		Loss				
		End of Borehole @ 23.0 m	RC		Loss				
23		Since 23.0 m, REEF LIMESTONE as sensed by driller, unfortunately ran out of driiling rod							

Table 3 Summary of Soil Properties Test Results

Borehole No.	sample No.	Depth (m)		Water Content (%)	Total Unit Weight (ton/m^3)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	Specific Gravity, Gs	Grain Size Analysis (%)					Undrained Shear Strength, c_u (ton/m^2)	Modulus @50% Stress, E50	Colour	USCS	Soil Description
									Gravel	Sand			Silt+Clay					
		From	To							Coarse	Medium	Fine						
BH-J2	SS-1	3.00	3.45	75.7	-	NP	NP	2.56	0	0	3	24	73			Blackish Brown	-	SILT with sand
BH-J2	SS-4	7.50	7.95	63.3	1.50	NP	NP	2.56	1	0	3	11	85			Blackish Brown	-	SILT with sand
BH-J2	UD-1	11.00	12.00	59.8	1.58	76.9	33.6	2.60	0	0	1	7	91	3.7	144	Greenish Brown	MH	SILT
BH-J2	SS-11	18.50	18.95	57.1	-	53.2	20.0	2.59	0	1	5	11	83			Greenish Brown	MH	SILT with sand
BH-J2	SS-13	21.00	21.45	50.5	1.49	55.4	19.8	2.62	0	0	0	2	97			Blackish Brown	MH	SILT

Note : UD denotes Shelby Tube Sample, D denotes Split Spoon Sample and NP denotes Nonplastic

*** denotes insufficient soil for testing**

SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty End (Offshore Side)	BH-J2	SS-1	3.00-3.45	SILT with sand	75.7	-	NP	NP	NP	2.56	0	0	3	24	73

UNIT WEIGHT DETERMINATION

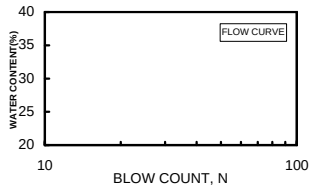
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.68	20.19
Wt. of Wet Soil + Can (g)	102.95	102.32
Wt. of Dry Soil + Can (g)	66.94	67.06
Water Content, w_c (%)	**76.2**	**75.2**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	32.07
Temperature (deg. C)	22.0
Wt. of Water+Soil+Flask (g)	681.28
Wt. of Water + Flask (g)	661.73
Specific Gravity, Gs	**2.56**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 22.63

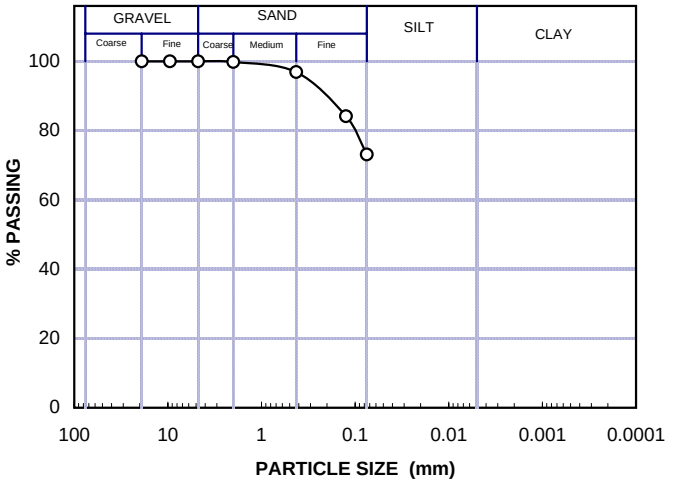
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.04	**99.8**
0.425	0.66	**96.9**
0.125	2.88	**84.2**
0.075	2.50	**73.1**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty End (Offshore Side)	BH-J2	SS-2	7.50-7.95	SILT with sand	63.3	1.50	NP	NP	NP	2.56	1	0	3	11	85

UNIT WEIGHT DETERMINATION

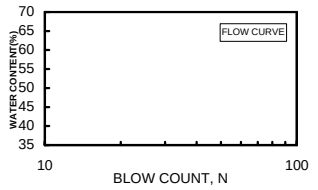
Sample Height (cm)	6.85
Sample Diameter (cm)	3.53
Wt. of Tube (g)	18.21
Wt. of Wet Soil +Tube (g)	119.02
Total Unit Weight (g/cc)	**1.50**
Dry Unit Weight (g/cc)	**0.92**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	18.21	19.49
Wt. of Wet Soil + Can (g)	119.02	114.65
Wt. of Dry Soil + Can (g)	80.59	77.16
Water Content, w_c (%)	**61.6**	**65.0**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	58.76
Temperature (deg. C)	21.8
Wt. of Water+Soil+Flask (g)	699.86
Wt. of Water + Flask (g)	663.97
Specific Gravity, Gs	**2.56**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 34.47

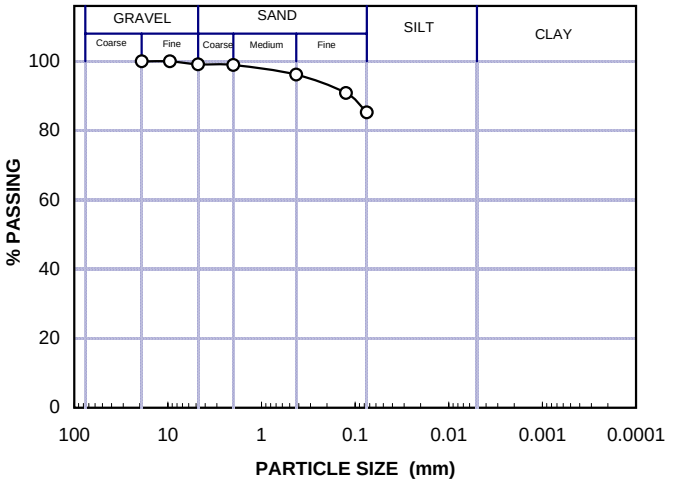
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.30	**99.1**
2.00	0.07	**98.9**
0.425	0.95	**96.2**
0.125	1.83	**90.9**
0.075	1.93	**85.3**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty End (Offshore Side)	BH-J2	UD-1	11.00-12.00	SILT (MH)	59.8	1.58	76.9	43.3	33.6	2.60	0	0	1	7	91

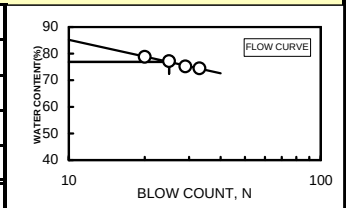
UNIT WEIGHT DETERMINATION

Sample Height (cm)	7.10
Sample Diameter (cm)	3.53
Wt. of Tube (g)	17.71
Wt. of Wet Soil +Tube (g)	127.34
Total Unit Weight (g/cc)	**1.58**
Dry Unit Weight (g/cc)	**0.99**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	33	29	25	20
Wt. of Can (g)	17.71	16.09	14.21	14.62	24.54	27.53	27.70	27.54
Wt. of Wet Soil + Can (g)	127.34	124.98	24.22	25.21	29.02	31.86	32.47	32.05
Wt. of Dry Soil + Can (g)	86.45	84.07	21.21	22.00	27.11	30.00	30.39	30.06
Water Content, w_c (%)	**59.5**	**60.2**	42.98	43.59	74.46	75.18	77.19	78.82

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	104.27
Temperature (deg. C)	22.9
Wt. of Water+Soil+Flask (g)	725.84
Wt. of Water + Flask (g)	661.55
Specific Gravity, Gs	**2.60**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 68.71

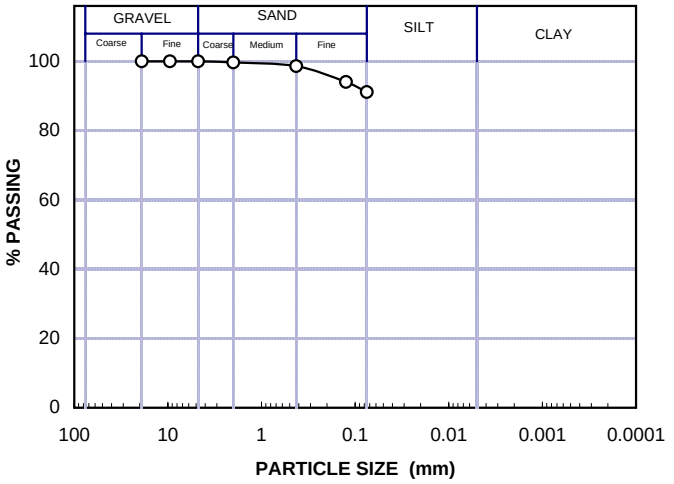
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.20	**99.7**
0.425	0.75	**98.6**
0.125	3.13	**94.1**
0.075	2.00	**91.2**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

CONSOLIDATION TEST

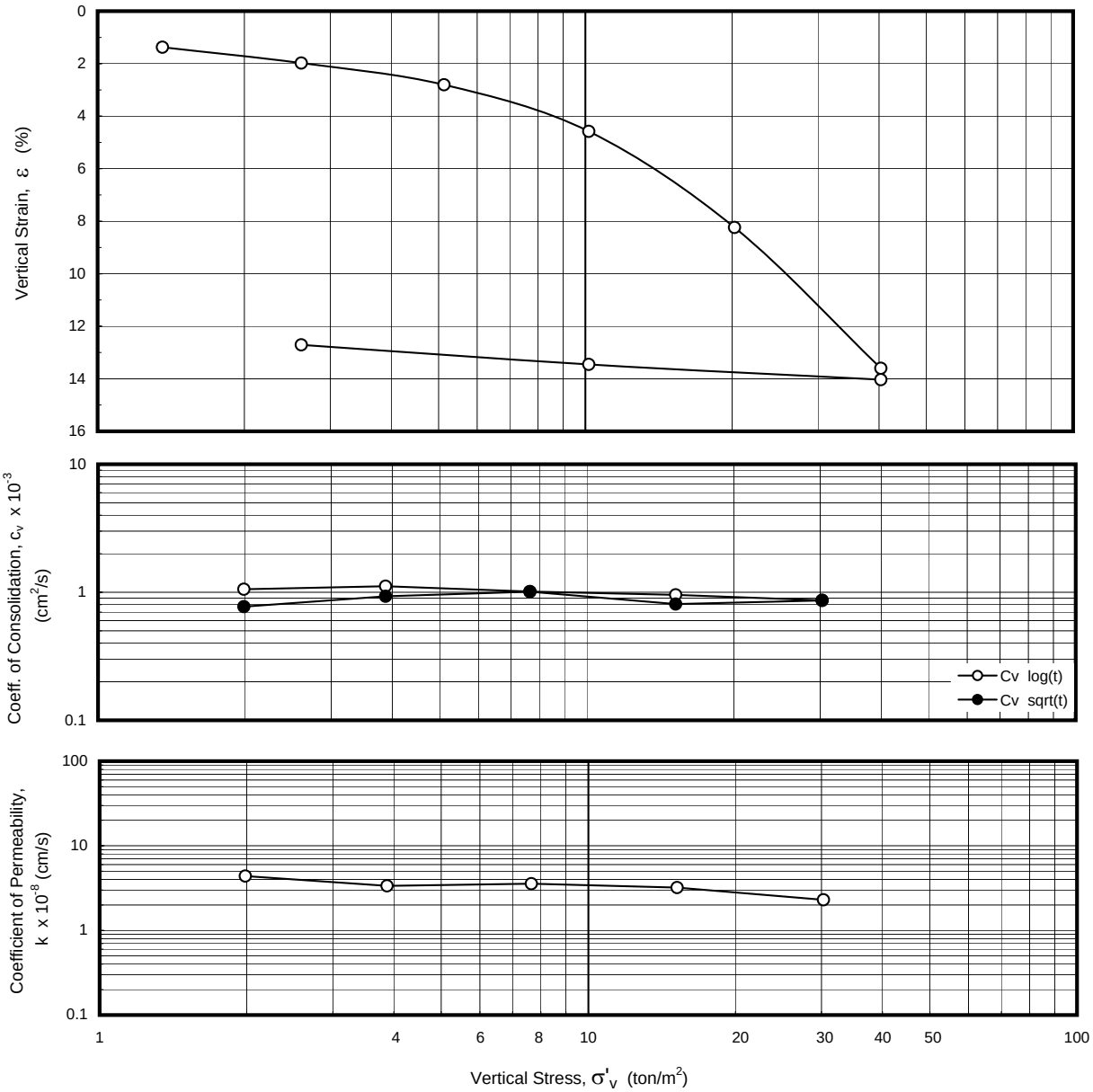
Project: New Auki Market & Jetty Renovation Location: Jetty End Tested by: MAAG

Borehole: BH-J2 Sample No: UD-1 Depth (m.): 11.00 - 12.00

Soil Description:	SILT				
Water Content, w_n	61.6	%	Liquid Limit, LL	76.88	%
Initial Void Ratio, e_0	1.675		Plasticity Index, PI	33.59	%
Total Unit Weight, γ_t	1.57	ton/m^3	Height of Solid, H_s	0.748	cm.
Specific Gravity, G_s	2.60		Preconsolidation Pressure, $\sigma_{c'}$	14.7	ton/m^2

Vertical Stress (ton/m^2)	Vertical Strain ε_{100} (%)	Vertical Strain ε_f (%)	Void ratio e_{100}	Void ratio e_f	Time t_{90} (min.)	Time t_{50} (min.)	Coefficient of Consolidation c_v x 10^{-3} (cm^2/sec) sqrt(t)	log(t)	Average	Permea. k x 10^{-8} (cm/sec)	Compres. Ratio CR
1.4	1.4	1.7	1.638	1.630							
2.6	2.0	2.2	1.622	1.616	17.6	3.0	0.8	1.1	0.9	4.4	0.021
5.1	2.8	3.0	1.599	1.595	14.4	2.8	0.9	1.1	1.0	3.4	0.028
10.2	4.6	5.1	1.552	1.538	13.0	3.0	1.0	1.0	1.0	3.6	0.060
20.2	8.2	8.6	1.454	1.444	15.2	3.0	0.8	1.0	0.9	3.2	0.123
40.4	13.6	14.0	1.311	1.299	13.0	3.0	0.9	0.9	0.9	2.3	0.179
10.2	13.5	13.4	1.315	1.315							0.002
2.6	12.7	12.5	1.335	1.341							0.013

Note: Compression Ratio = $\frac{\Delta\varepsilon}{\log(\sigma_2/\sigma_1)}$

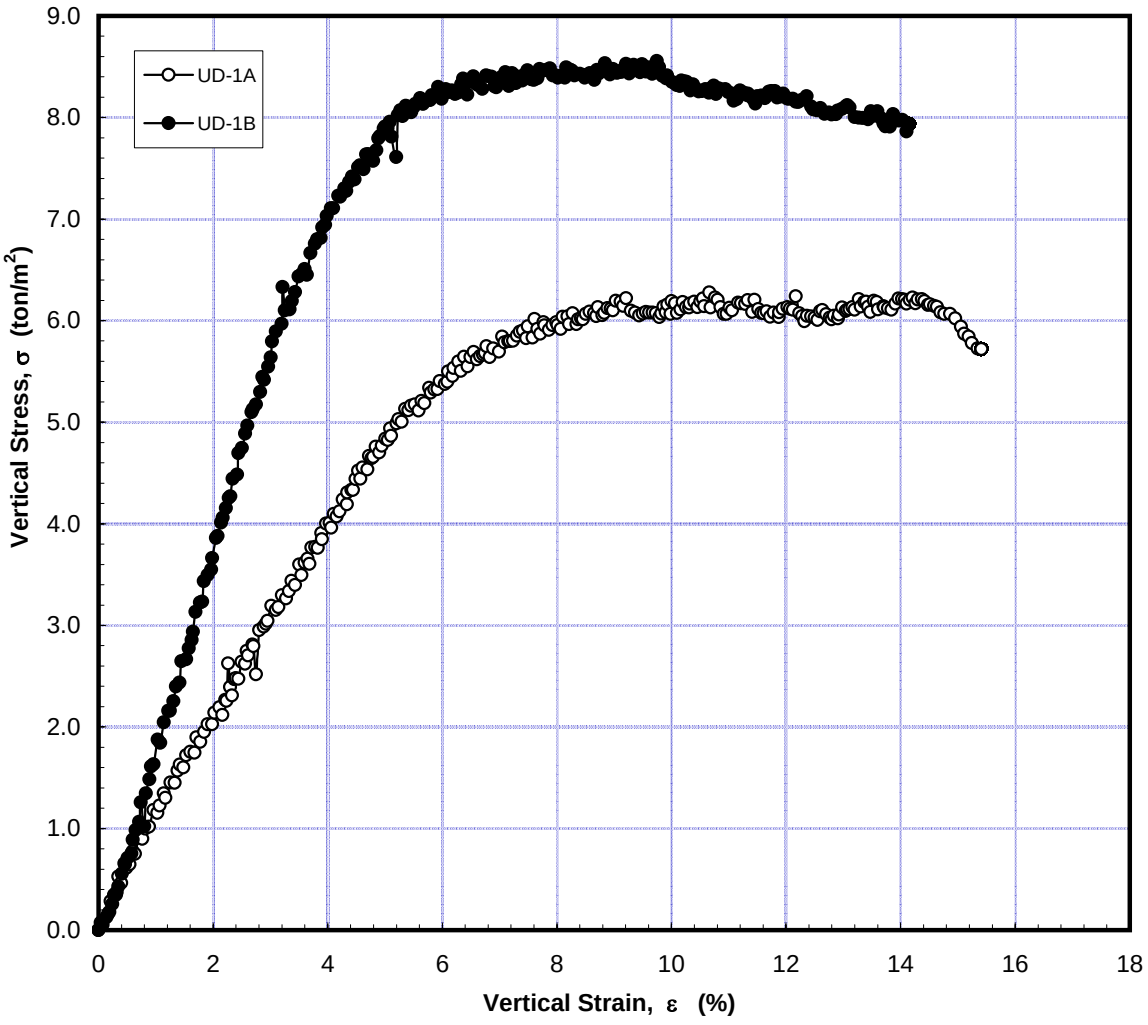


SIAM TONE

UNCONFINED COMPRESSION TEST

Project	New Auki Market and Jetty Renovation			Borehole No :	BH-J2
Location:	Jetty End (Offshore Side)			Sample No :	UD-1
Tested by:	MAAG	Date :	Mar 2007	Depth (m) :	11.00-12.00

Test Summary			
Soil Description:	SILT		
Test No.	UD-1A	UD-1B	
Water Content, w_n	59.5	60.2	%
Total Unit Weight, γ_t	1.61	1.62	ton/m^3
Unconfined Compressive Strength, q_u	6.3	8.6	ton/m^2
Undrained Shear Strength, c_u	3.1	4.3	ton/m^2
Strain at Failure, ε_f	10.7	9.7	%
Modulus at 50% Stress Level, E_{50}	103	185	ton/m^2
Failure Mode			



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty End (Offshore Side)	BH-J2	SS-11	18.50-18.95	SILT with sand (MH)	57.1	-	53.2	33.3	20.0	2.59	0	1	5	11	83

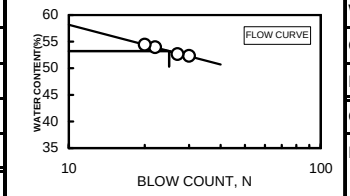
UNIT WEIGHT DETERMINATION

Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	30	27	22	20
Wt. of Can (g)	18.80	19.82	14.27	13.87	24.71	24.96	27.35	27.58
Wt. of Wet Soil + Can (g)	147.29	158.37	24.93	23.91	28.92	29.70	31.85	32.47
Wt. of Dry Soil + Can (g)	100.97	107.63	22.25	21.42	27.48	28.06	30.27	30.75
Water Content, w_c (%)	**56.4**	**57.8**	33.55	32.98	52.33	52.67	53.95	54.44

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	G
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	80.31
Temperature (deg. C)	22.0
Wt. of Water+Soil+Flask (g)	710.26
Wt. of Water + Flask (g)	660.85
Specific Gravity, Gs	**2.59**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 30.47

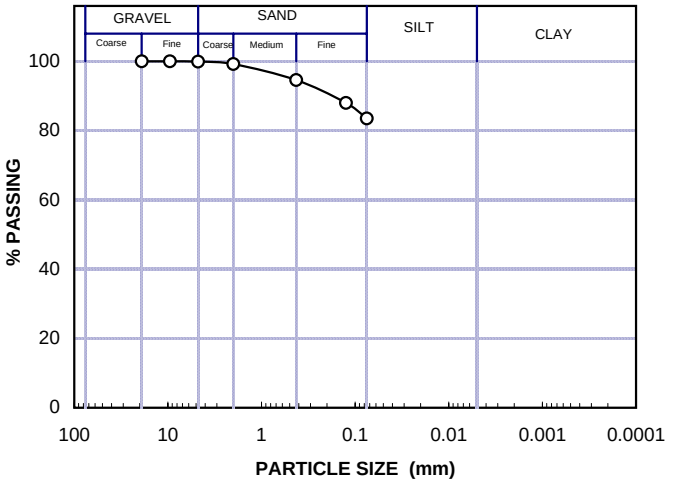
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.03	**99.9**
2.00	0.20	**99.2**
0.425	1.41	**94.6**
0.125	2.02	**88.0**
0.075	1.37	**83.5**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Jetty End (Offshore Side)	BH-J2	SS-13	21.00-21.45	SILT (MH)	50.5	1.49	55.4	35.6	19.8	2.62	0	0	0	2	97

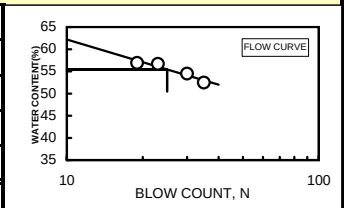
UNIT WEIGHT DETERMINATION

Sample Height (cm)	6.87
Sample Diameter (cm)	3.52
Wt. of Tube (g)	19.25
Wt. of Wet Soil +Tube (g)	119.01
Total Unit Weight (g/cc)	**1.49**
Dry Unit Weight (g/cc)	**0.99**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	35	30	23	19
Wt. of Can (g)	19.25	18.97	11.22	14.21	27.37	24.69	28.83	27.37
Wt. of Wet Soil + Can (g)	119.01	128.57	21.89	24.27	32.14	28.32	32.94	31.71
Wt. of Dry Soil + Can (g)	85.39	91.94	19.07	21.65	30.50	27.04	31.45	30.14
Water Content, w_c (%)	**50.8**	**50.2**	35.96	35.25	52.48	54.49	56.70	56.92

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	95.04
Temperature (deg. C)	22.8
Wt. of Water+Soil+Flask (g)	723.59
Wt. of Water + Flask (g)	664.77
Specific Gravity, Gs	**2.62**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 30.60

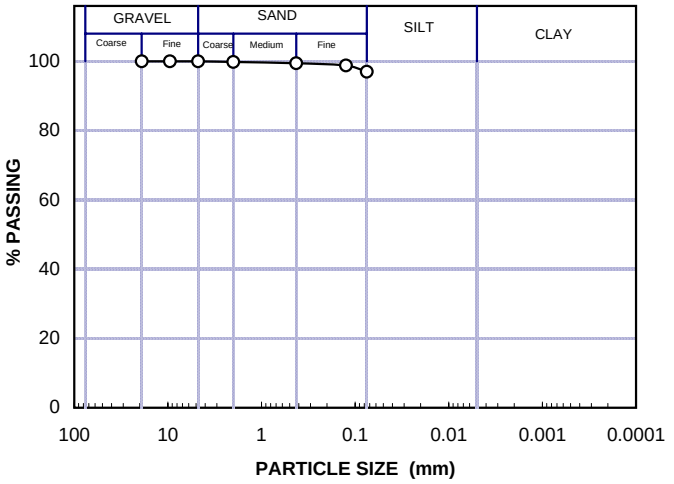
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.05	**99.8**
0.425	0.11	**99.5**
0.125	0.21	**98.8**
0.075	0.55	**97.0**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



ボーリング No.BH-M1
（市場サイト中央）

Borehole No.BH-M1
(Market Site / Center)

BH-M1 (1/2)

SIAM TONE CO., LTD.

BORING LOG

BORING NO. **BH-M1**

SHEET **1 OF 2**

PROJECT: Basic Design, Auki New Market and Jetty Renovation

LOCATION: Center of New Auki Market Site

CLIENT: Fisheries Engineering Co., Ltd.

Coordinates: N: 9029785.820 E: 686929.617

Ground Elevation (m-MSL): 1.894 m

Max.Drilling Depth: 27.50 m

Water Level: -1.050 m

Starting Date: 11/2/2007

Finishing Date: 14/102/07

DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)
1		0.0-1.05 m, BACKFILL, crushed/compacted gravel-cobble sized reef limestone with max ~ 6 cm ϕ, hard but brittle, dense, brown at ground then pale white	SS	1	45
			SS	2	45
		1.05-3.0 m, CL, silty CLAY, with 10% fine gravel sized, angular, and well graded coral reef with max ~ 2-3 mm and 20% silt, soft, low-medium plasticity, blackish brown	SS	3	40
2			SS	4	25
			SS	5	20
3		3.0-5.0 m, SC, clayey SAND, with 30% clay and 10% fine gravel sized, angular, and well graded coral reef with max ~ 2-4 mm, subangular-angular coarse grained sand, loose, non-plasticity, blackish brown	SS	6	30
4			SS	7	25
			SS	8	20
5		5.0-24.0 m, CL, silty CLAY, with 20% silt and some very minor random shell and coral reef of fine gravel sized with max ~2 mm, soft, medium plasticity, blackish brown	SS	9	45
6			SS	10	8
7			SS	11	45
8			SS	12	45
9			SS	13	45
10			SS	14	45
11			SS	15	45
12			SS	16	45
13			UD	1	100
14			SS	17	45
15			SS	18	45
16					
17			SS	19	45
			SS	20	45
18					
19			SS	21	45
20			SS	22	45
21					
22			SS	23	45
23		24.0-24.7 m, CL, silty-sandy CLAY, with 30% silt-fine grained angular sand and little fine gravel sized reef limestone with max ~2-3 mm, soft, low-medium plasticity, blackish brown	SS	24	45
24					
25		24.7-27.5 m, REEF LIMESTONE, hard but brittle, pale white with some random gray banded of neighbor rock (?), moderately-highly weathered, can not achieved by rock coring, when SPT - crushed rock sample obtained	SS	25	30

Total Unit Weight (Ton/m^3): 1.6 1.8 2.0

Plastic Limit / Natural Water Content / Liquid Limit (%): 30 60 90 120

Unconfined Compressive Strength (Ton/m^2): 2 4 6

SPT Blow Count (Blow/ft): 10 20 30 40

SPT values: 9, 13, 7, 2, 3, 10, 3, 12, 3, 2, 2, 2, 3, 4, 5, 4, 5, 7, 5, 6, 6, 8, 6, 6, 27, 50

SIAM TONE CO., LTD.

BORING LOG

BORING NO. BH-M1

SHEET 2 OF 2

PROJECT:	Basic Design, Auki New Market and Jetty Renovation	Coordinates: N: 9029785.820	E: 686929.617	Water Level:	-1.050 m
LOCATION:	Center of New Auki Market Site	Ground Elevation (m-MSL):	1.894 m	Starting Date:	11/2/2007
CLIENT:	Fisheries Engineering Co., Ltd.	Max.Drilling Depth:	27.50 m	Finishing Date:	14/102/07

DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)	Total Unit Weight (Ton/m^3) 1.6 1.8 2.0	Plastic Limit / Natural Water Content / Liquid Limit (%) 30 60 90 120	Specific Gravity 2.4 2.6 2.8	SPT Blow Count (Blow/ft) 10 20 30 40
26		24.7-27.5 m, REEF LIMESTONE, hard but brittle, pale white with some random gray banded of neighbor rock (?), moderately-highly weathered, can not acchieved by rock coring, when SPT - crushed rock sample obtained	RC	1	20				50
27			SS	26	45				50
		End of Borehole @ 27.5 m							

Table 3 Summary of Soil Properties Test Results

Borehole No.	sample No.	Depth (m)		Water Content (%)	Total Unit Weight (ton/m^3)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	Specific Gravity, Gs	Grain Size Analysis (%)					Undrained Shear Strength, c_u (ton/m^2)	Modulus @50% Stress, E50	Colour	USCS	Soil Description
									Gravel	Sand			Silt+Clay					
		From	To							Coarse	Medium	Fine						
BH-M1	SS-4	1.50	1.95	73.9	1.51	NP	NP	2.52	11	10	20	14	45			Blackish Brown	SM	Silty SAND
BH-M1	SS-7	3.50	3.90	30.5	-	NP	NP	2.53	49	16	14	7	14			Blackish Brown	GM	Silty GRAVEL with sand
BH-M1	SS-11	7.00	7.45	66.7	1.58	NP	NP	2.63	0	0	1	13	86			Blackish Brown	ML	SILT with sand
BH-M1	UD-1	13.00	14.00	69.7	1.57	48.1	10.5	2.61	11	1	1	6	82	7.2	386	Blackish Brown	ML	SILT with gravel and sand
BH-M1	SS-22	20.00	20.45	66.2	-	NP	NP	2.51	0	2	2	23	73			Blackish Brown	-	SILT with sand
BH-M1	SS-24	23.00	23.41	65.4	1.52	55.4	17.5	2.55	0	0	1	5	94			Blackish Brown	MH	SILT

Note : UD denotes Shelby Tube Sample, D denotes Split Spoon Sample and NP denotes Nonplastic

*** denotes insufficient soil for testing**

SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	SS-4	1.50-1.95	Silty SAND (SM)	73.9	1.51	NP	NP	NP	2.52	11	10	20	14	45

UNIT WEIGHT DETERMINATION

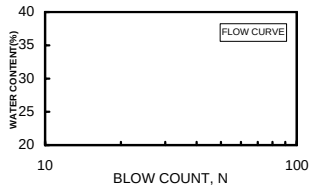
Sample Height (cm)	5.17
Sample Diameter (cm)	3.53
Wt. of Tube (g)	19.15
Wt. of Wet Soil +Tube (g)	95.37
Total Unit Weight (g/cc)	**1.51**
Dry Unit Weight (g/cc)	**0.87**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.15	18.79
Wt. of Wet Soil + Can (g)	95.37	90.00
Wt. of Dry Soil + Can (g)	62.53	60.15
Water Content, w_c (%)	**75.7**	**72.2**

ATTERBERG LIMITS

	w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	42.28
Temperature (deg. C)	20.8
Wt. of Water+Soil+Flask (g)	690.70
Wt. of Water + Flask (g)	665.15
Specific Gravity, Gs	**2.52**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 42.35

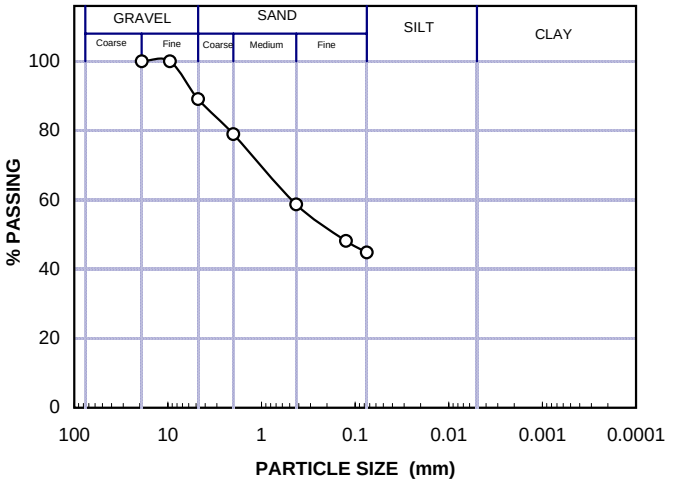
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	4.61	**89.1**
2.00	4.30	**79.0**
0.425	8.59	**58.7**
0.125	4.46	**48.1**
0.075	1.40	**44.8**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	SS-7	3.50-3.90	Silty GRAVEL with sand (GM)	30.5	-	NP	NP	NP	2.53	49	16	14	7	14

UNIT WEIGHT DETERMINATION

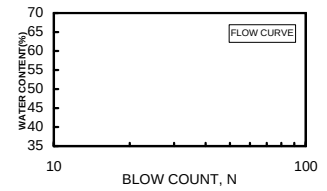
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.91	19.75
Wt. of Wet Soil + Can (g)	91.66	101.37
Wt. of Dry Soil + Can (g)	75.60	81.53
Water Content, w_c (%)	**28.8**	**32.1**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	61.27
Temperature (deg. C)	17.5
Wt. of Water+Soil+Flask (g)	699.67
Wt. of Water + Flask (g)	662.63
Specific Gravity, Gs	**2.53**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 55.70

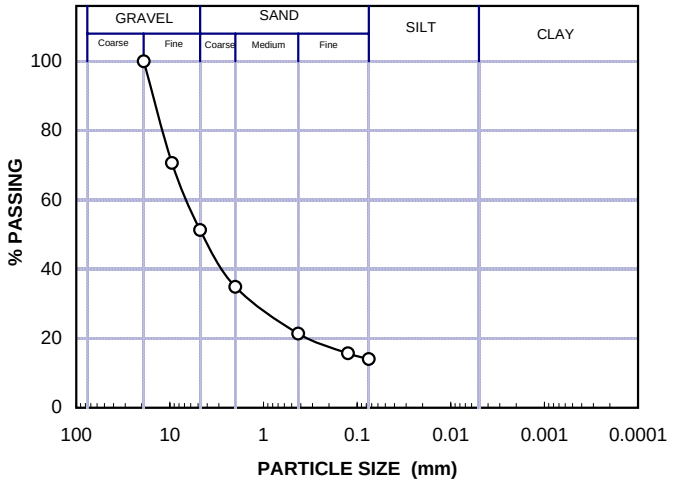
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	16.35	**70.6**
4.75	10.77	**51.3**
2.00	9.14	**34.9**
0.425	7.52	**21.4**
0.125	3.16	**15.7**
0.075	0.94	**14.0**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	SS-11	7.00-7.45	SILT with sand (ML)	66.7	1.58	NP	NP	NP	2.63	0	0	1	13	86

UNIT WEIGHT DETERMINATION

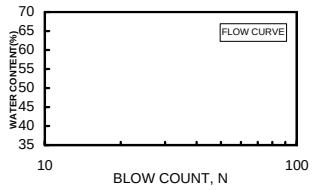
Sample Height (cm)	6.73
Sample Diameter (cm)	3.41
Wt. of Tube (g)	19.42
Wt. of Wet Soil +Tube (g)	116.71
Total Unit Weight (g/cc)	**1.58**
Dry Unit Weight (g/cc)	**0.95**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.42	19.30
Wt. of Wet Soil + Can (g)	116.71	91.50
Wt. of Dry Soil + Can (g)	77.98	62.45
Water Content, w_c (%)	**66.1**	**67.3**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	103.29
Temperature (deg. C)	23.1
Wt. of Water+Soil+Flask (g)	728.78
Wt. of Water + Flask (g)	664.71
Specific Gravity, Gs	**2.63**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 34.74

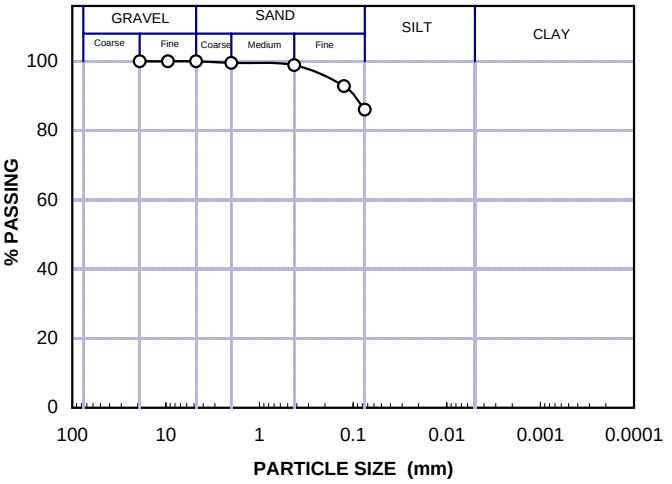
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.16	**99.5**
0.425	0.22	**98.9**
0.125	2.10	**92.9**
0.075	2.37	**86.0**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	UD-1	13.00-14.00	SILT with gravel and sand (ML)	69.7	1.57	48.1	37.6	10.5	2.61	11	1	1	6	82

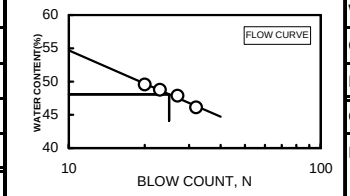
UNIT WEIGHT DETERMINATION

Sample Height (cm)	7.10
Sample Diameter (cm)	3.53
Wt. of Tube (g)	18.22
Wt. of Wet Soil +Tube (g)	127.56
Total Unit Weight (g/cc)	**1.57**
Dry Unit Weight (g/cc)	**0.93**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Tesr 1	Test 2	32	27	23	20
Wt. of Can (g)	18.22	19.48	14.23	14.23	20.64	20.66	26.03	21.79
Wt. of Wet Soil + Can (g)	127.56	120.71	24.30	24.30	25.35	25.74	31.28	26.22
Wt. of Dry Soil + Can (g)	82.44	79.35	21.55	21.55	23.86	24.10	29.56	24.75
Water Content, w_c (%)	**70.3**	**69.1**	37.57	37.57	46.11	47.86	48.75	49.54

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	109.39
Temperature (deg. C)	21.2
Wt. of Water+Soil+Flask (g)	731.68
Wt. of Water + Flask (g)	664.09
Specific Gravity, Gs	**2.61**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 101.22

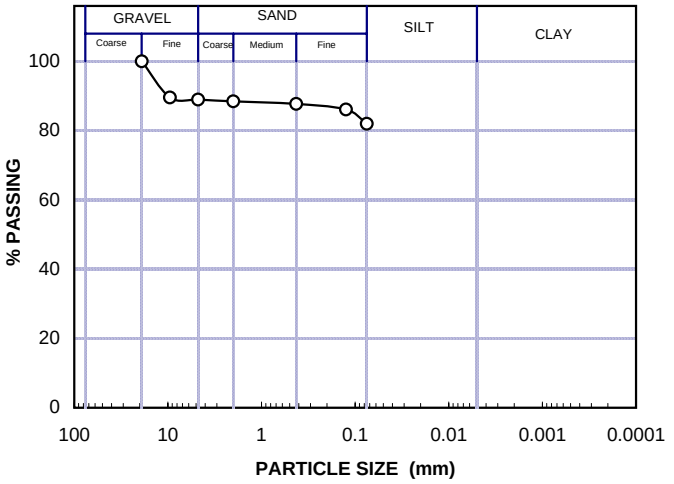
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	10.54	**89.6**
4.75	0.64	**89.0**
2.00	0.51	**88.5**
0.425	0.74	**87.7**
0.125	1.66	**86.1**
0.075	4.13	**82.0**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

CONSOLIDATION TEST

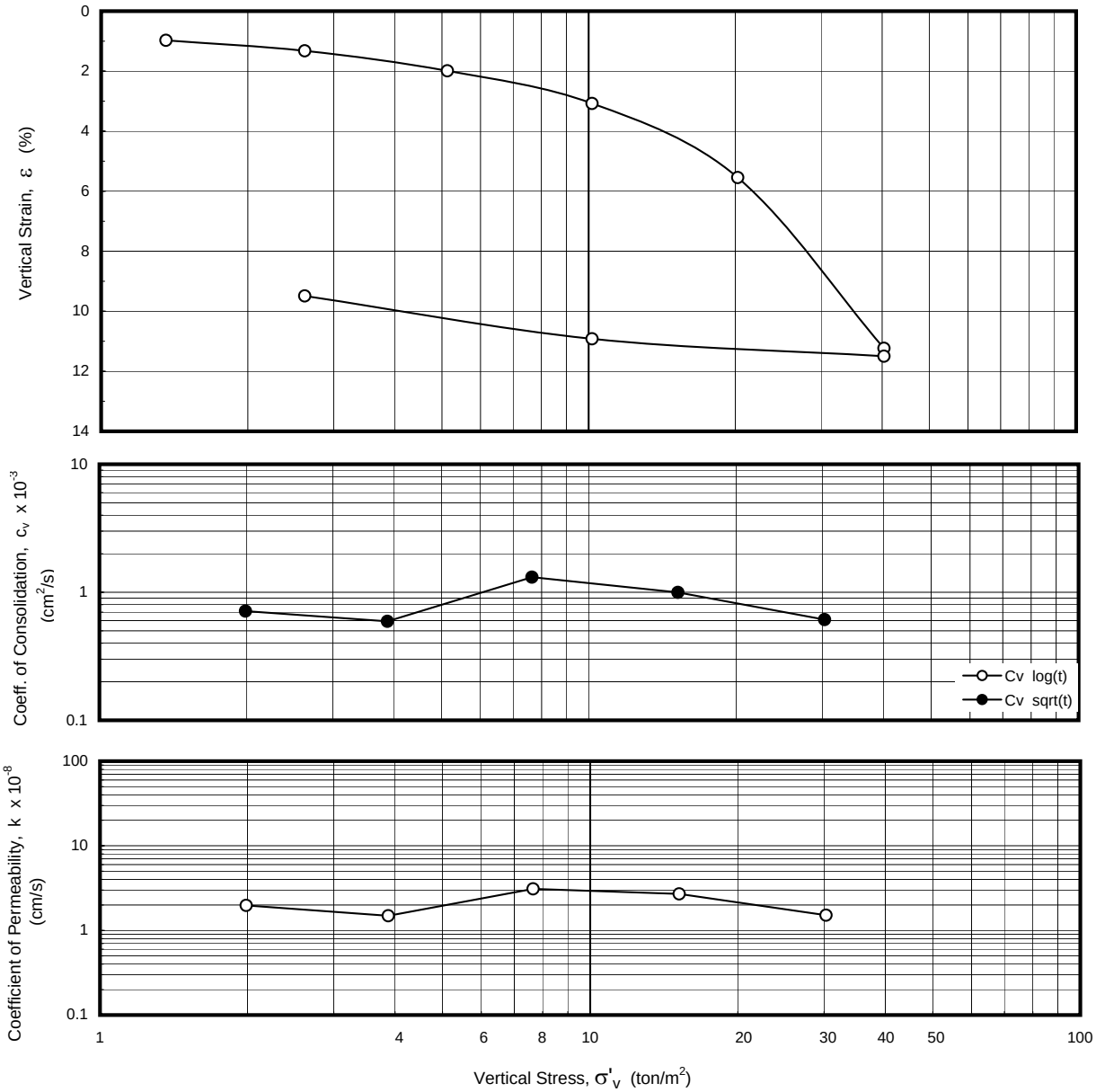
Project: New Auki Market & Jetty Renovation Location: Center of New Market Tested by: MAAG

Borehole: BH-M1 Sample No: UD-1 Depth (m.): 13.00 - 14.00

Soil Description:	SILT with gravel and sand				
Water Content, w_n	68.8	%	Liquid Limit, LL	48.1	%
Initial Void Ratio, e_0	1.886		Plasticity Index, PI	10.5	%
Total Unit Weight, γ_t	1.53	ton/m^3	Height of Solid, H_s	0.693	cm.
Specific Gravity, G_s	2.61		Preconsolidation Pressure, $\sigma_{c'}$	17.8	ton/m^2

Vertical Stress (ton/m^2)	Vertical Strain ε_{100} (%)	Vertical Strain ε_f (%)	Void ratio e_{100}	Void ratio e_f	Time t_{90} (min.)	Time t_{50} (min.)	Coefficient of Consolidation c_v x 10^{-3} (cm^2/sec) sqrt(t)	log(t)	Average	Permea. k x 10^{-8} (cm/sec)	Compres. Ratio CR
1.4	1.0	1.1	1.858	1.855							
2.6	1.3	1.3	1.848	1.847	19.4	4.5	0.7	0.7	0.7	2.0	0.012
5.1	2.0	2.0	1.829	1.828	23.0	6.0	0.6	0.5	0.6	1.5	0.023
10.2	3.1	3.3	1.797	1.791	10.2	2.0	1.3	1.6	1.4	3.1	0.037
20.2	5.5	5.6	1.726	1.723	13.0	2.5	1.0	1.2	1.1	2.7	0.083
40.4	11.2	11.5	1.562	1.554	19.4	6.0	0.6	0.5	0.5	1.5	0.190
10.2	10.9	10.7	1.571	1.576							0.005
2.6	9.5	9.4	1.612	1.616							0.024

Note: Compression Ratio = $\dfrac{\Delta\varepsilon}{\log(\sigma_2/\sigma_1)}$



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	SS-22	20.00-20.45	SILT with sand (ML)	66.2	-	NP	NP	NP	2.51	0	2	2	23	73

UNIT WEIGHT DETERMINATION

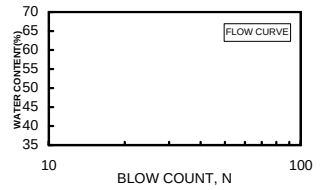
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.90	19.66
Wt. of Wet Soil + Can (g)	150.27	135.31
Wt. of Dry Soil + Can (g)	97.85	89.65
Water Content, w_c (%)	**67.2**	**65.2**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	113.54
Temperature (deg. C)	19.5
Wt. of Water+Soil+Flask (g)	730.65
Wt. of Water + Flask (g)	662.23
Specific Gravity, Gs	**2.51**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 29.83

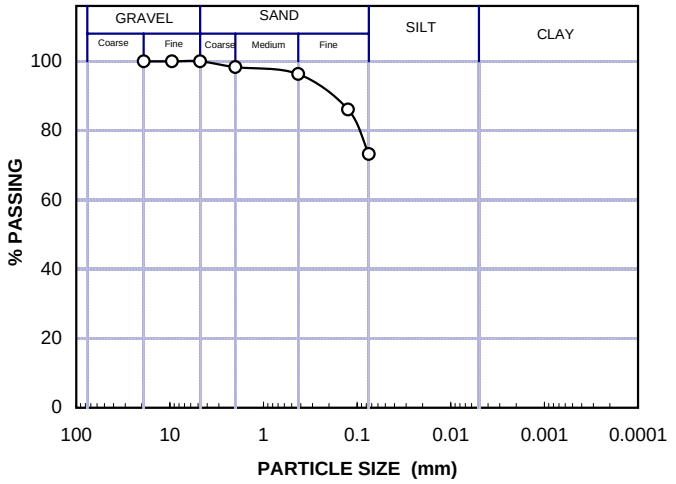
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.49	**98.4**
0.425	0.60	**96.3**
0.125	3.06	**86.1**
0.075	3.83	**73.2**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovaation	Center of New Market	BH-M1	SS-24	23.00-23.41	SILT (ML)	65.4	1.52	55.4	37.9	17.5	2.55	0	0	1	5	94

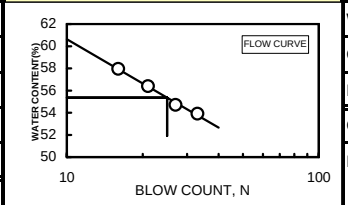
UNIT WEIGHT DETERMINATION

Sample Height (cm)	6.76
Sample Diameter (cm)	3.50
Wt. of Tube (g)	19.18
Wt. of Wet Soil +Tube (g)	118.31
Total Unit Weight (g/cc)	**1.52**
Dry Unit Weight (g/cc)	**0.92**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Tesr 1	Test 2	33	27	21	16
Wt. of Can (g)	19.18	19.79	10.46	11.04	21.07	20.69	20.75	20.87
Wt. of Wet Soil + Can (g)	118.31	111.05	23.08	23.51	25.71	24.73	25.36	25.49
Wt. of Dry Soil + Can (g)	78.96	75.14	19.55	20.14	24.09	23.30	23.70	23.80
Water Content, w_c (%)	**65.8**	**64.9**	38.76	37.03	53.91	54.71	56.39	57.96

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	73.01
Temperature (deg. C)	21.6
Wt. of Water+Soil+Flask (g)	708.40
Wt. of Water + Flask (g)	664.01
Specific Gravity, Gs	**2.55**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 24.20

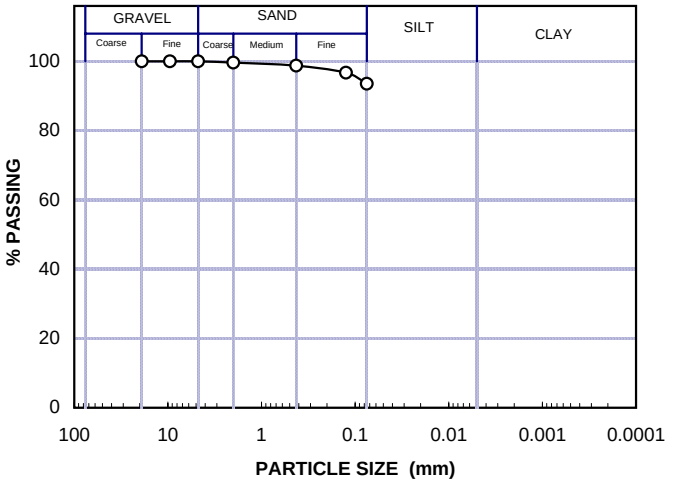
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.09	**99.6**
0.425	0.21	**98.8**
0.125	0.49	**96.7**
0.075	0.77	**93.6**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



ボーリング No.BH-M2
（市場サイト海側）

Borehole No.BH-M2
(Market Site / Near Shoreline)

BH-M2 (1/2)

SIAM TONE CO., LTD.

BORING LOG

BORING NO. BH-M2

SHEET 1 OF 2

PROJECT: Basic Design, Auki New Market and Jetty Renovation

LOCATION: Shoreline of New Auki Market Site

CLIENT: Fisheries Engineering Co., Ltd.

Coordinates: N: 9029777.179 E: 686905.961

Ground Elevation (m-MSL): 1.860 m

Max.Drilling Depth: 30.00 m

Water Level: -1.100 m

Starting Date: 21/2/2007

Finishing Date: 23/102/07

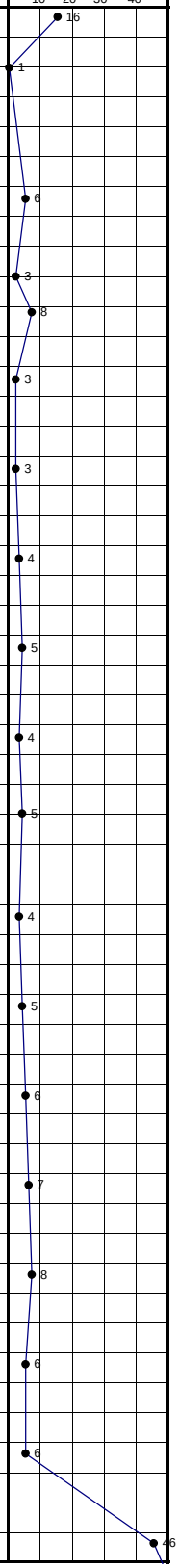
DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)
1		0.0-1.0 m, BACKFILL, crushed/compacted gravel-cobble sized reef limestone with max ~ 4 cm ϕ, hard but brittle, dense, brown at ground then pale white	SS	1	30
			Sample Loss		
2		1.0-5.0 m, SP, SAND with gravel, poorly graded and coarse grained sand, angular, loose, non-plasticity, dak brown, with 20% fine gravel size of white backfilled reef limestone,subangular, with max ~ 3 cm ϕ			
3			SS	2	30
4					
			Sample Loss		
5		5.0-25.5 m, CL, silty CLAY, with 30% silt, soft, medium plasticity, blzckish brown	SS	3	20
6			SS	4	45
7					
8			SS	5	45
9			SS	6	45
10					
11			SS	7	45
12			SS	8	45
13					
			Sample Loss		
14			UD	1	100
15			SS	9	45
16					
17			SS	10	45
18			SS	11	45
19					
20			SS	12	45
21			SS	13	45
22					
23			SS	14	45
24					
			Sample Loss		
25					
		25.5-27.5 m, REEF LIMESTONE (details on next page)	SS	15	45

Total Unit Weight (Ton/m^3): 1.6 1.8 2.0

Plastic Limit — Natural Water Content — Liquid Limit (%): 30 60 90 120

Unconfined Compressive Strength (Ton/m^2): 2 4 6

SPT Blow Count (Blow/ft): 10 20 30 40



BH-M2 (2/2)

SIAM TONE CO., LTD.

BORING LOG

BORING NO. **BH-M2**

SHEET **2 OF 2**

PROJECT: Basic Design, Auki New Market and Jetty Renovation

LOCATION: Shoreline of New Auki Market Site

CLIENT: Fisheries Engineering Co., Ltd.

Coordinates: N: 9029777.179 E: 686905.961

Ground Elevation (m-MSL): 1.860 m

Max.Drilling Depth: 30.00 m

Water Level: -1.100 m

Starting Date: 21/2/2007

Finishing Date: 23/102/07

DEPTH (m.)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLING METHOD	SAMPLE NO.	RECOVERY (cm)	Total Unit Weight (Ton/m^3) 1.6 1.8 2.0	Plastic Limit / Natural Water Content / Liquid Limit (%) 30 60 90 120	Specific Gravity 2.4 2.6 2.8	SPT Blow Count (Blow/ft) 10 20 30 40
26		25.5-27.5 m, REEF LIMESTONE, hard but brittle, pale white, moderately-highly weathered, can not acchieved by rock coring, when SPT - crushed rock sample obtained	SS	15	45				
27			SS	16	10				50
28		27.5-28.5 m, SP, SAND, poorly graded, fine grained, subround, loose-medium dense, non-plasticity, pale brown	MUD	1	None				
29		28.5-30.0 m, REEF LIMESTONE, hard but brittle, pale white, moderately-highly weathered, can not acchieved by rock coring, when SPT - crushed rock sample obtained	RC	1	Loss				
30		End of Borehole @ 30.0 m							

Table 3 Summary of Soil Properties Test Results

Borehole No.	sample No.	Depth (m)		Water Content (%)	Total Unit Weight (ton/m^3)	Liquid Limit, LL (%)	Plasticity Index, PI (%)	Specific Gravity, Gs	Grain Size Analysis (%)					Undrained Shear Strength, c_u (ton/m^2)	Modulus @50% Stress, E50	Colour	USCS	Soil Description
									Gravel	Sand			Silt+Clay					
		From	To							Coarse	Medium	Fine						
BH-M2	SS-2	3.00	3.45	30.3	-	NP	NP	2.65	42	7	38	3	9			Dark Brown	SW-SM	Well graded SAND with silt and gravel
BH-M2	SS-3	5.00	5.45	54.6	-	NP	NP	2.56	0	0	1	35	64			Blackish Brown	-	Sandy SILT
BH-M2	SS-6	9.00	9.45	67.4	1.59	NP	NP	2.56	0	0	0	8	91			Blackish Brown	-	SILT
BH-M2	UD-1	14.00	15.00	64.3	1.57	87.1	46.7	2.55	5	1	1	6	87	9.3	437	Blackish Brown	MH	SILT
BH-M2	SS-11	18.00	18.45	69.2	-	60.1	23.3	2.54	0	0	1	9	90			Blackish Brown	MH	SILT
BH-M2	SS-14	22.50	22.95	67.0	-	NP	NP	2.54	0	0	2	16	82			Blackish Brown	-	SILT with sand
BH-M2	Mud-1			34.6	-	NP	NP	2.67	0	0	1	70	30			Pale Brown	SM	Silty SAND

Note : UD denotes Shelby Tube Sample, D denotes Split Spoon Sample and NP denotes Nonplastic

*** denotes insufficient soil for testing**

SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%)			Silt+Clay (%)
													Coarse	Medium	Fine	
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	SS-2	3.00-3.45	Well graded SAND with silt and gravel	30.3	-	NP	NP	NP	2.65	42	7	38	3	9

UNIT WEIGHT DETERMINATION

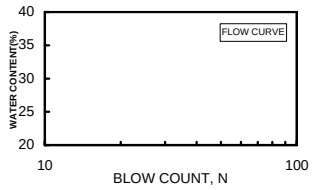
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.17	19.72
Wt. of Wet Soil + Can (g)	112.45	108.32
Wt. of Dry Soil + Can (g)	92.02	86.53
Water Content, w_c (%)	**28.0**	**32.6**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	72.48
Temperature (deg. C)	21.2
Wt. of Water+Soil+Flask (g)	710.29
Wt. of Water + Flask (g)	665.08
Specific Gravity, Gs	**2.65**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 47.13

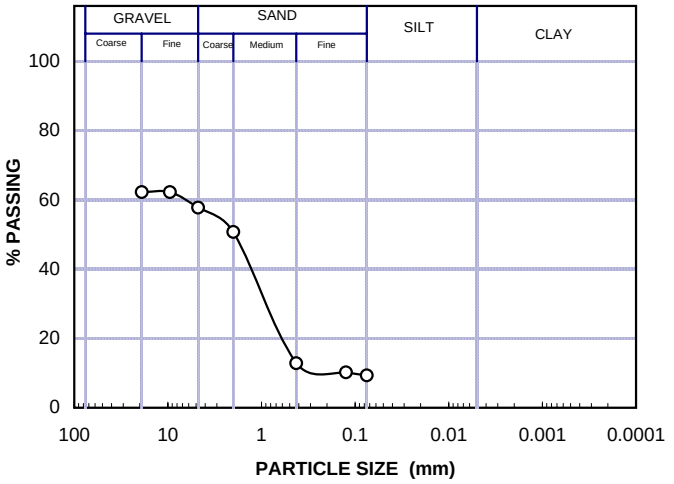
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	17.78	**62.3**
9.5	0.00	**62.3**
4.75	2.12	**57.8**
2.00	3.32	**50.7**
0.425	17.86	**12.8**
0.125	1.24	**10.2**
0.075	0.40	**9.4**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	SS-3	5.00-5.45	Sandy SILT	54.6	-	NP	NP	NP	2.56	0	0	1	35	64

UNIT WEIGHT DETERMINATION

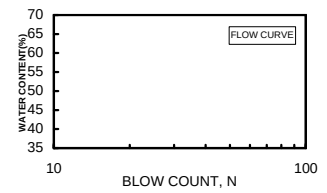
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.37	19.05
Wt. of Wet Soil + Can (g)	102.28	91.43
Wt. of Dry Soil + Can (g)	73.57	65.38
Water Content, w_c (%)	**53.0**	**56.2**

ATTERBERG LIMITS

w_p		w_l			



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	D
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	41.76
Temperature (deg. C)	22.0
Wt. of Water+Soil+Flask (g)	687.20
Wt. of Water + Flask (g)	661.73
Specific Gravity, Gs	**2.56**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 33.65

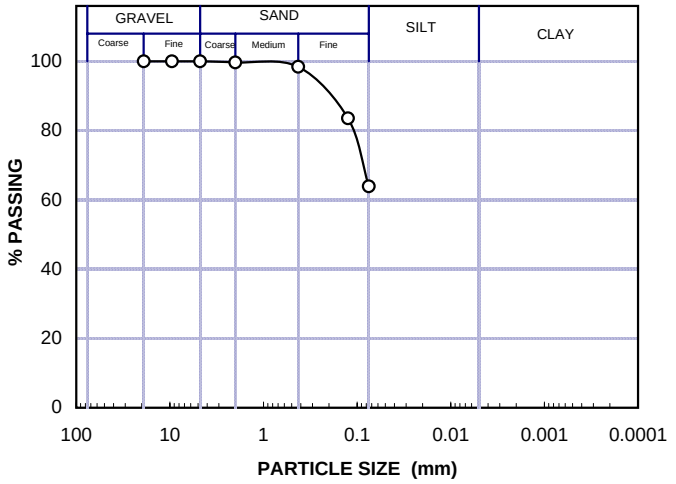
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.11	**99.7**
0.425	0.41	**98.5**
0.125	5.01	**83.6**
0.075	6.61	**63.9**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	SS-6	9.00-9.45	SILT	67.4	1.59	NP	NP	NP	2.56	0	0	0	8	91

UNIT WEIGHT DETERMINATION

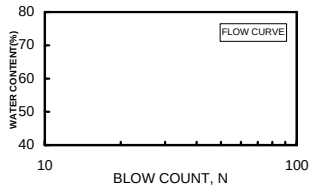
Sample Height (cm)	6.80
Sample Diameter (cm)	3.48
Wt. of Tube (g)	18.99
Wt. of Wet Soil +Tube (g)	122.03
Total Unit Weight (g/cc)	**1.59**
Dry Unit Weight (g/cc)	**0.95**

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	18.99	19.18
Wt. of Wet Soil + Can (g)	122.03	106.12
Wt. of Dry Soil + Can (g)	80.41	71.20
Water Content, w_c (%)	**67.8**	**67.1**

ATTERBERG LIMITS

	w_p		w_l			
Test Condition/Blows	Test 1	Test 2				
Wt. of Can (g)						
Wt. of Wet Soil + Can (g)						
Wt. of Dry Soil + Can (g)						
Water Content, w_c (%)						



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	61.53
Temperature (deg. C)	21.7
Wt. of Water+Soil+Flask (g)	701.57
Wt. of Water + Flask (g)	663.99
Specific Gravity, Gs	**2.56**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 30.47

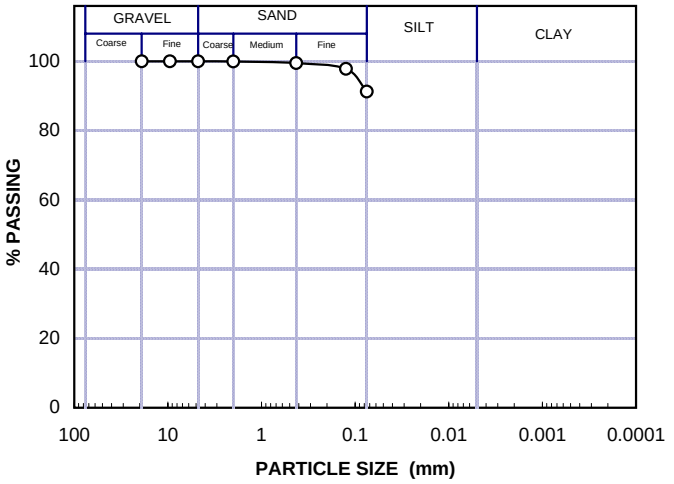
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.01	**100.0**
0.425	0.14	**99.5**
0.125	0.51	**97.8**
0.075	2.00	**91.3**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	UD-1	14.00-15.00	SILT (MH)	64.3	1.57	87.1	40.4	46.7	2.55	5	1	1	6	87

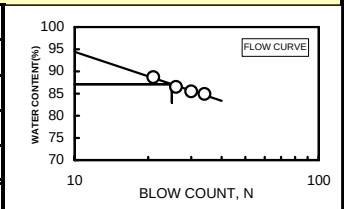
UNIT WEIGHT DETERMINATION

Sample Height (cm)	7.07
Sample Diameter (cm)	3.42
Wt. of Tube (g)	17.43
Wt. of Wet Soil +Tube (g)	119.77
Total Unit Weight (g/cc)	**1.57**
Dry Unit Weight (g/cc)	**0.96**

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	34	30	26	21
Wt. of Can (g)	17.43	15.86	10.94	10.20	32.58	30.51	27.62	27.47
Wt. of Wet Soil + Can (g)	119.77	123.83	21.22	24.26	36.87	34.69	32.21	31.89
Wt. of Dry Soil + Can (g)	78.81	82.58	18.21	20.30	34.90	32.76	30.08	29.81
Water Content, w_c (%)	**66.7**	**61.8**	41.51	39.21	84.91	85.49	86.49	88.71

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	E
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	104.78
Temperature (deg. C)	22.0
Wt. of Water+Soil+Flask (g)	727.72
Wt. of Water + Flask (g)	663.93
Specific Gravity, Gs	**2.55**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 61.40

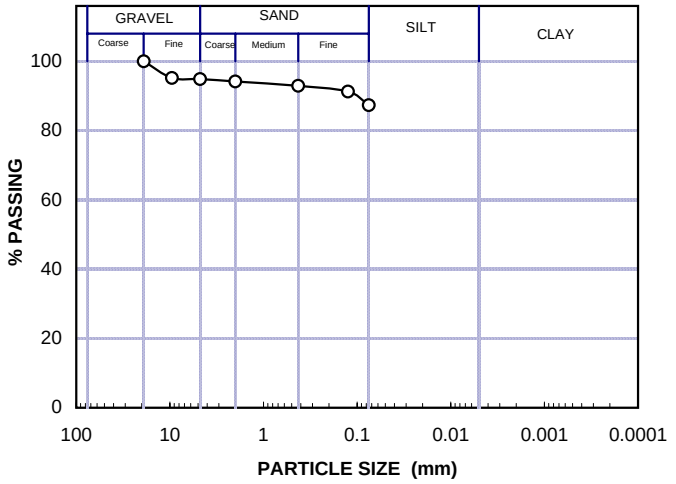
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	2.94	**95.2**
4.75	0.19	**94.9**
2.00	0.43	**94.2**
0.425	0.78	**92.9**
0.125	1.01	**91.3**
0.075	2.42	**87.3**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



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D-1

SIAM TONE CO., LTD.

CONSOLIDATION TEST

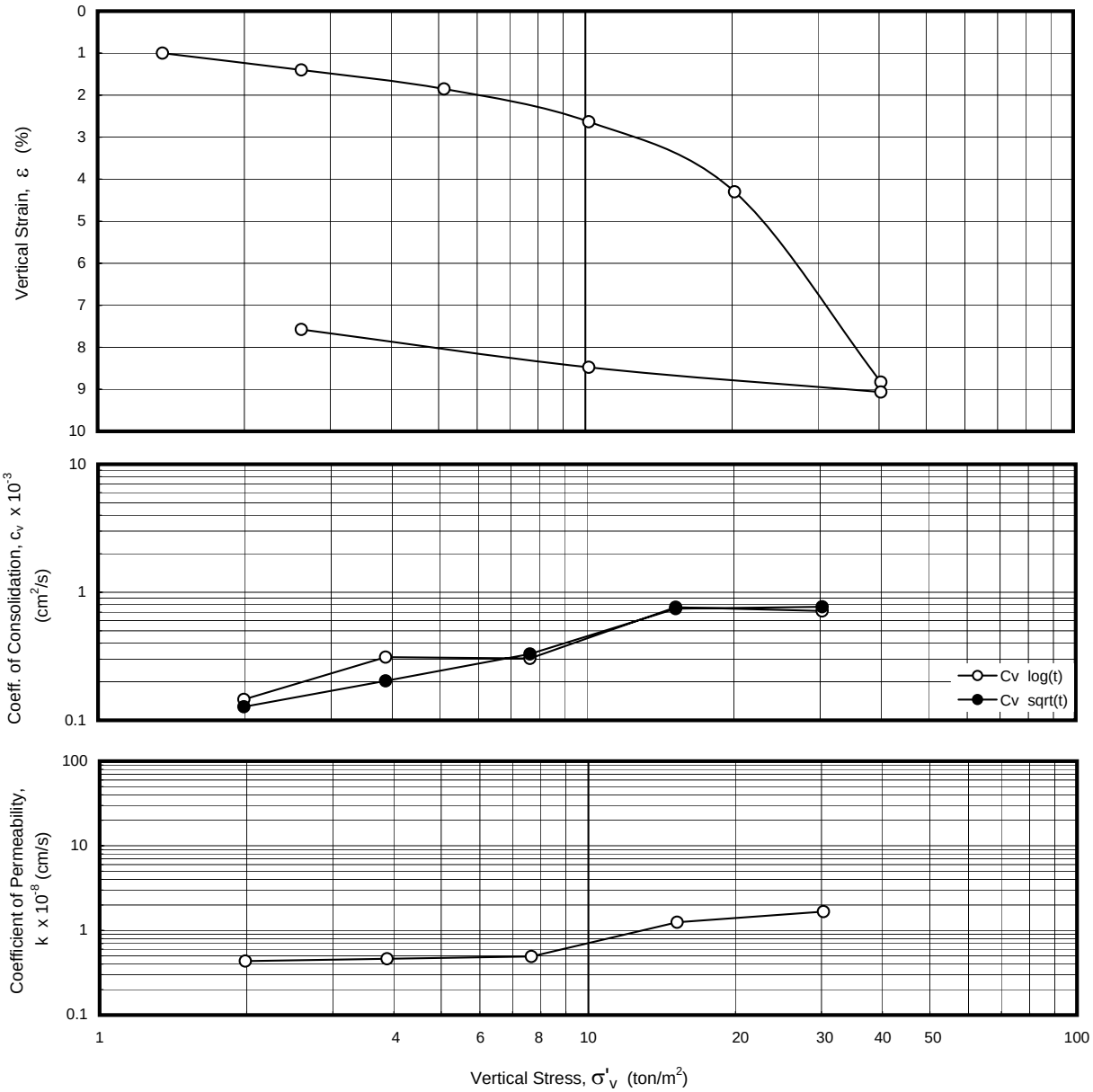
Project: New Auki Market & Jetty Renovation Location: Shoreline of New Market Tested by: MAAG

Borehole: BH-M2 Sample No: UD-1 Depth (m.): 14.00 - 15.00

Soil Description:			SILT		
Water Content, w_n	65.1	%	Liquid Limit, LL	87.11	%
Initial Void Ratio, e_0	1.722		Plasticity Index, PI	46.75	%
Total Unit Weight, γ_t	1.55	ton/m^3	Height of Solid, H_s	0.735	cm.
Specific Gravity, G_s	2.55		Preconsolidation Pressure, $\sigma_{c'}$	20.0	ton/m^2

Vertical Stress (ton/m^2)	Vertical Strain ε_{100} (%)	Vertical Strain ε_f (%)	Void ratio e_{100}	Void ratio e_f	Time t_{90} (min.)	Time t_{50} (min.)	Coefficient of Consolidation c_v x 10^{-3} (cm^2/sec) sqrt(t)	log(t)	Average	Permea. k x 10^{-8} (cm/sec)	Compres. Ratio CR
1.4	1.0	1.1	1.695	1.692							
2.6	1.4	1.5	1.684	1.681	108.2	22.0	0.1	0.1	0.1	0.4	0.014
5.1	1.9	1.9	1.671	1.670	67.2	10.2	0.2	0.3	0.3	0.5	0.015
10.2	2.6	2.8	1.650	1.646	41.0	10.3	0.3	0.3	0.3	0.5	0.026
20.2	4.3	4.5	1.605	1.600	17.6	4.0	0.7	0.8	0.8	1.2	0.056
40.4	8.8	9.1	1.481	1.475	16.0	4.0	0.8	0.7	0.7	1.7	0.151
10.2	8.5	8.4	1.491	1.493							0.006
2.6	7.6	7.5	1.516	1.516							0.015

Note: Compression Ratio = $\frac{\Delta\varepsilon}{\log(\sigma_2/\sigma_1)}$



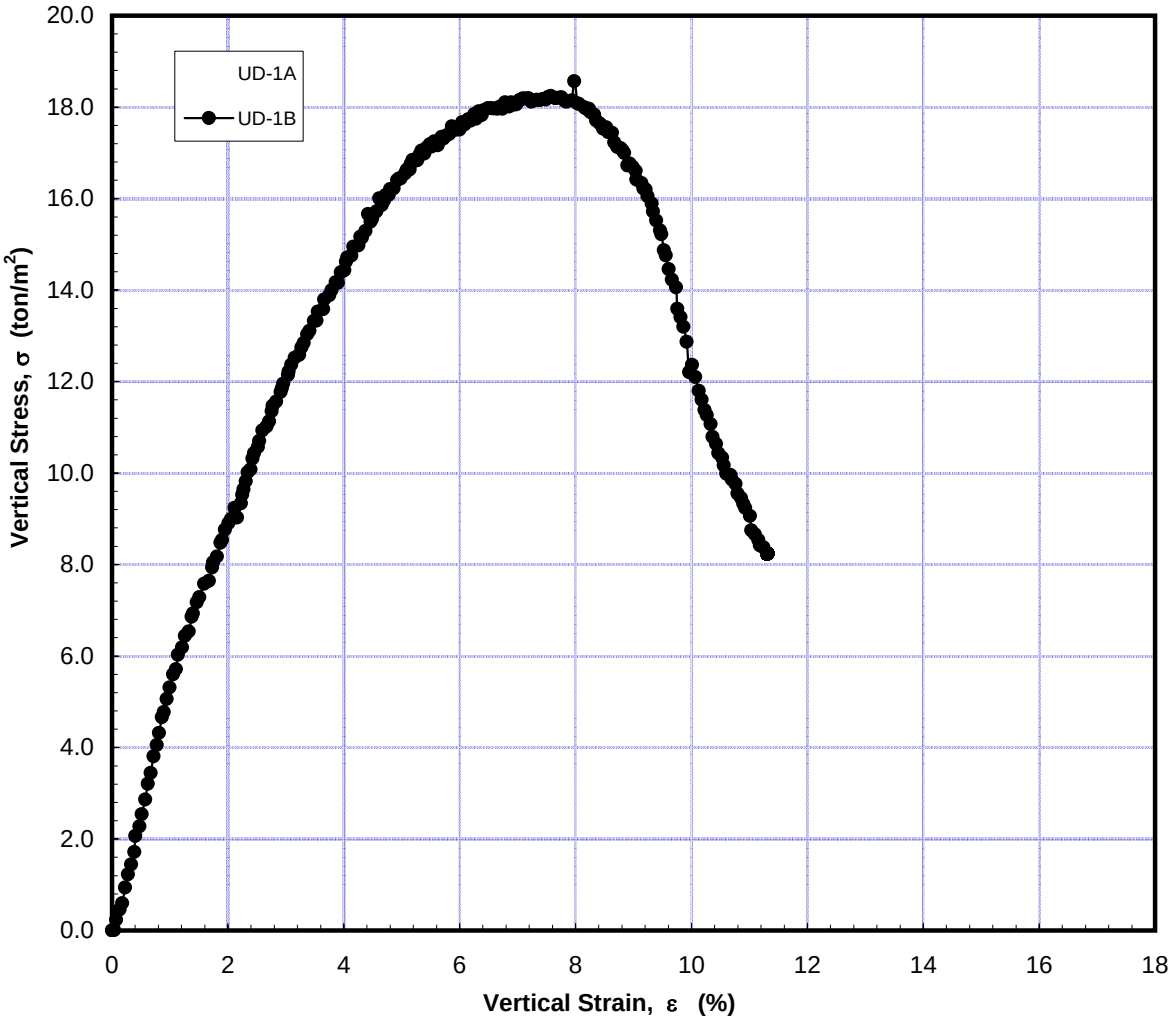
SIAM TONE

UNCONFINED COMPRESSION TEST

Project	New Auki Market and Jetty Renovation			Borehole No :	BH-M2
Location:	Shoreline of New Market			Sample No :	UD-1
Tested by:	MAAG	Date :	Mar 2007	Depth (m) :	14.00-15.00

Test Summary			
Soil Description:	SILT		
Test No.	UD-1A	UD-1B	
Water Content, w_n	66.7	61.8	%
Total Unit Weight, γ_t	1.51	1.59	ton/m^3
Unconfined Compressive Strength, q_u	Disturbed*	18.6	ton/m^2
Undrained Shear Strength, c_u		9.3	ton/m^2
Strain at Failure, ε_f		8.0	%
Modulus at 50% Stress Level, E_{50}		437	ton/m^2
Failure Mode			

Note: * insufficient soil for retest



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	SS-11	18.00-18.45	SILT (MH)	69.2	-	60.1	36.8	23.3	2.54	0	0	1	9	90

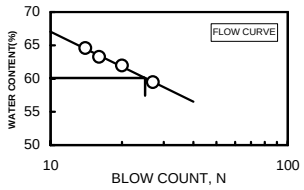
UNIT WEIGHT DETERMINATION

Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c		w_p		w_l			
Test Condition/Blows	A	B	Test 1	Test 2	27	20	16	14
Wt. of Can (g)	19.60	19.16	14.54	14.38	28.93	27.82	25.72	20.82
Wt. of Wet Soil + Can (g)	97.45	85.27	24.81	24.47	40.53	31.79	30.78	24.90
Wt. of Dry Soil + Can (g)	65.69	58.15	22.03	21.78	36.21	30.27	28.82	23.30
Water Content, w_c (%)	**68.9**	**69.6**	37.23	36.33	59.45	61.97	63.27	64.58

ATTERBERG LIMITS



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	G
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	42.33
Temperature (deg. C)	22.0
Wt. of Water+Soil+Flask (g)	686.52
Wt. of Water + Flask (g)	660.85
Specific Gravity, Gs	**2.54**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g) 29.96

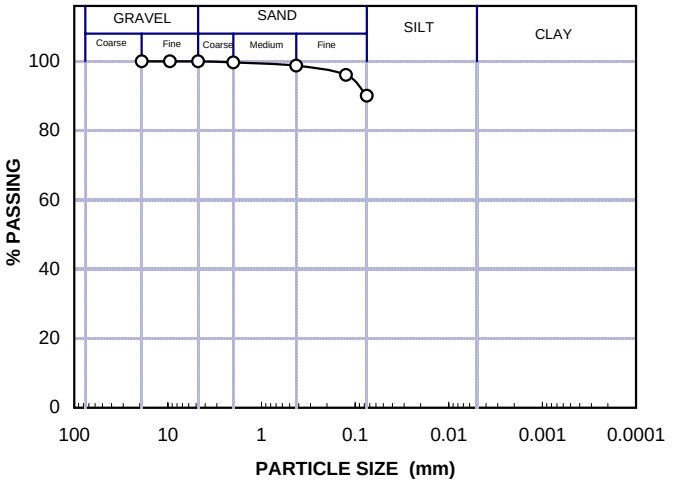
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.10	**99.7**
0.425	0.27	**98.8**
0.125	0.80	**96.1**
0.075	1.80	**90.1**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g)

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



SIAM TONE CO., LTD.

LABORATORY TESTING

SUMMARY OF LABORATORY TESTS

Project	Location	Borehole No.	Sample No.	Depth (m)	Soil Description	Water Content (%)	Total Unit Weight (t/m^3)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Specific Gravity	Gravel (%)	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Silt+Clay (%)
New Auki Market & Jetty Renovation	Shoreline of New Market	BH-M2	SS-14	22.50-22.95	SILT with sand	67.0	-	NP	NP	NP	2.54	0	0	2	16	82

UNIT WEIGHT DETERMINATION

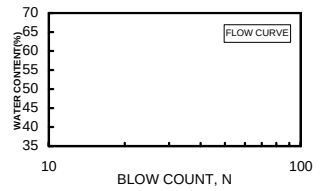
Sample Height (cm)	
Sample Diameter (cm)	
Wt. of Tube (g)	
Wt. of Wet Soil +Tube (g)	
Total Unit Weight (g/cc)	
Dry Unit Weight (g/cc)	

WATER CONTENT

	w_c	
Test Condition/Blows	A	B
Wt. of Can (g)	19.53	19.68
Wt. of Wet Soil + Can (g)	111.93	100.61
Wt. of Dry Soil + Can (g)	75.20	67.87
Water Content, w_c (%)	**66.0**	**67.9**

ATTERBERG LIMITS

w_p		w_l			
Test 1	Test 2				



ORGANIC CONTENT

Wt. of Dish (g)	
Oven-Dried soil + Dish (g)	
Fired Soil + Dish (g)	
Organic Content, (%)	

Note: Fired Soil at 440 deg. C to burn off organic matters

SPECIFIC GRAVITY

Flask No.	C
Wt. of Tin (g)	
Wt. of Tin + Dry Soil (g)	37.42
Temperature (deg. C)	21.0
Wt. of Water+Soil+Flask (g)	687.82
Wt. of Water + Flask (g)	665.12
Specific Gravity, Gs	**2.54**

WET SIEVE ANALYSIS

Wt. of Dry Soil (g): 33.97

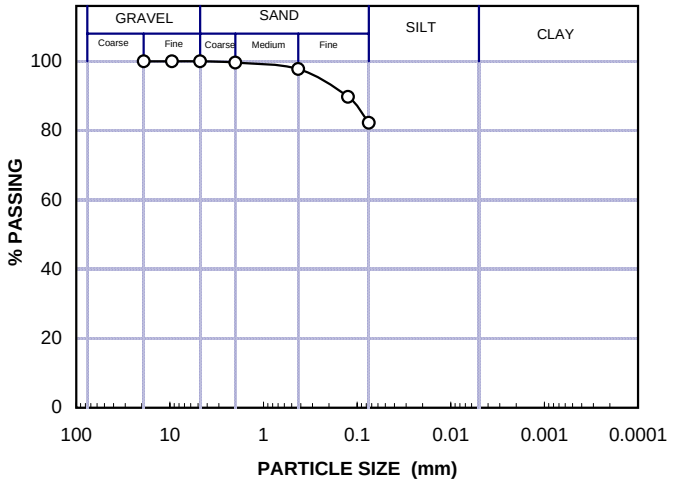
Particle Size (mm)	Soil Retained (g)	% Passing
19.0	0.00	**100.0**
9.5	0.00	**100.0**
4.75	0.00	**100.0**
2.00	0.13	**99.6**
0.425	0.62	**97.8**
0.125	2.73	**89.8**
0.075	2.54	**82.3**

HYDROMETER ANALYSIS (GRAIN SIZE)

Wt. of Dry Soil (g):

Elapsed Time (min)	R= 1000(r-1)	R_w= 1000(r_w-1)	Temp (C)	G_w (g/cc)	M (gs/cm^2)	Z_r (cm)	Diameter D (mm)	% Finer

GRAIN SIZE DISTRIBUTION



7-2-4. 流況調査結果

ＣＴ－１　中層　2007年2月15日　18h00m～2007年2月16日　17h00m

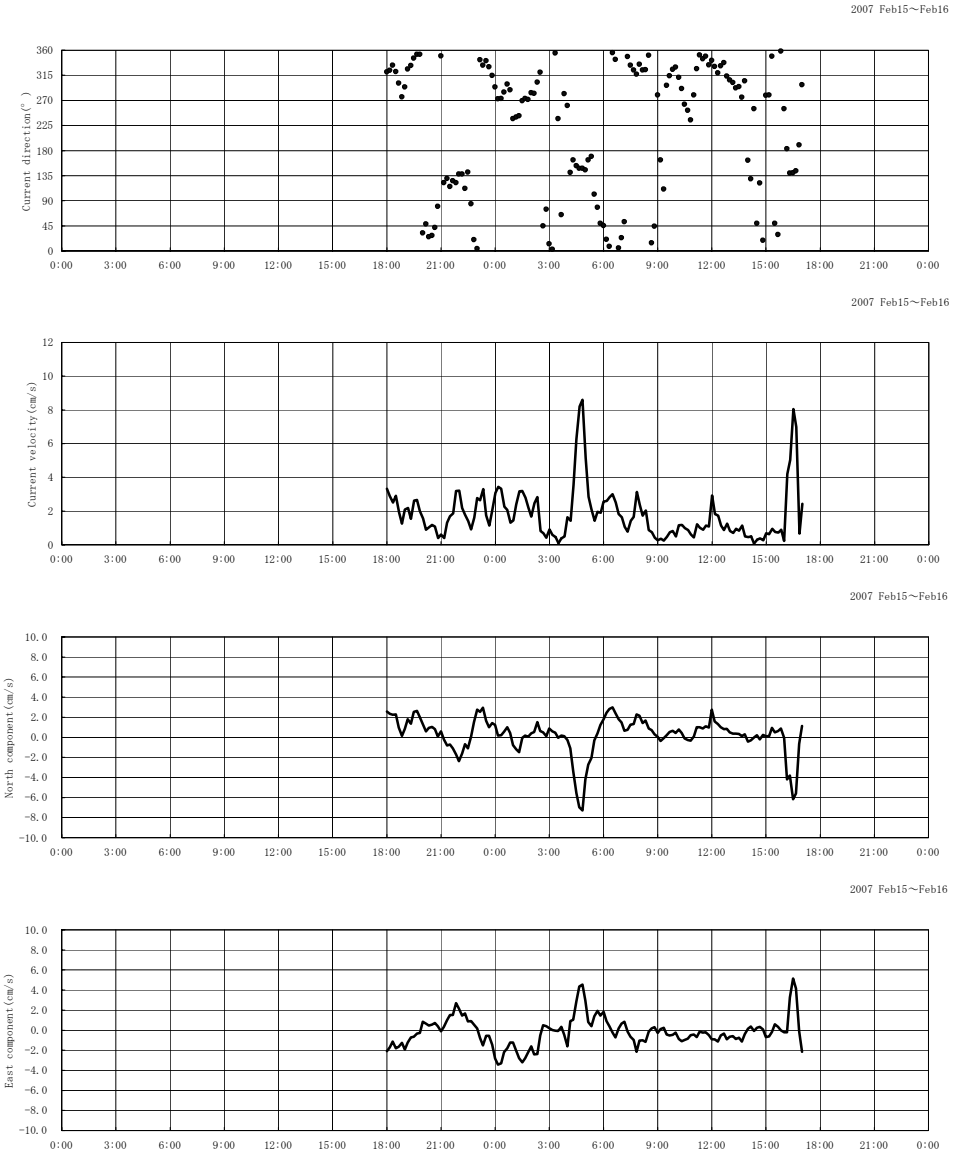
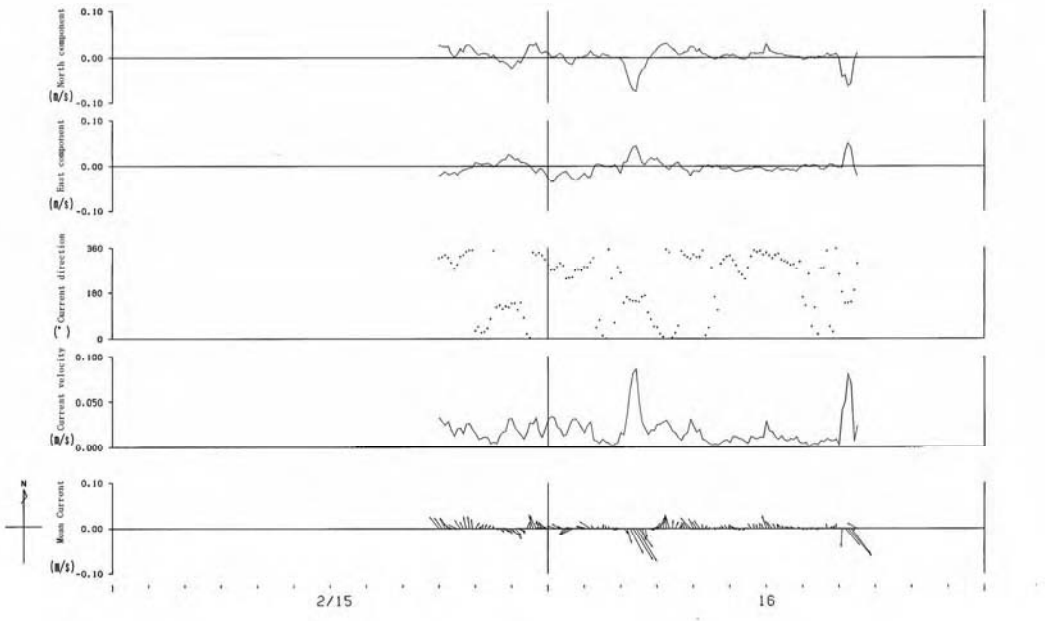


Figure Time seriese data of current at Solomon



ＣＴ－２： 中層　2007年2月16日　18h00m～2007年2月17日　18h00m

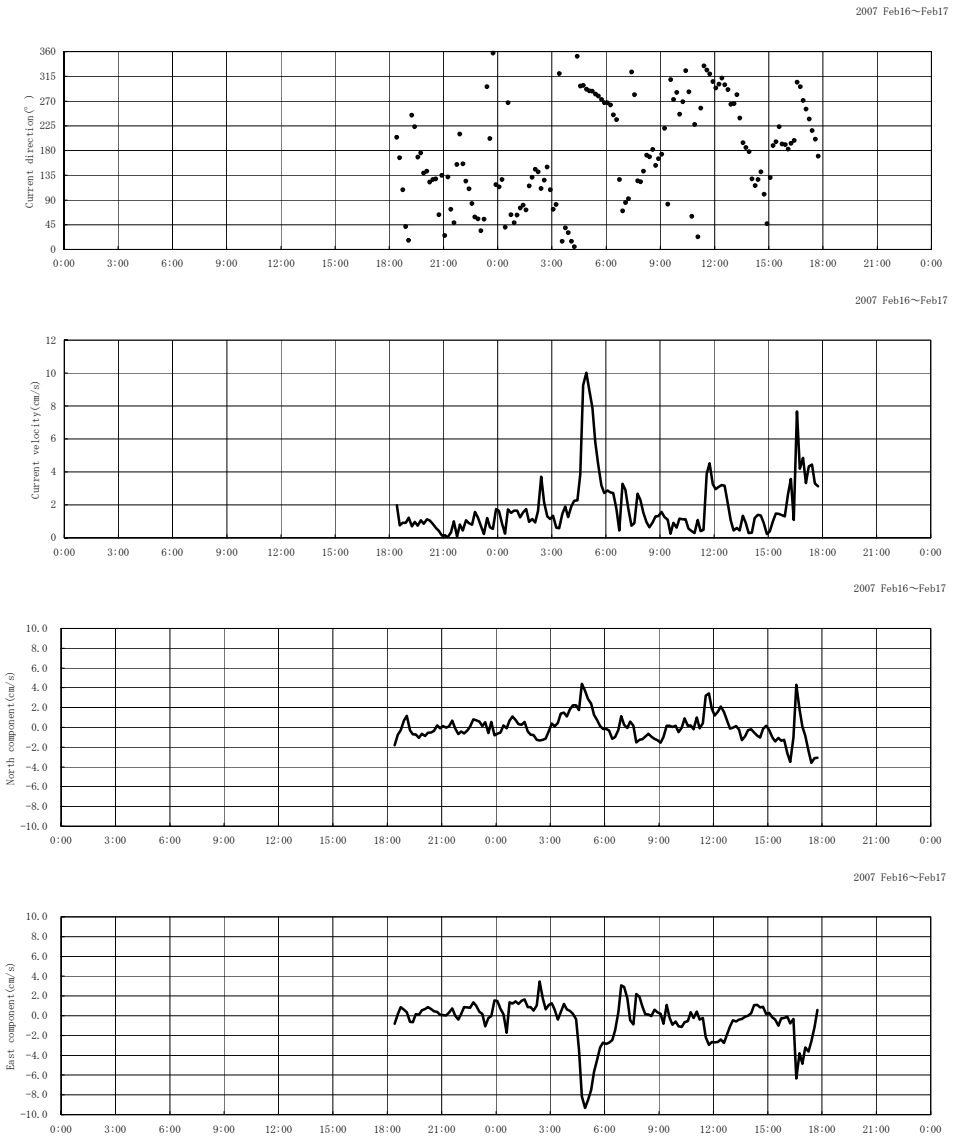
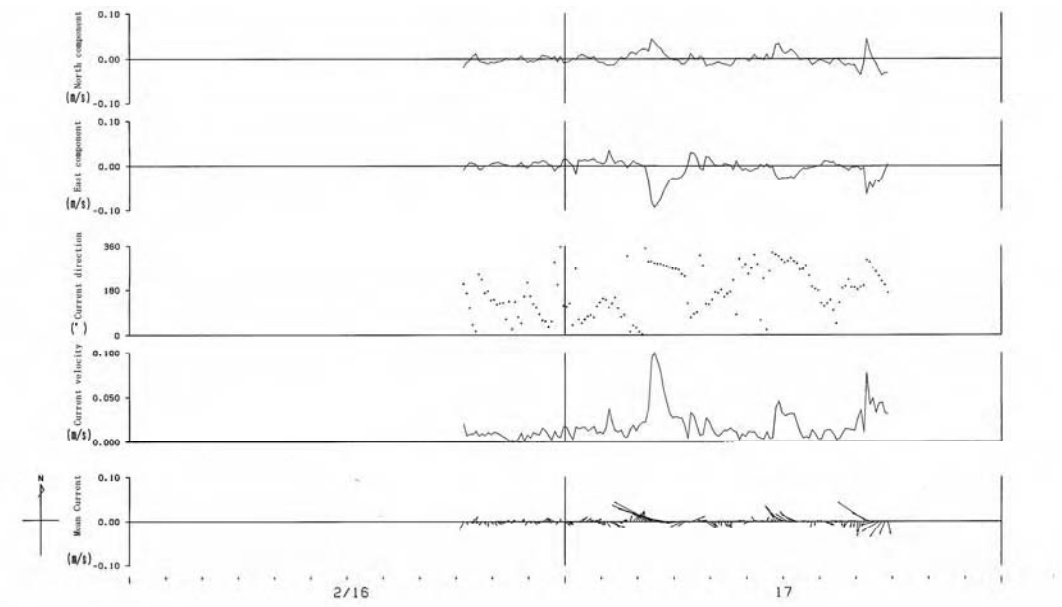


Figure Time seriese data of current at Solomon



水質調査結果（第１回：干潮時）

採水日時　：　2007 年 2 月 13 日 (干潮時)

採水箇所　：　4 ヶ所　（WS-1～WS-4）

※採水地点は資料 7-2-1: 自然条件調査位置図に示す。

検査項目　：　水温、pH 、COD、大腸菌群数

検査方法　：　水温　：　デジタル温度計

pH　　：　デジタル pH 計

COD（化学的酸素要求量）：　簡易パックテスト

大腸菌群数　：　簡易大腸菌数検出紙

検査結果　：　結果を下表に示す。

表 1：水質検査結果

項目 採水地点	水温 (℃)	pH	化学的酸素要求量 (COD) (mg/L)	大腸菌数 (MPN/100ml)
WS-1	29.5	7.7	13.0	14.0×10^2
WS-2	29.5	7.7	50.0	10.0×10^2
WS-3	29.5	7.7	13.0	30.0×10^2
WS-4	29.5	7.7	10.0	11.0×10^2

表 2：我が国における水質基準

項目 類型	pH	COD	大腸菌数
1)　環境基本法 公共水域の水質基準 環境保全(C 型)	7.0 以上 8.3 以下	8mg／L 以下	－
2)　水道法 水質基準	－	－	検出されないこと

注）C 型：国民の日常生活（沿岸の遊歩などを含む）において不快を感じない限度

評価　：

- pH は、pH8.0 前後を示しており、通常の自然海水と同様、表 2 の 1）の基準を満たしている。
- COD は、全 4 ヶ所ともに表 2 の 1）基準値を上回った。
- 大腸菌数は、各地点で検出され、屎尿による汚染をうけた可能性が高い。特に新設市場に近い汀線部の草むらに近い WS-2 において非常に高い値を示した。
- 第2回目（満潮時）の試験結果と比較すると、干潮時の汚染濃度は、全箇所共により高い値が検出された。
- アウキ市では生活排水（排泄物含む）の処理施設が整備されておらず、全ての排水が海に直接流入している。このため、COD や大腸菌数の値が、基準値を上回る結果となったと考えられる。

水質調査結果（第２回：満潮時）

採水日時　：　2007 年 2 月 16 日 (満潮時)

採水箇所　：　7 ヶ所　（WS-1～WS-7）

※採水地点は資料 7-2-1: 自然条件調査位置図に示す。

検査項目　：　水温、pH 、COD、大腸菌群数

検査方法　：　水温　：　デジタル温度計

pH　　：　デジタル pH 計

COD（化学的酸素要求量）：　簡易パックテスト

大腸菌群数　：　簡易大腸菌数検出紙

検査結果　：　結果を下表に示す。

表 1：水質検査結果

項目 採水地点	水温 (℃)	pH	化学的酸素要求量 (COD) (mg/L)	大腸菌数 (MPN/100ml)
WS-1	31.5	8.0	5.0	10.0×10^2
WS-2	31.5	8.1	5.0	5.0×10^2
WS-3	31.5	7.8	10.0	4.0×10^2
WS-4	31.5	7.9	5.0	12.0×10^2
WS-5	31.5	7.8	10.0	8.0×10^2
WS-6	31.5	8.0	5.0	4.0×10^2
WS-7	30.5	7.9	5.0	$13.\times10^2$

表 2：我が国における水質基準

項目 類型	pH	COD	大腸菌数
1)　環境基本法 公共水域の水質基準 環境保全(C 型)	7.0 以上 8.3 以下	8mg／L 以下	－
2)　水道法 水質基準	－	－	検出されないこと

注）C 型：国民の日常生活（沿岸の遊歩などを含む）において不快を感じない限度

評価　：

- pH は、pH8.0 前後を示しており、通常の自然海水と同様、表 2 の 1）の基準を満たしている。
- COD は、7 ヶ所中、5 ヶ所は基準値未満を示したが、2 ヶ所については、表 2 の 1）基準値を上回った。
- 大腸菌数は、各地点で検出され、屎尿による汚染をうけた可能性が高い。
- アウキ市では生活排水（排泄物含む）の処理施設が整備されておらず、全ての排水が海に直接流入している。このため、COD や大腸菌数の値が、基準値を上回る結果となったと考えられる。

7-3　アウキ市場及び桟橋利用者インタビュー調査の概要

１．アウキ市場利用者調査

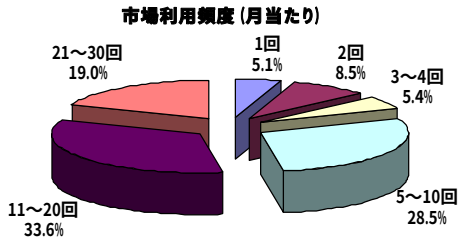
1.1 調査日等

アウキ市場利用者のインタビュー調査を 2 月 9 日(金)から 2 月 16 日(金)までの 8 日間、現地調査員 4 名にて実施した。調査数は男性 184 名、女性 207 名、計 391 名であった。2 月 11 日(日)を除く、各日に計数した売場数とインタビュー件数を表 6 に示す。平均すると出店者数の 18.3%にインタビュー調査を実施した結果となった。なお、調査員には、インタビュー対象者の重複を避けるように指示した。

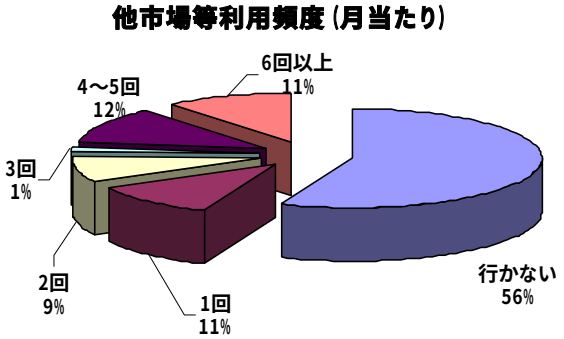
表 1　調査日のアウキ市場売場数とインタビュー件数

	計数した店舗数	インタビュー件数	比率
2月9日(金)	373	42	11.3%
2月10日(土)	478	54	11.3%
2月12日(月)	190	47	24.7%
2月13日(火)	220	55	25.0%
2月14日(水)	234	57	24.4%
2月15日(木)	267	61	22.8%
2月16日(金)	276	57	20.7%
合計	2,038	373	18.3%

1.2 調査結果の概要

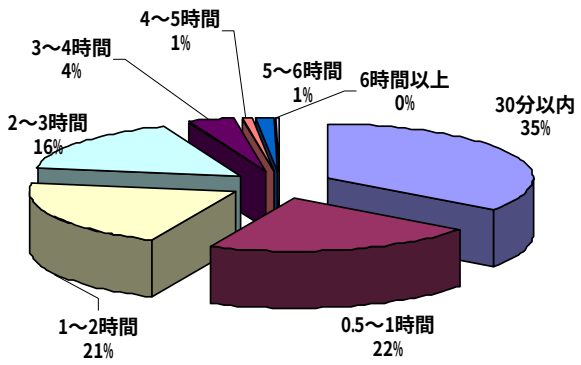


アウキ市場出店頻度（月当たり）	
1回	5.1%
2回	8.5%
3～4回	5.4%
5～10回	28.5%
11～20回	33.6%
21～30回	19.0%



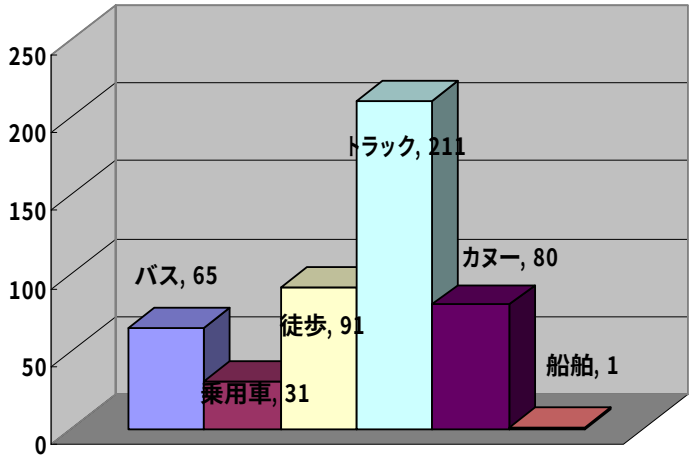
他市場利用頻度	（月当たり）
行かない	169
1回	33
2回	26
3回	4
4～5回	36
6回以上	33

市場への移動時間



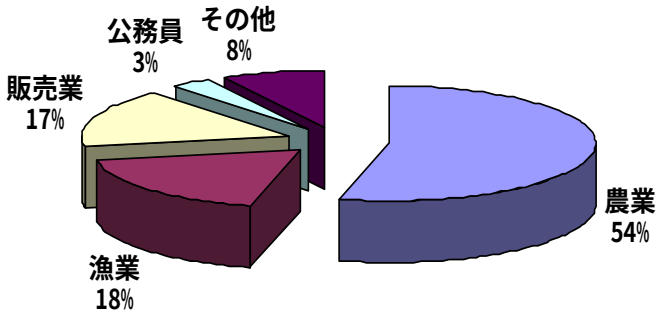
移動時間	
30分以内	137
0.5～1時間	84
1～2時間	81
2～3時間	64
3～4時間	14
4～5時間	4
5～6時間	5
6時間以上	1

交通手段（複数回答あり）



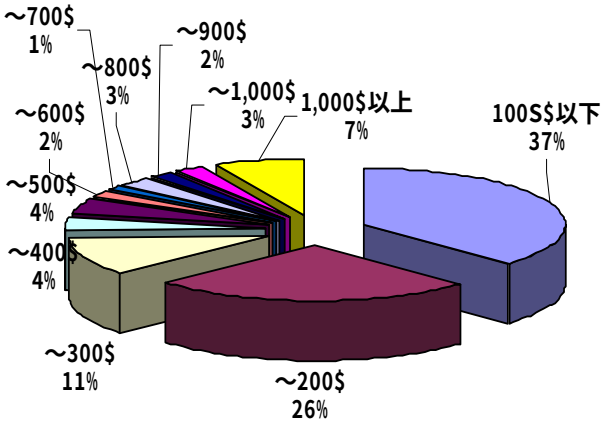
交通手段	（複数回答あり）
バス	65
乗用車	31
徒歩	91
トラック	211
カヌー	80
船舶	1
その他	0

市場利用者職業



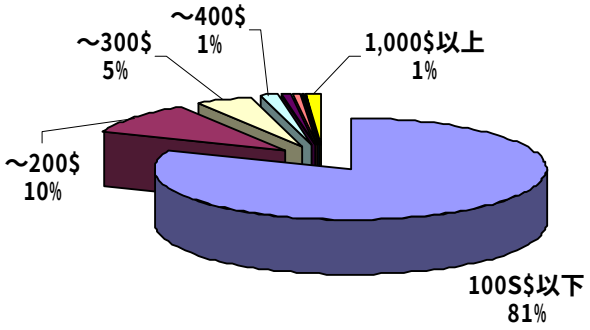
職業	
農業	231
漁業	78
販売業	72
公務員	13
その他	34

売上金額（1日）



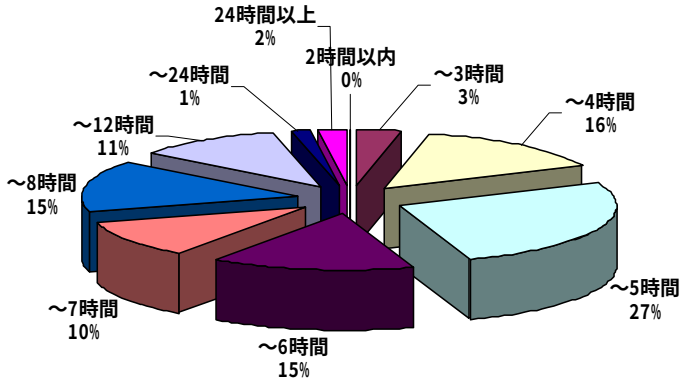
売上金額（1日）	
平均	S$ 401
Max	S$ 8,000
Min	S$ 10
Median	S$ 165
100S$以下	141
～200$	98
～300$	41
～400$	16
～500$	16
～600$	7
～700$	4
～800$	11
～900$	7
～1,000$	10
1,000$以上	27

アウキでの購買金額



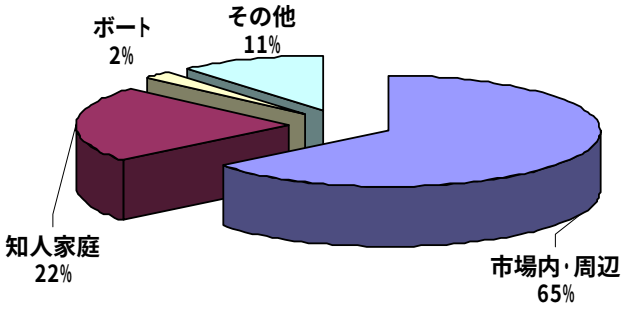
アウキでの購買金額	
平均	S$ 95
Max	S$ 2,000
Min	0
Median	S$ 47.5
100S$以下	312
～200$	39
～300$	18
～400$	5
～500$	4
～600$	2
～700$	1
～800$	0
～900$	0
～1,000$	0
1,000$以上	4

市場滞在時間



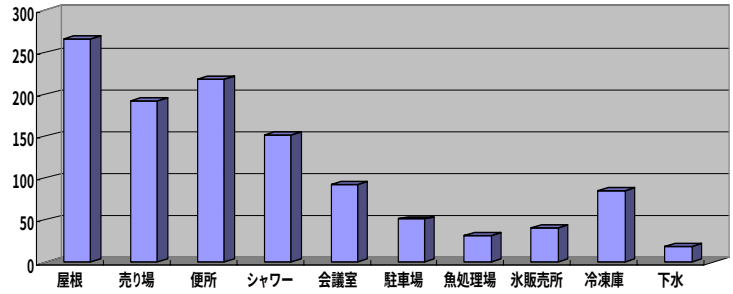
滞在時間	
平均	6.8時間
Median	5.8時間
2時間以内	0
～3時間	9
～4時間	42
～5時間	73
～6時間	43
～7時間	29
～8時間	42
～12時間	30
～24時間	4
24時間以上	6

夜間滞在場所

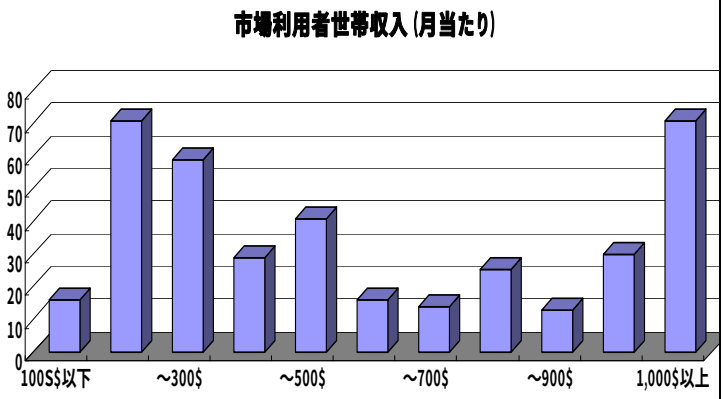


夜間滞在場所	
市場内･周辺	217
知人家庭	76
ボート	7
その他	38

市場利用者希望施設(複数回答あり)



市場利用者要望施設（複数回答あり）	
屋根	267
売り場	192
便所	218
シャワー	151
会議室	92
駐車場	51
魚処理場	32
氷販売所	41
冷凍庫	85
下水	19



月当たり世帯収入	S$
Median	475
100S$以下	16
～200$	71
～300$	59
～400$	29
～500$	41
～600$	16
～700$	14
～800$	25
～900$	13
～1,000$	30
1,000$以上	71

市場利用者のアウキでの購買品目

順位	購買品目	購買者数
1	米	52
2	塩	34
3	鮮魚	32
4	砂糖	30
5	タロ	25
6	キャベツ	20
7	軽油	17
8	麺類	15
9	石けん	13
10	小麦粉	10
11	塩干魚	5
12	ビートルナッツ	5
13	雑品	3

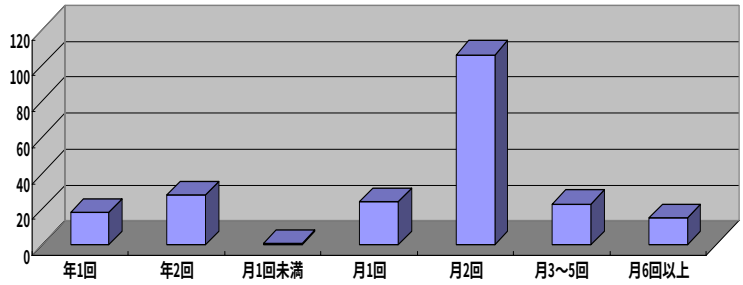
２．アウキ桟橋利用者調査

2.1 調査日等

アウキ桟橋利用者のインタビュー調査を 2 月 10 日(土)、13 日(火)、14 日(水)、15 日(木)、16 日(金)、17 日(土)の深夜及び早朝に、現地調査員 4 名にて実施した。調査数は男性 133 名、女性 117 名、計 250 名であった。調査期間中、アウキ桟橋を利用した船舶は、MV Bellama, MV Belona, MV Bikoi, MV H.Noda, MV Pelican Express, MV Renbel, MV Sa'alia, MV Temotu, MV Tomoko であった。

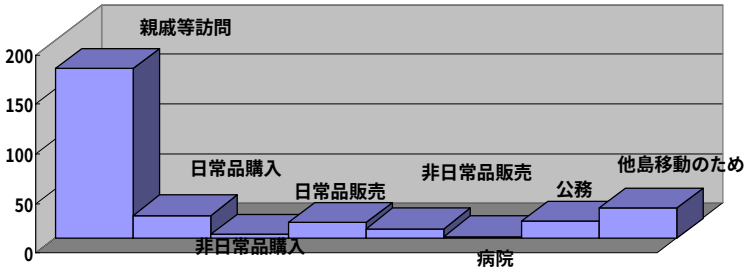
2.2 調査結果の概要

連絡船乗客ホニアラ往復頻度



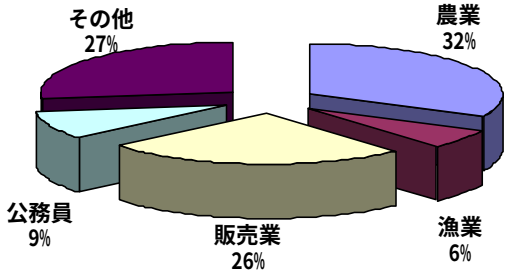
乗客交通手段	
バス	58
乗用車	69
徒歩	33
トラック	140
カヌー	20
船舶	0

乗客の旅行目的(複数回答あり)



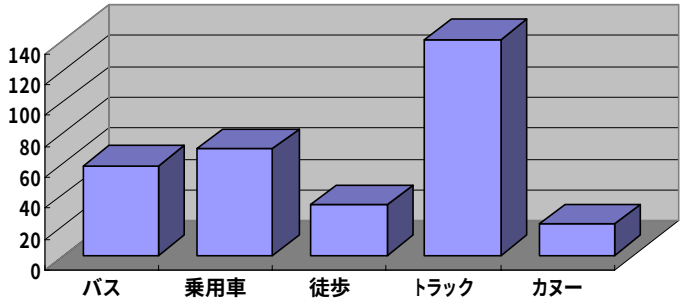
旅行目的	(複数回答あり)
親戚等訪問	171
日常品購入	23
非日常品購入	4
日常品販売	16
非日常品販売	10
病院	2
公務	17
他島移動のため	30

乗客職業

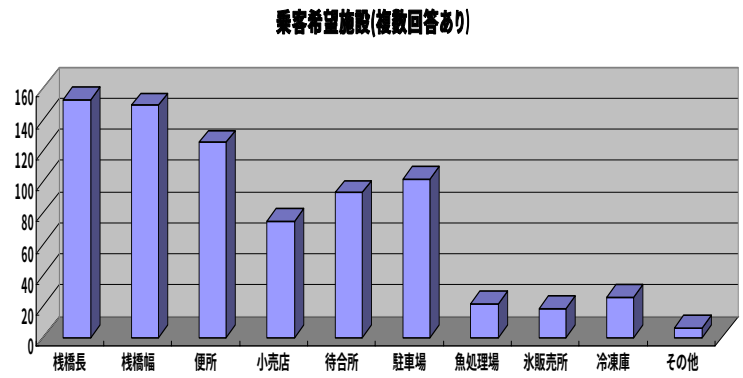


乗客職業	
農業	77
漁業	14
販売業	61
公務員	22
その他	64

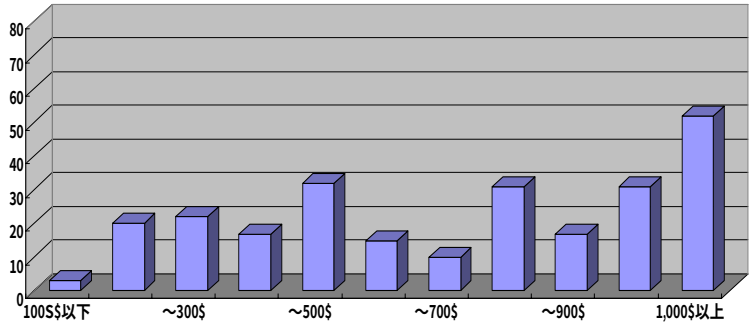
乗客交通手段 (複数回答あり)



乗客交通手段	(複数回答あり)
バス	58
乗用車	69
徒歩	33
トラック	140
カヌー	20
船舶	0



乗客希望施設	(複数回答あり)
桟橋長	153
桟橋幅	149
便所	125
小売店	75
待合所	93
駐車場	102
魚処理場	22
氷販売所	19
冷凍庫	26
その他	6



乗客月当たり世帯収入	
Median	S$ 700
100S$以下	3
～200$	20
～300$	22
～400$	17
～500$	32
～600$	15
～700$	10
～800$	31
～900$	17
～1,000$	31
1,000$以上	52

桟橋利用者の携行品 (アウキ着船舶)		
順位	携行品目	回答数
1	米	31
2	麺類	14
3	魚缶詰	12
4	キャベツ	11
5	ナイフ	6
6	豆類	5
6	スリッパリーキャベツ	5
6	シャロット	5
6	パン	5
6	砂糖	5
11	白菜	4
11	トマト	4
11	小麦粉	4