and water table. Three percolation tests were also carried out. This work was carried out under the supervision of a senior civil engineer from TGA office on 1st, 2nd, 3rd and 12th December 2003.

Scala penetrometer, test pits and percolation test positions are shown in Figure 1 of Appendix 2.

2.0 SUBSURFACE GROUND CONDITIONS

2.1 Geology

The published geological information shows the site is underlain by Fagaloa Volcanics formation which comprise of fine grained basalt. Test pit profiles suggest that the local geology has been formed by weathered basalt.

2.2 Field Test Information

The site generally has average top soil of 150mm to 200mm. The soil is typically sandy gravel with boulders of 100mm to 400mm in size with angular and vesicular basalt clasts. Hard basalt were encountered at shallow depths (less than 1.0m) in some test pits. Highly vesicular basalts were encountered at depths of 2.8 to 3.5m in some test pits. The vesicular basalt was not difficult to break using the bucket of the backhoe. The hard basalt was difficult to break.

The soil is relatively moist, most probably due to the high rainfall during the past weeks. Field plasticity is medium to low and the soil is slightly cohesive. There was basement rock stratum encountered in half the number of test pits. Pit excavation were stopped at depths where hard boulders and basalt outcrop layer exist. There was no water table encountered in all test pits.

Test pits logs and pictures are given in Appendix 2. Scala penetrometer results are given in Appendix 3.

3.0 ENGINEERING CONSIDERATION

3.1 General

Building foundation shall be founded below the humic layer. This humic layer shall be removed. Due to the sloping nature of the site, cut and fill of the existing ground should be considered to reduce the quantity of earthworks and concrete foundation.

Strip footings and column pad foundation with tie beams is considered appropriate for this site. There is no sign of soil contamination on this site. Step footings can be considered to suit the sloping terrain.

3.2 Engineering Fill

Seleccted material from site excavation can be used as general backfill. Structural fill should be imported from other nearby sources if the existing material is found unacceptable.

3.3 Foundation

The new proposed school buildings are mainly two storeys and strip footings or column pad footings with tie beams are considered suitable. Footings of the new building structures shall be founded at depth below the humic layer or at least 800mm below the existing ground level. Strip footings and tie beams can be stepped to match ground profile to minimise earthworks.

3.4 Bearing Capacity

The recommended allowable bearing pressures for the design of footings of the new building structures are as follows:

Loadings	q allowable
Dead + Live	100 kPa
Wind/Seismic	150 kPa

3.5 Compaction of Fill

Fill where required will be placed in layers of no more than 150mm thick per layer, and should be tested for compaction by means of scala penetrometer or a Glegg hammer equipment. All imported and selected fill material should be compacted to 90 percent maximum dry density. In-situ subgrade soil should be compacted to CBR 10% before placing the imported fill material.

3.6 Percolation Test

Three percolation tests were carried out on this site. The site provides 6 minutes for the water to percolate 25mm. The percolation test results are given in Appendix 4.

4.0 APPLICABILITY

This report is prepared for the particular site in question. Data and opinions contained in it may not be used in other context or for any other purpose

without our prior review and agreement.

During excavation and construction, the site should be examined by an engineer competent to judge whether the exposed subsoils are compatible with the inferred conditions.

5.0 ACKNOWLEDGEMENT

We gratefully acknowledge the assistance of the assistant CEO of the Samoa Polytechnic and local residents of Toomatagi and Vaivase who were able to provide information regarding previous flooding in the area.

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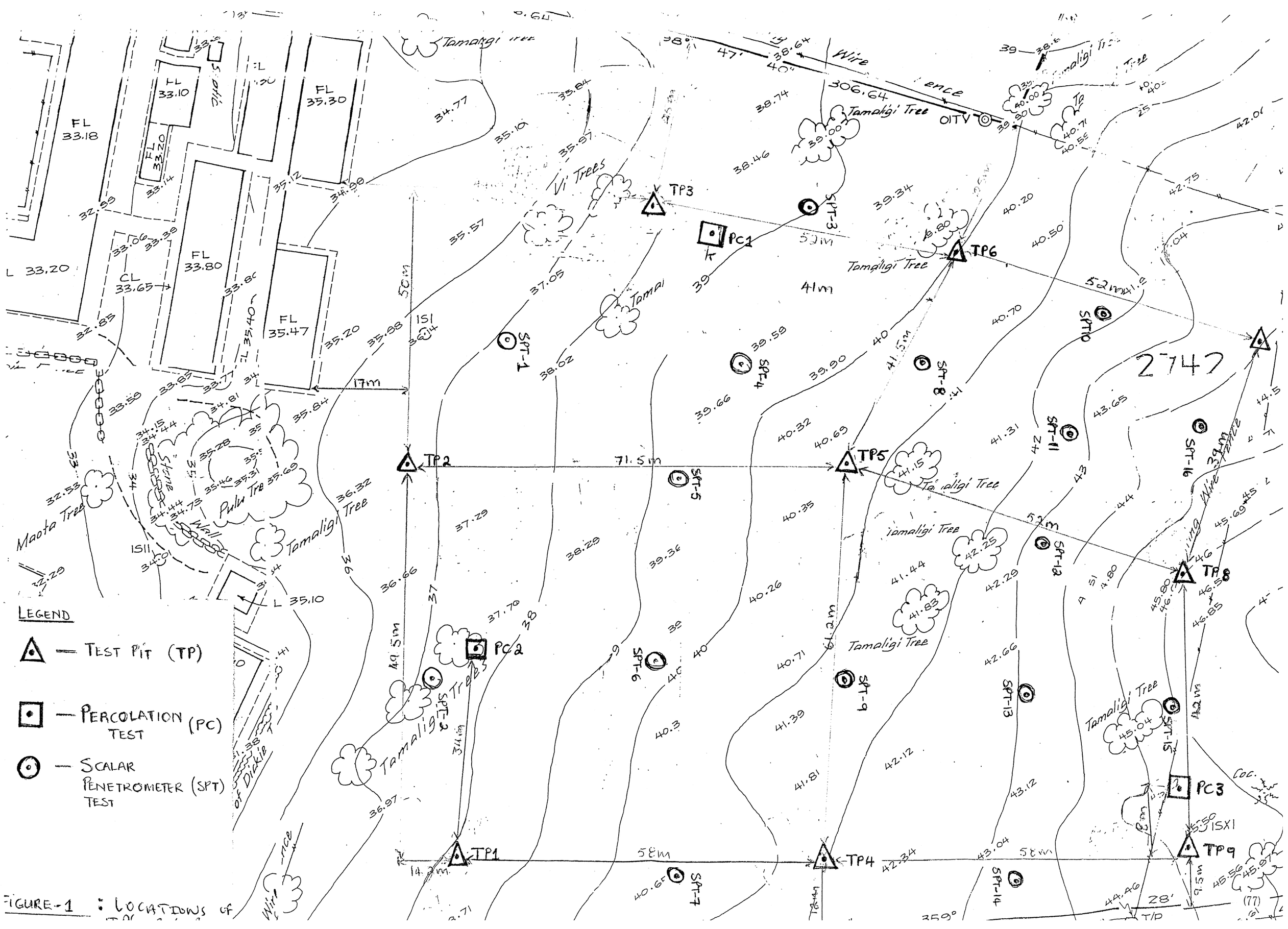
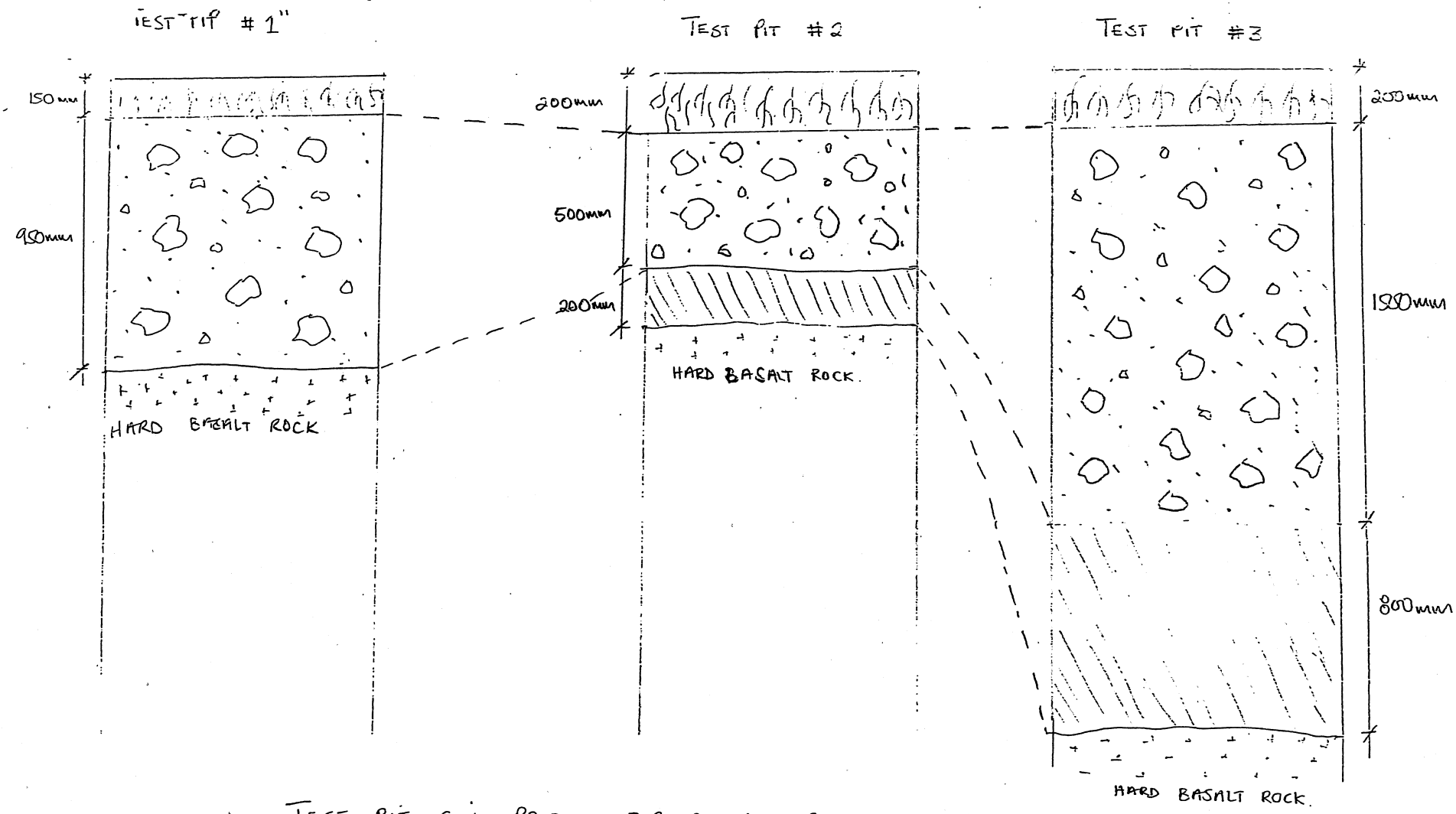


LEGEND

- — TEST PIT (TP)
- — PERCOLATION TEST (PC)
- — SCALAR PENETROMETER (SPT) TEST

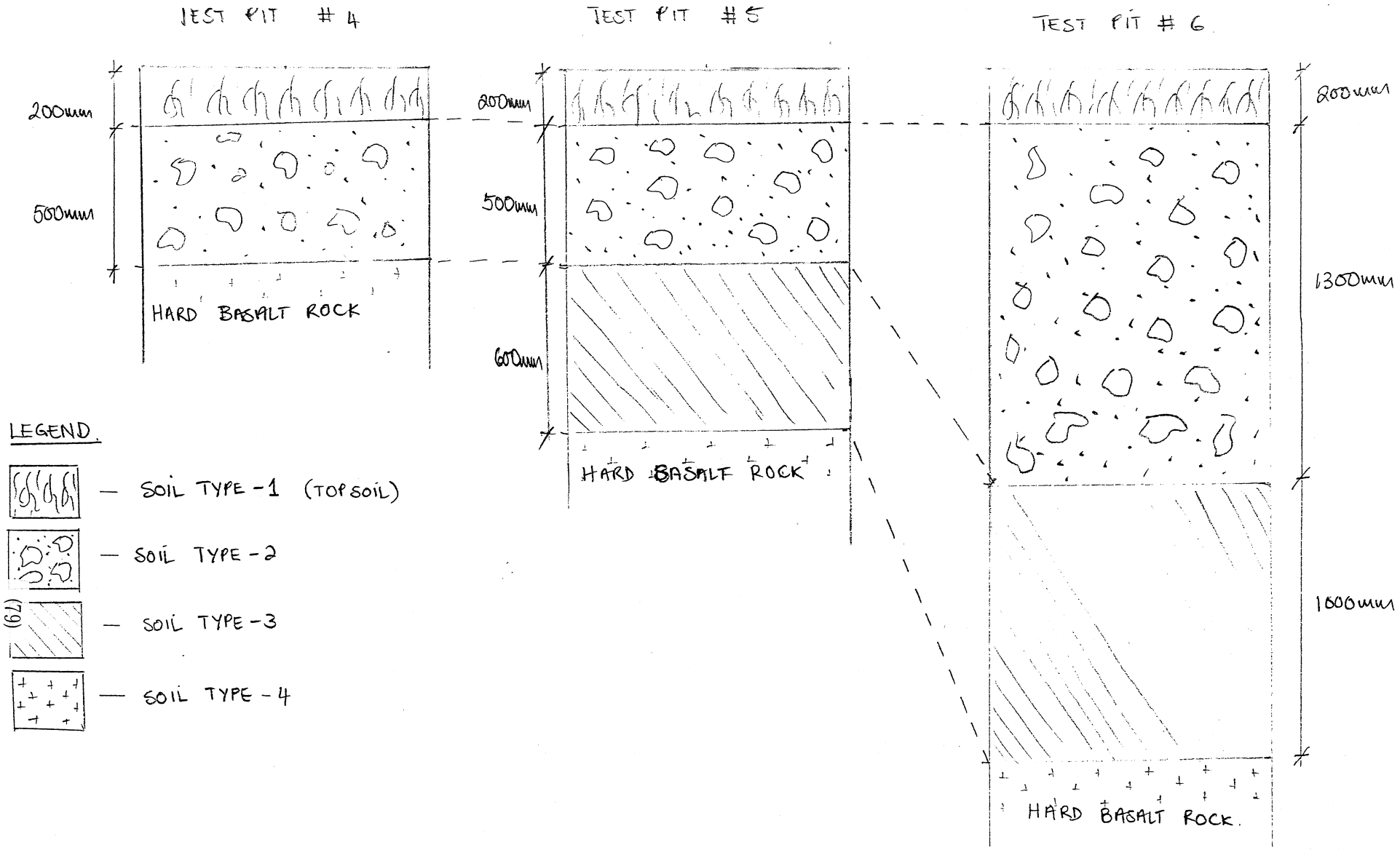
FIGURE-1 : LOCATIONS OF

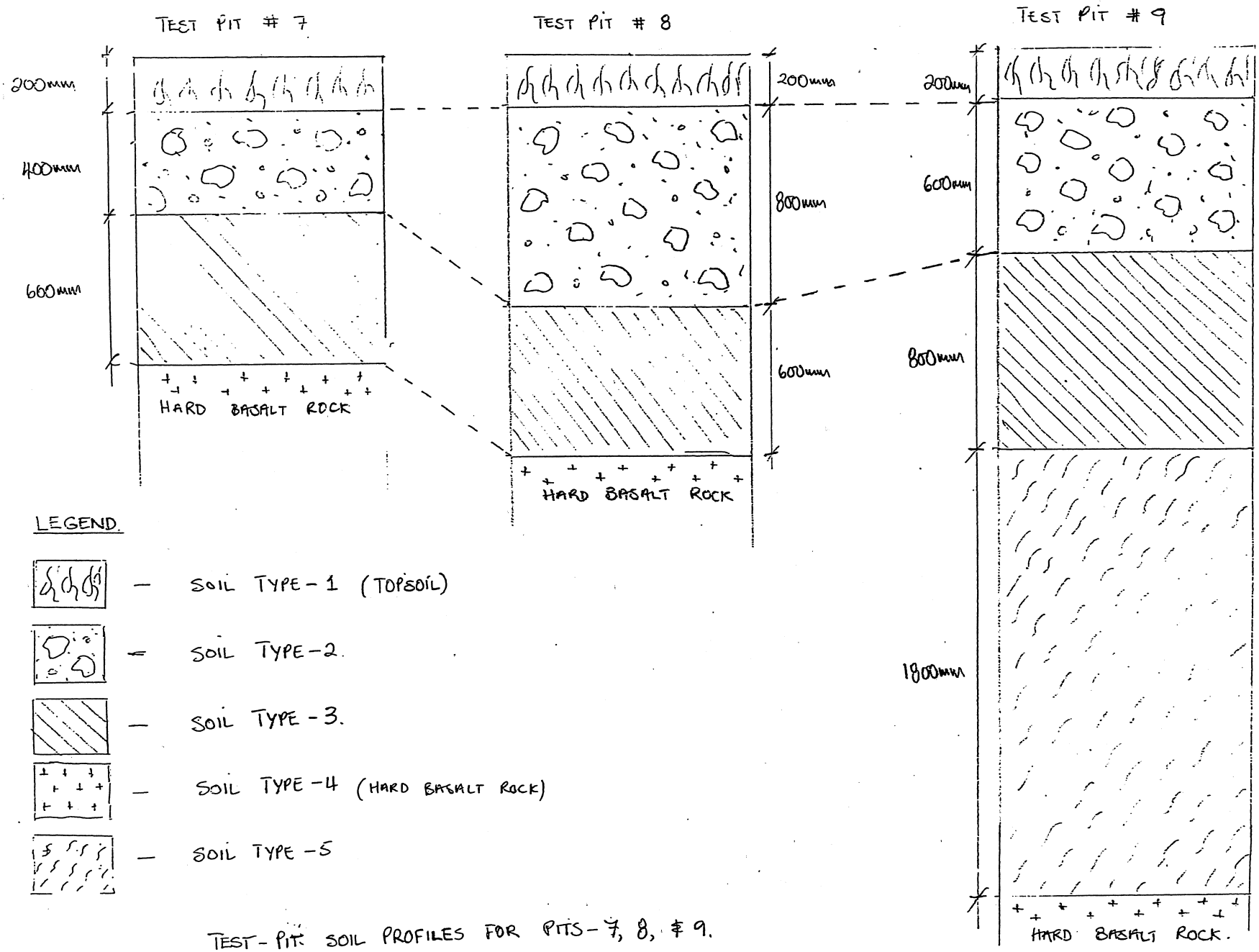


TEST PIT SOIL PROFILES FOR PITS 1, 2, & 3.

SAMOA POLYTECHNIC INSTITUTE

FIGURE - 1:


TEST PIT #4
TEST PIT #5
TEST PIT #6
200mm
500mm
HARD BASALT ROCK
200mm
500mm
600mm
HARD BASALT ROCK
200mm
1300mm
1000mm
HARD BASALT ROCK.
LEGEND
— SOIL TYPE - 1 (TOPSOIL)
— SOIL TYPE - 2
— SOIL TYPE - 3
— SOIL TYPE - 4



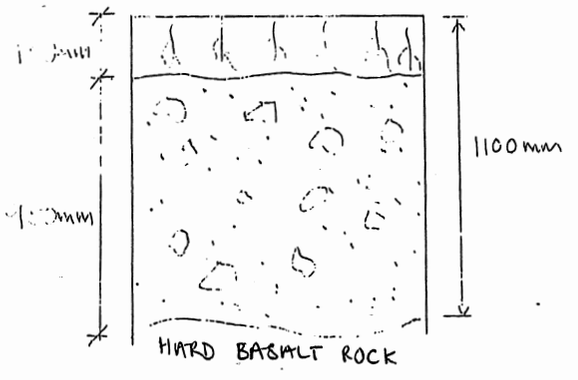
TEST-PIT SOIL PROFILES FOR PITS - 7, 8, & 9.

FIGURE-3. SAMOA POLYTECHNIC INSTITUTE

Test Pit Investigation Sheet

Site Name	SAMOA POLYTECHNIC	**Test Pit No.**	1
Soil Name / Description			
Soil Origin			
Rock Formation		**Rock Type**	
Field Plasticity		**Field Moisture**	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		**Soil Zonation**	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

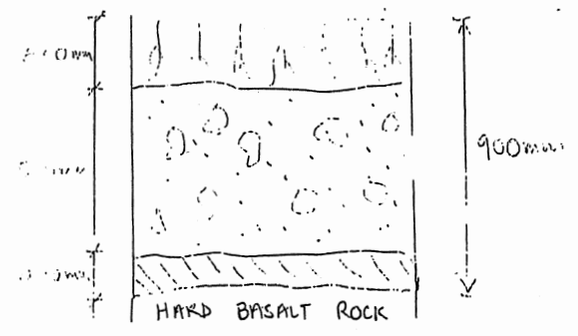
Pit Diagram



- TOPSOIL LAYER 150mm THICK WITH ROOTS + ROOT FIBRES.
- 2ND LAYER – 950mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS RANGING FROM GRAVEL TO BOULDERS (10mm – 400mm)
- GRAVELY SOIL MATRIX
- HOLE STOPPED AT 1100mm DUE TO HARD LARGE BASALT.

Site Name	SAMOA POLYTECHNIC	**Test Pit No.**	2
Soil Name / Description			
Soil Origin			
Rock Formation		**Rock Type**	
Field Plasticity		**Field Moisture**	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		**Soil Zonation**	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

Pit Diagram

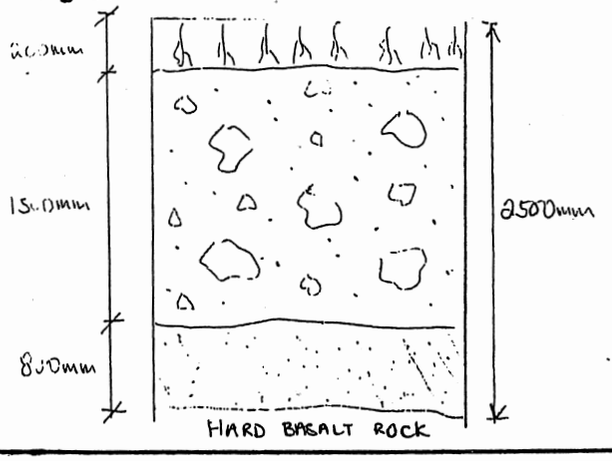


- TOPSOIL LAYER 200mm THICK WITH ROOTS + ROOT FIBRE
- 2ND LAYER – 500mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS RANGING FROM GRAVEL TO BOULDERS (100mm – 600mm)
- GRAVELY SOIL MATRIX
- HOLE STOPPED AT 900mm DUE TO HARD LARGE BASALT

Test Pit Investigation Sheet

Site Name	SAMOA POLYTECHNIC	**Test Pit No.**	3
Soil Name / Description			
Soil Origin			
Rock Formation		**Rock Type**	VESICULAR BASALT
Field Plasticity		**Field Moisture**	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		**Soil Zonation**	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

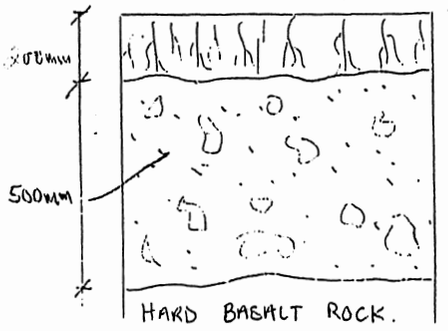
Pit Diagram



- TOPSOIL LAYER 200mm THICK WITH ROOTS & ROOT FIBRES
- 2ND LAYER - 1500mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS RANGING FROM GRAVEL TO BOULDERS (10mm – 600mm)
- GRAVELY SOIL MATRIX
- 800mm THICK LAYER OF BLACK SOFT BASALTIC TYPE ROCK BEFORE HARD LARGE BASALT.
  - POORLY WEATHERED BASALT ROCK

Site Name	SAMOA POLYTECHNIC	**Test Pit No.**	4
Soil Name / Description			
Soil Origin			
Rock Formation		**Rock Type**	
Field Plasticity		**Field Moisture**	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		**Soil Zonation**	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

Pit Diagram

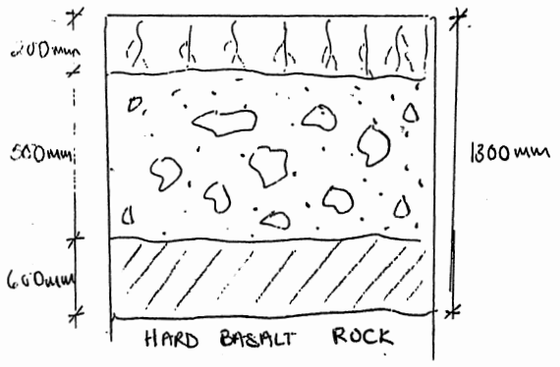


- TOPSOIL LAYER - 200mm THICK WITH ROOTS & ROOT FIBRE.
- 2ND LAYER – 500mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS (GRAVEL TO BOULDERS: 10mm – 300mm)
- GRAVELY SOIL MATRIX
- HOLE STOPPED AT 700mm DUE TO HARD BASALT ROCK.
- NO LAYER OF POORLY WEATHERED BASALT ROCK FOUND AT DEPTH < 700mm FROM SURFACE.

Test Pit Investigation Sheet

Site Name	SAMOA POLYTECHNIC	Test Pit No.	5
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

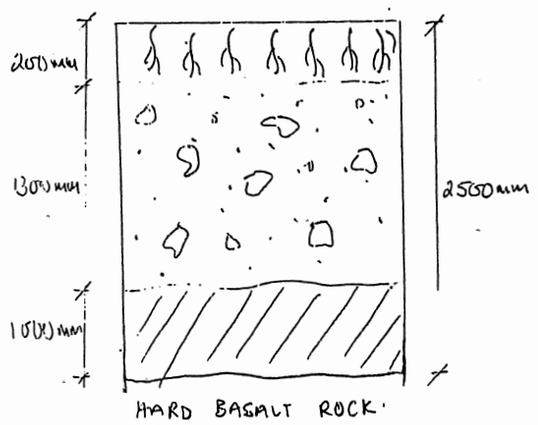
Pit Diagram



- TOPSOIL LAYER 200mm THICK WITH ROOTS & ROOT FIBRES.
- 2ND LAYER – 500mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS RANGING FROM GRAVEL TO BOULDERS (100mm – 400mm)
- GRAVELY SOIL MATRIX
- 600mm THICK LAYER OF BLACK SOFT BASALTIC TYPE ROCK BEFORE HARD LARGE BASALT.
  – POORLY WEATHERED BASALT ROCK LAYER.

Site Name	SAMOA POLYTECHNIC	Test Pit No.	6
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

Pit Diagram

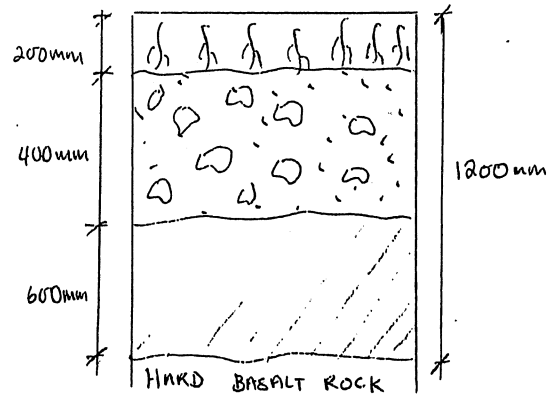


- TOPSOIL LAYER – 200mm THICK WITH ROOTS & ROOT FIBRES
- 2ND LAYER – 1300mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS (GRAVEL TO BOULDERS :- 10mm – 400mm)
- GRAVELY SOIL MATRIX
- HOLE STOPPED AT 2500mm DEEP DUE TO HARD BASALT ROCK.
- 3RD LAYER – 1000mm THICK POORLY WEATHERED BASALT ROCK LAYER (BREAKABLE)

Test Pit Investigation Sheet

Site Name	SAMOA POLYTECHNIC	Test Pit No.	7
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

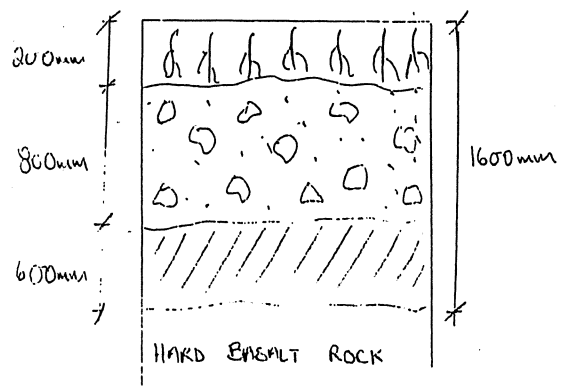
Pit Diagram



- TOPSOIL LAYER - 200mm THICK WITH ROOTS & ROOT FIBRES.
- 2ND LAYER - 400mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS. (GRAVEL TO BOULDERS - 10mm - 400mm)
- 3RD LAYER - 600mm THICK POORLY WEATHERED BASALT ROCK LAYER
- HOLE STOPPED AT 1200mm DEEP DUE TO HARD BASALT ROCK
- GRAVELY SOIL MATRIX.

Site Name	SAMOA POLYTECHNIC	Test Pit No.	8
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

Pit Diagram

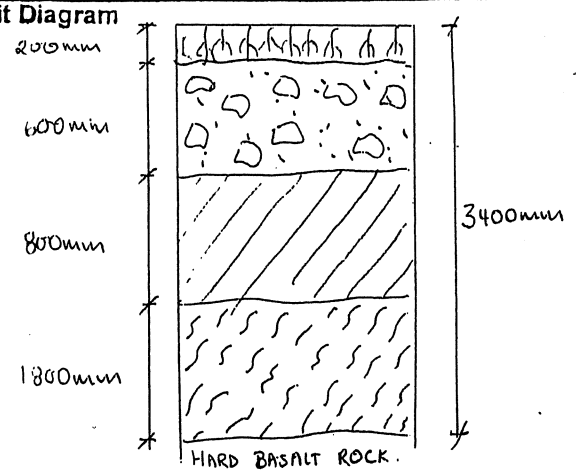


- TOPSOIL LAYER - 200mm THICK WITH ROOTS & ROOT FIBRES
- 2ND LAYER - 800mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS. (GRAVEL TO BOULDERS :- 10mm - 700mm)
- 3RD LAYER - 600mm THICK POORLY WEATHERED BASALT ROCK LAYER.
- HOLE STOPPED AT 1600mm DEEP DUE TO HARD BASALT ROCK.

Test Pit Investigation Sheet

Site Name	SAMOA POLYTECHNIC	Test Pit No.	9
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table			
Bedrock Description			
Comments			

Pit Diagram



- TOPSOIL LAYER – 200mm THICK WITH ROOTS & ROOT FIBRES
- 2ND LAYER - 600mm THICK CONTAINS ANGULAR VESICULAR BASALT CLASTS (GRAVEL TO BOULDERS:- 10mm – 400mm)
- 3RD LAYER - 800mm THICK POORLY WEATHERED BASALT ROCK LAYER
- 4TH LAYER - 1800mm THICK. WELL WEATHERED BASALT ROCK LAYER BEFORE THE HARD BASALT ROCK AT 3400mm DEEP.

Site Name		Test Pit No.	
Soil Name / Description			
Soil Origin			
Rock Formation		Rock Type	
Field Plasticity		Field Moisture	
(Low, Medium, High)		*(Dry, Moist, Wet)*	
Soil Colour / Shade			
Soil Consistancy		Soil Zonation	
(Cohesive, Non-Cohesive)		*(Layering, Lens, Pocket, Thickness, Defects)*	
Water Table	N/A		
Bedrock Description			
Comments			

Pit Diagram

11. 基本設計概要表

基本設計概要表

1. 案件名
サモア国　職業訓練学校拡充計画
2. 要請の背景（協力の必要性・位置付け）
サモア国の初･中等教育での就学率は、初等教育（1～8 年生）で 82.5%、中等教育（9～13 年生）で 57.6%と高く、国民の識字率も 98%と高い（サモア教育省 2002 年)。 サモア国の高等教育機関としては、国内唯一の国立大学であるサモア国立大学（NUS)、フィジーに本部を置く南太平洋大学（USP）サモアキャンパスの農学部および高等職業訓練教育機関としてのサモア・ポリテクニク（SP）があり、官界、民間産業界における専門職、技術職の育成に重要な役割を果たしている。 サモア国の国家開発計画の基本方針は、2002 年 1 月に財務省より発表された「サモア国開発戦略(SDS) 2002－2004」で定められており、その中で「教育水準の改善」が謳われ、人的資源の開発を国の急務として、技術教育訓練の量的・質的改善を目標の一つとして掲げ、技術教育訓練を通しての人的資源の開発を重要な課題としている。 しかしながら、サモア国の唯一の高等職業訓練教育機関である SP の施設は一部を除き築後 30 年を経過しており、施設、機材共に老朽化および不足をきたしていることから、効果的な教育・訓練の実施が困難な状況となっている。 また、サモア政府は 2002 年に教育省の主導のもと合同調整委員会（Steering Committee）を発足させ同国の高等教育機関の整理・統合を進めている。その一環として、高等教育機関の合理化、強化、効果的な教育環境の設立、産業界との連携などを目的に NUS と SP の合併計画を進めており、2006 年までに統合を完了させる予定である。
3. プロジェクト全体計画概要
下線部：本無償資金協力に直接関係する成果、活動及び投入 （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） アピア市に拡充・整備する SP において国内の産業界の発展に寄与する人材が継続的に育成される。 (裨益人口：技術学科コース 225 人/年、商業・一般教養コース 180 人/年) （2） プロジェクト全体計画の成果 ① SP の運営体制が整備される。 ② SP の施設、機材が整備される。 ③ SP の機材の保守管理体制が整備される。 ④ 訓練修了有資格者が養成される。 （3） プロジェクト全体計画の主要活動 ① SP,NUS 合併後の運営組織を形成する。 ② SP の訓練教育施設および合併後の共有施設を建設する。 ③ SP の一部既存訓練施設を改修する。 ④ 必要な訓練教育機材を調達して、据付を行う。 ⑤ SP の機材保守管理体制を形成する。 ⑥ SP の 3 学部において職業訓練教育を実施する。

（4） 投入（インプット）

① 日本側

ア）無償資金協力　16.29 億円

② 相手国側

ア）必要な人員の配置

イ）建設用地の確保

ウ）敷地の造成

エ）必要なインフラの敷地への供給

オ）運営・維持管理に係る経費

（5） 実施体制

実施機関：教育・スポーツ・文化省及び SP

4. 無償資金協力案件の内容

（1） サイト

アピア市

（2） 概要

アピア市内の SP に職業訓練教育施設および管理施設の建設

（3） 相手国側負担事項

① 建設用地の確保

② 必要インフラの敷地への引き込み

③ 敷地内の障害物の撤去および整地

（4） 概算事業費

16.61 億円（無償資金協力　16.29 億円、サモア国側負担　0.32 億円）

（5） 工期

1 期　詳細設計および入札期間を含め 16 ヶ月

2 期　詳細設計および入札期間を含め 16 ヶ月

（6） 貧困、ジェンダー、環境及び社会面の配慮

サモア国建築規準に基づいたバリアーフリーを考慮

5. 外部要因リスク

① SP、NUS の合併計画が予定どおり実施されない。

② 産業界のニーズが低下する。

6. 過去の類似案件からの教訓の活用

特になし

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

①各学部の修了者数

	2003 年	2010 年
技術学部	106	225
商業・一般教養学部	107	180

注）2003 年の修了者数には海洋訓練学部の卒業生 47 名を含まず。

（2） その他の成果指標

特になし

（3） 評価のタイミング

施設完成後 3 年経過の 2010 年以降