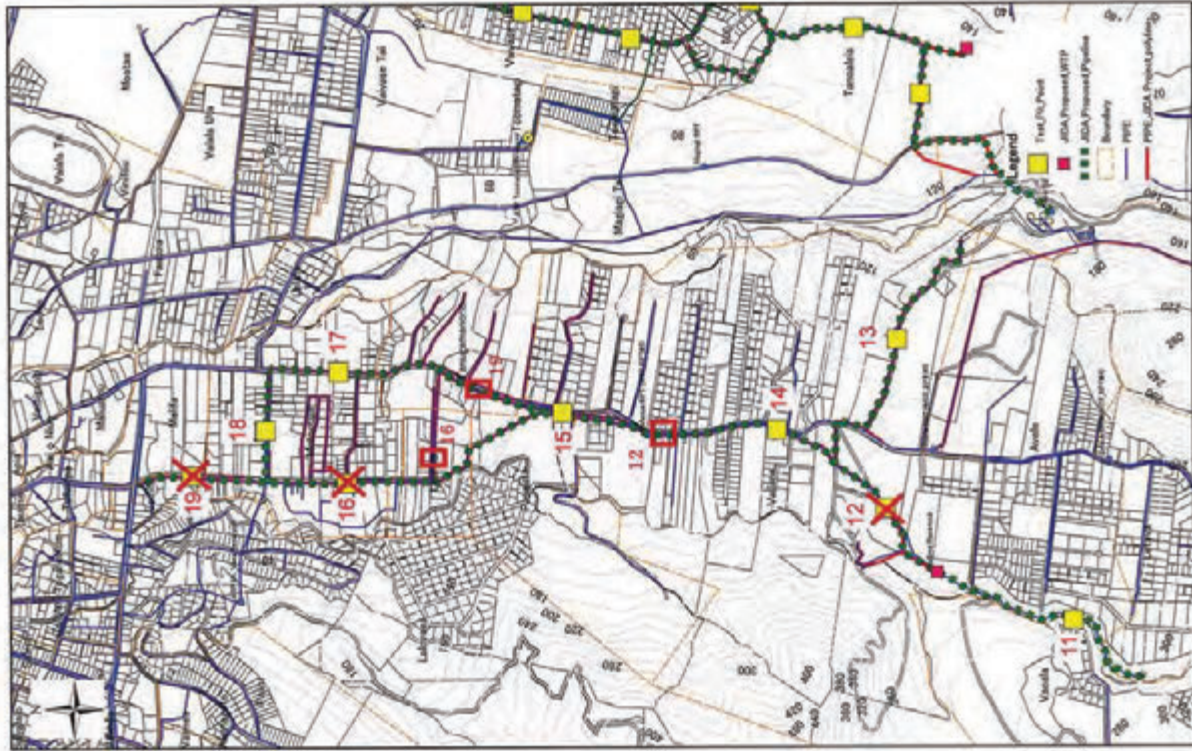
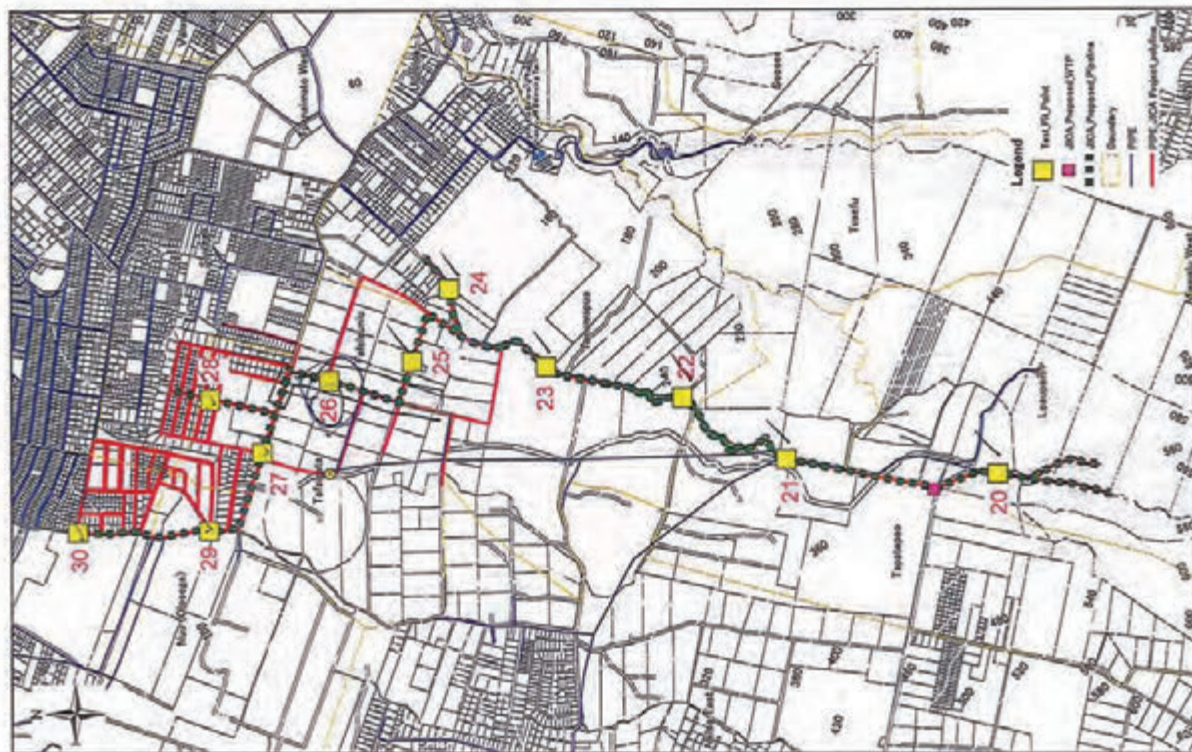


## 資料 9 試掘調査結果



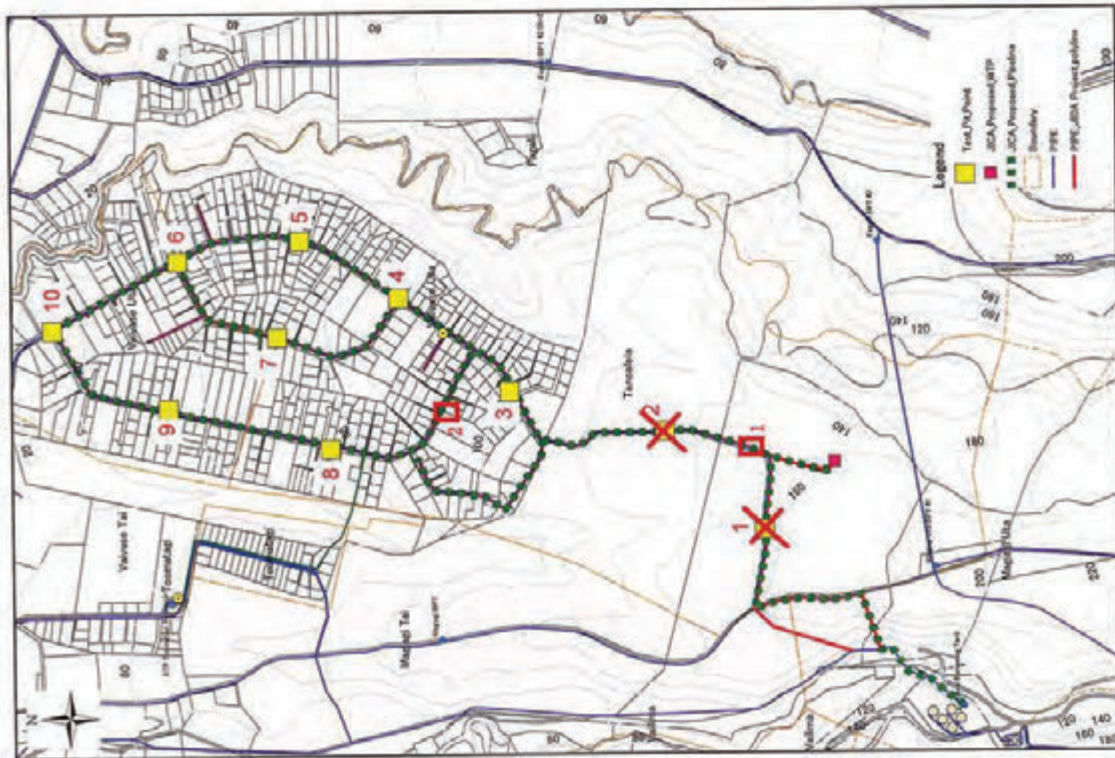


2. Vailima Water scheme



3. Tapatapao Water scheme

# Test Pit Investigation – Template



1. Vaivase-Uta Water scheme















Test Pit Investigation - Water Scheme, Apia, Samoa

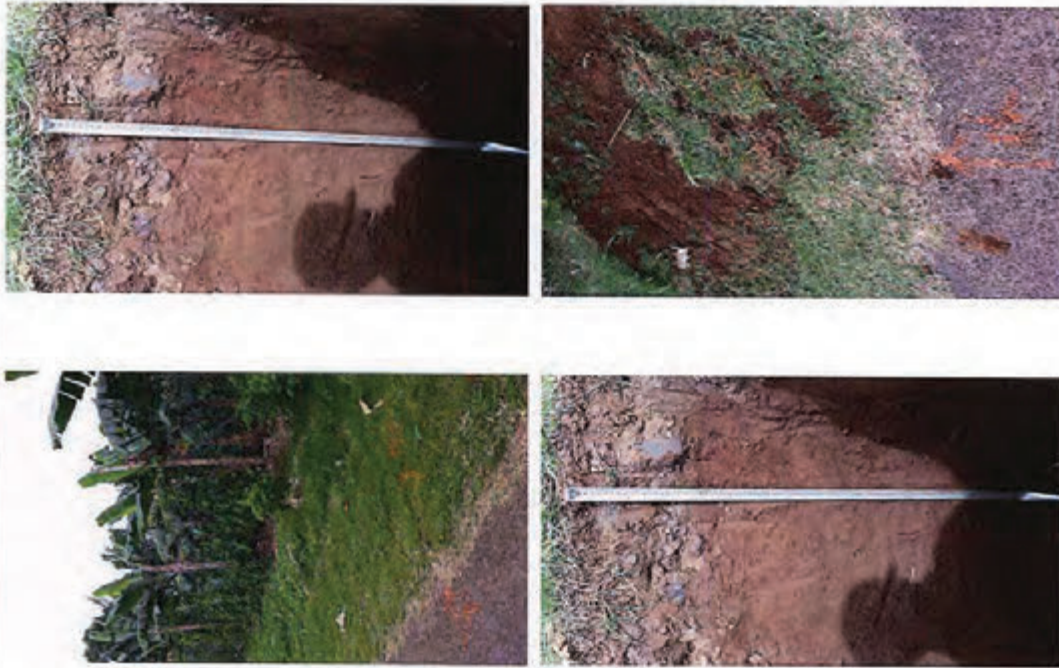


Fig 7. .as per site plan

Page 1 of 1  
Client Ref: 750956

Site: In and around Apia, Samoa Job No.: 615478.178  
 Client: T&TI Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 51' 25.0" W 171° 44' 40.4" Date sampled:  
 Chainage: Sampling method:  
 House No.: Sample condition:  
 Pit No.: 7 Date Received:

Depth (mm)	Description
0 - 250	Silty GRAVEL with some sand; brown, mottled grey, Moist.
250 - 1200	Clayey SILT with trace of gravel; brown, Moist, Non-plastic.
1200	End of pit.

Estimated Field CBR

**Density By Nuclear Densometer**

Basecourse	Subgrade
Wet density (t/m <sup>3</sup> ):	N/A
Dry density (t/m <sup>3</sup> ):	N/A
Water content (%):	N/A

Basecourse sample recovered at: (mm) N/A  
 Sub-base sample recovered at: (mm) N/A  
 Subgrade sample recovered at: (mm) N/A  
 Depth from ground surface to commencement of penetration: (mm) 0

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements"  
 IANZ Accreditation does not apply

Tested by: LZ Date: 5/07/2013 Checked by: IW Date: 16/07/2013

Test Pit Investigation - Water Scheme, Apia, Samoa

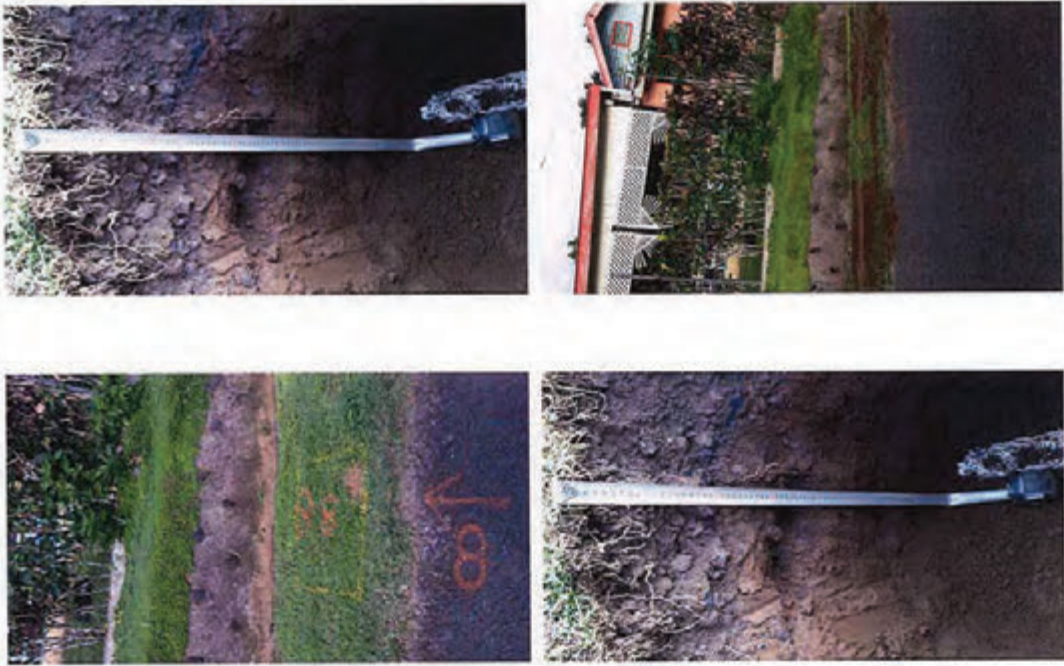


Fig 8. - in per site plan

Page 1 of 1

Site: In and around Apia, Samoa Job No.: 615478.178 Client Ref: 750956  
 Client: T&T Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 51' 22.8" W 171° 44' 48.1" Date sampled:  
 Chainage: Sampling method:  
 House No.: Sample condition:  
 Pit No.: 8 Date Received:

Depth (mm)	Description
0 - 200	Sandy GRAVEL with trace of silt; dark brown, mottled grey. Moist.
200 - 350	Gravelly SILT with minor clay; brown, mottled grey. Moist, Non-plastic.
350 - 800	Clayey SILT with trace of gravel; brown. Moist, Non-plastic.
800	White pipe, ~100mm diameter.
800	End of pit.

Estimated Field CBR

Density By Nuclear Densometer	
Basecourse	Subgrade
Wet density (t/m <sup>3</sup> ):	N/A
Dry density (t/m <sup>3</sup> ):	N/A
Water content (%):	N/A

Basecourse sample recovered at: (mm) N/A  
 Sub-base sample recovered at: (mm) N/A  
 Subgrade sample recovered at: (mm) N/A  
 Depth from ground surface to commencement of penetration: (mm) 0

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements"  
 IANZ Accreditation does not apply

Tested by: LZ Date: 4/07/2013 Checked by: IW Date: 16/07/2013

Test Pit Investigation - Water Scheme, Apia, Samoa



Fig 9 - as per site plan

Page 1 of 1  
 Client Ref: 750956

Site: In and around Apia, Samoa Job No.: 615478-178 Client Ref: 750956  
 Client: T&TI Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 51' 09.8" W 171° 44' 45.2" Date sampled:  
 Chainage: T&TI Sampling method:  
 House No.: Sample condition:  
 Pit No.: 9 Date Received:

Depth (mm)	Description
0 - 800	Clayey SILT with some gravel; brown, Moist, Non-plastic.
800	White pipe, ~100mm diameter.
800	End of pit.

Basecourse sample recovered at: (mm) N/A  
 Sub-base sample recovered at: (mm) N/A  
 Subgrade sample recovered at: (mm) N/A  
 Depth from ground surface to commencement of penetration: (mm) 0

**Density By Nuclear Densometer**

	Basecourse	Subgrade
Wet density (t/m <sup>3</sup> ):	N/A	N/A
Dry density (t/m <sup>3</sup> ):	N/A	N/A
Water content (%):	N/A	N/A

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTRROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements"  
 IANZ Accreditation does not apply

Tested by: LZ Date: 4/07/2013

Checked by: IW Date: 16/07/2013









Test Pit Investigation - Water Scheme, Apia, Samoa



TP 13 - as per site plan

Page 1 of 1

Site: In and around Apia, Samoa Job No.: 615478.178 Client Ref: 750956  
 Client: T&TI Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 52' 02.8" W 171° 45' 26.8" Date sampled:  
 Chainage: Sampling method:  
 House No.: Sample condition:  
 Pit No.: 13 Date Received:

Depth (mm)	Description
0 - 100	Sandy SILT with minor clay; dark brown. Moist, Non-plastic.
100 - 200	Gravelly SAND; light grey. Dry.
200 - 400	Gravelly SAND with minor silt; dark brown. Moist.
400 - 1200	Clayey SILT with minor gravel; brown. Moist, Non-plastic.
1200	End of pit.

Basecourse sample recovered at: (mm)  
N/A

Sub-base sample recovered at: (mm)  
N/A

Depth from ground surface to commencement of penetration: (mm)  
0

**Density By Nuclear Densometer**

Basecourse	Subgrade
N/A	N/A
N/A	N/A
N/A	N/A

Wet density (t/m<sup>3</sup>):  
N/A

Dry density (t/m<sup>3</sup>):  
N/A

Water content (%):  
N/A

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements"  
 IANZ Accreditation does not apply

Tested by: LZ

Date: 3/07/2013

Checked by: IW

Date: 16/07/2013







**Test Pit Investigation - Water Scheme, Apia, Samoa**



TP 17, as per site plans

Page 1 of 1

Site: In and around Apia, Samoa Job No.: 615478.178 Client Ref: 750956  
 Client: T&TI Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 50' 48.4" W 171° 45' 35.0" Date sampled:  
 Chainage: Sampling method:  
 House No.: Sample condition:  
 Pit No.: 17 Date Received:

Depth (mm)	Description
0 - 100	Sandy SILT with trace of clay, dark brown. Moist, Non-plastic.
100 - 450	Sandy SILT with some gravel, brown. Moist, Non-plastic.
450	Concrete drainage, ~0.5m diameter.
450	End of pit.

Basecourse sample recovered at: (mm) N/A  
 Sub-base sample recovered at: (mm) N/A  
 Subgrade sample recovered at: (mm) N/A  
 Depth from ground surface to commencement of penetration: (mm) 0

**Density By Nuclear Densometer**

Basecourse	Subgrade
N/A	N/A
N/A	N/A
N/A	N/A

Wet density (t/m<sup>3</sup>):  
 Dry density (t/m<sup>3</sup>):  
 Water content (%):

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements".  
 IANZ Accreditation does not apply

Tested by: LZ

Date: 3/07/2013

Checked by: IW

Date: 16/07/2013



Test Pit Investigation - Water Scheme, Apia, Samoa



TP 19, as per site plan

Page 1 of 1

Site: In and around Apia, Samoa Job No.: 615478.178 Client Ref: 750956  
 Client: T&TI Contractor: Geotechnics Ltd  
 Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

### TEST PIT INVESTIGATION LOG REPORT

Project: Samoa Water Treatment scheme Sampled by:  
 Location: S 13° 51' 04.9" W 171° 45' 35.6" Date sampled:  
 Chainage: Sampling method:  
 House No.: Sample condition:  
 Pit No.: 19 Date Received:

Depth (mm)	Description
0 - 150	Sandy SILT; dark brown. Moist, Non-plastic.
150 - 300	Sandy SILT with some demolition rubbish; reddish brown. Moist, Non-plastic.
300 - 900	Sandy SILT with some gravel, minor household waste; brown. Moist, Non-plastic.
900	Top of rock.
900	End of pit.

Estimated Field CBR

Depth (m)

Density By Nuclear Densometer	
Basecourse	Subgrade
Wet density (t/m <sup>3</sup> ):	N/A
Dry density (t/m <sup>3</sup> ):	N/A
Water content (%):	N/A

Basecourse sample recovered at:	(mm)
Sub-base sample recovered at:	N/A
Subgrade sample recovered at:	N/A
Depth from ground surface to commencement of penetration:	0

**COMMENTS:**  
 The estimated CBR values are based on Figure 5.3, Correlation of Dynamic Cone Penetration and CBR AUSTROADS (2004) "Pavement Design - A Guide to the Structural Design of Road Pavements"  
 IANZ Accreditation does not apply

Tested by: LZ Date: 3/07/2013 Checked by: IW Date: 16/07/2013



























## 資料 10 地盤調査結果



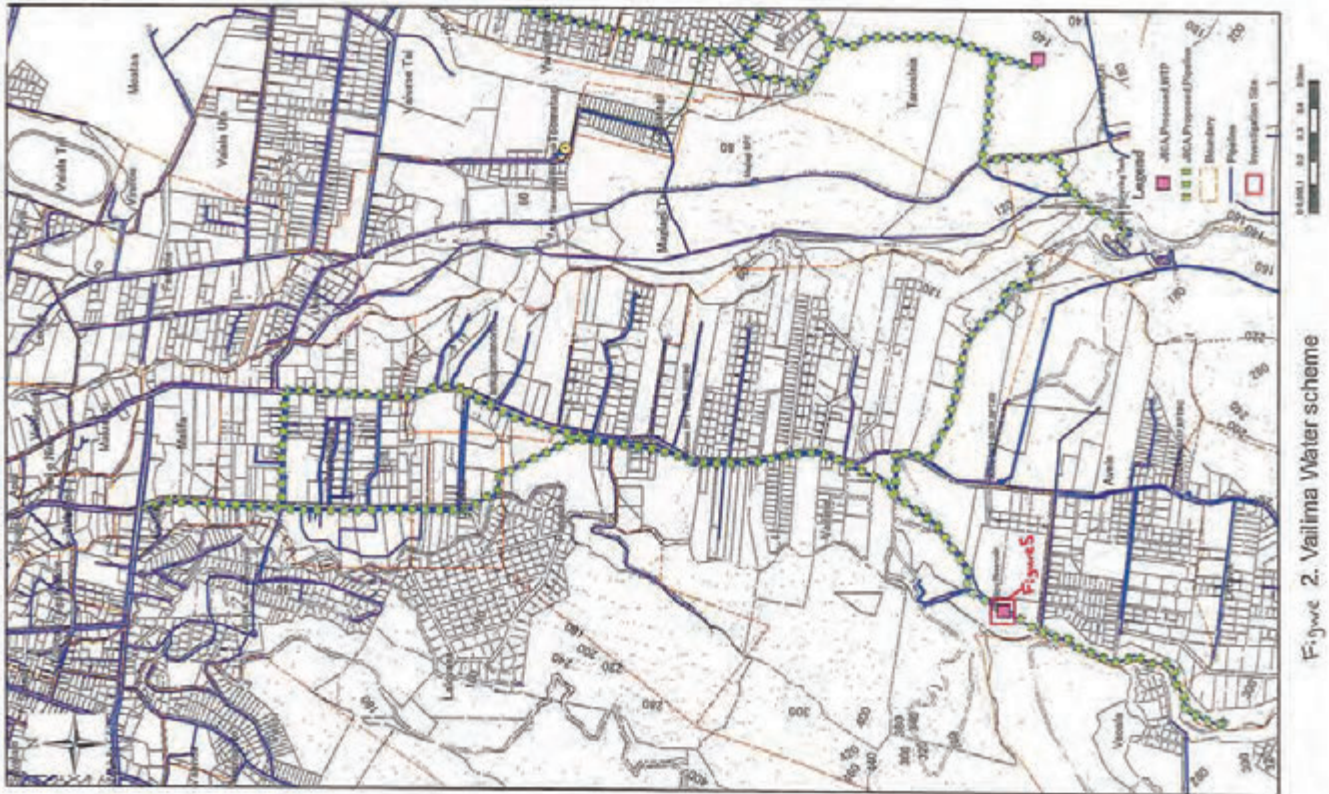


Figure 2. Vailima Water scheme

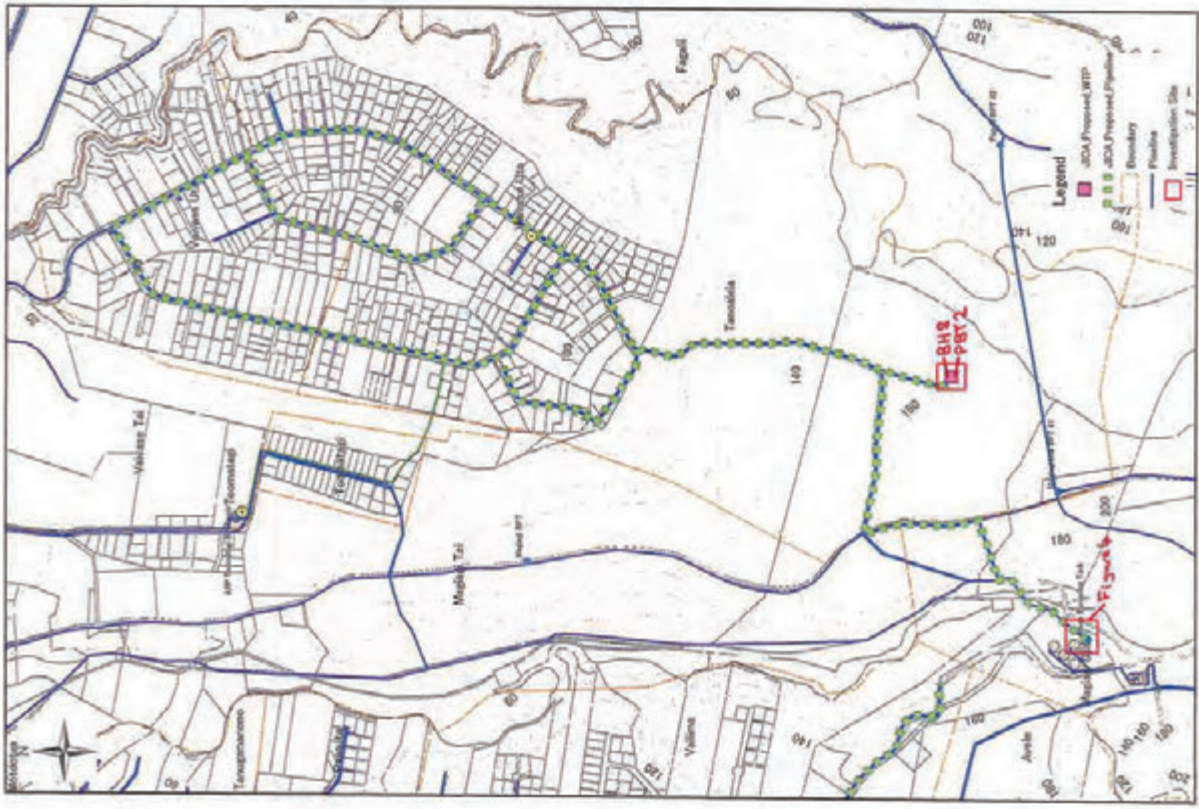


Figure 1. Vaivase-Uta Water scheme



Figure 4: Existing Alaoa water treatment plant

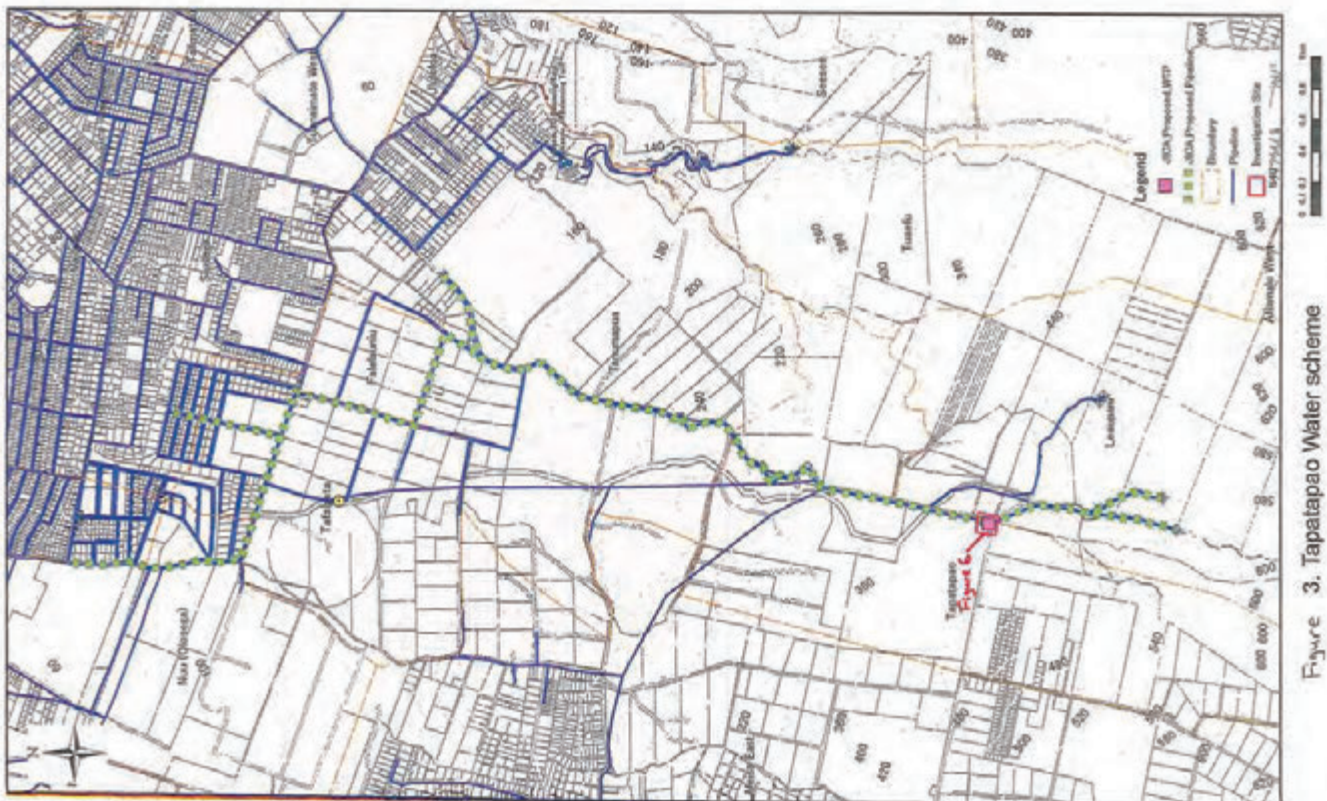


Figure 3. Tapatapao Water scheme





**TONKIN & TAYLOR LTD**  
**BOREHOLE LOG**

BOREHOLE No: BH1  
Hole Location: Vallima  
SHEET 1 OF 1

PROJECT: Samoa Water  
LOCATION: Samoa  
JOB No: 750956  
CO-ORDINATES: -13°52'6.90"N  
-171°49'56.10"E  
DRILL TYPE: DB520  
HOLE FINISHED: 9/8/13  
DRILLED BY: MNRE  
R.L.:  
DATUM: LOGGED BY: LZ  
CHECKED: CWM

GEOLOGICAL UNIT, GENERIC NAME, MINERAL COMPOSITION	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING	STRENGTH DENSITY	CLASSIFICATION	SHEAR STRENGTH	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	ENGINEERING DESCRIPTION		
																		SOIL DESCRIPTION	ROCK DESCRIPTION	
VOLCANIC GRAVEL AND ASH			50	HQ3		11 39 N=50 for 125mm			1									GRAVEL with some cobbles, grey, very dense, coarse, vesicular basalt gravel and cobbles		
			100	HQ3		47 63 2.1 N=10			2									SILT with minor gravel, brown, soft		
			100	SPT		21 22 2.4 N=10			3									Silty GRAVEL, brown, loose		
			100	SPT		613 2426 N=50 for 120mm			4										SILT with some sand, minor gravel, trace clay, dark brown, moist, non-plastic	
			100	SPT		714 1522 13 N=50 for 165mm			5										Sandy GRAVEL fine grained, very dense	
			100	SPT		11 0.2 1.1 N=4			6										Gravelly COBBLES, grey, very dense, sub-angular basalt	
			100	SPT		21 22 4.4 N=12			7										Sandy SILT with minor clay, red-brown	
			100	SPT		2525 N=50 for 100mm			8										Gravelly COBBLES, grey/brown, very dense	
			100	HQ3					9										COBBLES with some gravel, very dense, basalt cobbles	
			100	HQ3					10										BASALT BOULDERS, slightly weathered, strong, highly vesicular	
BASALT			100	HQ3		50 N=50 for 50mm												Slightly weathered BASALT, strong, grey, highly vesicular, moderately widely spaced joints		
			100	HQ3		50 N=50 for 40mm													END OF BOREHOLE AT 10m	



**TONKIN & TAYLOR LTD**  
**BOREHOLE LOG**

BOREHOLE No: BH2  
Hole Location: Vallima  
SHEET 1 OF 1

PROJECT: Samoa Water  
LOCATION: Samoa  
JOB No: 750956  
CO-ORDINATES: -13°52'6.40"N  
-171°49'55.00"E  
DRILL TYPE: DB520  
HOLE FINISHED: 9/8/13  
DRILLED BY: MNRE  
R.L.:  
DATUM: LOGGED BY: LZ  
CHECKED: CWM

GEOLOGICAL UNIT, GENERIC NAME, MINERAL COMPOSITION	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING	STRENGTH DENSITY	CLASSIFICATION	SHEAR STRENGTH	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	ENGINEERING DESCRIPTION		
																		SOIL DESCRIPTION	ROCK DESCRIPTION	
VOLCANIC GRAVEL AND ASH			0	HQ3		12 12 1.2 N=6			1									Clayey SILT with trace gravel, dark brown, firm, moist, non-plastic		
			100	SPT		25 89 8 10 N=35			2									Silty GRAVEL with minor clay, brown, dense		
BASALT			100	HQ3		347 N>50 for 120mm			3									Un-weathered BASALT, grey, strong, some vesicles, moderately widely spaced joints		
			100	HQ3					4										END OF BOREHOLE AT 3.5m No Ground water encountered	









**TONKIN & TAYLOR LTD**  
**BOREHOLE LOG**



**TONKIN & TAYLOR LTD**  
**BOREHOLE LOG**

BOREHOLE No: BH7  
Hole Location: Alaoa  
SHEET 1 OF 1

PROJECT: Samoa Water  
LOCATION: Samoa  
JOB No: 750956  
CO-ORDINATES: -13°52'20.30"N  
-171°46'2.60"E  
DRILL TYPE: DB520  
HOLE FINISHED: 27/7/13  
DRILLED BY: MNRE  
R.L.:  
DATUM: LOGGED BY: LZ  
CHECKED: CWM

GEOLOGICAL UNIT GENERIC NAME MINERAL COMPOSITION	ENGINEERING DESCRIPTION															
	FLUID LOSS	WATER	CORE RECOVERY (%)	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	MOISTURE / WEATHERING	STRENGTH DENSITY	CLASSIFICATION	SHEAR STRENGTH	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOL DESCRIPTION
ALLUVIUM		29/07/2013	33	HQ3	1.0 1.0 1.0 N=2			1								Silty SAND, with some gravel, a piece of plant, dark brown.
			33	HQ3	3.4 3.8 7.9 N=27			2								SANDY GRAVEL, with trace silt, brownish dark grey.
			50	HQ3	50 N=50 for 40mm			3								Blocky BASALT, slightly weathered, grey strong, closely spaced joints, some vesicles (core broken by drilling)
BASALT					50 for 25mm N=100			4								END OF BOREHOLE AT 4.0m.

BOREHOLE No: BH8  
Hole Location: Vaivase - Uta  
SHEET 1 OF 2

PROJECT: Samoa Water  
LOCATION: Samoa  
JOB No: 750956  
CO-ORDINATES: -13°52'11.20"N  
-171°46'2.60"E  
DRILL TYPE: DB520  
HOLE FINISHED: 25/7/13  
DRILLED BY: MNRE  
R.L.:  
DATUM: LOGGED BY: LZ  
CHECKED: CWM

GEOLOGICAL UNIT GENERIC NAME MINERAL COMPOSITION	ENGINEERING DESCRIPTION																
	FLUID LOSS	WATER	CORE RECOVERY (%)	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	MOISTURE / WEATHERING	STRENGTH DENSITY	CLASSIFICATION	SHEAR STRENGTH	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOL DESCRIPTION	
ALLUVIUM		0	HQ3		2.1 1.2 1.2 N=6			1								Sandy SILT, brown, loose, non-plastic	
		100	HQ3		3.2 1.1 1.1 N=4			2								Sandy SILT, with some gravel, brown, wet, non-plastic.	
		50	HQ3		1.0 2.1 2.1 N=6			3								SILT, with some clay, minor gravel, brown, moist, low plasticity	
		100	HQ3		1.1 0.1 0.1 N=2			4									Silty SAND, with some gravel, brown.
VOLCANIC ASH		0	HQ3		1.0 0.0 1.0 N=1			6								SILT with some sand, minor clay and trace gravel, dark brown, very soft, moist, low plasticity	
		100	HQ3		1.3 5.14 21.10 N=50 for 200mm			7									Silty SAND, with some gravel, brown.
		100	HQ3		1.0 0.0 0.0 N=0			8								SILT with some clay, trace sand, greyish brown, moist, low plasticity	
	100	HQ3		1.0 0.1 0.1 N=3			9									SILT with some clay and trace sand, dark brown, moist, low plasticity	



**TONKIN & TAYLOR LTD**  
**BOREHOLE LOG**

BOREHOLE No: BH8  
Hole Location: Vaivase - Uta  
SHEET 2 OF 2

PROJECT: Samoa Water  
LOCATION: Samoa  
JOB No: 750956  
CO-ORDINATES: -13°52'11.20"N  
-171°46'2.60"E  
DRILL TYPE: DB520  
HOLE STARTED: 25/7/13  
HOLE FINISHED: 25/7/13  
DRILL METHOD: RC  
DRILLED BY: MNRE  
LOGGED BY: LZ  
CHECKED: CWM  
DRILL FLUID: Water

GEOLOGICAL		ENGINEERING DESCRIPTION																					
GEOLOGICAL UNIT	GENERIC NAME	MINERAL COMPOSITION	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING	CONDITION	STRENGTH DENSITY	CLASSIFICATION	SHEAR STRENGTH	COMPRESSIVE STRENGTH (kPa)	DEFLECT SPACING (mm)	SOIL DESCRIPTION		
VOLCANIC ASH					100	SPT		1.1 1.3 N=6		11	11	X X X										SILT with some clay and trace sand, dark brown, moist, low plasticity	
					100	HO3		1.0 1.1 1.1 N=4		12	12	X X X										SILT with some sand, minor clay, firm, moist, low plasticity	
					100	SPT		3.3 1.2 1.1 N=5		13	13	X X X											SILT with some clay and trace sand, dark brown, moist, low plasticity
					100	HO3		1.1 1.1 1.1 N=4		14	14	X X X											SILT with some clay and trace sand, dark brown, moist, low plasticity
					100	SPT		2.1 1.1 2.1 N=5		15	15	X X X											SILT with some sand, dark brown mottled orange, loose, moist, non-plastic
										16	16											END OF BOREHOLE AT 15.45m.	
										17	17												
										18	18												
										19	19												
										20	20												

**Samoa Water Supply Scheme Project - Soil Investigation**



BH1 0.0-1.0m.jpg



BH1 1.0-2.0m.jpg



BH1 3.0-3.5m.jpg



BH1 4.0-4.5m.jpg



BH1 4.5-5.0m.jpg



BH1 5.0-6.0m.jpg



BH1 6.0-7.0m.jpg



BH1 7.0-7.5m.jpg

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Page 1 of 6

Samoa Water Supply Scheme Project - Soil Investigation



BH1 7.5-8.0m.jpg



BH1 8.0-9.0m.jpg



BH2 1.0-1.5m.jpg



BH2 1.5-2.0m.jpg



BH2 2.0-3.0m.jpg



BH2 3.0-3.5m.jpg



BH3 0.0-1.0m.jpg



BH3 2.0-2.5m.jpg

Samoa Water Supply Scheme Project - Soil Investigation



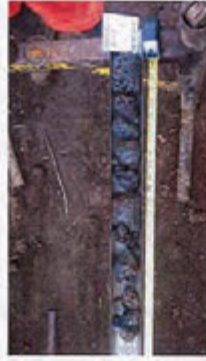
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BH3 3.0-3.5m.jpg



BH3 3.5-4.0m.jpg



BH4 2.0-3.0m.jpg



BH4 4.0-4.5m.jpg



BH4 5.0-6.0m.jpg



BH4 6.0-7.0m.jpg



BH4 8.0-9.0m.jpg

Samoa Water Supply Scheme Project - Soil Investigation



BH5 1.8-2.0m.jpg

BH5 4.8-5.0m.jpg



BH5 5.0-6.0m.jpg

BH5 6.0-6.4m.jpg



BH6 0.0-1.0m.jpg

BH6 1.0-2.0m.jpg



BH6 2.0-2.5m.jpg

BH6 1.0-1.5m.jpg

Samoa Water Supply Scheme Project - Soil Investigation



BH7 2.0-2.2m.jpg

BH7 2.2-3.0m.jpg



BH8 3.0-4.0m.jpg

BH8 2.0-2.5m.jpg



BH8 2.5-3.0 & 3.5-4.0m.jpg

BH8 3.0-3.5m.jpg



BH8 6.0-6.5m.jpg

BH8 7.0-7.5m.jpg

Samoa Water Supply Scheme Project - Soil Investigation



BH 8.0-8.5m.jpg



BH 9.0-9.5m.jpg



BH 10.0-10.5m.jpg



BH 11.0-11.5m.jpg



BH 12.0-12.5m.jpg



BH 13.0-13.5m.jpg



BH 14.0-14.5m.jpg



BH 15.0-15.5m.jpg

