Appendix C
Test Pit Logs

Test Pit No. TP_01

Project:	Richmond South Reservoir	*Coordinates:*	1614451 E 5421080 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm)	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS	0	Clayey SILT, some sand, trace of gravel; greyish brown. Soft, moist, moderate plasticity. Gravel, fine; sand, fine. Organic soil with grass and fine rootlets [TOPSOIL].				0				
ALLUVIAL		Silty CLAY, some sand and some gravel; mottled light orange grey. Soft, moist, moderate plasticity. Gravel, fine to coarse; sand, fine. Iron oxide present.								
		Silty CLAY, some sand and some gravel; mottled orange grey. Firm, dry to moist, moderate plasticity. Gravel, fine to coarse; sand, fine. Iron oxide common.								
	1					1				
		Gravelly CLAY, some sand, some silt and trace of cobbles, orange brown. Firm, moist, moderate plasticity. Weathered sandstone gravel, fine to coarse; sand, fine. Cobbles maximum 90mm size. Iron oxide common.								
	2	END OF PIT AT 2m - Target Depth Reached				2				
	3					3				
	4					4				

SCALA PENETROMETER (Blows per 100mm): 0 2 4 6 8 10 12 14 16 18 20

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

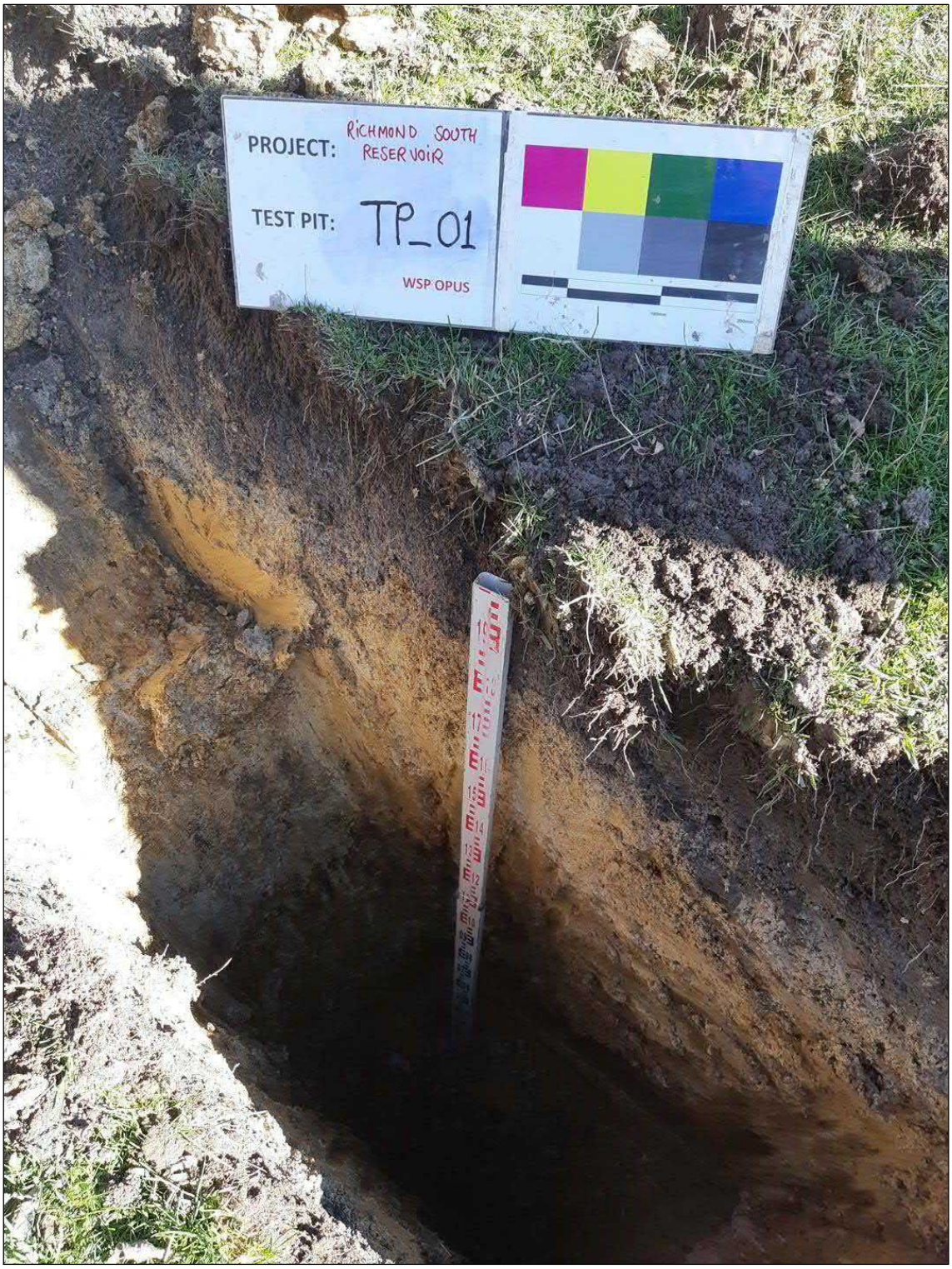
Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_01

Project:	Richmond South Reservoir	*Coordinates:*	1614451 E 5421080 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH



Testpit TP_01

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_02

Project:	Richmond South Reservoir	*Coordinates:*	1614459 E 5421121 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		Clayey SILT, some sand, trace of gravel; dark greyish brown. Soft, moist, moderate plasticity. Gravel, fine. Organic soil with grass and fine rootlets [TOPSOIL].								
ALLUVIAL		Sandy SILT, some clay; mottled light orange grey. Firm, moist, low plasticity. Iron oxide present.								
	1	Silty CLAY, some sand and some gravel; mottled orange grey. Firm, moist, high plasticity. Gravel, coarse, sand, fine. Iron oxide common.				1				
		Sandy fine to coarse GRAVEL with some clay, some silt and trace of cobbles; orange brown, homogeneous. Dense; wet; well graded; subrounded to angular; moderately weathered sandstone gravel; sand, fine to coarse; silt and clay, low plasticity. Cobbles maximum size 110mm. Iron oxide common. Increased moisture from 1.70m.		2m 22/06						
	2					2				
		END OF PIT AT 2.1m - Target Depth Reached								
	3					3				
	4					4				

Notes:
GWL at 2.00m (ground water slowly seeping into test pit).

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Test Pit No. TP_02

Project:	Richmond South Reservoir	*Coordinates:*	1614459 E 5421121 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Testpit TP_02

Notes:
GWL at 2.00m (ground water slowly seeping into test pit).

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_03

Project:	Richmond South Reservoir	*Coordinates:*	1614477 E 5421185 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		Clayey SILT, some sand and trace of gravel; greyish brown. Soft, dry to moist, low plasticity. Gravel, fine. Organic soil with grass and fine rootlets [TOPSOIL].								
ALLUVIAL	1	Sandy SILT, trace of clay; mottled light orange grey. Firm to stiff, dry, non-plastic. Iron oxide present. Gravel trench with red tile drain pipe intercepted at 0.80m depth. Drain pipe is 130/95mm (OD/ID) and 300mm long segments. Appears to be the end of the drain pipe, as not possible to trace pipe on other side of test pit.				1				
		Sandy SILT, trace of gravel; mottled orange grey. Soft to firm (softer towards the base with increased moisture), moist, low plasticity. Gravel, medium. Iron oxide common.								
	2	Clayey fine to coarse GRAVEL with some sand, some silt and some cobbles; orange brown. Dense; wet; well graded; subrounded to angular, moderately to highly weathered sandstone gravel; sand, fine; silt and clay, low to moderate plasticity. Iron oxide common [weathered MOUTERE GRAVELS].		2m 22/06		2				
		END OF PIT AT 2.1m - Target Depth Reached								
	3					3				
	4					4				

Notes:
GWL at 2.00m (ground water seeping into test pit).

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_03

Project:	Richmond South Reservoir	*Coordinates:*	1614477 E 5421185 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Testpit TP_03

Notes:
GWL at 2.00m (ground water seeping into test pit).

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_04

Project:	Richmond South Reservoir	*Coordinates:*	1614442 E 5421165 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		Clayey SILT, some sand, trace of gravel; greyish brown. Soft, moist, low to moderate plasticity. Gravel, fine; sand, fine. Organic soil with grass and fine rootlets [TOPSOIL].								
MOUTERE GRAVELS		Silty CLAY, some gravel; light orange brown. Soft to firm, moist, low to moderate plasticity. Gravel, fine to coarse, angular (weathered residual clasts). Iron oxide present.								
	1	Clayey fine to coarse GRAVEL with some sand, some silt and some cobbles and boulders; light orange brown, indistinctly bedded. Dense; dry; well graded; bedding, sub-horizontal, moderately thick; subrounded to angular, moderately weathered sandstone gravel; sand, fine; silt and clay, low plasticity. Boulders maximum 260mm size [MOUTERE GRAVELS].				1				
	2					2				
		END OF PIT AT 2.1m - Target Depth Reached								
	3					3				
	4					4				

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_04

Project:	Richmond South Reservoir	*Coordinates:*	1614442 E 5421165 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Testpit TP_04

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_05

Project:	Richmond South Reservoir	*Coordinates:*	1614431 E 5421137 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		Clayey SILT, some sand, trace of gravel; greyish brown. Soft, moist, moderate plasticity. Gravel, fine; sand, fine. Organic soil with grass and fine rootlets [TOPSOIL].								
MOUTERE GRAVELS		Silty CLAY, some gravel; orange light brown. Soft to firm, moist, low to moderate plasticity. Gravel, fine to coarse, angular (weathered residual clasts). Iron oxide present.								
	1	Clayey fine to coarse GRAVEL with some sand, some silt and some cobbles and boulders; light orange brown, indistinctly bedded. Dense; dry; well graded; bedding, sub-horizontal, moderately thick; subrounded to angular, moderately weathered sandstone gravel; sand, fine; silt and clay, low plasticity. Boulders maximum 240mm size [MOUTERE GRAVELS].				1				
	2					2				
		END OF PIT AT 2.1m - Target Depth Reached								
	3					3				
	4					4				

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP_05

Project:	Richmond South Reservoir	*Coordinates:*	1614431 E 5421137 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Location Plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Testpit TP_05

Notes:
Test pit dry

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	22/06/2020
Excavator:	14t excavator
Tested by:	T Fischer
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP06

Project:	Richmond South Reservoir	*Coordinates:*	1614526 E 5421265 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS	0	SILT, brown. Moist, very soft, high plasticity. Organic soil with grass and rootlets to 0.3 m				0				
ALLUVIAL	1	CLAY, light brown. Very soft, moist, high plasticity.				1				
	2	Sandy CLAY, brown. Soft, moist, low-plasticity. Sand, well-graded.				2				
	3	Sandy SILT; bluey gray with orange mottle. Soft, moist, low-plasticity. Small amounts of vegetation noticed in hole Seepage noticed in hole		3.7m 21/07		3				
	4	END OF PIT AT 3.8m - Target Depth Reached				4				

Notes:

Date Tested:	21/07/2020
Excavator:	13t excavator
Tested by:	R Weston
Checked by:	H Hendrickson

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP06

Project:	Richmond South Reservoir	*Coordinates:*	1614526 E 5421265 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Notes:

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	21/07/2020
Excavator:	13t excavator
Tested by:	R Weston
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP07

Project:	Richmond South Reservoir	*Coordinates:*	1614558 E 5421424 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		SILT with some gravels and minor sands; dark brown. Moist, soft, low-plasticity. Gravel, well-graded, loosely packed, sub-rounded to rounded. Sand, fine. Organic soil with grass and rootlets [TOPSOIL].								
ALLUVIAL		SILT with minor gravels and sand; light brown. Moist, soft, high-plasticity. Gravel; well-graded, sub-angular to sub-rounded. Traces of rootlets to a depth.								
	1	Silty fine to coarse GRAVEL with some cobbles; light brown. Dense; moist; well-graded; sub-angular to sub-rounded. Silt; soft; high plasticity. Soil becomes saturated at 1.1 m, traces of rootlets to a depth of 1.0 m. At approx 1.8 m, trench starting collapsing (non-cohesive behavior in soil)		1.1m 21/07		1				
	2					2				
		SILT with some gravels; blue. Saturated, very soft, low-plasticity. Gravels, fine, sub-angular to angular.								
	3	Fine to coarse GRAVEL with some silt; blue. Saturated; well-graded; sub-angular to sub-rounded. Silt, high-plasticity, firm.				3				
		END OF PIT AT 3.3m - Target Depth Reached								
	4					4				

Notes:

Date Tested: 21/07/2020
Excavator: 13t excavator
Tested by: R Weston
Checked by: H Hendrickson

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP07

Project:	Richmond South Reservoir	*Coordinates:*	1614558 E 5421424 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Notes:

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	21/07/2020
Excavator:	13t excavator
Tested by:	R Weston
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Test Pit No. TP08

Project:	Richmond South Reservoir	*Coordinates:*	1614523 E 5421668 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

GEOLOGY	DEPTH (m)	DESCRIPTION	GRAPHIC LOG	WATER LEVEL	R.L. (m)	DEPTH (m)	SOIL TESTS: SCALA PENETROMETER (Blows per 100mm) 0 2 4 6 8 10 12 14 16 18 20	SHEAR STRENGTH (kPa)	OTHER TESTS	SAMPLES
TS		SILT with minor gravels; dark brown. Very soft, moist, low plasticity. Organic soil with grass and rootlets [TOPSOIL].								
ALLUVIAL		Fine to coarse GRAVELS with some silt with minor sand and trace cobbles; light brown. Loosely packed; moist; well-graded; sub-angular to sub-rounded. Trace rootlets								
	1	Gravelly CLAY with trace cobbles; brown. Moist, high plasticity, soft. Gravel; loosely packed, well-graded, sub-angular to sub-rounded.				1				
		Silty fine to coarse GRAVEL with some sand and trace cobbles and boulders; light brown. Loosely packed; moist; sub-angular to sub-rounded; coarse. Silt, soft, low plasticity. At 2.1 m soil becomes saturated.		2.1m 21/07						
	2	Silty fine to coarse GRAVEL with some cobbles, minor clay and trace boulders; light brown. Saturated; sub-rounded to rounded; well-graded. Silt, very soft, low plasticity.				2				
		END OF PIT AT 2.7m - Refusal - Excavator Lifting Up								
	3					3				
	4					4				

Notes:
Redundant services encountered on initial dig. Pt moved 5 m south and repeated.

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4

Date Tested:	21/07/2020
Excavator:	13t excavator
Tested by:	R Weston
Checked by:	H Hendrickson

Test Pit No. TP08

Project:	Richmond South Reservoir	*Coordinates:*	1614523 E 5421668 N
Client:	Tasman District Council	*Ref. Grid:*	NZTM
Project No.:	5-G3104.09	*R.L.:*	Not established
Location:	Refer Site Location plan 520 Hill Street, Richmond		

PIT PHOTOGRAPH

Notes:
Redundant services encountered on initial dig. Pt moved 5 m south and repeated.

Test Methods:
Determination of the Penetration Resistance of a Soil, NZS 4402 Test 6.5.2:1988
Guideline for Hand Held Shear Vane Test, NZ Geotechnical Soc., 2001

Date Tested:	21/07/2020
Excavator:	13t excavator
Tested by:	R Weston
Checked by:	H Hendrickson

Logged in accordance with NZ Geotechnical Society Guidelines (2005). See attached key sheet for explanation of symbols.

Scale 1:25 @ A4