

63-05-026

175781-R-S-C043

Received

31 MAR 2009

31 March 2009

The Chief Executive
Rotorua District Council
Private Bag 3029
ROTORUA 3046

Attn: Keith Lloyd

RE: PIONEER PROPERTY TRUST LTD - WESTERN ROAD
SUBDIVISION OF LOT 96 DP 389915 - STAGE 3
LT 393131
YOUR REF: 63-05-026/05

Note:

Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.



Further to our recent email contact with Andrew Robinson please find attached another copy of the Earthwork Completion Report for Stage 3 (now reviewed by Andrew Robinson) and a Form 1B certificate.

We trust that this is as required.

Yours faithfully
MTEC CONSULTANTS LTD

A handwritten signature in blue ink, appearing to read 'Bart Yetsenga'.

Bart Yetsenga
Registered Professional Surveyor

**SURVEYORS
ENGINEERS
PLANNERS**

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ROTORUA

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OFFICES AT
Rotorua
Tauranga
Te Puke
Whakatane
Opotiki



RRD001CUL9

Document Number: **RDC-37160**

Date Received: **1/04/2009**

175781-R-S-C043-BY-new eworks report.doc

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

**To: The District Engineer
Rotorua District Council
Private Bag
ROTORUA**

**IB - STATEMENT OF PROFESSIONAL OPINION AS TO SUITABILITY OF LAND
FOR BUILDING DEVELOPMENT**

Subdivision: **OAKLANDS – STAGE 3**

Owner/Developer: **PIONEER PROPERTY TRUST LTD**

Location: **WESTERN ROAD, NGONGOTAHA**

I, **Stephen Michael Pittman** of **MTEC Consultants Ltd**
(Full Name) (Name and Address of Firm)

hereby confirm that:

1. I am a Certified Professional Engineer experienced in the field of soils engineering and was retained by the owner/developer as the Soils Engineer on the above subdivision.
2. The extent of my inspections during construction, and the results of all tests carried out are described in my report dated March 2009 and referenced 175781-R-E-C334
3. In my professional opinion, not be construed as a guarantee, I certify that:
 - *a) That earth fills shown on the attached Plan No.175781-R-E-D010 Sheet 26 Issue A have been placed in compliance with the Code of Practice of the Rotorua District Council.
 - *b) The completed works give due regard to land slope and foundation stability considerations.
 - *c) The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZ Building Act 2004 and NZ Building Regulations 2004, and related documents, providing that:
 - i) _____
 - ii) _____
 - iii) _____
 - *d) The original ground not affected by filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZ Building Act 2004 and NZ Building Regulations 2004, and related documents, providing that:
 - i) _____

Note:
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ii)

iii)

4. Certification of sections b), c) and d) above has been provided in the Geotechnical Completion Report prepared by Tonkin and Taylor dated March 2009 and referenced T & T Ref: 851126.
5. This professional opinion is furnished to the Council and the owner/developer for their purposes alone on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any dwelling.

Signed:



Date:

30/3/2009

*Delete items not applicable

Reviewed By:



30.3.2009

Andrew Robinson of MTEC Consultants Ltd
Geotechnical Engineer
Director

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

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**Earthworks Completion Report
For
Oaklands Subdivision – Stage 3
at**

**Western Road, Ngongotaha
ROTORUA**

File: 175781-R-E-C334
Date: March 2009

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

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Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

3. Extent of Works and Methodology

The Stage 3 earthworks were carried out as part of the earthworks for the entire site (Stages 1 to 4). The earthworks generally involved bulk cutting of material from the upper portion (Stage 4) of the site and placing of the fill material on the lower parts of the site (Stages 1, 2 and 3).

The earthworks for Stage 3 were carried out between September 2007 and December 2007. The majority of the Stage 3 area was earth worked, resulting in a site area of approximately 5.7ha.

The area was cleared of all trees, stumps, logs and other rubbish prior to any excavations. The earthworks operation involved stripping the topsoil to stockpiles and then carrying out the cut to fill operation, with fill being placed in layers of up to 0.2m deep and compacted with motorscrapers.

The majority of the bulk fill was sourced from the cut areas within Stage 4 and comprised predominantly sandy material. Where additional granular fill was required, imported pumice/rhyolite fill was used.

As required under Condition 41 of the Stage 3 Subdivision Consent (63-05-026) an overland flow path has been constructed through Lot 31 to contain the flows from the 1% AEP storm event.

At the completion of the contouring, the topsoil was re-spread across the Lots to a target depth of 250mm (minimum 100mm) and grassed.

4. Quality Controls

The earthworks specification for the earthworks construction contract gave specific requirements for quality control during earthworks including stripping, subgrade preparation, placement of fill, compaction, erosion and sediment control amongst others. The contract specification also refers to NZS 4404:2004 "Land Development and Subdivision Engineering", which in turn refers to NZS 4431 "Code of Practice for Earth Fill for Residential Development". A brief summary of the relevant requirements of these documents, with respect to the scope of this report, is as follows:

1. The site shall be cleared of all rubbish, debris etc and topsoil shall be completely removed from the area of works.
2. Fill shall be placed and compacted in layers not exceeding 200mm thick (150mm within 500mm of road subgrade).
3. Standard of Compaction for Fill (percentage of maximum dry density to be obtained as a minimum).

	Heavy Clay Silt, Sandy Clay and Gravel	Sands
Within 0.5m of subgrade	100%	102%
Elsewhere	95%	100%

Note:
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Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

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It is our experience that, in granular pumiceous soils such as the fill material present on this site, if the imported fill can be demonstrated to meet the definition of 'good ground' as per NZS 3604:1999, the above requirements will have been met.

As such, Scala Penetrometer testing was used during and after the earthworks to monitor the fill compaction. The target requirement was 160mm penetration or less per 5 blows.

5. Supervision and Testing

All earthworks were supervised on a regular, but not continuous, basis by a representative of MTEC Consultants Ltd to ensure topsoil and any unsuitable material was completely removed and clean fill placed in an appropriate manner. We can confirm that the insitu and imported fill material was placed in thin layers and compacted satisfactorily.

The depth of earthworks across Stage 3 varied from 1.5m cut to 1.7m fill with a typical depth of around 0.5m of cut and 0.5m of fill across the site.

A series of 18 boreholes to 2.0m and 2 Scala Penetrometer tests per lot (after completion of earthworks) were undertaken on Stage 3. The post earthworks test results are attached to this report.

6. Discussion

All test results indicate that the desired compaction standard has been achieved within the fill material.

7. Conclusion

It is our conclusion and our professional opinion that the engineered fill within Stage 3 of the Oaklands Subdivision, Western Road, Ngongotaha, Rotorua has been placed and compacted in accordance with the requirements of the earthworks contract specifications and NZS 4431:1989 as applicable.

8. Limitations

The assessment given in this report is based on limited site data from discrete test locations. Variations in ground conditions could exist across the site. The nature and continuity of subsoil conditions away from the test sites are inferred and it must be appreciated that actual conditions could vary from the assumed model.

This report does not remove the requirement for normal testing and inspection of foundation conditions at the time of building, and particular attention is drawn to the fact that development of all sites must be carried out in accordance with the Tonkin and Taylor Geotechnical Completion Report noted in Section 1.

Note:
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Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

This report has been prepared for the sole benefit of the Pioneer Property Trust and Rotorua District Council in Stage 3 of the proposed Oaklands subdivision at Western Road, Ngongotaha, Rotorua. It is not to be relied upon or used out of context by any other person without reference to MTEC Consultants Ltd. The reliance by other parties on the information or opinions contained in the report shall, without prior review and agreement in writing, be at such party's sole risk.

MTEC CONSULTANTS LTD



Steve Pittman
BE(Hons), MIPENZ(Civil/Structural), CPEng

Reviewed By:



Andrew Robinson
Geotechnical Engineer
Director

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

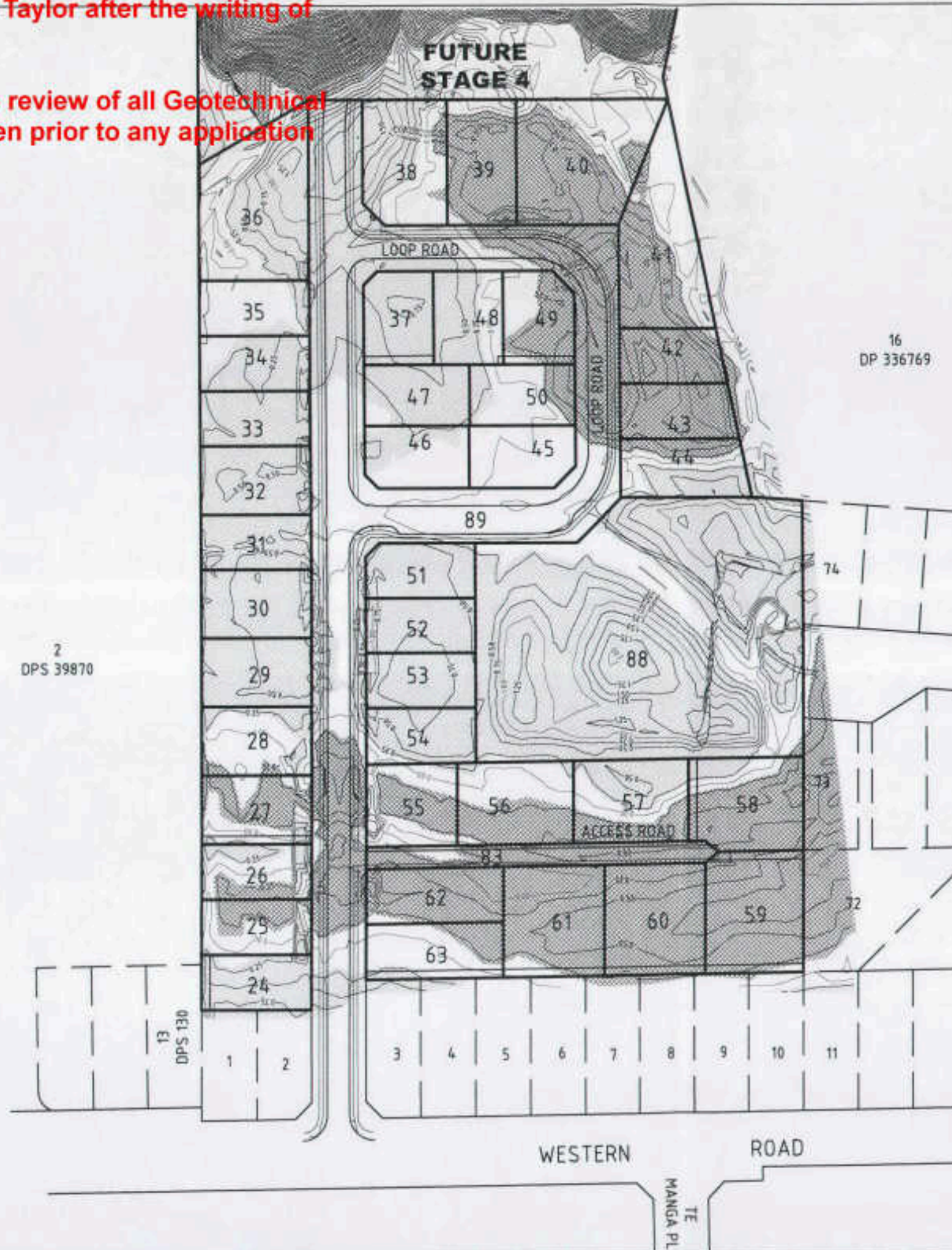
Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

Appendix A

As Built Earthworks Plans

Note:
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NOTES/KEY

CPTT

CPT TEST SITES



CUT AREAS > 0.1m



FILL AREAS > 0.1m



CUT TO FILL CONTOUR INTERVAL AT 0.5m

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THIS DOCUMENT SHALL BE USED ONLY FOR THE PURPOSE FOR WHICH IT WAS SUPPLIED AND MUST NOT BE USED IN ISOLATION FROM OTHER ASSOCIATED INFORMATION.

SERVICES

THE SERVICES SHOWN ON THIS PLAN ARE INDICATIVE ONLY AND MAY NOT COVER ALL OF THE SERVICES REQUIRED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL SERVICES BEFORE CONSTRUCTION.

21/01/08 PH ISSUED FOR APPROVAL

Drawn: PK Designed: JM

Checked: JM Surveyed by: .

LOCAL AUTHORITY REF



SURVEYORS
ENGINEERS
PLANNERS

ROTORUA TE PUKU OPOWAI
TAURANGA WHAKATANE

CLIENT

PIONEER PROPERTY TRUST LTD

PROJECT/LOCATION

WESTERN ROAD
NGONGOTAHA

DRAWING DESCRIPTION

AS BUILT - EARTHWORKS
OVER ALL PLAN
CUT/FILL PLAN

SCALE: 1 : 1200

ORIGINAL DWG. SIZE A2

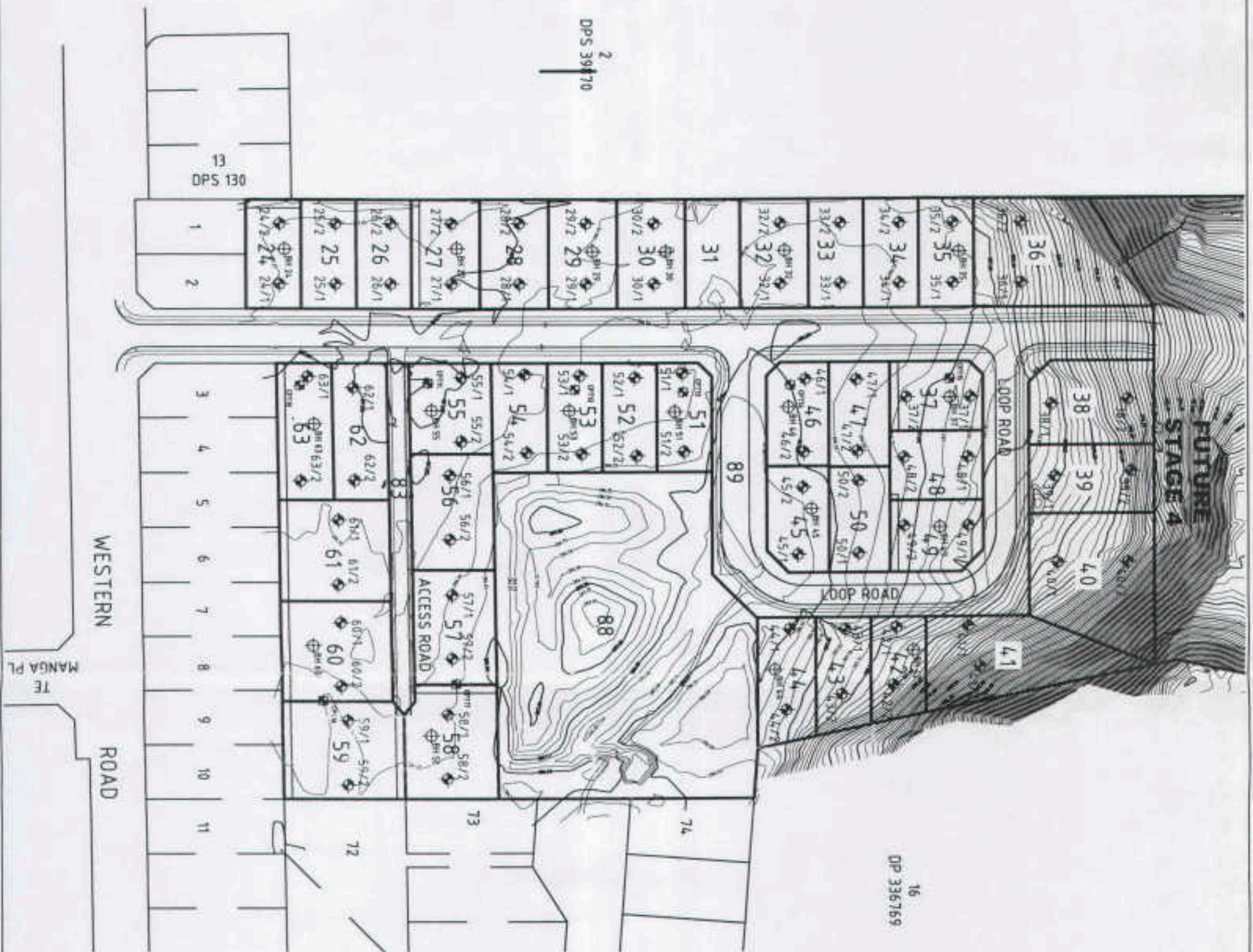
DRAWING No
175781-R-E-D010

SHEET No
26

ISSUE
A

Note: Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

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NOTES/KEY:

- OPT TEST SITES
- SCALE PENETROMETER TEST SITES
- 2.0m BORE HOLES

ASBUILT CONTOUR INTERVAL AT 0.25m

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SERVICES

Geotechnical Engineering Services including site investigation, design, and construction supervision.

No.	Date	By	For Approval
1	21/07/08	PK	DESIGNED - JM
2			CHECKED - JM
3			SURVEYED BY -

LOCAL AUTHORITY REF

IM
TEC
SURVEYORS
ENGINEERS
PLANNERS

CLIENT

PIONEER PROPERTY TRUST LTD

PROJECT/LOCATION

WESTERN ROAD
NGONGOTAHA

DRAWING DESCRIPTION

AS BUILT - EARTHWORKS
OVER ALL PLAN
AS BUILT CONTOURS

SCALE	1:1200	ORIGINAL DWG. SIZE A2
DRAWING NO.	175781-R-E-D010	SHEET NO. 28
ISSUE	A	

Note:
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Earthworks Completion Report Stage 3
Oaklands Subdivision, Western Road, Ngongotaha, Rotorua

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Appendix B

Soil Test Results & Test Location Plan

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

MTEC CONSULTANTS LTD

SCALA PENETROMETER TEST RESULTS

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHU, ROTORUA
 PROJECT: NEW TOWN CENTRE

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 24(1)			LOT 24(2)			LOT 25(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		210	170		170	130		210	170
10		330	120		280	110		310	100
15		390	60		360	80		400	90
20		460	70		430	70		500	100
25		540	80		510	80		570	70
30		630	90		600	90		640	70
35		740	110		690	90		720	80
40		840	100		790	100		800	80
45		940(2)	100		890	100		870	70
50					1000	110		960(3)	90
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 25(2)			LOT 26(1)			LOT 26(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		160	120		240	200		220	180
10		290	130		400	160		320	100
15		380	90		540	140		400	80
20		490	110		700	160		460	60
25		600	110		830	130		510	50
30		720	120		920	90		570	60
35		840	120		1000	80		630	60
40		1000	160					690	60
45								770	80
50								850	80
55								920	70
60								1000	80
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

MTEC CONSULTANTS LTD

SCALA PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
SITE ADDRESS: WESTERN ROAD, NGONGONG, NORTH AUCKLAND
JOB NUMBER: 175781/E

DATE: 27.09.07
BY: CBW

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 27(1)			LOT 27(2)			LOT 28(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		140	100		290	250		230	190
10		200	80		490	200		300	70
15		270	70		570	80		380	80
20		370	100		710	140		470	90
25		480	110		830	120		560	90
30		600	120		1000	170		660	100
35		710	110					750	90
40		790	80					850	100
45		870	80					940(2)	90
50		960(3)	90						
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 28(2)			LOT 29(1)			LOT 29(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		310	270		110	70		240	200
10		520	210		190	80		380	140
15		700	180		250	60		520	140
20		830	130		310	60		650	130
25		950(2)	120		380	70		780	130
30					430	50		900	120
35					500	70		1000	100
40					570	70			
45					640	70			
50					720	80			
55					800	80			
60					1000	200			
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been
undertaken by Tonkin & Taylor after the writing of
this report.

SCALE PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTARA, ROTORUA
 JOB NUMBER: 175781

DATE: 27.09.07
 BY: CBW

Please ensure complete review of all Geotechnical
Information is undertaken prior to any application
for building consent.

NOTE: PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 30(1)			LOT 30(2)			LOT 32(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		190	150		210	170		230	190
10		300	110		320	110		400	170
15		430	130		440	120		560	160
20		560	130		580	140		760	200
25		680	120		720	140		890	130
30		800	120		880	160		1000	110
35		910	110		1000	120			
40		1000	90						
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 32(2)			LOT 33(1)			LOT 33(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		170	130		200	160		250	210
10		300	130		350	150		340	90
15		420	120		500	150		430	90
20		500	80		640	140		520	90
25		570	70		780	140		610	90
30		640	70		900	120		700	90
35		720	80		1000	100		800	100
40		790	70					910	110
45		870	80					1000	90
50		960(2)	90						
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
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MTEC CONSULTANTS LTD

SCALA PENETROMETER TEST RESULTS

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JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTARA, ROTORUA
 PROJECT REF: PPT/01

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 34(1)			LOT 34(2)			LOT 35(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		330	290		290	250		120	80
10		380	50		390	100		230	110
15		410	30		490	100		340	110
20		460	50		540	50		430	90
25		510	50		570	30		500	70
30		560	50		640	70		570	70
35		630	70		700	60		630	60
40		740(4)	110		760	60		710	80
45					800	40		800	90
50					840	40		880	80
55					910	70		960(2)	80
60					1000	90			
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 35(2)			LOT 36(1)			LOT 36(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		90	50		160	120		130	90
10		140	50		260	100		210	80
15		210	70		370	110		290	80
20		270	60		470	100		400	110
25		340	70		560	90		530	130
30		500	160		650	90		660	130
35		630	130		740	90		770	110
40		730	100		820	80		890	120
45		830	100		900	80		1000	110
50		900	70		1000	100			
55		980(1)	80						
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
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SCALE PENETROMETER TEST RESULTS

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA
 DRAWN BY: 157781

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 37(1)			LOT 37(2)			LOT 38(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		130	90		100	60		180	140
10		160	30		150	50		300	120
15		200	40		220	70		410	110
20		250	50		300	80		500	90
25		300	50		370	70		580	80
30		340	40		440	70		670	90
35		380	40		510	70		770	100
40		440	60		590	80		830	60
45		510	70		670	80		890	60
50		620	110		800	130		950	60
55		740	120		910	110		1000	50
60		850	110		1000	90			
65		960(2)	110						
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 38(2)			LOT 39(1)			LOT 39(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		170	130		380	340		250	210
10		230	60		490	110		390	140
15		310	80		600	110		520	130
20		400	90		700	100		610	90
25		480	80		790	90		710	100
30		590	110		870	80		760	50
35		720	130		940	70		810	50
40		810	90		1000	60		880	70
45		900	90					960(2)	80
50		1000	100						
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

MTEC CONSULTANTS LTD

SCALA PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHIA, ROTORUA
 SITE NUMBER: 10721 E

DATE: 27.09.07
 BY: CBW

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 40(1)			LOT 40(2)			LOT 41(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		160	120		200	160		130	90
10		250	90		330	130		210	80
15		390	140		420	90		280	70
20		600	210		520	100		360	80
25		790	190		590	70		500	140
30		1000	210		660	70		630	130
35					770	110		770	140
40					900(3)	130		900(4)	130
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 41(2)			LOT 42(1)			LOT 42(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		360	320		300	260		210	170
10		560	200		480	180		370	160
15		780	220		620	140		500	130
20		1000	220		800	180		630	130
25					980(1)	180		770	140
30								910(3)	140
35									
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

SCALA PENETROMETER TEST RESULTS

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA
 DRAWN BY: S. J. JONES

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 43(1)			LOT 43(2)			LOT 44(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		110	70		120	80		130	90
10		150	40		180	60		300	170
15		190	40		260	80		450	150
20		260	70		310	50		580	130
25		340	80		370	60		700	120
30		420	80		450	80		800	100
35		500	80		530	80		890	90
40		590	90		630	100		1000	110
45		690	100		740	110			
50		770	80		840	100			
55		850	80		940(3)	100			
60		920	70						
65		1000	80						
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 44(2)			LOT 45(1)			LOT 45(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		150	110		140	100		190	150
10		240	90		240	100		300	110
15		330	90		340	100		420	120
20		430	100		450	110		560	140
25		500	70		510	60		690	130
30		560	60		600	90		800	110
35		630	70		690	90		910(4)	110
40		700	70		770	80			
45		780	80		850	80			
50		900	120		920	70			
55		1000	100		1000	80			
60									
65									
70									
75									
80									
85									
90									
95									
100									

undertaken by Tonkin & Lee

JOB NAME: PIONEER PROPERTY TRUST LTD

SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA

DATE: 27.09.07

BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL

TABLE OF PENETRATION IN mm PER 5 BLOWS

LINE INDICATES LEVEL OF FIRM GROUND

[illegible]

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

MTEC CONSULTANTS LTD

SCALA PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA
 PROJECT: PIONEER

DATE: 27.09.07
 BY: CBW

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 49(1)			LOT 49(2)			LOT 50(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		140	100		160	120		170	130
10		240	100		270	110		250	80
15		280	40		380	110		320	70
20		300	20		490	110		390	70
25		330	30		600	110		470	80
30		370	40		700	100		550	80
35		410	40		790	90		630	80
40		450	40		880	90		710	80
45		530	80		970(2)	90		800	90
50		600	70					890	90
55		670	70					1000	110
60		740	70						
65		810	70						
70		870	60						
75		940	70						
80		1000	60						
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 50(2)			LOT 51(1)			LOT 51(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		230	190		170	130		210	170
10		310	80		260	90		350	140
15		400	90		380	120		460	110
20		490	90		700	320		600	140
25		580	90		930(3)	230		980(1)	380
30		660	80						
35		740	80						
40		800	60						
45		870	70						
50		930	60						
55		1000	70						
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been
undertaken by Tonkin & Taylor after the writing of
this report

SOLID PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: 175781 R-E-S050-(27.09.2007)-MTEC PENT TEST STANDARD.xls
 JOB NUMBER: 175781/E

DATE: 27.09.07
 BY: CBW

Please ensure complete review of all Geotechnical
Information is undertaken prior to any application
for building consent.

NO PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 52(1)			LOT 52(2)			LOT 53(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		200	160		210	170		190	150
10		320	120		330	120		300	110
15		480	160		410	80		420	120
20		660	180		490	80		520	100
25		1000	340		860(4)	370		610	90
30								700	90
35								780	80
40								930	150
45								1010	80
50								1090	80
55								1160	70
60								1220	60
65								1290	70
70								1350	60
75								1400	50
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 53(2)			LOT 54(1)			LOT 54(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		150	110		180	140		210	170
10		270	120		280	100		320	110
15		370	100		390	110		430	110
20		460	90		480	90		740(4)	310
25		540	80		550	70			
30		630	90		640	90			
35		800	170		850	210			
40		980(1)	180		1000	150			
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

SCALA PENETROMETER TEST RESULTS

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA
 PROJECT: NEW HOUSE

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 55(1)			LOT 55(2)			LOT 56(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		180	140		220	180		210	170
10		280	100		350	130		350	140
15		390	110		640(4)	290		460	110
20		550	160					600	140
25		670	120					970(1)	370
30		810	140						
35		950(2)	140						
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 56(2)			LOT 57(1)			LOT 57(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		180	140		220	180		190	150
10		280	100		400	180		300	110
15		350	70		540	140		450	150
20		730(3)	380		680	140		590	140
25					800	120		720	130
30					920(3)	120		840	120
35								960(2)	120
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

SCALA PENETROMETER TEST RESULTS

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

JOB NAME: PIONEER PROPERTY TRUST LTD
 SITE ADDRESS: WESTERN ROAD, NGONGOTAHA, ROTORUA
 LOT NUMBER: 58(1)

DATE: 27.09.07
 BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL
 TABLE OF PENETRATION IN mm PER 5 BLOWS
 LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 58(1)			LOT 58(2)			LOT 59(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		240	200		210	170		200	160
10		400	160		330	120		330	130
15		620	220		410	80		450	120
20		770	150		490	80		550	100
25		840	70		610	120		660	110
30		920	80		730	120		770	110
35		1000	80		860(4)	130		1000	230
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 59(2)			LOT 60(1)			LOT 60(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		180	140		150	110		250	210
10		280	100		270	120		360	110
15		380	100		370	100		440	80
20		470	90		460	90		520	80
25		540	70		540	80		630	110
30		630	90		630	90		850	220
35		840	210		750	120		1000	150
40		1000	160		890	140			
45					1000	110			
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

MTEC CONSULTANTS LTD

SOIL PENETROMETER TEST RESULTS

JOB NAME: PIONEER PROPERTY TRUST LTD
SITE ADDRESS: 115-117 RAILWAY ROAD, ROSS
JOB NUMBER: 175781E

DATE: 27.09.07
BY: CBW

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

Penetration begins at existing ground level
TABLE OF PENETRATION IN mm PER 5 BLOWS
LINE INDICATES LEVEL OF FIRM GROUND

NUMBER OF BLOWS	LOT 61(1)			LOT 61(2)			LOT 62(1)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		210	170		180	140		200	160
10		310	100		280	100		290	90
15		410	100		390	110		400	110
20		520	110		550	160		610	210
25		630	110		800	250		790	180
30		730(4)	100		1000	200		980(1)	190
35									
40									
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

NUMBER OF BLOWS	LOT 62(2)			LOT 63(1)			LOT 63(2)		
	RL	READING	PENETR.	RL	READING	PENETR.	RL	READING	PENETR.
RL START									
0	-0.04	40	0	-0.04	40	0	-0.04	40	0
5		170	130		220	180		240	200
10		290	120		300	80		340	100
15		500	210		430	130		400	60
20		640	140		560	130		470	70
25		710	70		700	140		630	160
30		780	70		800	100		770	140
35		900	120		900	100		970(1)	200
40		1000	100		1000	100			
45									
50									
55									
60									
65									
70									
75									
80									
85									
90									
95									
100									

Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

MTEC CONSULTANTS LTD

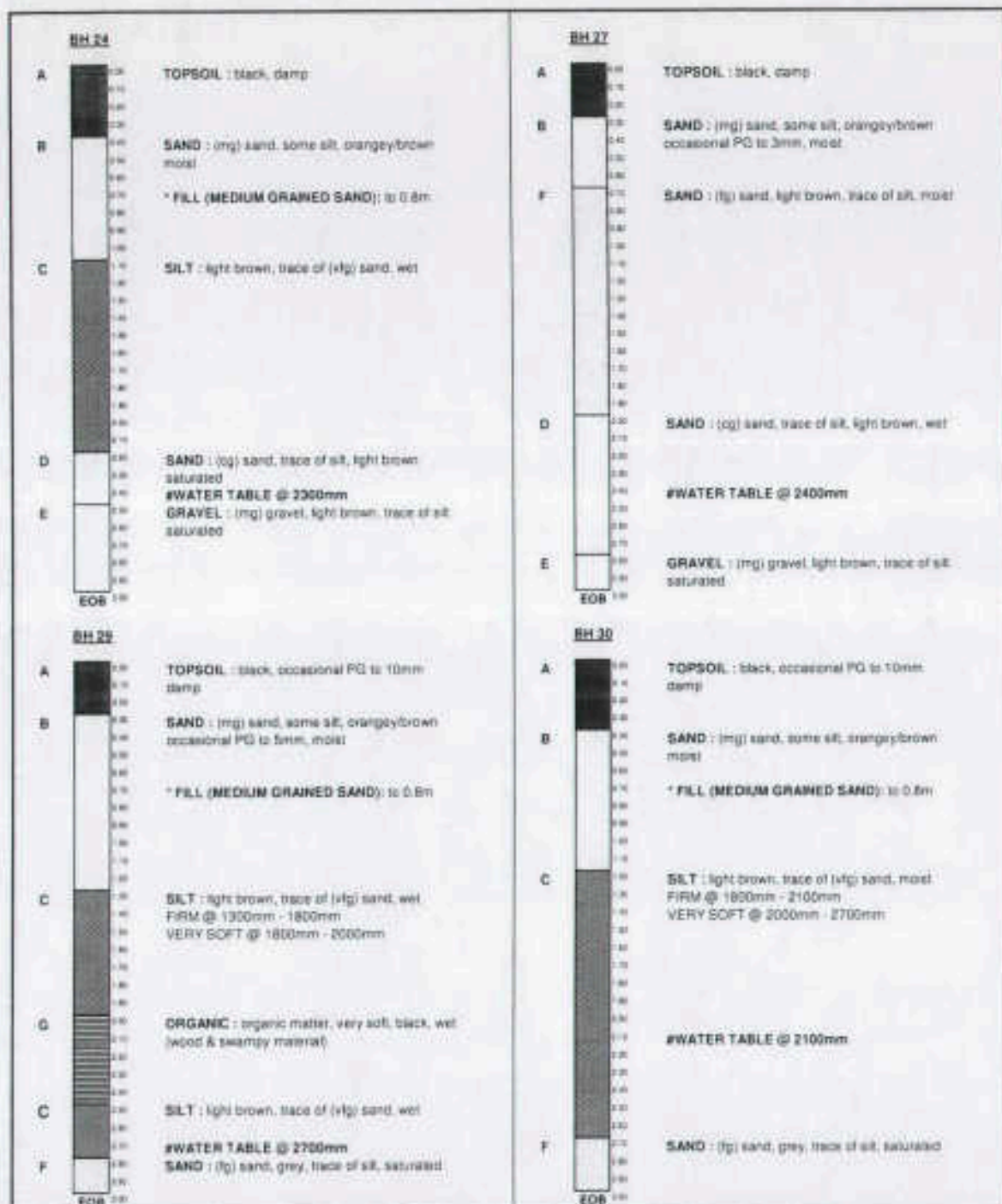
BOREHOLE LOGS

CLIENT: WESTER PROPERTY TRUST LTD (STAGE B)
SITE ADDRESS: WESTERN ROAD, NGONGOTAHIA
JOB NUMBER: 175761/E

DATE:
BY:

10.04.08
CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL



Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

CONSULTANT

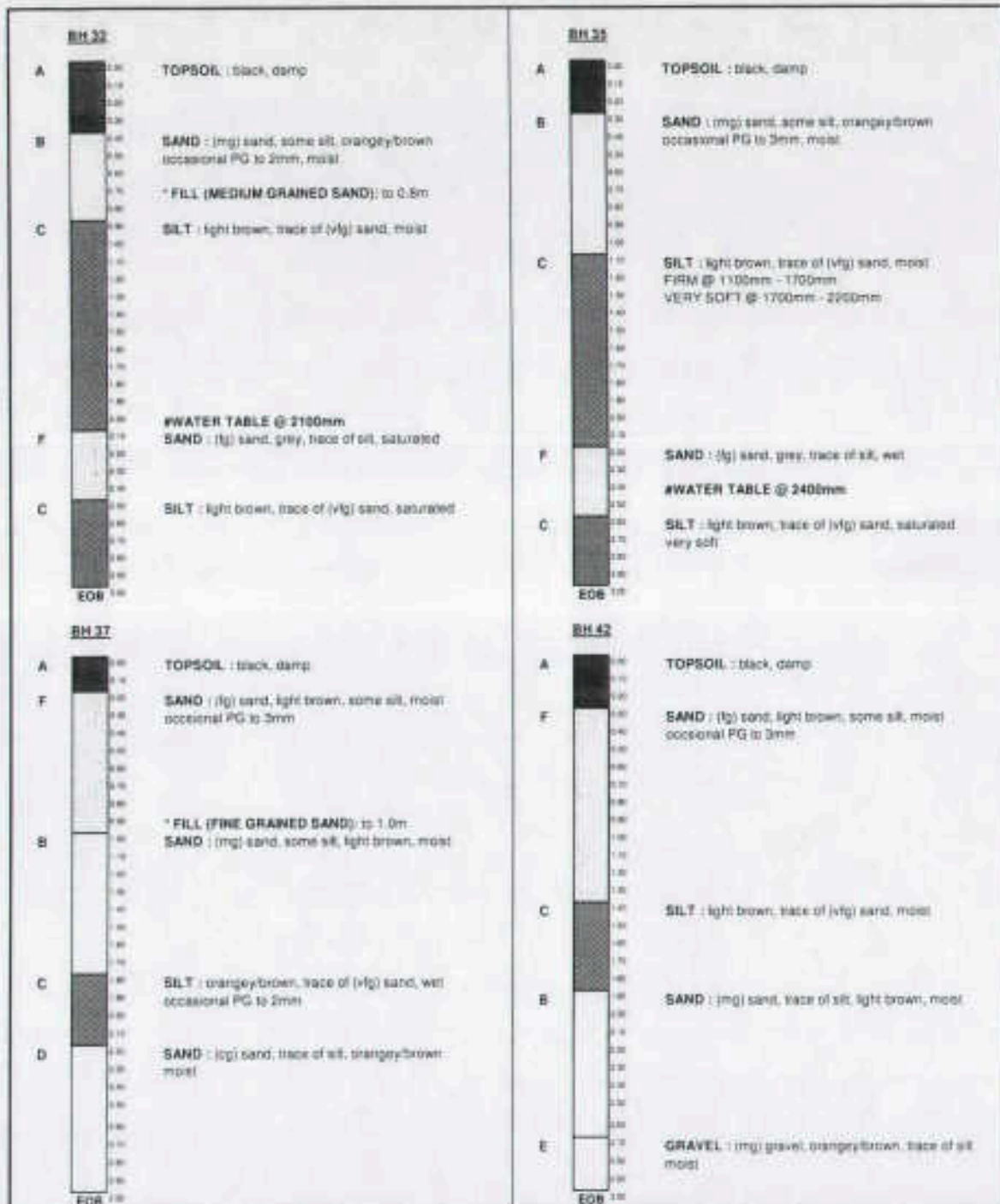
REFERENCE

CLIENT: THE TRUSTEES OF THE TRUSTEE PROPERTY TRUST LTD (STAGE II)
SITE ADDRESS: WESTERN ROAD, NGONGOTAHIA
JOB NUMBER: 115781/E

DATE:
BY:

10.04.08
CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL



Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

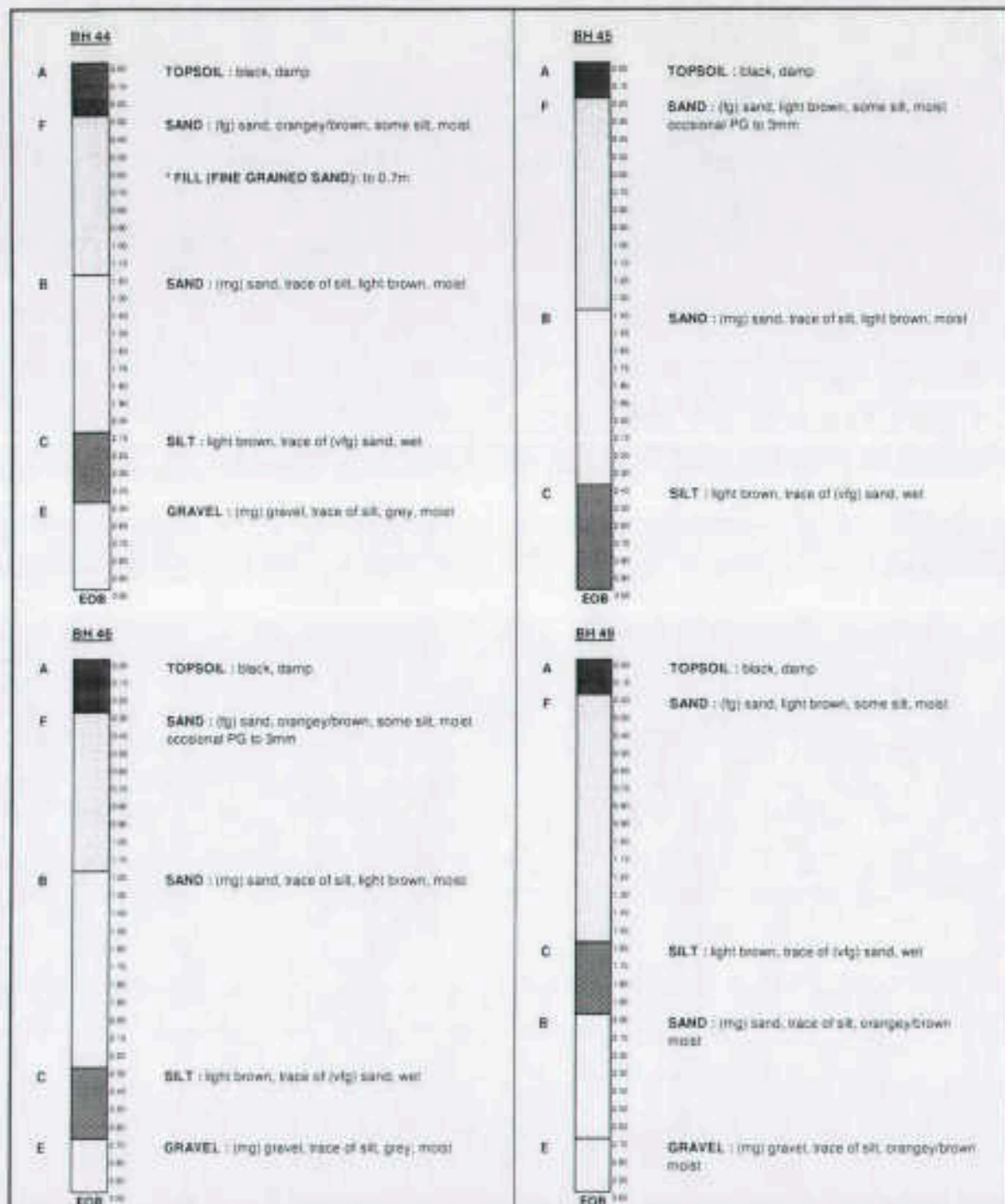
MTFC CONSULTANTS

WORKS PLANS

CLIENT: WESTER PROPERTY TRUST LTD (STAGE III)
SITE ADDRESS: WESTERN ROAD, NGONGOTAHU
JOB NUMBER: 175781/E

DATE: 10.04.08
BY: CBW

NOTE: DEPTH OF PENETRATION BEDS AT EXISTING GROUND LEVEL



Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

INFORMED CONSENT

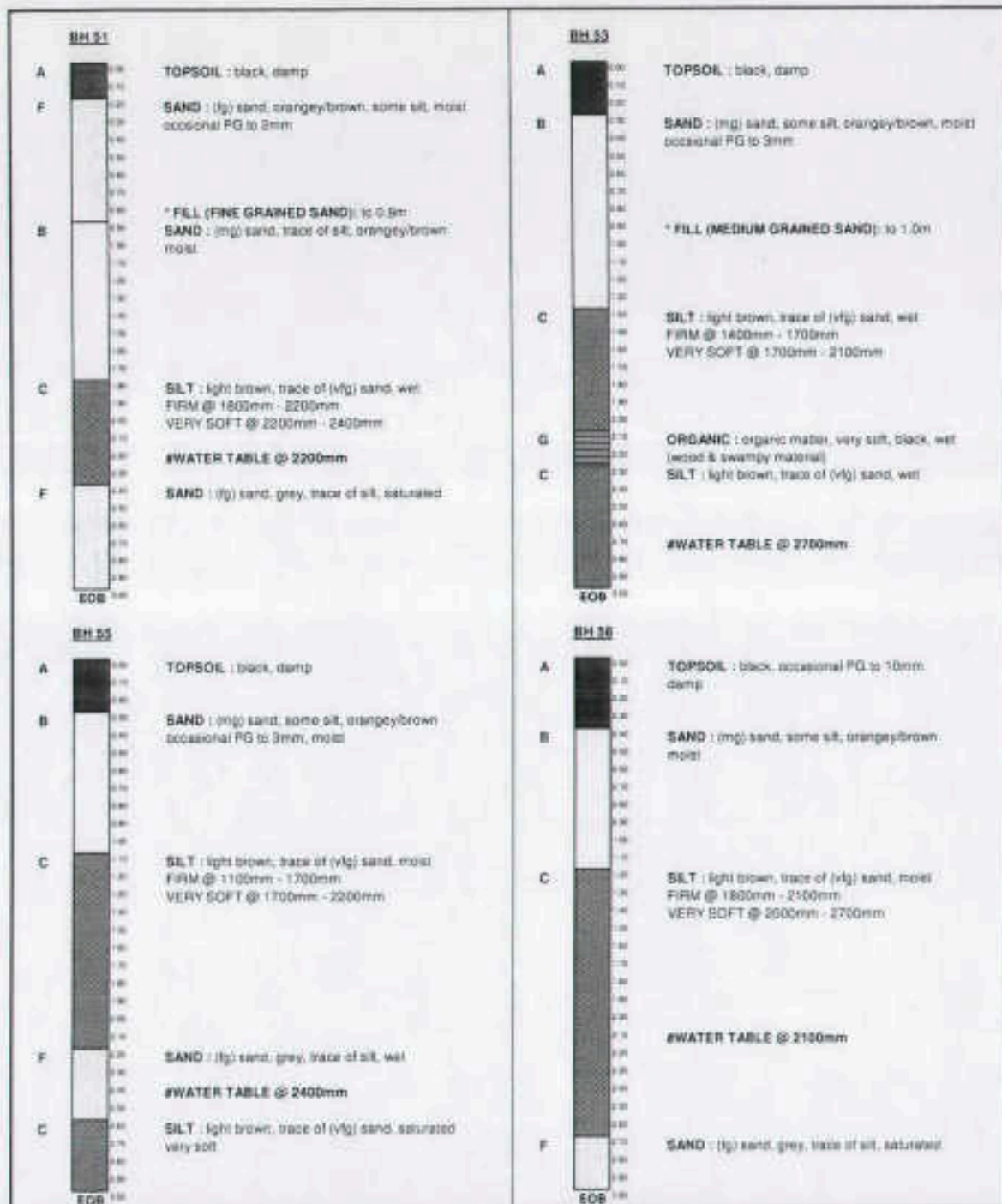
REFERENCE

CLIENT: WESTERN PROPERTY TRUST LTD (STAGE 1B)
SITE ADDRESS: WESTERN ROAD, NGONGOTAHIA
JOB NUMBER: 175781/E

DATE:
BY:

10.04.08
CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL



Note:
Geotechnical Investigations have been undertaken by Tonkin & Taylor after the writing of this report.

Please ensure complete review of all Geotechnical Information is undertaken prior to any application for building consent.

MTEC CONSULTANTS LTD

BOREHOLE LOGS

JOB NAME: PIONEER PROPERTY TRUST LTD (STAGE II)
SITE ADDRESS: WESTERN ROAD, NGONGOTAHU
JOB NUMBER: 175781/E

DATE: 10.04.08
BY: CBW

NOTE: DEPTH OF PENETRATION BEGINS AT EXISTING GROUND LEVEL

