



EAST WANNEROO CELL 6 AGREED
STRUCTURE PLAN (ASP8): PROPOSED
AMENDMENT NO. 43
LOT 2 (NO. 26) DRIVER ROAD, DARCH

DOCUMENT CONTROL

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2. CADASTRAL INFORMATION





PART ONE

IMPLEMENTATION

Amendment No. 43 to the East Wanneroo Cell 6 Agreed Structure Plan (ASP8)



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STRUCTURE PLAN AMENDMENT

Amendment No. 43 to the East Wanneroo Cell 6 Agreed Structure Plan (ASP8)

The City of Wanneroo, pursuant to its District Planning Scheme No.2, hereby amends the Agreed Structure Plan by:

1. Amending the zoning of Lot 2 Driver Road, Darch as shown on the Zoning Plan from Landfill Precinct to Residential Precinct;
2. Amending the residential density coding of Lot 2 Driver Road as shown on the Structure Plan from Residential R20 to Residential R20, R30 and R60;
3. Modifying Clause 4.3 Business Precinct 'Criteria' to remove criteria b) and modify criteria e) to require a 1m landscape setback for any new development;
4. Modifying Clause 4.3 Business Precinct, 'Table 1 - Non-Permitted Uses within the Business Precinct' to exempt 'Service Station' from the table for the easternmost portion of the 'Business Precinct' corner of Furniss Road and Mirrabooka Avenue; and
5. Revising the indicative road layout.

TABLE OF AMENDMENTS

Record of Amendments made to the East Wanneroo Cell 6 Structure Plan (ASP8)

AMENDMENT NUMBER	SUMMARY OF AMENDMENT	FINAL ENDORSEMENT DATE BY CITY OF WANNEROO	FINAL ENDORSEMENT DATE BY WAPC
43	Rezones Lot 2 Driver Road, Darch to Residential; recodes portions of Lot 2 Driver Road, Darch; amends the criteria relating to setbacks and landscaping and the non-permitted uses table for the easternmost portion of the 'Business Precinct' corner of Furniss Road and Mirrabooka Avenue in relation to Service Station and revises the indicative road layout.		



RECORD OF ENDORSEMENT

This structure plan amendment is prepared under the provisions of the City of Wanneroo District Planning Scheme No.2.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN AMENDMENT No. 43 TO THE EAST WANNEROO CELL 6 AGREED STRUCTURE PLAN (AGREED STRUCTURE PLAN NO.8) WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

..... Date

Signed for and on behalf of the Western Australian Planning Commission:

.....

an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

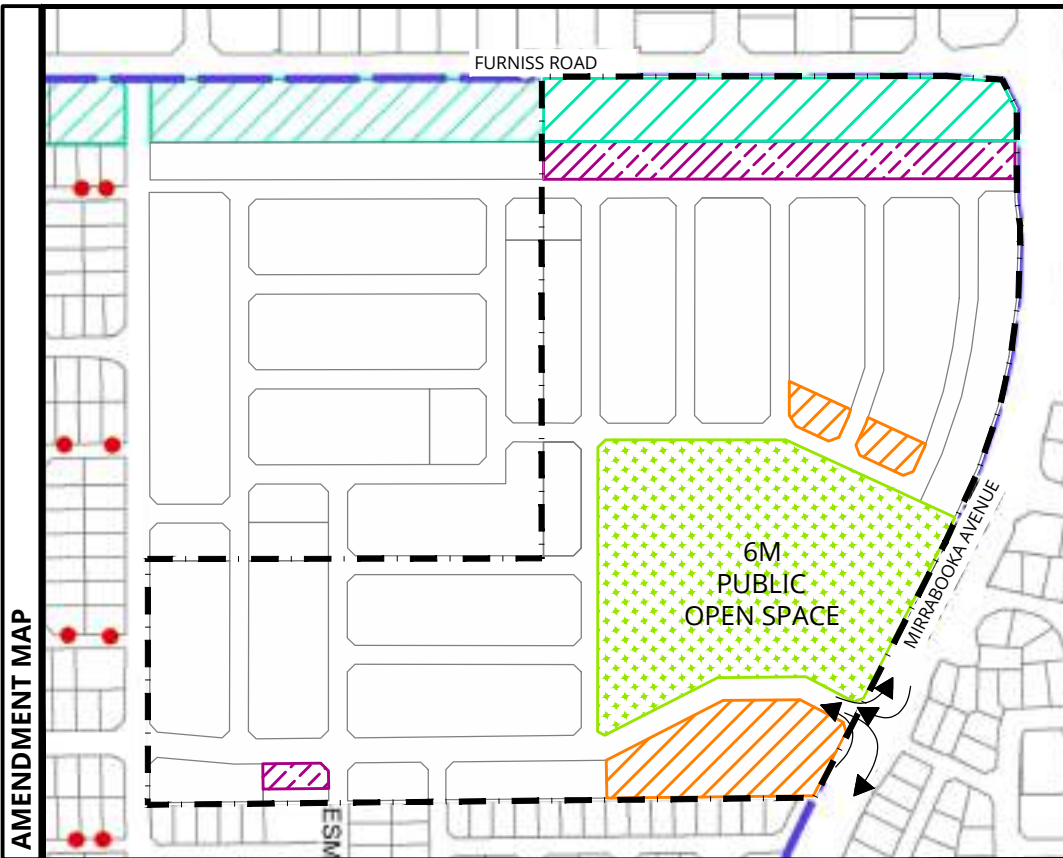
..... Witness

..... Date

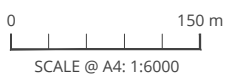
..... Date of Expiry



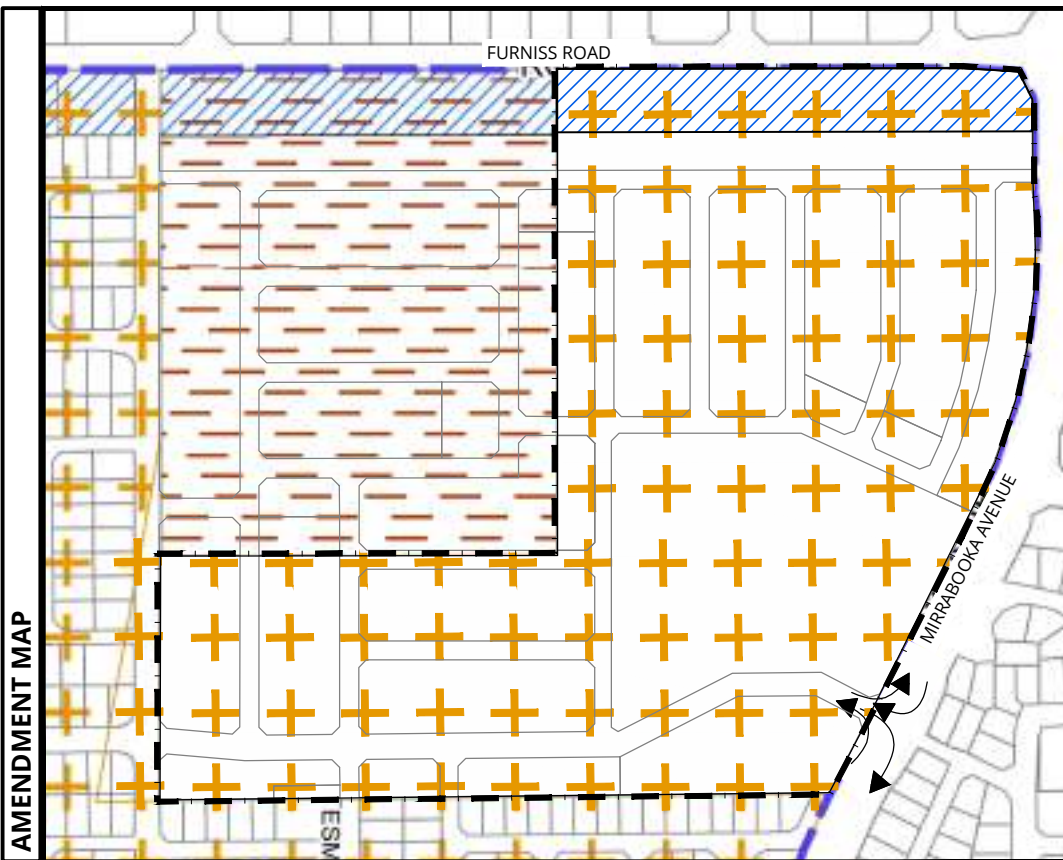
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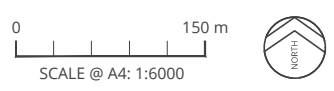
LEGEND	
	SUBJECT SITE
	RESIDENTIAL R30
	RESIDENTIAL R60
	BUSINESS PRECINCT
	PUBLIC OPEN SPACE



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LEGEND	
	SUBJECT SITE
	BUSINESS DISTRICT
	LANDFILL PRECINCT
	RESIDENTIAL PRECINCT





PART TWO

EXPLANATORY SECTION



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1. BACKGROUND

1.1 INTRODUCTION AND PURPOSE

Rowe Group acts on behalf of Parcel Property, the project managers of Lot 2 (No. 26) Driver Road, Darch ('the subject site'). This report has been prepared in support of a proposed amendment request to the *East Wanneroo Cell 6 Structure Plan*, being Agreed Structure Plan 8 (ASP8) (the 'Structure Plan'). The proposed amendment seeks to modify the existing spatial layout of the Structure Plan to facilitate residential subdivision of the subject land.

The Structure Plan amendment has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Structure Plan Framework (2015)* guidelines and represents a long-contemplated revision to the Cell 6 Structure Plan in relation to the subject land.

The amendment facilitates an integrated planning outcome which delivers the local Darch community the much-anticipated main playing fields open space together with an estimated 278 residential lots and business precinct.

1.2 THE PROJECT TEAM

Parcel Property has established a consultant team comprising experts across the following disciplines.

DISCIPLINE	CONSULTANT
Town Planning and Urban Design	Rowe Group
Servicing	Tabec
Traffic	Donald Veal Consultants
Urban Water Management	Urbaqua
Geotechnical and Site Assessment	Galt Geotechnics
Landscape Design	LD Total

Table 1: Project Team Details



2. DESCRIPTION OF SITE

2.1 LOCATION

The subject site is situated approximately 16.2 kilometres north of the Perth central business district within the City of Wanneroo. The land is approximately 7km east of the Mitchell Freeway, 3.5km east of Wanneroo Road and south of the Wangara business precinct.

Refer Figure 1 – Regional Location.

The subject site is located in the north east corner of the suburb of Darch. The land is bound by Furniss Road to the north, Mirrabooka Avenue to the east, Driver Road to the west, and established residential development to the south.

Refer Figure 2 – Local Location.

The locality is characterised by established single residential development to the west and south, which is serviced by well-established school, parkland and retail facilities. North of the subject site on Furniss Road is the Wangara commercial business precinct. The established Landsdale residential area is located east of the subject site.

2.2 SITE DESCRIPTION

Lot 2 comprises an area of 24.71 ha. The land has approximately 570m of frontage to Mirrabooka Avenue, with approximately 320m of frontage to Furniss Road.

The subject site was originally mined for sand supplies for the building industry, together with adjoining Lot 1. Sand was gradually removed, and the area operated as landfill facility for non-organic waste (mainly building rubble). The subject site has been filled following the processing of material through a crushing plant and now remains as vacant land.

2.3 CADASTRAL INFORMATION

The subject site comprises one land parcel.

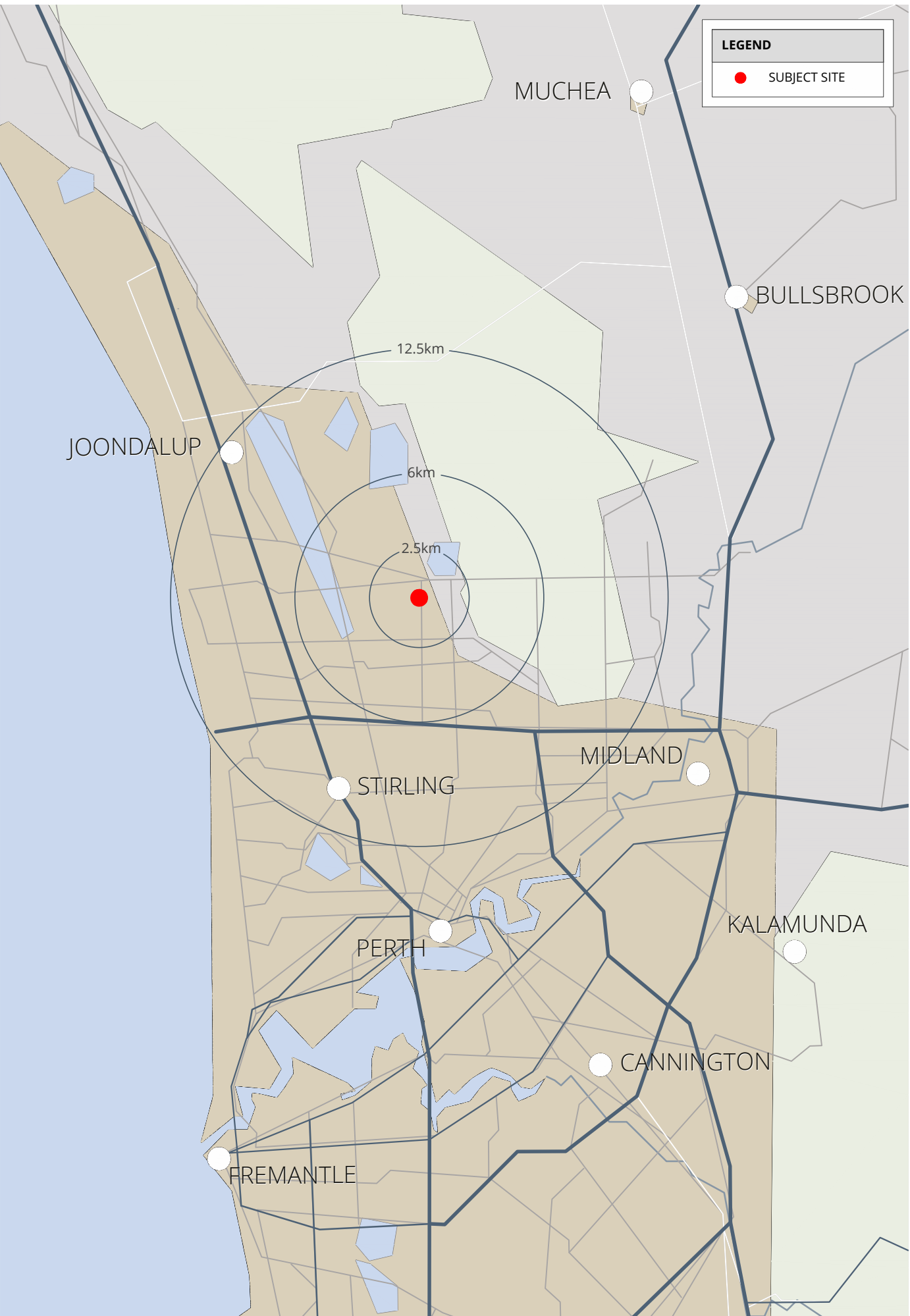
LOT	STREET ADDRESS	DEPOSITED PLAN	VOLUME / FOLIO	PROPRIETOR	AREA
2	26 Driver Road	69382	2973 / 813	Parcel Darch Pty. Ltd.	24.71 Hectares

Table 2: Cadastral Information

Refer Figure 3 – Site Plan and Appendix 1 – Certificate of Title.



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8997_FIG01A_20190405 Darchi (Regional Location) DRAWN: A. GLASKIN - DATE CREATED: 2019.04.05 - PROJECTION: MGA50 GD494 - NITDAWN PLANNING\8997\8997\06\FINAL\CAD - ADAM GLASKIN - 2019.11.06

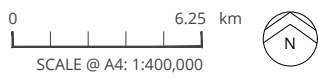
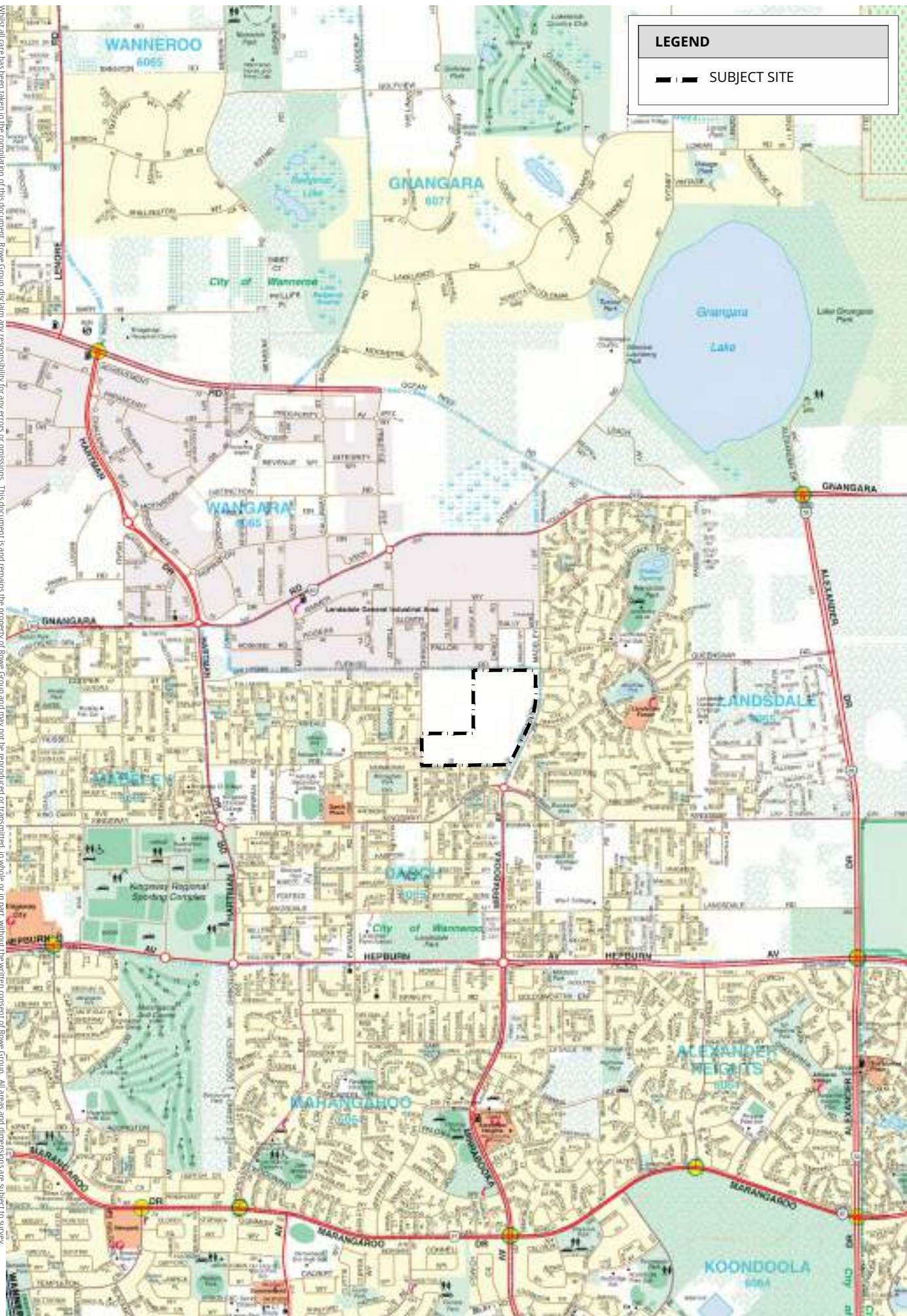


FIGURE 1
REGIONAL LOCATION

LEGEND

— ■ — SUBJECT SITE



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


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8997_FIG02A_20191106 Darch (Local location) - DRAWN: A. GLASKIN - DATE CREATED: 2019.11.06 - PROJECTION: MGA50 GDA94 - CADASTRE: LANDGATE - MAP DATA: STREETSMART



FIGURE 2
LOCAL LOCATION

LEGEND

-  SUBJECT SITE
-  CONTOURS
-  EXISTING BOUNDARIES
-  EXISTING LOT NUMBERS



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8997_FIG03A_20191106 Darch (Site plan) - DRAWN: A. GLASKIN - DATE CREATED: 2019.11.06 - PROJECTION: MGA50 GD84 - CADASTRE: LANDGATE - AERIAL: SPOOKFISH



FIGURE 3
SITE PLAN

3. TOWN PLANNING FRAMEWORK

3.1 ZONING

3.1.1 METROPOLITAN REGION SCHEME

The subject site is currently zoned 'Urban' under the Metropolitan Region Scheme ('MRS'), reflecting the long-held expectation that the land would ultimately transition to land uses reflective of the surrounding Darch urban residential area.

Refer Figure 4 – Metropolitan Region Scheme Zoning.

3.1.2 CITY OF WANNEROO LOCAL PLANNING SCHEME NO. 2

The subject site is zoned 'Urban Development' zone under the City of Wanneroo Local Planning Scheme No. 2 ('LPS 2'). The objectives of the 'Urban Development' Zone are to:

- (a) designate land for future urban development;*
- (b) provide for the orderly planning of large areas of land for residential and associated purposes through a comprehensive structure planning process;*
- (c) enable planning to be flexible and responsive to changing circumstances throughout the developmental stages of the area.*

As per section 3.14.3 of LPS 2:

Subject to Clause 27 of the deemed provisions, no subdivision (including strata or survey strata subdivision) or other development should be commenced or carried out in an Urban Development Zone until a Structure Plan has been prepared and adopted under the provisions of Part 4 of the deemed provisions. No subdivision (including strata or survey strata subdivision) should be commenced or carried out and no other development shall be commenced or carried out otherwise than in conformity with a Structure Plan which is in existence at the time the application for approval of the subdivision or other development is received by the responsible authority.

The subject site falls within an approved structure plan area with this proposed amendment intended to allow the orderly and subdivision and development of the land consistent with the objectives of the 'Urban Development' Zone.

Refer Figure 5 – Town Planning Scheme No.2 Zoning.

3.2 EAST WANNEROO CELL 6 AGREED LOCAL STRUCTURE PLAN 8

The East Wanneroo Cell 6 – Darch / Madeley Structure Plan (Agreed Structure Plan No.8) (ASP8) has been endorsed by the City of Wanneroo and WAPC. Various amendments to ASP8 dating back to 2004 have subsequently also been approved.

ASP8 incorporates approximately 600 ha of land and provides an overarching framework for coordinating and assessing subdivision and development applications within Cell 6. Since adoption, the majority of the structure plan area has been developed, with the subject site and adjoining Lot 1 representing one of the last remaining undeveloped areas.



The Structure Plan currently identifies the subject site as 'Landfill Precinct'. Clause 4.2 of the Structure Plan Report identifies the following objective for the 'Landfill Precinct':

Whilst it is generally intended that land uses within the Landfill Precinct will be guided by the Agreed Structure Plan, prior to the Council issuing a use or development approval, or subdivision support to an application within the Landfill Precinct, the Agreed Structure Plan will need to be modified to remove the Landfill Precinct zoning and replace it with an appropriate zoning eg, Residential Precinct. Such a modification will only be supported by Council if it can be clearly demonstrated that any geotechnical or other environmental clearances have been obtained to the satisfaction of Council, the WAPC or DEP as the case requires.

In addressing the intent of clause 4.2, it is important to understand that the above text was written prior to the introduction of the:

- ▲ *Contaminated Sites Regulations 2006* and particularly Part 6 – Certificates of contamination audit; and
- ▲ *Planning and Development (Local Planning Scheme) Regulations 2015* and particularly Part 4 – Structure Plans of the Schedule 2 Deemed Provisions.

The *Contaminated Sites Regulations 2006* provide the legal basis for the reporting, auditing and remediation of contaminated sites. The Regulations are directly relevant as they provide the legislative framework for the appointment of an Auditor and conduct of a Mandatory Audit Report and site remediation.

This process exists entirely independent of the planning framework and no subdivision or development of land can occur without completion of an audit under the Regulations. The outcome of this audit determines the suitability of the site for a specific or range of uses. The completion of the audit occurs on completion of site remediation works and the 'audit' of these works.

Given the basis on which the Regulations operate, and the acceptance that sites can be audited on a stage by stage basis, it is inappropriate and impractical to delay or defer amendment to the Cell 6 Structure Plan pending site audit and remediation. The proposed structure plan amendment, if approved, will remove the subject site from the 'Landfill' Precinct of ASP8, though the land will still be subject to any conditions imposed through the MAR process which are capable of being reiterated through the subdivision approval process.

The *Planning and Development (Local Planning Schemes) Regulations 2015* to effect on 19 October 2015. Among other matters the Regulations clarified the role and function of structure plans. In particular, the Regulations established that Structure Plans have the status of 'due regard' rather than the force and effect of a town planning scheme.

Given the introduction of the Regulations, the ASP8 structure plan provides a 'due regard' guidance for the planning and development of the subject land. The determination of whether the land can and will be suitability for a specific or range of uses will be settled through the above-mentioned site audit process.



Pending the completion of the audit process, it is the role and function of the structure plan to set intended land use, density and layout for the subject site. Each of these elements are addressed in detail within this structure plan amendment request.

3.3 STATE PLANNING POLICIES

3.3.1 STATE PLANNING POLICY 2.4 BASIC RAW MATERIALS (DRAFT)

State Planning Policy 2.4 – Basic Raw Materials Policy ('SPP 2.4') is intended to facilitate the responsible extraction of basic raw materials, while ensuring the protection of people and the environment. The policy aims to facilitate resource extraction while considering future land use.

While the subject site is no longer identified as a 'Priority Resource Location', it is relevant to note that SPP2.4 logically contemplates sequential land use planning and rehabilitation of land to recognise long-term development. The approach being undertaken for the subject site, and the progression of this structure plan amendment request, is consistent with the intent of SPP2.4.

It should be note though, that SPP2.4 and the associated *Basic Raw Materials Guidelines* place an emphasis on the planning for and development approvals process for basic raw materials extraction. Both SPP2.4 and the Guidelines acknowledge the separate environmental legislation relating to management and mitigation which operate independently.

3.3.2 STATE PLANNING POLICY 3.0 – URBAN GROWTH AND SETTLEMENT

State Planning Policy 3.0 – Urban Growth and Settlement ('SPP 3') sets out the principles and considerations which apply to planning for urban growth and settlement in WA. SPP 3 recognises that:

The orderly planning of urban growth and settlement should be facilitated by structure plans, which should take into account the strategic and physical context of the locality, provide for the development of safe, convenient and attractive neighbourhoods which meet the diverse needs of the community, and facilitate logical and timely provision of infrastructure and services. Structure plans may consist of a hierarchy of plans ranging from broad district structure plans to more detailed plans for neighbourhoods and precincts.

As logical urban infill site, located within an approved structure plan area, this proposed amendment is entirely consistent with the abovementioned objectives for future urban growth. Consideration of the subject site's context is discussed further within this document together with an accompanying review of the included Concept Plan.

3.3.3 STATE PLANNING POLICY 5.4 – ROAD AND RAIL NOISE

State Planning Policy 5.4 – Road and Rail Noise ('SPP 5.4') sets out the principles for the consideration of road and rail transport noise and freight considerations in land use planning. The policy was updated as of 6 September 2019 and replace the earlier 2009 version.

The proposed structure plan amendment, and development of the subject site, has been assessed against SPP5.4. The section of Mirrabooka Avenue abutting the subject land was specifically considered and found not be a trigger for assessment under the policy. An acoustic assessment is therefore not required.



3.3.4 STATE PLANNING POLICY 7.3 – RESIDENTIAL DESIGN CODES VOLUME 1

State Planning Policy 7.3 – Residential Design Codes ('SPP 7.3') sets out the criteria to guide residential development throughout Western Australia. SPP 7.3 provides development control guidance for proposals in the form of 'deemed-to-comply' criteria and 'performance' criteria with respect to residential proposals.

This proposed structure plan amendment, including the proposed revision to the allocation of residential density codes and the modification to the indicative road network has regard to the future residential development of the land and compliance with SPP 7.3. This will ultimately be addressed in detail in any future subdivision and development of the land.

3.4 REGIONAL & SUB-REGIONAL STRATEGIES

3.4.1 PERTH AND PEEL @ 3.5 MILLION

The *Perth and Peel @3.5 Million* (March 2018) suite of documents provides a framework for the development of Perth and Peel regions as the population reaches an estimated 3.5 million people by 2050. The documents seek to meet the targets identified under Directions 2031 and the State Planning Strategy 2050. The suite of documents includes four planning frameworks for the Central, North-West, North-East and South Metropolitan Peel sub-regions.

3.4.2 NORTH WEST METROPOLITAN SUB-REGIONAL PLANNING FRAMEWORK

The subject site is located within the *North-West Sub-regional Planning Framework* (the 'Framework'). Within the Framework, the City of Wanneroo is expected to require an additional 146,160 dwellings by 2050. The subject site is identified as 'Urban' within the Framework, consistent with the subject site's zoning under the MRS.

3.5 DEVELOPMENT CONTROL & OPERATIONAL POLICIES

3.5.1 LIVEABLE NEIGHBOURHOODS

Liveable Neighbourhoods ('LN') is an operational policy of the WAPC and guides the design and assessment of residential structure plans and subdivision. The underlying objective of LN is to create safe, sustainable and attractive neighbourhoods with a strong site-responsive identity that reduces dependency on private vehicles and are more energy and land efficient.

LN identifies a series of objectives and requirements for structure plans that, when met, demonstrate compliance with the overall outcomes sought by LN. These objectives and requirements relate to items such as road layout, relationship of housing to open space and schools, school location/distribution, POS layout and location and housing densities.

The proposed amendment to this structure plan, and the associated Concept Plan included in this submission have been designed with regard to the various objectives and requirements of LN.



3.5.2 DEVELOPMENT CONTROL POLICY 2.2 – RESIDENTIAL SUBDIVISION

The WAPC's Development Control Policy 2.2 ('DC 2.2') aims to establish a consistent and coordinated approach to residential lot subdivision. This includes the level of amenity afforded residential lots, together with servicing, shape and sizing.

This proposed structure plan amendment, including the proposed revision to the indicative road network has regard to the future residential subdivision of the land and compliance with DC2.2.

3.6 LOCAL PLANNING POLICIES

A number of City of Wanneroo Local Planning Policies have been reviewed with regard to future subdivision and development of the subject site, these include:

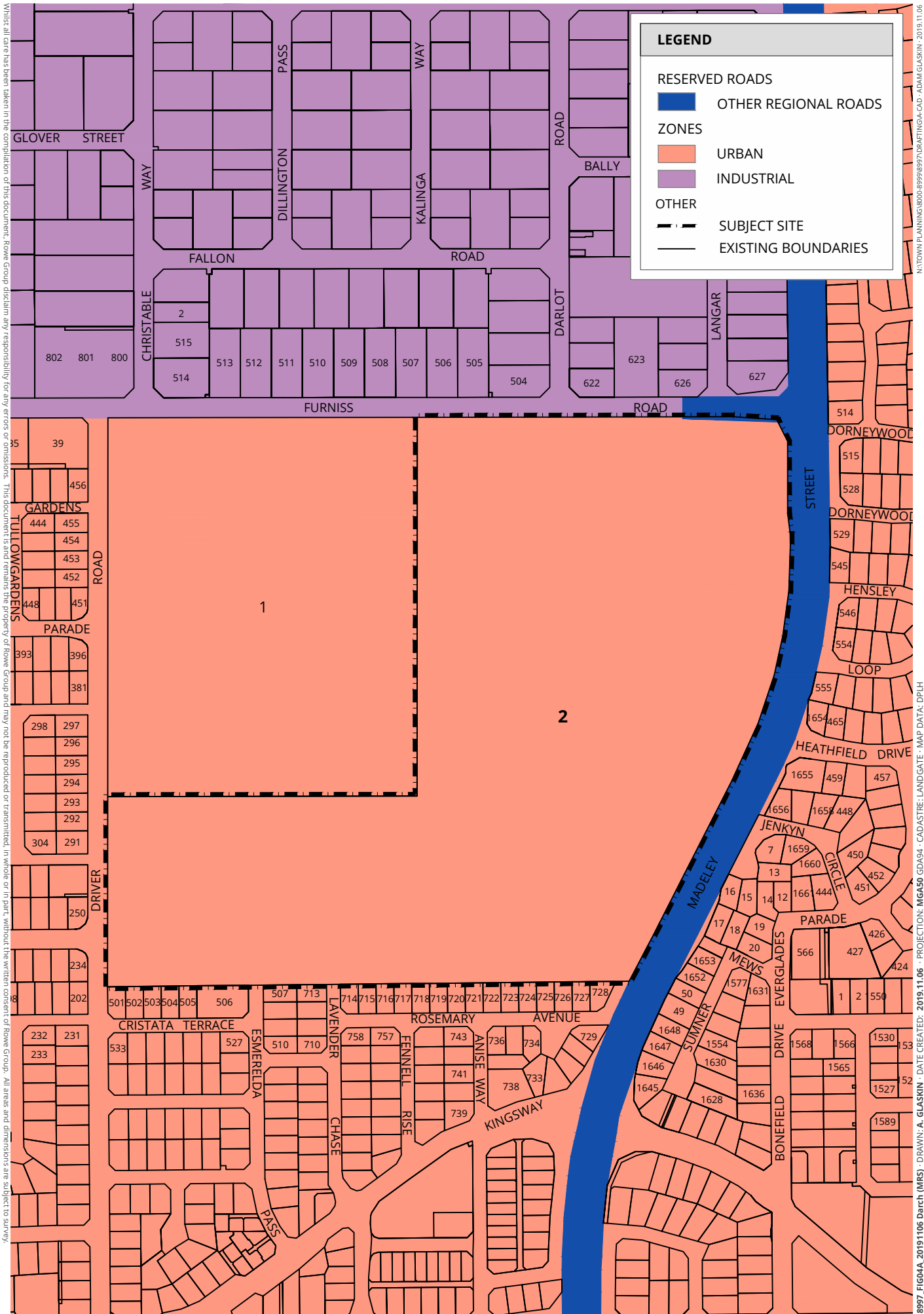
1. Local Planning Policy 2.1 – Residential Developments;
2. Local Planning Policy 2.4 – Site Works and Retaining for Residential Development;
3. Local Planning Policy 3.1 – Local Housing Strategy Implementation;
4. Local Planning Policy 4.19 – Medium-Density Housing;
5. Local Planning Policy 4.3 – Public Open Space;
6. Local Planning Policy 4.4 – Urban Water Management;
7. Local Planning Policy 4.7 – Uniform Fencing.

More detailed review and response to these policies will occur at the future subdivision and development stage.



LEGEND

- RESERVED ROADS
- OTHER REGIONAL ROADS
- ZONES
 - URBAN
 - INDUSTRIAL
- OTHER
 - SUBJECT SITE
 - EXISTING BOUNDARIES



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8997_FIG04A_20191106 Darch (MRS) - DRAWN: A. GLASKIN - DATE CREATED: 2019.11.06 - PROJECTION: MGA50 GDA94 - CADASTRE: LANDGATE - MAP DATA: DPLH

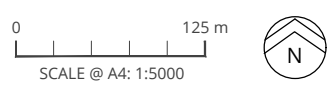


FIGURE 4
METROPOLITAN REGION SCHEME ZONING

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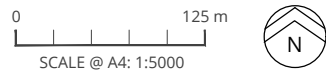
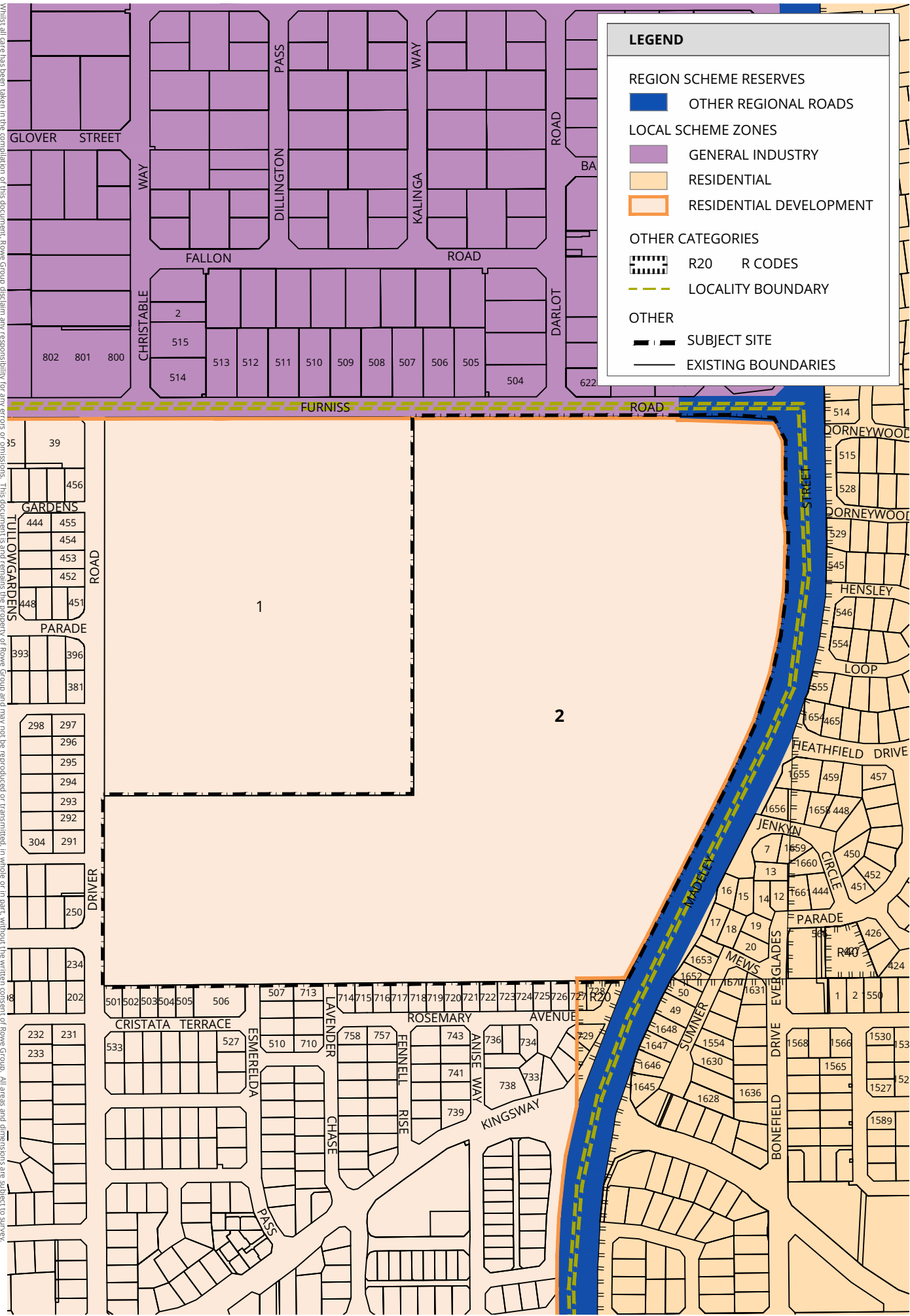


FIGURE 5
TOWN PLANNING SCHEME No. 2 ZONING

4. SITE ATTRIBUTES AND MANAGEMENT

As a former land fill site there have been several environmental and geotechnical studies conducted in regard to the land since the mid-2000s. These earlier studies were mainly completed to characterise the fill and assess the potential environmental risks to surrounding development while the site operated as a landfill.

This submission is accompanied by a site specific detailed geotechnical review undertaken by Galt Geotechnics (Galt) having regard to the future use and development of the land.

Similarly, this submission is accompanied by:

- ▲ Galt letter dated 26 November 2019 summarising the contamination assessment process being undertaken and demonstrating support for this proposed LSP amendment. The advice clearly confirms that the site will be suitable for the nominated land uses (being residential, commercial and POS) with only the appropriate remedial and gas protection measures to be determined. These are established independently and approved by an approved Auditor and DWER.
- ▲ Senversa letter dated 27 November 2019. Ms Vanessa Bryant of Senversa has been engaged to the accredited contaminated sites auditor to oversee the completion of a mandatory audit of the subject site. This letter summarises the background history of the property, the extensive amount of documentation audited to date and the current status of the audit process and work remaining. The advice clearly confirms that some contamination has been identified to date which requires further assessment, remediation and management but nothing has been detected or suspected that is not able to be easily managed or mitigated.

These two letters confirm there is no impediment to the progression of the proposal LSP amendment as there is no reason to believe the land cannot be remediated for the uses proposed – being residential, commercial and POS. These and related supporting documents are further in the sections below.

Refer Appendix 2 – Geotechnical Assessment.

Refer Appendix 3 – Letters of advice – Galt Geotech and Senversa

4.1 GEOTECHNICAL GROUND MODEL

As part of the work undertaken, Galt developed a site-specific geotechnical ground model for the subject land. The main geotechnical units within the vicinity of the site are described by Galt as:

- ▲ Unit 1: In-Situ Fill
- ▲ Unit 2: Natural Sand



4.1.1 IN-SITU FILL

Galt's review identified the subject land comprises three components of in-situ fill:

- ▲ Unit 1a: Sand Fill

The sand fill is a layer of sand and gravelly sand placed generally as a capping layer over uncontrolled fill (Unit 1b). The fill material is generally between 1.5m to 3m thick but does occur up to approximately 7.5m thick.

- ▲ Unit 1b: Uncontrolled Fill

The uncontrolled fill is generally located under the sand fill and occurs across most of the site. Importantly, Galt note that

"We have referred to this material as 'uncontrolled fill' due to its composition, however anecdotal evidence and our own observation indicate that effort was provided during the extensive filling process to select appropriate materials for incorporation in the fill. We dug over 60 large test pits and trenches and noted that the material was well-packed with minimal large voids in all instances." (p6)

- ▲ Unit 1c: Screened Fill

The screened fill is a layer of typically gravelly sand which appears to be a <10mm product left over from screening operations on Lot 1. Its structural performance is expected to be similar to unit 1a as capping sand unit 1a.

4.1.2 NATURAL SAND

Natural sand was found at surface in the south west corner of Lot 2 and in localised locations along the site boundary.

4.1.3 GEOTECHNICAL ASSESSMENT

Galt completed a review of the site's suitability for proposed residential development and open space. The assessment established that while the current site conditions require improvement, it will be possible to achieve a standard suitable for the proposed land use outcome. Based on a review of the required site engineering, Galt prepared an 'Indicative Site Classification Plan' comprising Figure 3 in Appendix 2 of this report.

The Indicative Site Classification Plan indicates that:

- ▲ the majority of proposed residential lots will likely attain a Class 'S' site classification;
- ▲ a portion of Lot 2 in the southwest corner appears capable of achieving either Class 'S' or Class 'A';
- ▲ a limited run of lots adjacent to Mirrabooka Avenue and on the southern boundary of Lot 2 may be classified as Class 'M'; and
- ▲ the main open space area is expected to achieve a Class 'P' classification.

The Galt review outlines the methodology required to engineer the site for these classifications to be met.



4.2 CONTAMINATED SITES

4.2.1 SUMMARY OF RECORD

The subject site is listed on the Department of Water and Environmental Regulation (DWER) records with the classification of 'Restricted Use'. This classification restricts the site to a managed landfill site. The site classification is based on information submitted to the then Department of Environment and Conservation (DEC) in September 2009.

While the classification, and the basis for it, identified a range of considerations associated with the former landfill use, the listing also recognises that the classification of the site is based:

"...on the information available at the time of classification. It is acknowledged that the contamination status may have changed since this time, and as such the usefulness of this information may be limited." (DWER Basic Summary of Records, Site ID 65506, p3).

4.2.2 SITE AUDIT & REMEDIATION PROCESS

In order to remove or reclassify the subject land's listing as Restricted Use, the landowner has appointed Galt to undertake an Environmental Assessment Report (EAR). This work is independent to the geotechnical assessment of the site and the site classification expectations outlined in this report and appended hereto. The work is also in parallel to, but independent of this structure plan amendment request.

DWER's *Requirements for Mandatory Auditor's Reports: Contaminated Sites Guidelines (2016)* recognises that it:

"...is common practice for a proponent to proceed in stages with progressive assessment, remediation and validation of sub-areas of the site. The management of such projects may be complex and DER recommends that the proponent, environmental consultant and auditor work together to determine an effective and efficient strategy..."

The landowner has appointed Galt and engaged a certified auditor (Ms Vanessa Bryant from Senversa) for the purposes of reviewing and reclassifying the subject site.

This amendment to the Cell 6 Structure Plan (ASP8) is not contingent on progression of the site audit and remediation. While it is important that the City and community understand that a Mandatory Audit Report (MAR) is being undertaken with an accredited Auditor, this occurs under a separate regulatory outcome. The Auditor and DWER, in assessing the MAR, determine the conditions and required works and management plans necessary for safe and acceptable site improvement. These are legally binding requirements and remain independent to the structure plan process. Correspondence provided by Galt and the Auditor (Senversa) confirm that there is no impediment to the uses proposed herein.

Normal practice ensures that necessary management plans and works recommended by the MAR process are reflected as conditions of future subdivision approval.

4.2.3 SITE AUDIT PROGRAM

The program to agree methodology, undertake site investigation and compile information for the auditor has already been substantially progressed. Galt continue to work with the auditor on this



basis with staged reporting to occur. The individual land use precincts within the structure plan area are to be assessed and audited in the following order:

- ▲ Business Precinct
- ▲ Public Open Space
- ▲ Residential Precinct

The timing of this reporting and auditing will occur in parallel to this structure plan amendment and, while not contingent upon the audit program ongoing updates can be provided to the City as part of this.

Correspondence from the Auditor (Ms Vanessa Bryant, Senversa) further explains this process.

4.3 VEGETATION, FLORA AND FAUNA

As a former landfill site, Lot 2 has been cleared of all vegetation. There are no other environmental attributes to the site or its immediate surrounds that require consideration.

As part of the detailed site planning undertaken to inform the future residential development, a landscape concept plan has been prepared in conjunction with a local water management strategy. This is discussed further in Part 7 of this report.

4.4 HERITAGE

4.4.1 INDIGENOUS HERITAGE

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System identified no registered sites within the subject site or immediate surrounds.

4.4.2 NON-INDIGENOUS HERITAGE

No places were identified on the Heritage Council of Western Australia Heritage Places Database or the City of Wanneroo's Municipal Heritage List for the subject site.

4.5 BUSHFIRE MANAGEMENT

The subject site is not identified as lying within the Department of Fire and Emergency Services (DFES) map of bush fire prone areas. In addition, future open space will be maintained in a managed state for active recreation use. The proposal does not therefore warrant a bushfire management plan.

4.6 WATER MANAGEMENT

A Local Water Management Strategy (LWMS) has been prepared by Urbaqua to accompany this structure plan amendment. A summary of existing conditions is provided below.

Refer Appendix 4 – Local Water Management Strategy.



4.6.1 GROUNDWATER

Groundwater flows in a southwest direction through the site, with maximum groundwater levels varying between 38m AHD and 42m AHD. Regional mapping indicates that depth to groundwater varies between 3.5m and 20m across the site. Site specific groundwater measurements were undertaken by Galt to inform the LWMS prepared by Urbaqua and indicate there has been a trend of rising groundwater levels in the surrounding locality following cessation of market gardening and transition to urban residential use. Urbaqua note that development of the subject land will have limited impact on regional groundwater levels.

4.6.2 SURFACE WATER RESOURCES

There are no natural water bodies within the subject site and no existing drainage infrastructure. There are no wetlands within or in proximity to the subject site.

Review of the surrounding residential development drainage network was undertaken to inform water management planning for the site. Formal pit and pipe drainage systems discharging to sumps and basins exist throughout the suburb. Two sumps are located in close proximity to the subject site on Driver Road and on Cristata Terrace. The functionality and capacity of the surrounding network and these sumps is considered in detail in the LWMS.



5. CIVIL SERVICES AND INFRASTRUCTURE

Tabec Civil Engineering Consultants have prepared a review of the subject site's ability to be serviced for urban residential development in accordance with the structure plan amendment. This is summarised below.

Similarly, Donald Veal Consultants (DVC) have completed a Transport Impact Assessment (TIA) which is also referenced below.

Refer Appendix 5 – Engineering Infrastructure Report and Appendix 6 – Transport Impact Assessment.

5.1 ROAD NETWORK

DVC have completed a comprehensive review of the road network, access and transport considerations for the subject site. The existing road network adjacent to Lot 2 includes Mirrabooka Avenue to the east which was recently upgraded to a dual carriageway and has a 70km/h speed limit. Mirrabooka Avenue is classified as a 'Distributor A' road in accordance with Main Roads WA (MRWA) functional road hierarchy.

Furniss Road runs along the northern boundary of the site, has a 10m wide paved carriageway and is classified as a Local Distributor Road by MRWA. The City have has advised that Driver Road carried a large number of commercial vehicles accessing the Landsdale Industrial Area, and as a result speed calming measures were installed to reduce commercial vehicles cutting through the residential area.

The subject site is highly accessible from the surrounding established road network. Details regarding the proposed residential development of the land, and extension of the road network are outlined later in this report.

5.2 WASTEWATER

Water Corporation has existing wastewater planning that includes Lot 2 and has confirmed that the subject site can be serviced via extension of the existing gravity sewer network. The site falls within the catchment of the existing Waste Water Pump Station (WWPS) on Driver Road, to the immediate southwest of Lot 2. Furniss Road and Mirrabooka Avenue form catchment boundaries for this sewer pump station.

The developer will be responsible for funding reticulation extensions and the installation of the sewer network within any future subdivision of the land.

5.3 WATER

There are a number of Water Corporation reticulation and distribution water mains surrounding Lot 2. This includes infrastructure in Driver Road, Furniss Road and a trunk main in Mirrabooka Avenue.

Adequate capacity exists to extend the existing water infrastructure to service future residential development of the subject site.



5.4 POWER, GAS & TELECOMMUNICATIONS

Existing underground power infrastructure surrounds the site and has sufficient capacity to service the proposed development.

Connections to existing ATCO gas assets in the surrounding road network are expected to be made to service the proposed residential development.

NBN Co has substantially commenced the NBN rollout within the Darch area, with a large portion of the existing residential area already serviced. NBN services would be extended to service the future residential subdivision of the subject site.



6. PROPOSED STRUCTURE PLAN AMENDMENT

The East Wanneroo Cell 6 (ASP8) Structure Plan is proposed to be amended by:

1. Amending the zoning of Lot 2 Driver Road, Darch as shown on the Zoning Plan from Landfill Precinct to Residential Precinct;
2. Amending the residential density coding of Lot 2 Driver Road as shown on the Structure Plan from Residential R20 to Residential R20, R30 and R60;
3. Modifying Clause 4.3 Business Precinct 'Criteria' to remove criteria b) and modify criteria e) to require a 1m landscape setback for any new development.
4. Modifying Clause 4.3 Business Precinct, 'Table 1 - Non-Permitted Uses within the Business Precinct' to exempt 'Service Station' from the table for the easternmost portion of the 'Business Precinct' corner of Furniss Road and Mirrabooka Avenue; and
5. Revising the indicative road layout.

Refer Figure 6 – Agreed Zoning Plan No. 8 East Wanneroo Cell 6 and Figure 7 – Agreed Structure Plan No. 8 East Wanneroo Cell 6.

Further details on each aspect of the structure plan amendment request are detailed below.

6.1 AMENDMENT TO CELL 6 ZONING PLAN

The amendment seeks to modify the zoning plan by removing Lot 2 from 'Landfill Precinct' and including it within the 'Residential Precinct'.

Clause 4.2 of ASP8 acknowledges that

"... the Agreed Structure Plan will need to be modified to remove the Landfill Precinct zoning and replace it with an appropriate zoning eg, Residential Precinct."

Consistent with the intent of ASP8 this amendment request now seeks to transition the subject land's use to residential and open space. Historic landfill activity on the site has ceased and the land has been subject to extensive geotechnical and site assessment review.

6.2 AMENDMENT TO CELL 6 STRUCTURE PLAN DENSITY

The proposed modification to ASP8 provides an opportunity to review the residential density coding that should apply to Lot 2.

Paragraph 2 of ASP8 clause 4.1 reads:

"Unless otherwise identified on 'The Local Structure Plan' the residential density to apply to this precinct is R20."

Since the Cell 6 structure plan's preparation, both the WAPC and City of Wanneroo have supported greater emphasis on diversity in housing form and density through the planning framework.



The amendment retains the base coding of R20 across the majority of Lot 2, ensuring consistency with the surrounding residential environment, while introducing limited Residential R60 opposite the main public open space, and R30 to the north of the site.

6.3 MODIFY CRITERIA RELATING TO SETBACKS AND LANDSCAPING IN THE BUSINESS PRECINCT

Acknowledging the need for the development of Business lots to minimise impact on adjoining residential development, this amendment proposes to remove the currently required 10m rear setback, and reduce the associated landscape setback from 10m to 1m.

The current application of these criteria within the established Business lots to the west suggests a more practical solution is needed. In addition, development of the subject site (Lot 2) is expected to result in a 1.8m to 2m finished level difference between the higher Business lots and the lower residential. With 1.8m high fence height, this would result in a screening from 3.6m to 3.8m. This in itself will provide a significant divide, minimising impact and providing a sound basis on which to modify the criteria as proposed.

The proposed setback allows for functional use of the Business lots while retaining an element of landscape presentation.

6.4 MODIFY TABLE 1 NON-PERMITTED USES IN THE BUSINESS PRECINCT

The objectives of the Business Precinct include providing a transition between residential development and industrial land use north of Furniss Road.

Clause 4.3 of ASP8 reads,

“The permissibility of land uses and general provisions for the Business Precinct are the same as those that apply to the Business Zone in the scheme except where indicated to the contrary...”

Development criteria and land use permissibility have been modified from the City of Wanneroo Scheme in response to this.

Review of the development potential for Lot 2, and the Business Precinct component of the land, has identified an opportunity for a service station use at the corner of Furniss Road and Mirrabooka Avenue. Service station is listed as a ‘non-permitted’ use in Table 1 of Clause 4.3 of ASP8. Service Station would ordinarily be a ‘D’ use under DPS2.

This amendment seeks to modify Table 1 of ASP8 to include a note for ‘Service Station’. The amendment is stated below:

Service Station¹

¹ To the extent that table 1 applies, the easternmost portion of the ‘Business Precinct’ at the corner of Furniss Road and Mirrabooka Avenue is excluded.

The amendment seeks to remove service station from being a non-permitted use within the easternmost portion of the ‘Business Precinct’, meaning it would revert to a ‘D’ use in accordance



with DPS2. This would allow any future proposed service station to be considered on its merits by the City, having regard to the objectives of the Business Zone and the adjoining Residential Zone.

The requested modification removes the predetermined restriction on this use for what would be a single site at the easternmost portion of the 'Business Precinct', allowing any future application to be considered on the merits of the proposal.

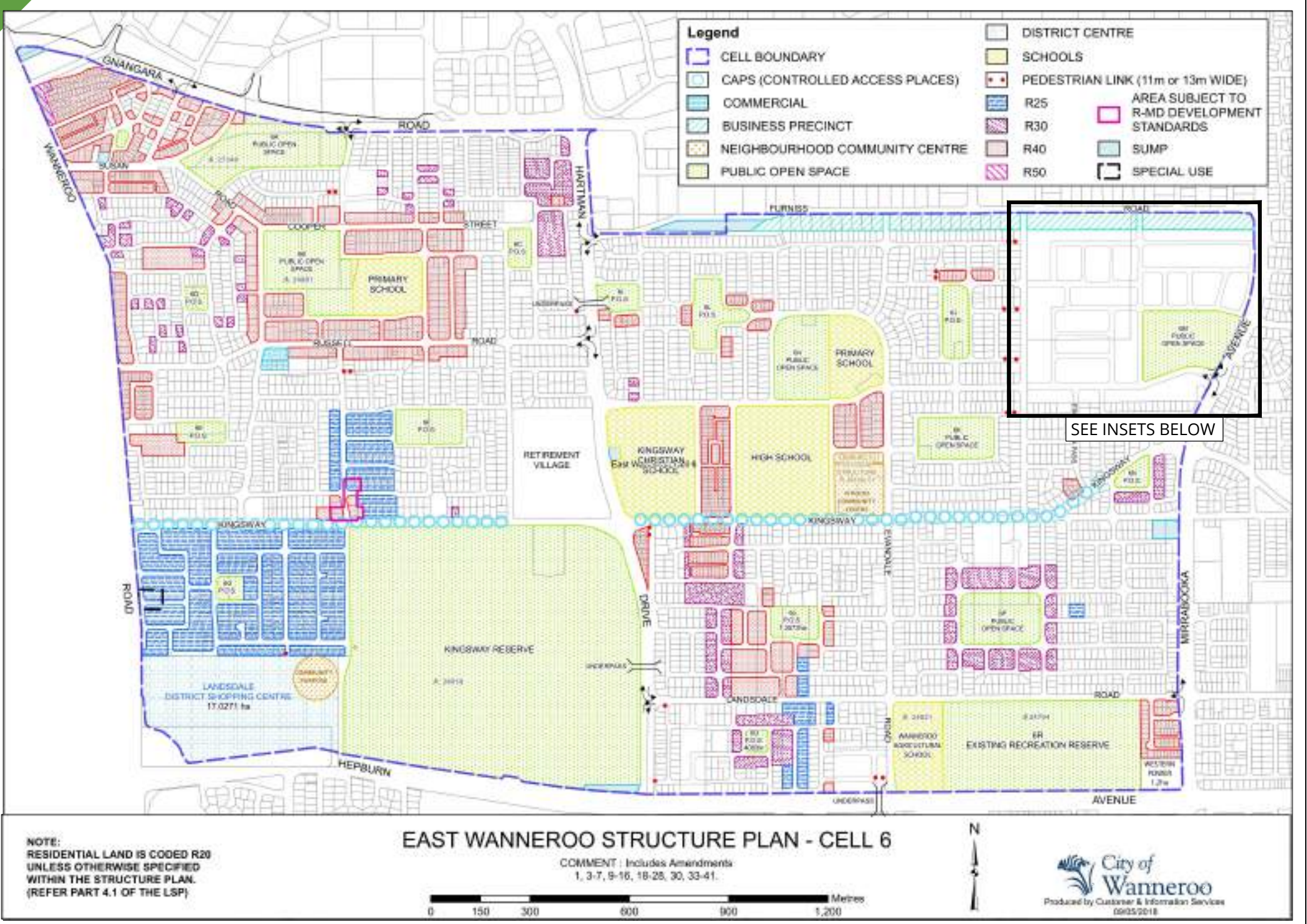
6.5 INDICATIVE ROAD LAYOUT REVISION

This structure plan amendment is supported by detailed technical analysis to inform the future subdivision and development of Lot 2. Infrastructure servicing, geotechnical, urban water management, traffic and landscape inputs have all been undertaken. Together with a review of likely market demand for new housing within the Darch area, these studies have informed the proposed revisions to the indicative structure plan layout for Lot 2 and its integration with both adjoining Lot 1 and the established local road network.

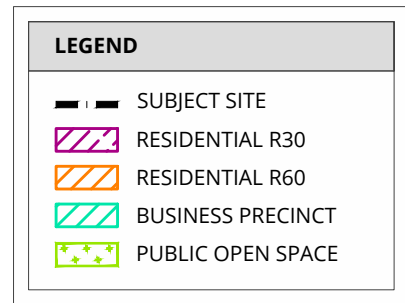
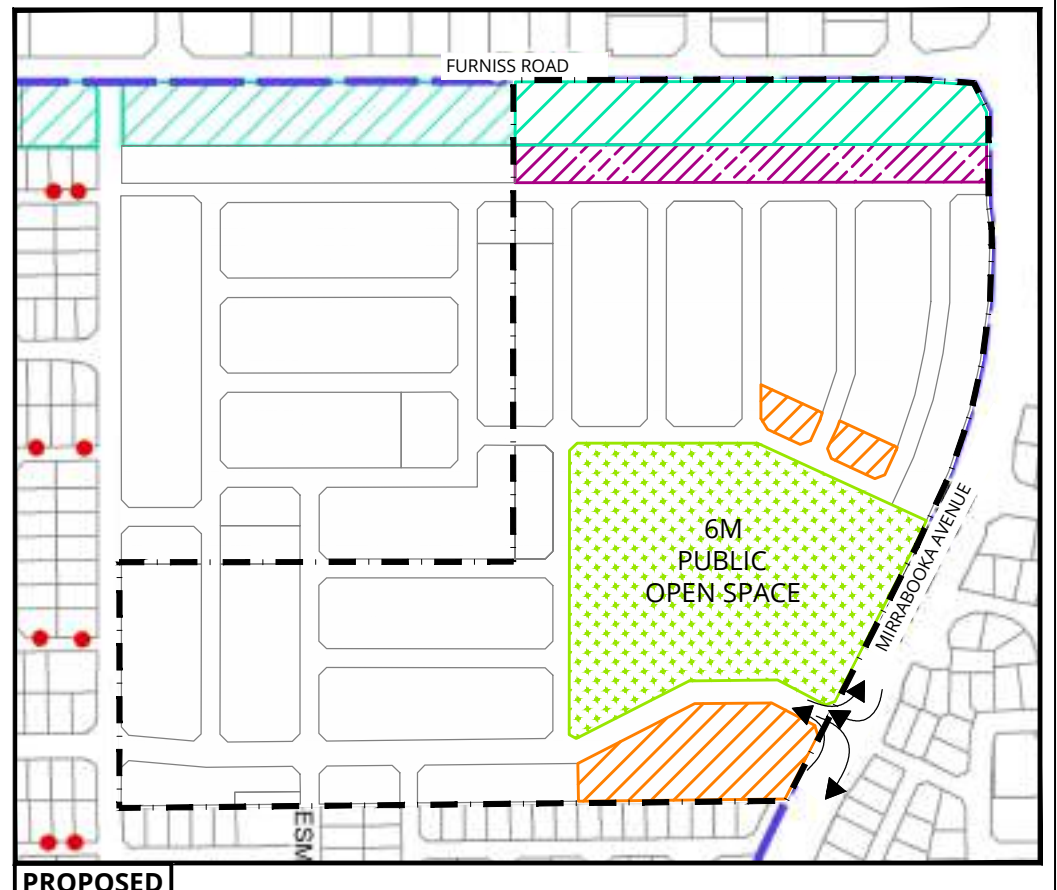
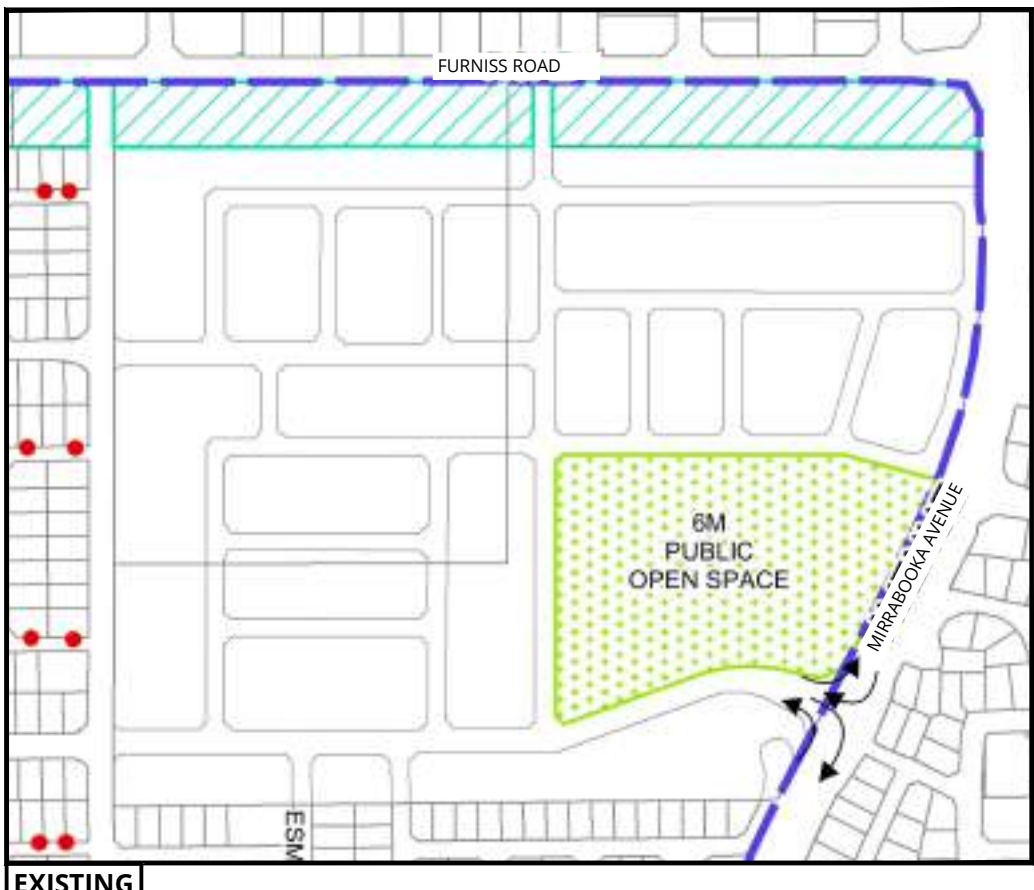
The proposed revisions provide for a more legible and connected local road network while remaining consistent with the original design. This is discussed in greater detail in Part 7 to this report.



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EXISTING EAST WANNEROO STRUCTURE PLAN - CELL 6



EAST WANNEROO STRUCTURE PLAN - CELL 6 AMENDMENT

LOT 2 (No. 26) DRIVER ROAD
DARCH



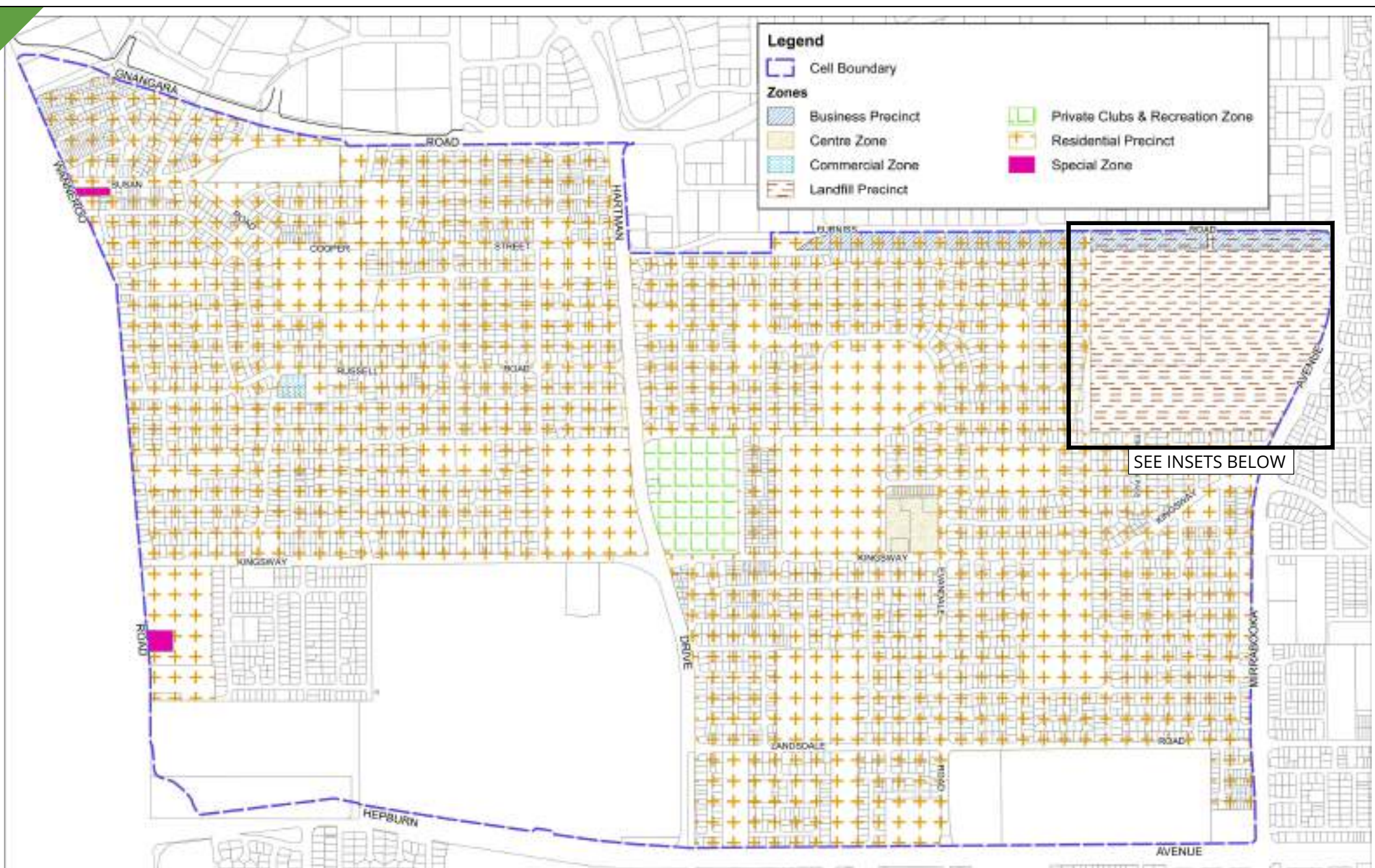
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18997_FIG07A_20191009 Darch (SP Amendment) DRAWN: W. CLEMENTS DATE CREATED: 2019.10.08

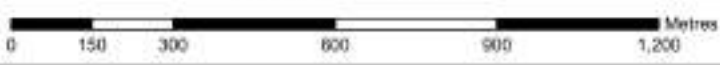
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18997_FIG09A_20191009 Darch (Zoning Amendment) - DRAWN: W. CLEMENTS - DATE CREATED: 2019.10.09



EAST WANNEROO ZONING PLAN - CELL 6

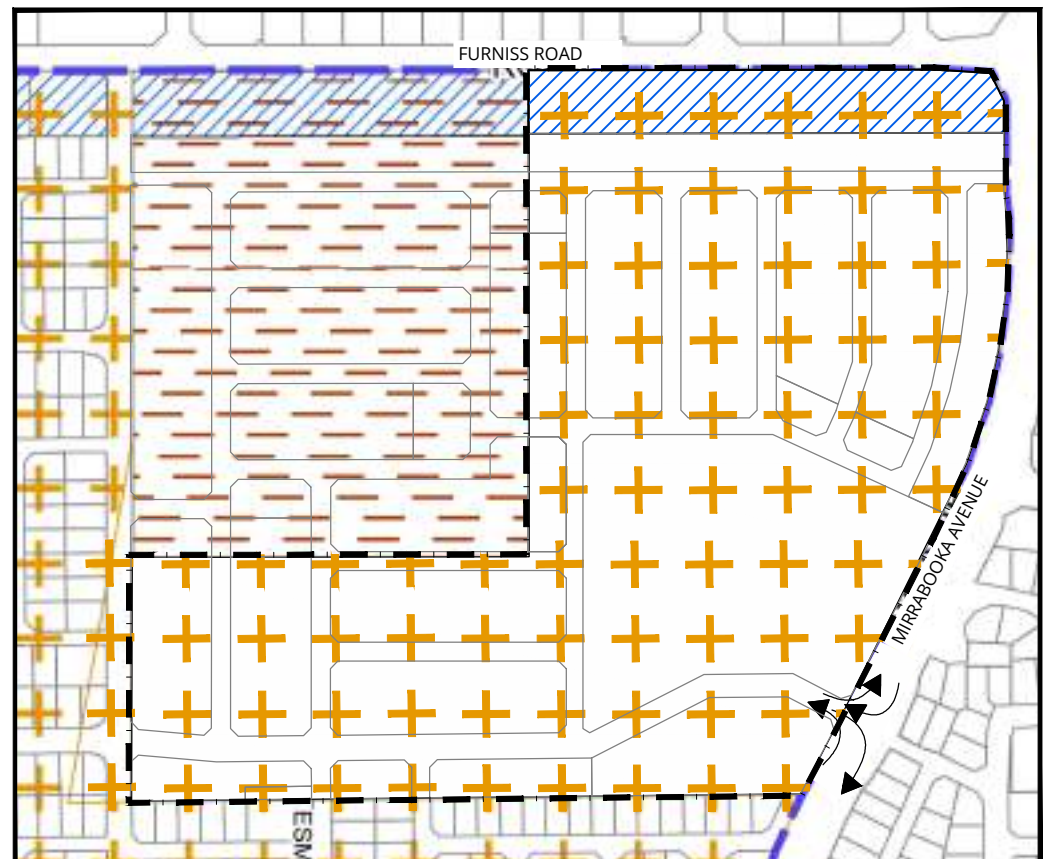
COMMENT : Includes Amendments
1, 3-7, 9-16, 18-25, 30, 33-40.



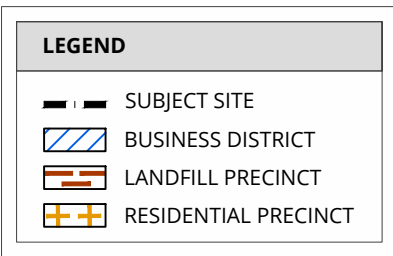
EXISTING EAST WANNEROO ZONING PLAN - CELL 6



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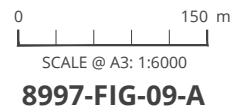


PROPOSED



EAST WANNEROO ZONING PLAN - CELL 6 AMENDMENT

LOT 2 (No. 26) DRIVER ROAD
DARCH



7. CONCEPT PLAN

The subject site is proposed to be developed in accordance with the structure plan amendment for primarily residential purposes with business zone land fronting Furniss Road and a centrally located main open area. A concept plan has been prepared to accompany this structure plan amendment and inform the related technical reports.

Refer Appendix 7 – Concept Plan

7.1 DESIGN APPROACH

As an ‘infill’ site within the Darch residential area, review of the originally contemplated structure plan design has focused on achieving an integrated residential development that provides strong connectivity to existing local amenities and services. Key road connections and linkages are retained in the concept design, as appropriate. An indicative layout over adjoining Lot 1 has been included to ensure better integration (though Lot 1 does not form part of this proposal). The following revisions to the Indicative layout have occurred:

- ▲ at the southern lot boundary of Lot 1, to avoid the need for a future land exchange between lots 1 and 2 to create the future lots;
- ▲ at the eastern lot boundary of Lot 1, to avoid a similar land exchange between lots 1 and 2 to create the future lots; and minor adjustment to the dimensions of POS 6M as a result of the updated road network.

7.2 RESIDENTIAL DENSITY AND DIVERSITY

Residential development for the subject site is proposed at the prevailing residential R20 coding per the ASP8 structure plan and consistent with the surrounding Darch area. Limited residential R30 is proposed to the north of the site, with three precincts of R60 proposed to ‘frame’ the public open space. Both the R30 and R60 codings will provide an opportunity to introduce a limited number of differing dwelling types in an area that is predominantly traditional R20 single residential housing. The siting of these is consistent with other medium density locations (proximity to open space and the like) within the structure plan. The R60 density will provide an opportunity to support terrace or similar style lots immediately north of the POS, while a grouped housing site is identified on the southern boundary of Lot 2. Given access to this southern boundary location is constrained, yet the site enjoys good northerly aspect across the POS, it is ideally suited to a small grouped housing development.

It is estimated that approximately 278 residential lots will be created if the land is developed in accordance with this proposed structure plan amendment and the Concept Plan.



7.3 PUBLIC OPEN SPACE

Public open space within the Cell 6 Structure Plan is provided in accordance with Schedule 4. This reflects the agreed distribution of open space for the locality. The subject land includes public open space site "6M" which is listed as being a 4.8142ha site in the approved structure plan.

This proposed structure plan amendment does not seek to alter the size of POS 6M. Minor refinement to the dimensions of the site have been made to best respond to the updated road network.

A Landscape Master Plan has been prepared by LD Total to inform further detailed design work. The Master Plan demonstrates at a concept level the ability of the main POS to accommodate a range landscaping, active playing fields, community facilities and drainage.

Refer Appendix 8 – Landscape Master Plan.

7.4 MOVEMENT NETWORK

The proposed structure plan amendment seeks several modifications to the indicative structure plan road layout, detailed as follows:

- ▲ The creation of Access Roads C ranging in width from 15 metres to 20 metres;
- ▲ The creation of 13.2 metre road reserves to the north and west of the POS; and
- ▲ The removal of the north-south street through the 'Business Precinct' to Furniss Road.

The road network allows for the coordinated subdivision and development of land across Lot 2 and adjoining Lot 1 without the need for land exchanges to occur. The road network also better manages connectivity to Furniss Road to avoid the potential impact of commercial traffic entering the residential area.

In support of this amendment the TIA prepared by DVC examines and confirms the acceptability of the proposed road network.

Refer Appendix 6 - Transport Impact Assessment.

A number of matters in the TIA are worth highlighting:

- ▲ The proposed road network discourages drivers from cutting through the subject site from neighbouring suburbs as quicker alternative routes exist outside of the subject site;
- ▲ All streets within the subject site are Access Roads C with a road reserve width ranging from 15 metres to 20 metres, which is considered adequate to accommodate development traffic and some through-traffic;
- ▲ A preliminary SIDRA assessment of the proposed intersection of Westport Parade and Mirrabooka Avenue was undertaken based on traffic counts. DVC consider the functionality of this intersection, which is consistent with the approved Cell 6 structure plan, to be acceptable;

- ▲ Two existing commuter bus services are within 400m of the subject site and provide access to Whitfords and Warwick train stations; and
- ▲ Pedestrian and cyclist access in the surrounding Darch area is well connected and is assumed to be extended in a consistent manner within the subject site.

The adjoining Lot 1 was included within the TIA to provide a more complete impact assessment. It was concluded that the revised layout is acceptable from a traffic and transport perspective. Any matters relating to intersection design would be addressed at the detailed design stage through the preparation of engineering drawing and plans.

7.5 EARTHWORKS

Tabec have completed a preliminary earthworks design, having regard to the ground improvement methodology outlined in the Galt geotechnical review. Figure 9 to the Tabec report comprising Appendix 5 details the earthworks design. It is expected that works will follow a traditional form for residential land subdivision with lots elevated above road reserves. Some retaining will be necessary to manage varied site levels.

7.6 WATER MANAGEMENT

Following review of groundwater and surface water management conditions, and the completion of site testing and modelling, Urbaqua prepared a Local Water Management Strategy (LWMS) for the subject site.

Refer Appendix 4.

A summary of the key elements of the LWMS are outlined below.

7.6.1 GROUNDWATER MANAGEMENT

Notwithstanding remedial site works envisaged for the subject site, Urbaqua note that soakwell installation will be possible at the front and back of individual lots as necessary. Slopes of the subject site will also allow for groundwater through flow and prevent localised mounding. Infiltration across the site can be maintained to predevelopment conditions.

7.6.2 STORMWATER MANAGEMENT

The LWMS has identified five catchment areas based upon which event management has been planned. These are depicted in Figure 15 of the LWMS appended to this report and are summarised in brief below:

- ▲ Catchment 1 is located in the southwest of the subject site with stormwater management achieved through a combination of large raingardens within road reserves and modification to the existing sump on Cristata Terrace. This includes minor expansion of the sump area into the subject site to ensure adequate volumes are achieved;
- ▲ Catchment 2 is located centrally and includes the District POS and surrounding roads and lots. Runoff from the lots and roads is directed to a drainage basin in the southwest of



the main POS. This location is the low part of the POS for drainage and an integrated design outcome is considered a better solution;

- ▲ Catchment 3 and Catchment 3a are proposed to be managed through a combination of larger raingardens and a shared drainage basin in the northwest. The shared basin is considered a better integrated design outcome than two individual basins (for each of Lot 1 and 2); and
- ▲ Catchment 4 includes the remainder of Lot 1 which is outside the subject site but was modelled to provide an indicative basin area. Drainage from lot 1 is not expected to enter the subject site.
- ▲ Business Precinct and Grouped Site stormwater will be managed internally within the respective lots.

7.6.3 LWMS IMPLEMENTATION

Ultimately the LWMS will be implemented on a staged development basis through Urban Water Management Plans (UWMPs) which represent the final detailed engineering and landscape design outcome. These will be required as conditions of future subdivision approval.

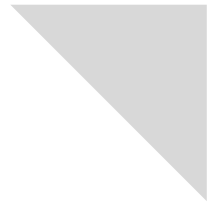
8. CONCLUSION

This report has been prepared in support of an application to amend the *Cell 6 East Wanneroo Structure Plan (ASP8)*. The proposed amendment is justified on the following grounds:

- ▲ The amendment reflects the long-planned transition of the land for urban-residential use and is accompanied by detailed technical review demonstrating service, water management, traffic and related matters;
- ▲ The amendment provides a logical integrated street layout with the limited introduction of residential R30 and R60 to an area that is otherwise devoid of housing diversity; and
- ▲ Having regard to the former land fill use and clause 4.2 of ASP8, the amendment can be progressed as submitted given it is:
 - accompanied by a detailed geotechnical report undertaken by Galt Geotechnics which documents the site conditions, a geotechnical model and methodology to engineer the site and gain appropriate lot classification for residential use. The geotechnical works will be undertaken as a condition of future subdivision approval and would be subject to further geotechnical testing during and post works completion at that time;
 - not contingent on progression of site audit and remediation. The Auditor, in assessing the MAR, determine the conditions and required works and management plans necessary for acceptable site improvement. These are legally binding requirements and are independent to the structure plan process. Normal practice ensures that necessary works imposed by the MAR process are also reflected as conditions of future subdivision approval.

The structure plan amendment is consistent with the State and local planning framework and it is therefore requested the City of Wanneroo and Western Australian Planning Commission support the amendment as proposed.





APPENDIX 1

CERTIFICATE OF TITLE



ROWE
GROUP
DESIGN

WESTERN



AUSTRALIA

REGISTER NUMBER 2/DP69382	
DUPLICATE EDITION 1	DATE DUPLICATE ISSUED 29/10/2019

RECORD OF CERTIFICATE OF TITLE
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **2973** FOLIO **813**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 2 ON DEPOSITED PLAN 69382

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

PARCEL DARCH PTY LTD OF LEVEL 3, 14 WALTERS DRIVE OSBORNE PARK WA 6017
(T O229180) REGISTERED 3/9/2019

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. *K192639 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 16/5/2007.
2. L046136 LEASE TO MILIND PTY LTD OF 50 DRIVER ROAD, LANDSDALE EXPIRES: SEE LEASE. AS TO PORTION ONLY. REGISTERED 19/8/2009.
L046135 TRANSFER OF LEASE L046136, LESSEE NOW CELL 6 PTY LTD OF 196 SCARBOROUGH BEACH ROAD, DOUBLEVIEW REGISTERED 19/8/2009.
3. *L730320 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 9/9/2011.
4. *L730321 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 9/9/2011.
5. *L796683 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. LODGED 30/11/2011.
6. *O229181 CAVEAT BY CITY OF WANNEROO LODGED 3/9/2019.

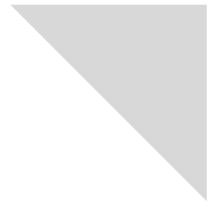
Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP69382
PREVIOUS TITLE: 2786-703, 2786-704
PROPERTY STREET ADDRESS: 26 DRIVER RD, DARCH.
LOCAL GOVERNMENT AUTHORITY: CITY OF WANNEROO



APPENDIX 2

GEOTECHNICAL ASSESSMENT



ROWE
GROUP
DESIGN



Report on
GEOTECHNICAL ASSESSMENT
PROPOSED MIXED-USE DEVELOPMENT
26 DRIVER ROAD, DARCH

Submitted to:
Parcel Property
Level 3, 14 Walters Drive
OSBORNE PARK WA 6017

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1. INTRODUCTION

This report presents the outcomes of Galt Geotechnics Pty Ltd's (Galt's) geotechnical assessment for the proposed mixed use development of 26 Driver Road, Darch ("the site").

The location of the site relative to the surrounding area is shown on Figure 1, Site Plan.

This report supersedes our original, J1801113 005 R Rev1, dated 17 September 2019, and now includes further testing throughout the southwest of the site (excluding the area of the as-yet undemolished house and sheds, which has not yet been tested).

2. BACKGROUND

The site was originally mined for sand supplies for the building industry. The sand was progressively removed and the area was operated as a disposal area for non-organic waste (mainly building rubble). The site has now been entirely filled apart from an area in the north west corner designated Lot 1 (which lies outside the site and scope of the current study). Land use activities previously done on Lot 1 consist of operating a crushing plant to crush concrete rubble and demolition debris delivered to site. At present, no further activities are taking place on Lot 1. Lot 1 is not specifically addressed in this study, which applies to the landfilled area. Figure 1 shows the site boundary and the location of Lot 1 (also known as 115 Furniss Road, Darch)

Filling began in about 1989, initially in the north east corner of the site followed by filling along the eastern boundary. The filling process to the west and along the eastern boundary (south of the north east corner of fill) was done under the direction of Soil and Rock Engineering Pty Ltd. A section in the south west corner of the site adjacent to Driver Road was also filled under the direction of Soil and Rock Engineering personnel.

It is understood that most of the initial fill was placed to City of Wanneroo requirements, initially under the guidance of City of Wanneroo personnel then controlled by a Civil Engineer for a number of years. We also understand that records for this phase of the work have been lost.

We also understand that the following apply to the remaining area (southern section):

- ✦ it was progressively filled with non-organic waste processed through a crushing plant; and
- ✦ the fill was placed in an engineered manner which involved placing in loose layers up to about 0.5 m thick and compacting using multiple passes of rubber tired and tracked earthmoving equipment inclusive of a rubbish compactor.

From anecdotal evidence from former site staff, we understand that the site was always intended for subsequent development, i.e. all filling was done with the objective of producing a stable site for later construction.

Photographs of the site are presented in Appendix A.

3. PREVIOUS STUDIES

There have been several environmental and geotechnical studies conducted by others at the site since the mid-2000s. The studies were primarily conducted to characterise the fill and assess the potential environmental risks to surrounding residents whilst the site continued to operate as a landfill. A detailed geotechnical assessment has not been done, however a desktop study and a field investigation was done by CMW Geosciences in 2017, reported in their report:

- ✦ CMW Geosciences (ref. PER2017-0193AB, Rev0, dated 14 March 2018): “Proposed landfill re-development – Desktop review plus draft borehole and CPT logs”.

We have included the CMW borehole and CPT reports from this investigation in Appendix B.

4. PROPOSED DEVELOPMENT

Based on plans provided to us, we understand that the following land uses are proposed for the site:

- ✦ residential (presumably single dwellings) across the eastern, southern and western portions (this includes a sales village to be located in a strip along Mirrabooka Avenue);
- ✦ light industrial lots along Furniss Road to tie in with the existing light industrial precinct to the north; and
- ✦ public open space (POS) in the central portion.

We understand that the proposed sub-division layout design is currently at a preliminary stage and likely subject to changes based on environmental, geotechnical and other planning and engineering constraints. The current concept plan (subject to change) is included in Appendix C.

Based on our discussions with Parcel Property, we understand that the preferred staging plan for the development is as follows:

- ✦ Stage 1 – Development of the commercial precinct in the northern portion of the site along with the Sales Village along Mirrabooka Avenue.
- ✦ Stage 2 – Construction of the primary POS in the central portion of the site.
- ✦ Stage 3 – Development of the residential lots across the balance of the site.

5. PROJECT OBJECTIVES

The objectives of the assessment were to:

- ✦ assess subsurface soil and groundwater conditions across the site, with a particular emphasis on:
 - The thickness, composition and density of any fill present on the site
 - The presence and level of groundwater as this may influence the development
 - Development of geotechnical sections to inform civil design and development (not specifically addressed in this report, although contour plots are included);
- ✦ provide a site classification(s) in accordance with AS 2870-2011 “Residential Slabs and Footings”;
- ✦ provide recommendations for site preparation measures to achieve a site classification of “Class A”, “Class S” or “Class M”; and
- ✦ recommend further geotechnical studies to progress the project to detailed design, if required.

This study addresses the larger site based on the current concept plan included in Appendix C (excluding the area not yet tested in the far southwest of the site, where an existing house and sheds are still present). Some revisions to our advice may be necessary dependent on the final configuration of the lots, depending on the areas of the development which lie on filled and unfilled portions of the site.

There are potential environmental constraints to the development, which are being addressed by Galt in separate reports.

6. FIELDWORK

Fieldwork was carried out in several stages.

A plan showing the test locations is included as Figure 1, with an inset for the southwestern area as Figure 2. A summary of the tests is presented in Tables A1 to A3 at the end of the text of this report.

6.1 Broad Site Coverage

Fieldwork specifically for the geotechnical assessment was undertaken between 29 April and 21 May 2019 and comprised:

- ☛ cone penetration testing (CPTs) at 29 locations (PGCPT01 to PGCPT29), extending to a depth of up to 5 m; and
- ☛ excavation of test pits at 43 locations (PGTP01 to PGTP43), extending to depths of between 2.6 m and 7.9 m.

This assessment also refers to the borehole drilling for the environmental campaign. That is:

- ☛ drilling of boreholes at 45 locations (LG01 to LG40 (excluding LG11) and MW01 to MW06), extending to depths of between 4 m and 19.8 m using air core drilling techniques.

The borehole drilling was used to obtain material thicknesses and does not influence the engineering recommendations made in this report.

Cone Penetration Tests

Cone penetration tests were carried out by Probedrill Pty Ltd using 7 tonne and 11 tonne track mounted CPT rigs. The tests were carried out in accordance with AS1289.6.5.1. The results of the CPTs are presented in Appendix D along with a method of interpretation proposed by Robertson et al (1986).

Test Pits

Test pits were excavated using a 28 tonne Samsung SE280LC-2 tracked excavator equipped with a 1,200 mm toothed bucket. Test pit reports are presented in Appendix E along with a method of soil description and a list of explanatory notes and abbreviations used in the reports.

Boreholes

Aircore boreholes were drilled using a Comacchio track mounted drill rig, supplied and operated by Proline Drilling.

Borehole reports are presented in Appendix F. The method of soil description and a list of explanatory notes and abbreviations used in the reports is included in Appendix C.

6.2 Infiltration Testing – First Stage

The first stage of infiltration testing was undertaken on 26 July and 7 August 2019 by geotechnical engineers from Galt Geotechnics. Testing was done generally using the inverse auger hole method described by Cocks¹. A modified version of this test, using a test pit (rather than a small augered borehole) was done for selected materials due to possible scale effects and the heterogeneity of the materials on site. Site photographs taken during testing are included in Attachment A. The approximate locations of the tests are shown on Figure 1.

¹ Cocks, G (2007), "Disposal of Stormwater Runoff by Soakage in Perth Western Australia", Journal and News of the Australian Geomechanics Society, Volume 42 No. 3, pp 101-114.

The results of the infiltration testing are presented in Appendix G and summarised in Table 1.

Table 1 - Summary of Infiltration Test Results - Stage 1

Test Location	Test Method	Material Tested	Minimum Unsaturated Hydraulic Conductivity ¹ , k (m/day)		
			Test 1	Test 2	Test 3
IT01	IAH	Unit 1a - SAND	8.3	7.6	7.9
IT02	IAH	Unit 1a - SAND	9.5	9.1	9.1
IT03	IAH	Unit 1a - SAND	>15	12.8	12.4
IT04	IAH	Unit 1a - SAND	12.0	10.3	9.4
IT05	IAH	Unit 1a - SAND	6.9	6.6	6.6
IT06	IAH	Unit 1a - SAND	9.8	9.3	9.2
IT07	IAH	Unit 1a - SAND	8.7	7.1	8.0
IT08	IAH	Unit 1a - SAND	8.5	7.4	7.6
IT09	IAH	Unit 1a - SAND	7.6	7.6	7.4
IT10	IAH	Unit 1a - SAND	5.0	4.0	4.0
IT11	IAH	Unit 1c – Screened FILL	7.3	7.4	7.4
IT12	IAH	Unit 1c – Screened FILL	9.4	8.4	7.1
IT13	IAH	Unit 1c – Screened FILL	5.9	7.0	8.8
IT14	TP	Unit 1b – Uncontrolled FILL	13.7	-	-
IT15	TP	Unit 1b – Uncontrolled FILL	4.9	-	-
IT16	TP	Unit 1b – Uncontrolled FILL	4.2	-	-
IT17	TP	Unit 1b – Uncontrolled FILL	>15	-	-
IT18	TP	Unit 1b – Uncontrolled FILL	14.5	-	-
IT19	TP	Unit 1b – Uncontrolled FILL	9.9	-	-
IT20	TP	Unit 1c – Screened FILL	5.4	-	-
IT21	TP	Unit 1c – Screened FILL	>15	-	-

- Notes:**
1. The minimum hydraulic conductivities are typically recorded towards the end of the test, with pressure head varying between about 0.15 m and 0.4 m.
 2. IAH – inverse auger hole, TP – test pit
 3. Reporting of hydraulic conductivity in excess of 15 m/day is not done due to the inaccuracy of the test at high rates.
 4. Reporting of hydraulic conductivity to one decimal place does not imply accuracy of the test, which is approximate.
 5. Due to limitations of water supply, only one test was done for test pit soakage tests. It is likely that the unsaturated hydraulic conductivity would reduce somewhat with repeated testing (as can be observed in the inverse auger hole test results).

Perth sand penetrometer (PSP) testing was done adjacent to shallow (inverse auger hole) tests to provide a basis for evaluating material density. Test results are included in Attachment G.

6.3 Detailed Testing in Southwestern Area

Supplementary fieldwork was undertaken for geotechnical assessment of the southwestern area of the site, which was found to be only partly underlain by Unit 1B (Uncontrolled Fill). Fieldwork was undertaken between 13 and 19 September 2019 and comprised:

- ↻ cone penetration testing (CPTs) at 40 locations (PGCPT30 to PGCPT69), extending to a depth of up to 8.2 m;
- ↻ excavation of test pits at 13 locations (PGTP44 to PGTP56), extending to depths of between 1.5 m and 8 m;
- ↻ excavation of trenches at 15 locations (TR01 to TR06, TR09 to TR17), extending to depths of up to 8 m; and
- ↻ infiltration testing using the inverse auger hole method described by Cocks at 10 locations (GP01 to GP10), at a depth of 0.9 m in each instance.

Cone Penetration Tests

Cone penetration tests were carried out by Probedrill Pty Ltd using a 12 tonne track mounted CPT rig. The tests were carried out in accordance with AS1289.6.5.1. The results of the CPTs are presented in Appendix D.

Test Pits and Trenches

Test pits were excavated using a 28 tonne Samsung SE280LC-2 tracked excavator equipped with a 1,200 mm toothed bucket. Test pit reports are presented in Appendix E. We note that trenches were excavated primarily to delineate the edges of Unit 1B uncontrolled fill and therefore were not fully face mapped. Trench reports represent the conditions at a specific point along the trench (which was not always in the area underlain by Unit 1B).

Infiltration Testing

The second stage of infiltration testing was undertaken using the inverse auger hole method described by Cocks. The results of the infiltration testing are presented in Appendix G and summarised in Table 2.

Table 2 - Summary of Infiltration Test Results – Stage 2

Test Location	Test Method	Material Tested	Minimum Unsaturated Hydraulic Conductivity ¹ , k (m/day)		
			Test 1	Test 2	Test 3
GP01	IAH	Unit 1a - SAND	>15	>15	>15
GP02	IAH	Unit 1a - SAND	>15	>15	>15
GP03	IAH	Unit 1a - SAND	>15	>15	>15
GP04	IAH	Unit 1a - SAND	>15	>15	>15
GP05	IAH	Unit 1a - SAND	>15	>15	>15
GP06	IAH	Unit 1a - SAND	>15	>15	>15
GP07	IAH	Unit 1a - SAND	>15	>15	13.2
GP08	IAH	Unit 1a - SAND	>15	>15	>15
GP09	IAH	Unit 1a - SAND	>15	>15	>15
GP10	IAH	Unit 1a - SAND	>15	>15	>15

- Notes:**
1. The minimum hydraulic conductivities are typically recorded towards the end of the test, with pressure head varying between about 0 m and 0.1 m.
 2. No reporting of hydraulic conductivity in excess of 15 m/day due to the inaccuracy of the test at high rates.
 3. Reporting of hydraulic conductivity to one decimal place does not imply accuracy of the test, which is approximate.

7. SITE CONDITIONS

7.1 Regional Geology

The Perth sheet of the 1:50,000 scale Environmental Geology series map (compiled and published by the Geological Survey of Western Australia) indicates that the area is underlain by sand derived from the weathering of Tamala limestone, described as:

- ✦ SAND, pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin.

The geology at the site appeared to comprise a mix of sand derived from Tamala limestone and Bassendean sand. We infer that the sand from Tamala limestone probably overlies the Bassendean sand in this area.

8. GEOTECHNICAL GROUND MODEL

Galt developed a site-specific geotechnical ground model based on the test pit reports, CPT plots and borehole reports from the geotechnical investigations that have been carried both as part of this study and historically;

The geotechnical ground model is an approximation of actual site conditions. The geotechnical ground model has been created to not only describe the origin of different geotechnical units, but also to create a classification system where the units are separated according to their engineering characteristics in a well-defined and logical manner.

The geotechnical ground model comprises three main units based on the material classification and engineering characteristics.

The main geotechnical units within the vicinity of the site are as follows:

- ✦ **Unit 1:** In-situ Fill
 - **Unit 1a:** Sand Fill
 - **Unit 1b:** Uncontrolled Fill
 - **Unit 1c:** Screened Fill
- ✦ **Unit 2:** Natural Sand

It should be noted that there may be large variations in the engineering parameters within each of these units due to localised variations in materials, interbedding, lenses and layering of materials, composition of fill, etc.

8.1 Unit 1a – Sand Fill

The sand fill is a layer of sand and gravelly sand placed, generally as a capping layer over the uncontrolled fill (Unit 1b). The fill material is up to about 7.5 m thick, although typically around 1.5 m to 3 m thick and appears to have been placed in several stages.

Anecdotally, this sand was originally imported as unsuitable material for “plasterer’s sand” or “brickie’s sand” from sand quarries. Later, once sand prices rose, the import switched to import of sand where site re-levelling, etc was done and excess sand was derived from development sites.

That is, the sand is notionally clean sand, generally derived from quarry sources but also including spoil excavated from numerous sites.

Unit 1a – Sand Fill can be described as:

- ✦ FILL: SAND (SP), fine to coarse grained, sub-angular to sub-rounded, yellow / brown, trace fines, trace fine to medium grained gravel, trace to with fines, trace organics, trace (less 1%) deleterious waste (steel, timber, plastic etc.), variable density typically ranging between loose and dense (often medium dense to dense), present across most of the site to depths of between 1 m and 7.5 m.

We note that the density of the Unit 1a material in the southwest of the site (where no Unit 1b is present) is variable – it is predominantly medium dense to dense but locally loose.

8.2 Unit 1b – Uncontrolled Fill

The uncontrolled fill (Unit 1b) is typically encountered under the sand fill (Unit 1a/1c) across most of the site.

Unit 1b – Uncontrolled Fill can be described as:

- ✦ FILL: SAND / BUILDING DEBRIS / RUBBISH: Comprises a mixture of SAND (SP) – approximately 40% to 80%, Inert BUILDING DEBRIS – approximately 20% to 70% and RUBBISH – less than 10%.
 - SAND can be described as fine to coarse grained, sub-angular to sub rounded, grey/brown, trace fines.
 - BUILDING DEBRIS can be described as inert building demolition / site clean-up materials, typically comprising bricks, concrete slabs and limestone gravels/cobbles. Particle sizes typically ranging from 0.05 m to 0.5 m diameter, although large concrete pieces (up to ~1.5 m long) are present.
 - RUBBISH can be described as plastic (strapping, bags, buckets, bottles), organics (wood fragments, timber, grass, roots), scrap metal (pipes, rods, reinforcing bars, star pickets, canisters, etc).

We have referred to this material as ‘uncontrolled fill’ due to its composition, however anecdotal evidence and our own observations indicate that effort was provided during the extensive filling process to select appropriate materials for incorporation in the fill (i.e. largely excluding putrescible and deleterious materials, which comprise a relatively small proportion of the overall fill) and to provide compaction to the fill. We dug over 60 large test pits and trenches and noted that the material was well-packed with minimal large voids in all instances.

8.3 Unit 1c – Screened Fill

The screened fill is a layer of typically gravelly sand which appears to be a <10 mm product left over from screening operations on Lot 1. It incorporates sand and gravel-sized particles of brick, concrete and limestone. It includes a trace of rubbish (glass, plastic, wood fragments, etc.) but these inclusions are not considered significant to its structural performance.

This material is distinguished from Unit 1a in that it appears to have been derived from a different source but its structural performance is expected to be similar and it has therefore been grouped together with Unit 1a in the thickness of the capping sand.

8.4 Unit 2 – Natural Sand

The natural sand was encountered at surface in the south western corner and at localized areas along the boundary of the site. Across most of the site this natural sand was mined out to around the depth of the water table and has subsequently been covered with the above fill units (Unit 1a and 1b).

Unit 2 – Natural Sand can be described as:

- ⚡ SAND (SP), fine to medium grained, sub-angular to sub-rounded, yellow/pale yellow / pale brown becoming white or pale grey at depth, trace fines, typically medium dense becoming dense / very dense with depth, present to the maximum depth of investigation (19 m).

We noted localized pockets of ‘coffee rock’ (iron indurated sand) present around the level of the groundwater table.

The Unit 2 sand was loose in some areas of the southwest of the site, where Unit 1b material was absent.

8.5 Groundwater

The Perth Groundwater Atlas (1997) shows the maximum historical groundwater level to be around RL 39 m in the south west corner rising to RL 41 m AHD in the north east corner.

Groundwater encountered in the test holes during our investigation was typically between the depths of 5.1 m and 19.8 m below the existing ground surface (about RL 37.4 m to RL 40.4 m AHD). During our investigation, the groundwater level typically fell from the north of the site to the southwest.

9. GEOTECHNICAL ASSESSMENT

9.1 Suitability for Development

We consider that the site is generally unsuitable for the proposed mixed-use development in its current condition. This is due to the presence of deep uncontrolled fill, which is locally loose and also contains putrescible/deleterious material and will be subject to irregular creep settlements.

We consider that it will be possible to improve the site to a sufficient standard for the proposed residential / industrial development, with appropriate engineering treatments.

9.2 Creep Settlement

Secondary compression of granular soils is generally what is referred to as creep. Creep is a time-dependent increase in strain, and thus deformations occurs under a constant effective stress.

Creep deformations continue at a lessening rate for an undefined length of time (up to several decades) with the creep settlements potentially amounting to a considerable portion of the total settlement.

The creep settlement potential of different fill types for a 10 year period, as a percentage of the total depth of fill is typically in the following ranges:

- | | |
|-------------------------------------|--------------|
| ⚡ Well compacted sand and gravel | 0.2% to 1.0% |
| ⚡ Minimally compacted clay and sand | 1.0% to 2.0% |
| ⚡ Uncompacted sand | 2.0% to 4.0% |

Estimates of the total and ongoing settlements that could be expected to occur within the next 50 years for varying creep percentages are presented in Table 3. The creep experienced to date is based on survey monitoring done by Ion Services for the previous owners of the site between 2000 and 2018 (data provided to us). A comparison survey was done for settlements between 2008 and 2018 (drawing included in Appendix H).

Table 3: Creep Settlement – 15 m Fill Thickness

Fill Compaction	Estimated Total Creep Settlement (mm)	Estimated Post Earthworks Creep Settlement to date (mm) ¹	Estimated Creep Settlement next 50 years (mm) ²
Well Compacted (Creep 0.25%)	60 - 80	40 - 60	10 - 30
Well Compacted (Creep 0.5%)	120 - 160	80 - 120	30 - 50
Minimally Compacted (Creep 1.0%)	250 - 300	160 - 220	80 - 100

Note: 1. The estimated post creep settlements to date have been calculated based on a period of 15-20 years since the fill was placed (assumed to have been completed in late 1990s).
2. A design period for the creep of 50 years from 2020 has been assumed. The settlements above could be expected to increase by about 20% for a design life of 100 years.

When assessed for the 10 year period between 2008 and 2018 (period in which Ion Services undertook survey monitoring in the northern deep fill area) the estimated settlements are expected to be in the order of:

- ⚡ 10 mm to 15 mm for Well Compacted (0.25% creep);
- ⚡ 20 mm to 25 mm for Well Compacted (0.5% creep);
- ⚡ 40 mm to 50 mm for Minimally Compacted (1.0% creep);

The “Well Compacted – 0.5% creep” values presented above are generally in line with the settlements for the monitoring locations provided by Ion Services (typically in the range of 15 mm to 25 mm).

We consider that ongoing total settlements over the next 50 years are likely to be in the order of 30 mm to 50 mm with differential settlements over a normal house lot to be in the order of 25% to 50% of the total settlement (i.e. 10 mm to 20 mm). A site classification of “Class S” is therefore considered applicable for most of the residential lots, provided the site preparation requirements in Section 9.4 are undertaken.

It is noted that where there are sharp changes in the quarry topography (i.e. along the quarry boundaries a varying thickness of fill is present) greater differential settlement will result under these lots. This is typically applicable to the industrial lots along the northern boundary, and some of the residential lots along the eastern and southern boundaries. The differential settlement under these lots could be expected to be in the order of 20 mm to 40 mm (as thin fill or natural areas will experience essentially nil settlement), and therefore a site classification of “Class M” is considered applicable provided the site preparation requirements in Section 9.4 are undertaken.

Further work is recommended to assess the extent of the affected “Class M” lots along the southern boundary.

9.3 Site Classification

We consider that most of the site currently has a site classification of “Class P” in accordance with AS2870-2011, “Residential slabs and footings” due to presence of uncontrolled fill underlying the site.

We consider that the site can be improved to the following site classifications provided the remedial works in Section 9.5 are undertaken:

- ✦ “Class S” for part of the south west corner of the site and selected display home lots along the north eastern boundary, which are not underlain by Unit 1b. Parts of this area will be “Class A” (which cannot be delineated at this time – refer to Section 9.4 for further discussion).
- ✦ “Class S” for a majority of the residential lots within the site, wholly underlain by Unit 1b.
- ✦ “Class M” for the proposed industrial lots along the northern boundary and residential lots along the eastern and part of the southern boundary, which are partly underlain by Unit 1b and partly not.

A plan showing the indicative site classification for the lots is shown in Figure 3. Note where the site classification boundary is shown with question marks, further intrusive testing is required at a later stage to better define the boundary. Reconfiguration of the subdivision plan will also require reconsideration of site classes, mainly on the lots which straddle the areas underlain and not underlain by Unit 1b (Uncontrolled Fill). We note that the nominal “Class A” area to the southwest is partly underlain by Unit 1b (uncontrolled fill), which would either need removal or change of the site class in this area to “Class S” or “Class M”.

9.4 Site Classification for Southwestern Corner

We have assigned a site classification of “Class S” to the southwestern corner in areas not underlain by Unit 1b uncontrolled fill. This is on the basis that not all of the fill sand (some of which is up to 7 m deep) has not been compacted in parts and loose layers are present.

Extensive testing in the southwestern corner of the site and elsewhere has not revealed any significant concentration of deleterious material (putrescibles, etc.) in the Unit 1a/1c material, hence the classification is only on the basis of sand density.

We note that lot-by-lot reclassification to “Class A” will be possible where the lot is underlain only by medium dense to dense sand and no loose sand is present. This can be achieved by lot-by-lot CPTs (1 per lot) to 7 m depth. We note that extensive CPTs have already been done throughout the southwestern area and we can assign specific site classes on the strength of existing data once lot configurations are available. Some supplementary testing will be needed for any lots where a CPT has not yet been done.

We anticipate around 30% of lots not underlain by Unit 1b uncontrolled fill will be “Class S”, with the balance “Class A”.

Further to this, we note that testing has not yet been done in the far southwestern corner of the site, where a house and sheds are present. This area is likely to be “Class A” and not underlain by any significant fill, however this is not proven at this time and additional testing will be necessary following demolition.

9.5 Site Improvement Measures

9.5.1 General

The following sections detail the specific remedial works required for each area to make them suitable for the proposed development.

The extents of these areas are contingent on the ground conditions underlying specific lots. We cannot provide specific boundaries until a finalized structure plan is provided to us.

9.5.2 Area 1 – Majority of Site

Area 1 covers most of the site and is based on areas that are only underlain by deep Unit 1b uncontrolled fill (i.e. not areas which straddle the edge of the Unit 1b area and are partly underlain by natural sand or compacted sand fill without any Unit 1b present). Broadly speaking, the remedial measures required here include installation of layered geogrids with gravel fill below the sand fill. This is intended to minimize future differential settlements at the site surface.

The following remedial works are considered necessary to achieve a site classification of “Class S”:

- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (topsoil was imported to site by the previous owners and we expect that around 100 mm to 200 mm is present in most areas).
- ✦ Excavate sand fill (Unit 1a/1c) to the required level, if at all. Excavation into the underlying uncontrolled fill (Unit 1b) is not expected to be required, but may be done if needed. This boundary is distinct and a colour change (to dark grey/black) will be noted along with the appearance of rubbish within the uncontrolled fill.
- ✦ Stockpile any excavated sand fill (Unit 1a/Unit 1c) for potential re-use as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc.) or oversized inert material (greater than 250 mm diameter) within the Unit 1a fill must be removed. We do not expect a significant volume of deleterious / oversized material will require removal from the Unit 1a/1c fill.
- ✦ If the Unit 1b material is exposed:
 - saturate the exposed surface with a minimum of 40L per m² (note: actual volume of water to be assessed during trials at start of earthworks, however expected to range between 40 L and 80 L per m²). The intention of saturating surface is to fill / expose any near surface voids, as well as moisture conditioning the material for compaction.
 - Compact the exposed surface using an 18 tonne pad foot vibratory roller or larger in accordance with the assessed Method Specification (refer Section 9.7).
- ✦ If the Unit 1b material is not exposed, undertake standard proof compaction to achieve the degree of compaction specified in Section 9.7 to a depth of at least 0.9 m below the finished surface level.
- ✦ Place layer of geofabric (Bidim A34 or similar) and geogrid (Secugrid 40/40 or similar) or a combined product (Combigrid 40/40 or equivalent) across the exposed surface of the uncontrolled fill. Geogrid layers must overlap by a minimum of 300 mm and be cable tied at minimum 0.5 m centers.
- ✦ Place a thin layer of gravel fill (limestone gravel or similar, refer to Section 9.6.3) approximately 250 mm thick over the top of the geogrid layer and compact using a 10 tonne smooth drum roller or larger. Allow 4 passes with vibrations or 10 passes without vibrations. Compaction without vibration may be more suitable when in close proximity to existing houses.
- ✦ Place a thin layer of approved fill (see Section 9.5.6) approximately 250 mm thick over the top of the gravel and compact using a 10 tonne smooth drum roller or larger.
- ✦ Repeat placement of subsequent layer of geogrid and gravel. (end up with two layers of geogrid and gravel)
- ✦ Place approved fill (see Section 9.5.6) to the required design levels, placed and compacted in accordance with Section 9.7.
- ✦ Compact the exposed finished surface level in accordance with Section 9.7 to a depth of at least 0.9 m below the finished surface level.

9.5.3 Area 2 - South West Corner and Northern Display Village

Area 2 includes areas of the site that are underlain by predominantly natural sands and sand fill only. It also includes areas where a thin layer (typically less than 3 m) of uncontrolled fill (Unit 1b) is present. These areas include the south west corner and northern part of the proposed display village along the eastern boundary. Testing has indicated that

no significant deleterious material is present in the Unit 1a/1c fill, but that it is locally loose (up to ~4-5 m depth). We have assumed that deep, loose sands will not be remediated, where present, and that a "Class S" lot classification is acceptable in areas where deep, loose sands are present. Other lots will achieve "Class A" where no loose sand is present.

The following remedial works to achieve a site classification of "Class S" or "Class A" (as appropriate) are recommended:

- ✦ Prior to earthworks, or after earthworks, lot-by-lot testing is required for any lots not yet tested with a CPT. Testing is to be done at the rate of 1 test per lot to a depth of 7 m. Any lot underlain by in excess of 0.5 m thickness of loose sand ($q_c < 4$ MPa) at a depth of more than 1 m is to be classified "Class S". Where no loose sand is present, a "Class A" classification will apply. This is only for lots not underlain by Unit 1b uncontrolled fill.
- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (around 100 mm to 200 mm of topsoil is expected).
- ✦ Excavate to the required depth, if at all.
- ✦ Stockpile the sand fill (Unit 1a/1c) for re-use as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc) or oversized inert material (greater than 250 mm diameter) must be removed. We do not expect a significant volume of material requiring removal from the Unit 1a/1c fill.
- ✦ Compact the exposed surface to achieve the level of compaction specified in Section 9.7 to a minimum depth of 0.9 m.
- ✦ Place permanent fill to the required design levels using approved fill (see Section 9.5.6), placed and compacted in accordance with Section 9.7.
- ✦ Compact the exposed finished surface level in accordance with Section 9.7 to a depth of at least 0.9 m below the finished surface level.

We note that compaction in sand can be difficult to achieve when the groundwater level is within 1 m of the surface being compacted. Given the proposed levels and the lack of deep excavation for bulk earthworks in this area, we do not expect that this will be an issue. Should deep remediation be required at a later date (e.g. to improve site class to "Class A"), groundwater may become an issue. This may be the case after the removal of the sand fill / uncontrolled fill in the south western corner. Further advice should be sought if the required compaction cannot be achieved. To help minimise the need for dewatering, we recommend site preparation works occur in summer, preferably late summer, when the groundwater table can be expected to be at or near its seasonal low.

9.5.4 Area 3 – Northern, Eastern and Southern Boundaries

Area 3 includes the lots along the northern, eastern and southern boundaries which are underlain partly by natural sand and partly by deep uncontrolled fill (lots located along the crest of the old quarry slopes). These areas are expected to experience larger differential settlements than other areas (this is essentially not able to be corrected with any cost-effective earthworks scheme, hence a site classification of "Class M" will apply). Remedial measures are aimed at minimization of localized differential settlement and include construction of a layered geogrid-reinforced fill zone below sand fill.

These areas require the following remedial works to achieve a site classification of "Class M":

- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (around 100 mm to 200 mm of topsoil is expected).
- ✦ Excavate sand fill (Unit 1a/1c) to the required level, if at all. Excavation into the underlying uncontrolled fill (Unit 1b) is not expected to be required, but may be done if needed. This boundary is distinct and a colour change (to dark grey/black) will be noted along with the appearance of rubbish within the uncontrolled fill.

Areas that are only underlain by natural sand (typically adjacent to the site boundary) do not need to be excavated.

- ✦ Stockpile the sand fill (Unit 1a/1c) for reuse as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc) or oversized inert material (greater than 250 mm diameter) within the Unit 1a/1c fill must be removed. We do not expect a significant volume of deleterious / oversized material will require removal from the Unit 1a/1c fill.
- ✦ If the Unit 1b material is exposed:
 - saturate the exposed surface with a minimum of 40L per m² (note: actual volume of water to be assessed during trials at start of earthworks, however expected to range between 40 L and 80 L per m²). The intention of saturating surface is to fill / expose any near surface voids, as well as moisture conditioning the material for compaction.
 - Compact the exposed surface using an 18 tonne pad foot vibratory roller or larger in accordance with the assessed Method Specification (refer Section 9.7).
- ✦ If the Unit 1b material is not exposed, undertake standard proof compaction to achieve the degree of compaction specified in Section 9.7 to a depth of at least 0.9 m below the finished surface level.
- ✦ Moisture condition and compact the exposed natural sand – Unit 2 (where present) in accordance with Section 9.7 to a depth of at least 0.9 m.
- ✦ Place layer of geofabric (Bidim A34 or similar) and geogrid (Secugrid 40/40 or similar) or a combined product (Combigrid 40/40 or equivalent) across the exposed surface of areas underlain by Unit 1b uncontrolled fill (not required over natural sand). Geogrid layers must overlap by a minimum of 300 mm and be cable tied at minimum 0.5 m centers. Some potholing may be required to assess the extent of the uncontrolled fill, but approximate extents are shown on Figure 1 and Figure 2.
- ✦ Place a thin layer of gravel fill (limestone gravel or similar, refer to Section 9.6.3) approximately 250 mm thick over the top of the geogrid layer and compact using a 10 tonne smooth drum roller or larger. Allow 4 passes with vibrations or 10 passes without vibrations. Compaction without vibration may be more suitable when in close proximity to existing houses.
- ✦ Place a thin layer of approved fill (see Section 9.5.6) approximately 250 mm thick over the top of the gravel and compact using a 10 tonne smooth drum roller or larger.
- ✦ Repeat placement of subsequent layer of geogrid and gravel (end up with two layers of geogrid and gravel).
- ✦ Place approved fill (see Section 9.5.6) to the required design levels, placed and compacted in accordance with Section 9.7.
- ✦ Compact the exposed finished surface level in accordance with Section 9.7 to a depth of at least 0.9 m below the finished surface level.

9.5.5 Area 4 – Public Open Space

Area 4 (public open space) located in the center of the site does not require any specific site preparation requirements if the area is to remain undeveloped (i.e. no structures / pavements). A site classification of “Class P” would remain applicable for this area.

If structures were proposed, the site preparation requirements for Area 1 would be applicable, and a site classification of “Class S” would be applicable (subject to confirmation by Galt). The site preparation works would need to extend a minimum of 5 m beyond the footprint of any structures or pavements.

9.5.6 Remediation of Test Pits

We consider that specific remediation of the test pits is required, due to the disturbance done at each location (52 test pits and 15 trenches were done, locations are as per Figure 1 and Figure 2. This is to ensure that loosened material excavated during the test pitting does not cause an issue for future settlement.

Bucket tamping of the excavated material was done in layers and the various materials excavated were restored to the pit as well as possible with the excavator used.

The following process is to be adopted:

- ✦ Excavate all overlying sand fill (Unit 1a / 1c) over the disturbed footprint, which should be obvious when the earthworks are done (footprint approximately 6 m by 8 m for test pits and about 6 m wide by up to 50 m long for trenches) and stockpile.
- ✦ Excavate into the Unit 1b material over the disturbed footprint by at least 1 m and batter the sides no steeper than 1V:2H.
- ✦ Re-place and compact the Unit 1b material as per the method specification developed in accordance with Section 9.7. Alternatively, this may be replaced with compacted, approved sand fill and the excess Unit 1b material disposed of elsewhere on site or off-site. Fill back to the surrounding Unit 1b surface.
- ✦ Construct the geogrid reinforced layers and sand fill as per the recommendations in Section 9.5.2.

9.6 Approved Fill

9.6.1 Imported Sand Fill

Imported granular fill must comply with the material requirements as stated in AS 3798-2007, "Guidelines on Earthworks for Commercial and Residential Developments". Sand fill must comprise clean sand that is free of organic matter and has a fines content of less than 5%.

Clean imported sand fill (no demolition debris, <2% organics, <5% fines) is recommended for use in the top 1 m of the site, mainly from an aesthetic and stormwater disposal perspective. The existing Unit 1a and Unit 1c fill should be structurally adequate for inclusion in the profile, however careful scrutiny of permeability and organic content is recommended if this is done (refer to Section 9.6.2).

Any organic-rich sand or sand containing significant proportions of fines (material less than 0.075 mm in size) must not be used.

Where doubt exists, a geotechnical engineer must be engaged to inspect and approve the use of potential fill materials.

9.6.2 Existing Fill

The sand fill (Unit 1a) is also considered suitable for use as structural fill including as use as structural fill above the geogrid mattress layer and for replacing material where the uncontrolled fill (Unit 1b) is removed. All infiltration testing done to date has indicated that the Unit 1a sand is permeable even when compacted. It is possible that some zones of higher fines material may be present, due to the variable origin of the Unit 1a material.

The fine screened fill (Unit 1c) is likewise considered suitable as a structural fill. Infiltration testing done to date has indicated that the Unit 1c material is permeable and would be suitable for on-site stormwater disposal by infiltration. We note that when compacted, the Unit 1c material is quite hard and relatively difficult to excavate (by hand or using very small construction machinery).

The uncontrolled fill (Unit 1b) is not recommended for reuse as structural fill. The uncontrolled fill could be considered for use as low permeability general fill provided:

- ✦ The material is screened to remove the deleterious materials (plastic, wood, steel, etc.) and oversized inert material (>250 mm diameter);

- ↻ The organic content of the screened fill is less than 2%; and
- ↻ The inert oversize portion (bricks, concrete, etc.) is crushed and the maximum particle size was less than 250 mm.

The re-use of the screened uncontrolled fill at a depth of greater than 2 m below the finished surface is recommended. Infiltration testing done in the Unit 1b material has indicated that it is relatively permeable, however due to its variability, we do not recommend this material be assumed to be universally permeable.

We consider that the existing Unit 1b uncontrolled fill could alternatively be screened with a screening plant to produce a geotechnically suitable structural fill (material passing 20 mm). There would be a very large proportion of reject material from this process.

In general, we consider it is likely to be easier and more cost effective to avoid processing of Unit 1b material.

9.6.3 Gravel Fill

Gravel fill is required to engage the geogrid for areas underlain by Unit 1b (Uncontrolled Fill). Various materials can be used, however we suggest the use of <75 mm crushed limestone ("all in", not spalls/no-fines gravel). We note that, when compacted, this material may have a relatively low permeability, which must be considered in the civil design.

Alternate materials are possible (such as screened, crushed construction debris), however, if poorly graded or single sized products are used, then it will be necessary to either:

- ↻ Mix in sand to fill the voids, or
- ↻ Use a separator geotextile layer above each layer of gravel fill to stop sand from washing into the voids in the gravel layer.

Please contact us for further advice during the specification of the earthworks so that we may comment further on specific material types.

9.7 Compaction

9.7.1 General

Approved granular fill must be compacted using suitable compaction equipment to achieve a dry density ratio of at least 95% MMDD (maximum modified dry density) as determined in accordance with AS 1289 5.2.1.

Fill must be placed in horizontal layers of not greater than 0.35 m loose thickness. Each layer must be compacted by suitable compaction equipment, and carefully controlled to ensure even compaction over the full area and depth of each layer.

Care will need to be taken when compacting in the vicinity of existing structures. This is particularly important if vibratory compaction is being carried out. Tynan (1973)² provides assistance with the selection of compaction equipment for use adjacent to structures. Of particular concern are the nearby existing houses along the southern boundary.

We recommend:

- ↻ Vibration monitoring along the southern boundary.

² Tynan (1973) Ground Vibration and Damage Effects on Buildings, Australia Road Research Board, Special Report No. 11.

- ⚡ Setting of a vibration limit for the houses (a guideline value would be peak particle velocity, PPV<10 mm/s at the boundary).
- ⚡ Dilapidation survey of the houses adjacent to the site.

Large compaction equipment (self-propelled vibrating rollers, etc.) must not be used within 2 m behind retaining walls. Hand compaction plant must be used.

9.7.2 Clean Sand Fill – Performance Specification

Where sand is used as fill and the Perth sand penetrometer (PSP) is used for compaction control (only applicable for a material with <5% gravel and <5% fines), the following minimum PSP blow counts may be assumed to correlate to the required dry density ratio of 95% MMDD:

- ⚡ Depth range 0 m to 0.15 m: SET
- ⚡ Depth range 0.15 m to 0.45 m: 8 blows
- ⚡ Depth range 0.45 m to 0.75 m: 10 blows
- ⚡ Depth range 0.75 m to 1.05 m: 12 blows (or 6 blows for depth range 0.75 m to 0.9 m).

If difficulties are experienced in achieving the required blow count, an on-site PSP calibration should be undertaken to determine the site-specific blow count correlating to the required dry density ratio.

Over-excavation and replacement of loose materials must be done where the minimum dry density ratio cannot be achieved.

After compaction, verify that the required level of compaction has been achieved by testing to a minimum depth of 0.9 m:

- ⚡ On each lift of fill on a 40 m grid;
- ⚡ At each spread footing location;
- ⚡ at 15 m centres along gravity retaining wall footings and strip footings (where present); and
- ⚡ at 10 m centres below on-ground slabs and pavements.

A performance specification is considered appropriate for Unit 1a material. The elevated gravel content in Unit 1c material means that the use of a PSP is not appropriate in this material for compaction control. A method specification is likely to be required (refer below).

9.7.3 Development of Method Specification – Unit 1c (Screened Fill)

The Unit 1c (Screened Fill) has a high gravel content and therefore is unsuitable for testing with a PSP. We recommend development of a method specification that will allow production of a compacted fill with a minimum dry density ratio (DDR) of 95% MMDD. The method specification should be developed by constructing trial pads and incorporating nuclear density gauge (NDG) testing to determine the watering rate and number of compactor passes required to achieve the required DDR.

As a minimum, we consider the following is required:

- ⚡ Minimum trial pad dimensions: 10 m by 10 m
- ⚡ Maximum loose layer thickness: 350 mm (only with vibrations)
- ⚡ Maximum loose layer thickness (no vibrations): 200 mm
- ⚡ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).

- ⚡ Minimum number of NDG tests per pad: 3 for any given number of compactor passes
- ⚡ Minimum passes of compactor (using 10 tonne vibratory smooth drum roller or heavier roller), regardless of outcomes of NDG testing: 6

9.7.4 Development of Method Specification – Unit 1b (In situ Uncontrolled Fill)

A method specification will need to be assessed for the compaction of the in-situ uncontrolled fill layer given that conventional compaction testing will be unsuitable for the material. This will need to be assessed by a geotechnical engineer with the contractor during the initial site works.

COMPACTION OF UPPER SURFACE OF UNIT 1B MATERIAL TO REMAIN IN SITU

At this preliminary stage we consider that the following work will be required as a minimum:

- ⚡ Saturating the exposed surface with a minimum 40 L/m².
- ⚡ Compacting the exposed surface using an 18 tonne pad foot roller or larger.
- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

HANDLING AND COMPACTION OF RE-HANDLED UNIT 1B MATERIAL

Should re-working of Unit 1b material be required (e.g. to excavate in one area and fill in another), a method specification will need to be developed. We consider the following is required as minimum:

- ⚡ Minimum trial pad dimensions: 10 m by 10 m
- ⚡ Maximum particle size: 250 mm (or 2/3 of layer thickness)
- ⚡ All wood or similar deleterious material to be removed by hand-picking and discarded.
- ⚡ Only compaction with vibrations to be done.
- ⚡ Maximum loose layer thickness: 350 mm (only with vibrations)
- ⚡ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).
- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions of 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

9.7.5 Development of Method Specification – Gravel Fill for Geogrids

The gravel fill used for engaging the geogrids will need to be placed and compacted to a method specification to achieve a minimum DDR of 95% MMDD. A tentative method specification is provided below, based on the assumption of using imported <75 mm “all in” crushed limestone. As density testing using the NDG is unreliable in these coarse materials, we recommend development of the method specification based on settlements of a trial pad. Alternate materials will require a review of this method specification:

- ⚡ Minimum trial pad dimensions: 10 m by 10 m
- ⚡ Maximum loose layer thickness: 350 mm (only with vibrations)
- ⚡ Maximum loose layer thickness (no vibrations): 200 mm

- ⚡ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).
- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions of 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

10. FURTHER WORK

The following additional work is recommended to build upon the findings of the current report:

- ⚡ Additional testing (CPTs and test pits) in the far southwestern corner of the site, following demolition of structures in this area.
- ⚡ Testing on a lot-by-lot basis in the southwestern area of the site not underlain by Unit 1b uncontrolled fill (CPT to 7 m at the rate of 1 per lot), to assess “Class A” or “Class S” site classification (refer to Section 9.4).
- ⚡ Ongoing earthworks verification including assessment of method specifications for filling.

We consider that a high degree of engineering oversight is required for the earthworks at this site. ‘Level 1’ (full time) supervision as defined in AS3798-2007 is probably not necessary, however frequent visits are strongly recommended and occasional full-time supervision (such as when working on boundary areas and the early periods of implementing method specifications) will be needed.

11. CONCLUSION

We draw your attention to Appendix I of this report, Understanding your Report. The information provided within is intended to inform you as to what your realistic expectations of this report should be. Guidance is also provided on how to minimise risks associated with groundworks for this project. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

GALT GEOTECHNICS PTY LTD



Owen Woodland CPEng

Geotechnical Engineer

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Tables

Table A1: Summary of Tests – Cone Penetration Tests

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 1b)			
PGCPT01	5.2	1.0	>4.2	NE	Dry to 4.0 m	Target Depth
PGCPT02	0.3	0.3	NE	NE	Dry to 0.3 m	Refusal
PGCPT03	0.1	0.1	NE	NE	Dry to 0.1 m	Refusal
PGCPT04	2.6	1.2	>1.4	NE	Dry to 2.6 m	Refusal
PGCPT05	2.6	2.5	>0.1	NE	Dry to 2.6 m	Refusal
PGCPT06	5.2	1.6	NE	1.6	Dry to 4.2 m	Target Depth
PGCPT07	5.2	2.0	3.0	5.0	Dry to 3.5 m	Target Depth
PGCPT08	1.4	1.2	>0.2	NE	Dry to 1.2 m	Refusal
PGCPT09	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT10	2.8	1.5	>0.8	NE	Dry to 1.3 m	Refusal
PGCPT11	5.2	NE	NE	0.0	Dry to 4.0 m	Target Depth
PGCPT12	2.0	1.7	>0.3	NE	Dry to 1.9 m	Refusal
PGCPT13	2.5	1.1	>1.4	NE	Dry to 2.4 m	Refusal
PGCPT14	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT15	3.5	1.8	>2.7	NE	Dry to 3.0 m	Refusal
PGCPT16	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT17	3.2	3.0	>0.2	NE	Dry to 3.2 m	Target Depth
PGCPT18	3.3	1.8	>1.5	NE	Dry to 3.2 m	Target Depth
PGCPT19	5.2	NE	NE	0.0	Dry to 3.9 m	Target Depth
PGCPT20	5.2	2.1	1.7	3.8	Dry to 4.0 m	Target Depth
PGCPT21	3.7	2.3	>1.4	NE	Dry to 2.6 m	Refusal
PGCPT22	5.2	NE	NE	0.0	Dry to 4.2 m	Target Depth
PGCPT23	2.7	1.9	>0.8	NE	Dry to 2.6 m	Refusal
PGCPT24	2.2	1.2	>1.0	NE	Dry to 0.0 m	Refusal
PGCPT25	2.6	2.4	>0.2	NE	Dry to 2.5 m	Refusal
PGCPT26	2.0	1.9	>0.1	NE	Dry to 1.9 m	Refusal
PGCPT27	2.3	1.4	>0.9	NE	Dry to 2.3 m	Refusal
PGCPT28	3.0	1.9	>1.1	NE	Dry to 2.9 m	Refusal
PGCPT29	3.0	1.5	>1.5	NE	Dry to 2.3 m	Refusal
PGCPT30	7.2	3.1	0.5	3.6	Dry to 4.3	Target Depth
PGCPT31	8.2	4.4	1.4	5.8	Dry to 4.8	Target Depth
PGCPT32	8.2	4.6	2.3	6.9	Dry to 5.9	Target Depth
PGCPT33	8.2	6.0	NE	6.0	Dry to 5.8	Target Depth
PGCPT34	8.2	3.5	1.5	5.0	Dry to 5.4	Target Depth
PGCPT35	8.2	6.8	NE	6.8	6.7	Target Depth
PGCPT36	7.2	>7.2	NE	>7.2	Dry to 6.6	Target Depth

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 1b)			
PGCPT37	7.2	5.0	NE	5.0	4.9	Target Depth
PGCPT38	7.2	4.0	NE	4.0	Dry to 4.8	Target Depth
PGCPT39	5.7	1.9	NE	1.9	Dry to 2.9	Refusal
PGCPT40	4.7	1.2	NE	1.2	Dry to 2.8	Refusal
PGCPT41	7.2	4.0	NE	4.0	Dry to 3.8	Target Depth
PGCPT42	7.2	4.6	NE	4.6	Dry to 4.8	Target Depth
PGCPT43	7.2	5.7	NE	5.7	Dry to 7.2	Target Depth
PGCPT44	7.2	4.4	NE	4.4	Dry to 5.0	Target Depth
PGCPT45	8.2	5.8	NE	5.8	Dry to 5.5	Target Depth
PGCPT46	7.2	>7.2	NE	>7.2	Dry to 5.8	Target Depth
PGCPT47	7.2	3.8	NE	3.8	Dry to 4.5	Target Depth
PGCPT48	5.6	2.3	NE	2.3	Dry to 3.2	Target Depth
PGCPT49	7.2	1.0	NE	1.0	2.8	Target Depth
PGCPT50	7.2	0.4	NE	0.4	2.8	Target Depth
PGCPT51	7.5	NE	NE	0.0	Dry to 3.2	Target Depth
PGCPT52	4.7	1.0	>3.7	>4.7	Dry to 3.6	Refusal – probable Unit 1b
PGCPT53	3.5	2.5	>1.0	>3.5	Dry to 3.4	Refusal – probable Unit 1b
PGCPT54	4.8	3.1	>1.7	>4.8	Dry to 3.3	Refusal – probable Unit 1b
PGCPT55	7.2	1.6	1.7	3.3	Dry to 5.1	Target Depth
PGCPT56	7.2	NE	NE	0.0	Dry to 4.1	Target Depth
PGCPT57	6.3	5.7	>0.6	>6.3	Dry to 5.0	Refusal
PGCPT58	6.7	>6.7	NE	>6.7	Dry to 5.9	Refusal – probable Unit 1b
PGCPT59	8.2	6.0	NE	6.0	Dry to 6.1	Target Depth
PGCPT60	1.3	>1.3	NE	>1.3	Dry to 1.3	Refusal
PGCPT61	5.8	>5.8	NE	>5.8	Dry to 5.3	Refusal
PGCPT62	5.1	>5.1	NE	>5.1	Dry to 4.9	Refusal
PGCPT63	4.7	>4.7	NE	>4.7	Dry to 4.4	Refusal
PGCPT64	7.2	3.4	NE	3.4	Dry to 5.3	Target Depth
PGCPT65	2.2	>2.2	NE	>2.2	Dry to 2.0	Refusal – probable Unit 1b
PGCPT66	1.3	>1.3	NE	>1.3	Dry to 1.1	Refusal
PGCPT67	4.0	1.9	>2.1	>4.0	Dry to 3.5	Refusal
PGCPT68	7.2	5.0	NE	5.0	Dry to 6.1	Target Depth
PGCPT69	3.3	1.9	>1.4	>3.3	Dry to 3.3	Refusal

- Notes:**
1. GNE: Groundwater not encountered within the excavated depth,
 2. NE: Not encountered within the excavated depth
 3. Approximate depth to groundwater based on soil moisture
 4. Where multiple CPTs were done at a given location (due to refusal, as designated with PGCPT57A, PGCPT57B, etc), only the deepest test is summarized here.

Table A2: Summary of Tests – Test Pits

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
PGTP01	4.0	2.6	NE	2.6	GNE	Target Depth
PGTP02	5.5	3.6	1.5	5.1	5.1	Target Depth
PGTP03	7.2	3.2	>4.0	NE	GNE	Target Depth
PGTP04	6.4	3.5	>2.9	NE	GNE	Target Depth
PGTP05	7.5	2.5	>5.0	NE	GNE	Target Depth
PGTP06	7.9	1.9	>6.0	NE	GNE	Target Depth
PGTP07	4.6	4.2	NE	4.2	GNE	Target Depth
PGTP08	6.4	6.1	NE	6.1	GNE	Target Depth
PGTP09	7.4	3.4	>4.0	NE	GNE	Target Depth
PGTP10	7.7	2.0	>5.7	NE	GNE	Target Depth
PGTP11	7.5	2.9	>4.6	NE	GNE	Target Depth
PGTP12	7.5	3.0	>4.5	NE	GNE	Target Depth
PGTP13	6.7	3.6	>3.1	NE	GNE	Target Depth
PGTP14	7.9	5.6	2.1	7.7	GNE	Target Depth
PGTP15	7.4	5.4	>2.0	NE	GNE	Target Depth
PGTP16	7.5	4.7	>2.8	NE	GNE	Target Depth
PGTP17	7.6	3.3	>4.3	NE	GNE	Target Depth
PGTP18	6.6	3.2	>3.4	NE	GNE	Target Depth
PGTP19	7.6	3.5	>4.1	NE	GNE	Target Depth
PGTP20	6.8	5.2	>1.6	NE	GNE	Target Depth
PGTP21	2.6	1.9	>0.7	NE	GNE	Terminated (Asbestos Fill)
PGTP22	7.1	2.2	>4.9	NE	GNE	Target Depth
PGTP23	7.1	2.2	>4.9	NE	GNE	Target Depth
PGTP24	7.2	2.5	>4.7	NE	GNE	Target Depth
PGTP25	7.1	4.1	>3.0	NE	GNE	Target Depth
PGTP26	7.1	6.8	>0.3	NE	GNE	Target Depth
PGTP27	6.9	1.7	>5.2	NE	GNE	Target Depth
PGTP28	6.7	3.0	>3.7	NE	GNE	Target Depth
PGTP29	6.6	3.4	>3.2	NE	GNE	Target Depth
PGTP30	7.2	3.4	>3.8	NE	GNE	Target Depth
PGTP31	7.5	4.1	>3.4	NE	GNE	Target Depth

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
PGTP32	6.6	2.5	>4.1	NE	GNE	Target Depth
PGTP33	7.4	5.8	>1.6	NE	GNE	Target Depth
PGTP34	7.2	1.6	>5.6	NE	GNE	Target Depth
PGTP35	7.3	3.7	>3.6	NE	GNE	Target Depth
PGTP36	7.2	3.2	>4.0	NE	GNE	Target Depth
PGTP37	7.3	3.7	>3.6	NE	GNE	Target Depth
PGTP38	7.3	4.1	>3.2	NE	GNE	Target Depth
PGTP39	7.3	3.5	>3.8	NE	GNE	Target Depth
PGTP40	6.3	3.4	>2.9	NE	GNE	Target Depth
PGTP41	6.2	2.7	>3.5	NE	GNE	Target Depth
PGTP42	5.6	1.9	>3.7	NE	GNE	Target Depth
PGTP43	4.5	1.5	>3.0	NE	GNE	Target Depth
PGTP44	2.0	1.5	NE	1.5	GNE	Target Depth
PGTP45	2.0	1.8	NE	1.8	GNE	Target Depth
PGTP46	8.0	7.5	NE	7.5	GNE	Target Depth
PGTP47	6.5	6.0	NE	6.0	GNE	Target Depth
PGTP48	2.0	1.8	>0.2	>2.0	GNE	Target Depth
PGTP49	5.0	4.8	NE	4.8	GNE	Target Depth
PGTP50	2.0	1.6	NE	1.6	GNE	Target Depth
PGTP51	3.0	2.5	NE	2.5	GNE	Target Depth
PGTP52	3.0	2.5	NE	2.5	GNE	Target Depth
PGTP53	4.0	3.5	NE	3.5	GNE	Target Depth
PGTP54	3.5	2.0	NE	2.0	3.0	Target Depth
PGTP55	2.0	1.5	NE	1.5	GNE	Target Depth
PGTP56	1.5	1.0	NE	1.0	GNE	Target Depth

- Notes:**
1. GNE: Groundwater not encountered within the excavated depth
 2. NE: Not encountered within the excavated depth
 3. Approximate depth to groundwater based on soil moisture

Table A3: Summary of Tests – Boreholes

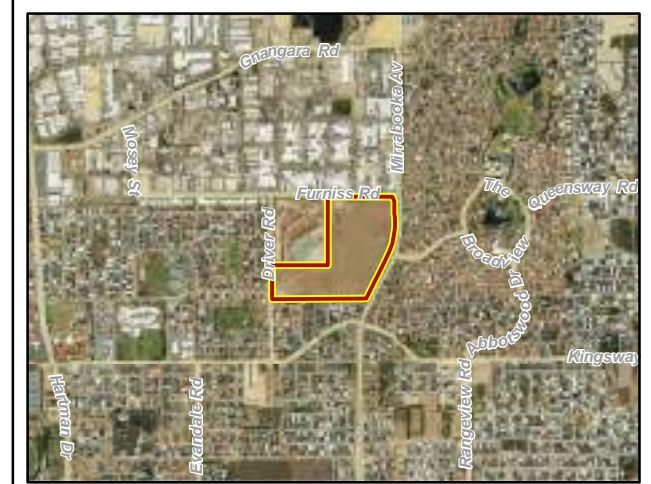
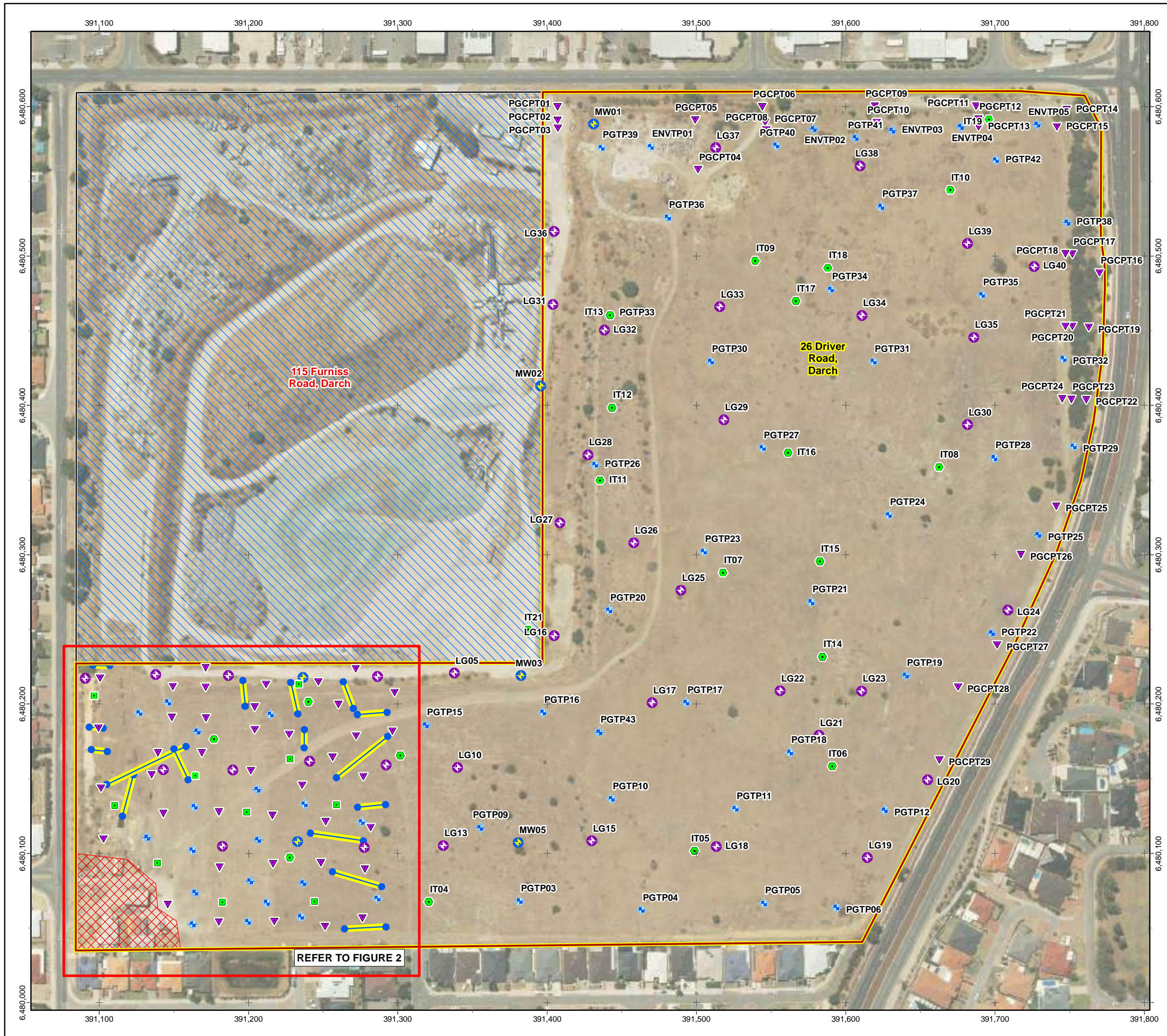
Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
BHMMW01	15.0	1.5	4.2	5.7	10.9	Target Depth
BHMMW02	10.5	1.0	5.3	6.3	6.5	Target Depth
BHMMW03	16.0	3.0	9.8	12.8	12.9	Target Depth
BHMMW04	10.5	4.7	NE	4.7	7.0	Target Depth
BHMMW05	15.0	2.5	9.5	12.0	12.3	Target Depth
BHMMW06	9.0	1.4	3.1	4.5	5.9	Target Depth
BHLG01	4.0	0.6	NE	0.6	GNE	Target Depth
BHLG02	10.5	2.0	6.2	8.2	7.4	Target Depth
BHLG03	4.5	2.6	NE	2.6	GNE	Target Depth
BHLG04	10.5	2.0	3.5	5.5	7.8	Target Depth
BHLG05	10.5	4.0	6.0	10.0	9.3	Target Depth
BHLG06	8.0	2.0	5.0	7.0	7.0	Target Depth
BHLG07	6.0	2.5	2.0	4.5	GNE	Target Depth
BHLG08	7.5	6.0	NE	6.0	GNE	Target Depth
BHLG09	10.5	4.5	4.0	8.5	9.0	Target Depth
BHLG10	13.5	5.0	7.0	12.0	11.0	Target Depth
BHLG12	4.0	3.0	NE	3.0	GNE	Target Depth
BHLG13	10.5	3.5	5.5	9.0	8.3	Target Depth
BHLG14	4.5	4.0	NE	4.0	GNE	Target Depth
BHLG15	11.0	2.0	>9.0	NE	GNE	Refusal
BHLG16	18.0	3.5	13.0	16.5	GNE	Target Depth
BHLG17	19.5	2.0	16.3	18.3	16.5	Target Depth
BHLG18	21.0	2.0	18.0	20.0	19.8	Target Depth
BHLG19	21.0	2.0	17.6	19.6	19.5	Target Depth
BHLG20	18.0	3.0	13.5	16.5	18.0	Target Depth
BHLG21	21.0	2.0	17.7	19.7	19.5	Target Depth
BHLG22	21.0	1.5	18.9	20.4	19.8	Target Depth
BHLG23	21.0	2.0	18.0	20.0	19.5	Target Depth
BHLG24	18.5	3.0	>15.5	>18.5	18.0	Refusal
BHLG25	19.5	2.0	16.0	18.0	17.2	Target Depth
BHLG26	19.8	3.8	14.2	18.0	16.7	Target Depth

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
BHLG27	19.5	8.0	10.5	18.5	18.2	Target Depth
BHLG28	18.0	6.0	11.5	17.5	17.0	Target Depth
BHLG29	18.0	1.5	15.5	17.0	16.4	Target Depth
BHLG30	18.0	1.5	15.5	17.0	16.4	Target Depth
BHLG31	9.0	1.0	6.5	7.5	GNE	Target Depth
BHLG32	18.0	5.0	10.5	15.5	15.2	Target Depth
BHLG33	16.0	2.6	12.4	15.0	15.2	Target Depth
BHLG34	18.0	2.0	13.5	15.5	14.7	Target Depth
BHLG35	18.0	3.0	12.5	15.5	15.7	Target Depth
BHLG36	12.0	1.0	9.6	10.6	GNE	Target Depth
BHLG37	12.0	3.3	8.2	11.5	11.5	Target Depth
BHLG38	15.0	2.0	12.0	14.0	13.5	Target Depth
BHLG39	18.0	2.0	14.1	16.1	15.5	Target Depth
BHLG40	18.0	3.0	13.5	16.5	15.5	Target Depth

- Notes:**
- 1 NE: Not encountered within the excavated depth
 - 2 Depth to groundwater based on soil moisture (not direct measurement of water level)

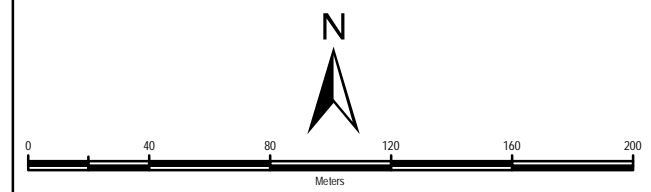


Figures



Legend

- Site Boundary
- Access not available
- Galt Geotechnics Test Locations**
- Cone Penetration Test
- Gas Monitoring Well
- Infiltration Test
- Monitoring Well
- Permeability Test
- Test Pit
- Trench



NOTES
Aerial Imagery and Cadastre sourced from Landgate/SLIP

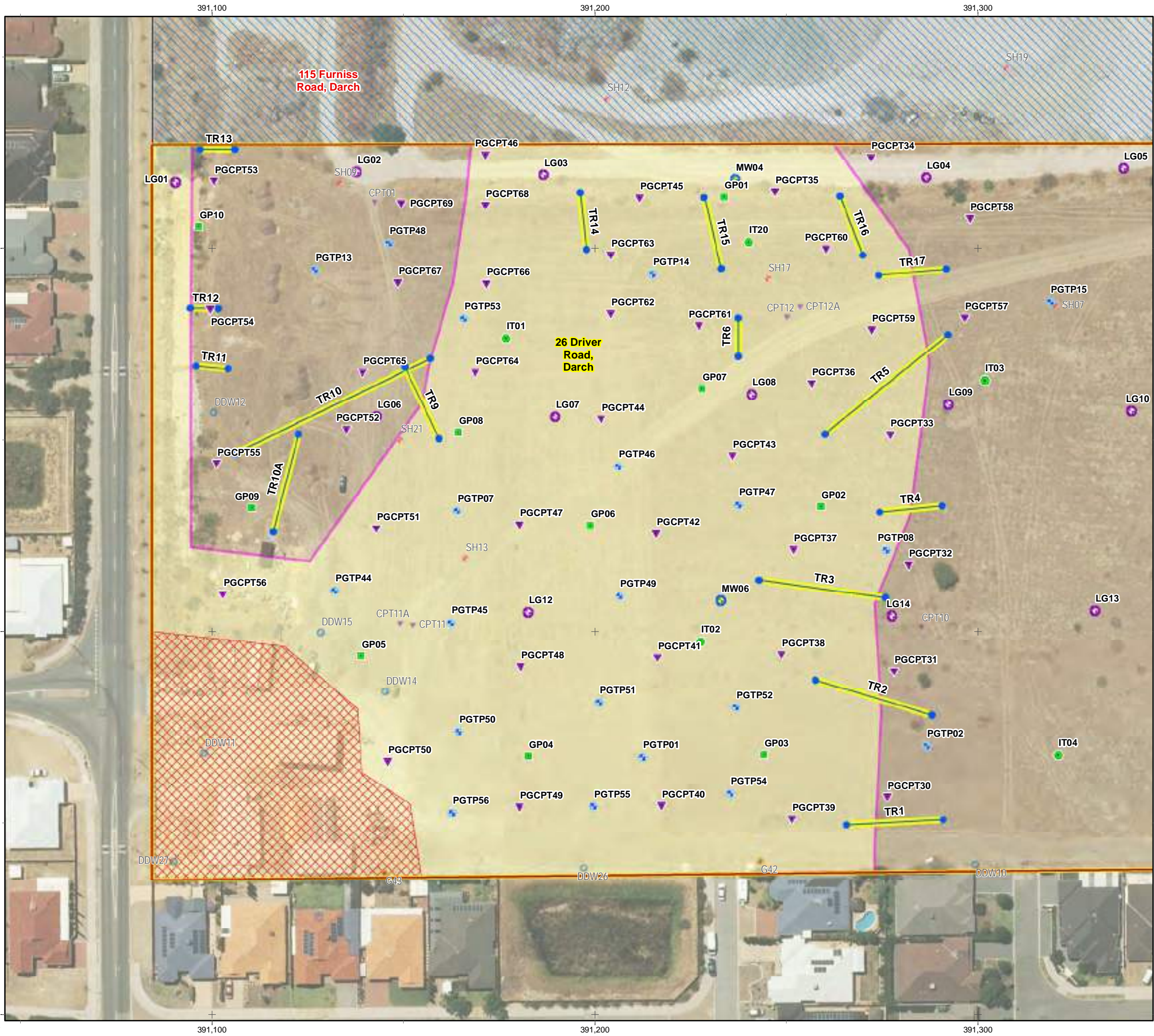


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DRAWN	DAC	
DATE DRAWN	17/10/2019	
CHECKED	ORW	
DATE CHECKED	28/08/2019	
PROJECTION	GDA 1994 MGA Zone 50	

Galt Geotechnics Pty Ltd
 ACN : 138 490 865
 Tel : +61 (0)8 6272-0200
 Address : 50 Edward Street
 Osborne Park WA 6017

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CLIENT	PARCEL PROPERTY		
PROJECT	PROPOSED MIXED USE SUBDIVISION		
LOCATION	26 DRIVER ROAD DARCH		
TITLE	SITE AND LOCATION PLAN		
Job No	J1801113	Fig No	FIGURE 1
Rev	A		



Legend

- Site Boundary
- Access not available
- Area not underlain by Unit 1B - Uncontrolled Fill

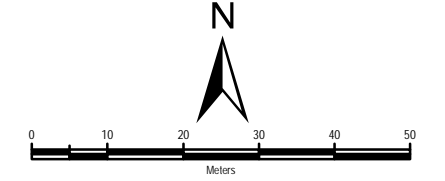
Galt Geotechnics Test Locations

- Cone Penetration Test
- Gas Monitoring Well
- Infiltration Test
- Monitoring Well
- Permeability Test
- Test Pit

- Trench

Historic Test Locations

- Borehole
- Cone Penetration test
- Gas Monitoring Well
- Groundwater Monitoring Well



NOTES
Aerial Imagery and Cadastre sourced from Landgate/SLIP

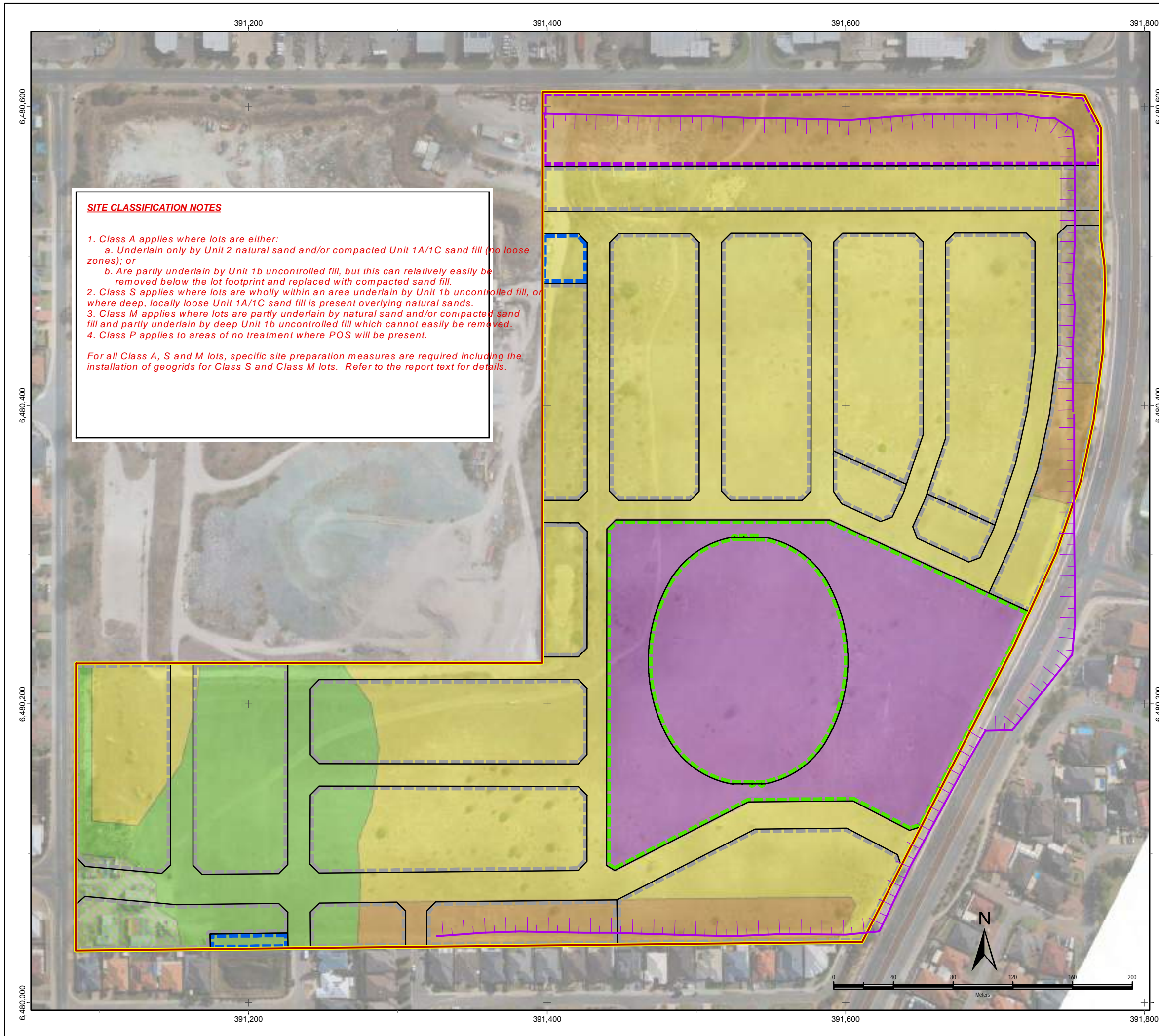


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DRAWN	DAC	
DATE DRAWN	17/10/2019	
CHECKED	ORW	
DATE CHECKED	28/08/2019	
PROJECTION	GDA 1994 MGA Zone 50	

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CLIENT	PARCEL PROPERTY		
PROJECT	PROPOSED MIXED USE SUBDIVISION		
LOCATION	26 DRIVER ROAD DARCH		
TITLE	SITE AND LOCATION PLAN - SOUTH WEST CORNER		
Job No	J1801113	Fig No	FIGURE 2
		Rev	A



SITE CLASSIFICATION NOTES

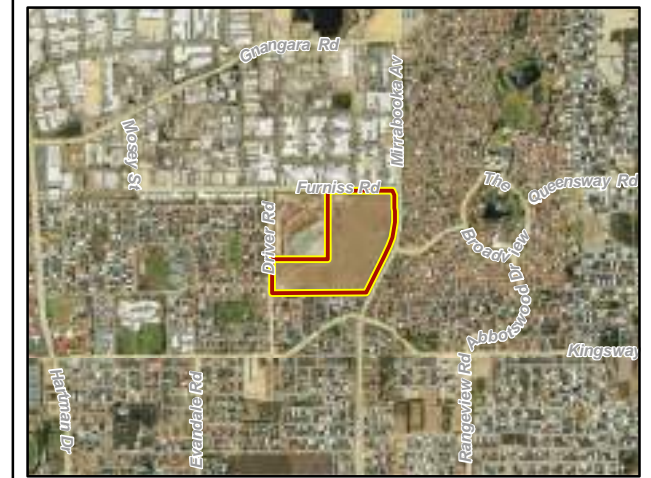
1. Class A applies where lots are either:
 a. Underlain only by Unit 2 natural sand and/or compacted Unit 1A/1C sand fill (no loose zones); or
 b. Are partly underlain by Unit 1b uncontrolled fill, but this can relatively easily be removed below the lot footprint and replaced with compacted sand fill.

2. Class S applies where lots are wholly within an area underlain by Unit 1b uncontrolled fill, or where deep, locally loose Unit 1A/1C sand fill is present overlying natural sands.

3. Class M applies where lots are partly underlain by natural sand and/or compacted sand fill and partly underlain by deep Unit 1b uncontrolled fill which cannot easily be removed.

4. Class P applies to areas of no treatment where POS will be present.

For all Class A, S and M lots, specific site preparation measures are required including the installation of geogrids for Class S and Class M lots. Refer to the report text for details.



Legend

- Site Boundary
- Design Concept**
- COMMERCIAL
- DRAINAGE
- LOTS
- POS
- SITE CLASSIFICATION (09/10/2019)**
- CLASS "S", POSSIBLE LOT BY LOT RECLASSIFICATION TO CLASS "A"
- NOT YET INVESTIGATED, PROBABLE CLASS
- CLASS "M"
- CLASS "M", CLASS "A" IF SHALLOW UNCONTROLLED FILL REMOVED
- CLASS "P"
- CLASS "S"
- Approximate Crest of Historical Excavation

NOTES
 Aerial Imagery and Cadastre sourced from Landgate/SLIP

	SCALE	1:2,500	(A3)
	DRAWN	DAC	
	DATE DRAWN	21/10/2019	
	CHECKED	ORW	
	DATE CHECKED	21/10/2019	
PROJECTION		GDA 1994 MGA Zone 50	

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CLIENT	PARCEL PROPERTY
PROJECT	PROPOSED MIXED USE SUBDIVISION
LOCATION	26 DRIVER ROAD DARCH
TITLE	INDICATIVE SITE CLASSIFICATION
Job No	J1801113
Fig No	FIGURE 3
Rev	B



Appendix A: Site Photographs



Photograph 1: Test Pitting



Photograph 2: CPT Rig



Photograph 3: CPT Rig



Photograph 4: Borehole Drilling



Photograph 5: Typical view across site, looking east



Photograph 6: Typical profile of sand fill overlying uncontrolled fill including rubbish



Photograph 7: IT02 (Unit 1a SAND FILL) – Inverse auger hole test setup



Photograph 8: IT04 (Unit 1a SAND FILL) – Inverse auger hole test setup



Photograph 9: Inverse auger hole setup for testing in Unit 1C (Screened FILL) present below surficial layer of Unit 1A (SAND FILL)



Photograph 10: Unit 1C (Screened Fill) present in test pit



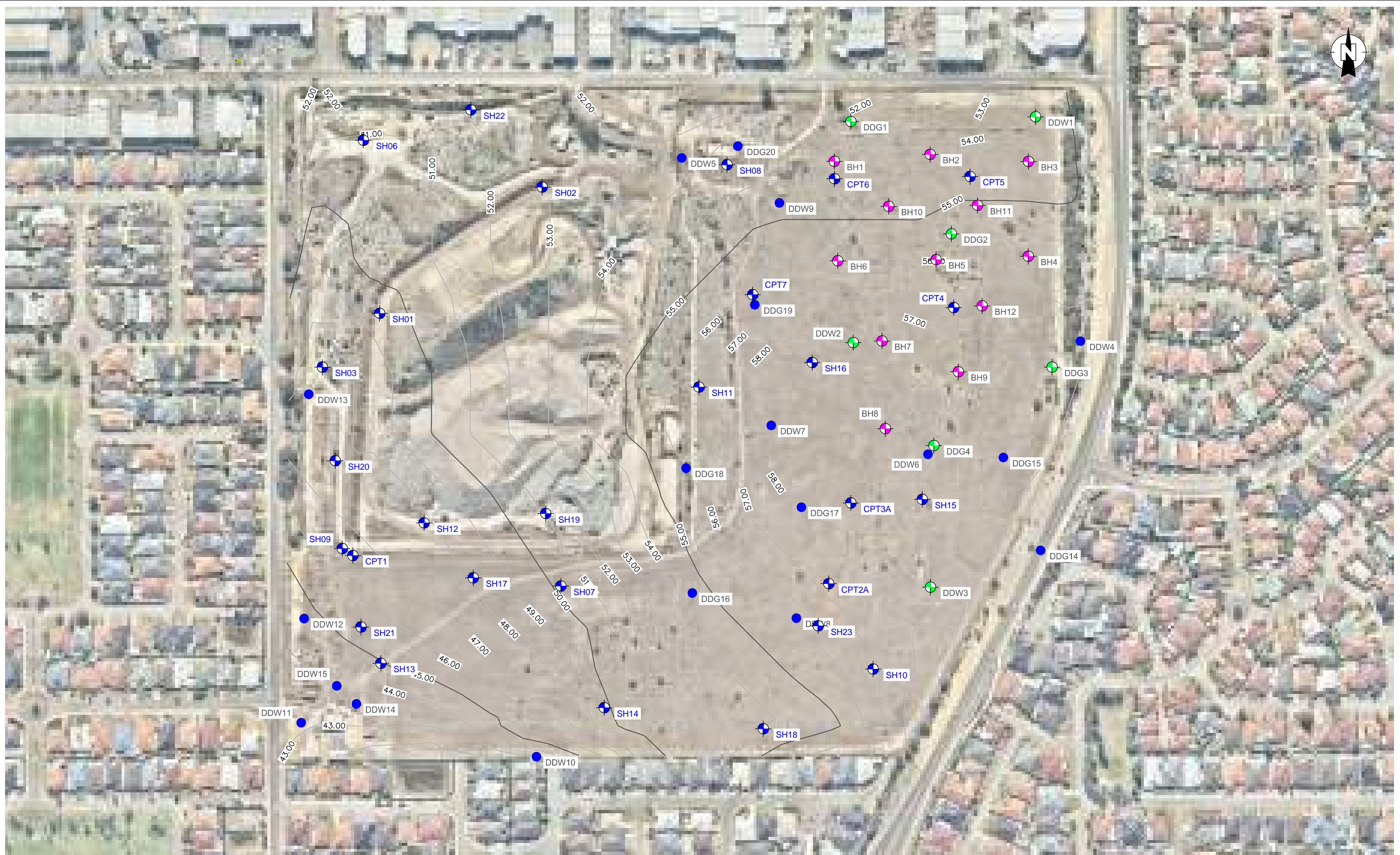
Photograph 11: Example test pit for infiltration testing in Unit 1B (Uncontrolled FILL) material – prior to water addition







Photograph 12: Testing in progress in Unit 1B (uncontrolled FILL) material



Appendix B: CMW Geosciences 2017 Data



LEGEND:

-  BH1 BOREHOLE LOCATION (GOLDER JUNE 2004)
-  DDW15 MONITORING WELL LOCATION (GOLDER JUNE 2008)
-  DDG1 BOREHOLE LOCATION (RPS FEB 2005)
-  CPT/SH CMW TEST LOCATION

NOTES:

1. IMAGE FROM NEARMAP 28.04.17
2. CONTOURS SUPPLIED



CLIENT:	HANDLE PROPERTY GROUP	DRAWN:	DE	PROJECT:	PER2017-0193
PROJECT:	LANDFILL REDEVELOPMENT DRIVER ROAD, DARCH, WA	CHECKED:	MW	FIGURE:	01
TITLE:	SITE INVESTIGATION PLAN	REVISION:	0	SCALE:	1:3000
		DATE:	03.08.17	SHEET:	A3 L

BOREHOLE LOG - SH01

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391165m N.6480418m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations	
		Depth	Type & Results								
		1.8-2.0	B		1						
					2		... at 2.10m, wood fragment				
					3		FILL: Sandy GRAVEL: angular to subrounded, fine to coarse grained, red brown, of brick; sand, fine to coarse grained, with cobbles.				
					4		FILL: SAND: subangular to subrounded, fine to medium grained, dark brown; with gravel, fine to coarse grained, of brick, concrete, tile, plastic, asphalt and glass; with cobbles; trace organic fines.				
					5		... from 5.00m to 5.10m, trace rootlets	M			
		7.2-7.3	B		7		... from 7.20m to 7.30m, trace rootlets				
					8	... at 8.40m, wood fragments					
					9						
					10						

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH01

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391165m N.6480418m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
							FILL: SAND: subangular to subrounded, fine to medium grained, dark brown; with gravel, fine to coarse grained, of brick, concrete, tile, plastic, asphalt and glass; with cobbles; trace organic fines. ... at 10.20m, trace wood chips ... at 10.40m, decomposed wood fragments			
					11		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH02

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391304m N.6480526m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		0.8-0.9	B		1		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, pale brown mottled grey; gravel, angular, medium to coarse grained, of concrete and brick; with silt, trace cobbles. ... from 0.80m to 1.10m, trace fragments of wood; trace organic fines			
		2.8-3.0	B		2		FILL: SAND: subangular to subrounded, fine to medium grained, black mottled dark brown; trace gravel of brick, concrete, tile, plastic and glass; trace organic fines.			
					3		FILL: Sandy GRAVEL: angular to subrounded, fine to coarse grained gravel, red brown, of brick.			
					4		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, mottled grey brown; gravel, angular, medium to coarse grained, pale brown, of concrete and brick; trace silt, trace cobbles, trace boulders.			
					5		... at 5.20m, piece of chipboard			
					6		... at 6.70m, piece of chipboard			
					7		... at 6.90m, asbestos sheeting			
					8		... at 7.40m, cardboard and woody fragments			
					9		... at 8.80m, metal strapping			
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH02

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391304m N.6480526m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		11.4-11.5	B		11	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, mottled grey brown; gravel, angular, medium to coarse grained, pale brown, of concrete and brick; trace silt, trace cobbles, trace boulders.</p> <p>... at 11.20m, woody fibres ... at 11.30m, copper wire/electronic waste</p> <p>FILL: SAND: subangular to subrounded, fine to medium grained, black mottled brown; trace gravel of brick, concrete, tile, plastic and glass; trace organic fines.</p> <p>... from 12.20m to 12.70m, clay laminations, orange-brown, medium plasticity</p> <p>... from 13.30m to 13.60m, Sandy GRAVEL, pale grey, with fines</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained sand, white streaked pale grey. (Bassendean Sand)</p> <p>Borehole terminated at 14.5 m</p>				
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH03

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391116m N.6480372m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1 2 3 4 5 6 7 8 9 10		<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled brown; with gravel of brick and concrete, with cobbles, trace fines.</p> <p>... at 4.00m, wood fragment</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained sand, yellow. (Bassendean Sand)</p> <p>... from 7.80m to 9.00m, pale grey</p> <p>Borehole terminated at 9.0 m</p>			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 1 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		1.7-1.8	1 B		1		FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete.			
					2		... from 2.30m to 3.00m, black colour			
					3		... from 3.20m to 3.30m, PVC fragments			
					4					
					5					
		5.8-6.0	2 B		6		... at 6.00m, fragments of metal			
					7		... from 7.20m to 7.35m, trace wood fragments			
					8					
		8.3-8.5	3 B		9		... at 8.80m, chipboard			
					10		... from 9.50m to 10.20m, fragments of metal and wood			

Termination Reason: Target Depth Reached

Remarks:

BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 2 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations				
		Depth	Type & Results											
		12.5-12.8	5 B		11		FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete. ... from 11.60m to 11.80m, fragments of wood and plastic strapping ... from 12.30m to 12.45m, wood pieces ... from 14.50m to 15.00m, fragments of wood, wire and plastic strapping							
		17.1-17.3	6 B	12	13						... from 17.50m to 17.70m, fragments of wood			
		19.2-19.4	7 B	14	15									
					16									
					17									
					18									
					19									
					20									

D to M

Termination Reason: Target Depth Reached

Remarks:



BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 3 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21	 FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete.				
					21	 SP: SAND: fine to medium grained, pale grey, trace fines. (Bassendean Sand)		W		
						Borehole terminated at 21.0 m				
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target Depth Reached

Remarks:

BOREHOLE LOG - SH06

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391151m N.6480566m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled brown; with gravel of brick, concrete and plastic; trace cobbles, trace fines.			
		2.0-2.1	B		2		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, insulation fibres and plastic; with fines, trace cobbles.			
		3.5-3.6	B		4		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled brown; trace gravel of brick, concrete and plastic; trace cobbles, trace fines.			
					5					
					6					
					7					
					8		... at 8.00m, trace wood fragments			
					9					
					10					

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH06

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391151m N.6480566m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		10.7-11.2	B		11		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled brown; trace gravel of brick, concrete and plastic; trace cobbles, trace fines. ... at 10.20m, decomposed wood board ... from 10.60m to 11.70m, black; with plastic, metal, wood and brick; strong HS2 odour			
					12		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of limestone.			
					13					
					14		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	M to W		
					14		Borehole terminated at 14.0 m			
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH07

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391320m N.6480185m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		7.8-7.9	B		0.00		SW: SAND: subangular to subrounded, fine to coarse grained sand, dark grey; trace gravel.			0.00m: Grass on the surface
					6.30		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					6.30-6.45		... from 6.30m to 6.45m, crushed glass			
					7.30		... at 7.30m, wood fibres			
					9.00-9.50					9.00-9.50m: potential loose zone/perched groundwater. Continual collapse of the borehole
					10.00		Borehole terminated at 10.0 m			

Termination Reason: Hole collapse due to perched groundwater

Remarks:

BOREHOLE LOG - SH08

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391462m N.6480545m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		9.5-9.6	B		1 2 3 4 5 6 7 8 9 10	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, limestone, insulation fibres and plastic; trace fines, trace cobbles.</p> <p>... at 7.40m, fibreglass fragments</p>				

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH08

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391462m N.6480545m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, limestone, insulation fibres and plastic; trace fines, trace cobbles.			
					12					
					13		SW: SAND: subangular to subrounded, fine to coarse grained sand, pale grey streaked dark grey. (Bassendean Sand)			
					14					
					15		Borehole terminated at 15.0 m			
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH09

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391133m N.6480217m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		2.5-2.6	B		1 2		FILL: SAND: subangular to subrounded, fine to coarse grained, brown streaked grey brown; trace gravel, of concrete and brick; trace fines.			0.00m: Grass on the surface
		7.0-7.1	B		3 4 5 6 7 8		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, brown mottled grey black; gravel, angular to subrounded, fine to coarse grained, of concrete, bitumen, limestone and brick; trace silt, with cobbles, trace boulders. ... at 2.20m, wood fragments ... from 7.20m to 7.20m, fibrous insulation ... from 7.50m to 7.90m, with glass and carpet			
					9		SW: SAND: subangular to subrounded, fine to coarse grained sand, white streaked pale grey. (Bassendean Sand)			
					10		Borehole terminated at 9.0 m			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH10

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391587m N.6480114m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.8-6.9	B		1 2 3 4 5 6 7 8 9 10		<p>SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled yellow brown; trace gravel of brick and concrete; trace cobbles.</p> <p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; with cobbles, trace boulders, trace fines.</p> <p>... from 5.60m to 5.70m, wood fragments and copper wire</p> <p>... at 6.60m, metal sheeting ... at 6.70m, plastic bag</p> <p>... at 8.90m, wood fragments</p> <p>... from 9.80m to 10.00m, carpet</p>			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH10

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391587m N.6480114m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		16.1-16.2	B		11	<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; with cobbles, trace boulders, trace fines.</p> <p>... at 11.40m, wood fragments</p> <p>... at 12.40m, wood fragments</p> <p>... at 15.80m, wood fragments</p> <p>... from 18.20m to 18.50m, trace root matter</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained, pale grey streaked dark grey. (Bassendean Sand)</p> <p>Borehole terminated at 19.5 m</p>				
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH11

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391438m N.6480355m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		2.1-2.2	B		1 2 3 4	<p>SW: SAND: subangular to subrounded, fine to coarse grained, brown; trace gravel of brick and concrete.</p>			0.00m: Grass on the surface	
		8.2-8.3	B		5 6 7 8 9 10	<p>... from 5.00m to 5.80m, becoming dark brown streaked black</p> <p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines.</p> <p>... at 6.90m, wood fragment</p> <p>... at 7.40m, styrofoam fragment</p> <p>... at 7.90m, aluminium can</p> <p>... at 8.50m, wood fragment</p>	D to M			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH11

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391438m N.6480355m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations	
		Depth	Type & Results								
		15.2-15.3	B		11		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines. ... at 10.00m, plastic sheeting ... from 11.00m to 12.00m, trace carpet and wood fragments				
					12			FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained, grey and red; gravel, angular to subrounded, fine to coarse grained, of brick and concrete; with cobbles, trace boulders, trace fines.			
					13			FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines. ... at 15.70m, metal fragments			
					14						
					15						
					16						
					17						
					18						
					19		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	W			
					20		Borehole terminated at 19.5 m				

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH12

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391203m N.6480239m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of concrete.			
					2		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	D to M		
					3					
					4					
					4.5		Borehole terminated at 4.5 m	W		
					5					
					6					
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH14

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391357m N.6480081m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.7-6.8	B		1 2 3 4 5 6 7 8 9 10					

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH14

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391357m N.6480081m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)		M		
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50

Sheet 1 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					0		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of concrete.			
					1		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					2					
					3					
					4					
					5					
					6		... at 5.90m, wood fragments			
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		18.2-18.3	B		11 12 13 14 15 16 17 18 19 20	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.</p>				
								D to M		

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 3 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					22		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					23			M to W		
					24		Borehole terminated at 24.0 m			
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.7-6.8	B		1		FILL: SAND: subangular to subrounded, fine to coarse grained, pale brown mottled pale brown; trace gravel of limestone and concrete.			
					2		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					3					
					4		... from 3.80m to 4.00m, with glass fragments			
					5				D to M	
					6		... from 5.50m to 5.80m, chipboard			
					7					
					8					
					9		... at 9.10m, wood fragment			
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	... from 10.90m to 11.10m, with glass fragments	FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					12					
					13					
					14					
					15					
					16					
					17					
					18	... from 17.70m to 17.90m, wood fragments	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					19			M to W		
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 3 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
							Borehole terminated at 21.0 m			
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH17

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391245m N.6480192m Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11		SAND: subangular to subrounded, fine to coarse grained sand, brown, trace fine to medium grained gravel, of iron cemented sand. (Bassendean Sand)			
						... from 11.00m to 12.00m, becoming white				
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH18

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391493m N.6480063m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled yellow brown; trace gravel, trace fines.	D to M		
				2						
				3			FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark grey brown streaked red; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.	W		
				4						
				5						
				6						
				7						
				8						
				9						
				10						

Termination Reason: Equipment refusal

Remarks:

BOREHOLE LOG - SH18

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391493m N.6480063m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		17.3-17.4	B		11 12 13 14 15 16 17 18 19 20	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark grey brown streaked red; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.</p> <p>... at 11.40m, wood fragments</p> <p>FILL: SAND: fine to medium grained sand, pale brown, with silt.</p> <p>Borehole terminated at 18.5 m</p>	M		18.00m: increase in ground vibrations / hard drilling	

Termination Reason: Equipment refusal

Remarks:

BOREHOLE LOG - SH19

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391307m N.6480247m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		3.8-4.3	B		1 2 3 4 5 6 7 8 9 10		<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark grey brown mottled black; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled dark grey brown; trace gravel, with fines. ... from 3.80m to 4.30m, blue grey, trace clay</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)</p>	M		
Borehole terminated at 9.0 m										

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH20

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391127m N.6480292m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1 2 3 4 5 6 7 8 9 10	<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled black; with gravel of brick and concrete; trace cobbles, trace fines.</p> <p>... at 4.10m, carpet</p> <p>... at 6.10m, plastic sheet</p>				

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH20

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391127m N.6480292m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)		W		
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH21

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391149m N.6480150m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		4.6-4.7	B		1 2 3 4 5 6 7 8 9 10		<p>FILL: SAND: subangular to subrounded, fine to coarse grained sand, grey brown mottled brown, trace fine to medium grained gravel, trace fines.</p> <p>... from 4.60m to 4.90m, pale brown, silty sand lens</p> <p>SAND: subangular to subrounded, fine to coarse grained sand, brown, trace fine to medium grained gravel, of iron cemented sand. (Bassendean Sand)</p>	D to M		
Borehole terminated at 9.0 m										

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH22

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391243m N.6480592m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		3.5-3.6	B		1 2 3 4 5 6 7 8 9 10	<p>FILL: SAND: angular to subangular, fine to coarse grained sand, angular, medium to coarse grained gravel, dark brown mottled black, with fine to coarse grained gravel, with cobbles, of concrete, brick, bitumen, tile, and plastic; trace boulders, of concrete. ... at 0.60m, plastic liner</p> <p>... at 3.40m, wood fragments</p> <p>... at 4.50m, plastic strapping</p> <p>... at 6.40m, steel wire</p>				

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH22

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391243m N.6480592m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	[Cross-hatched pattern]	FILL: SAND: angular to subangular, fine to coarse grained sand, angular, medium to coarse grained gravel, dark brown mottled black, with fine to coarse grained gravel, with cobbles, of concrete, brick, bitumen, tile, and plastic; trace boulders, of concrete. ... at 10.50m, wood fragment			
					12	[Dotted pattern]	SAND: subangular to subrounded, fine to coarse grained sand, white. (Bassendean Sand)			
					13					
					14				M to W	
					15		Borehole terminated at 15.0 m			
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH23

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 3

Logged by: DJP Position: E.391540m N.6480151m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					0		FILL: SAND: subangular to subrounded, fine to coarse grained sand, brown mottled yellow brown, trace fine to coarse grained gravel, trace cobbles, of brick and concrete.			
					1		FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained sand, dark brown black mottled grey brown, trace fine to coarse grained gravel, with cobbles, trace boulders, of brick, glass and concrete; trace fines.			
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH23

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 3 of 3

Logged by: DJP Position: E.391540m N.6480151m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained sand, dark brown black mottled grey brown, trace fine to coarse grained gravel, with cobbles, trace boulders, of brick, glass and concrete; trace fines.			
					22		SAND: subangular to subrounded, fine to coarse grained sand, white. (Bassendean Sand)			
					23			M to W		
					24		Borehole terminated at 24.0 m			
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

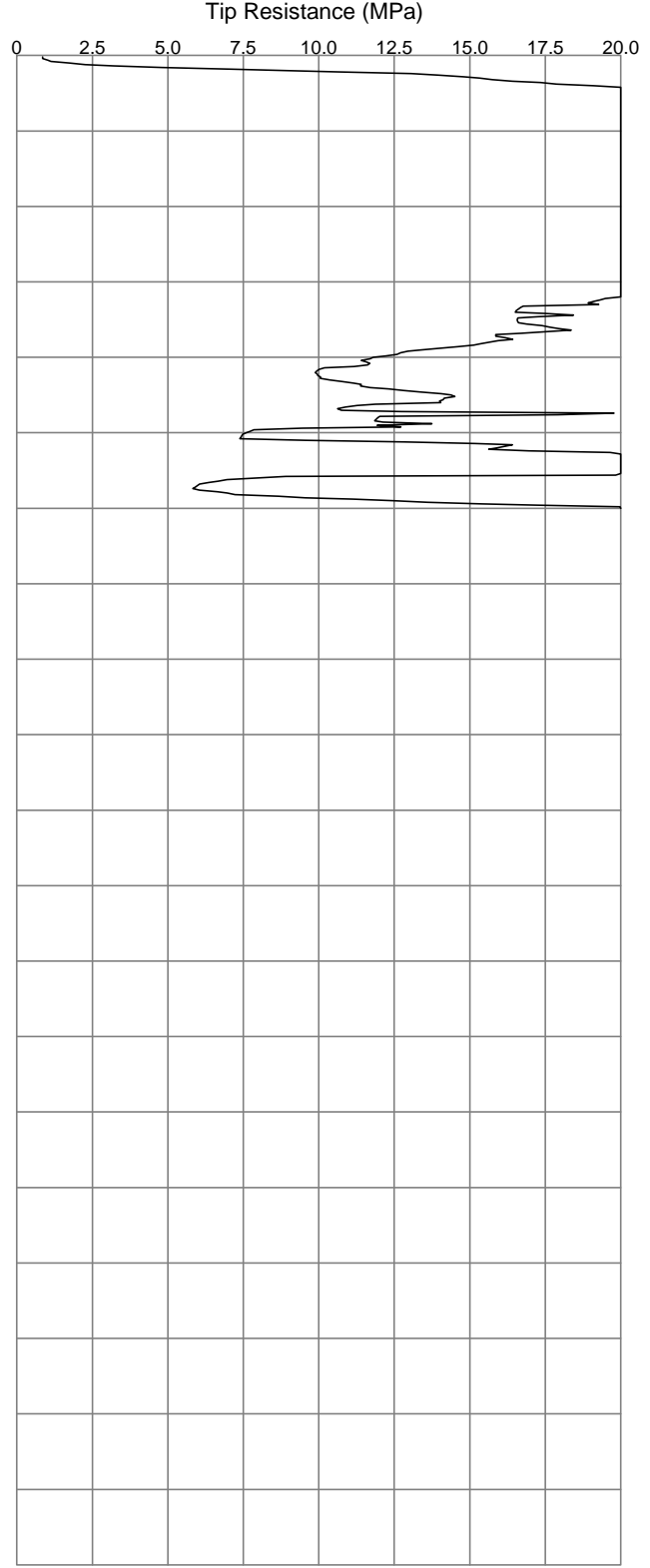
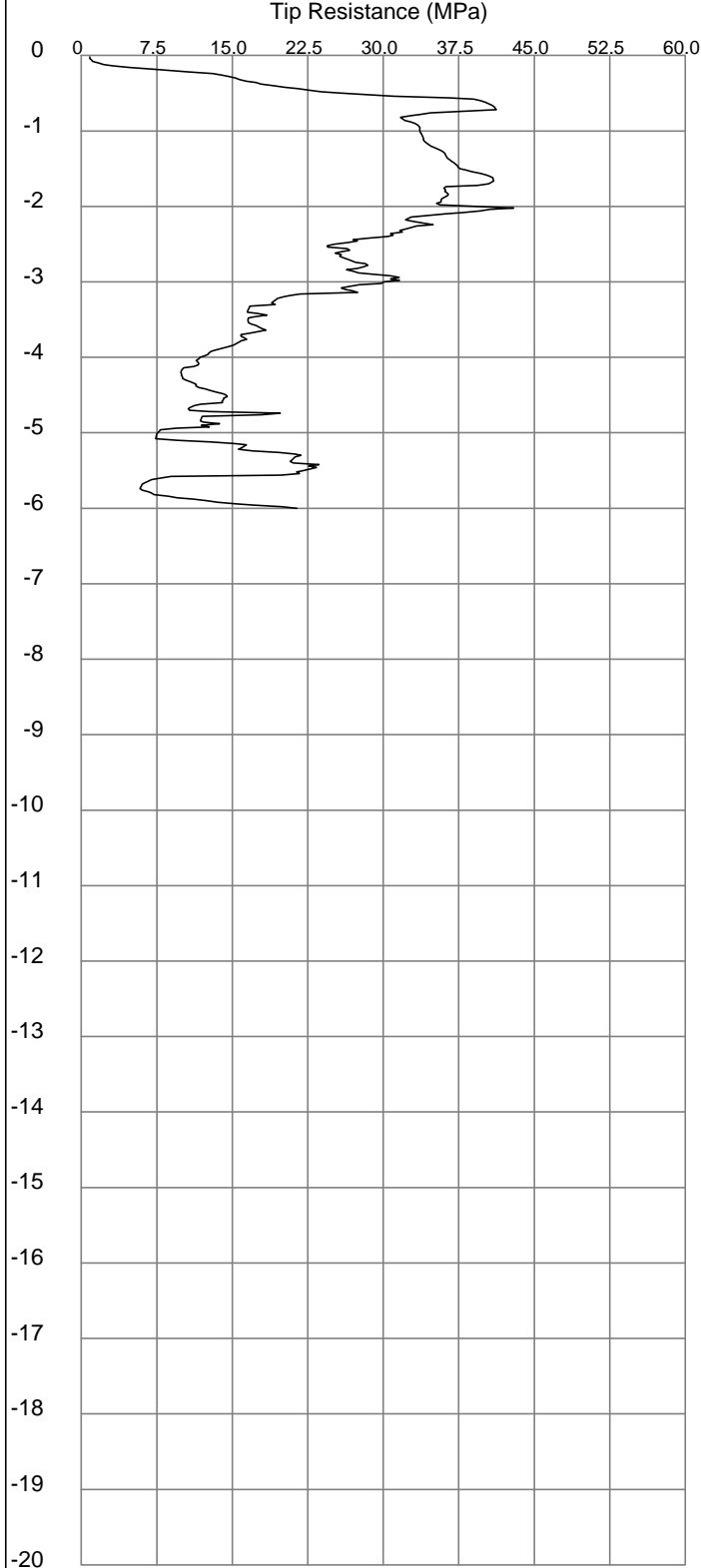


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Hole open to depth (m) -	Total depth (m) 6.00	Operator Brad	Sounding No. CPT 01
R/L = 45.54m AHD		Groundwater Level (m) -	Cone No. 100709M		File 1
Co ordinate: X= 391142.38 Y= 6480211.86		Pre Drilled depth (m)	Probe Rig PR001		Date Completed 28-8-2017
Co-ordinates in MGA94 Z50					



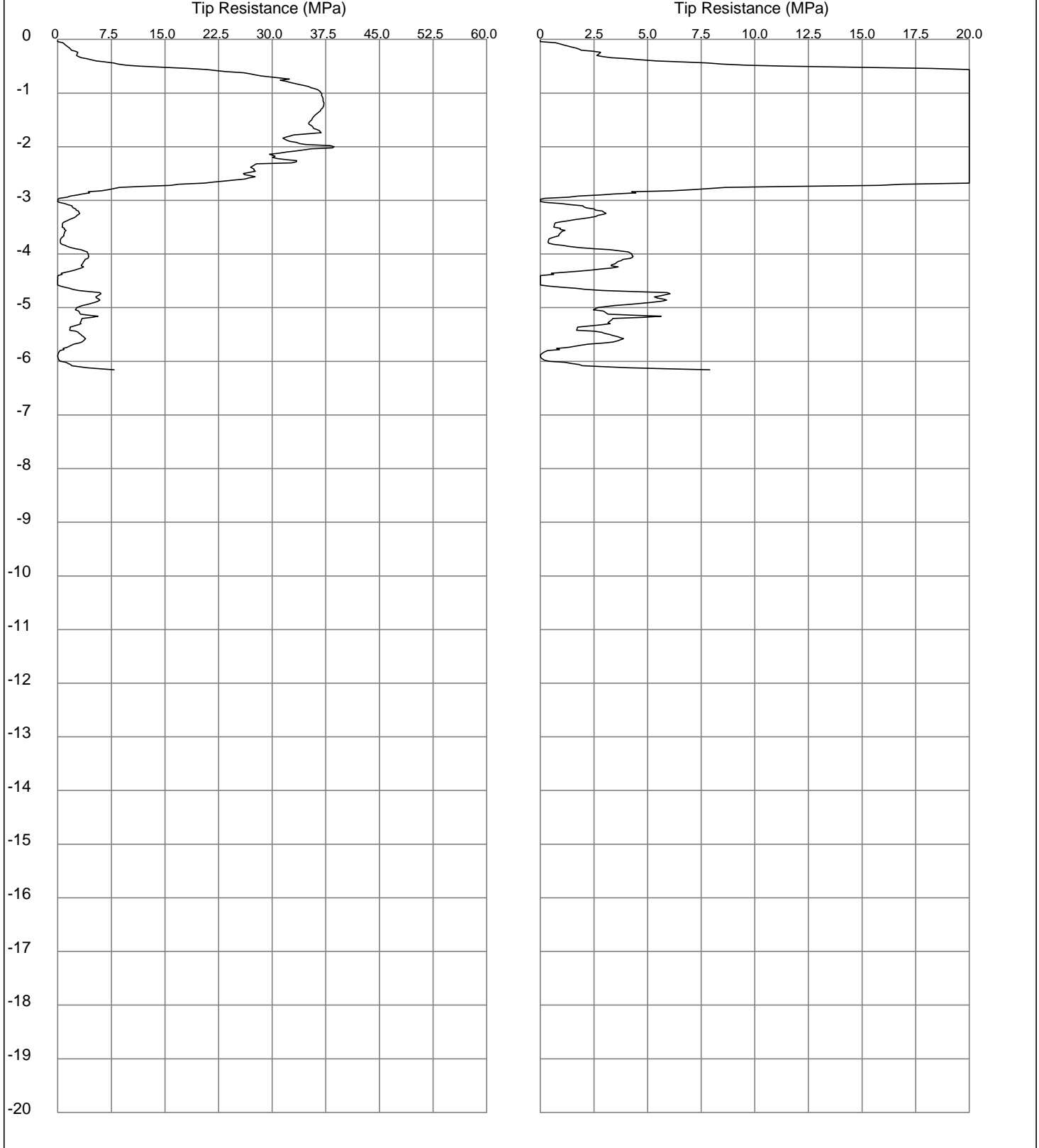


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 02	
R/L = 58.56m AHD	Hole open to depth (m) -	Total depth (m) 6.16	Operator Brad
Co ordinate: X= 391549.35 Y= 6480187.70	Groundwater Level (m) -	Cone No. 100709M	File 2
Co-ordinates in MGA94 Z50	Pre Drilled depth (m) -	Probe Rig PR001	Date Completed 28-8-2017



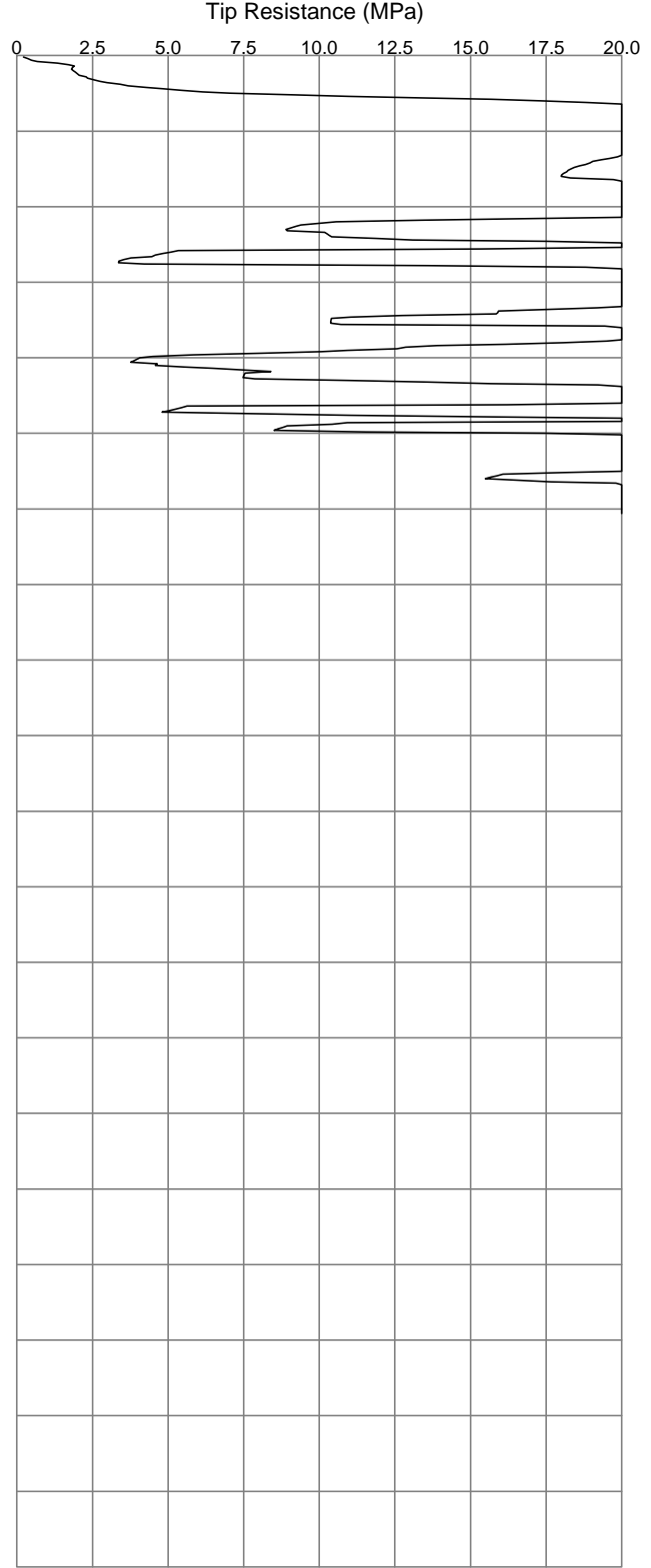
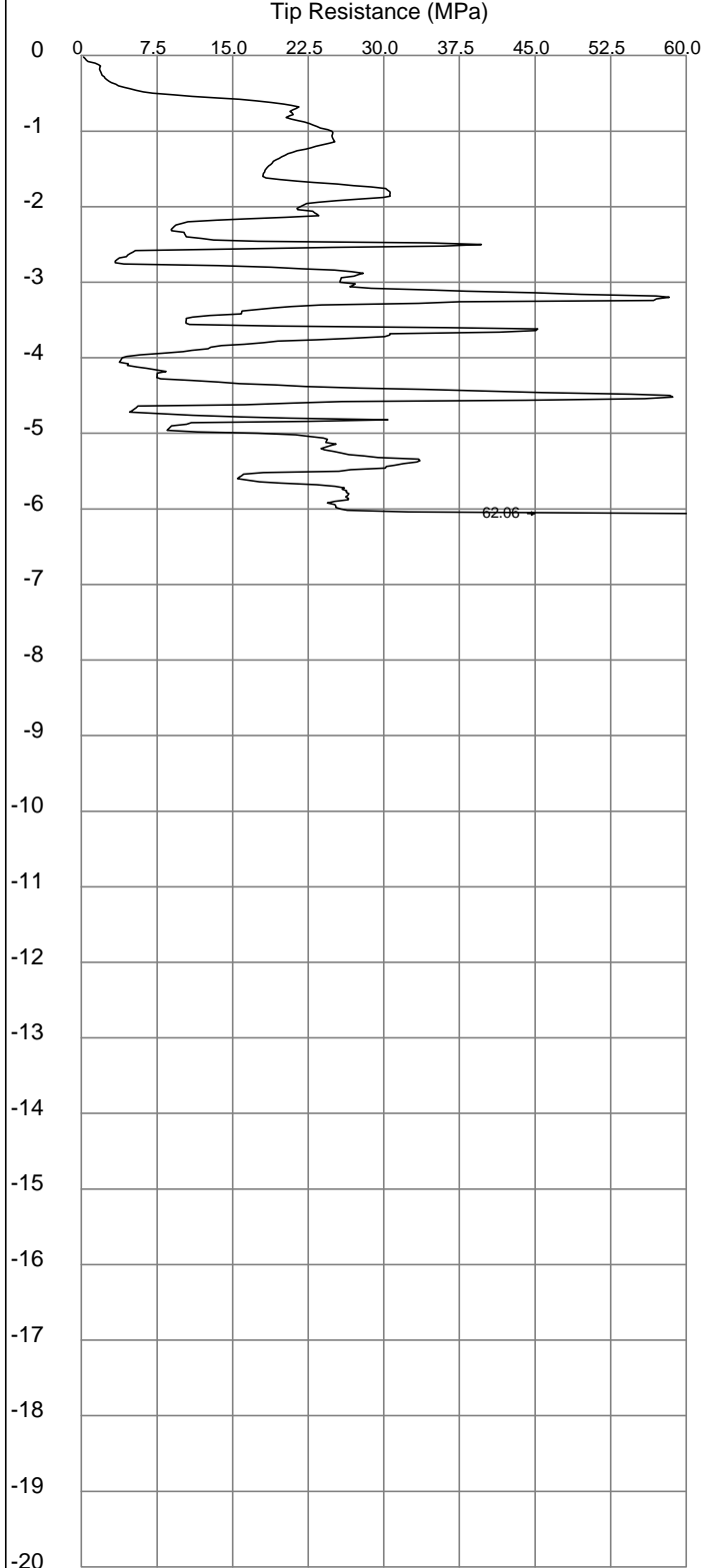


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 02A	
R/L = 58.45m AHD	Hole open to depth (m) -	Total depth (m) 6.06	Operator Brad
Co ordinate: X= 391549.70 Y= 6480187.48	Groundwater Level (m) -	Cone No. 100709M	File 3
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



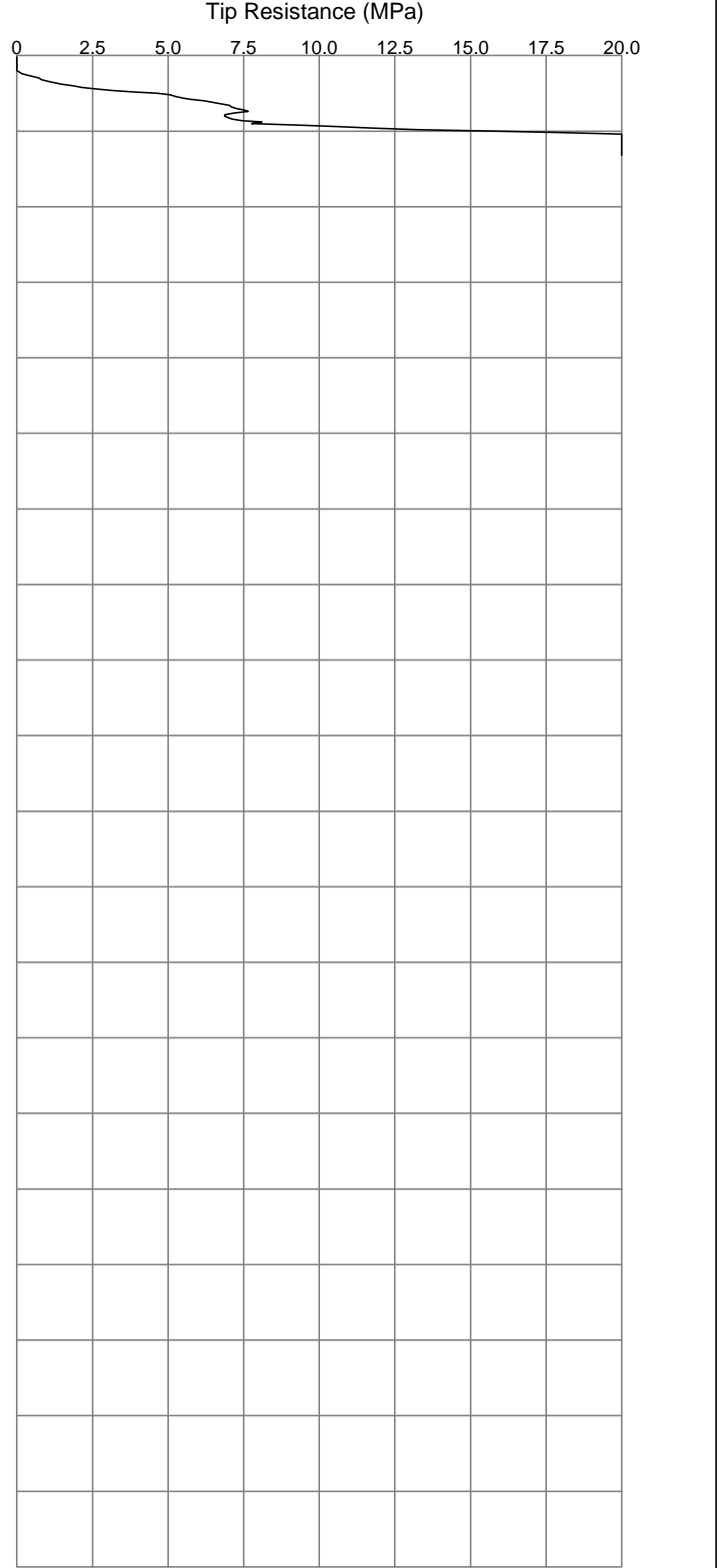
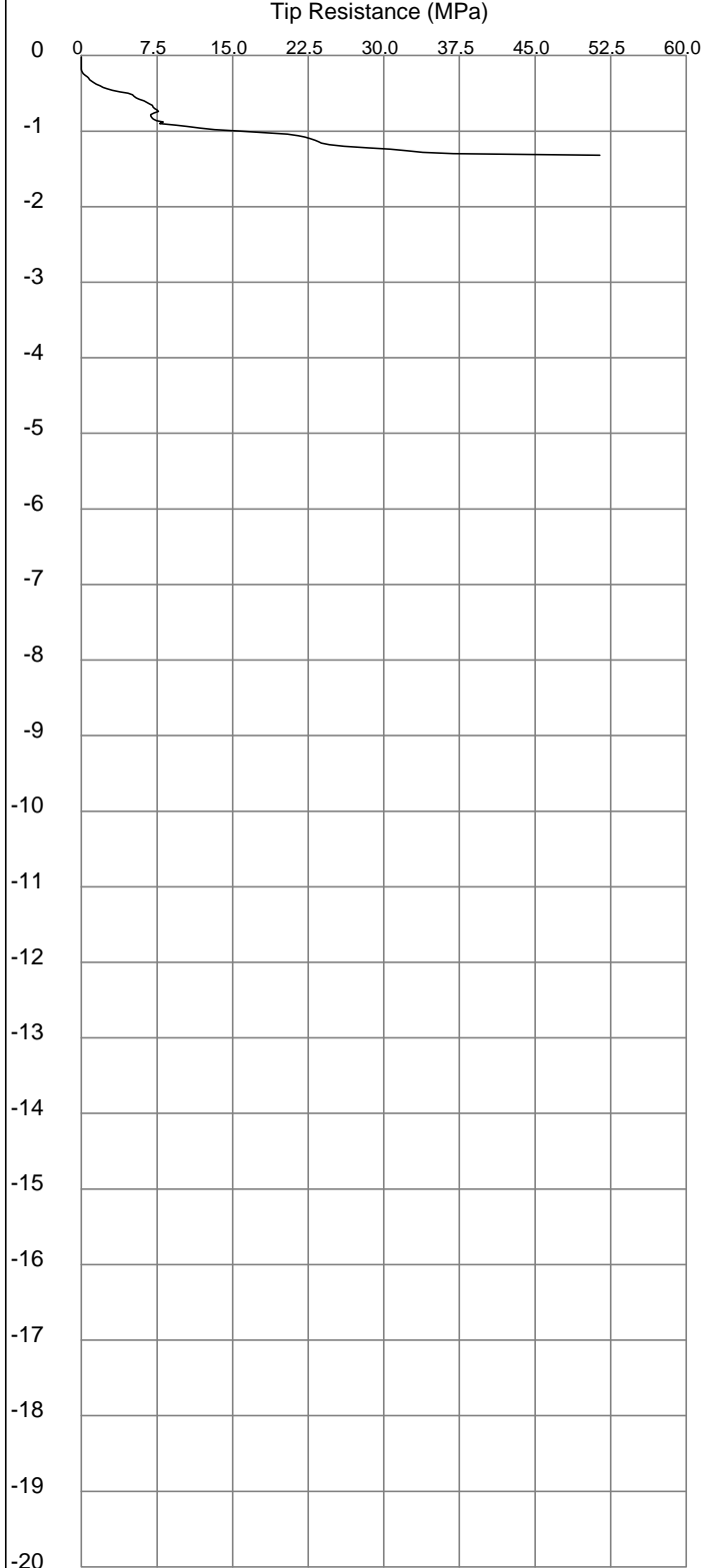


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 03	
R/L = 57.56m AHD	Hole open to depth (m) -	Total depth (m) 1.32	Operator Brad
Co ordinate: X= 391567.17 Y= 6480253.55	Groundwater Level (m) -	Cone No. 100709M	File 4
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



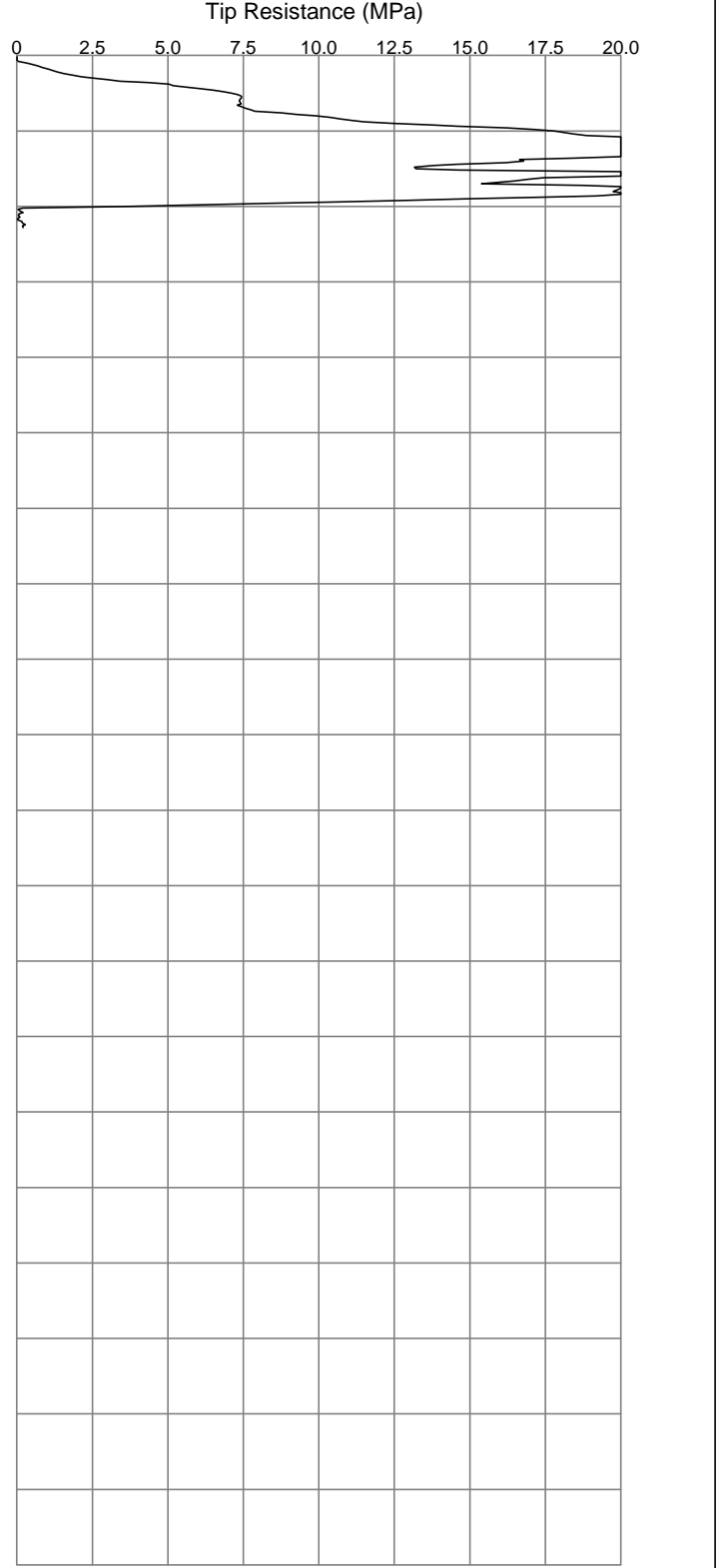
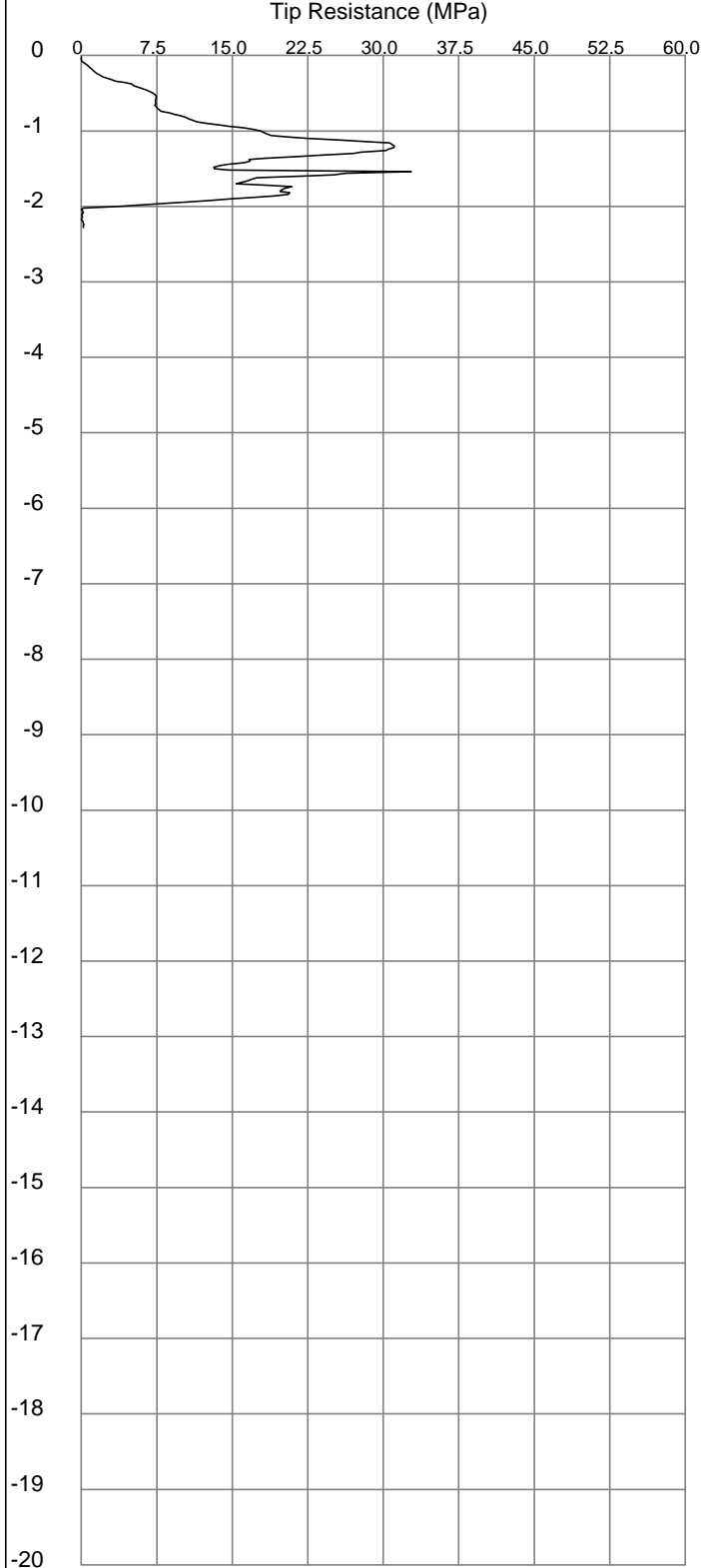


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 03A	
R/L = 57.46m AHD	Hole open to depth (m) -	Total depth (m) 2.28	Operator Brad
Co ordinate: X= 391568.09 Y= 6480256.79	Groundwater Level (m) -	Cone No. 100709M	File 5
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



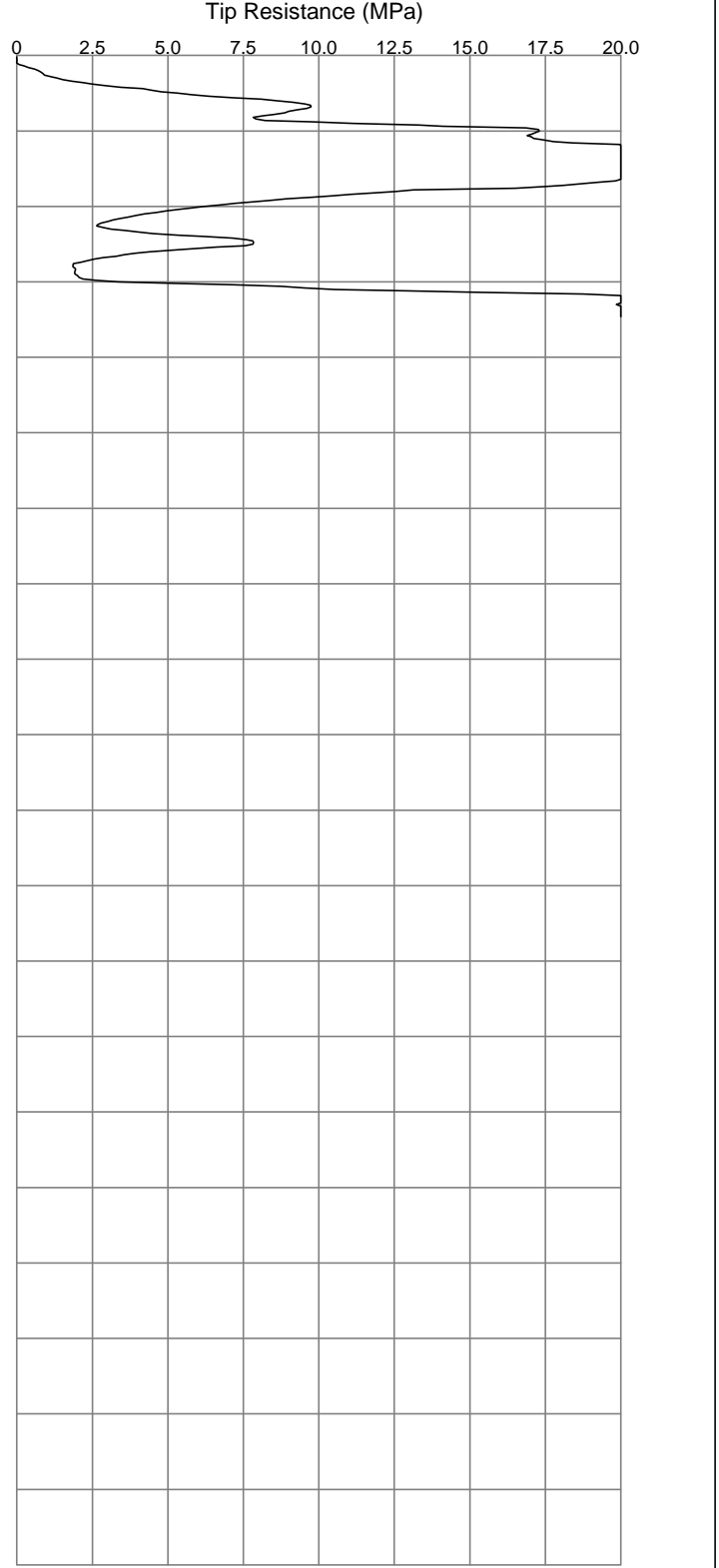
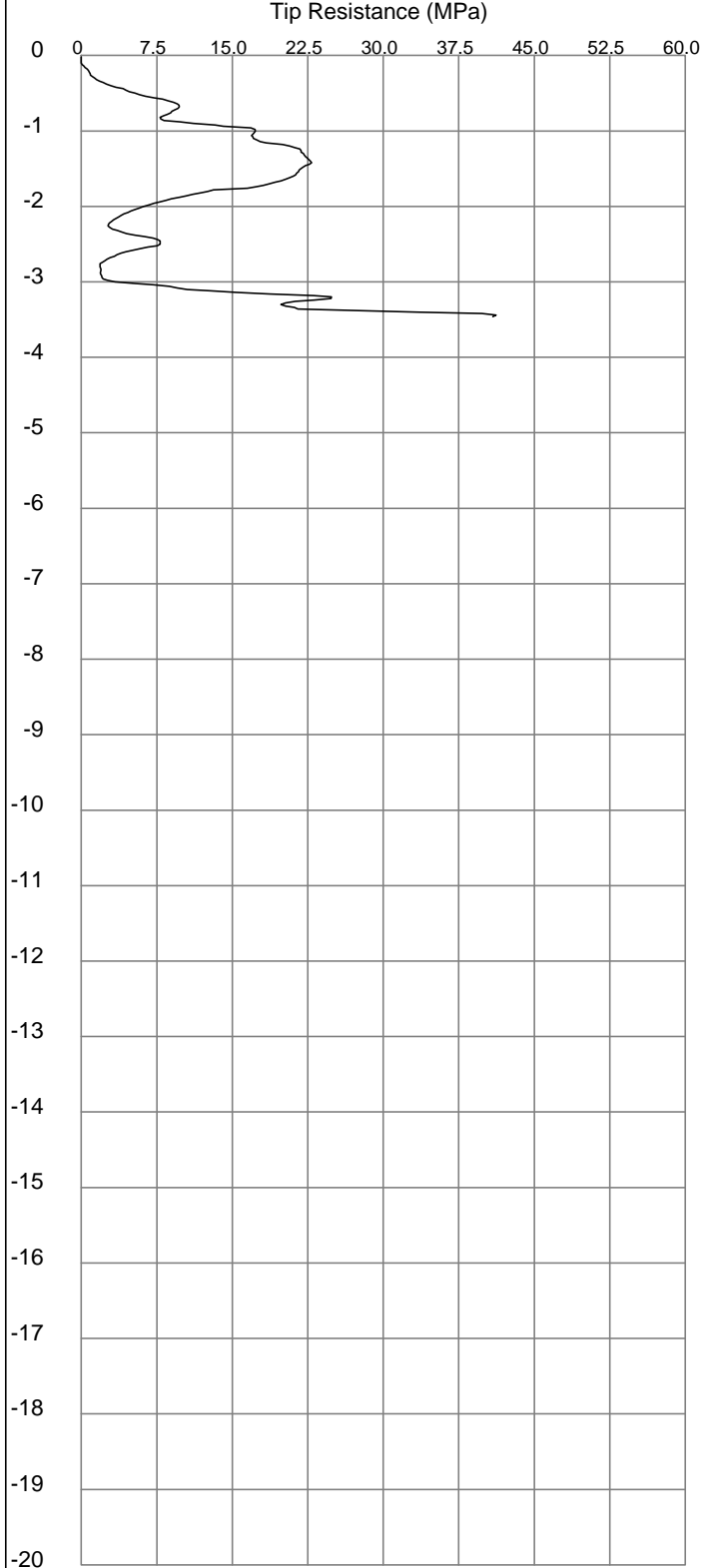


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 04	
R/L = 55.11m AHD	Hole open to depth (m) -	Total depth (m) 3.46	Operator Brad
Co ordinate: X= 391656.71 Y= 6480423.06	Groundwater Level (m) -	Cone No. 100709M	File 6
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



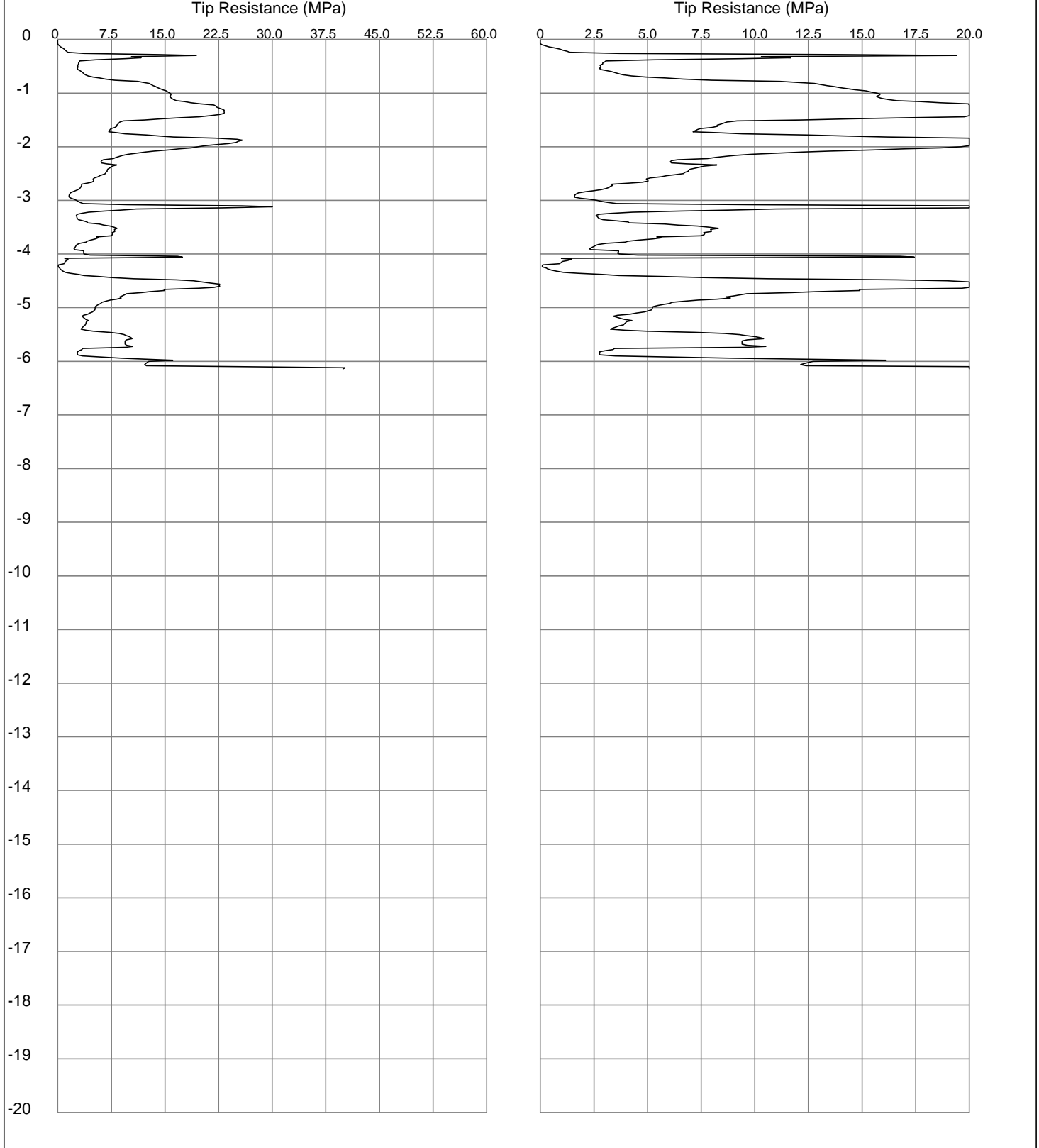


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 05	
R/L = 53.88m AHD	Hole open to depth (m) -	Total depth (m) 6.14	Operator Brad
Co ordinate: X= 391670.88 Y= 6480535.93	Groundwater Level (m) -	Cone No. 100709M	File 7
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



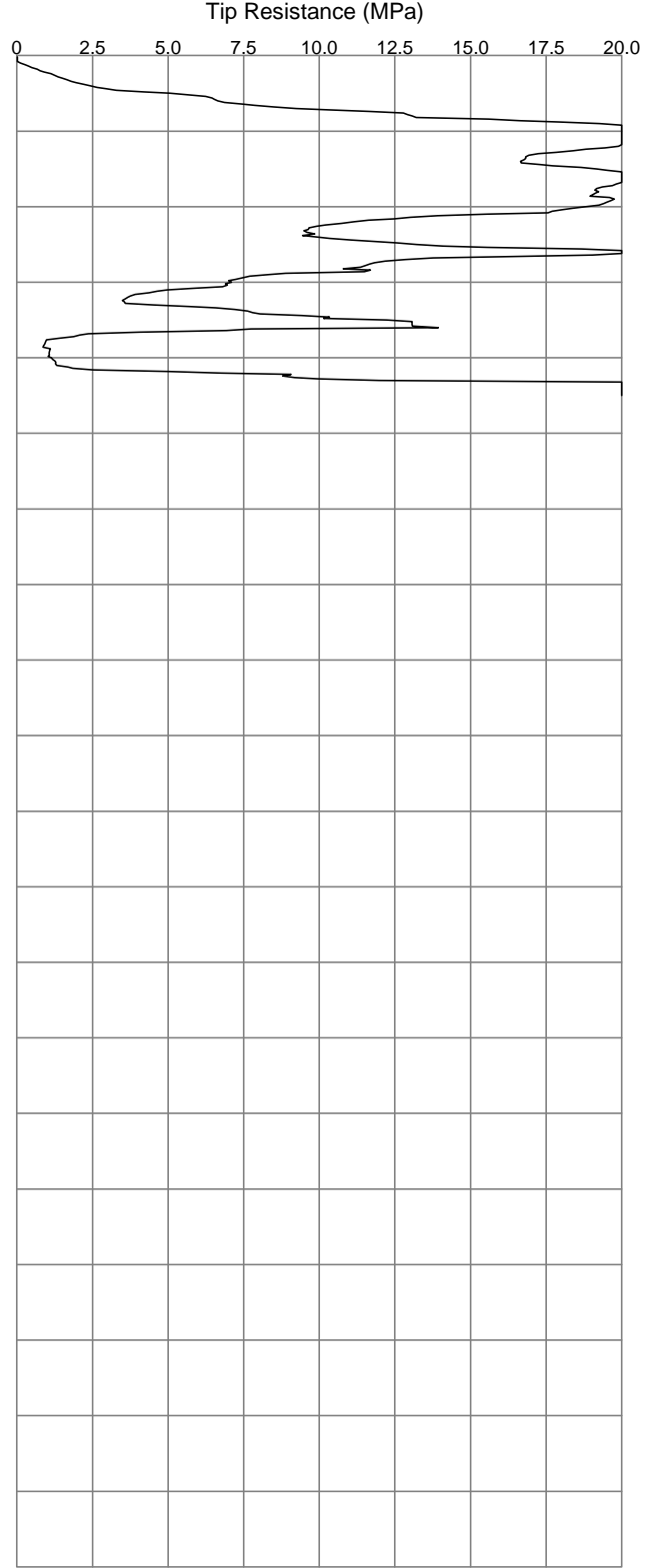
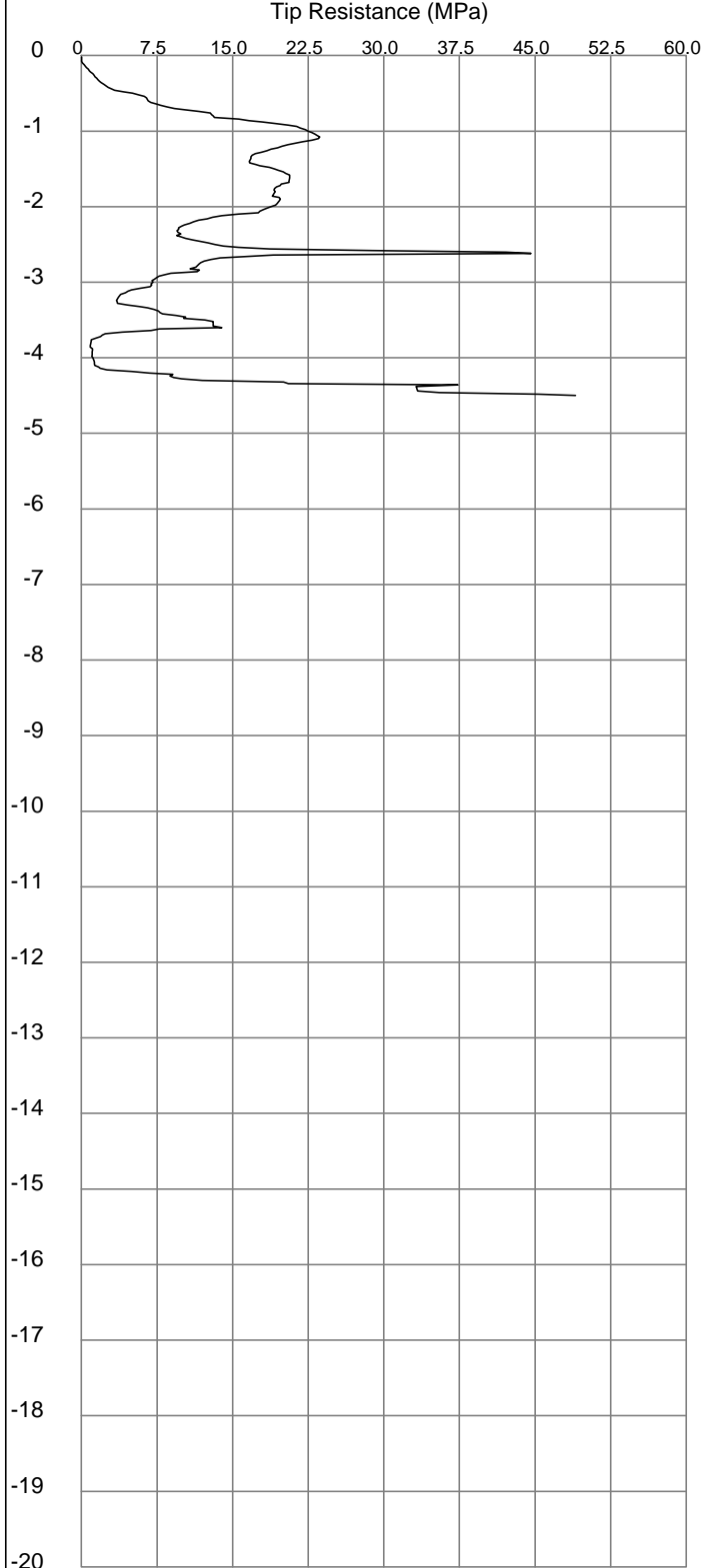


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 06	
R/L = 51.89m AHD	Hole open to depth (m) -	Total depth (m) 4.50	Operator Brad
Co ordinate: X= 391554.02 Y= 6480533.14	Groundwater Level (m) -	Cone No. 100709M	File 8
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



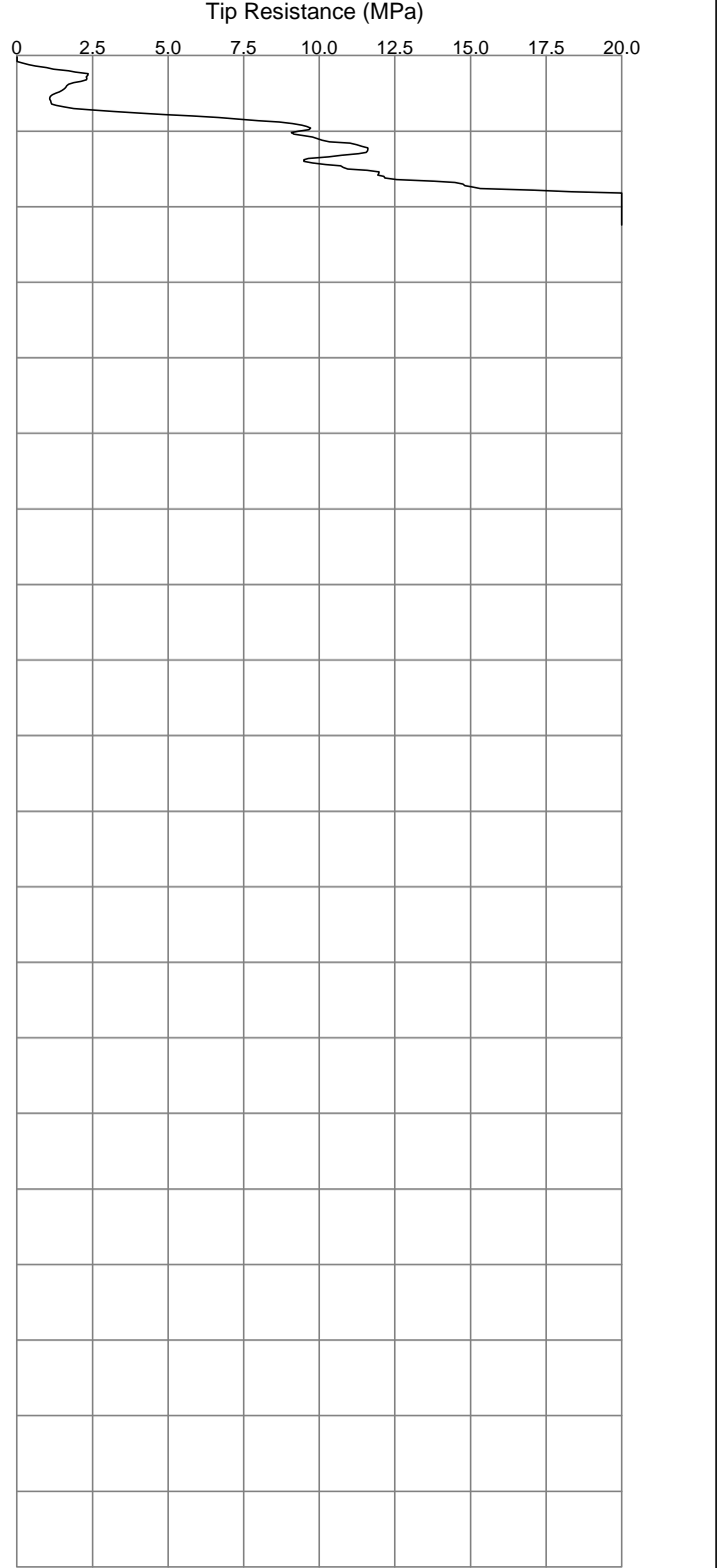
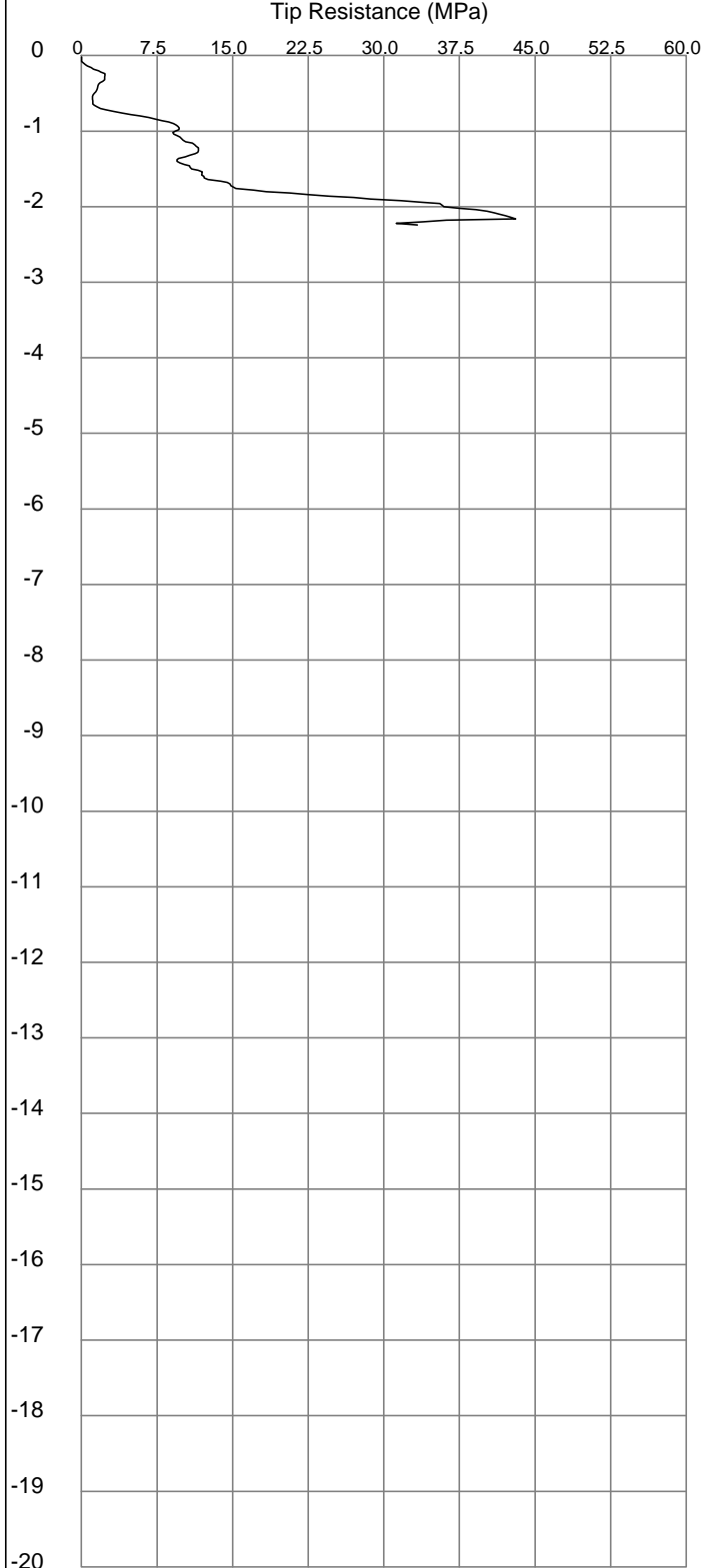


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 07	
R/L = 52.96m AHD	Hole open to depth (m) -	Total depth (m) 2.24	Operator Brad
Co ordinate: X= 391484.92 Y= 6480434.75	Groundwater Level (m) -	Cone No. 100709M	File 9
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



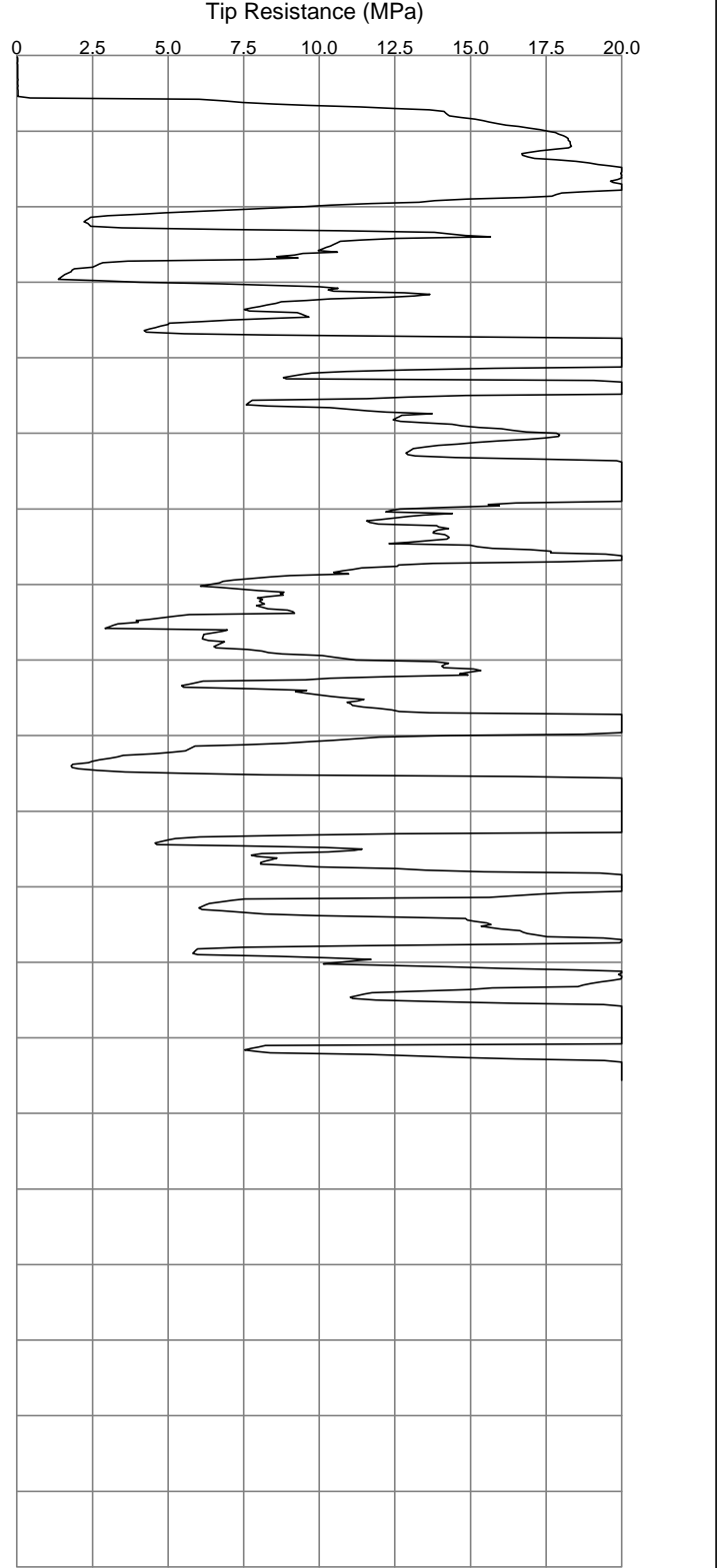
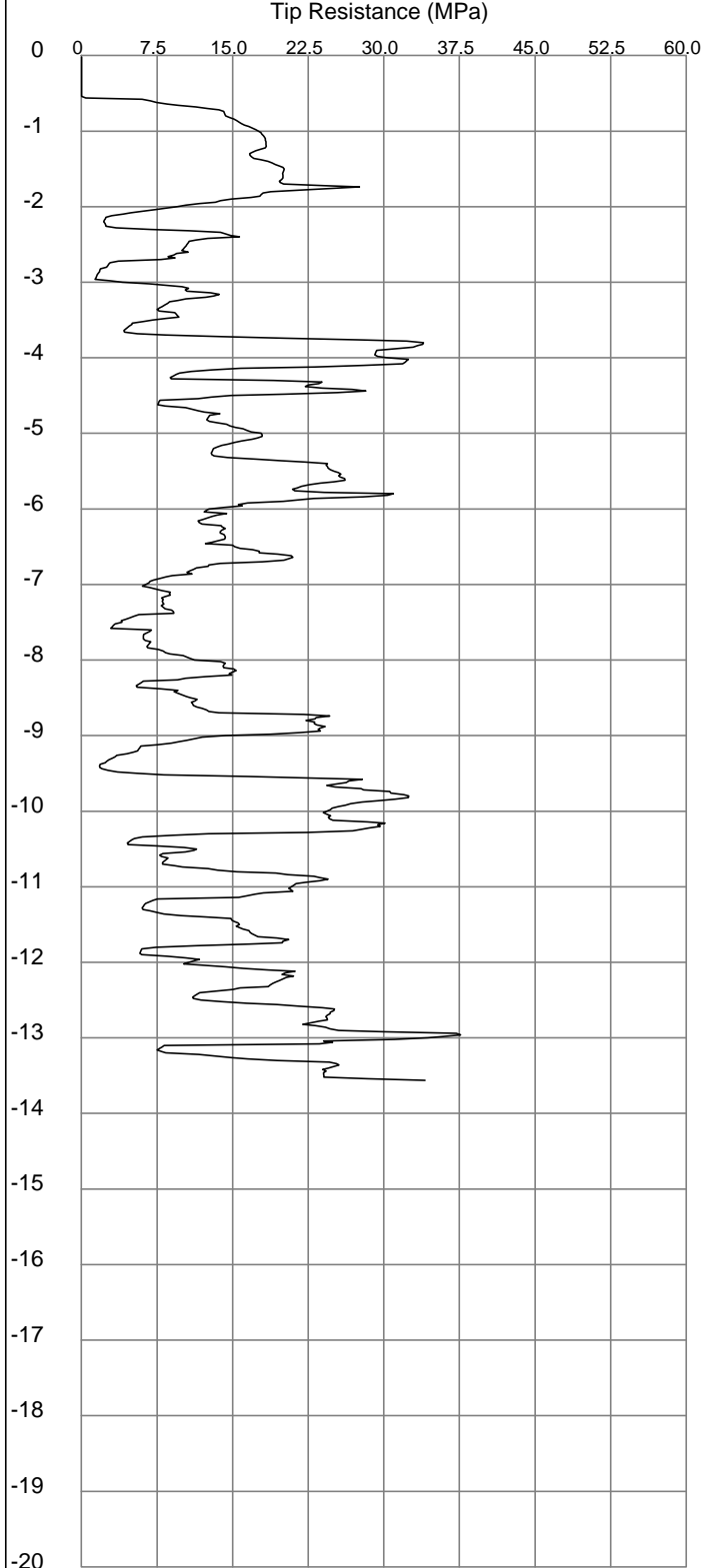


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Sounding No. CPT 08	
R/L = 58.43m AHD	Hole open to depth (m) 6.50	Total depth (m) 13.56	Operator Brad
Co ordinate: X= 391554.96 Y= 6480071.87	Groundwater Level (m) -	Cone No. 100709M	File 10
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



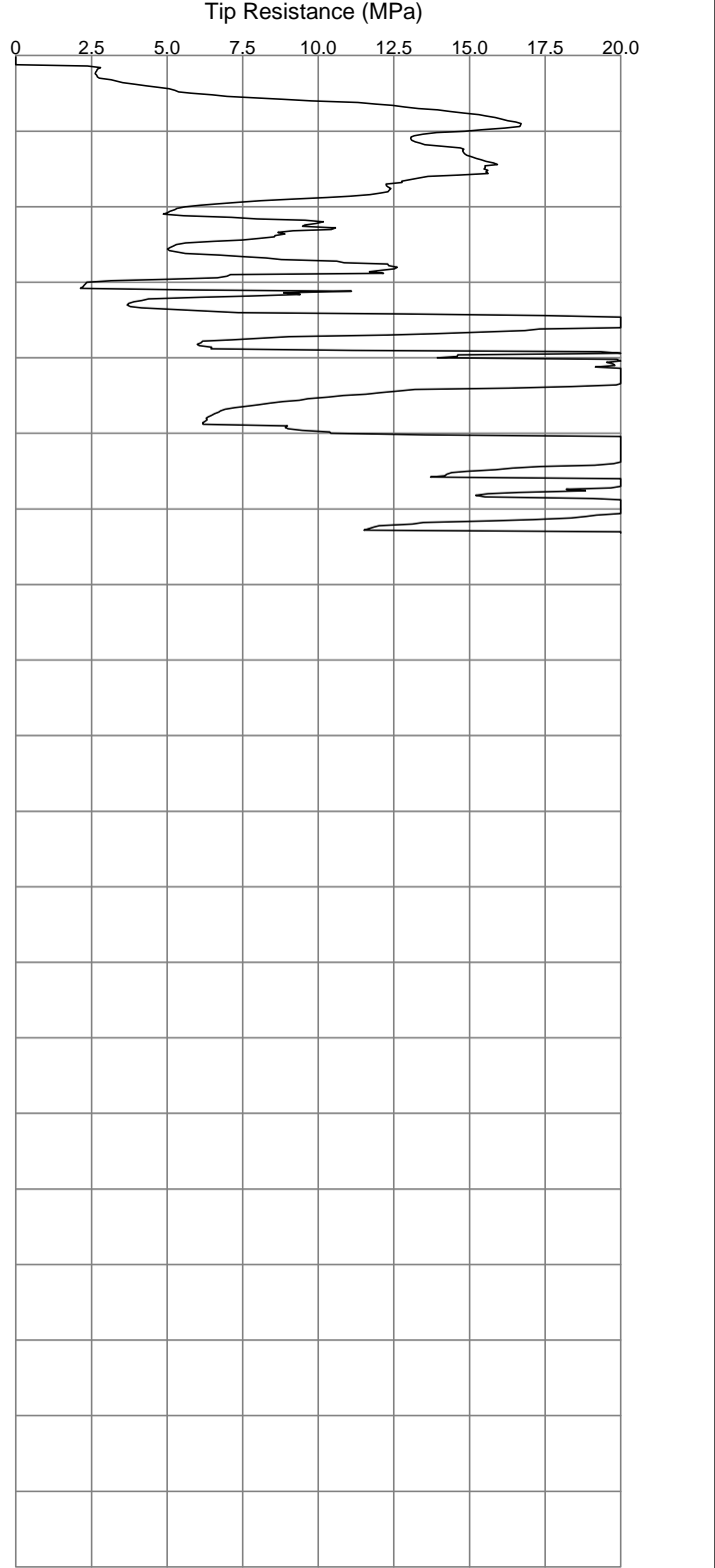
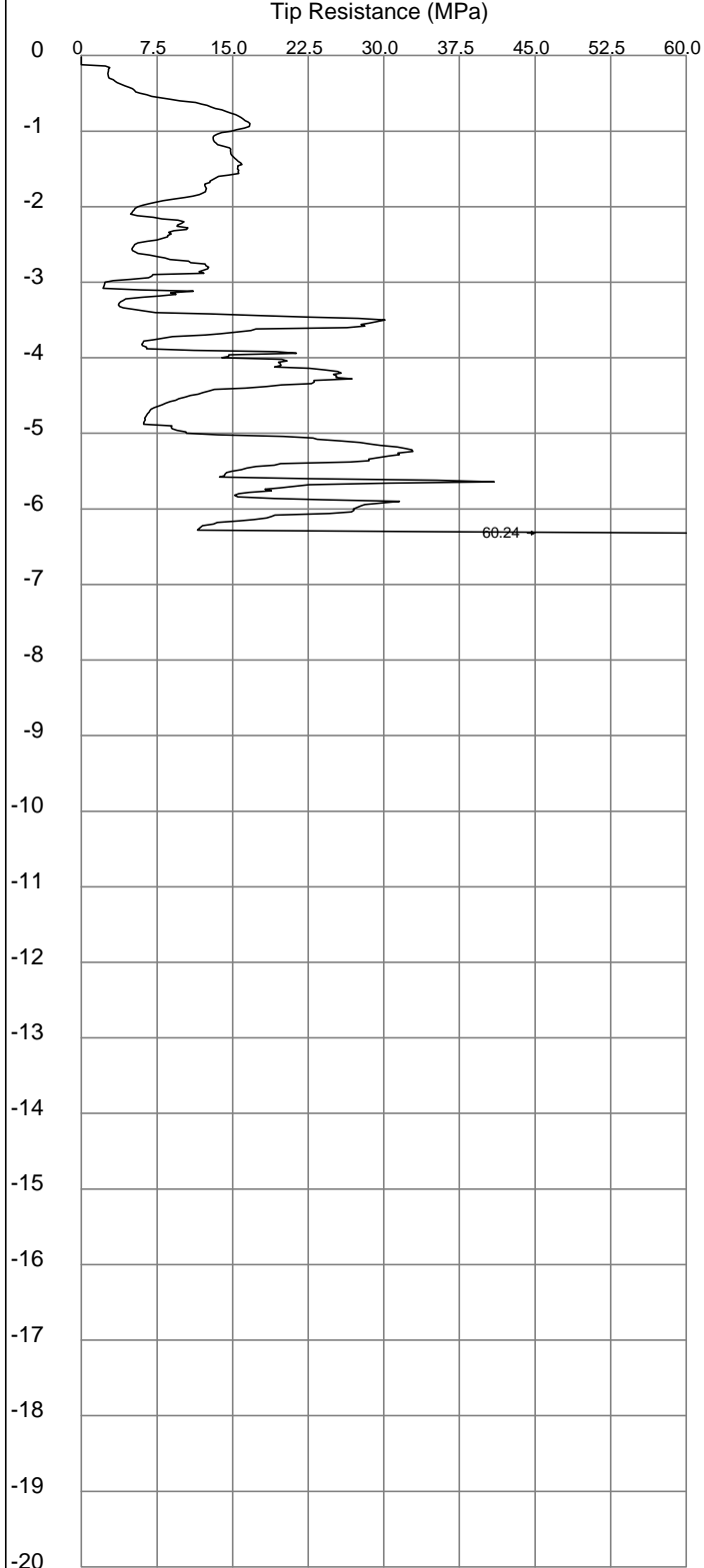


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 09	
R/L = 50.92m AHD	Hole open to depth (m) -	Total depth (m) 6.32	Operator Brad
Co ordinate: X= 391396.69 Y= 6480147.23	Groundwater Level (m) -	Cone No. 100709M	File 11
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



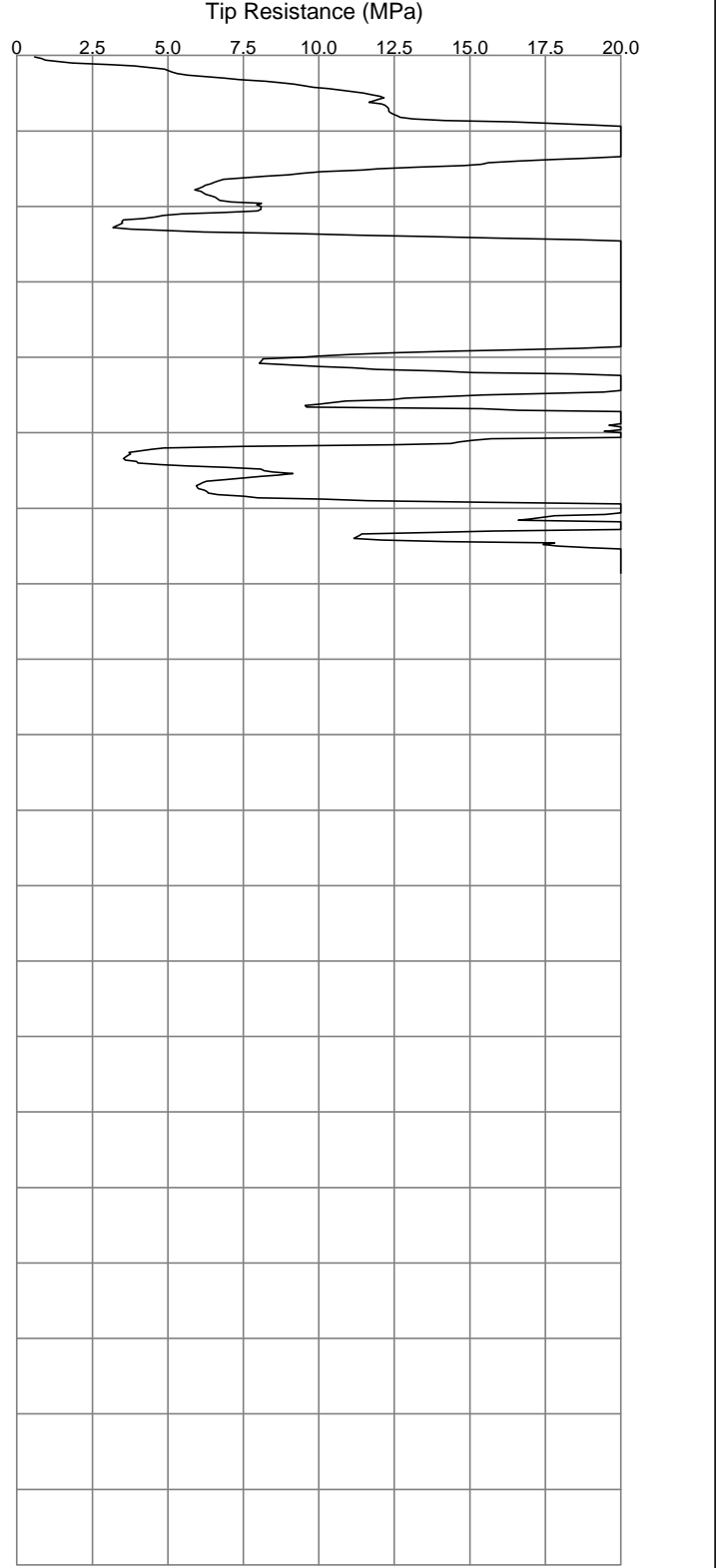
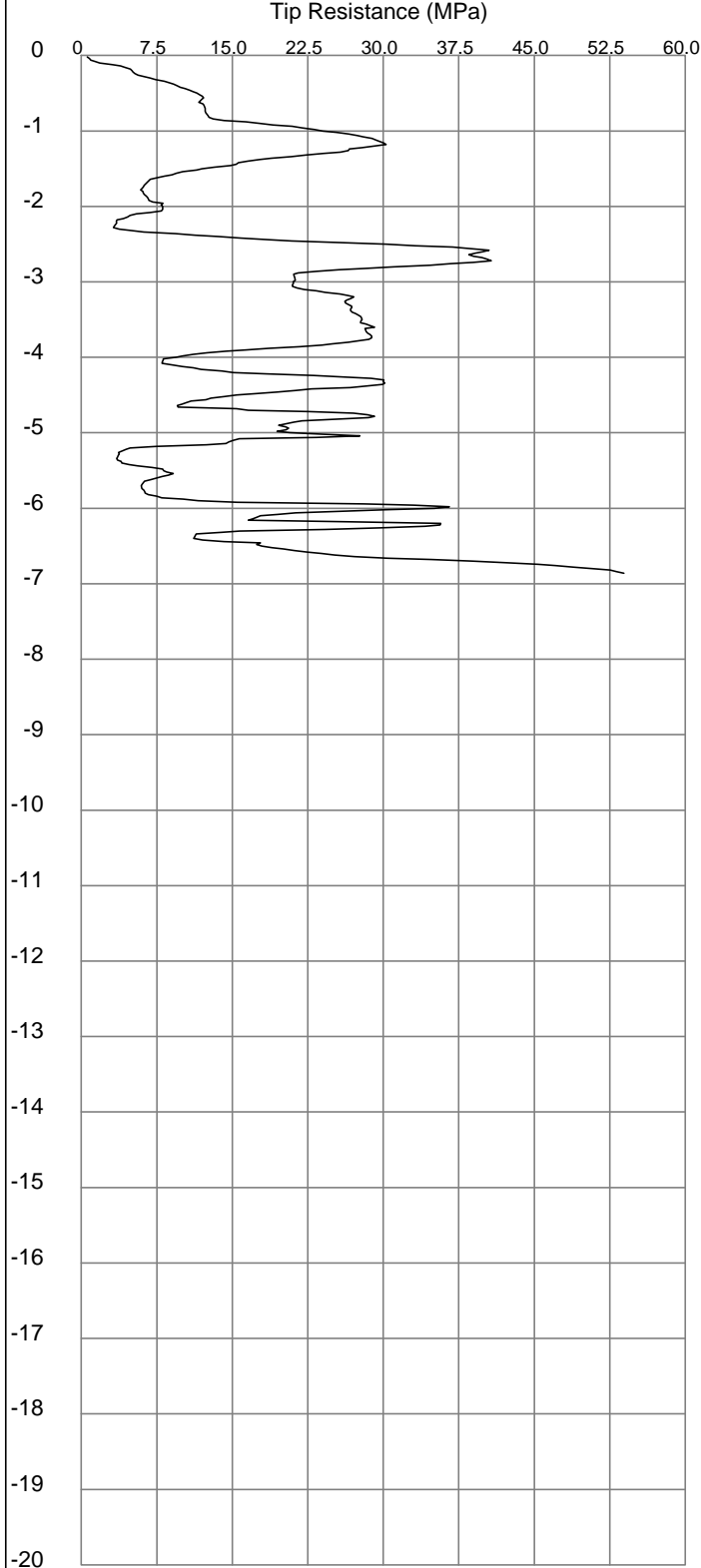


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Sounding No. CPT 10	
R/L = 44.38m AHD	Hole open to depth (m) -	Total depth (m) 6.86	Operator Brad
Co ordinate: X= 391284.99 Y= 6480100.95	Groundwater Level (m) -	Cone No. 100709M	File 12
Co-ordinates in MGA94 Z50	Pre Drilled depth (m) -	Probe Rig PR001	Date Completed 13-9-2017



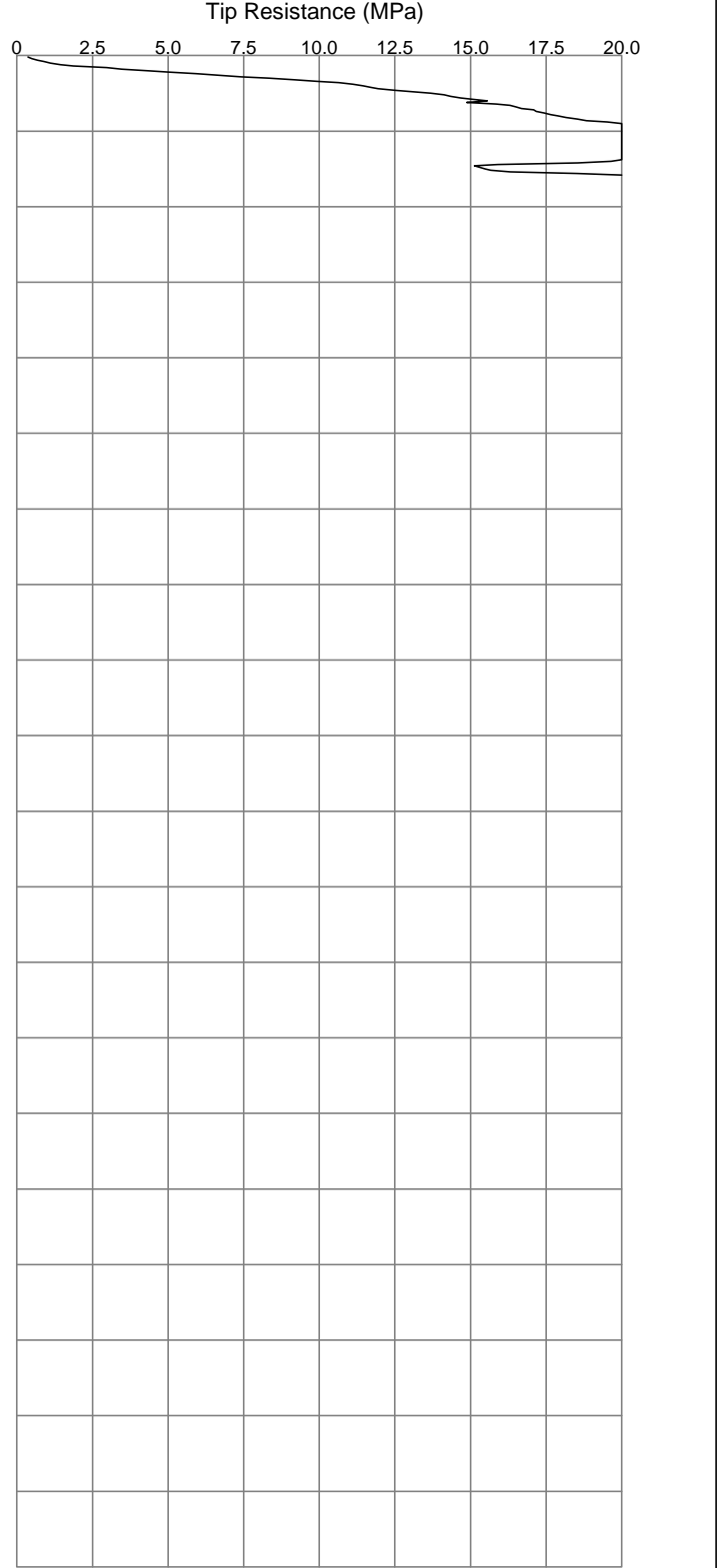
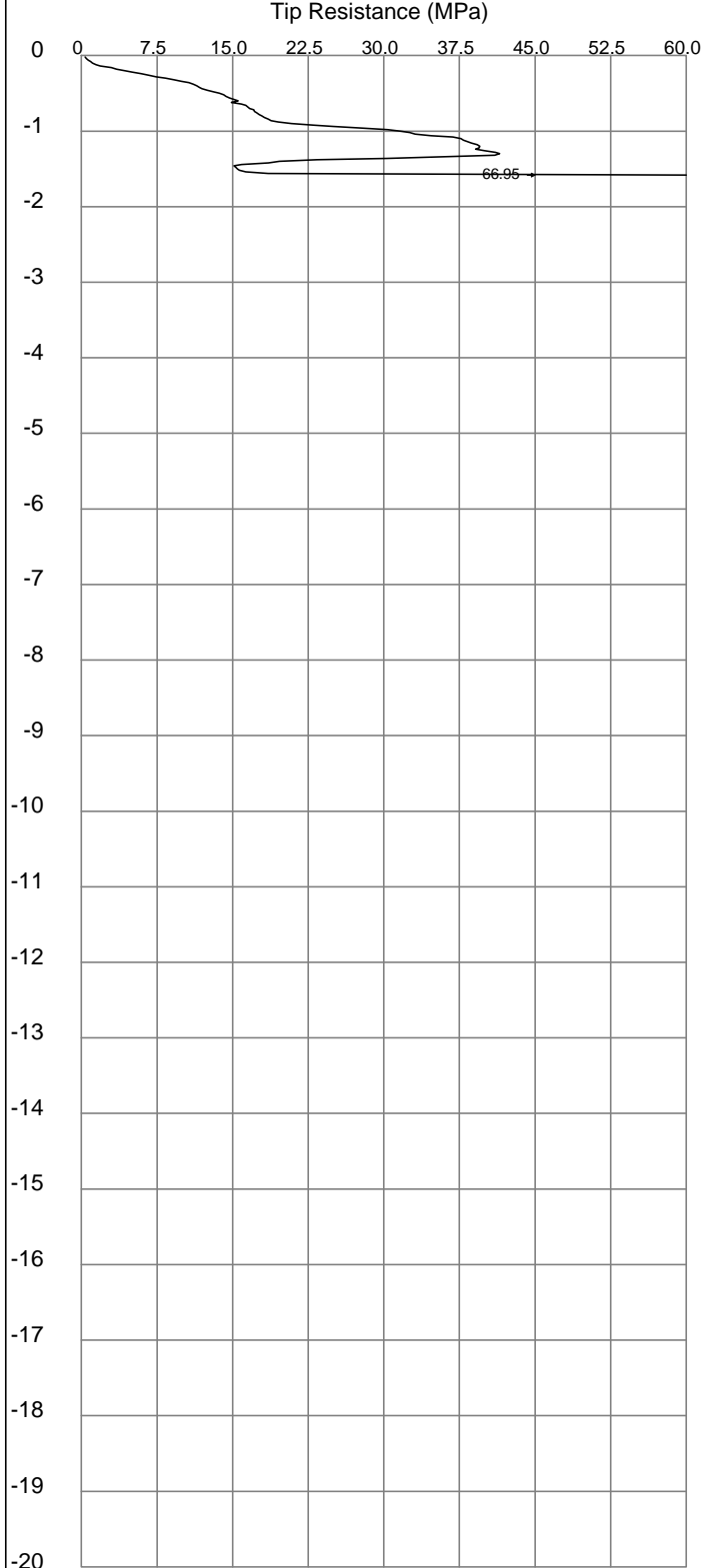


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 11	
R/L = 42.46m AHD	Hole open to depth (m) -	Total depth (m) 1.58	Operator Brad
Co ordinate: X= 391152.37 Y= 6480101.53	Groundwater Level (m) -	Cone No. 100709M	File 13
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



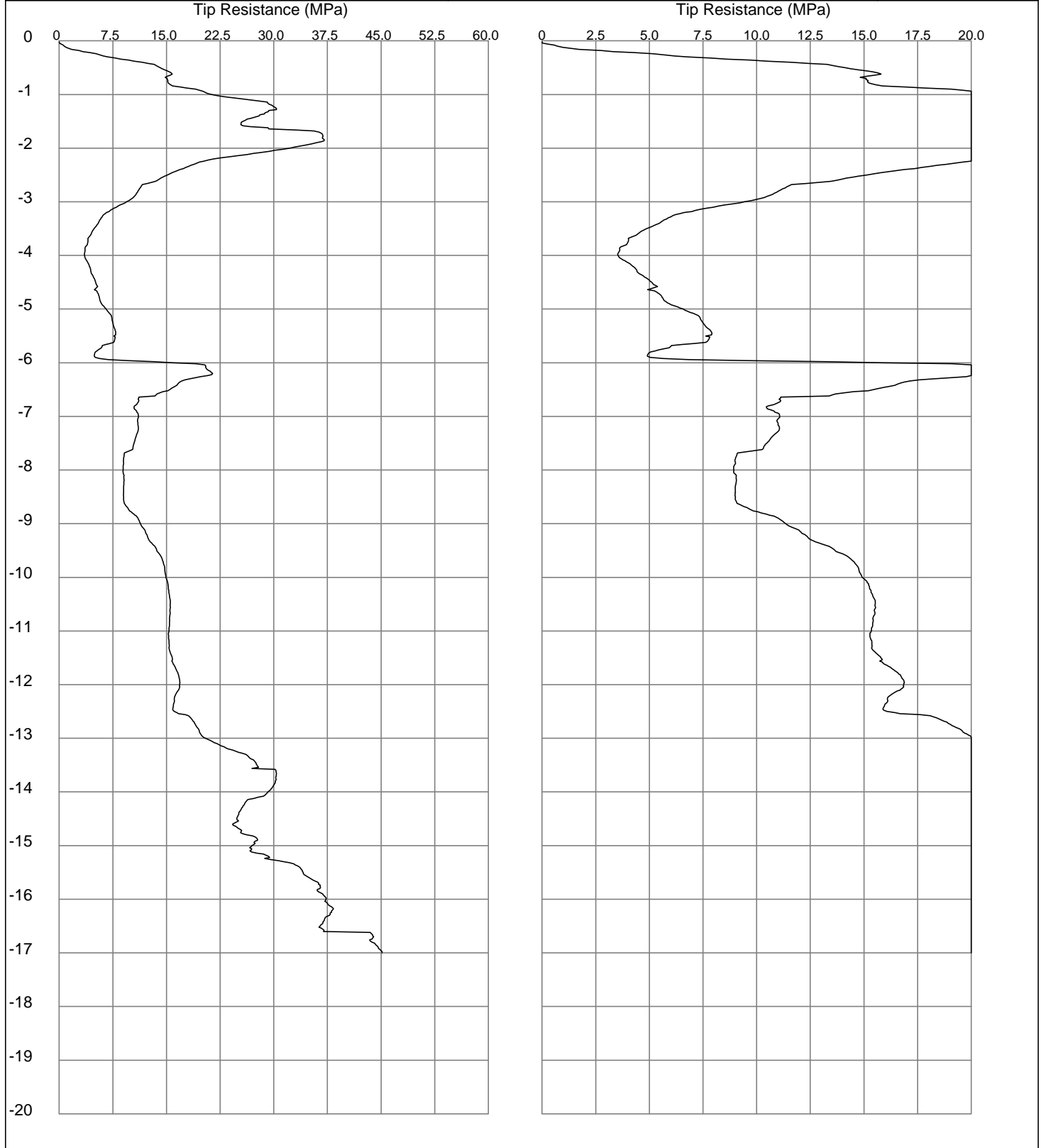


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks	Hole open to depth (m) 4.10	Total depth (m) 17.00	Operator Brad	Sounding No. CPT 11A
R/L = 42.44m AHD		Groundwater Level (m) 4.00	Cone No. 100709M		File 14
Co ordinate: X= 391149.07 Y= 6480101.94		Pre Drilled depth (m)	Probe Rig PR001		Date Completed 13-9-2017
Co-ordinates in MGA94 Z50					



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TESTED IN ACCORDANCE WITH AS 1289.6.5.1999

FRICITION REDUCER USED -42 MM

PR001 - 20 TONNE REACTION FRAME PR002 - 16 TONNE REACTION FRAME

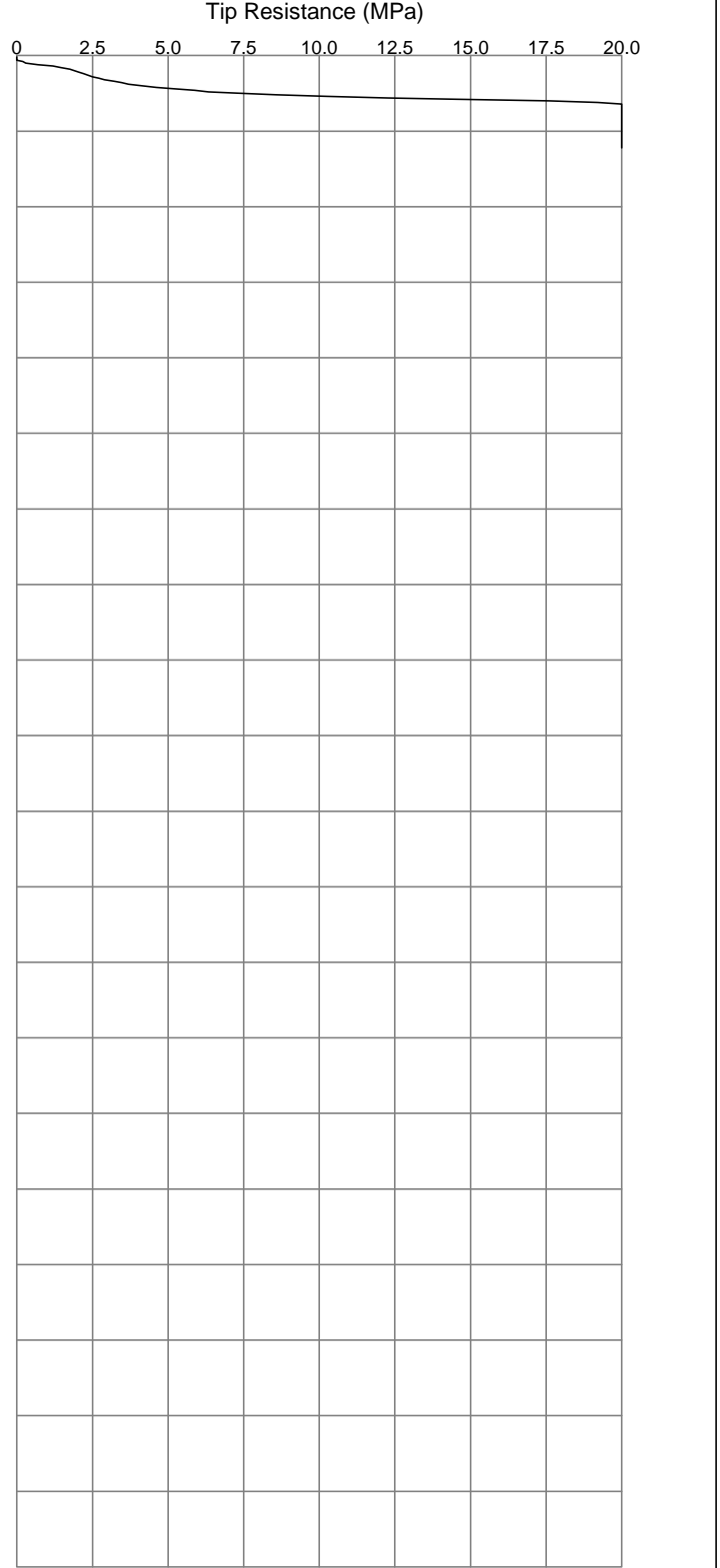
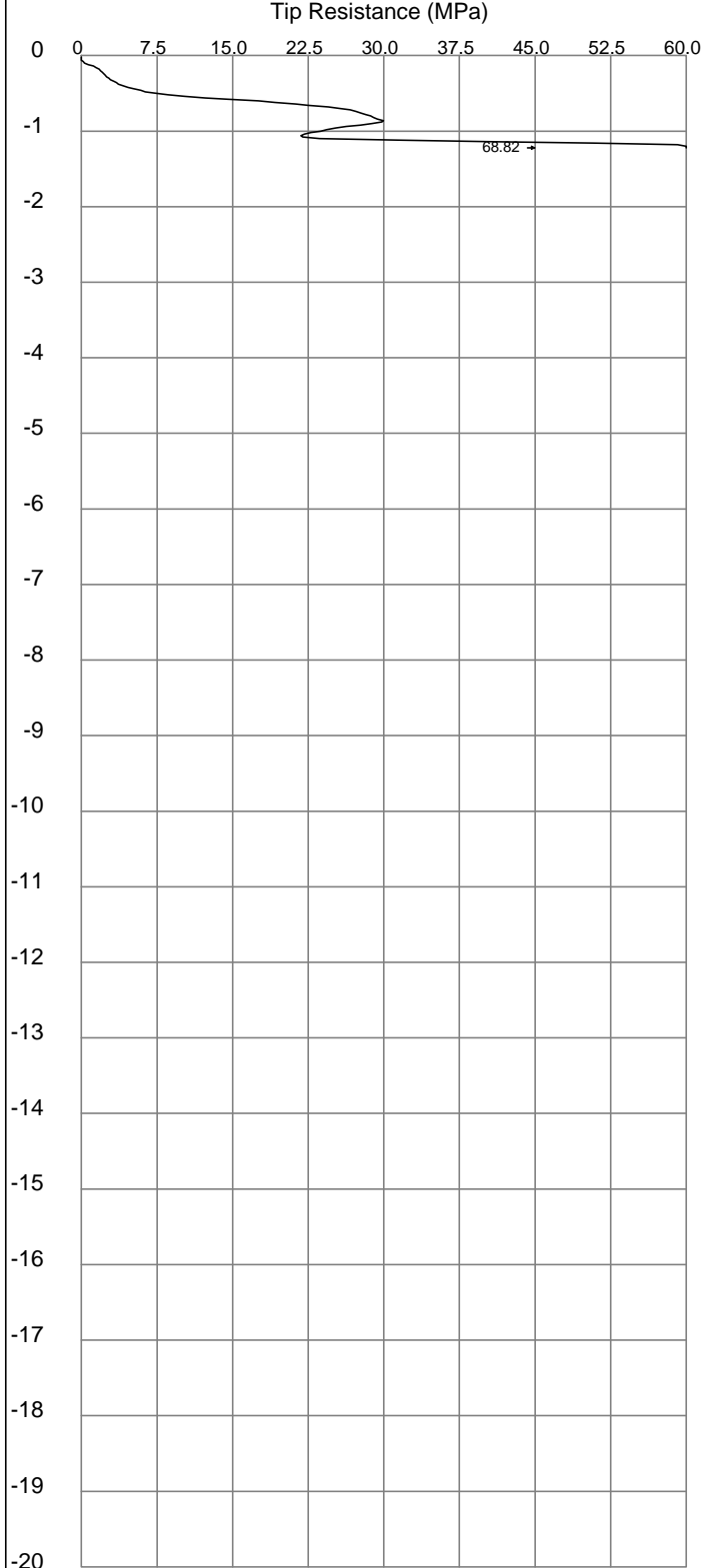


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 12	
R/L = 45.98m AHD	Hole open to depth (m) -	Total depth (m) 1.22	Operator Brad
Co ordinate: X= 391249.88 Y= 6480181.88	Groundwater Level (m) -	Cone No. 100709M	File 15
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



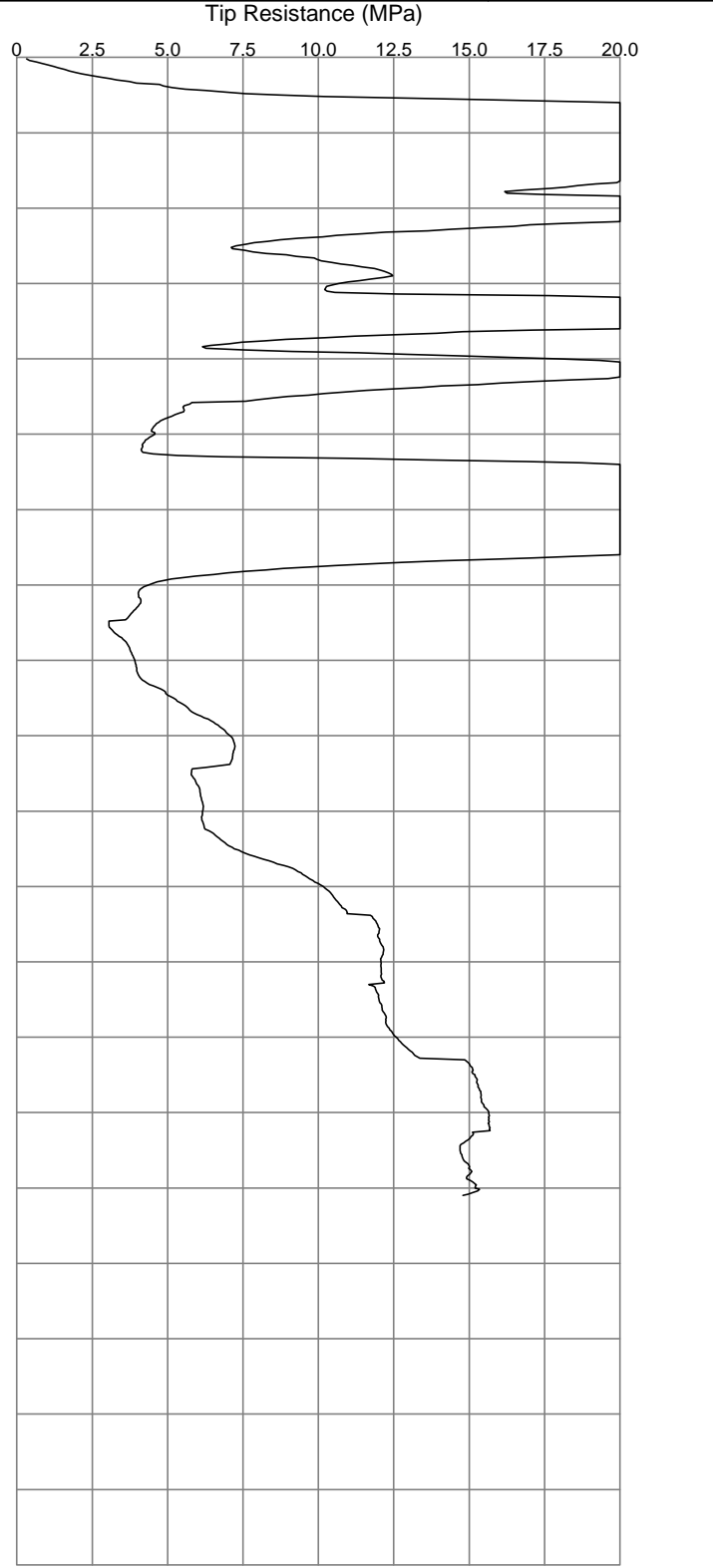
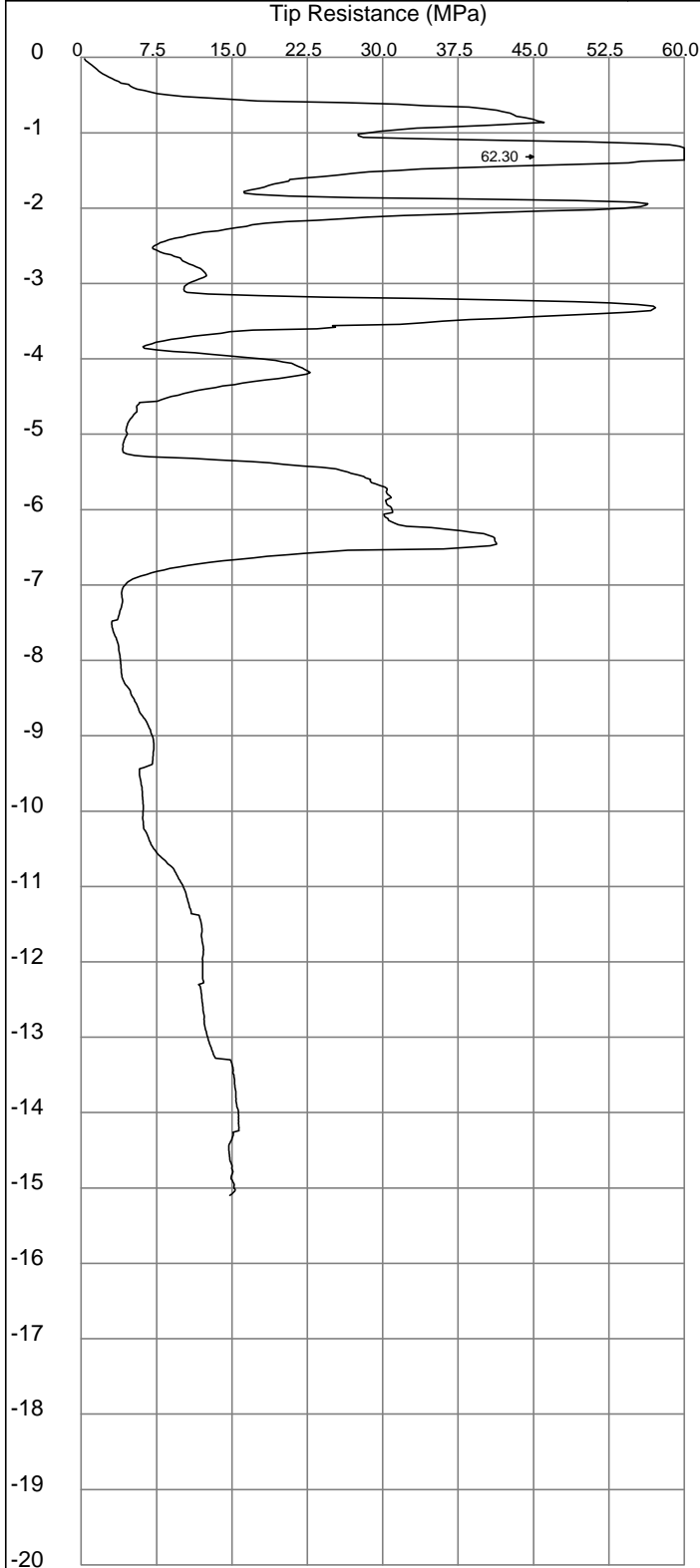


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks	Hole open to depth (m) -	Total depth (m) 15.10	Operator Brad	Sounding No. CPT 12A
R/L = 46.08m AHD		Groundwater Level (m) -	Cone No. 100709M		File 16
Co ordinate: X= 391253.42 Y= 6480184.58		Pre Drilled depth (m)	Probe Rig PR001		Date Completed 13-9-2017
Co-ordinates in MGA94 Z50					



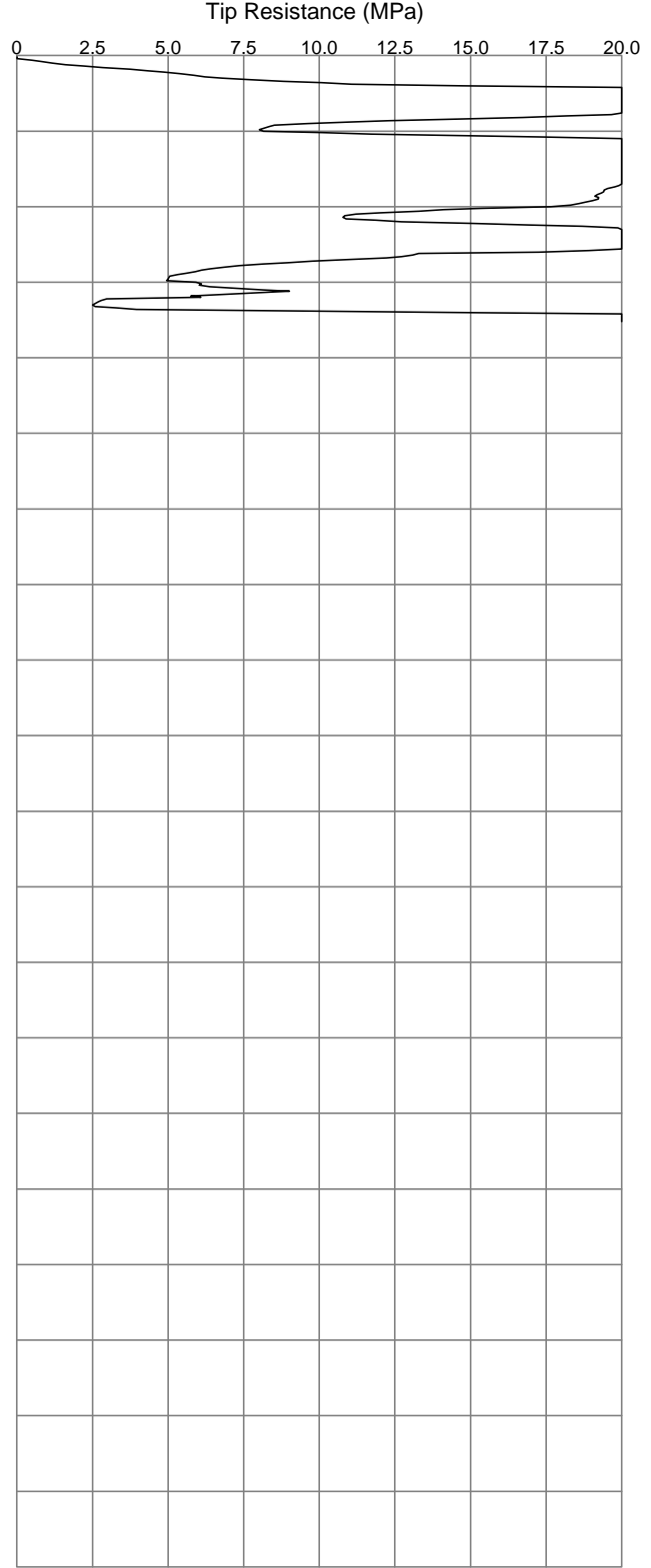
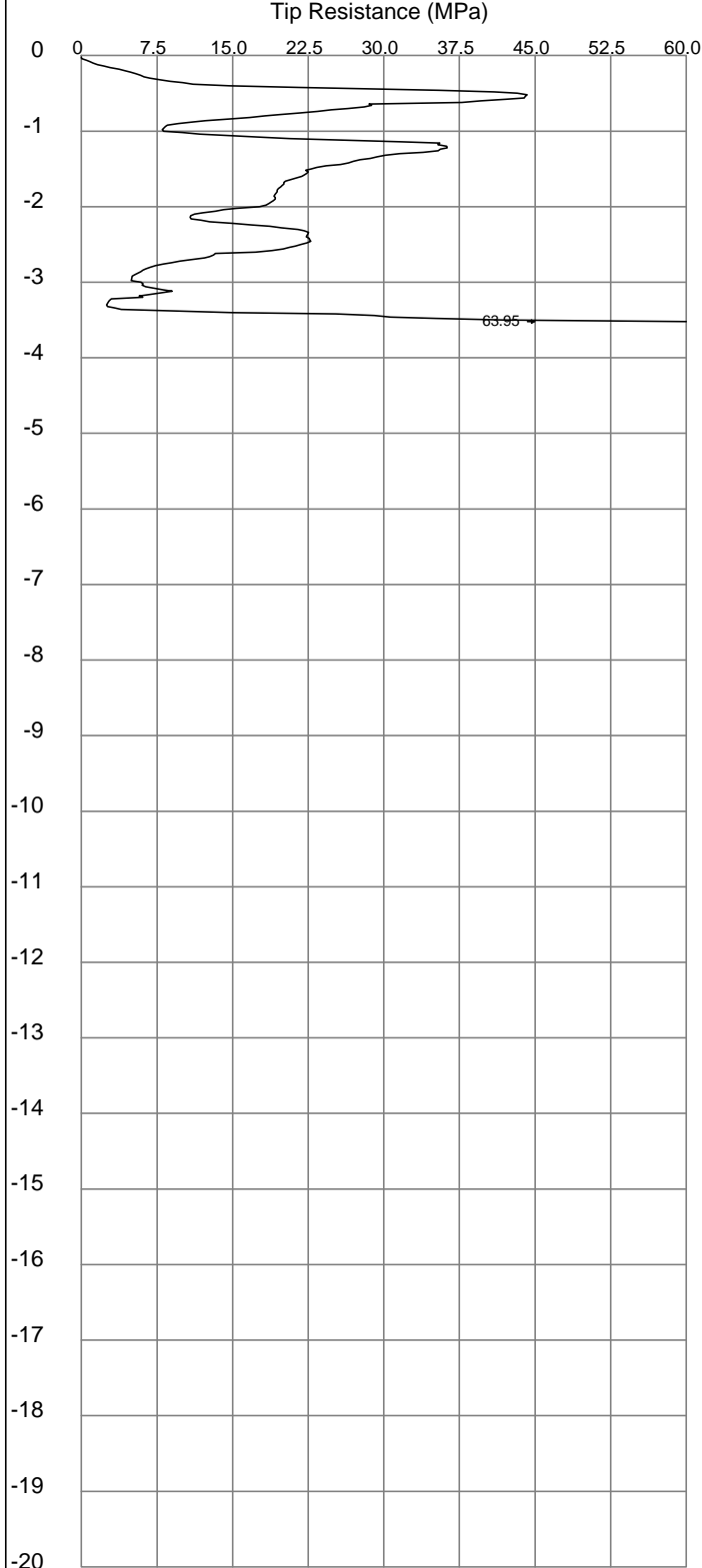


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 13	
R/L = 54.4 m AHD	Hole open to depth (m) -	Total depth (m) 3.52	Operator Brad
Co ordinate: X= 391435.84 Y= 6480236.17	Groundwater Level (m) -	Cone No. 100709M	File 17
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



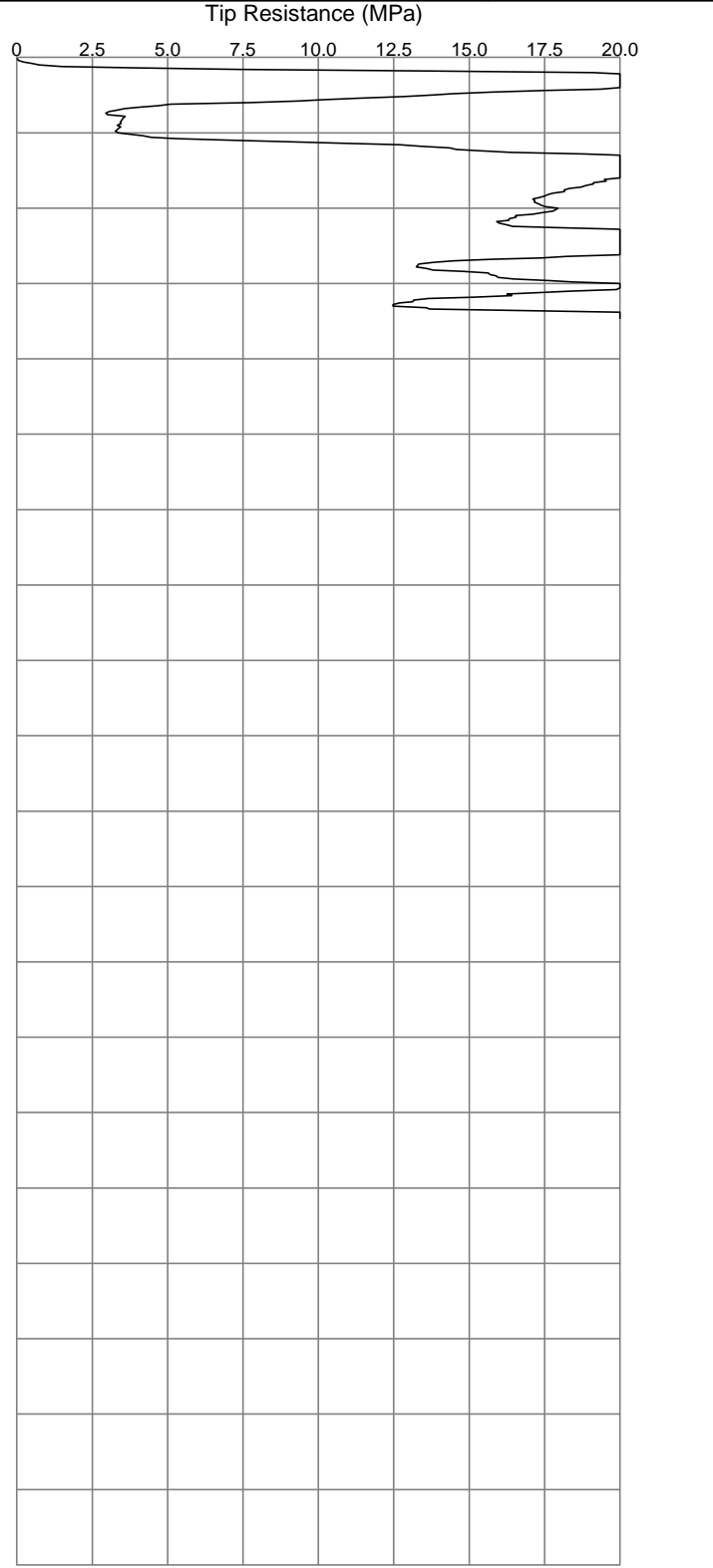
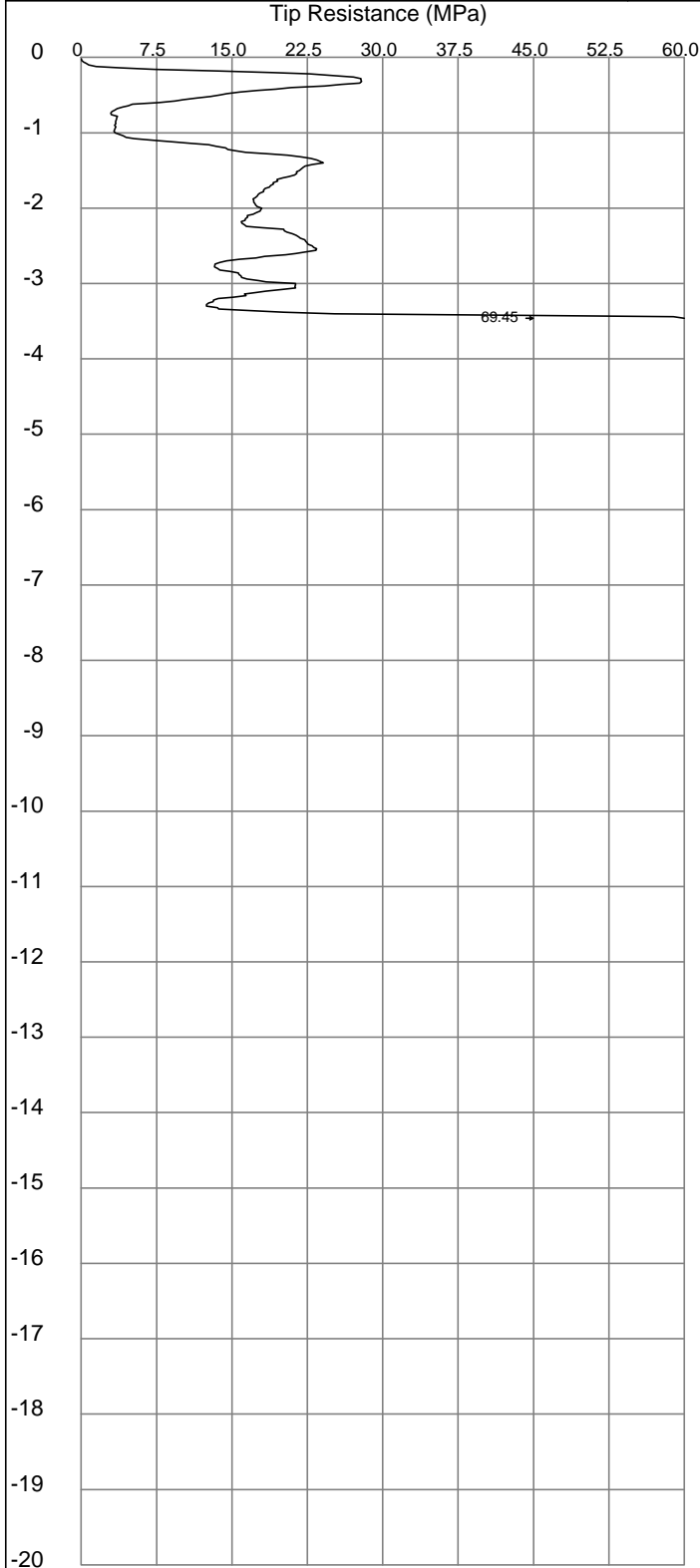


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 13A	
R/L = 54.54m AHD	Hole open to depth (m) -	Total depth (m) 3.46	Operator Brad
Co ordinate: X= 391435.56 Y= 6480241.73	Groundwater Level (m) -	Cone No. 100709M	File 18
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



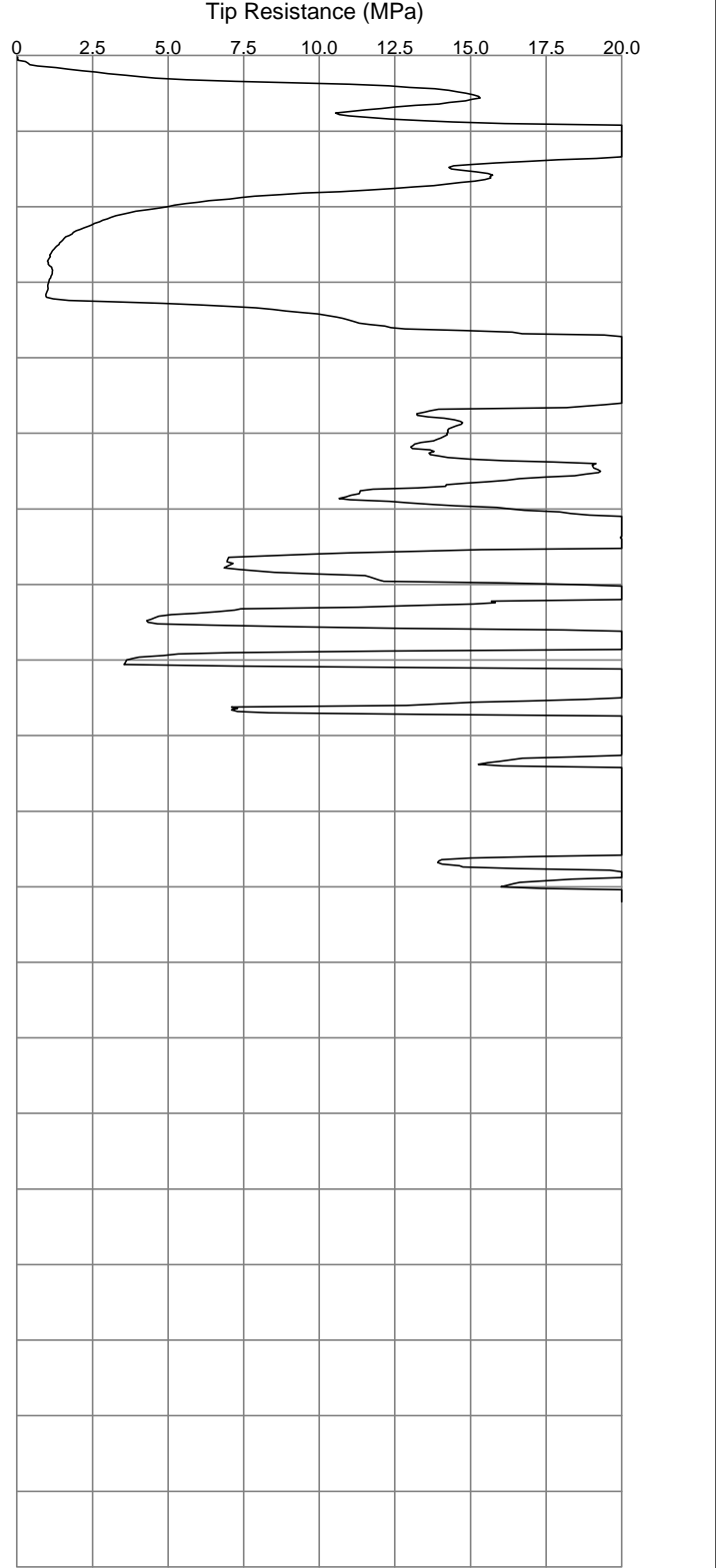
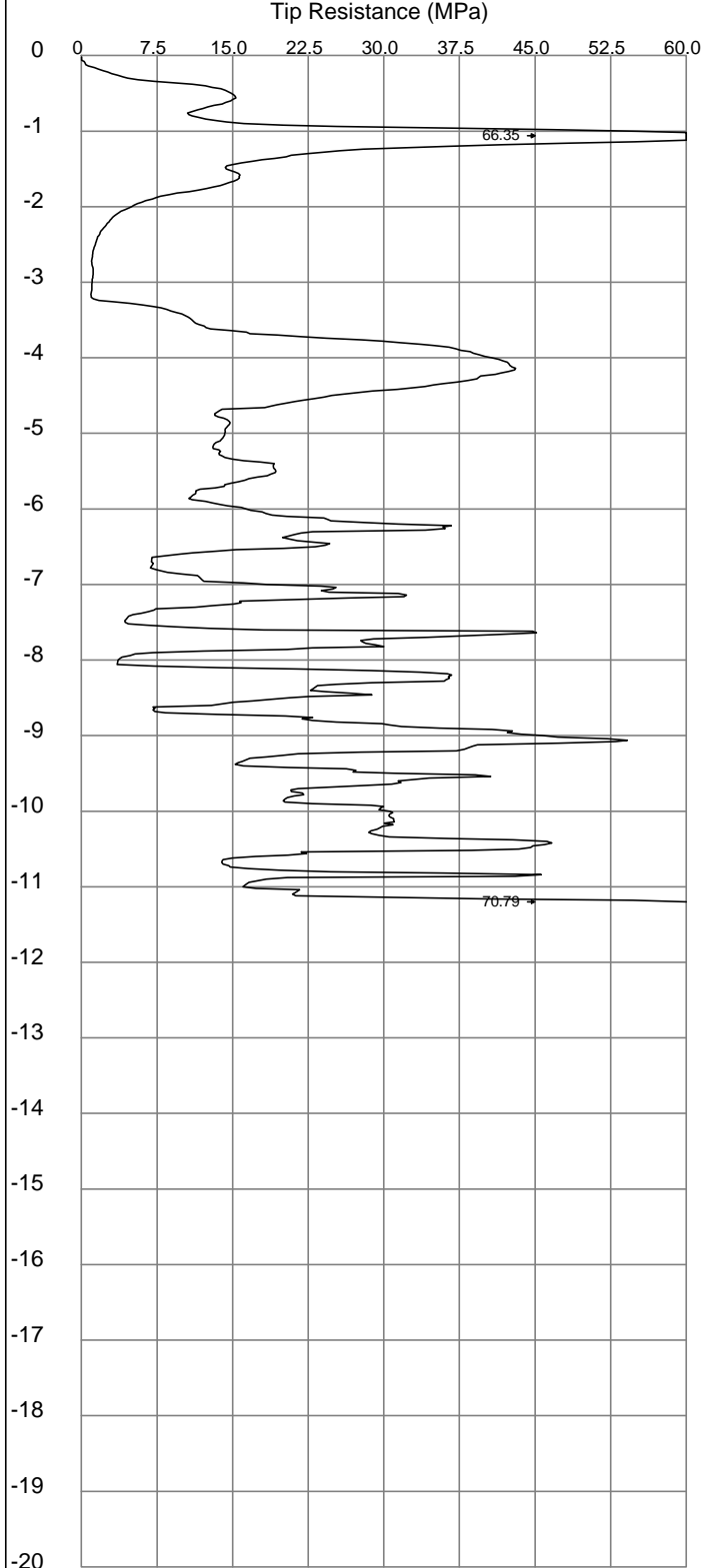


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 14	
R/L = 56.24m AHD	Hole open to depth (m) -	Total depth (m) 11.20	Operator Brad
Co ordinate: X= 391436.44 Y= 6480349.29	Groundwater Level (m) -	Cone No. 100709M	File 19
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



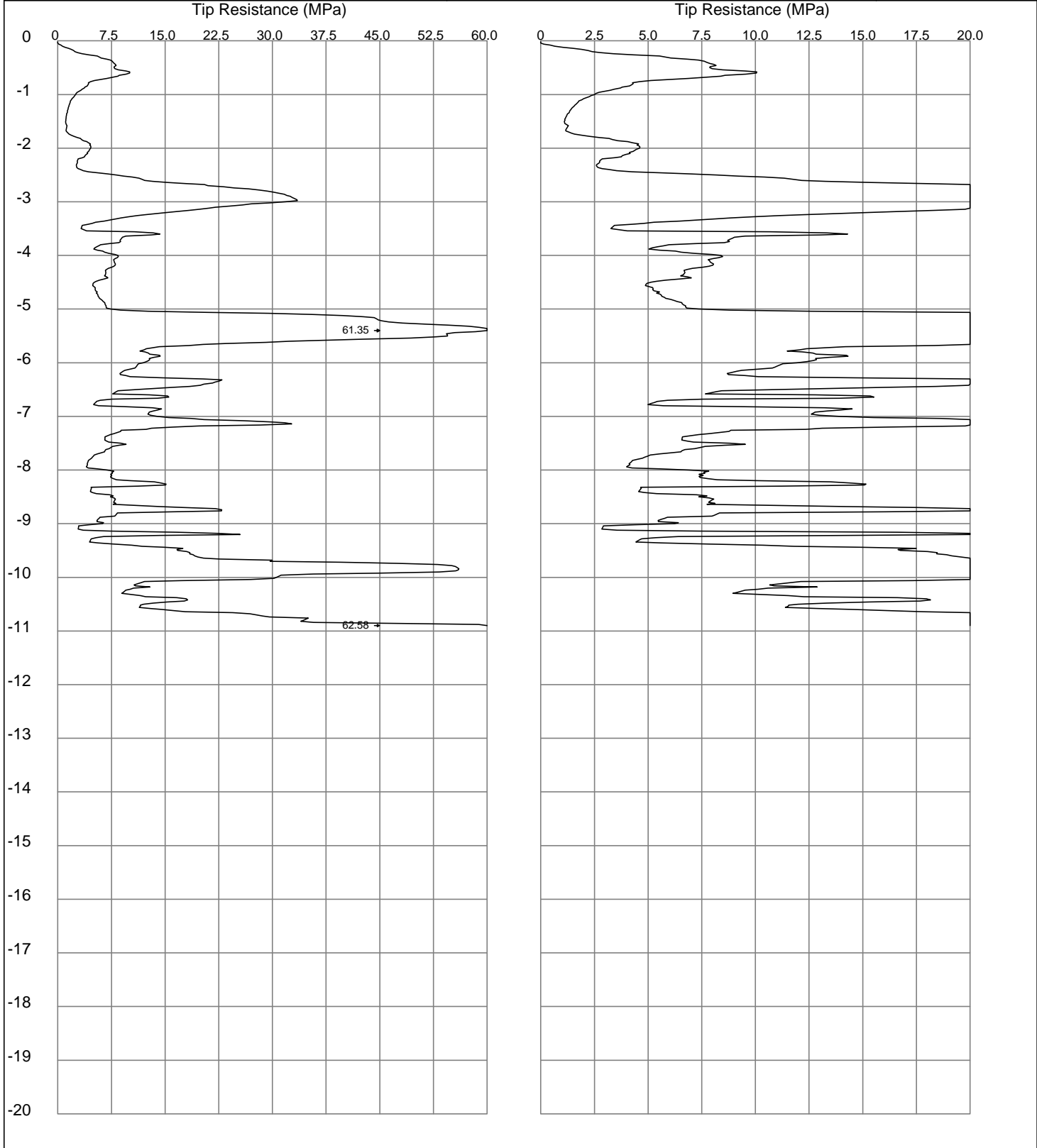


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 15	
R/L = 54.1 m AHD	Hole open to depth (m) -	Total depth (m) 10.90	Operator Brad
Co ordinate: X= 391434.00 Y= 6480472.03	Groundwater Level (m) -	Cone No. 100709M	File 20
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



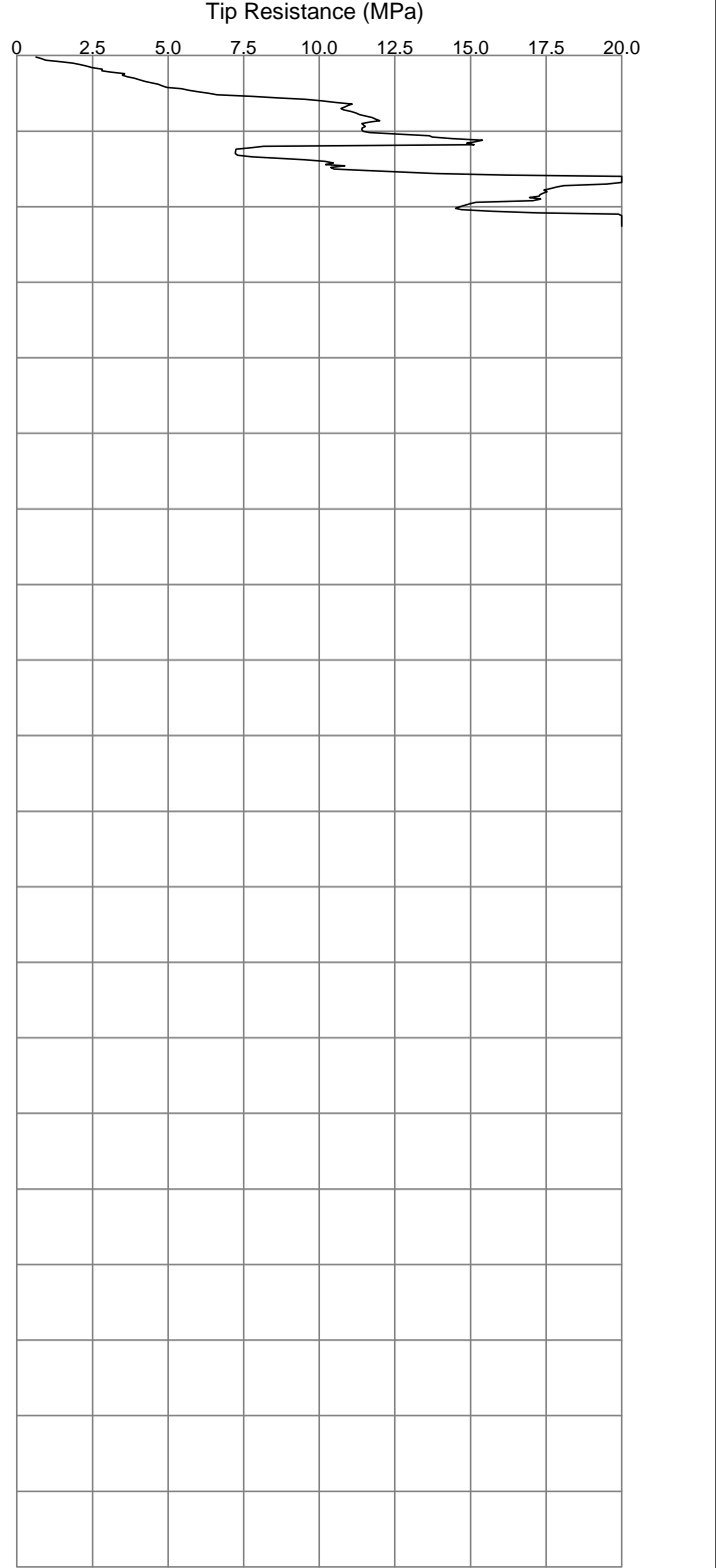
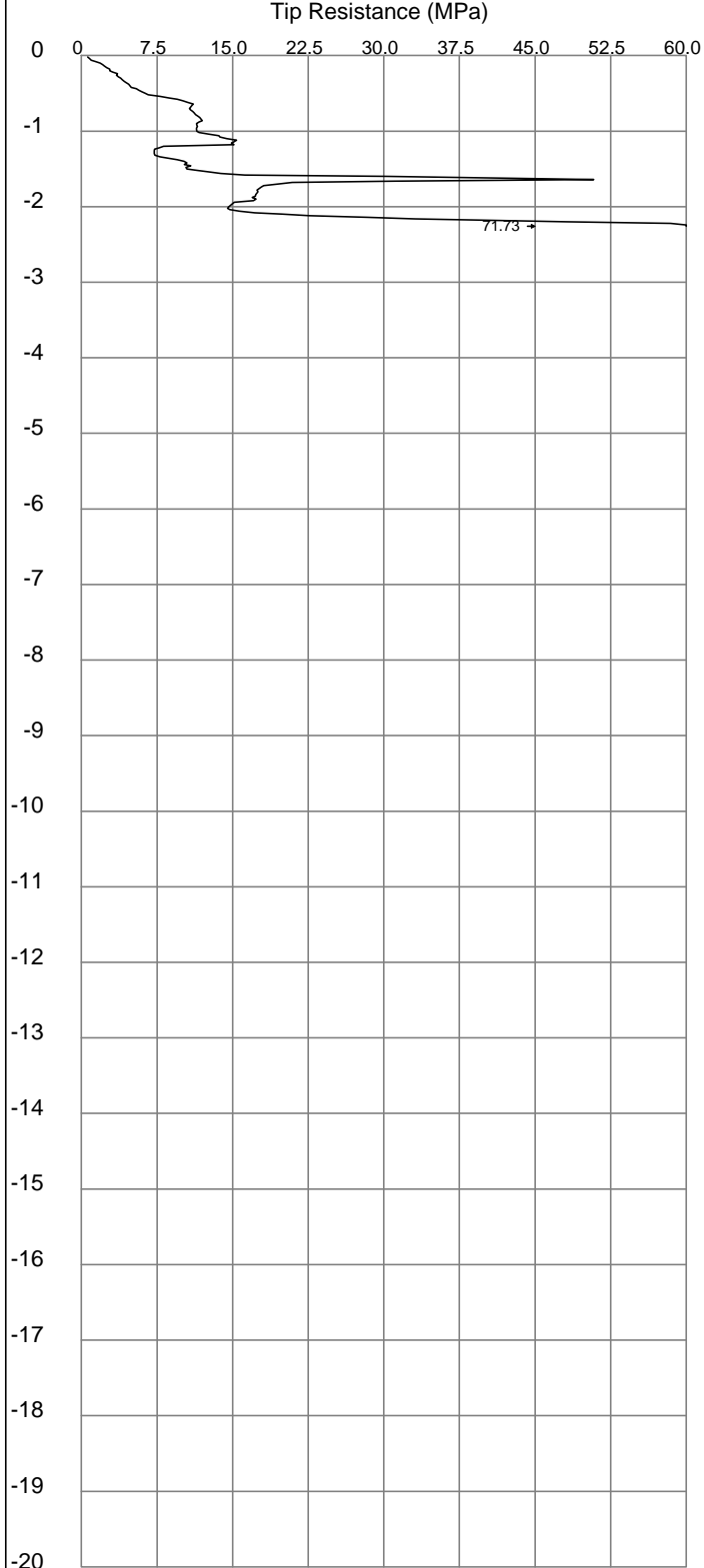


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 15	
R/L = 56.77m AHD	Hole open to depth (m) -	Total depth (m) 2.26	Operator Brad
Co ordinate: X= 391683.57 Y= 6480325.76	Groundwater Level (m) -	Cone No. 100709M	File 21
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



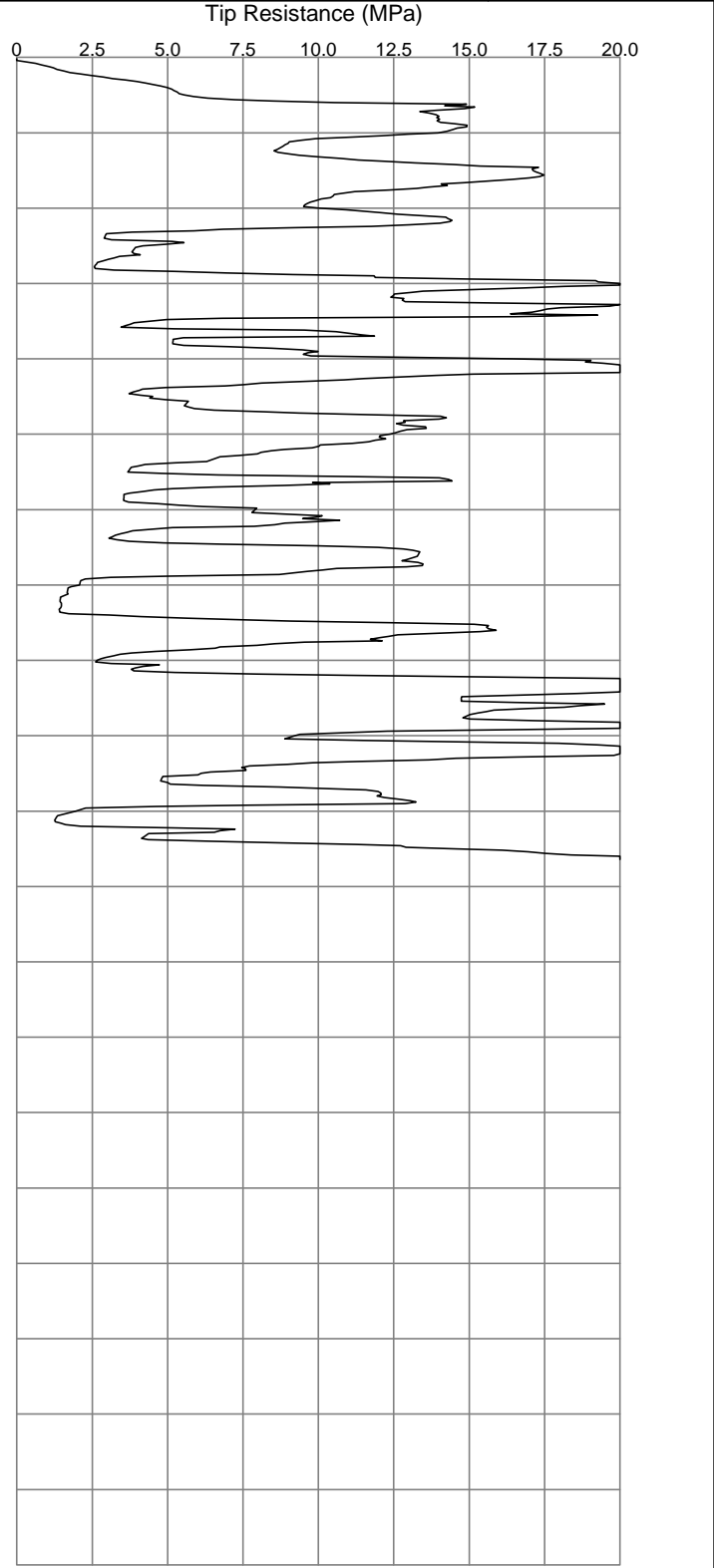
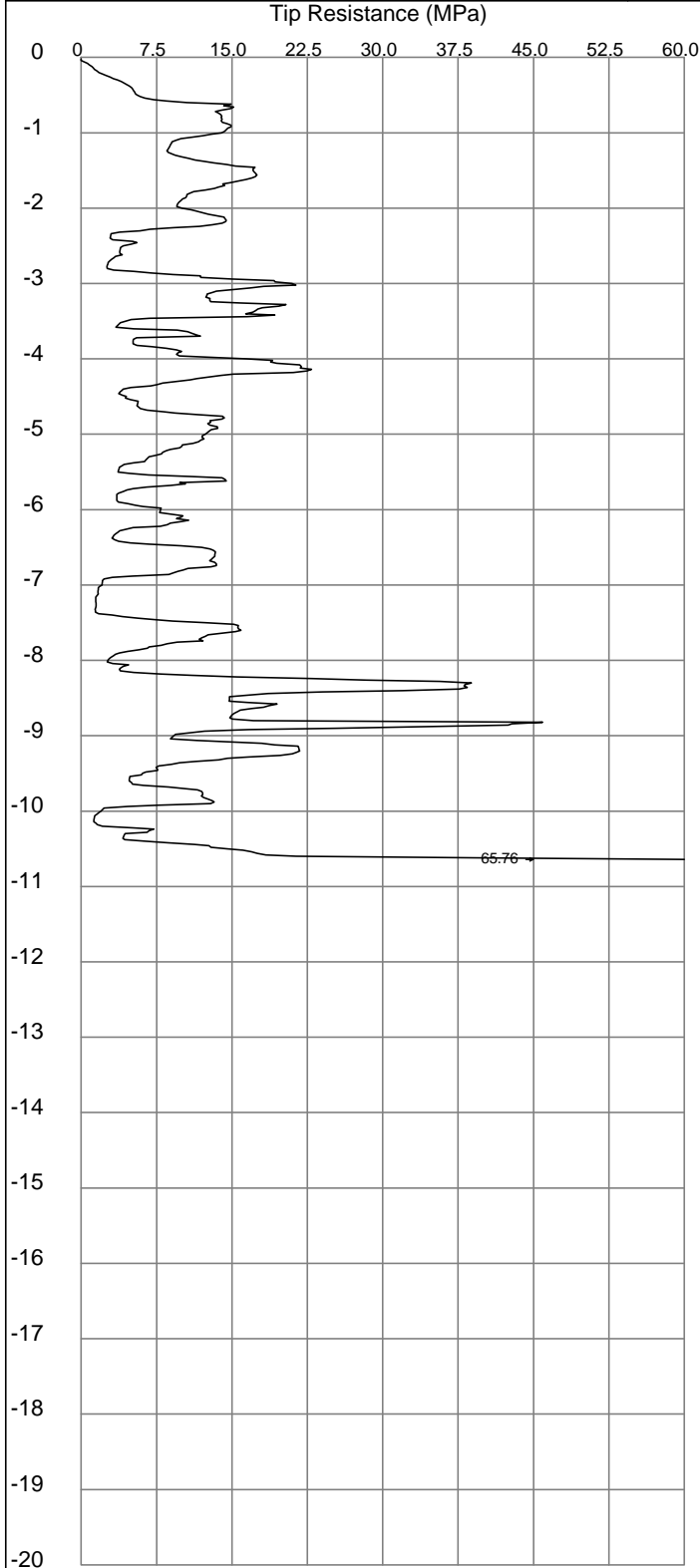


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 16A	
R/L = 56.8 m AHD	Hole open to depth (m) -	Total depth (m) 10.64	Operator Brad
Co ordinate: X= 391688.85 Y= 6480324.41	Groundwater Level (m) -	Cone No. 100709M	File 22
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



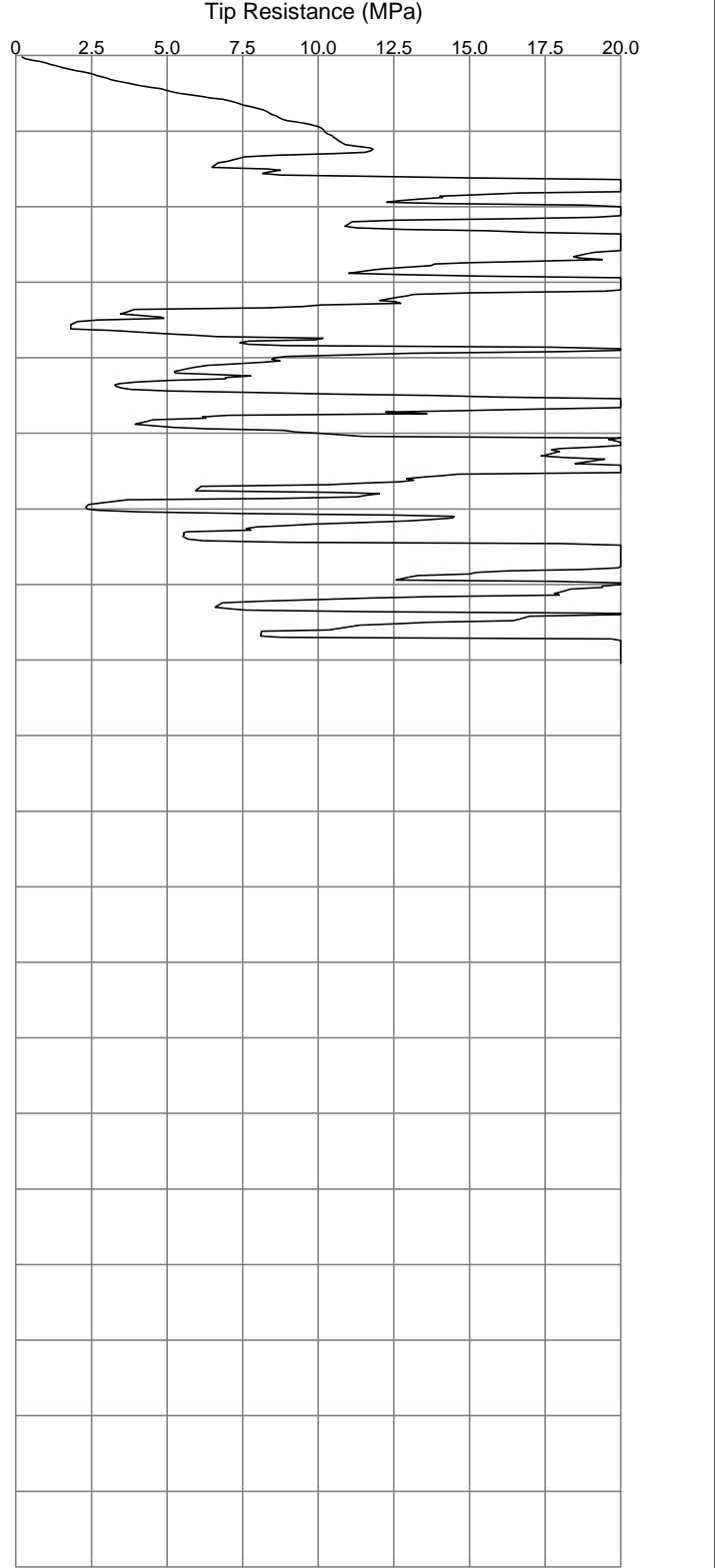
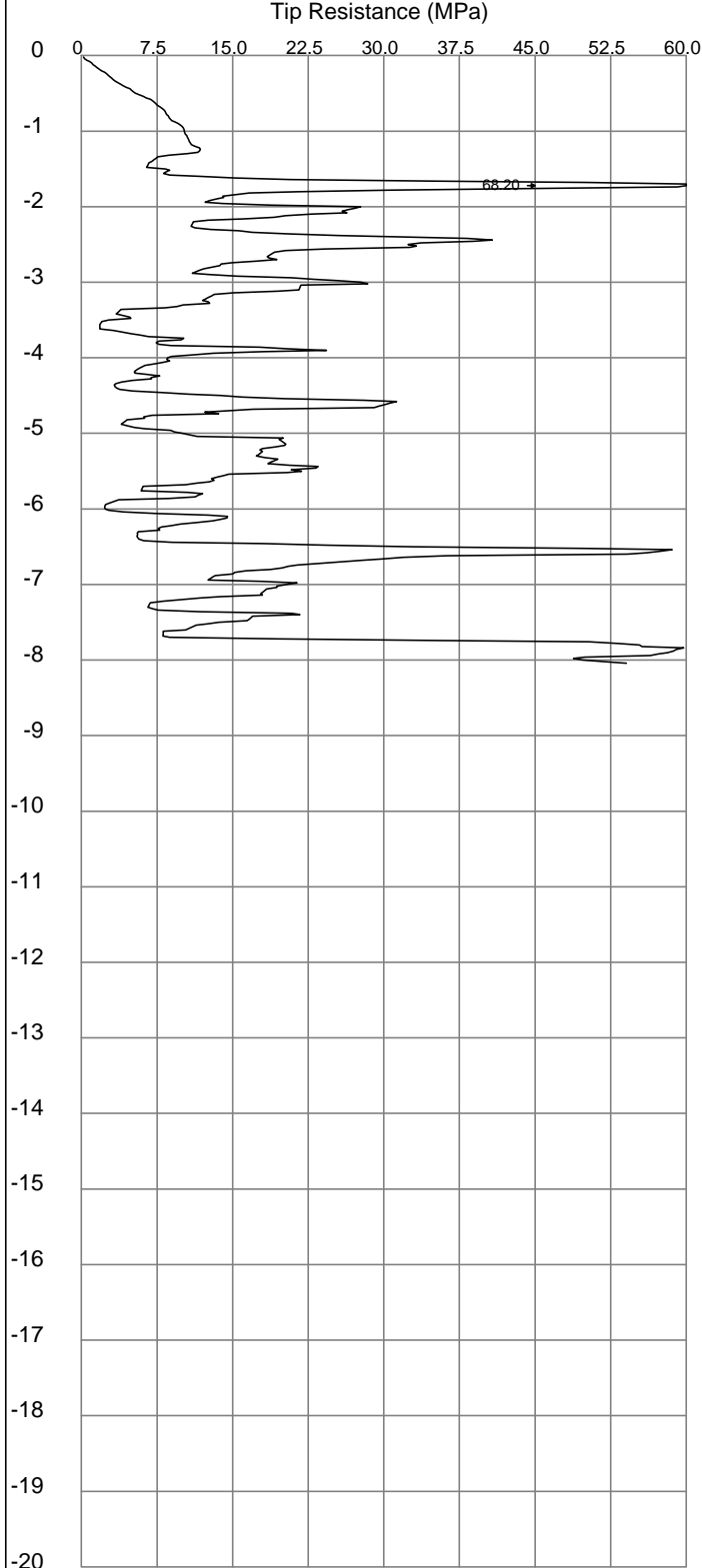


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Sounding No. CPT 17	
R/L = 56.17m AHD	Hole open to depth (m) -	Total depth (m) 8.04	Operator Brad
Co ordinate: X= 391552.10 Y= 6480378.74	Groundwater Level (m) -	Cone No. 100709M	File 23
Co-ordinates in MGA94 Z50	Pre Drilled depth (m) -	Probe Rig PR001	Date Completed 13-9-2017



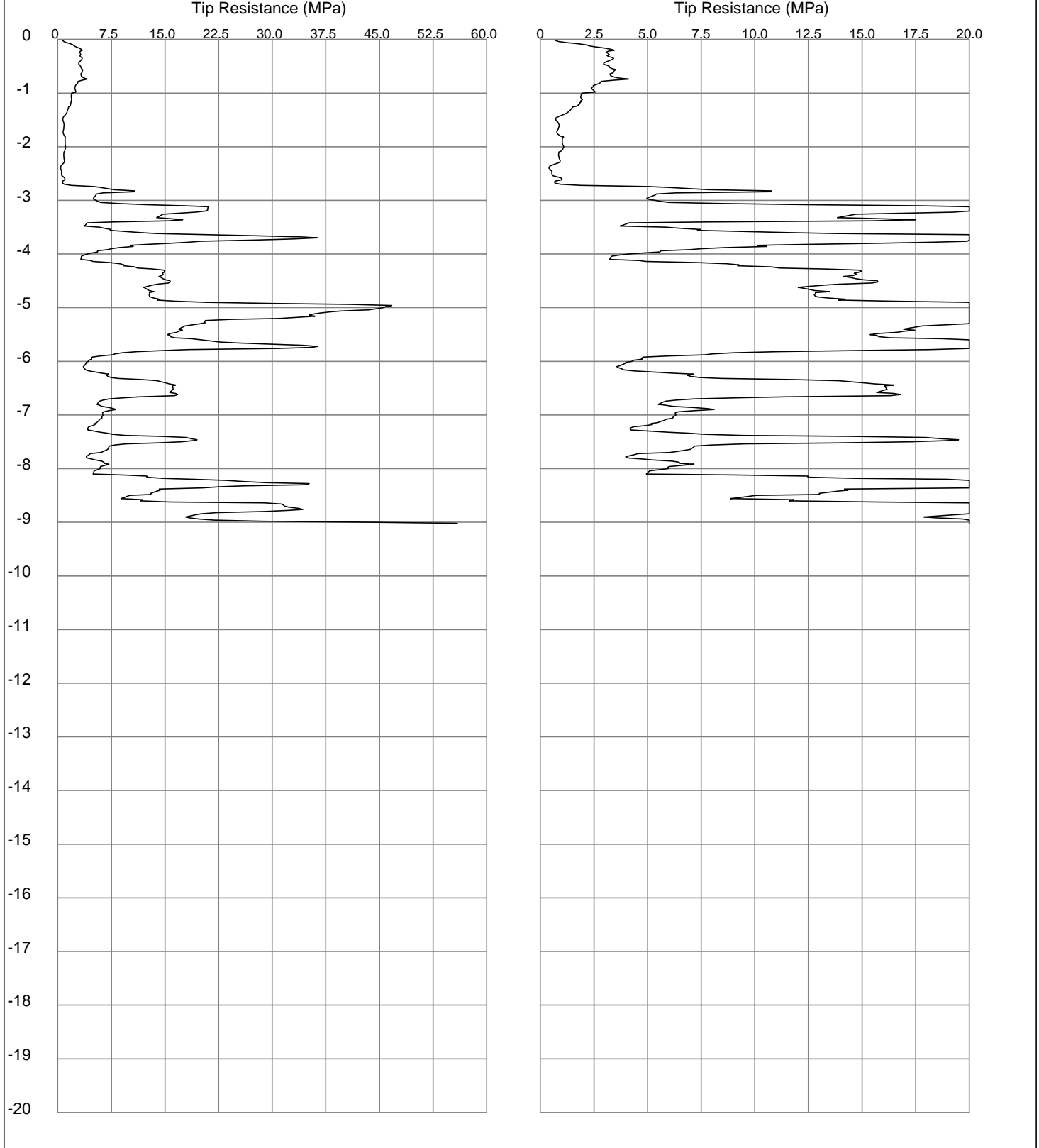


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 18	
R/L = 51.23m AHD	Hole open to depth (m) 8.60	Total depth (m) 9.02	Operator Brad
Co ordinate: X= 391464.47 Y= 6480539.08	Groundwater Level (m) 4.10	Cone No. 100709M	File 24
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



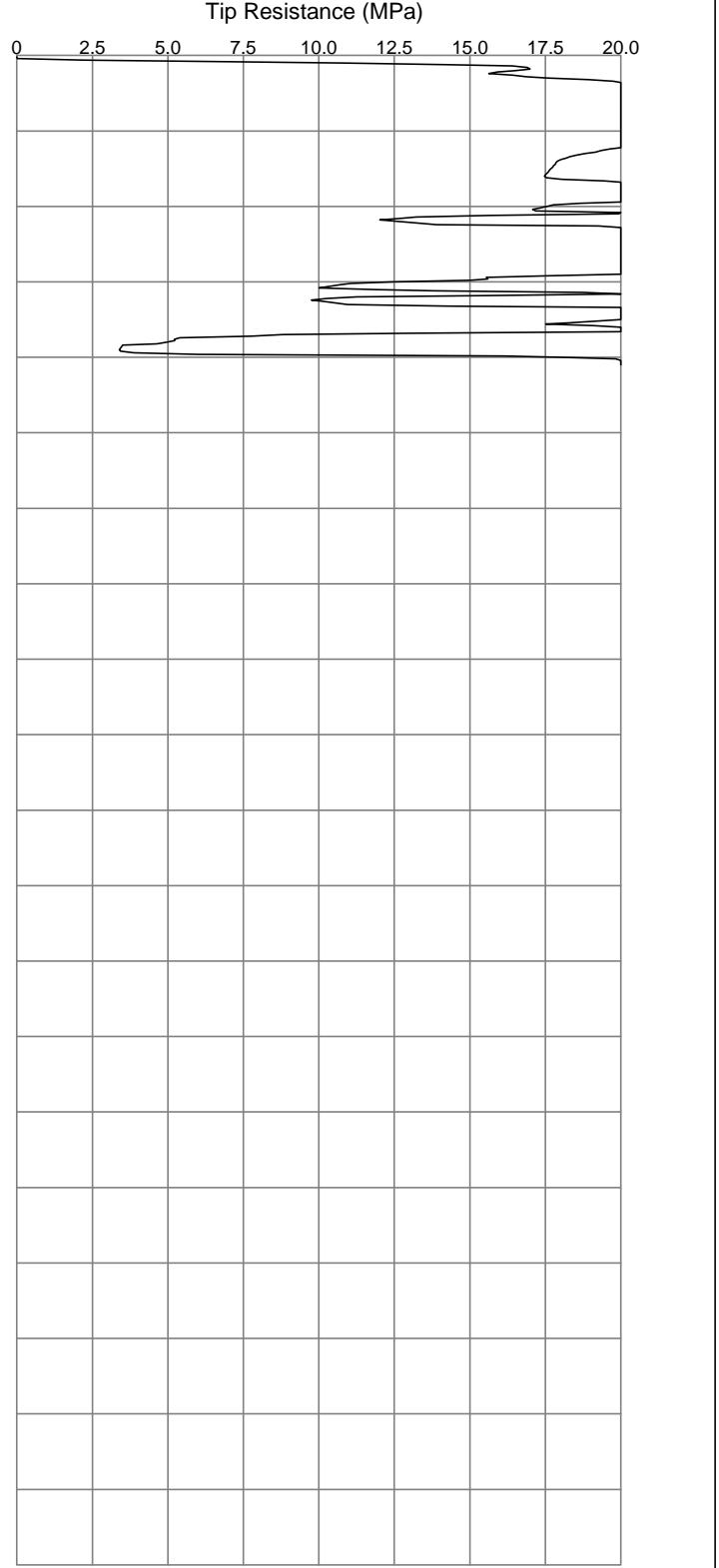
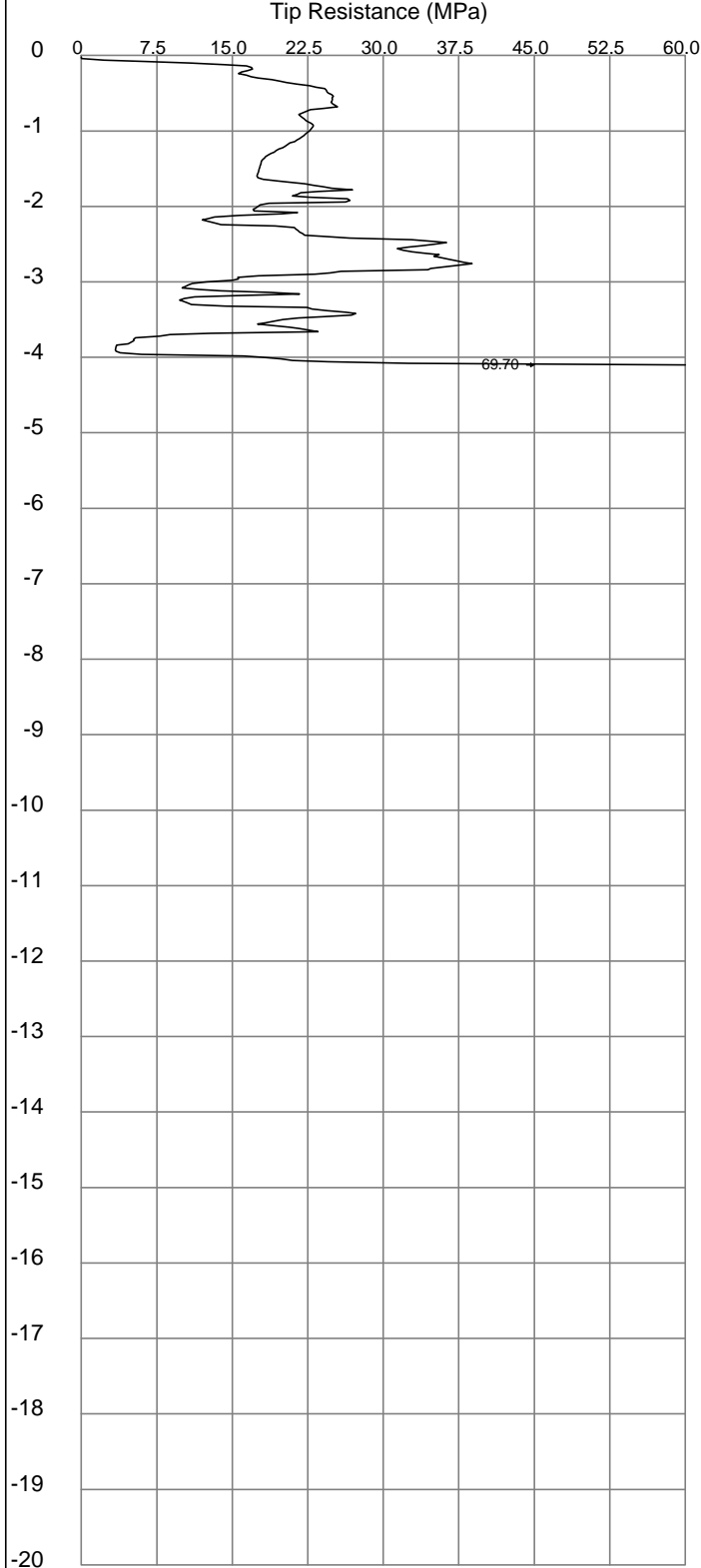


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 19	
R/L = 47.59m AHD	Hole open to depth (m) -	Total depth (m) 4.10	Operator Brad
Co ordinate: X= 391134.23 Y= 6480349.93	Groundwater Level (m) -	Cone No. 100709M	File 25
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



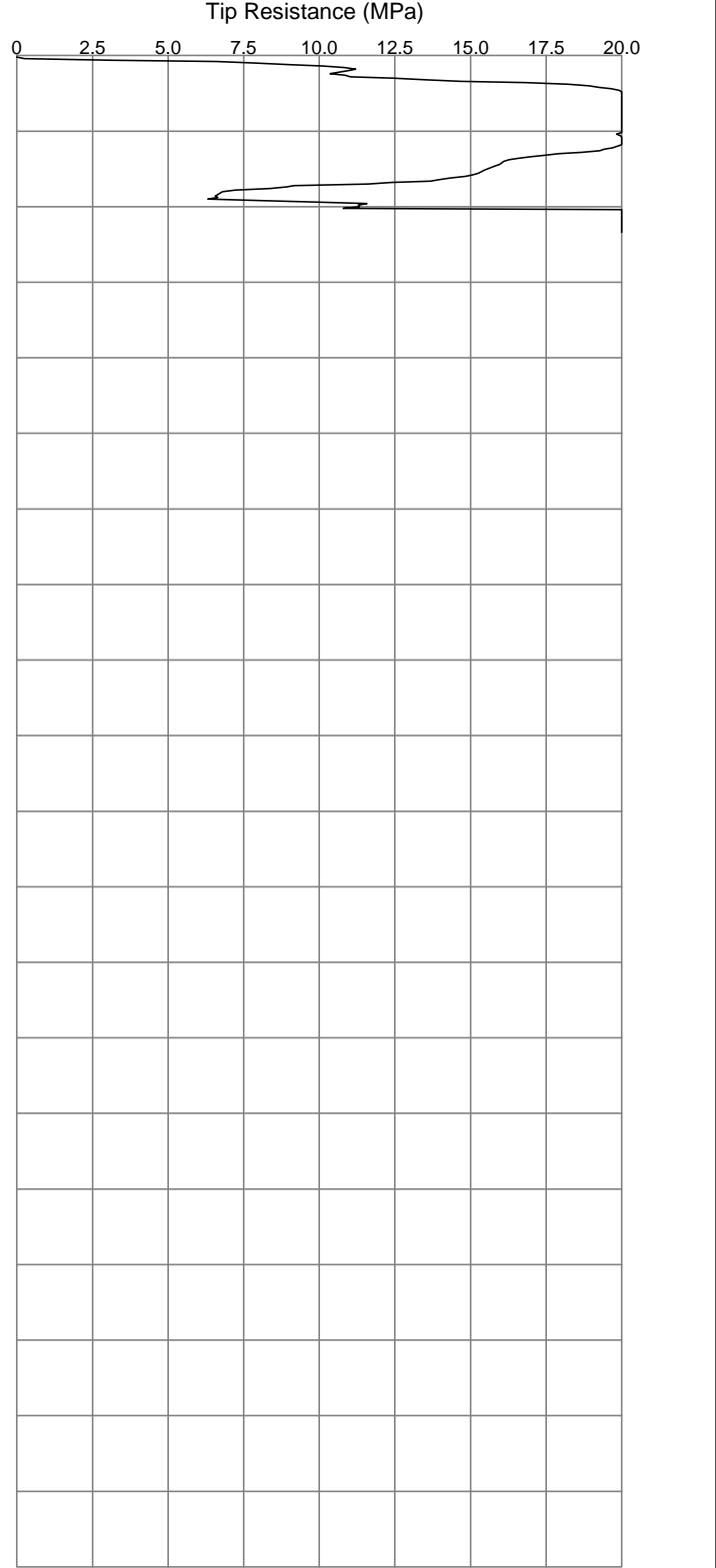
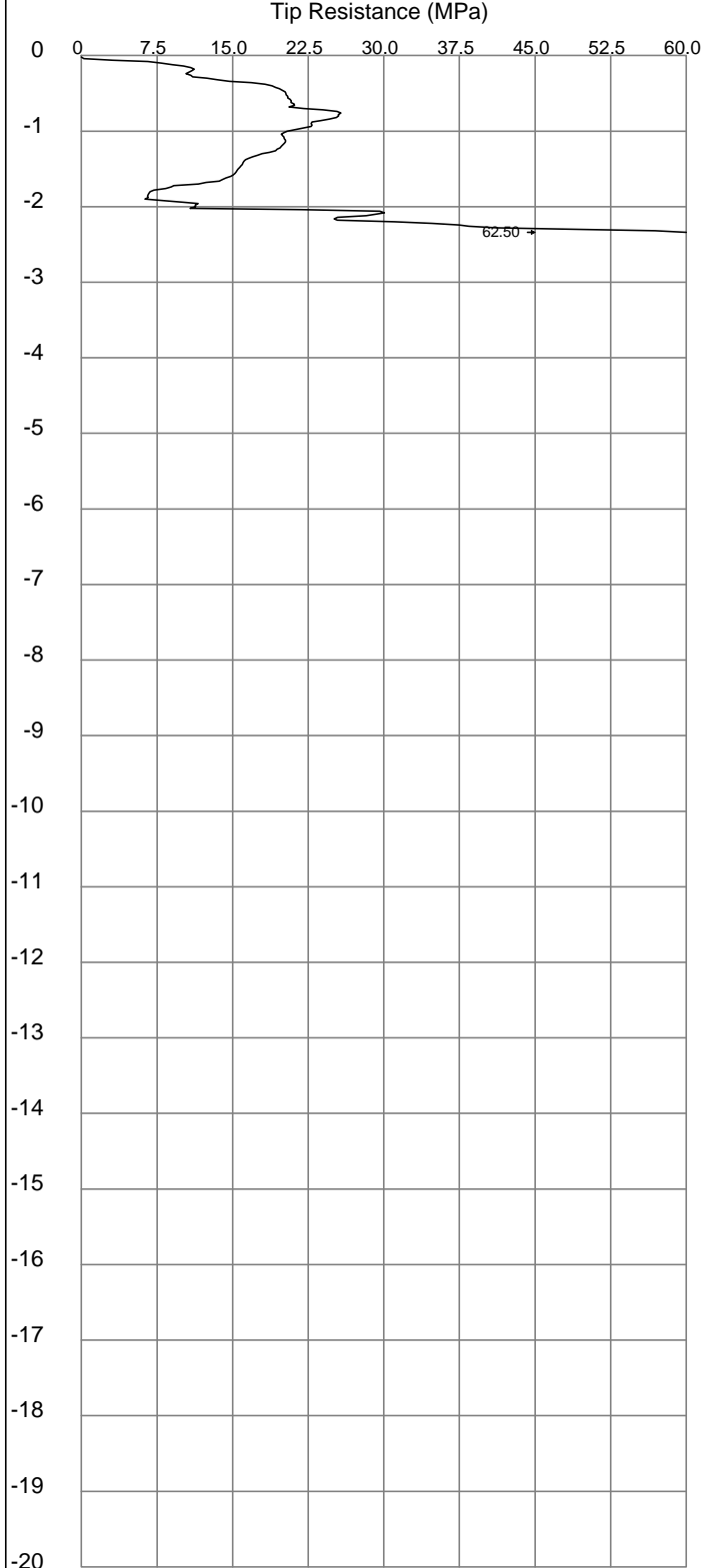


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 19A	
R/L = 47.73m AHD	Hole open to depth (m) -	Total depth (m) 2.34	Operator Brad
Co ordinate: X= 391134.63 Y= 6480354.21	Groundwater Level (m) -	Cone No. 100709M	Date Completed 13-9-2017
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	



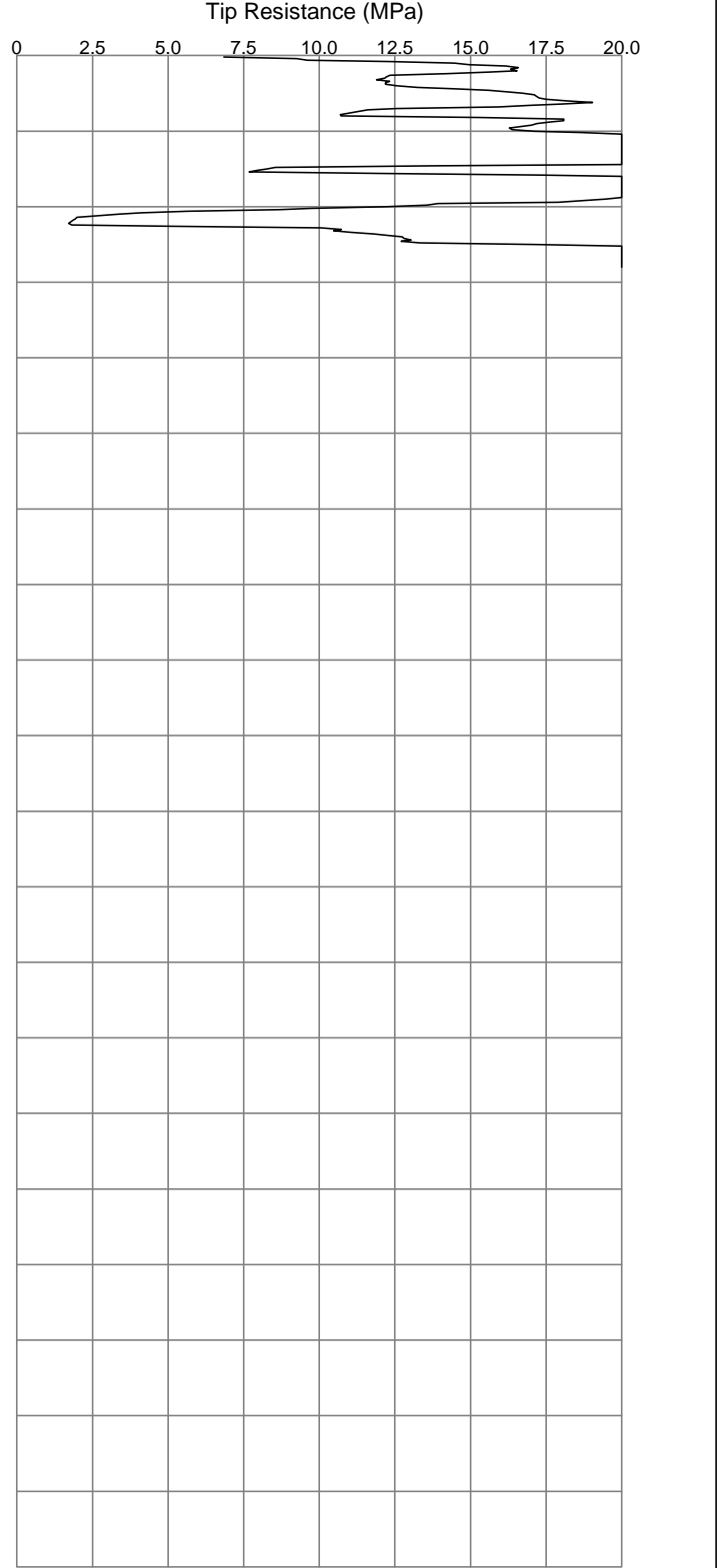
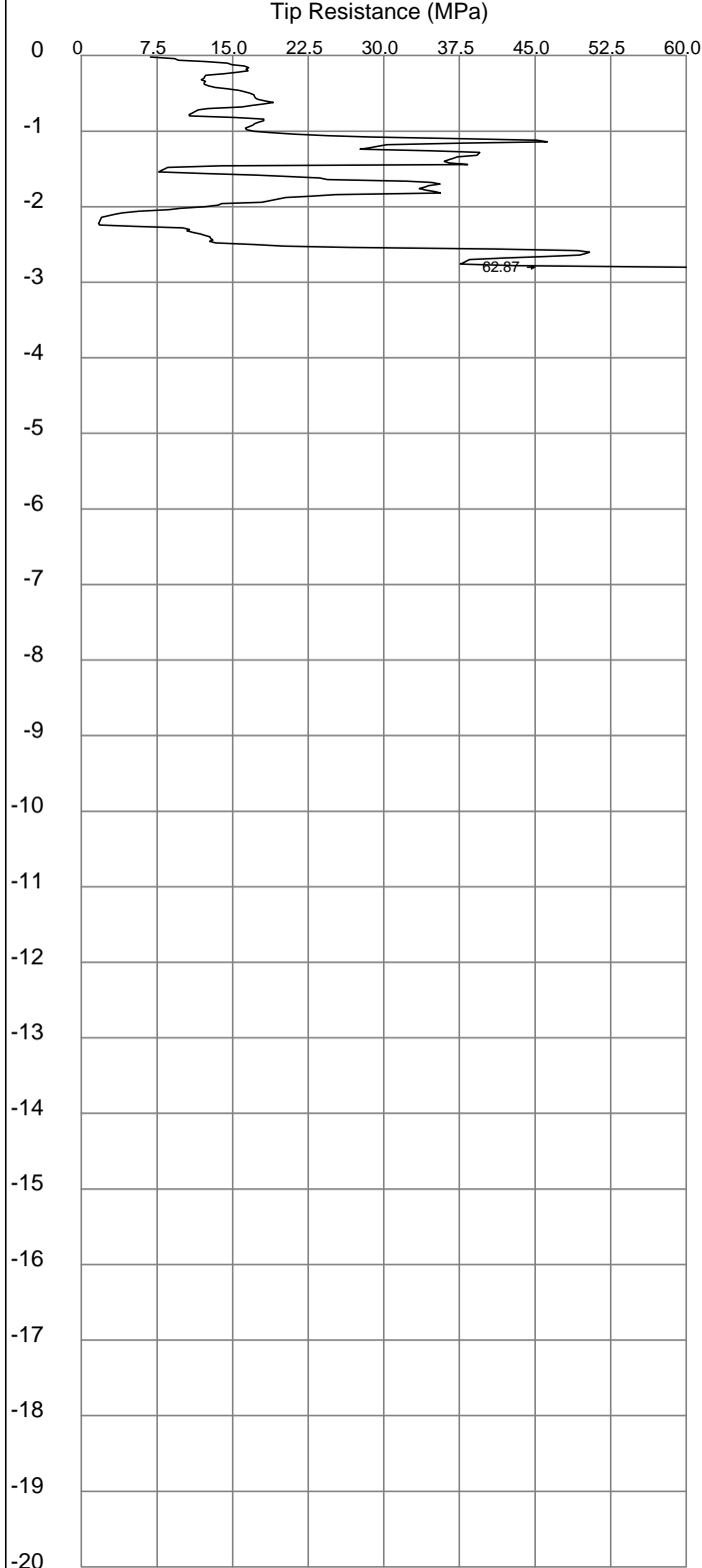


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 20	
R/L = 51.62m AHD	Hole open to depth (m) -	Total depth (m) 2.80	Operator Brad
Co ordinate: X= 391158.86 Y= 6480565.98	Groundwater Level (m) -	Cone No. 100709M	File 27
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



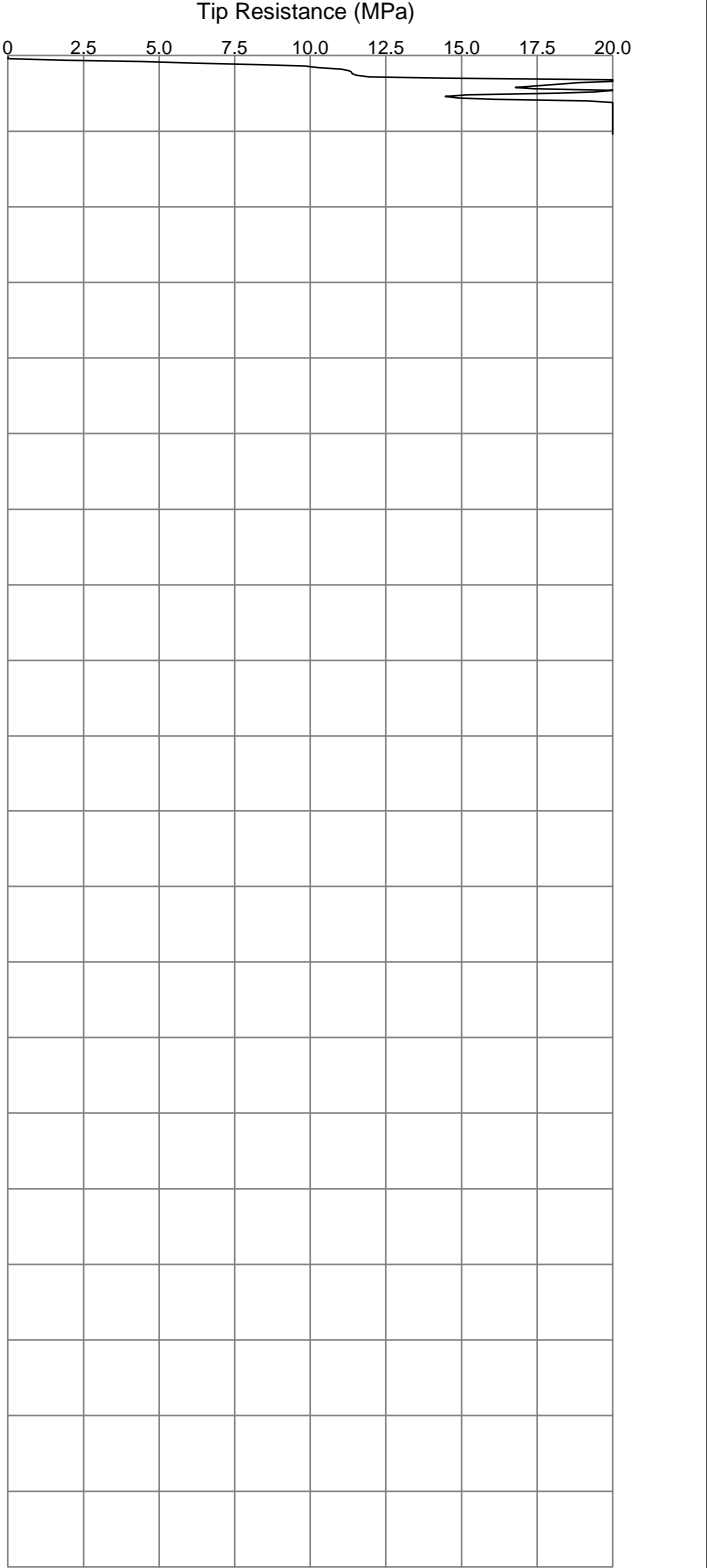
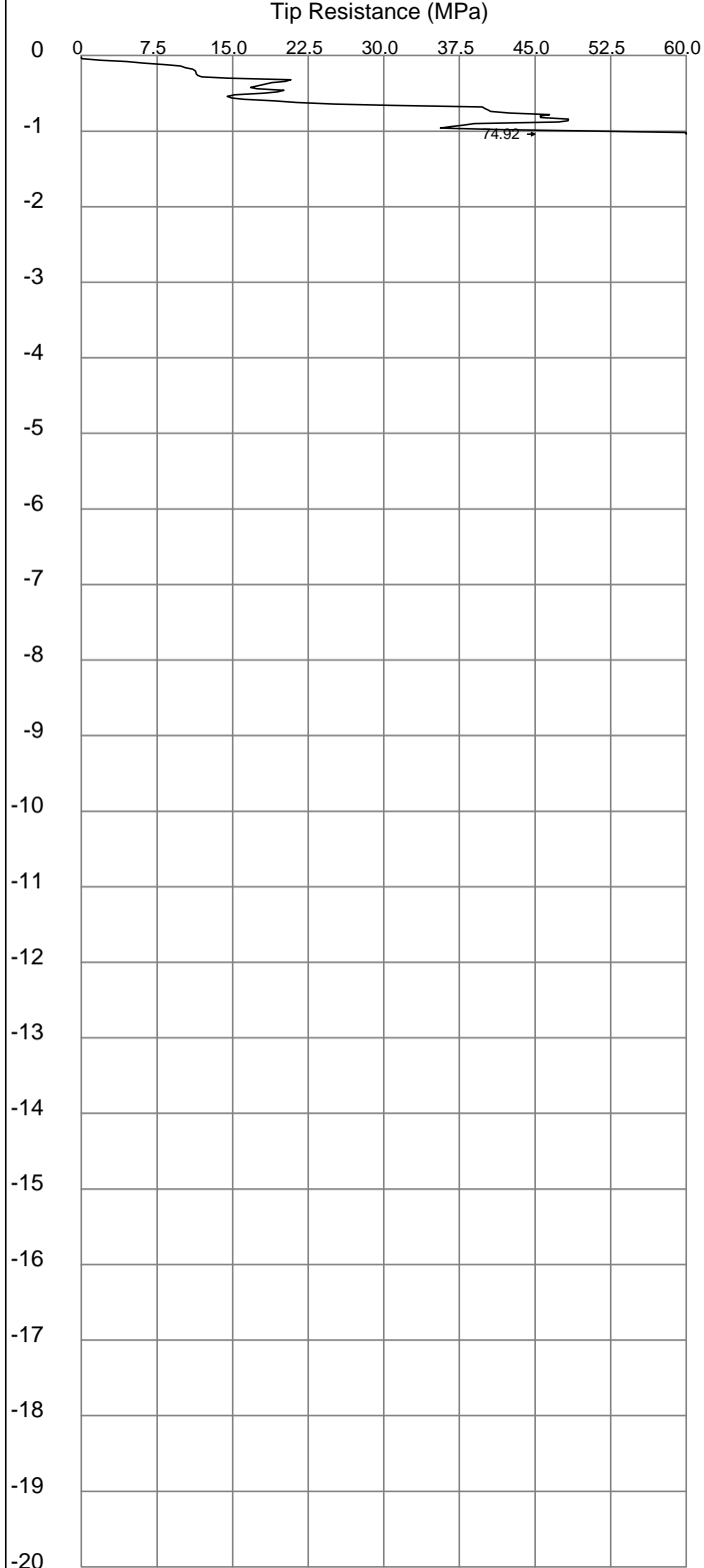


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 20A	
R/L = 51.49m AHD	Hole open to depth (m) -	Total depth (m) 1.04	Operator Brad
Co ordinate: X= 391161.61 Y= 6480584.48	Groundwater Level (m) -	Cone No. 100709M	File 28
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



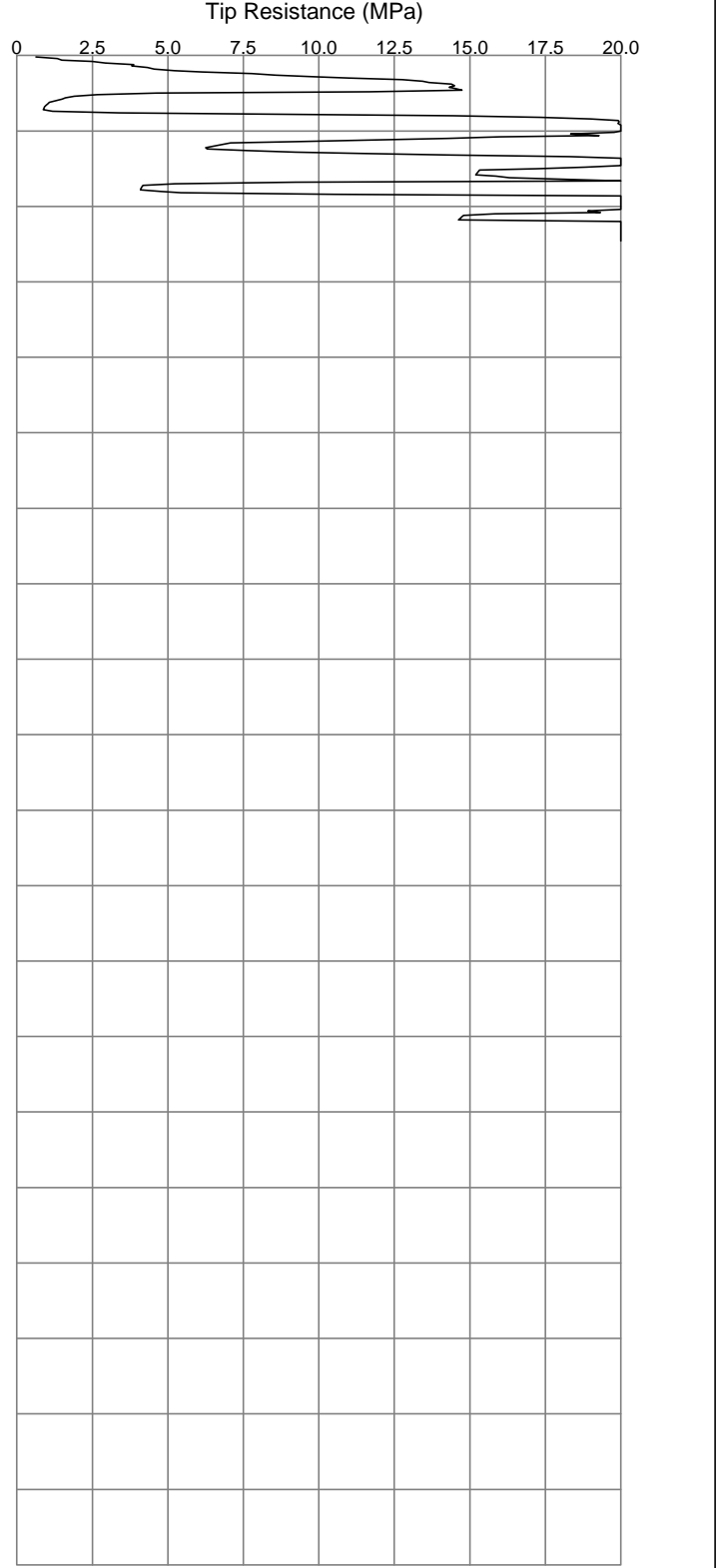
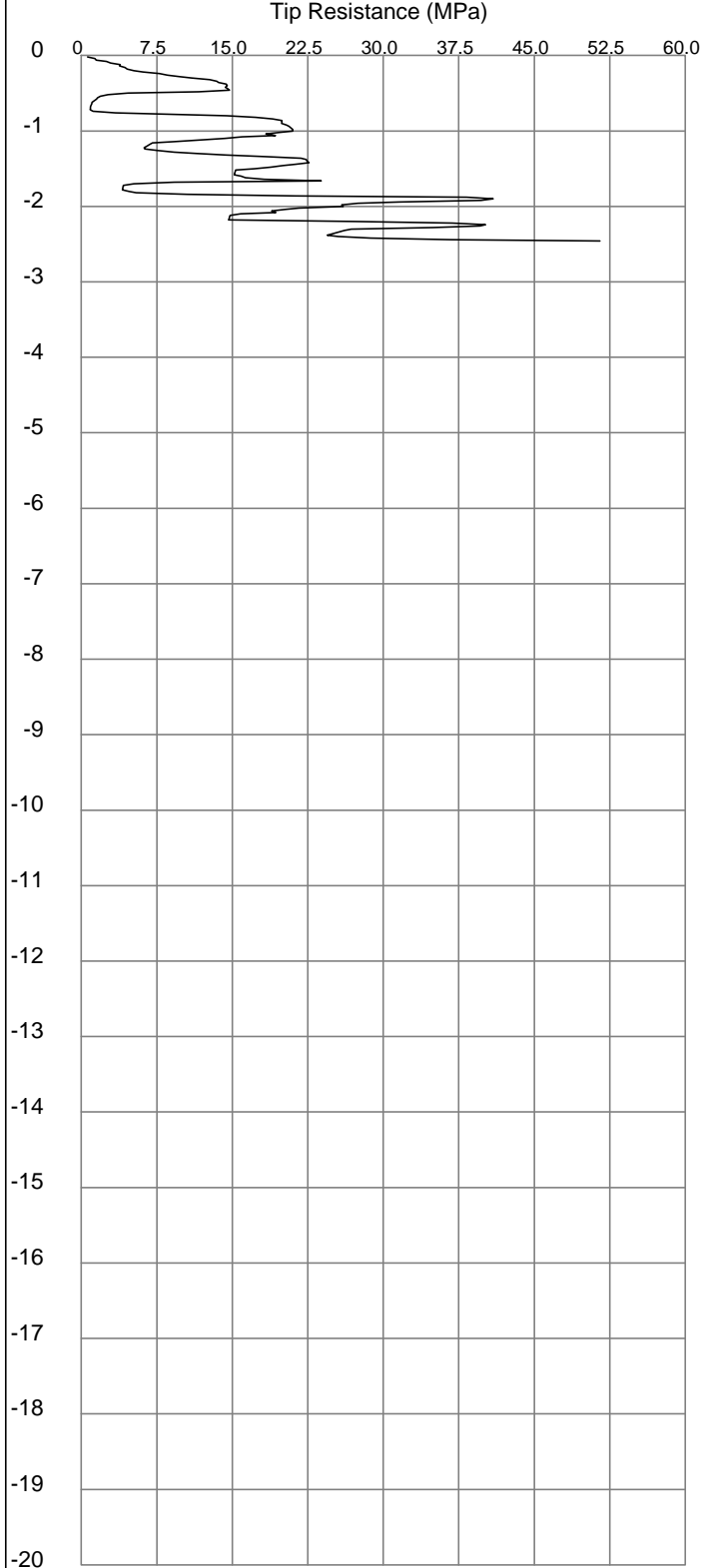


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 21	
R/L = 50.89m AHD	Hole open to depth (m) -	Total depth (m) 2.46	Operator Brad
Co ordinate: X= 391227.13 Y= 6480586.23	Groundwater Level (m) -	Cone No. 100709M	File 29
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



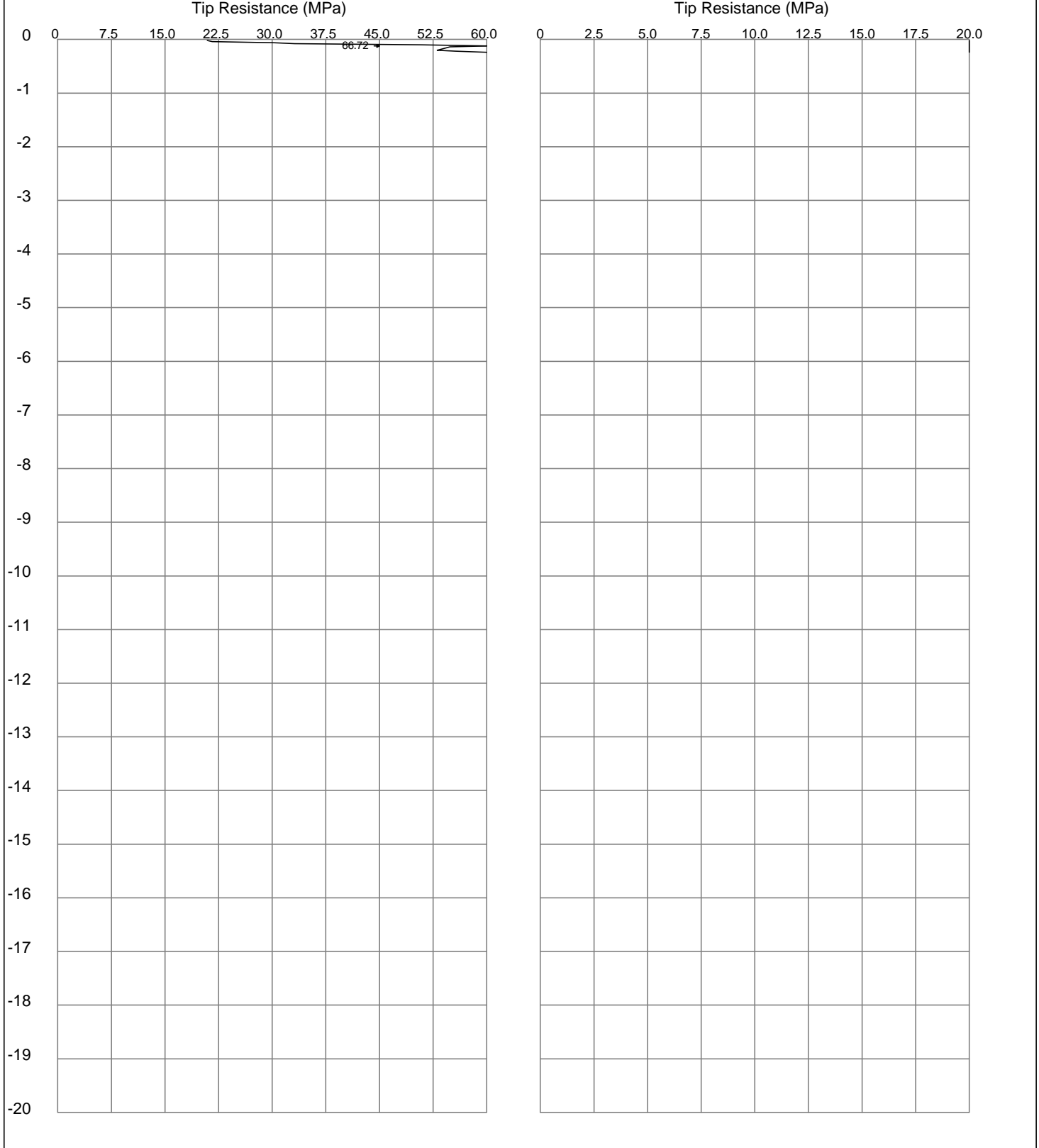


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 22	
R/L = 40.84m AHD	Hole open to depth (m) -	Total depth (m) 0.24	Operator Brad
Co ordinate: X= 391299.98 Y= 6480410.19	Groundwater Level (m) -	Cone No. 100709M	File 30
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



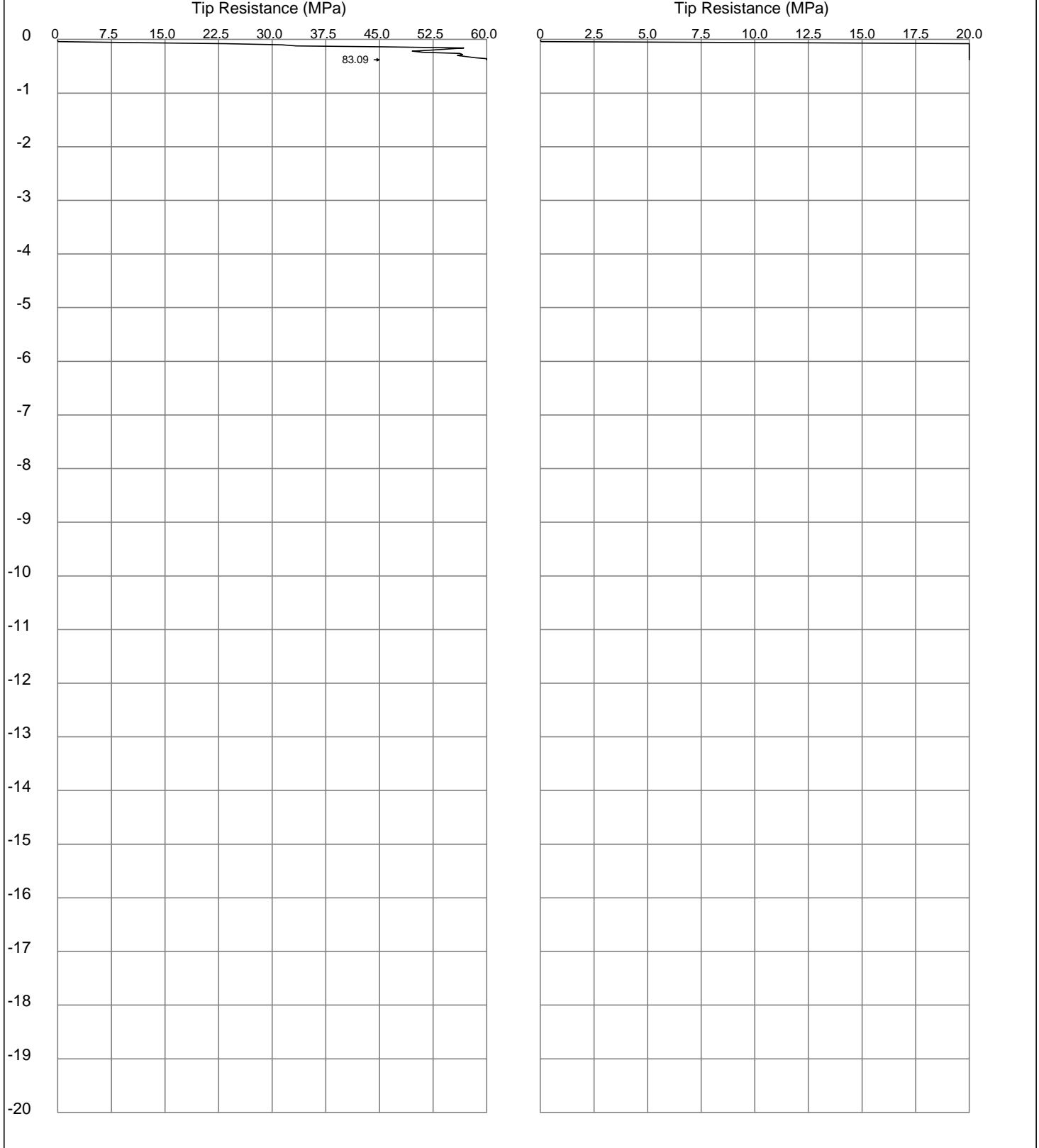


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

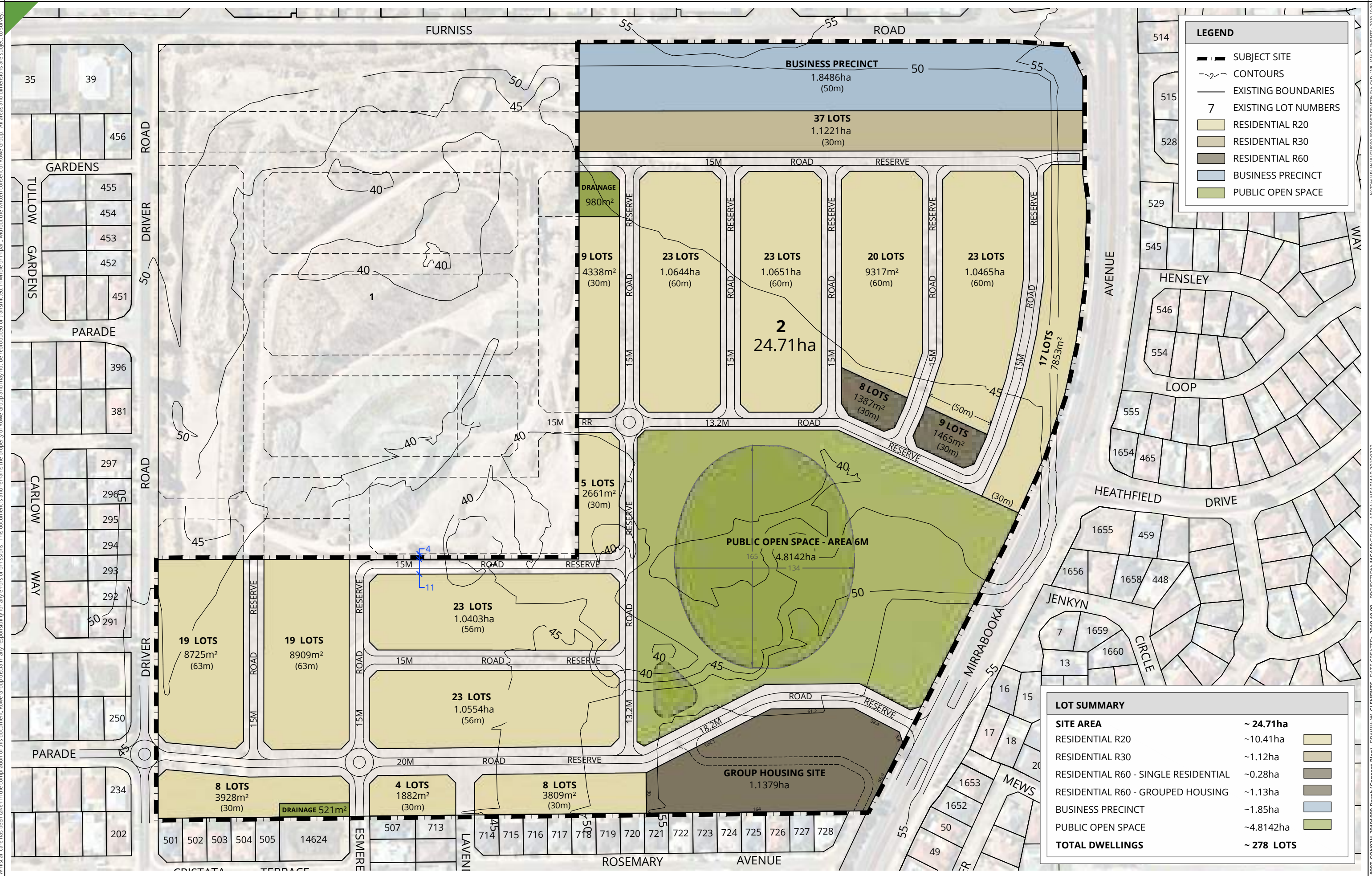
Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 22A	
R/L = 40.87m AHD	Hole open to depth (m) -	Total depth (m) 0.38	Operator Brad
Co ordinate: X= 391309.87 Y= 6480416.81	Groundwater Level (m) -	Cone No. 100709M	File 31
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017





Appendix C: Current Concept Subdivision Plan

While all care has been taken in the compilation of this document, Rowe Group disclaims any responsibility for any errors or omissions. This document is and remains the property of Rowe Group and may not be reproduced or transmitted, in whole or in part, without the written consent of Rowe Group. All areas and dimensions are subject to survey.



LEGEND

- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- 7 EXISTING LOT NUMBERS
- RESIDENTIAL R20
- RESIDENTIAL R30
- RESIDENTIAL R60
- BUSINESS PRECINCT
- PUBLIC OPEN SPACE

LOT SUMMARY

SITE AREA	~ 24.71ha	
RESIDENTIAL R20	~10.41ha	
RESIDENTIAL R30	~1.12ha	
RESIDENTIAL R60 - SINGLE RESIDENTIAL	~0.28ha	
RESIDENTIAL R60 - GROUPED HOUSING	~1.13ha	
BUSINESS PRECINCT	~1.85ha	
PUBLIC OPEN SPACE	~4.8142ha	
TOTAL DWELLINGS	~ 278 LOTS	

CONCEPT PLAN
 LOT 2 (No. 26) DRIVER ROAD
 DARCH

NORTH

0 62.5 m

SCALE @ A3: 1:2500

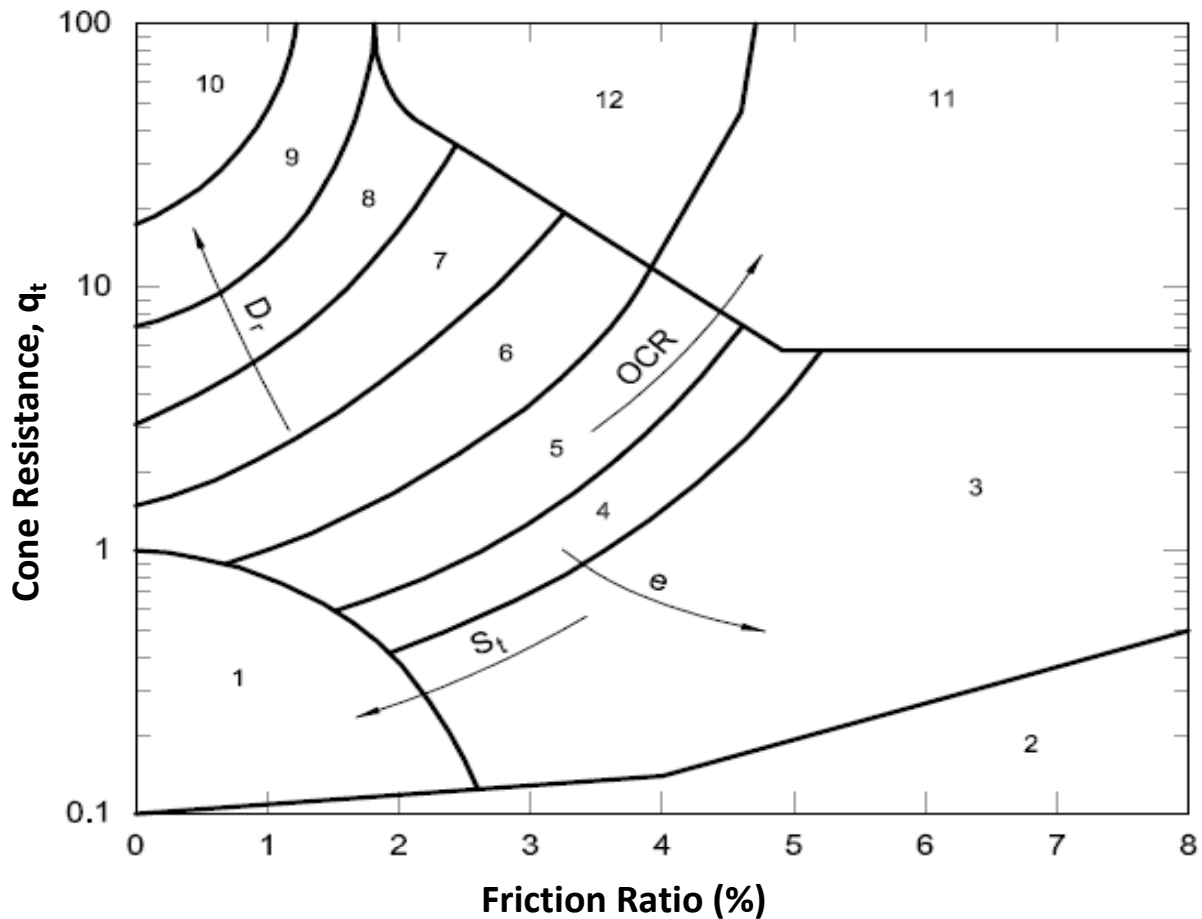
8997-CON-02-H

ROWE GROUP DESIGN

8997_CON02_H_20191009 Darch (Concept Plan) - DRAWN: W. CLEMENTS - DATE CREATED: 2019.10.09 - PROJECTION: MGA50 GD494 - AERIAL: NEARMAP 20190223



Appendix D: Cone Penetration Test Results



DEFINITIONS

- q_t : Cone tip resistance corrected for pore water pressure
- S_t : Sensitivity
- e : Void ratio
- D_r : Relative density
- OCR : Overconsolidation ratio
- OC : Overconsolidated

SOIL BEHAVIOUR TYPE ZONES

- | | |
|------------------------------|--|
| 1. Sensitive fine grained | 7. Silty sand to sandy silt |
| 2. Organic material | 8. Sand to silty sand |
| 3. Clay | 9. Sand |
| 4. Silty clay to clay | 10. Gravelly sand to sand |
| 5. Clayey silt to silty clay | 11. Very stiff fine grained material (OC/cemented) |
| 6. Sandy silt to clayey silt | 12. Sand to clayey sand (OC/cemented) |

NOTES

- A. Some overlap in type zones is expected
- B. Local correlations are preferred and may indicate soil type boundaries that are different from those shown above

Reference: Robertson, P.K., Campanella, R.G., Gillespie, D. and Grieg, J. (1986) "Use of Piezometer Cone Data". Proceedings of the ASCE Speciality Conference In Situ '86: Use of In Situ Tests in Geotechnical Engineering, Blacksburg, pp 1263-80, American Society of Civil Engineers (ASCE)



CONE PENETRATION TESTING (CPT) SOIL TYPE INTERPRETATION

ELECTRIC FRICTION-CONE PENETROMETER

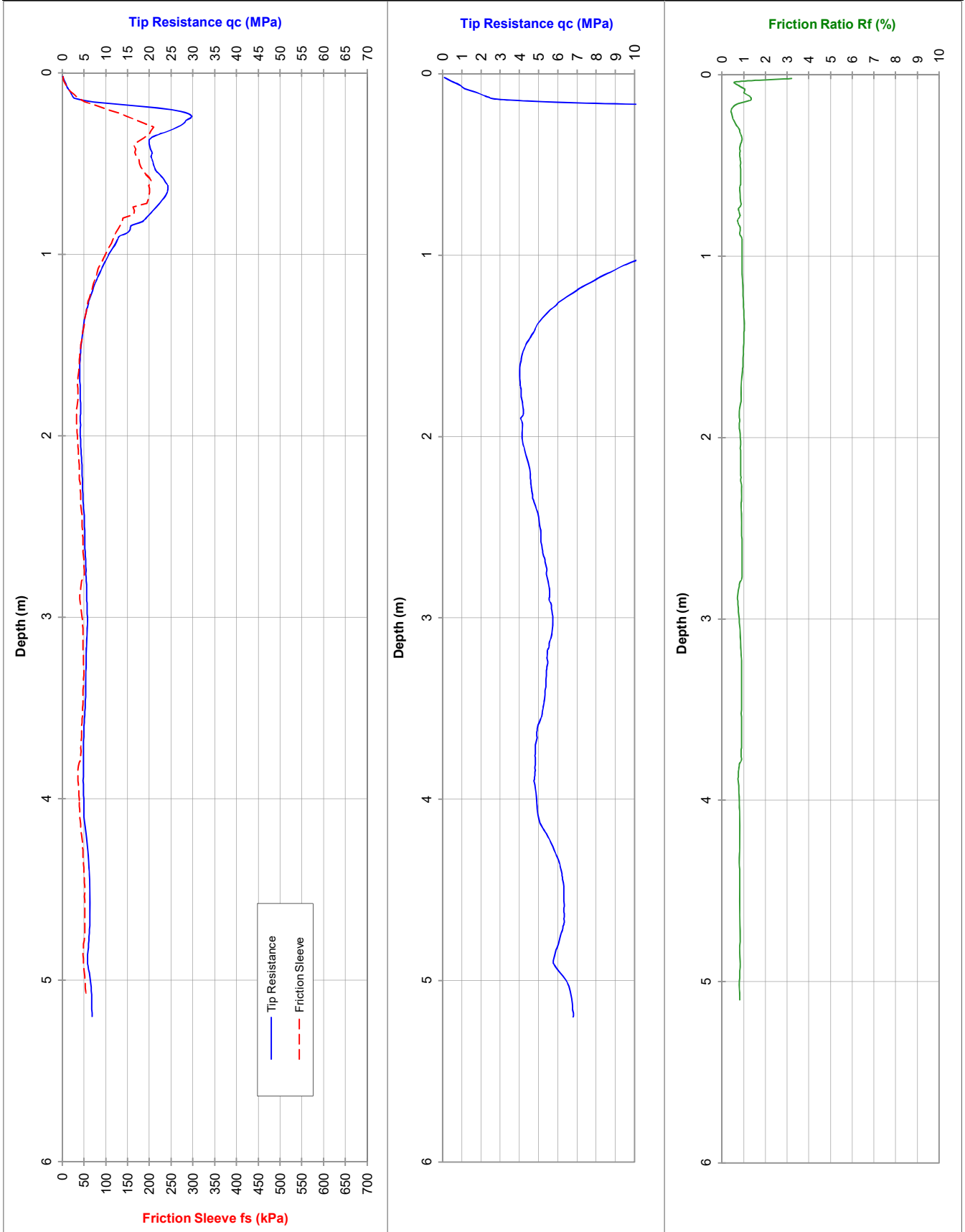
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 01

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0620M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

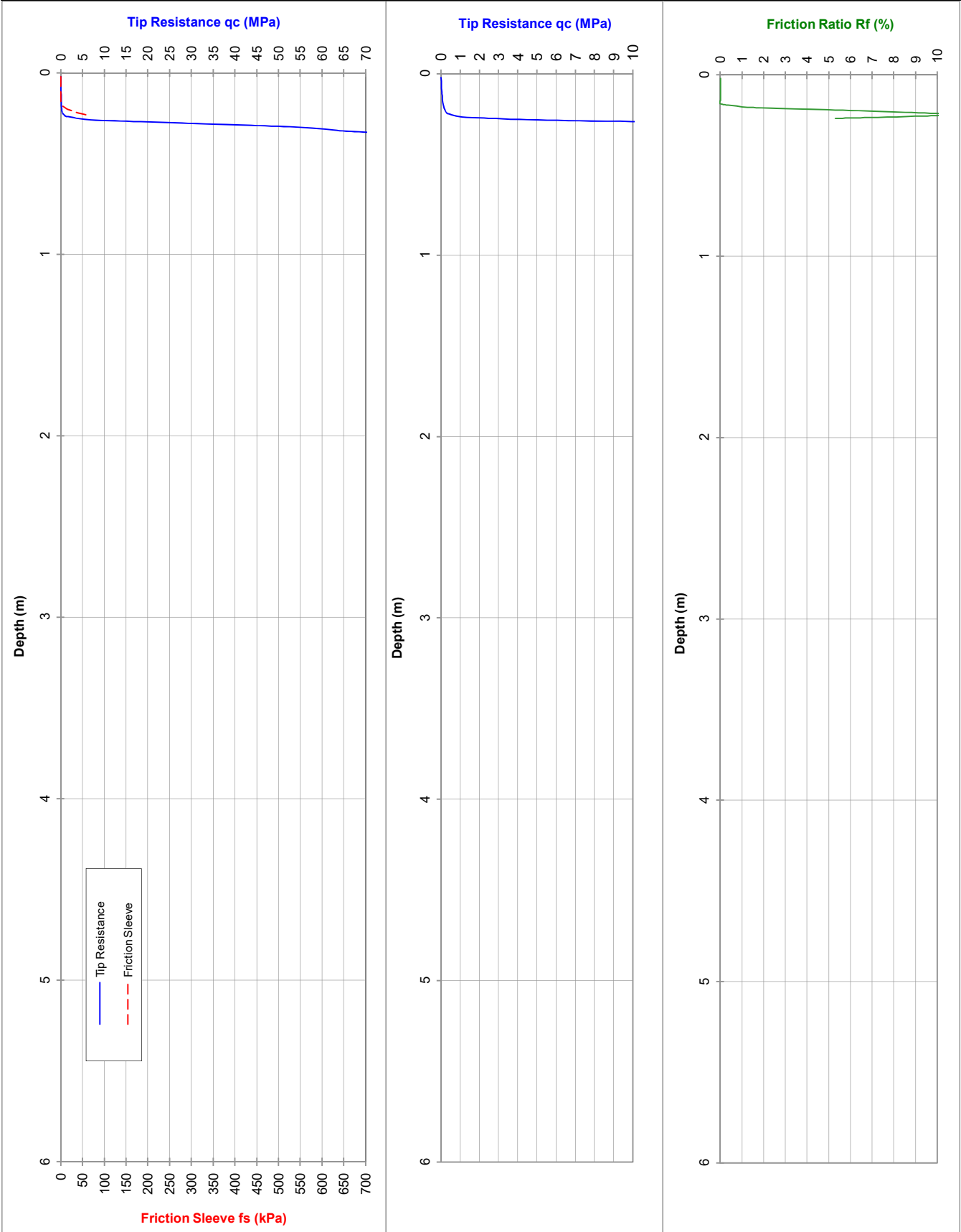
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 02

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 0.3

Pre-dug to (m): 0.3

Refusal: 80MPa

Cone I.D.: EC20

File: GL0619M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

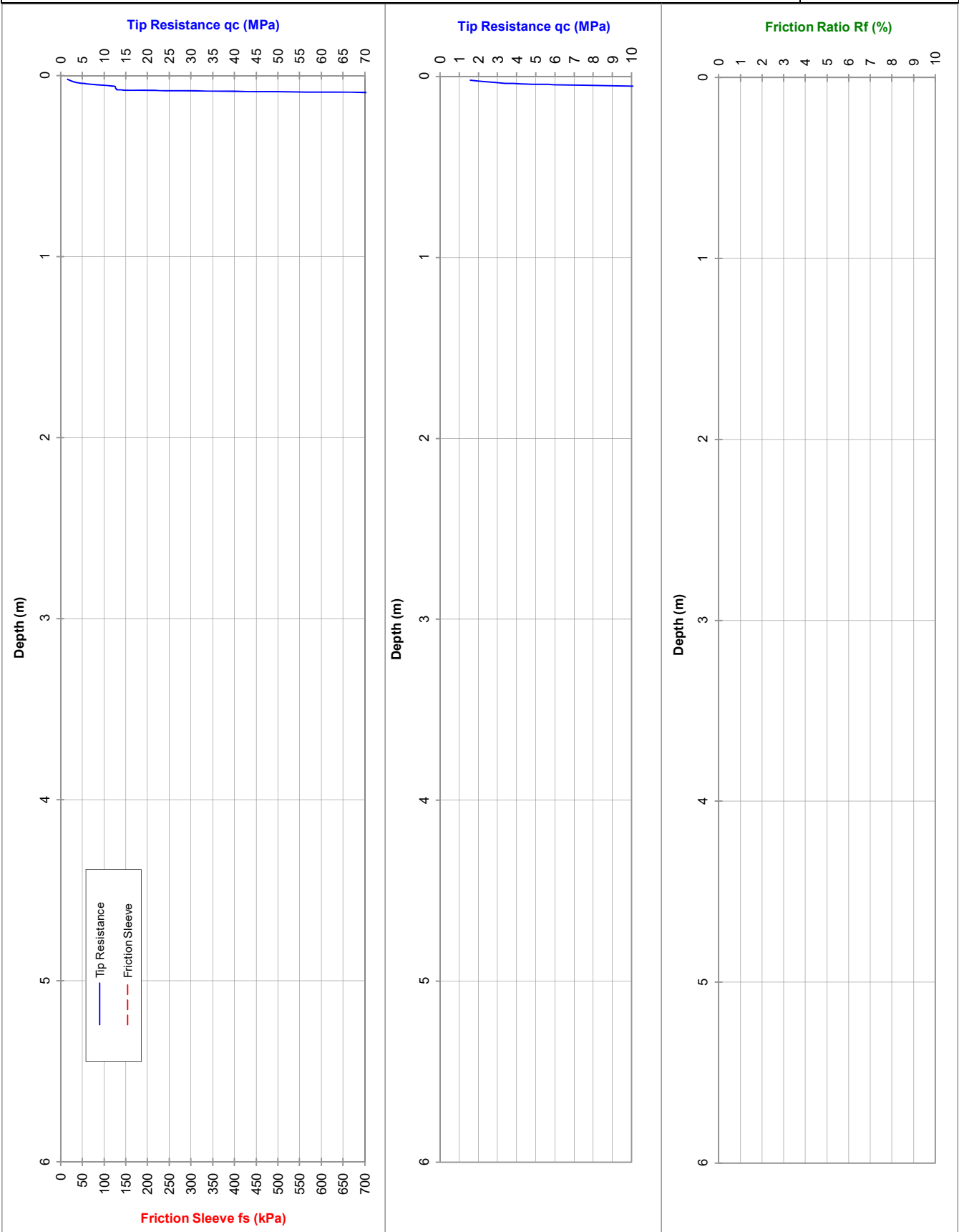
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 03

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Approx. Water (m): Dry to 0.1

Dummy probe to (m):

Refusal: 100MPa

Cone I.D.: EC20

File: GL0618M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

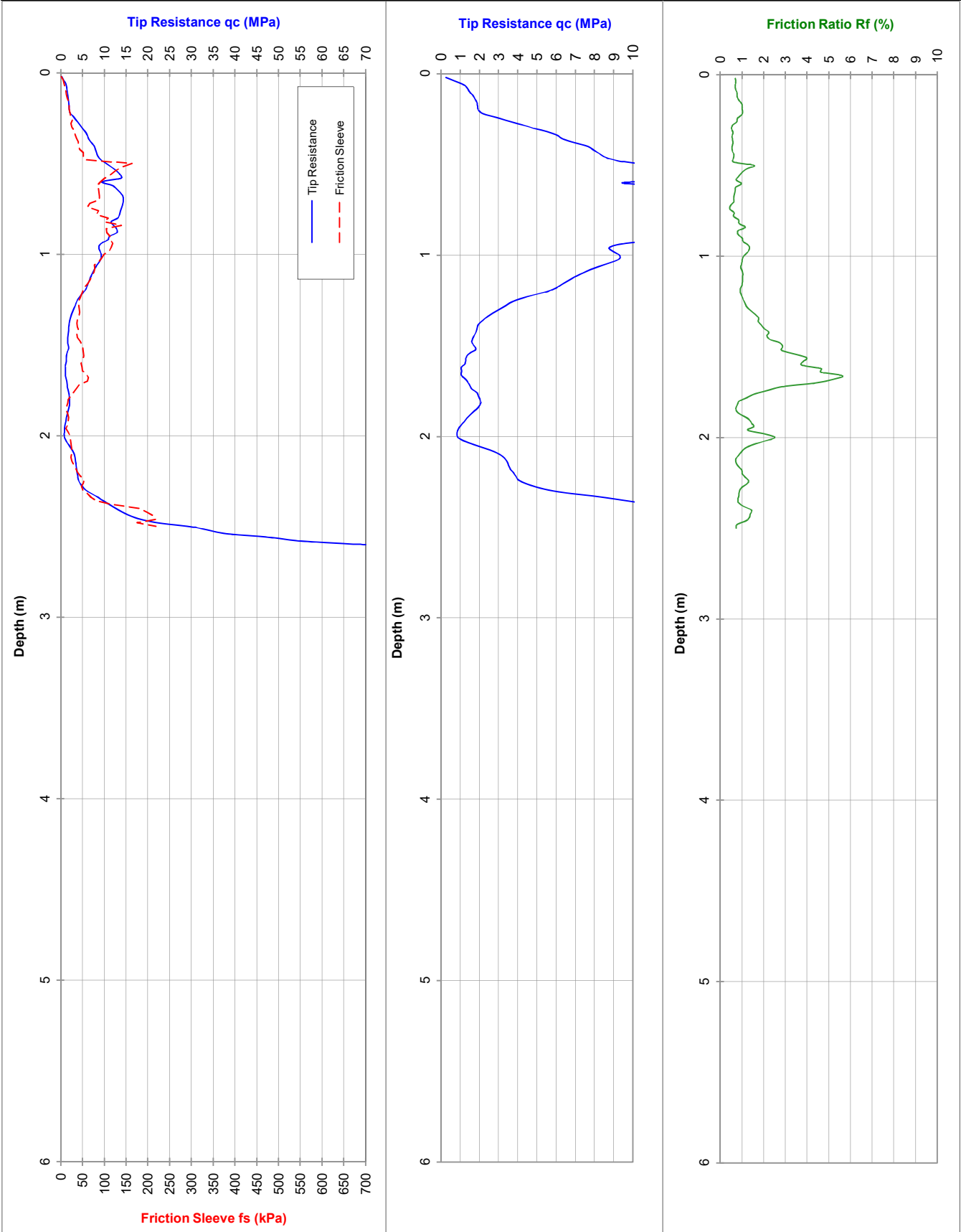
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 04

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: 70MPa

Cone I.D.: EC20

File: GL0617M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

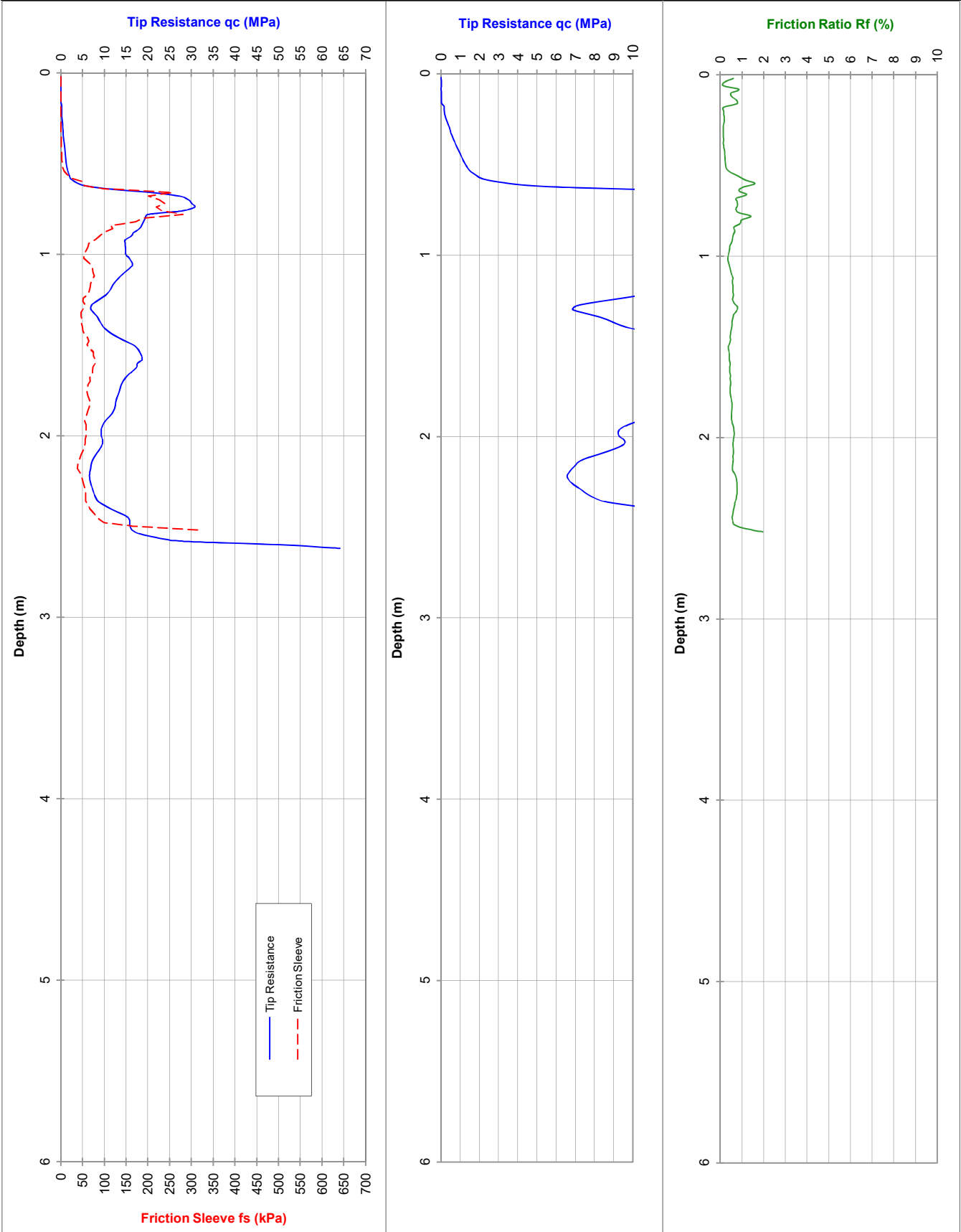
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 05

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: 64MPa

Cone I.D.: EC40

File: GL1080T

Rig Type: 7 tonne Track

ELECTRIC FRICTION-CONE PENETROMETER

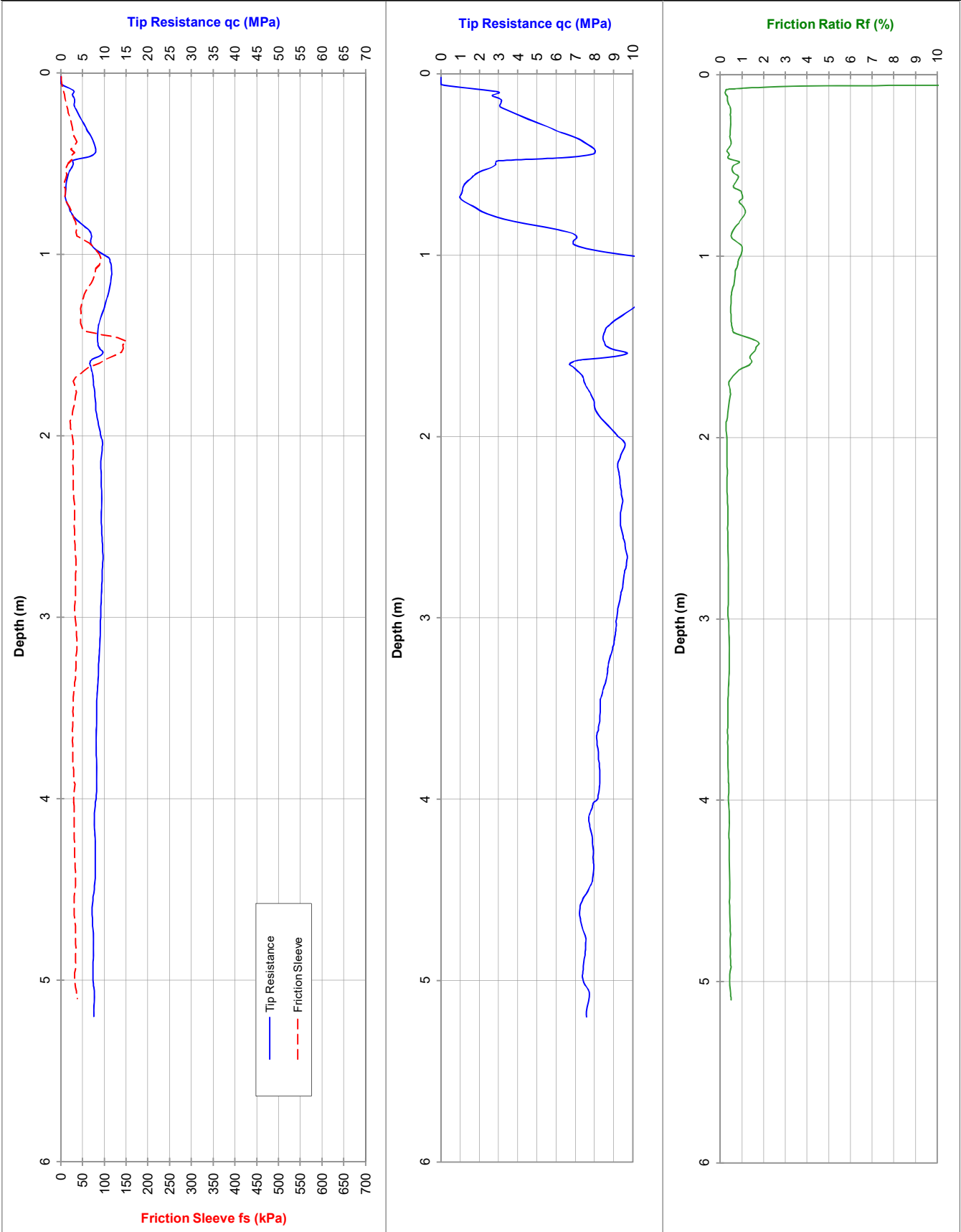
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 06

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL1076TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

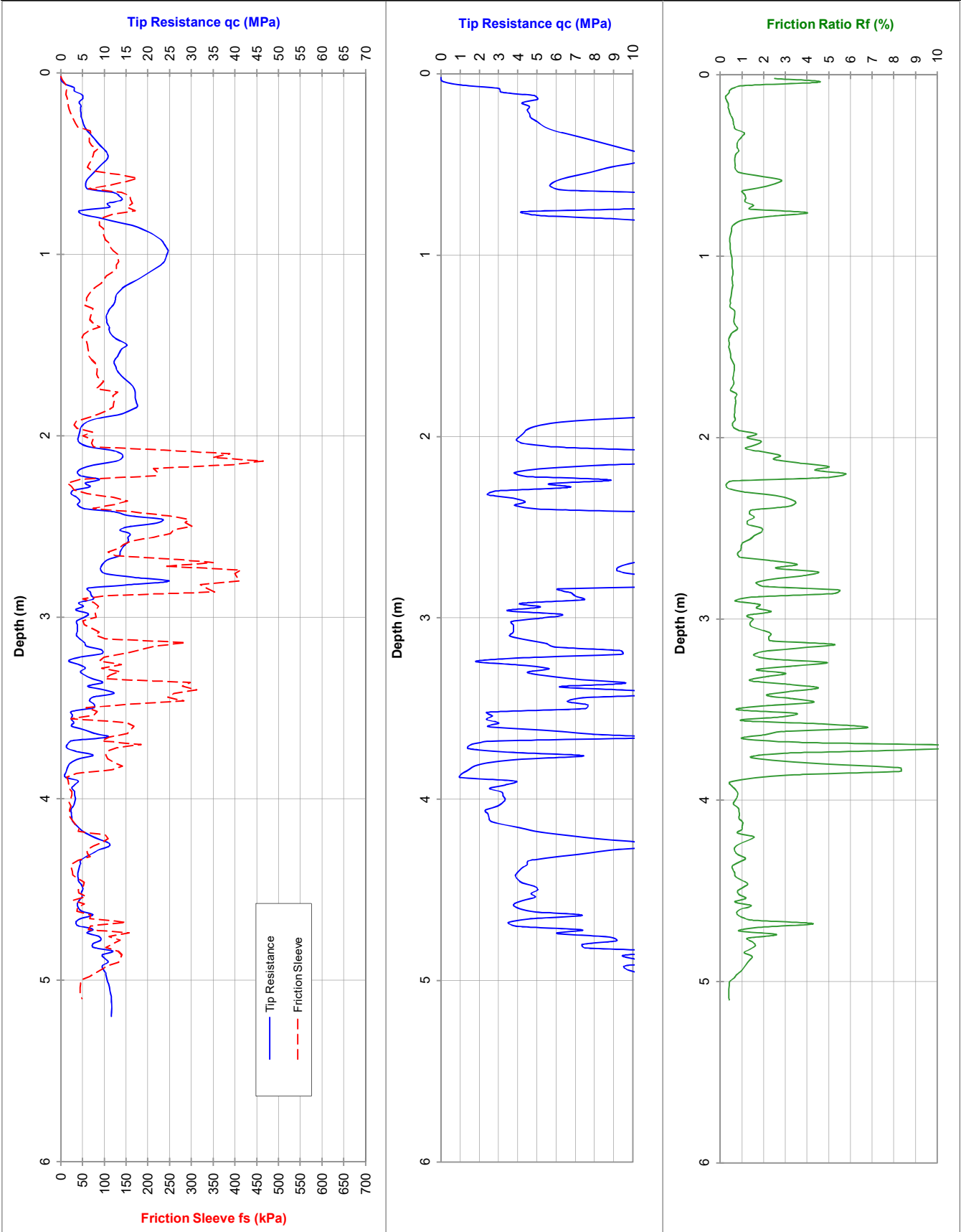
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 07

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.5

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL1077TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

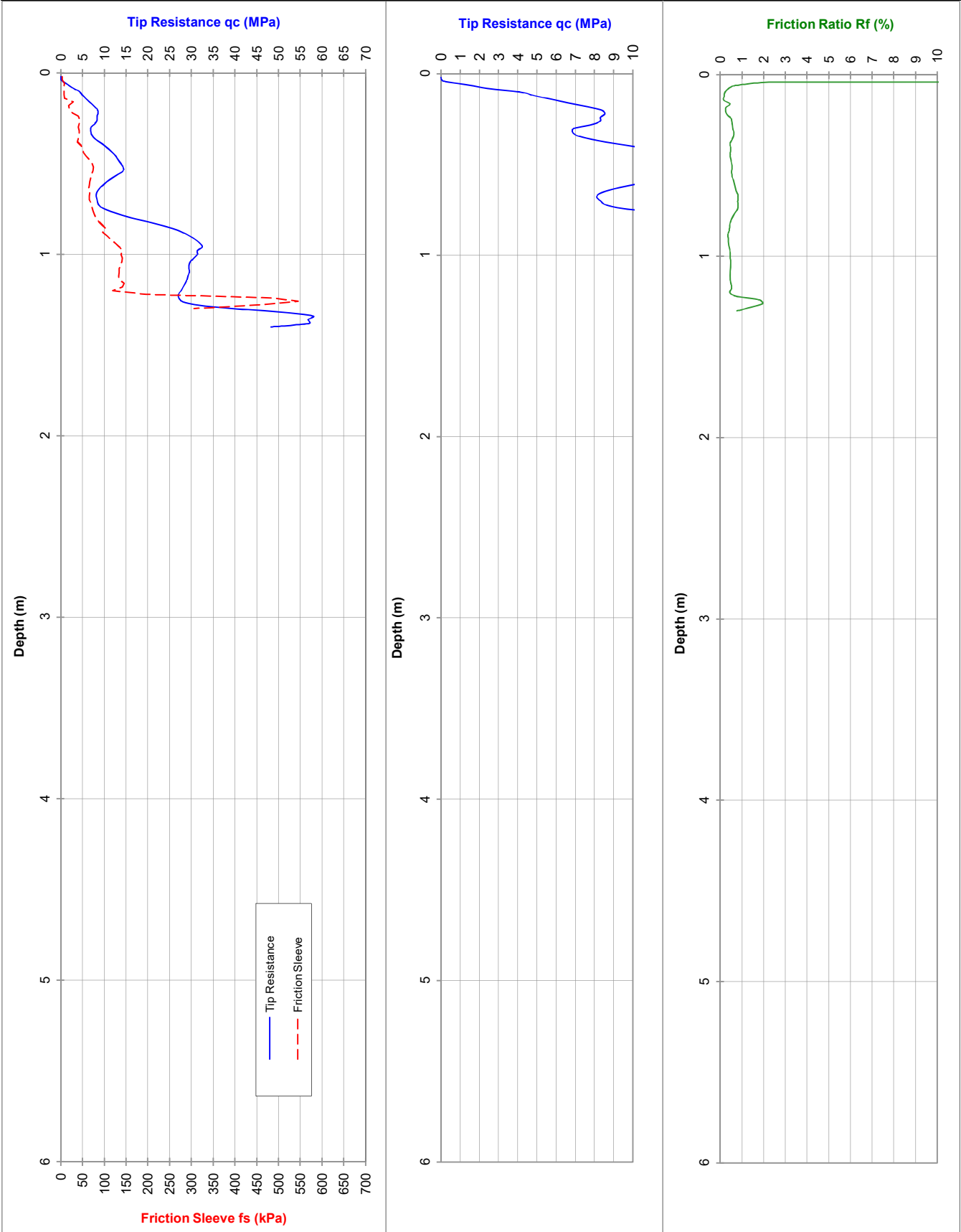
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 08

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL1078TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

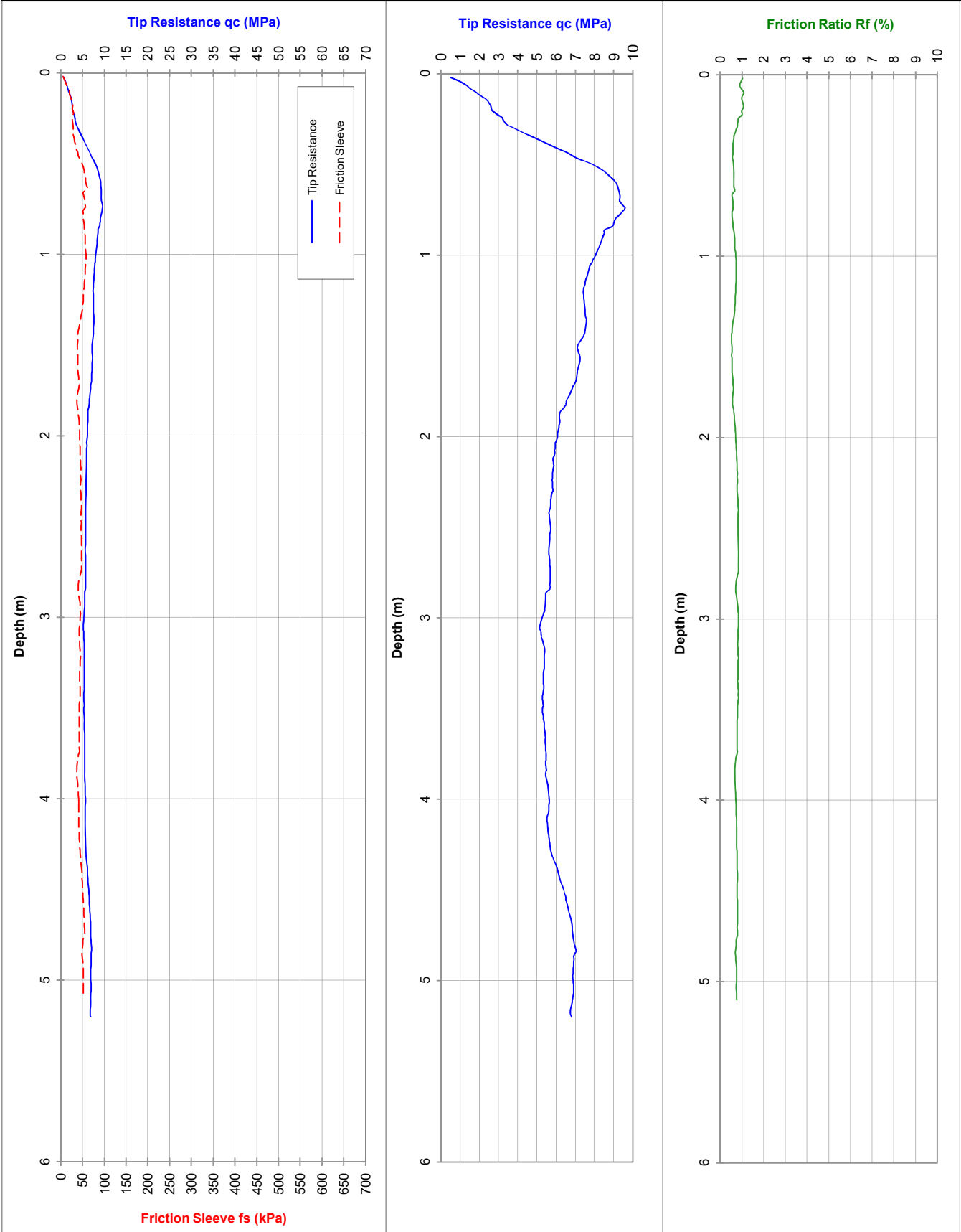
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 09

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0616M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

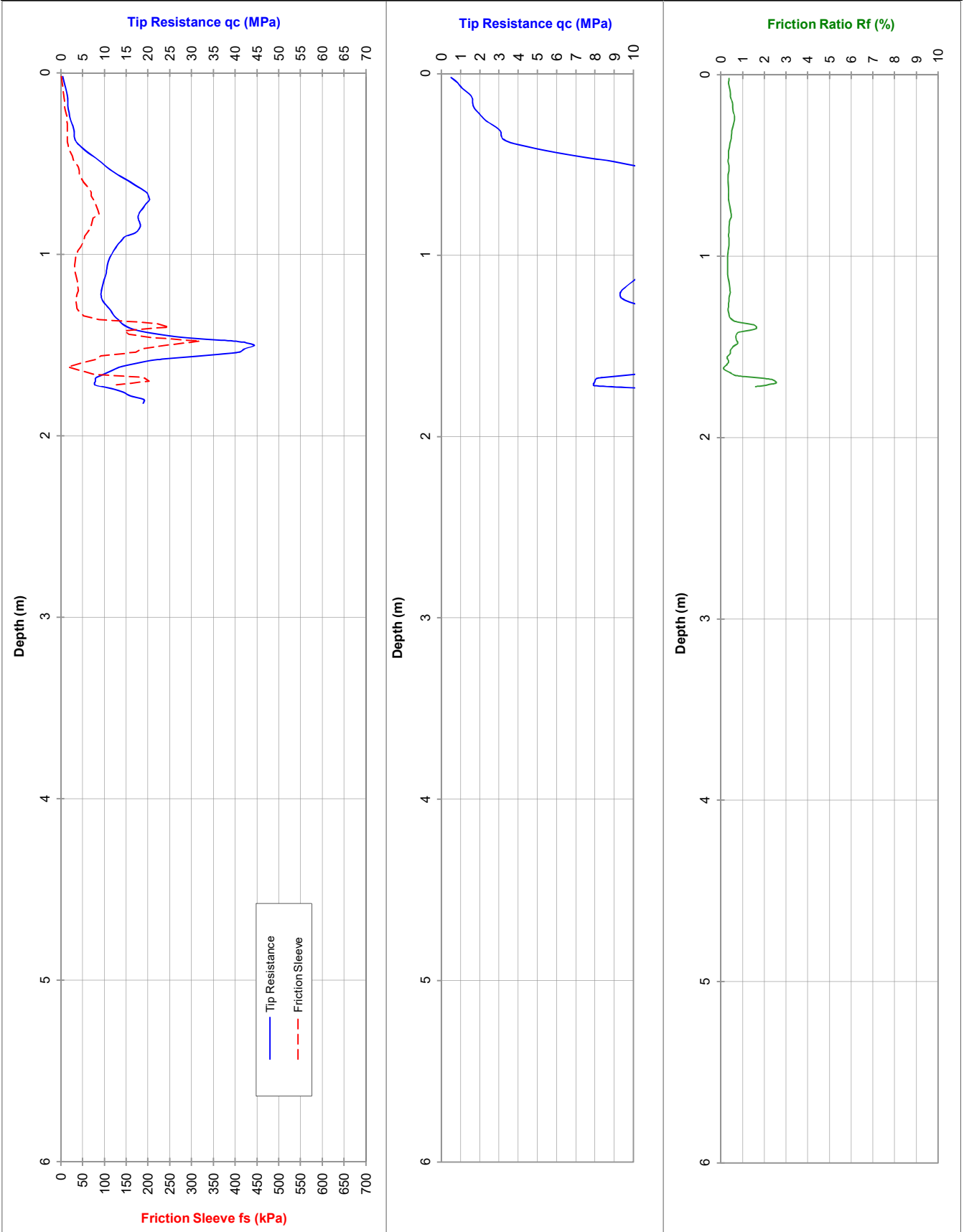
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 10

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.3

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL1079TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

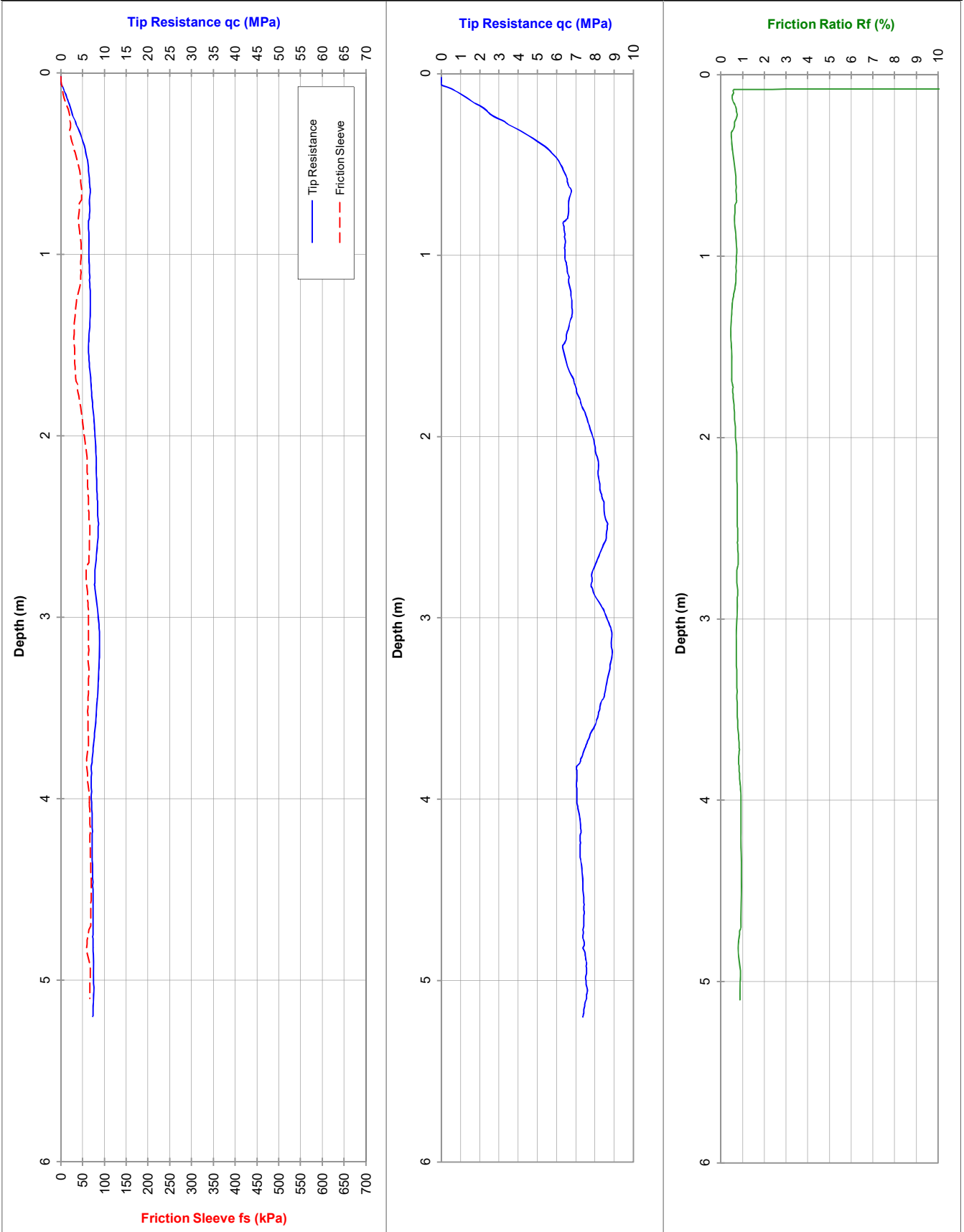
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 11

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0613M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

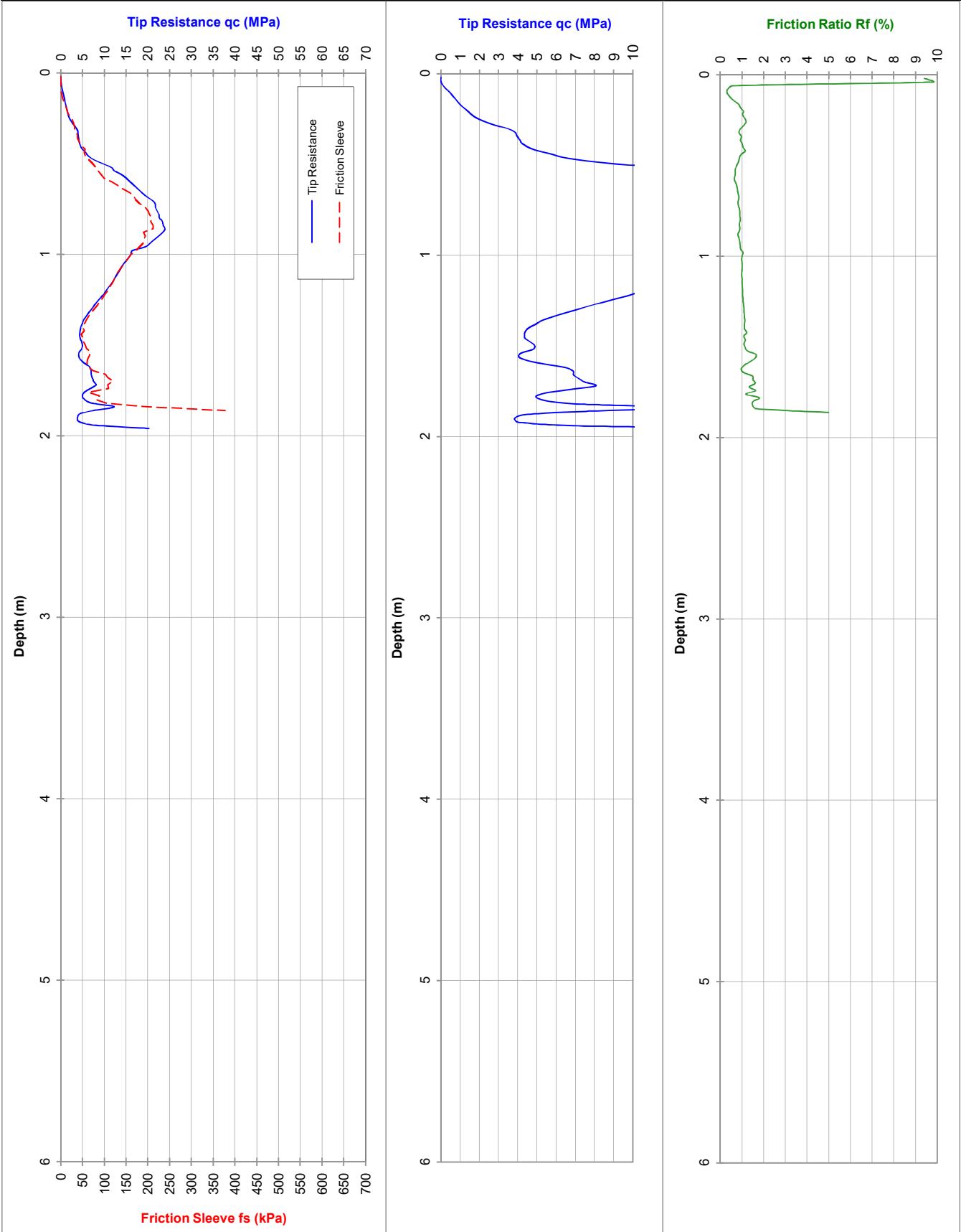
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 12

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0614M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

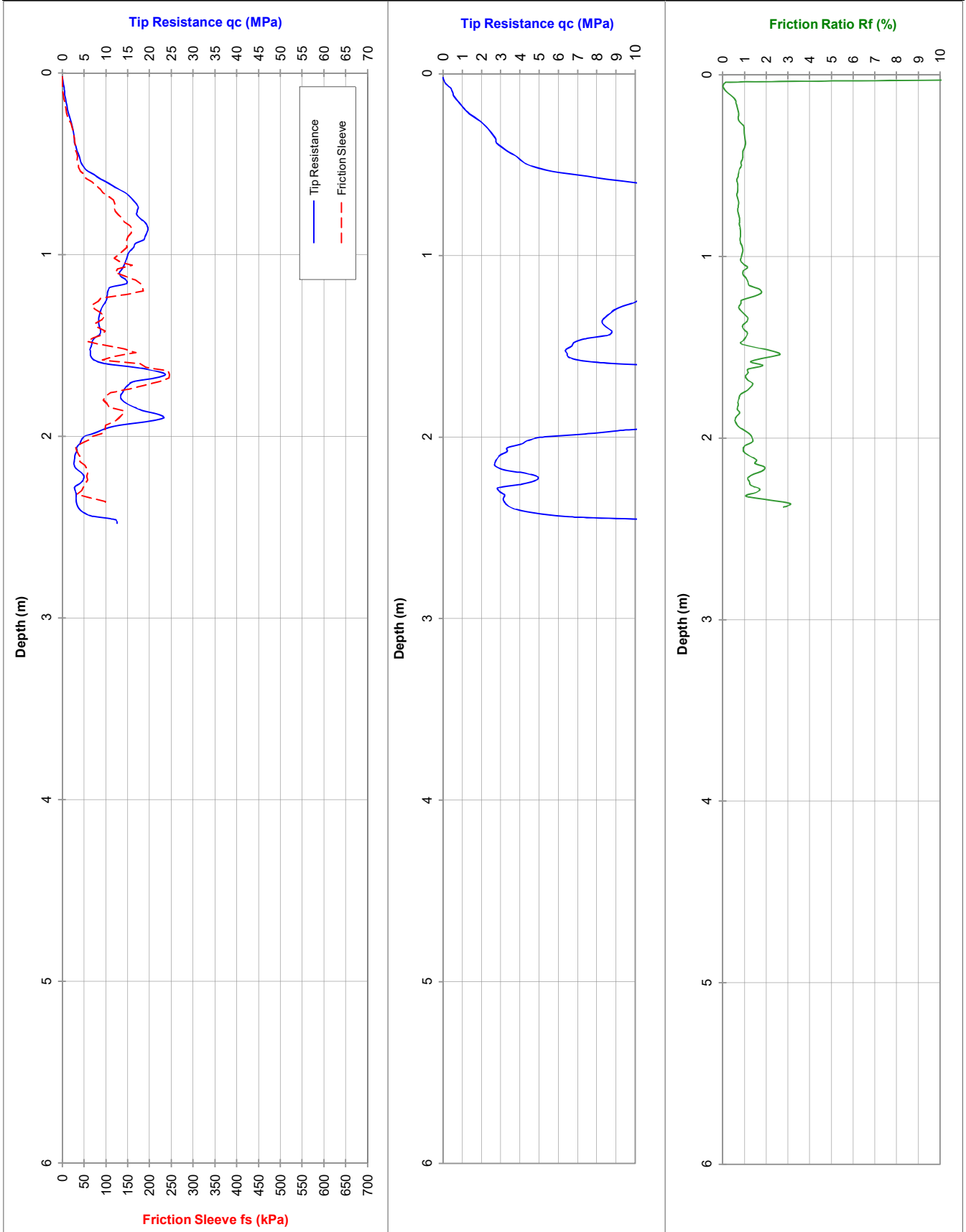
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 13

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.4

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0615M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

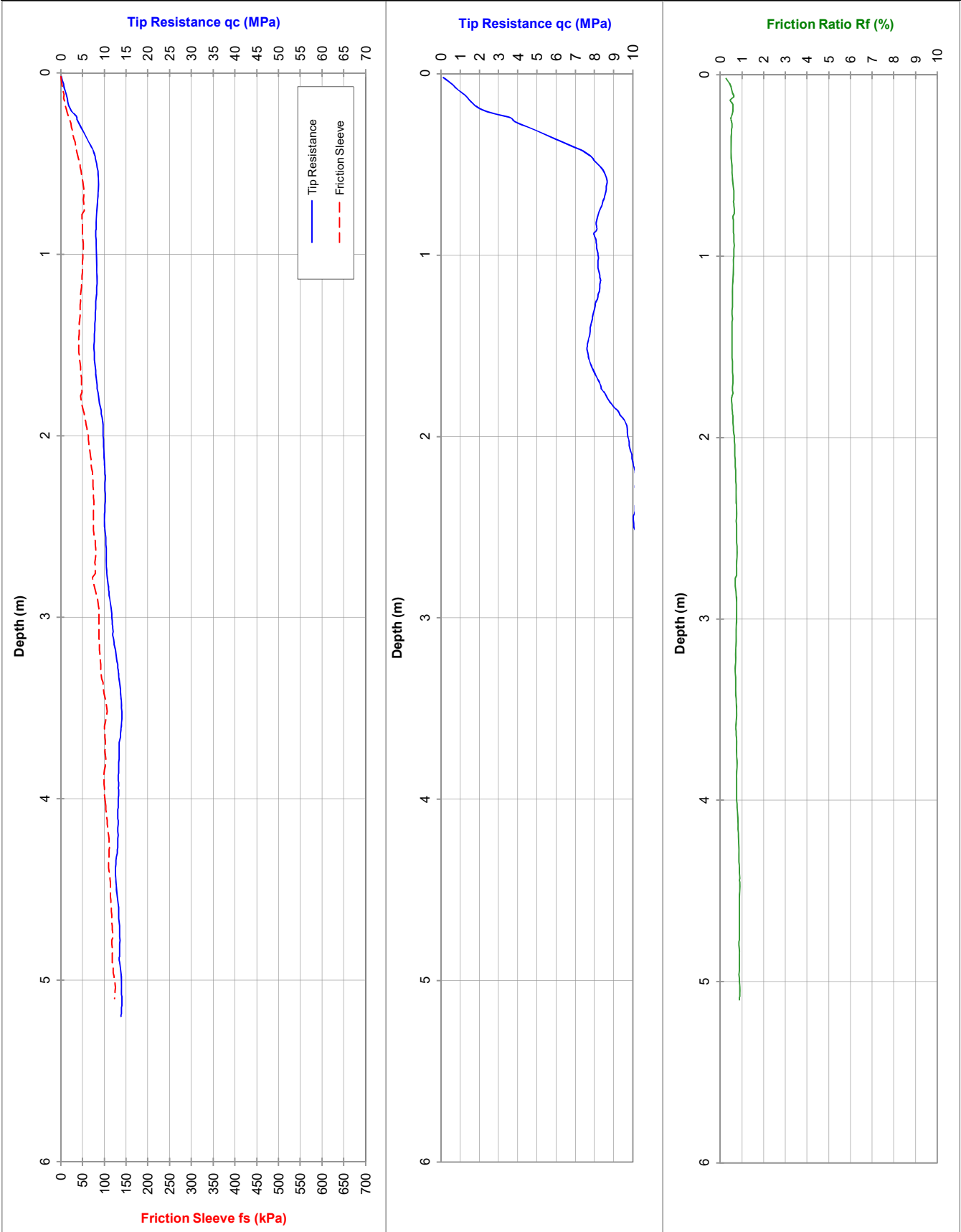
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 14

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0612M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

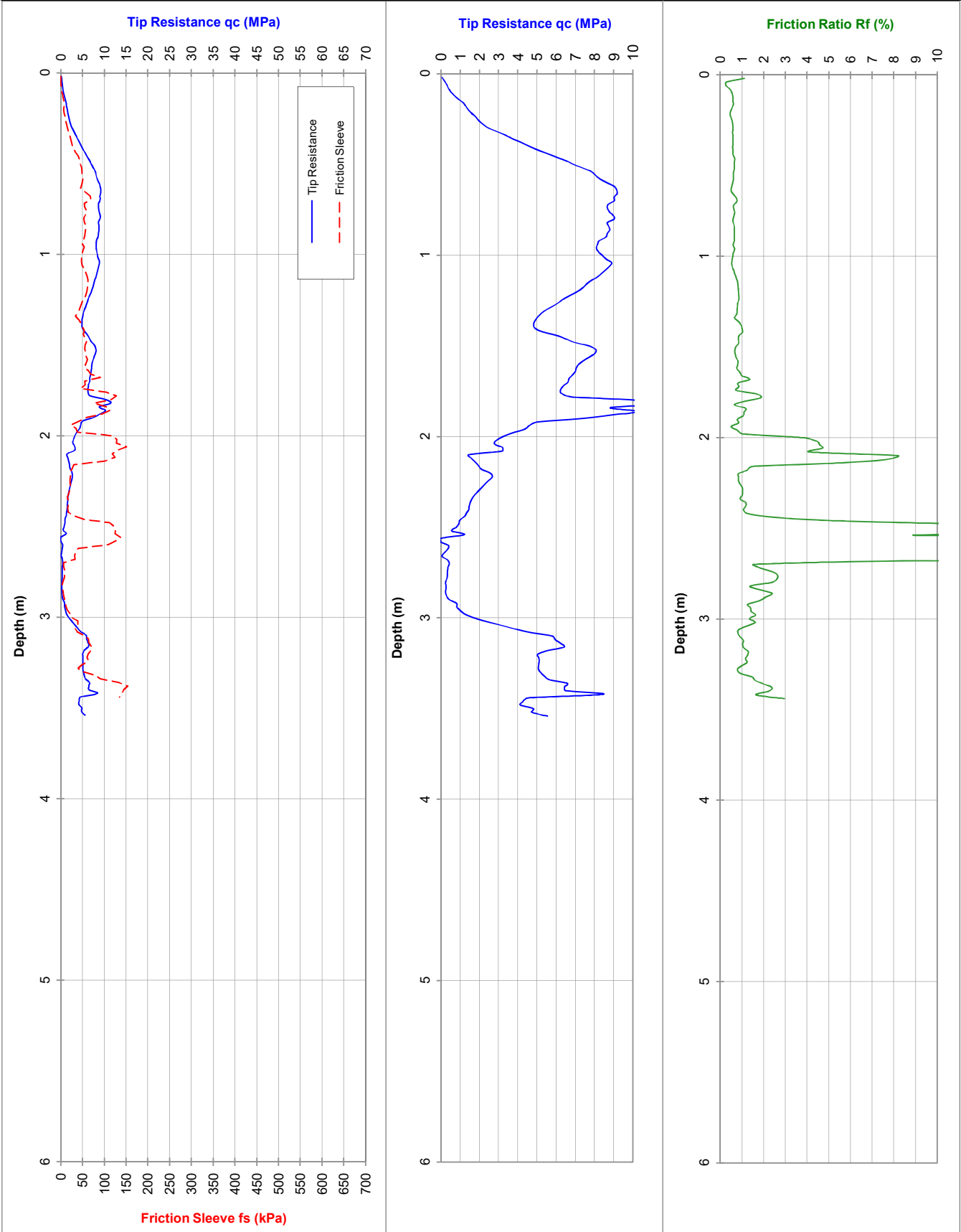
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 15

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.0

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0611M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

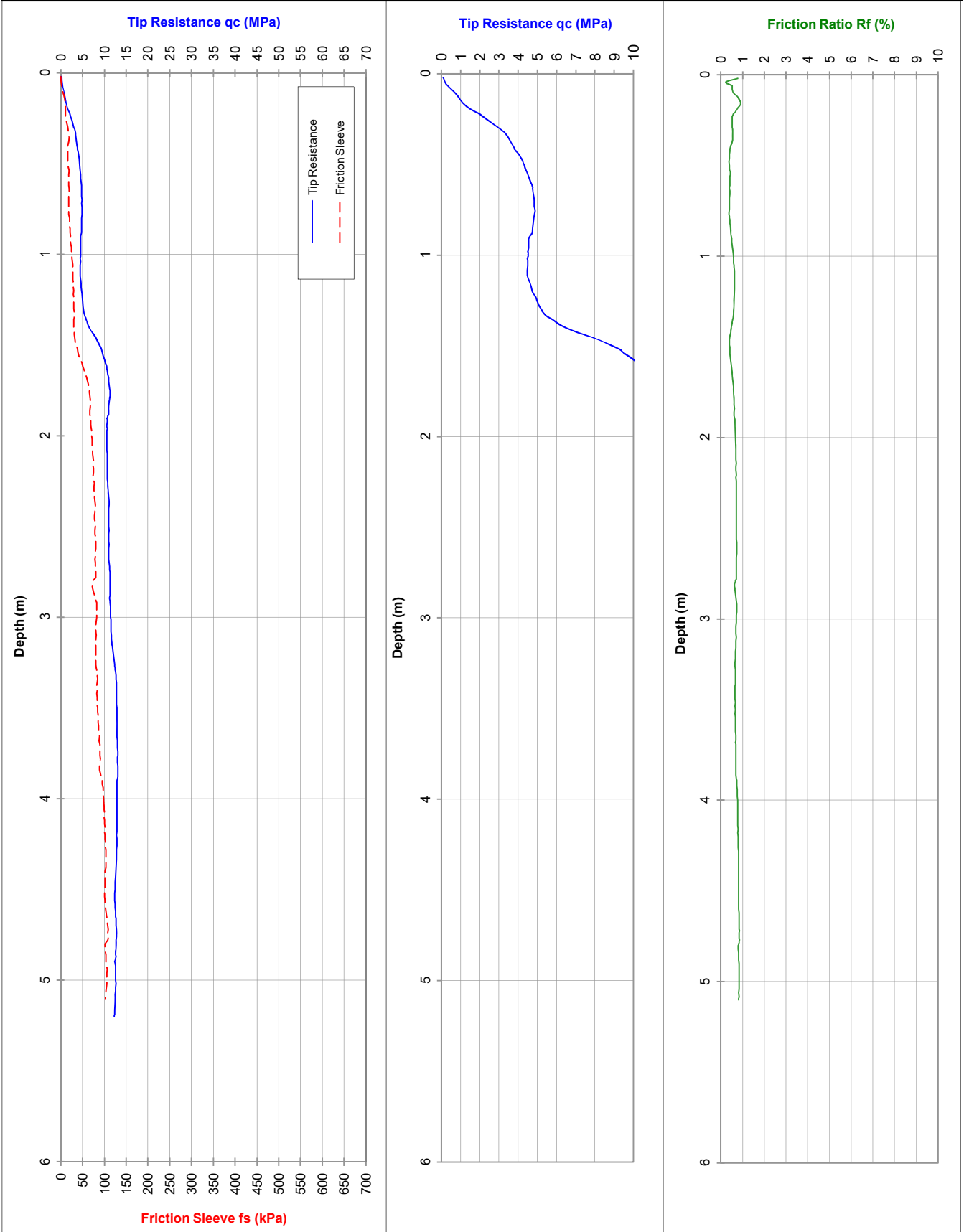
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 16

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0606M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

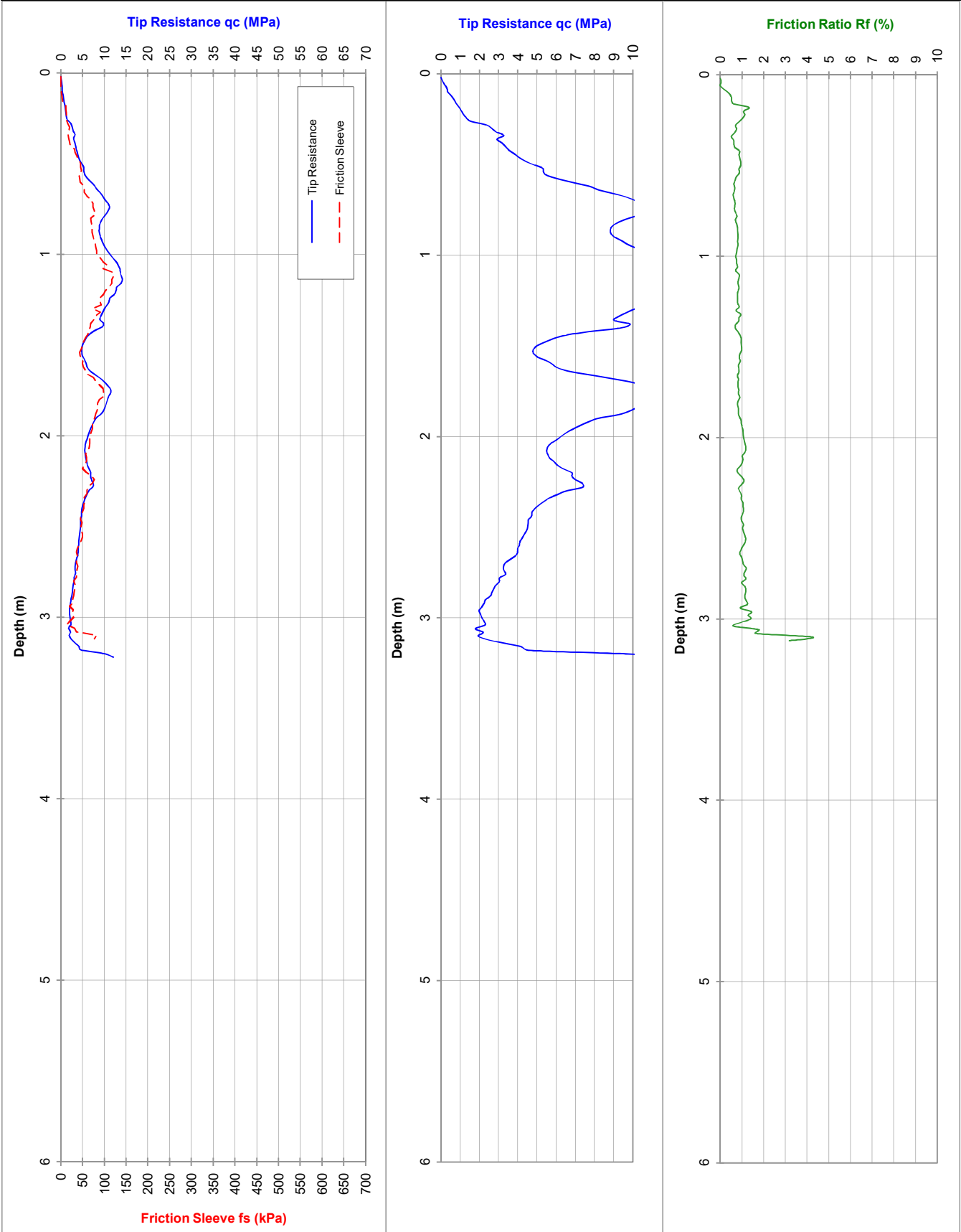
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 17

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0609M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

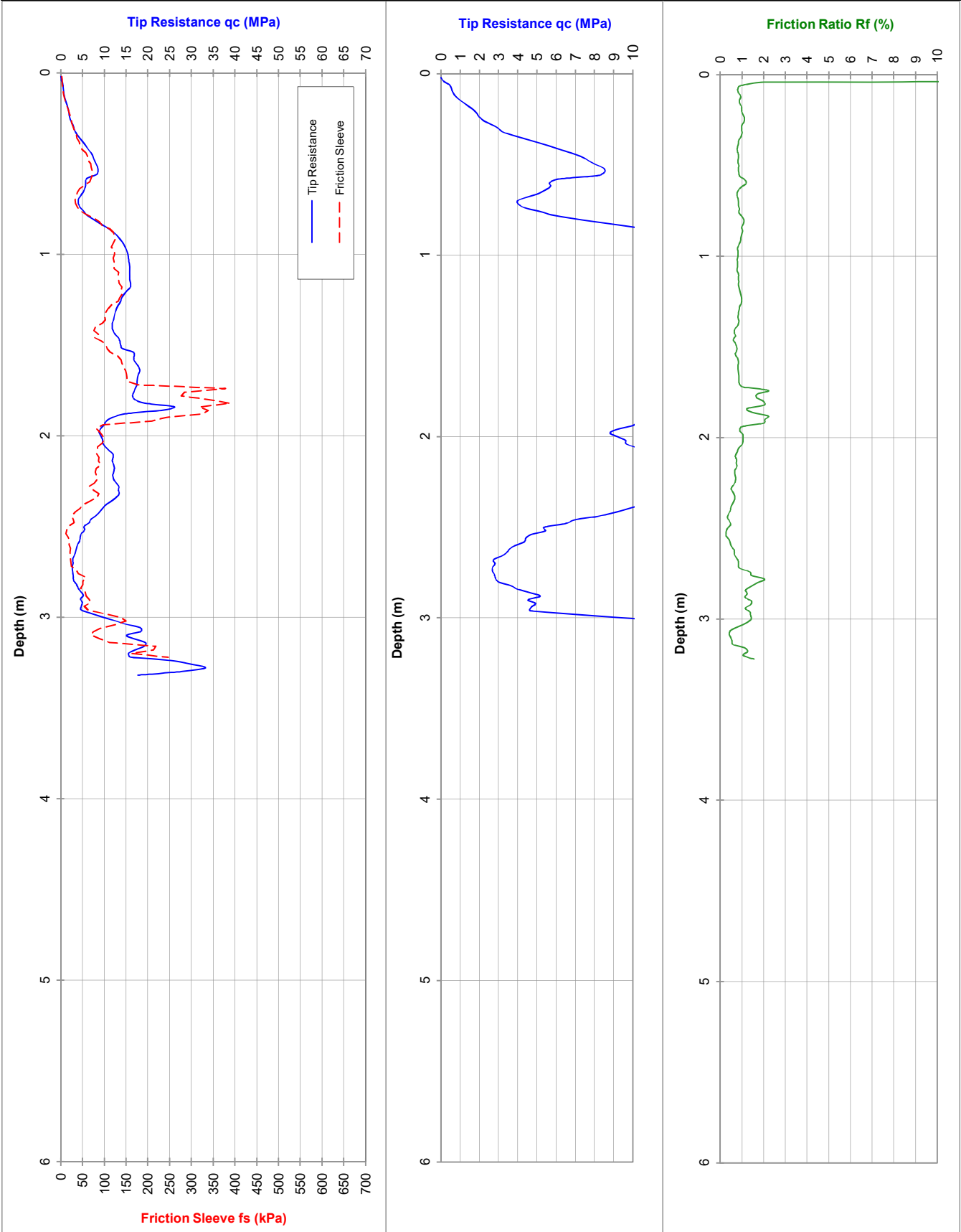
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 18

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0610M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

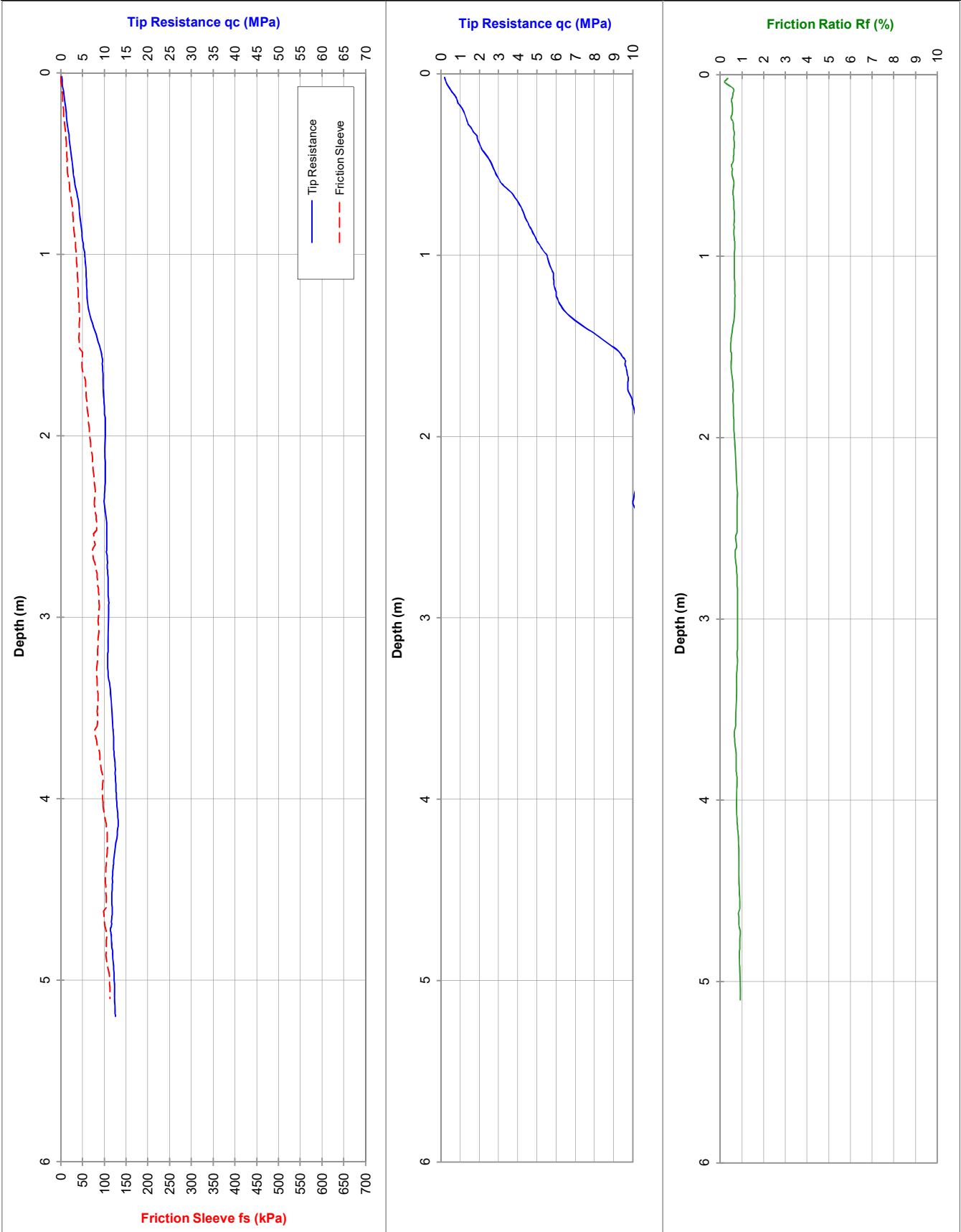
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 19

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0605M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

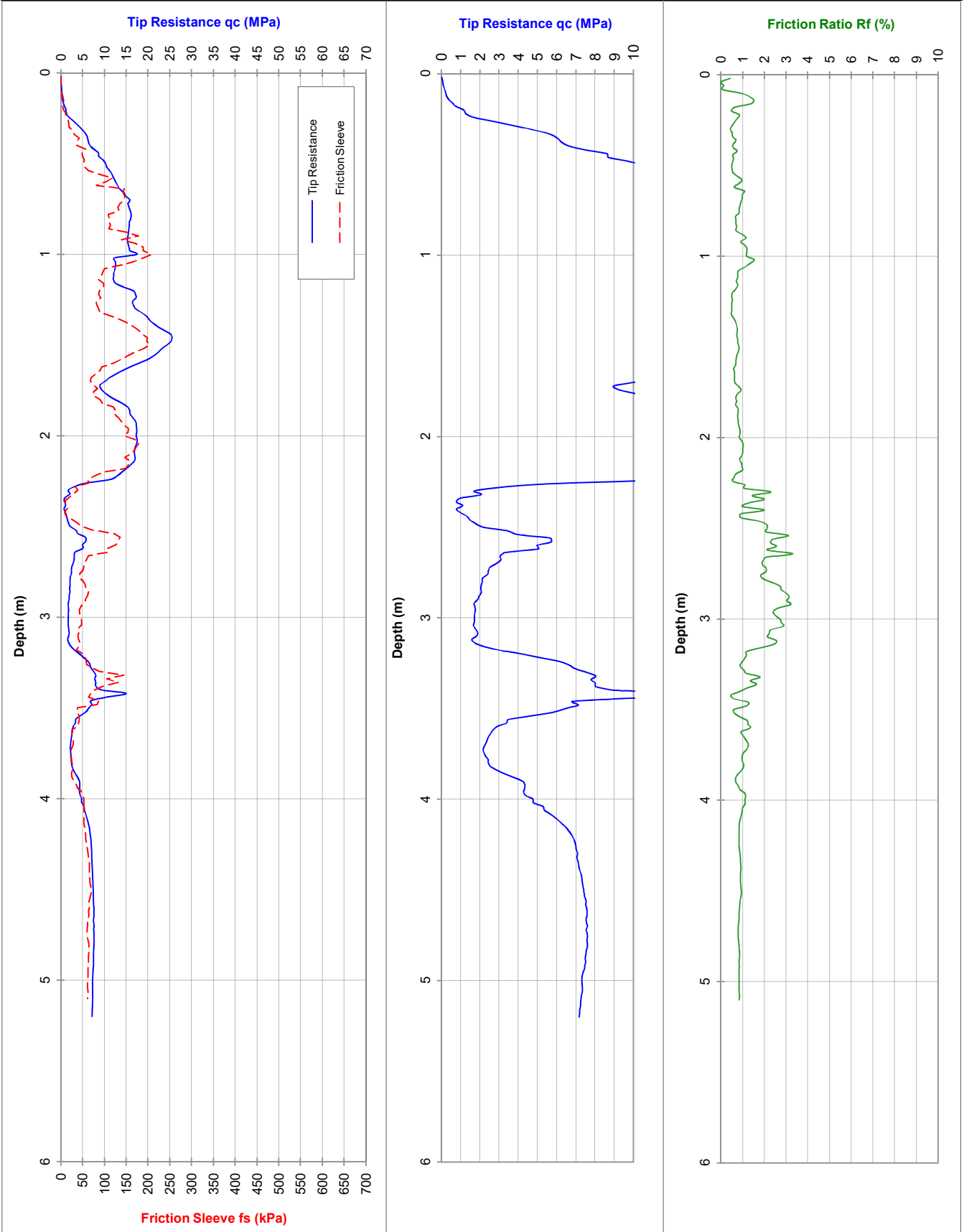
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 20

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0608M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

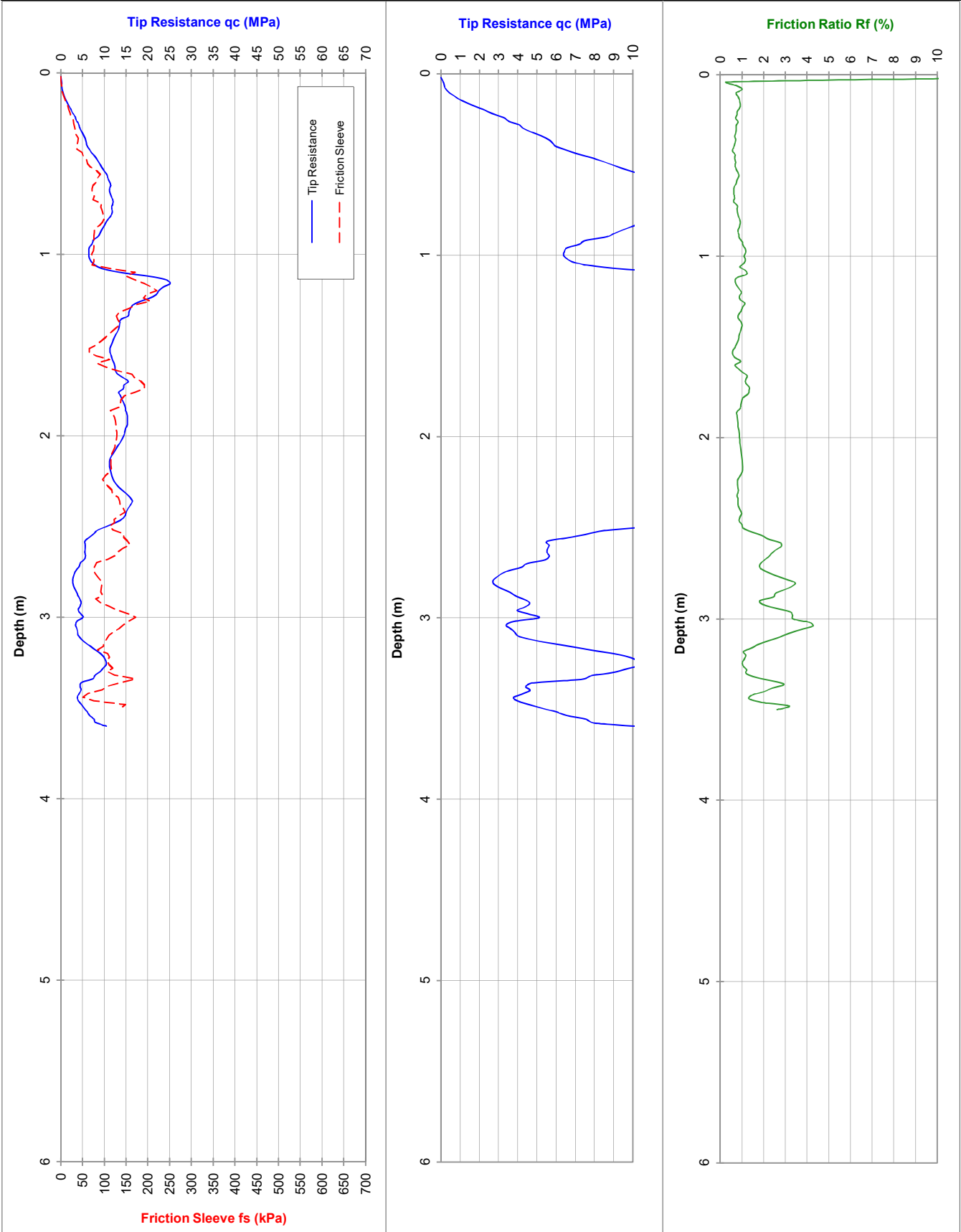
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 21

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0607M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

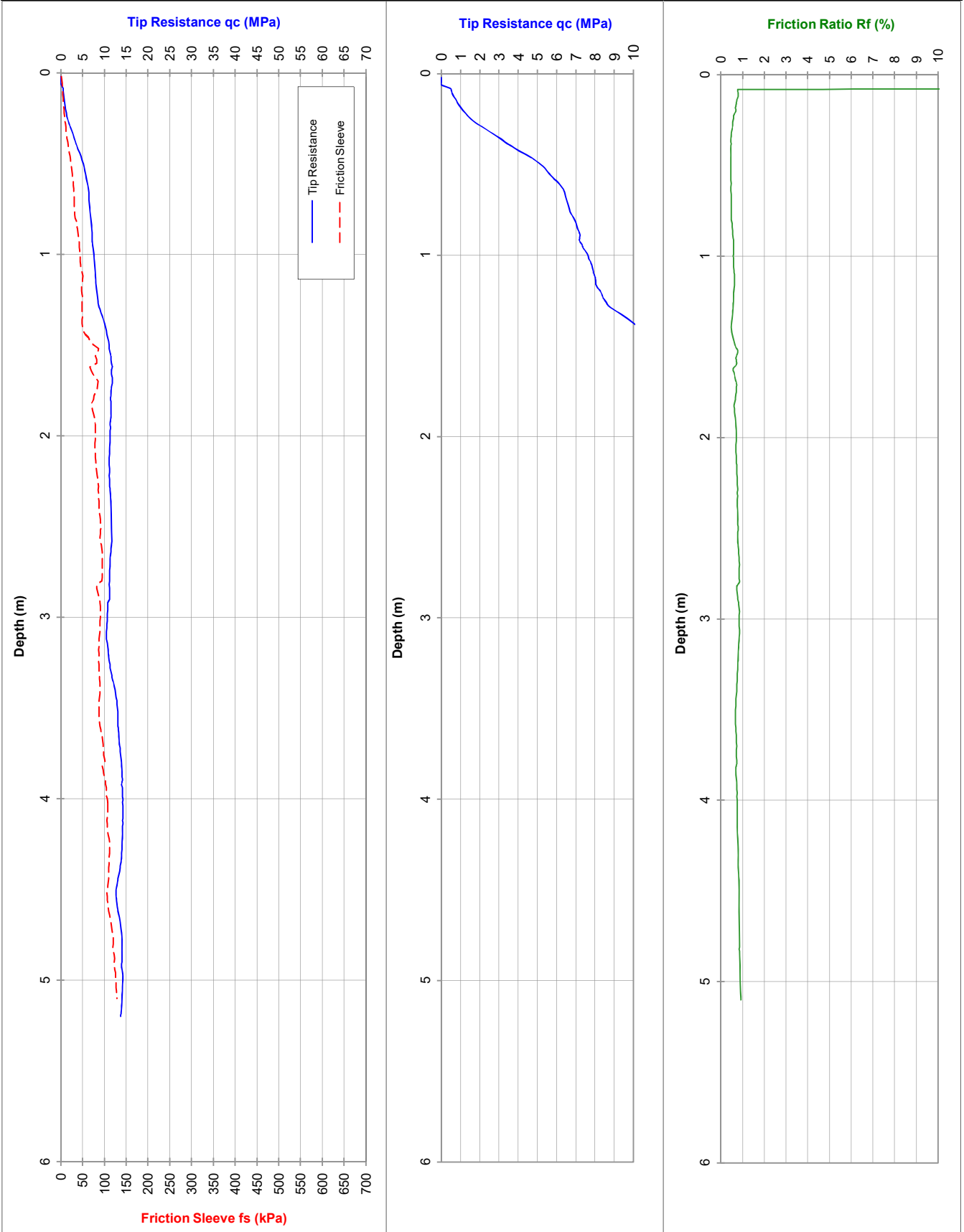
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 22

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0604M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

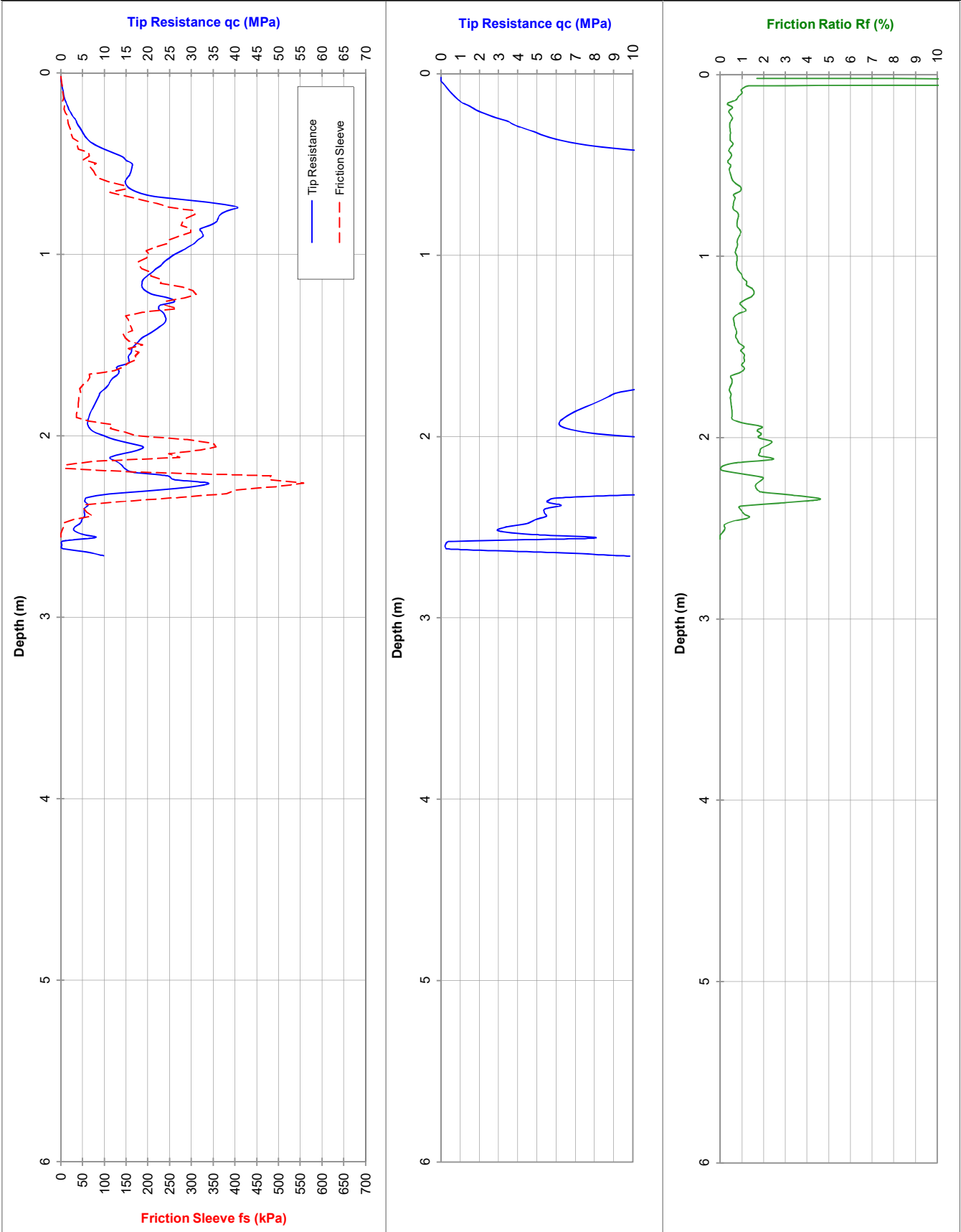
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 23

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0602M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

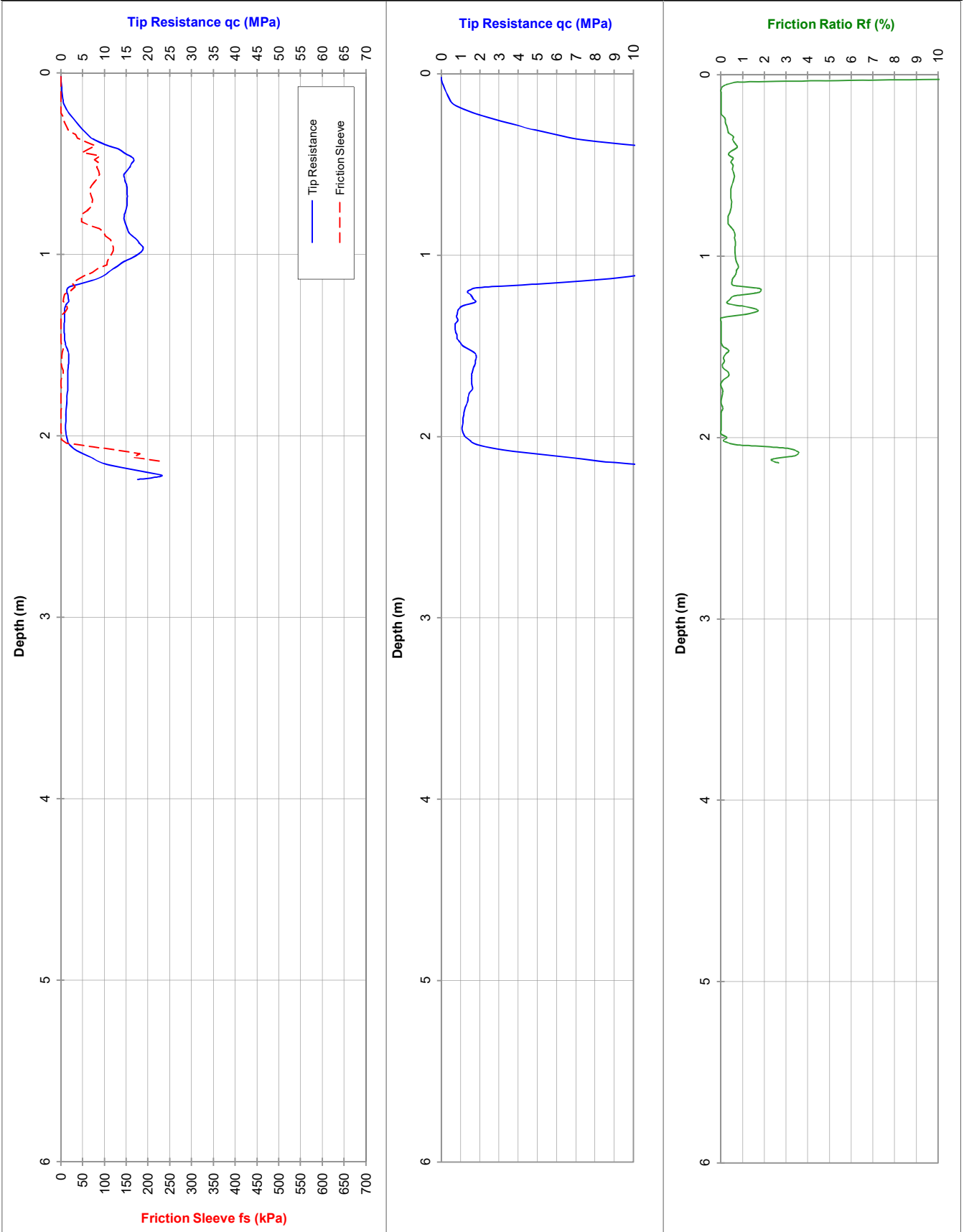
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 24

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): -
 Dummy probe to (m):
 Refusal: Inclination

Cone I.D.: EC38

File: GL0603M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

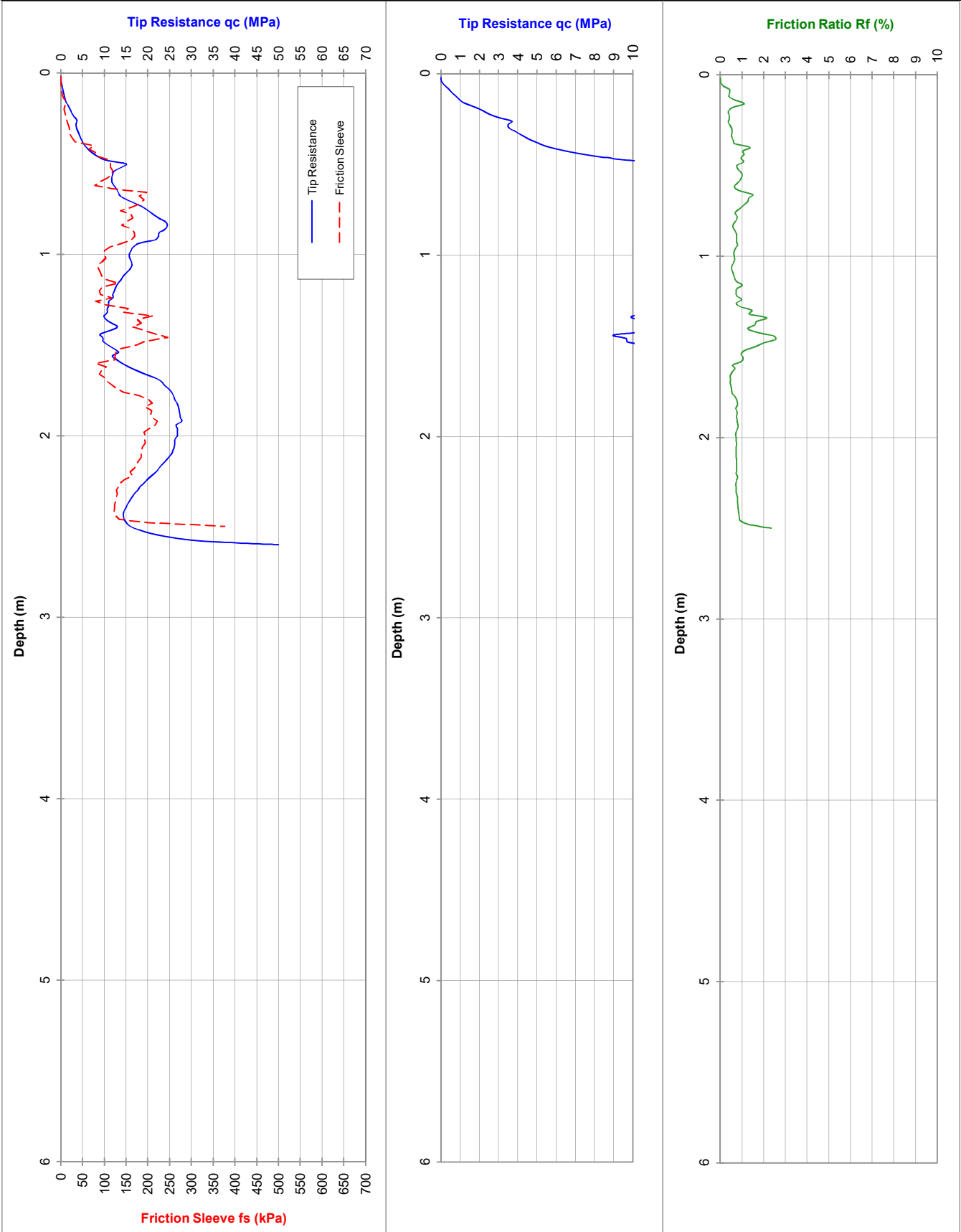
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 25

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.5

Dummy probe to (m):

Refusal: 50MPa + Inclination

Cone I.D.: EC38

File: GL0601M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

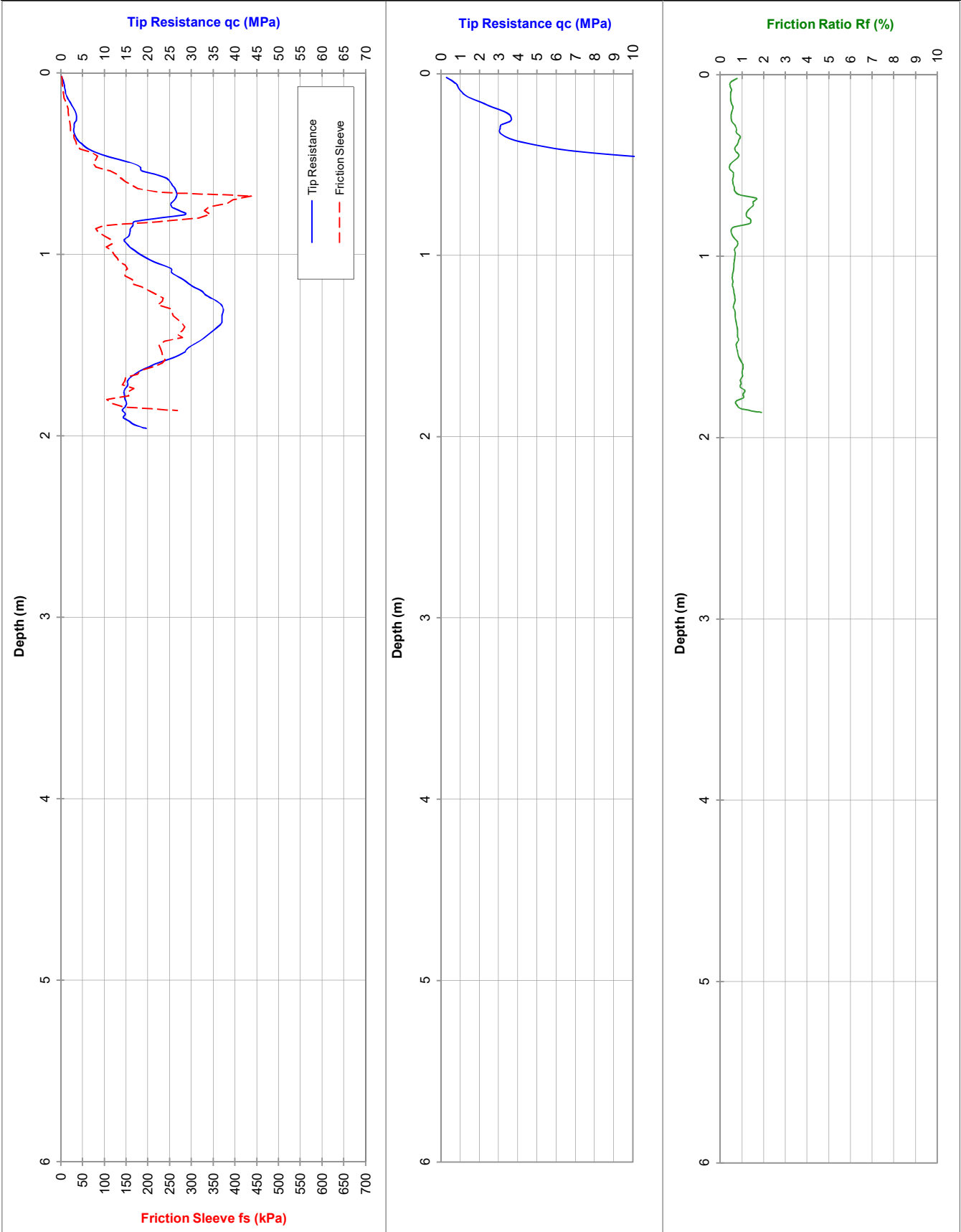
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 26

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.9

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0600M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

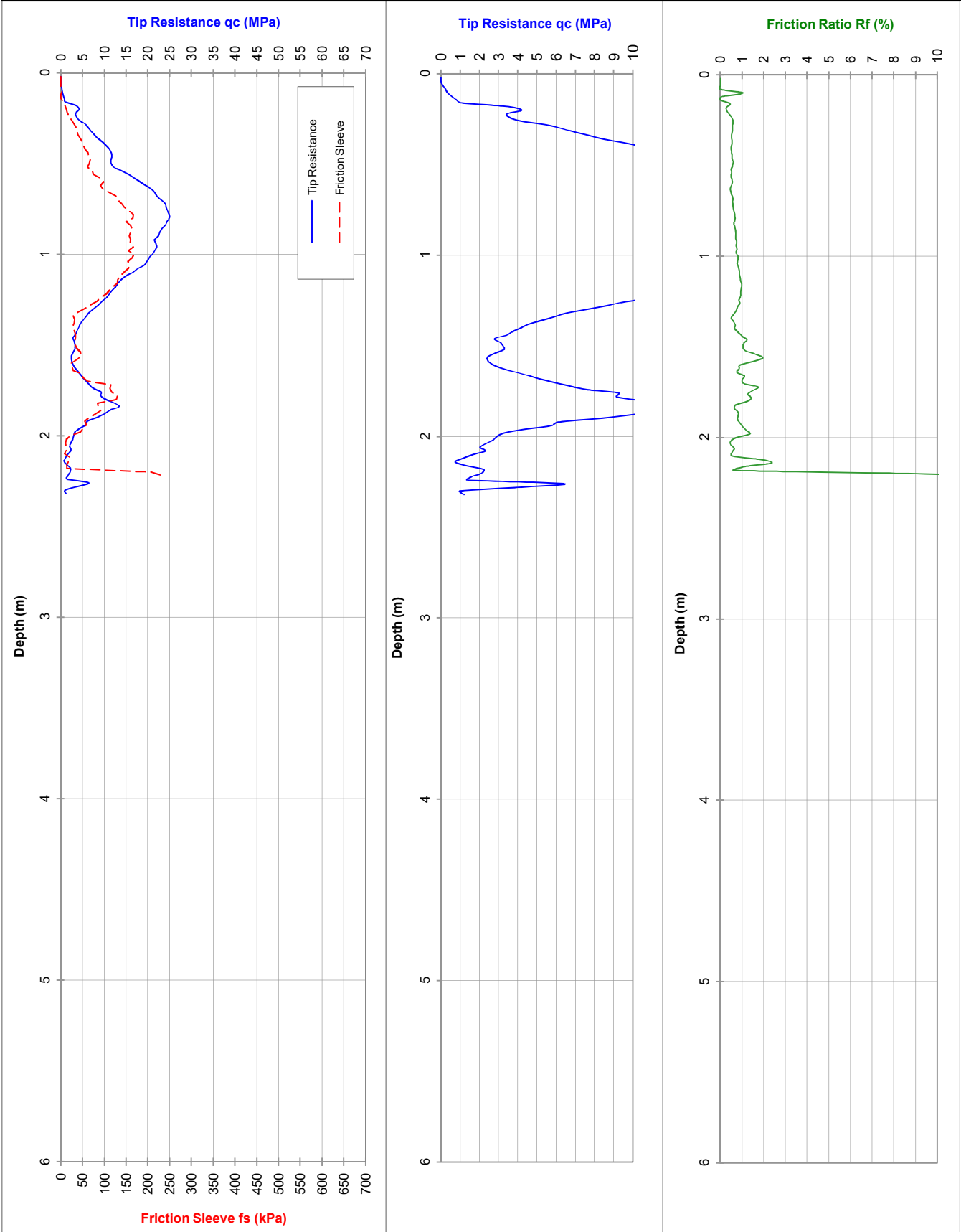
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 27

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.3

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0599M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

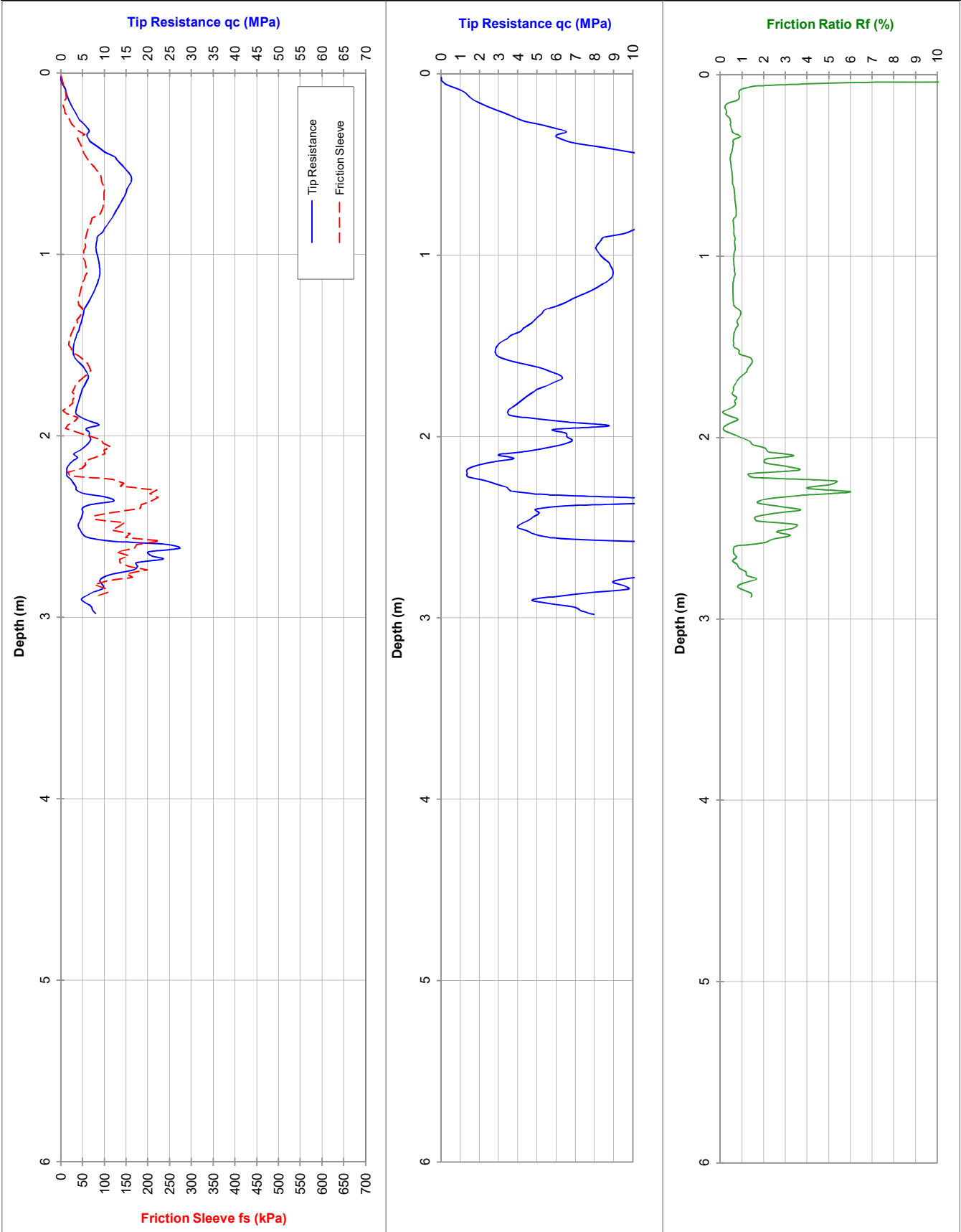
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 28

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.9

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0598M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

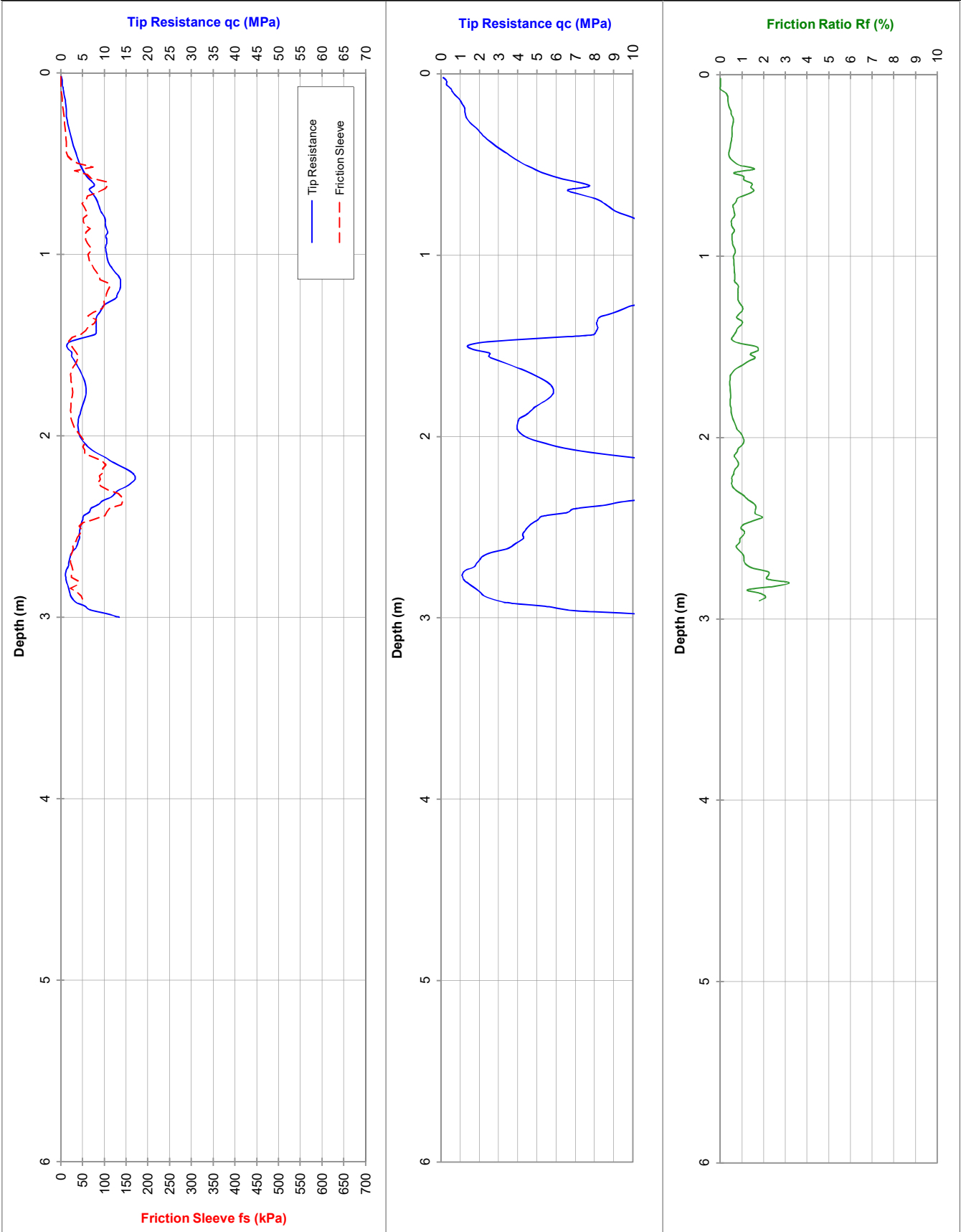
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 29

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.3

Dummy probe to (m):

Refusal: Inclination (Limestone on tip)

Cone I.D.: EC38

File: GL0597M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

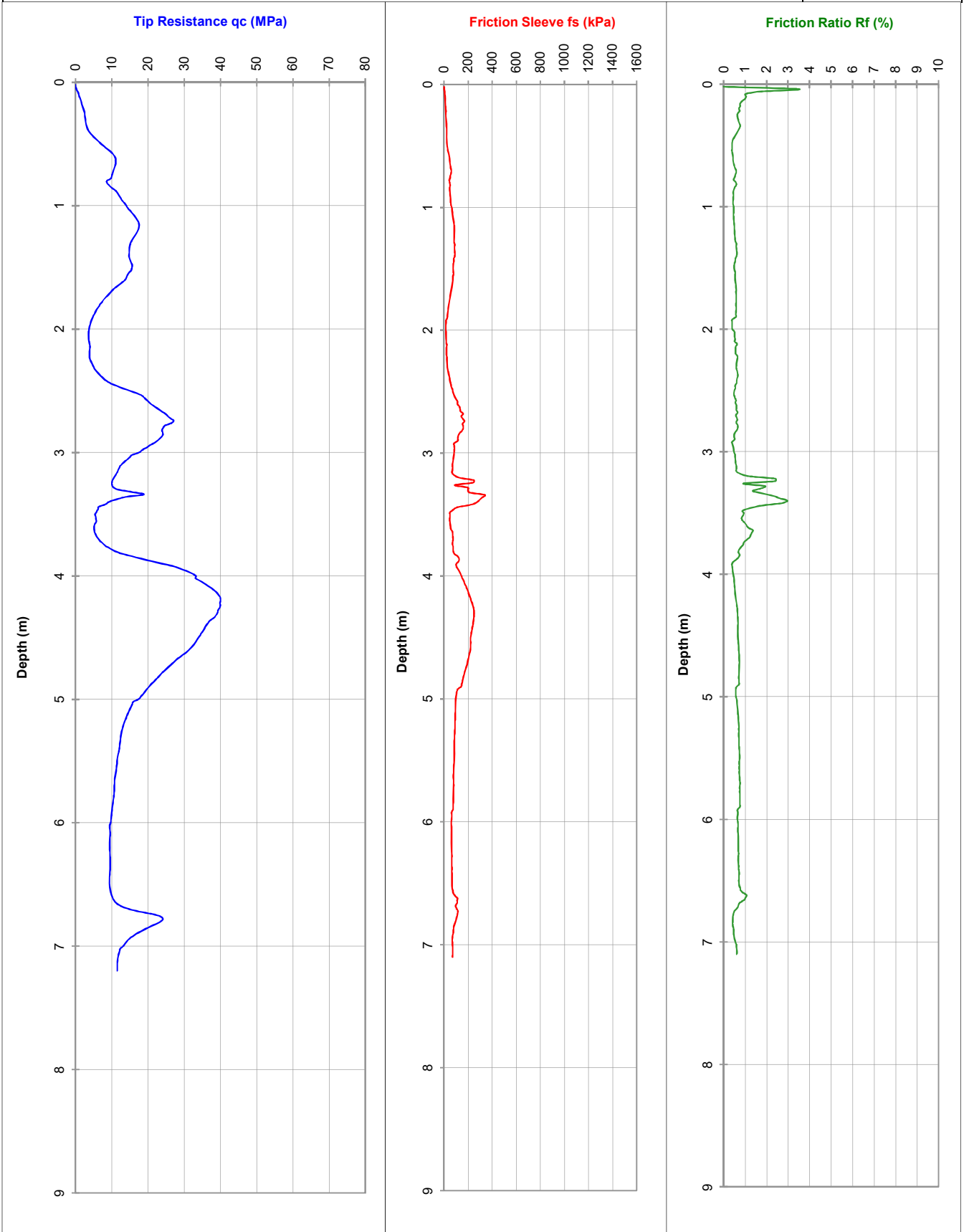
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 30

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.3

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0656M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

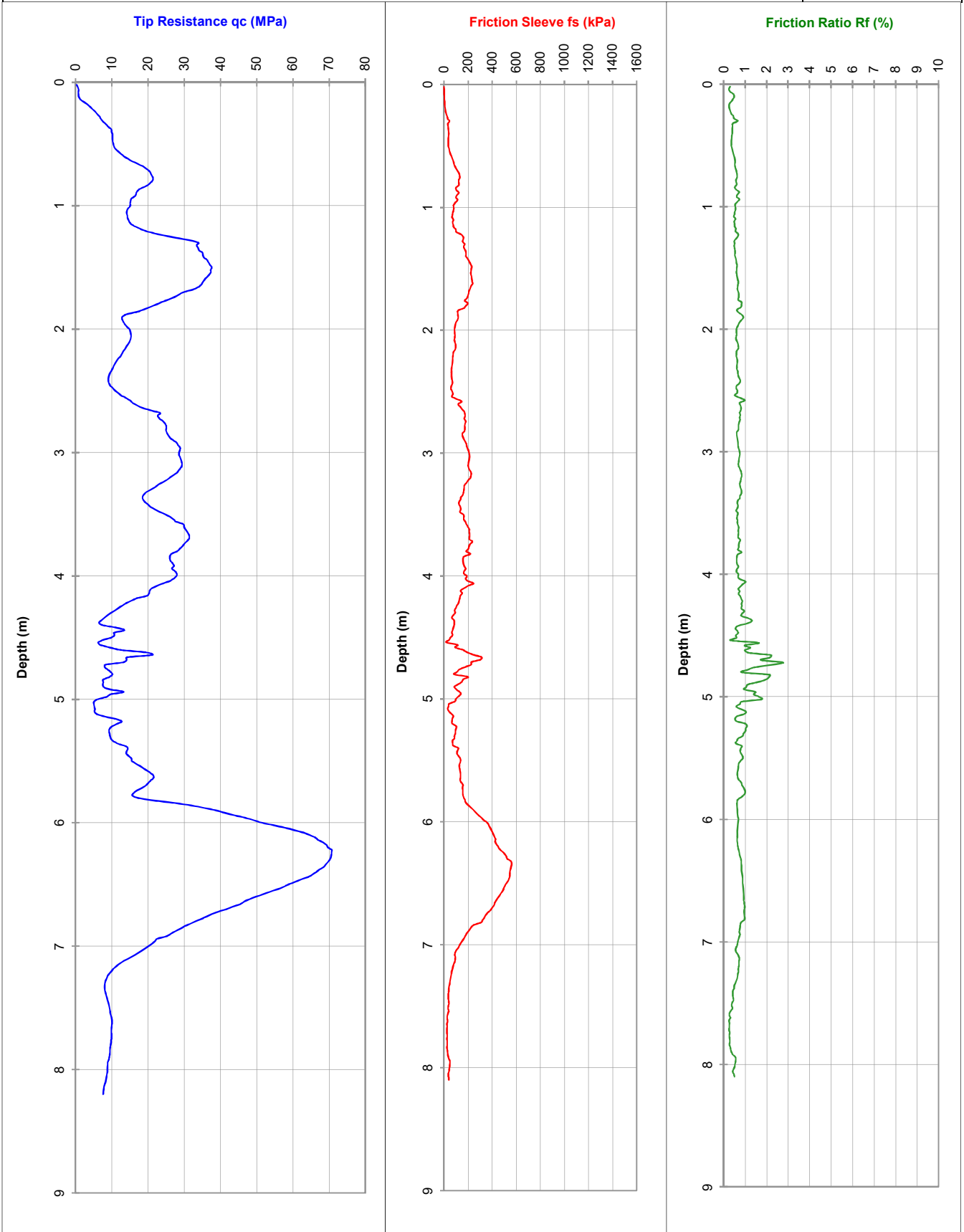
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 31

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0657M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

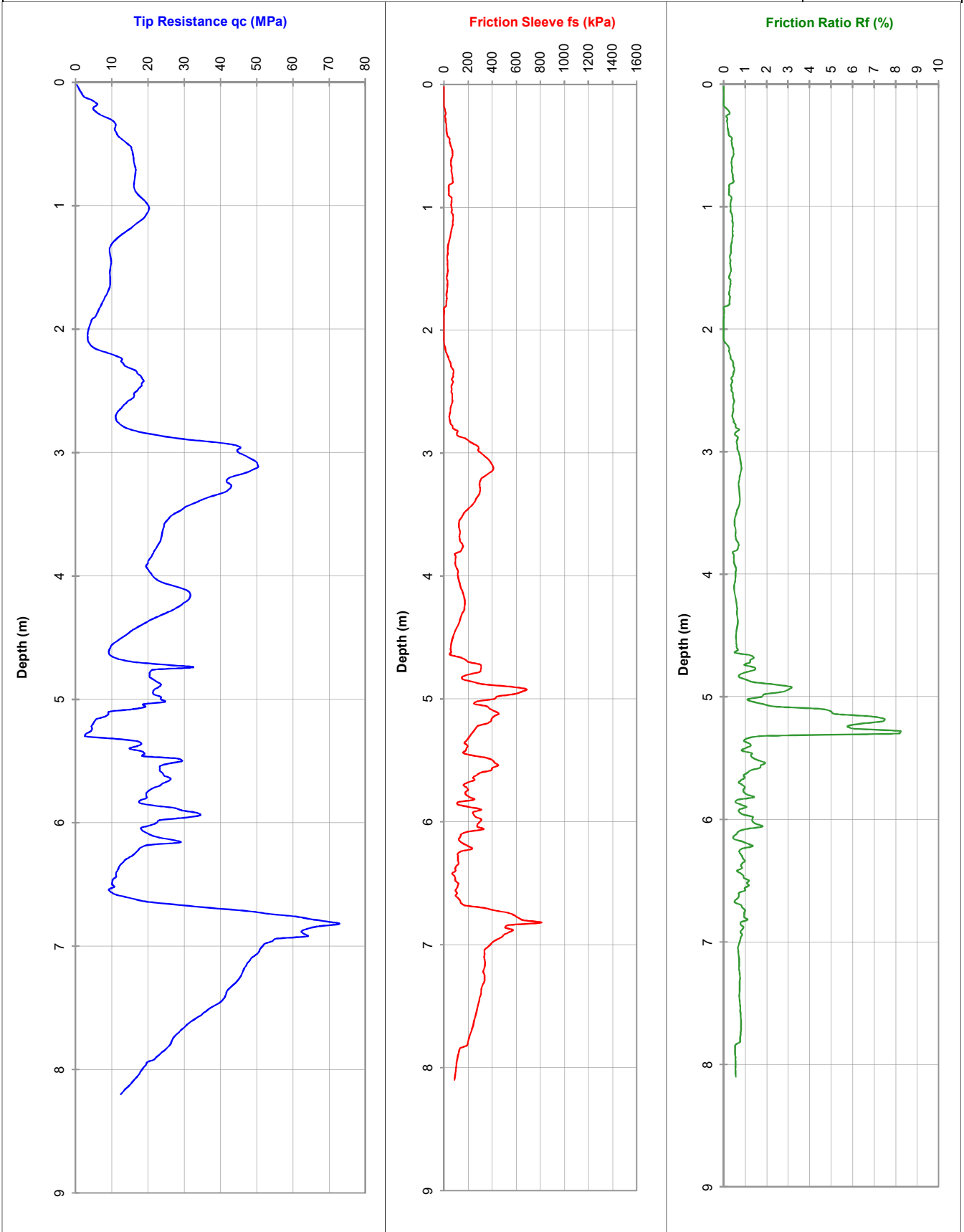
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 32

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0658M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

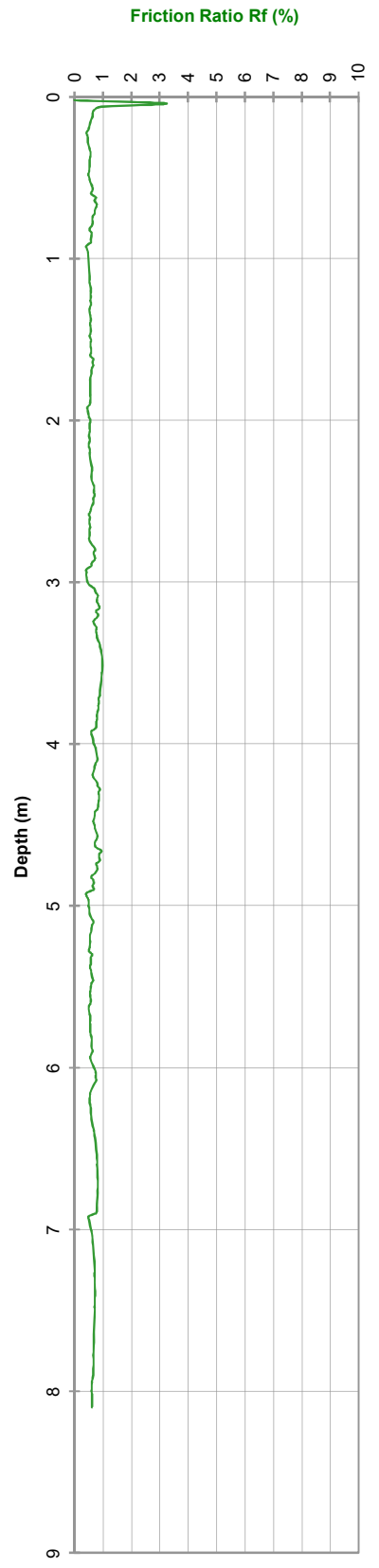
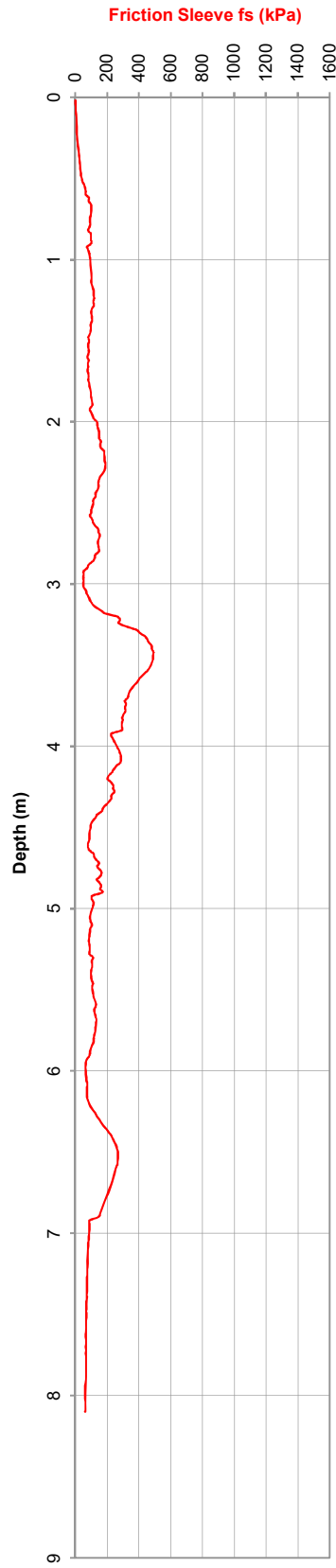
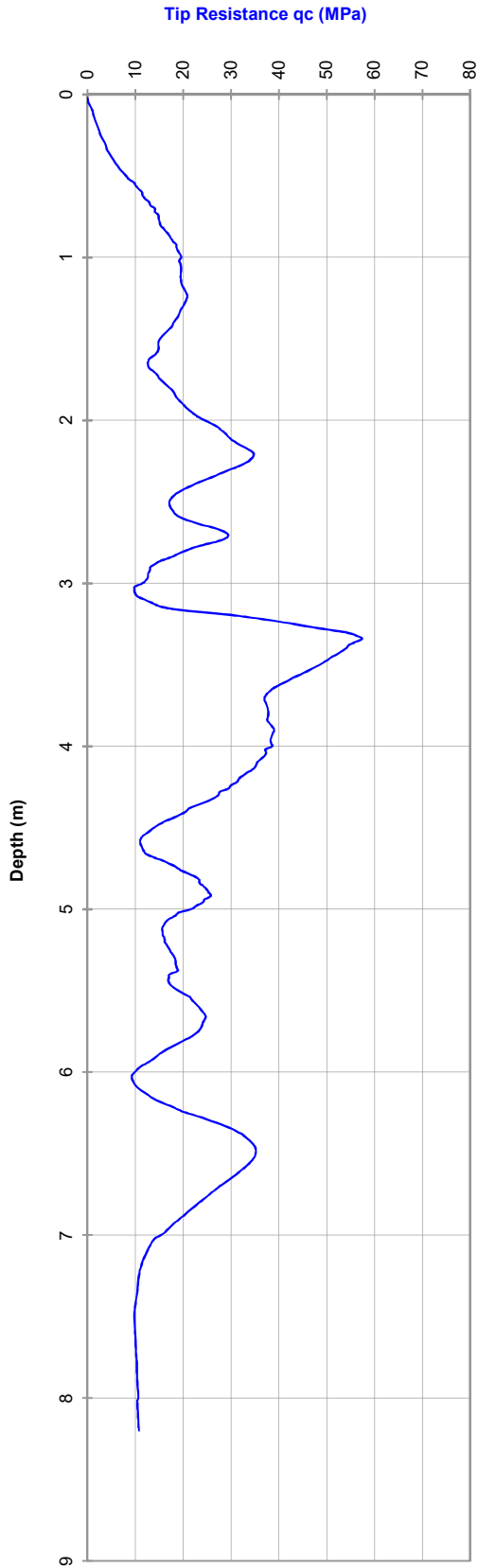
Probe I.D

CLIENT: Parcel
PROJECT: Site Investigation
LOCATION: Darch

Job No.: J1801113
RL (m):
Co-ords:

PGCPT 33

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0659M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

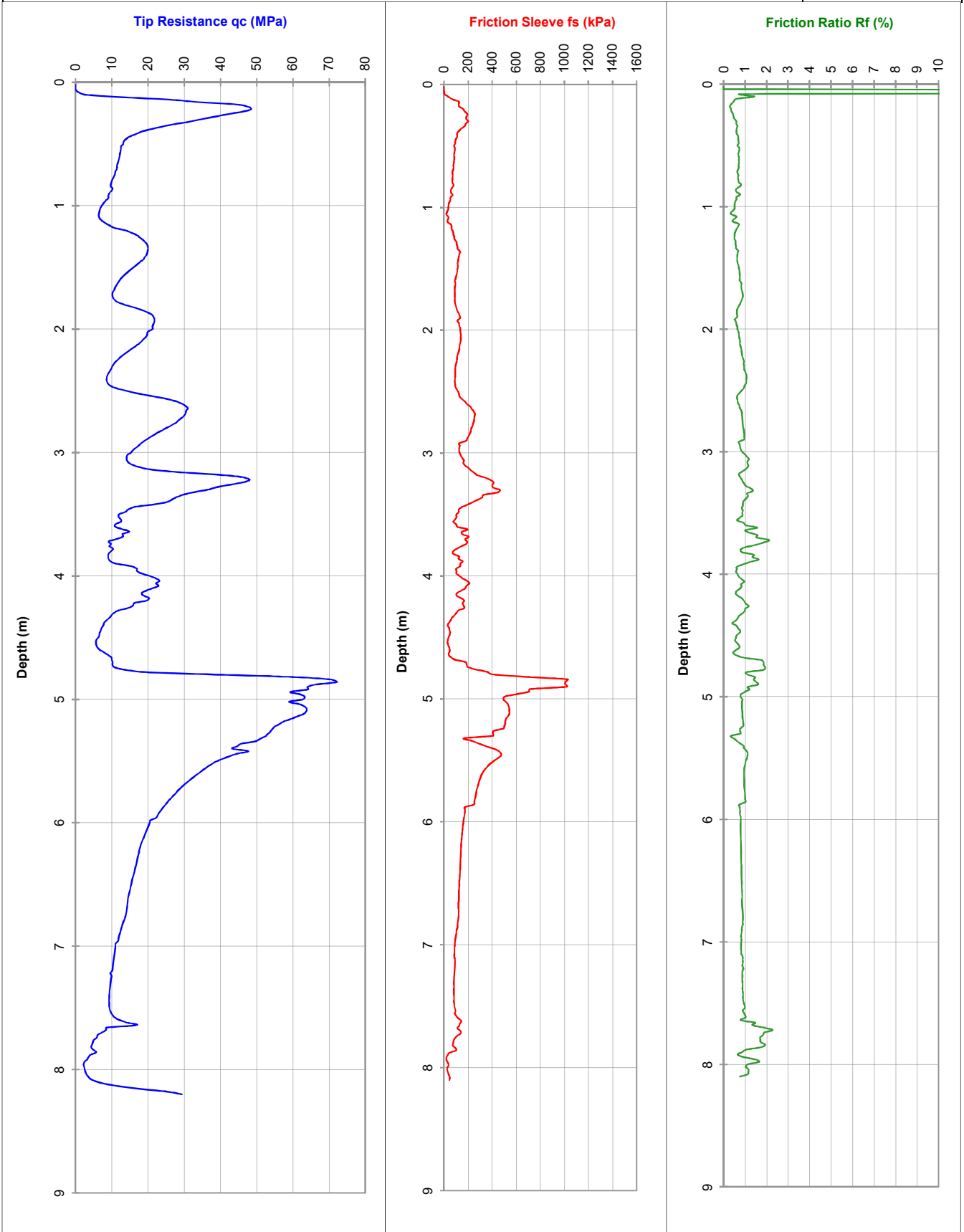
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 34

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.4

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0685M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

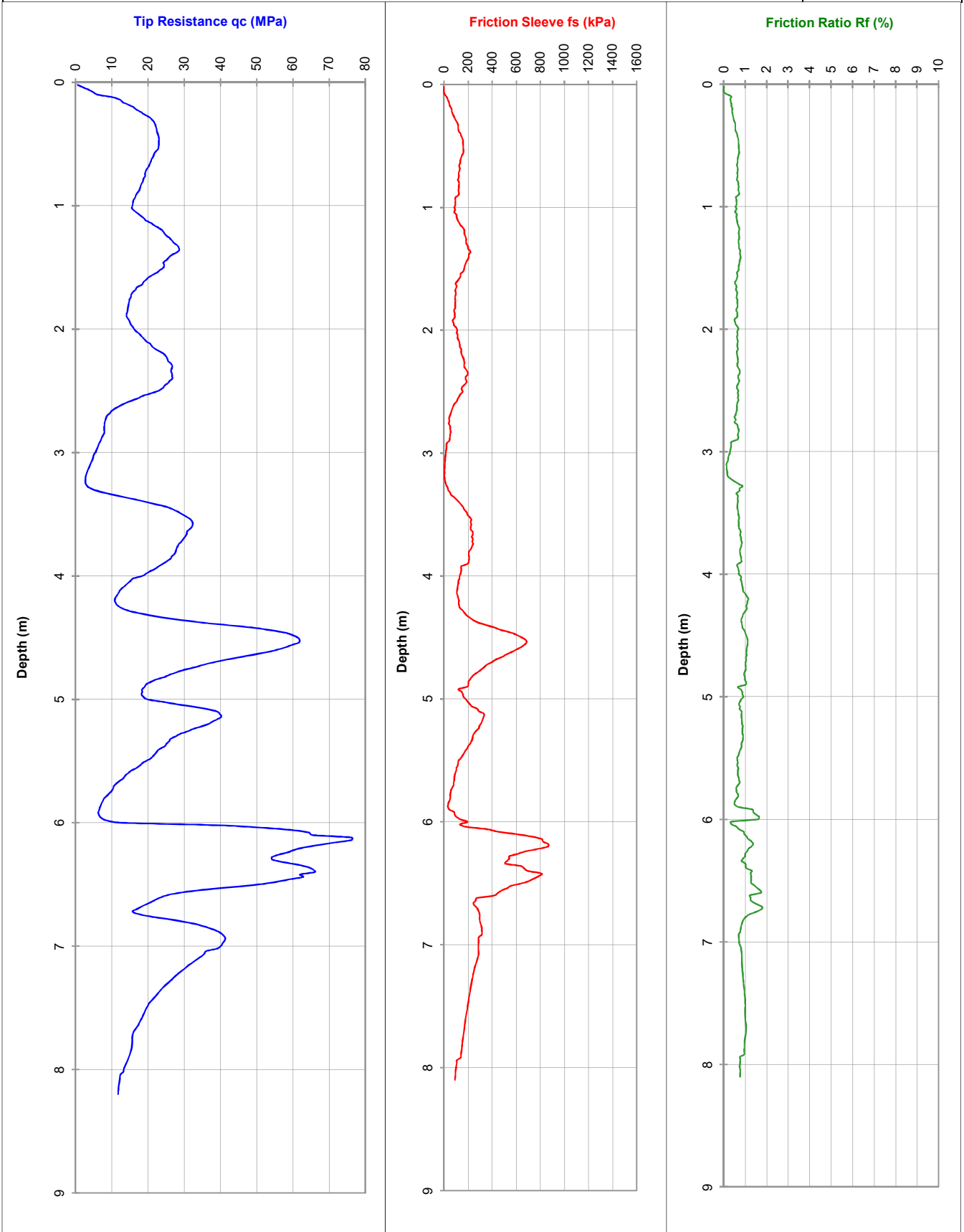
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 35

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): 6.7

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0692M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

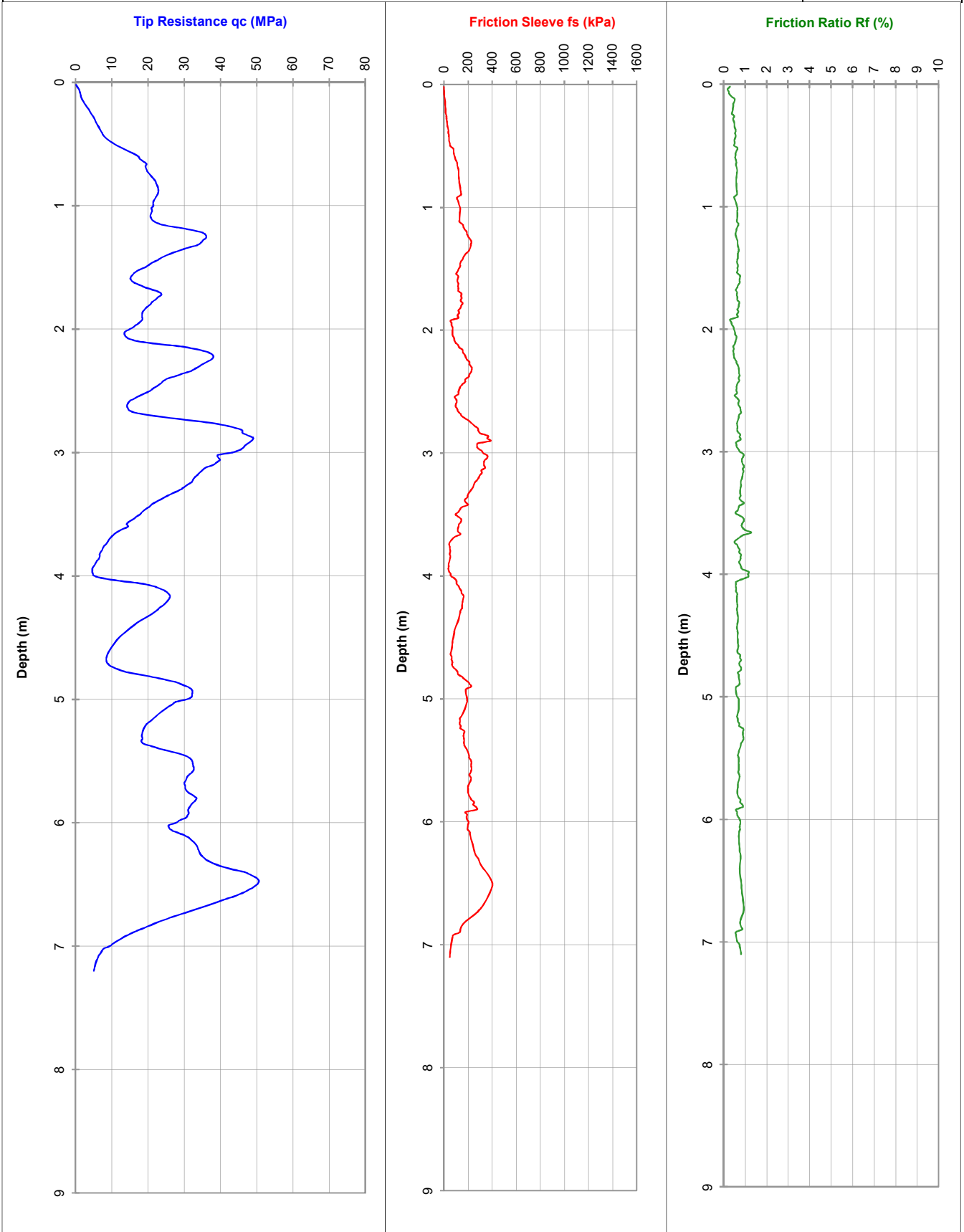
Probe I.D

CLIENT: Parcel
PROJECT: Site Investigation
LOCATION: Darch

Job No.: J1801113
RL (m):
Co-ords:

PGCPT 36

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 6.6

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0660M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

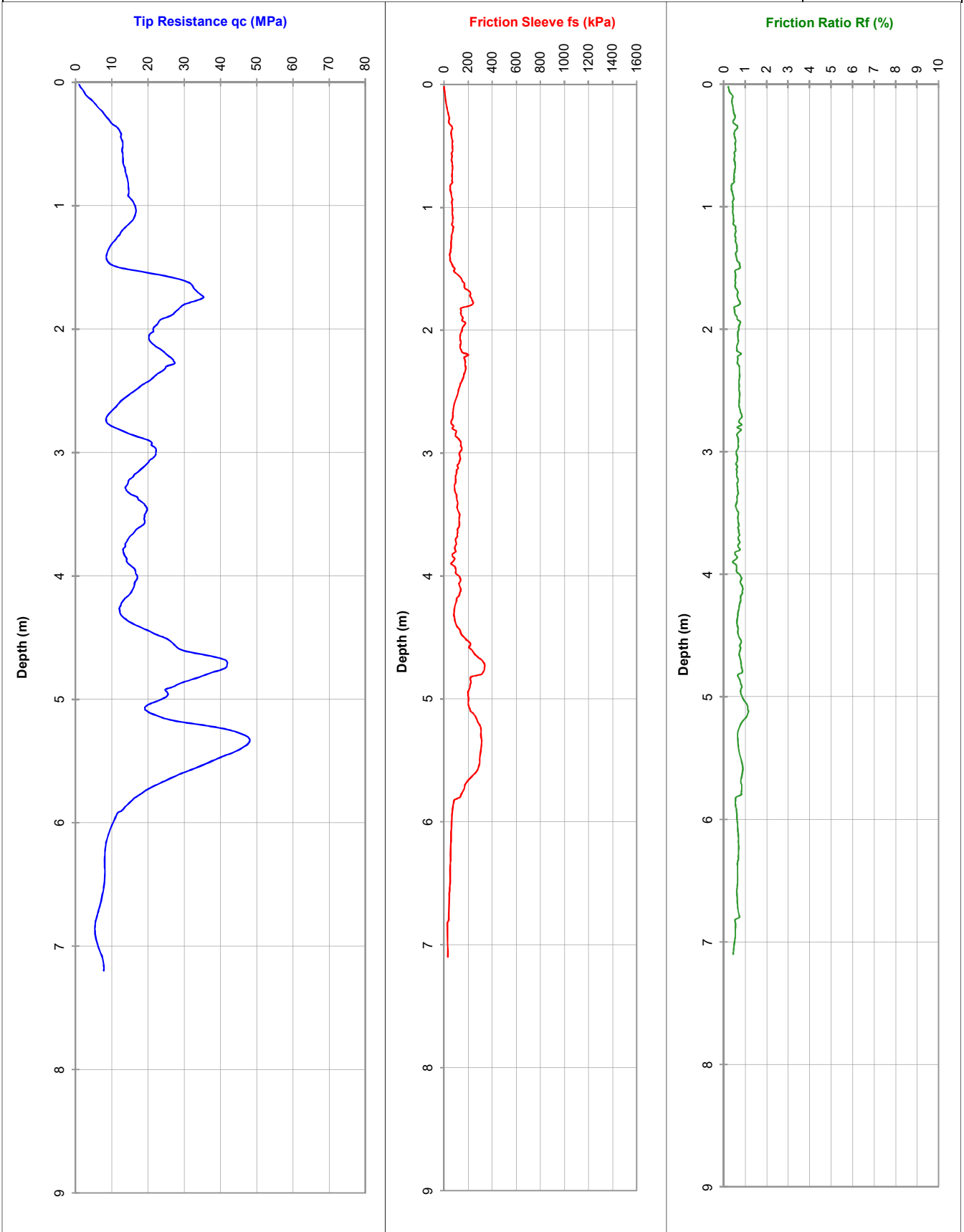
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 37

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): 4.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0662M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

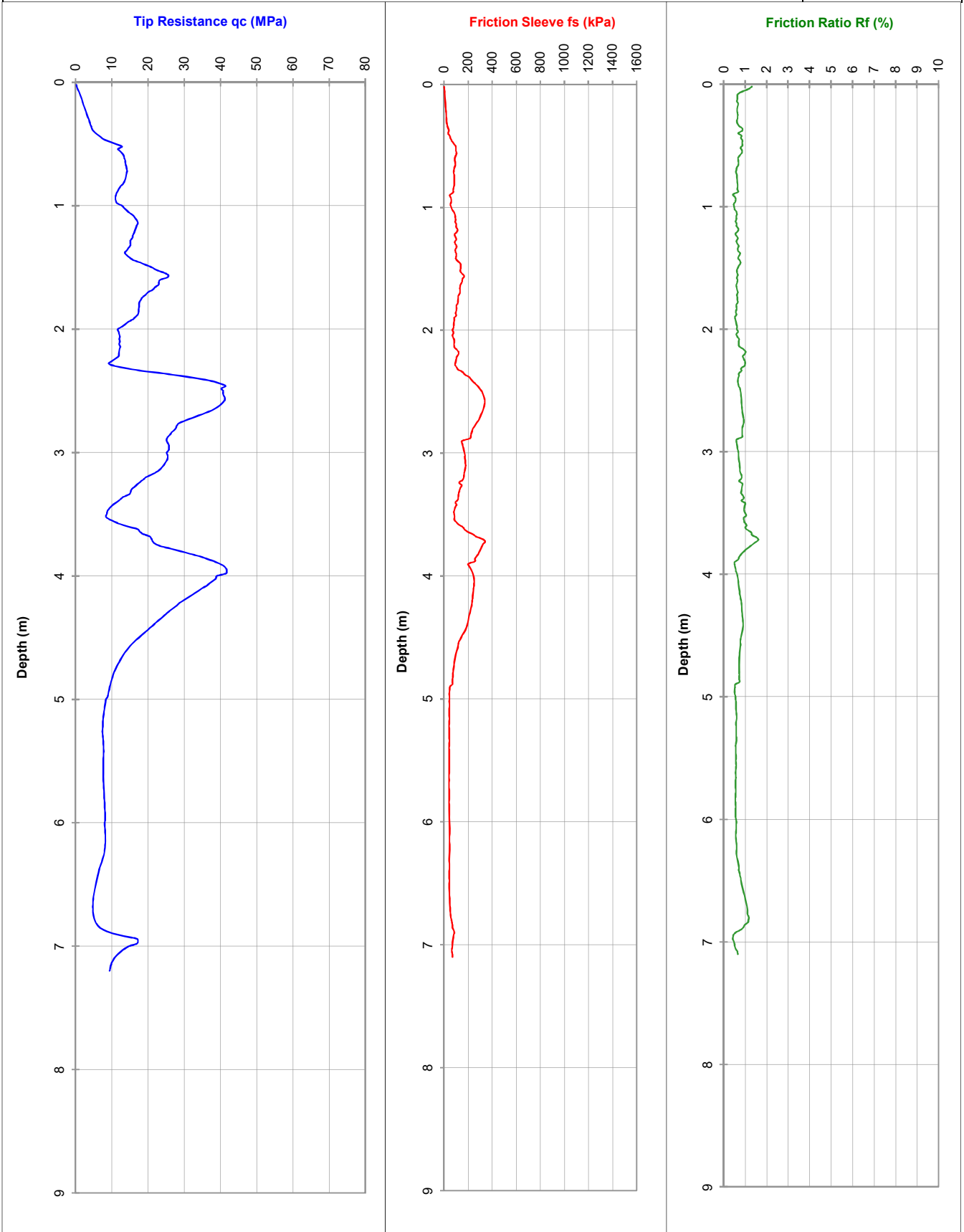
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 38

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0663M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

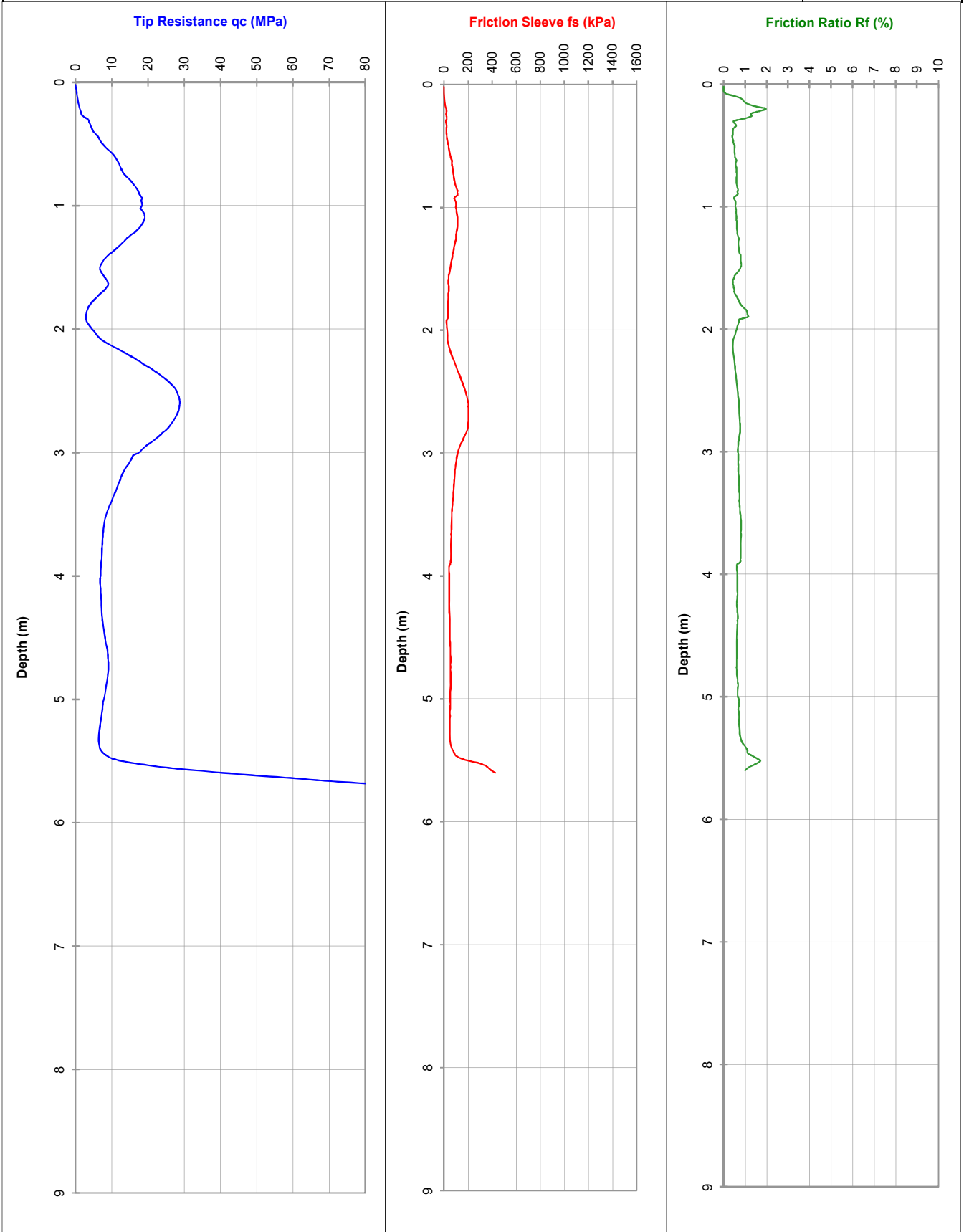
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 39

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 2.9

Dummy probe to (m):

Refusal: 90MPa

Cone I.D.: EC02

File: GL0664M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

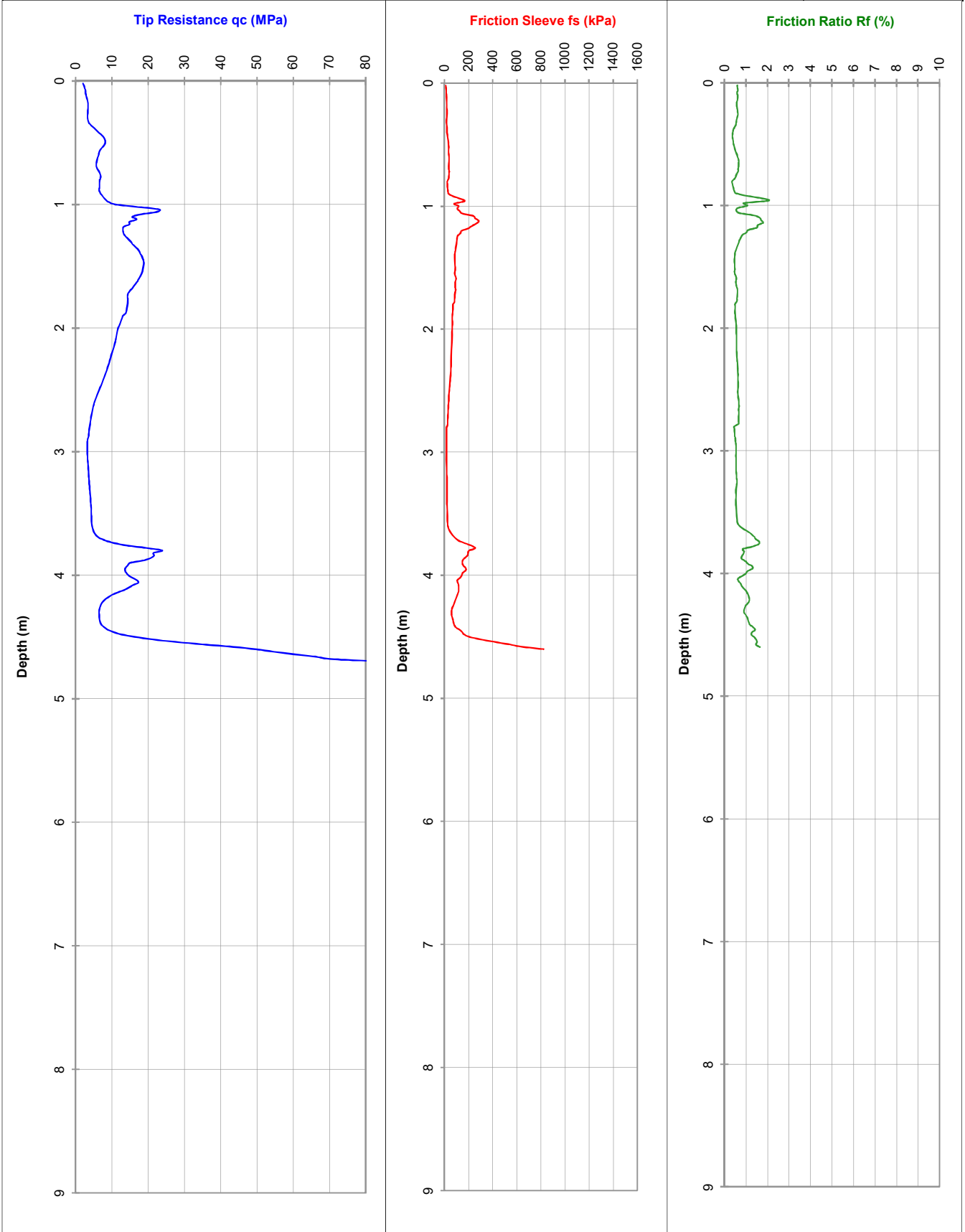
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 40

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 2.8

Dummy probe to (m):

Refusal: 86 Mpa

Cone I.D.: EC02

File: GL0665M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

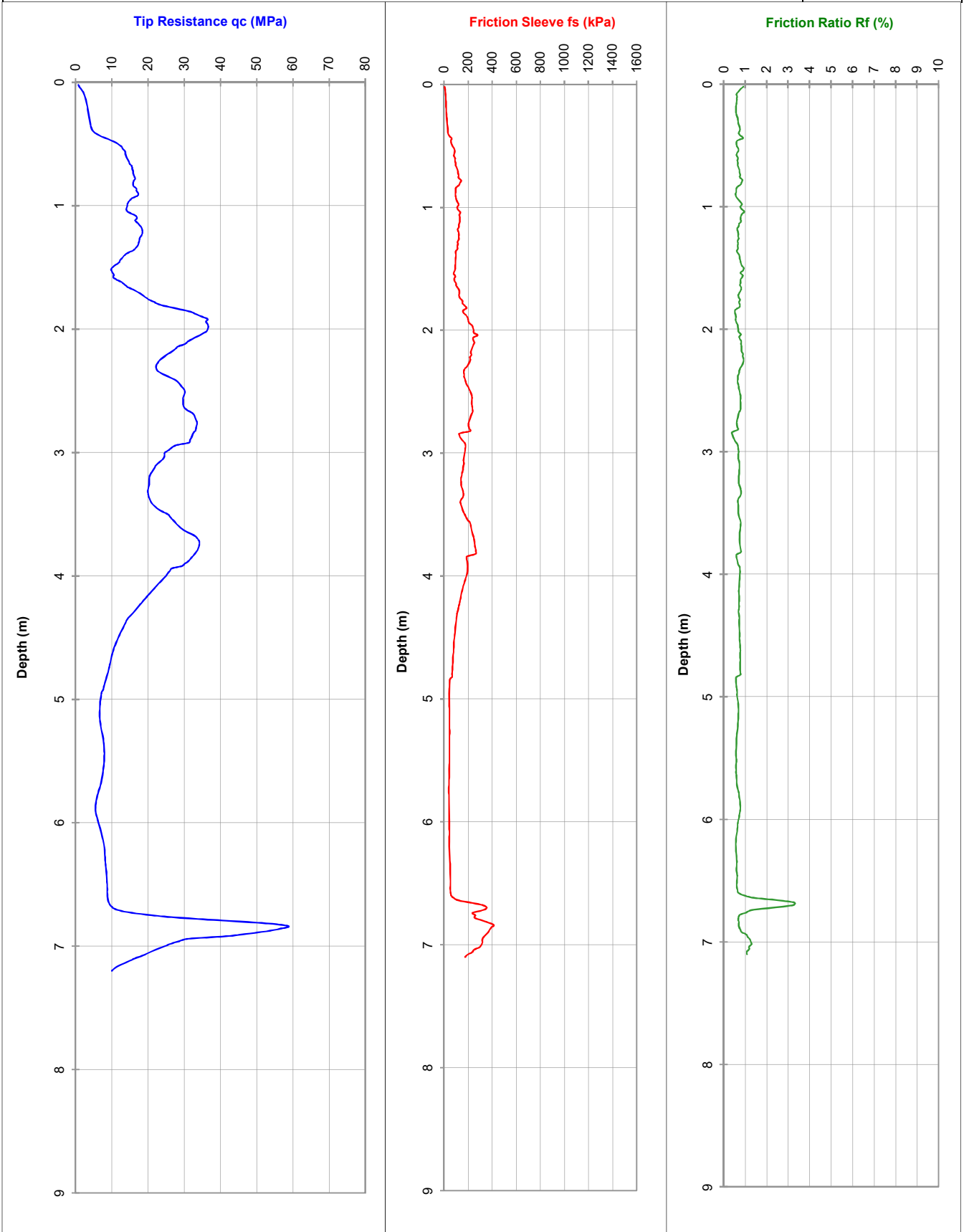
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 41

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0666M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

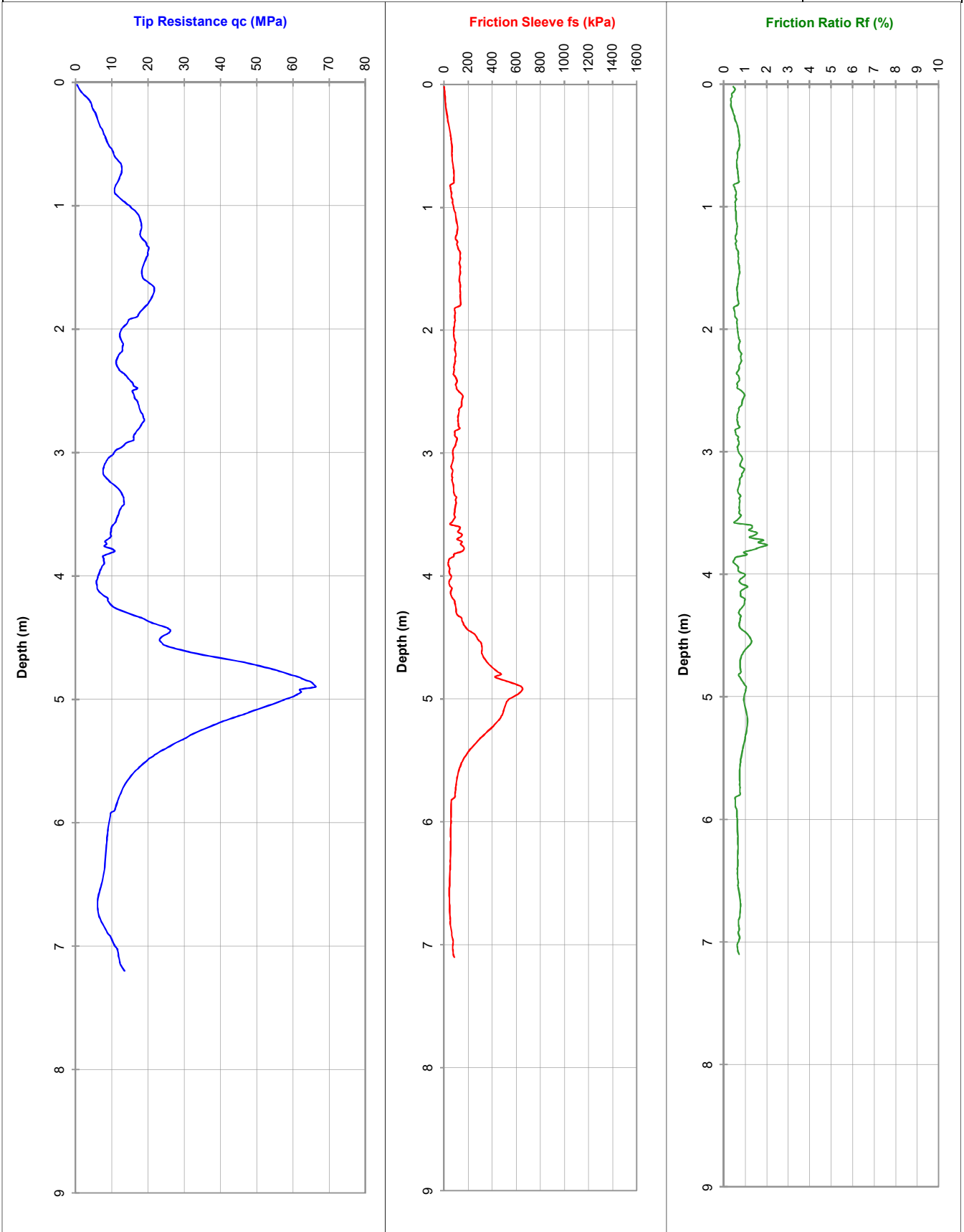
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 42

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0667M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

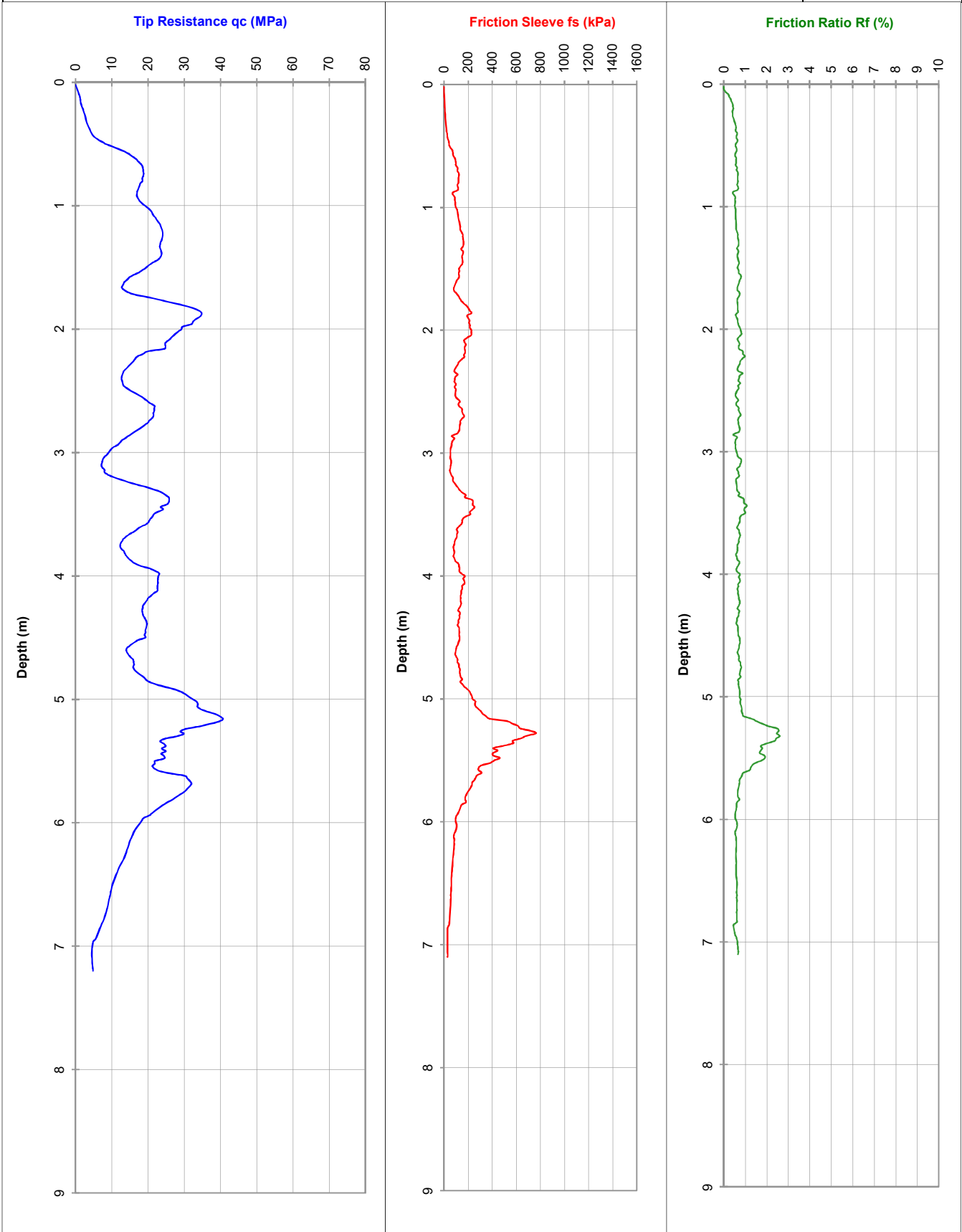
Probe I.D

CLIENT: Parcel
PROJECT: Site Investigation
LOCATION: Darch

Job No.: J1801113
RL (m):
Co-ords:

PGCPT 43

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 7.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0661M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

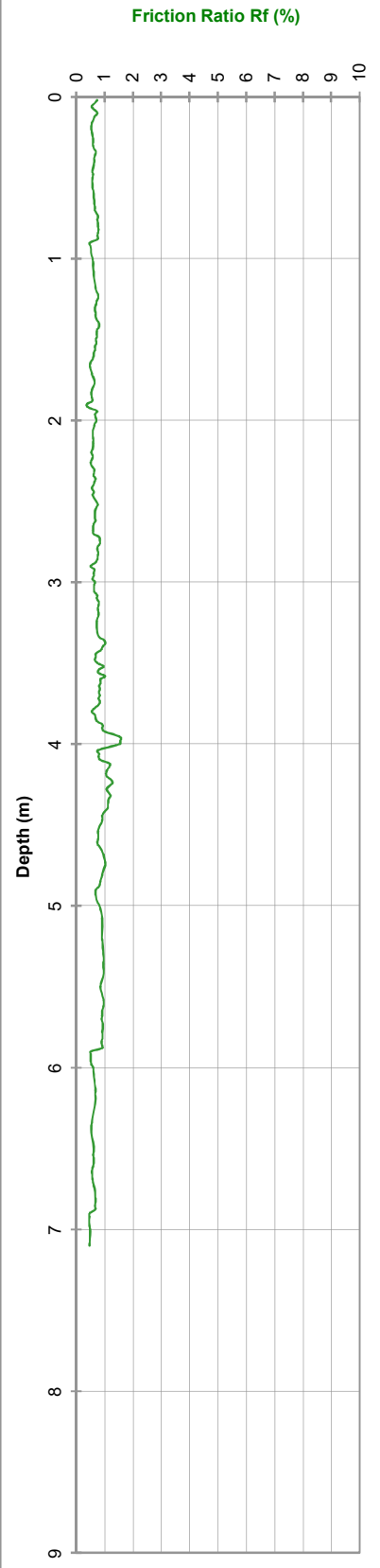
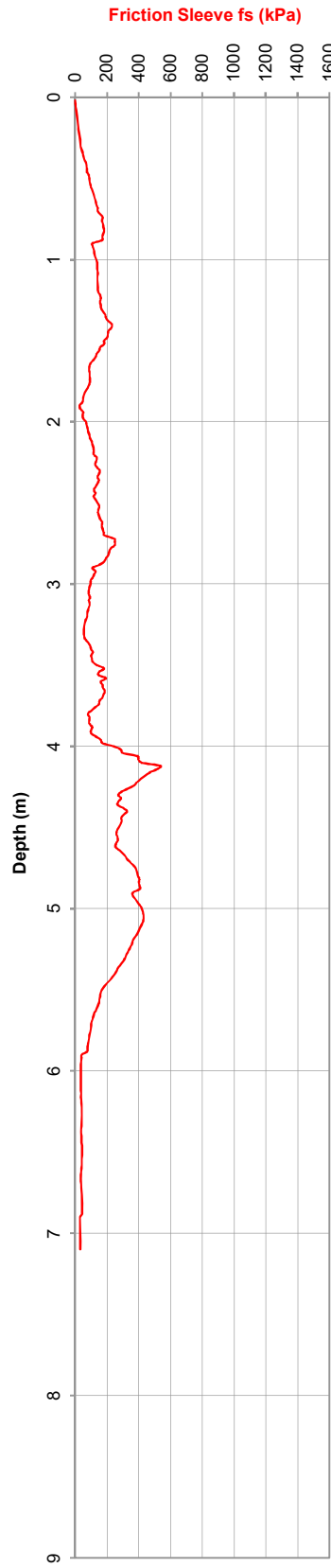
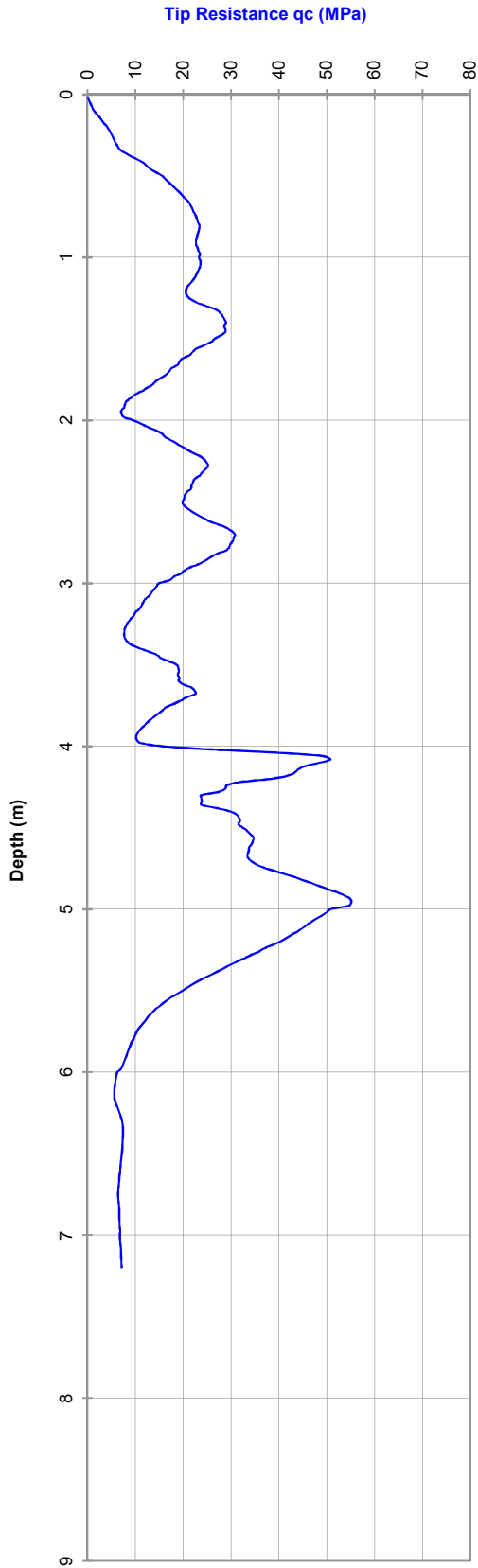
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 44

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0668M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

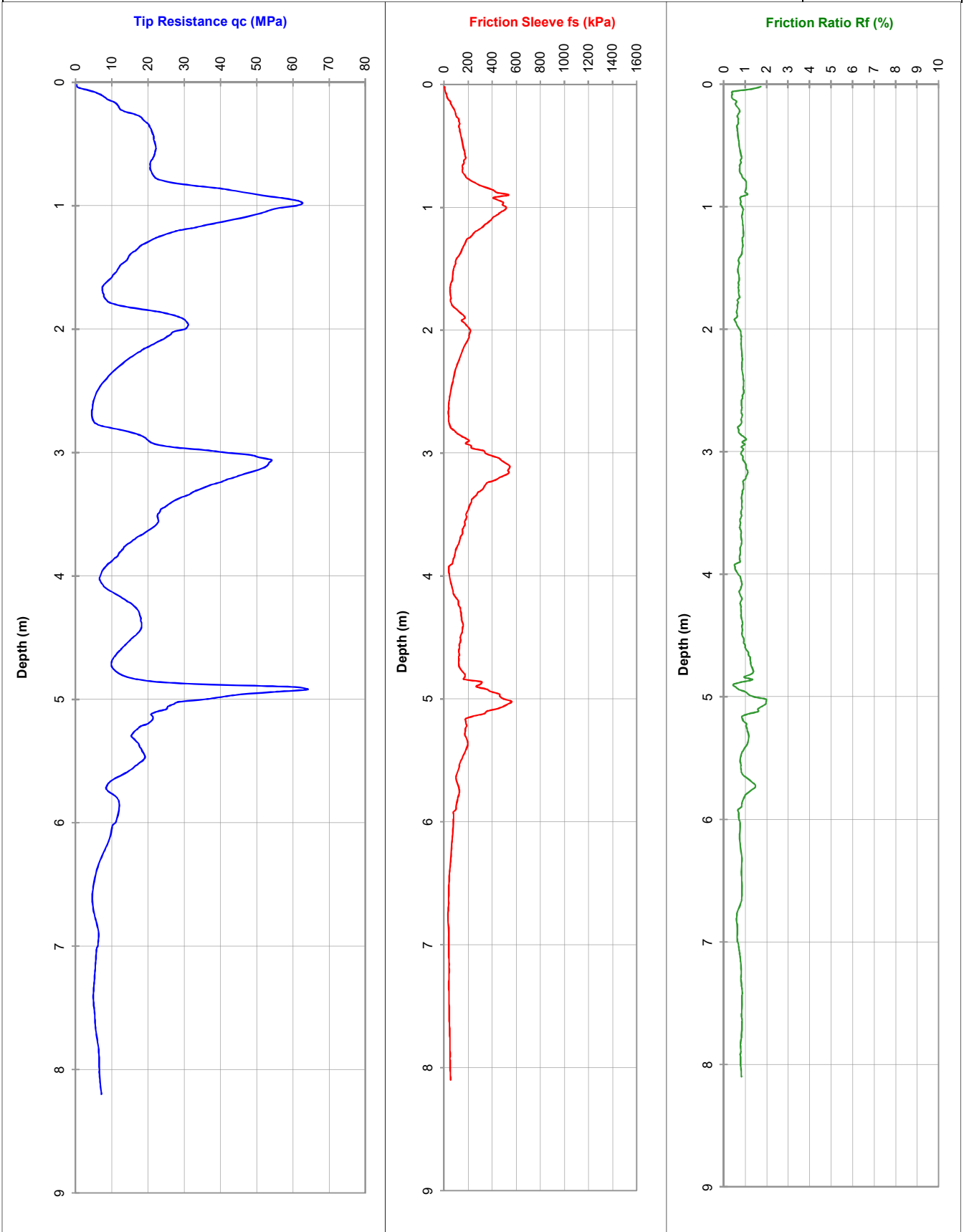
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 45

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.5

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0694M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

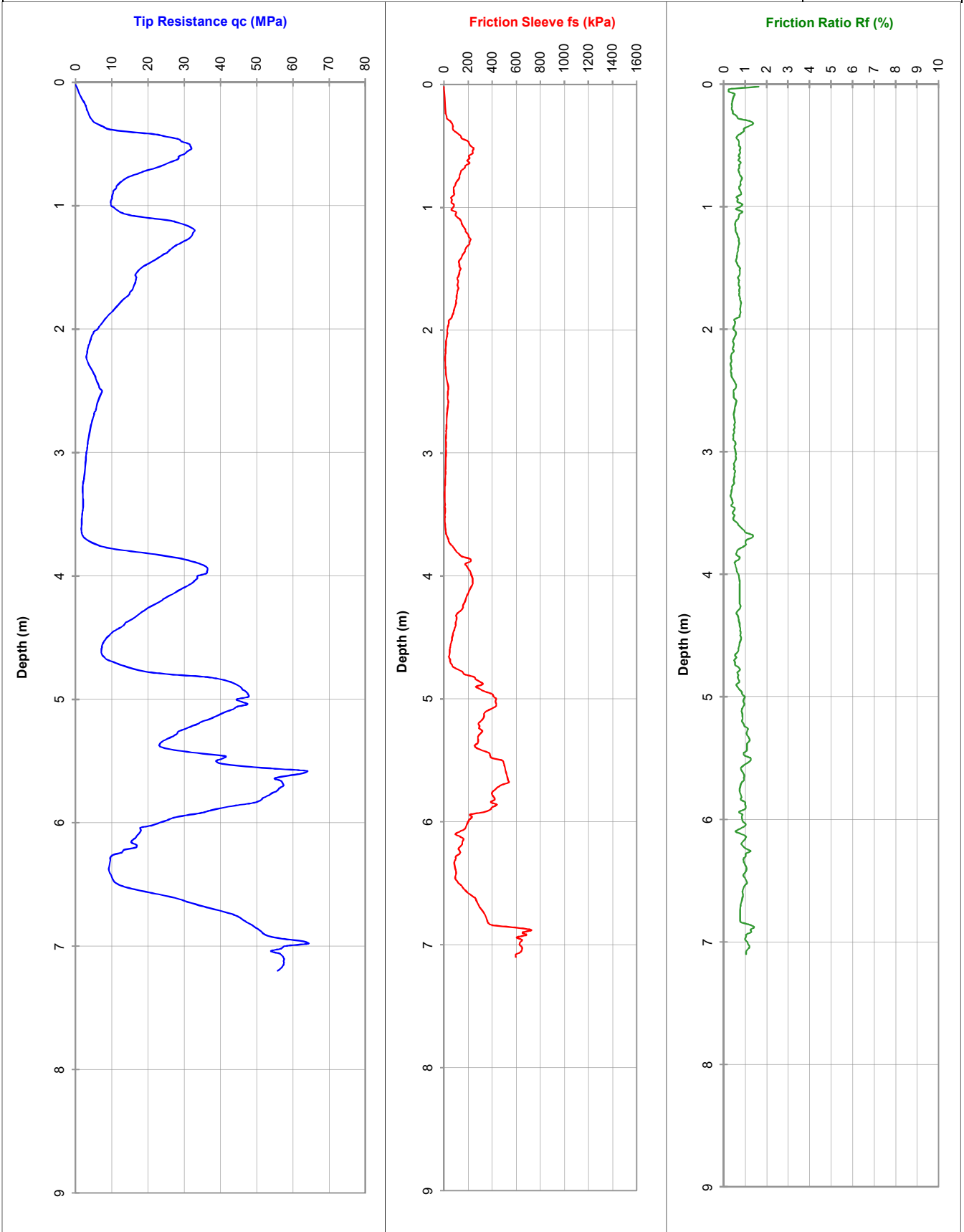
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 46

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0684M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

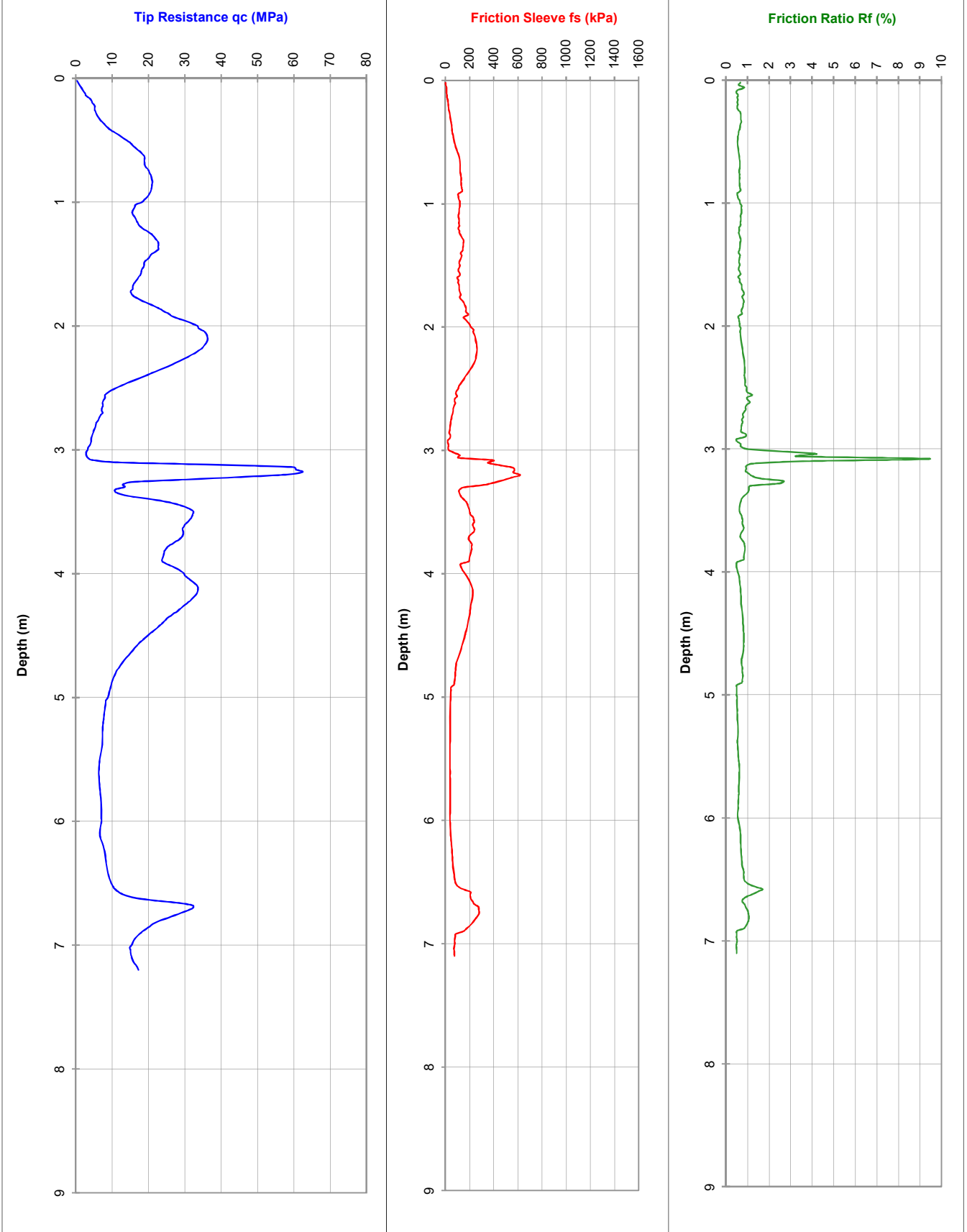
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 47

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.5

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0669M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

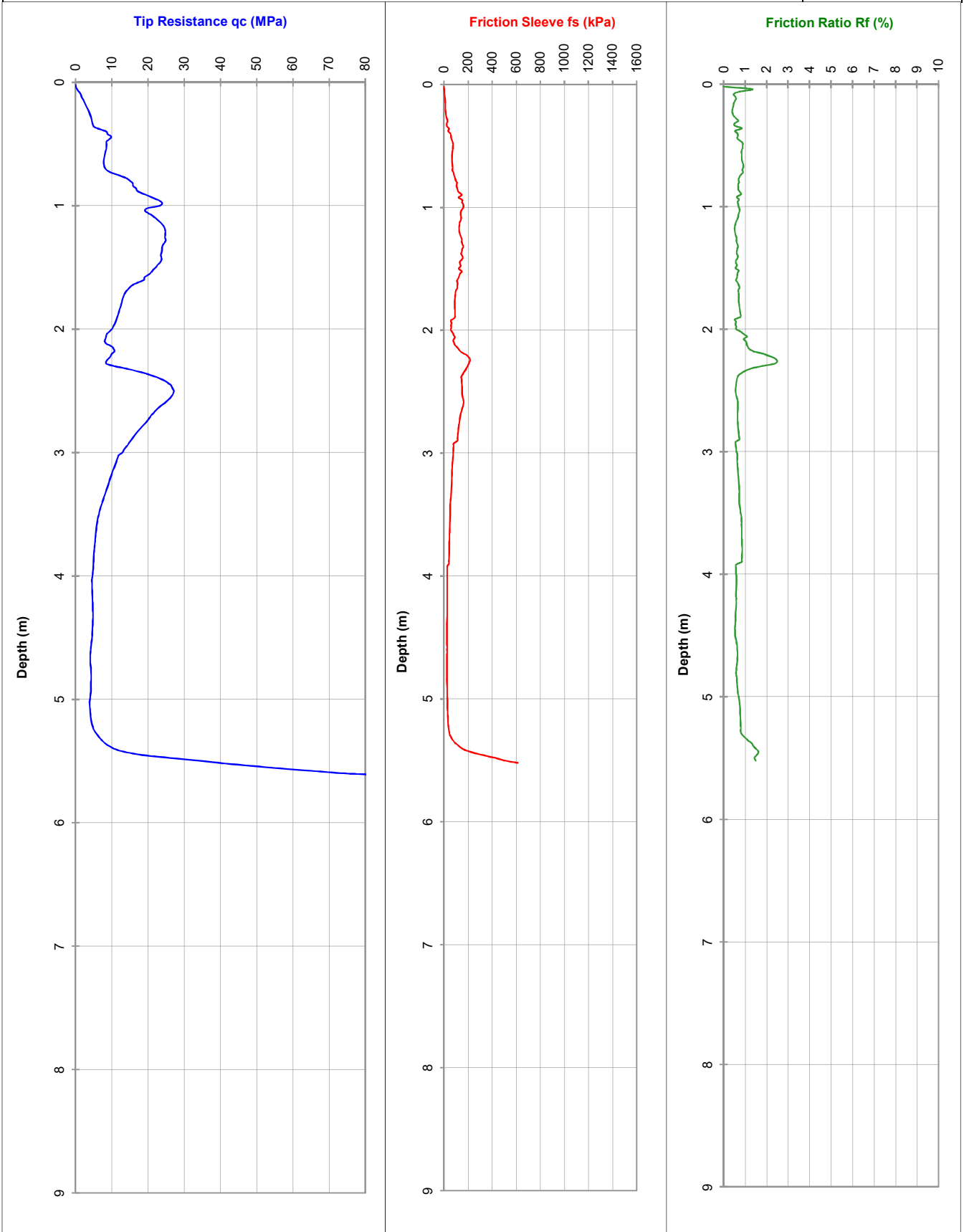
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 48

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.2

Dummy probe to (m):

Refusal: 88 MPa

Cone I.D.: EC02

File: GL0670M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

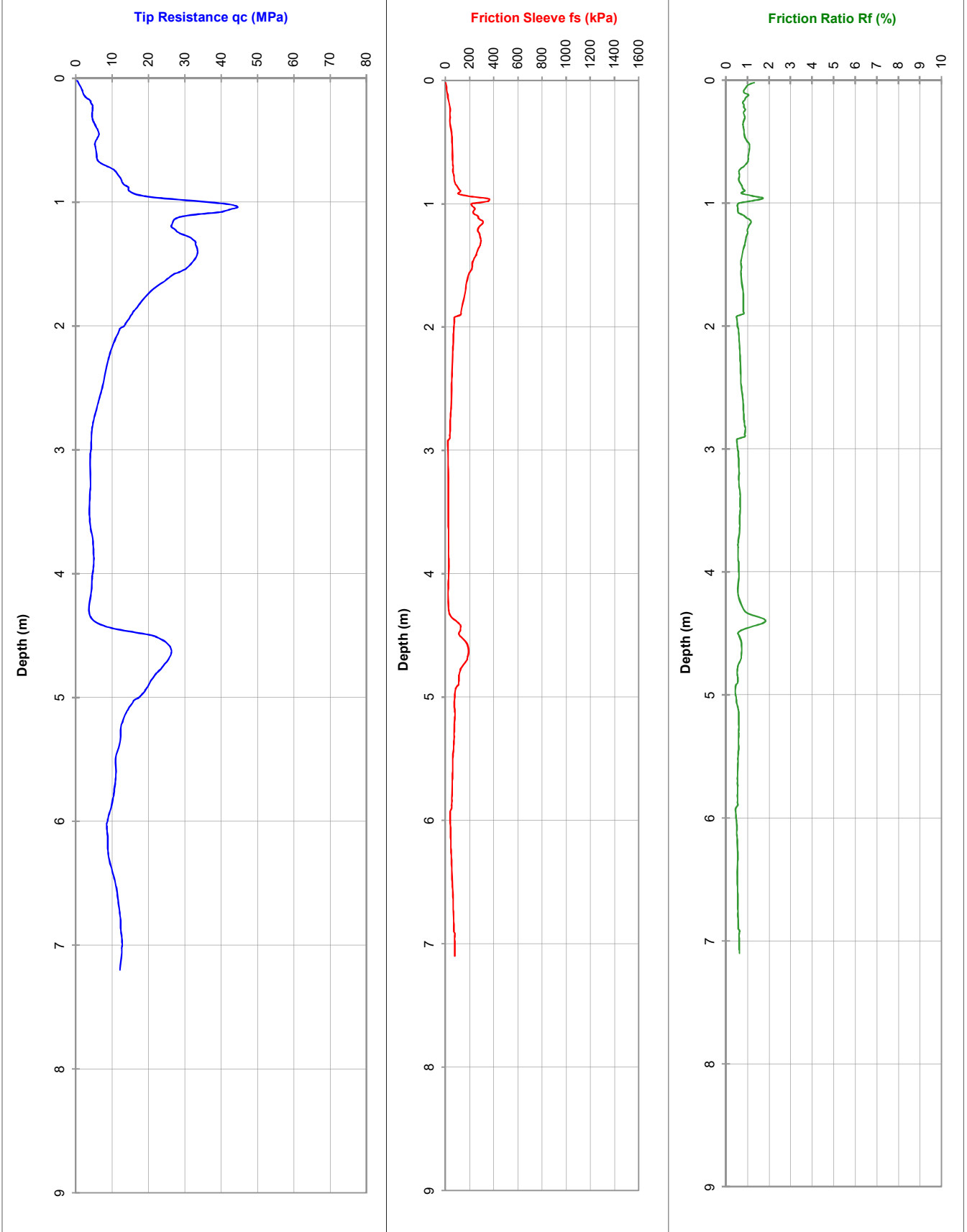
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 49

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): 2.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0671M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

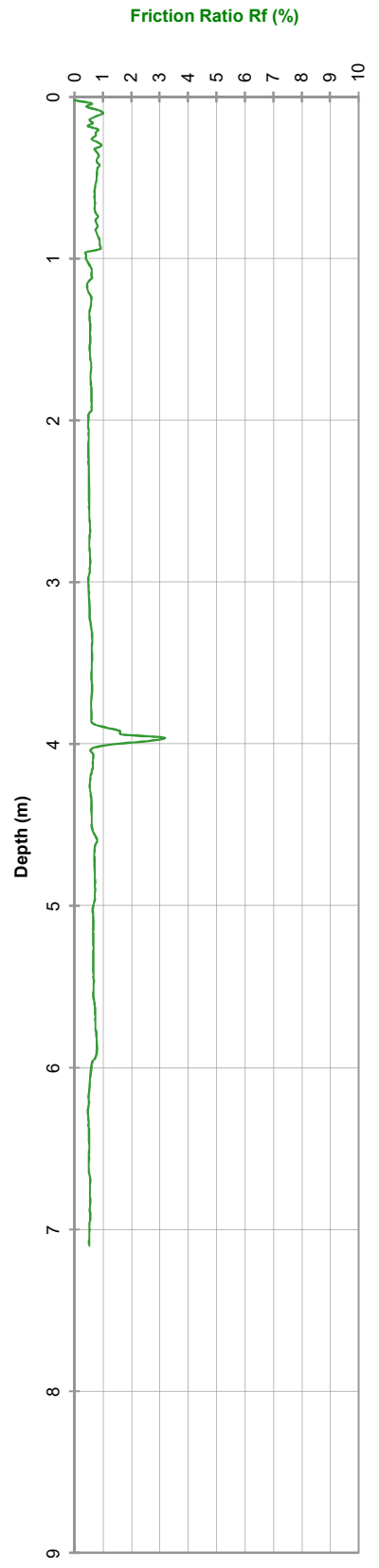
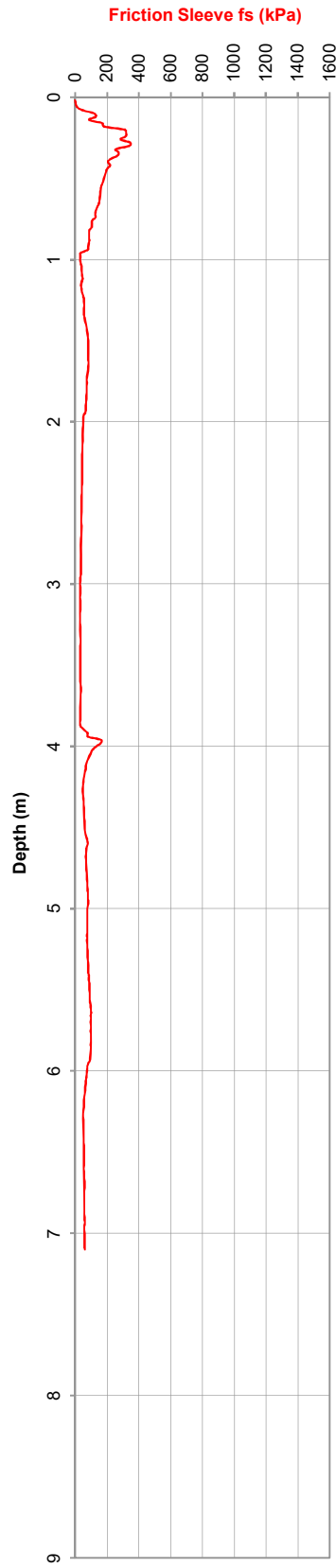
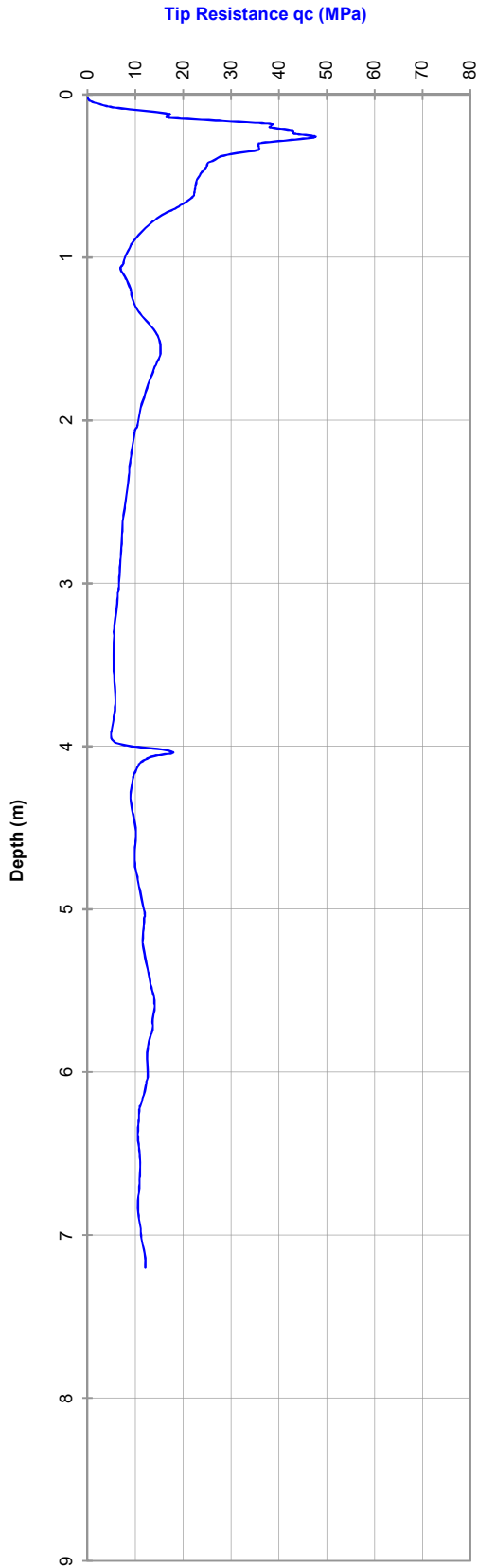
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 50

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): 2.8

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0672M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

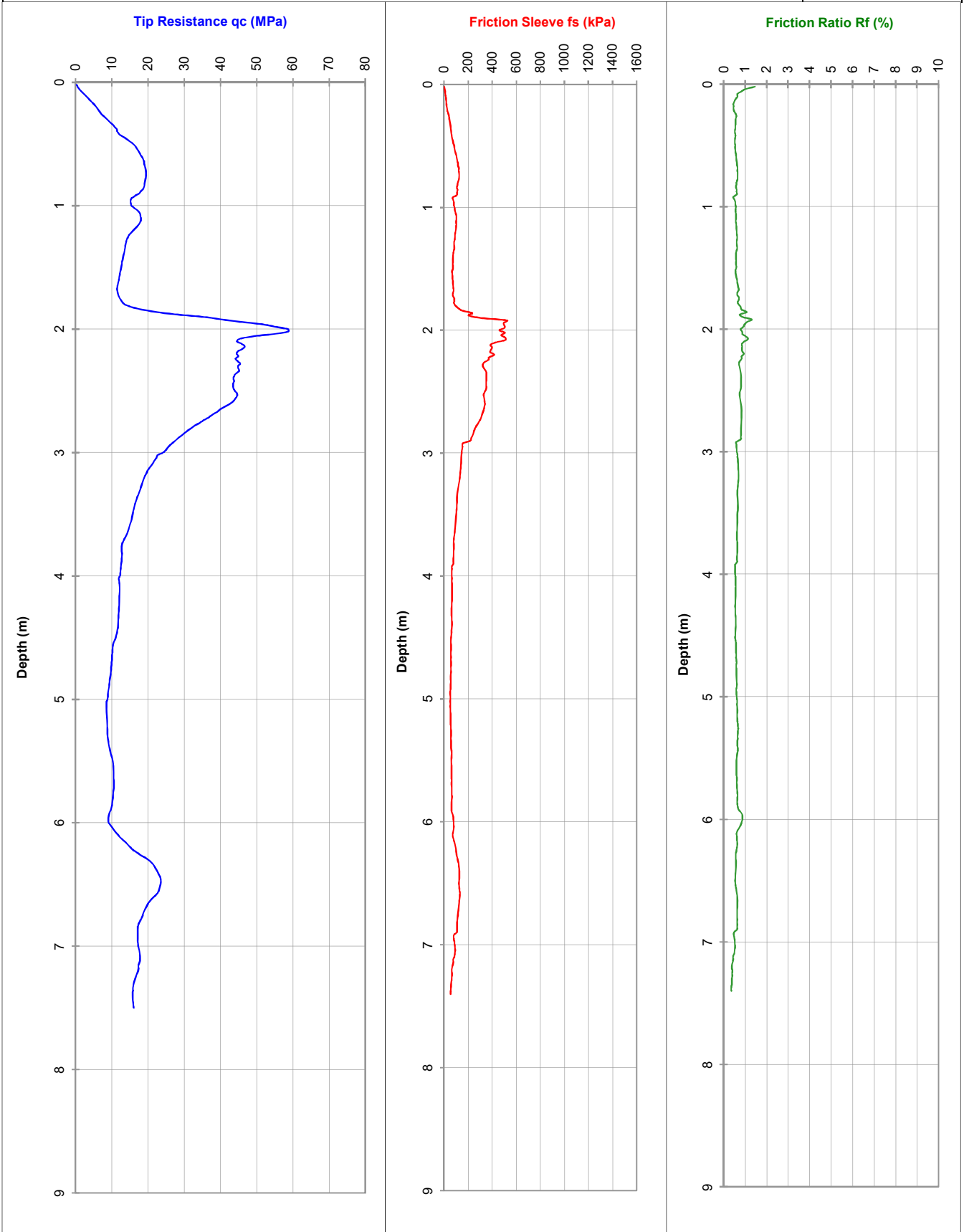
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 51

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC02

File: GL0673M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

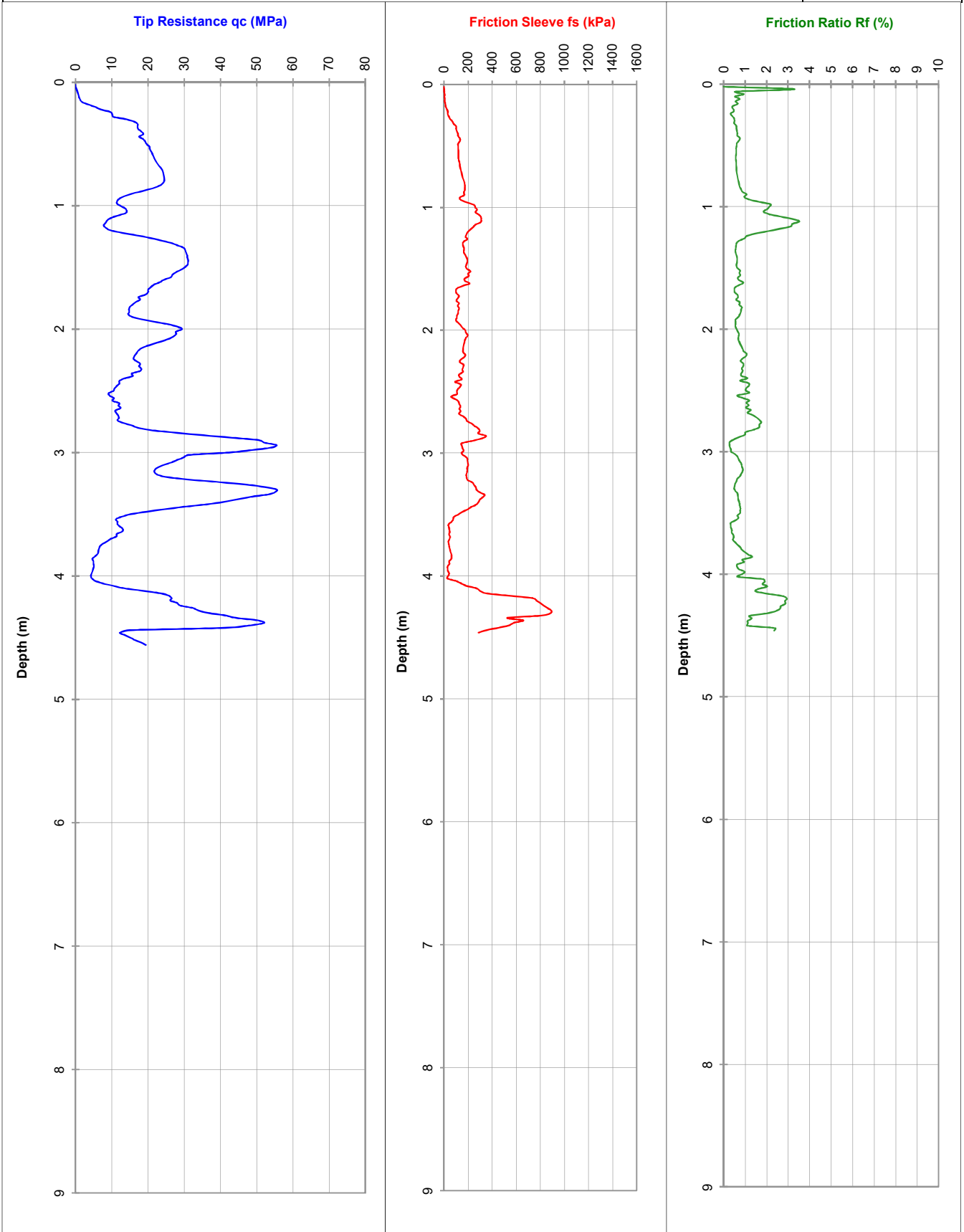
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 52

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.6

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC02

File: GL0674M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

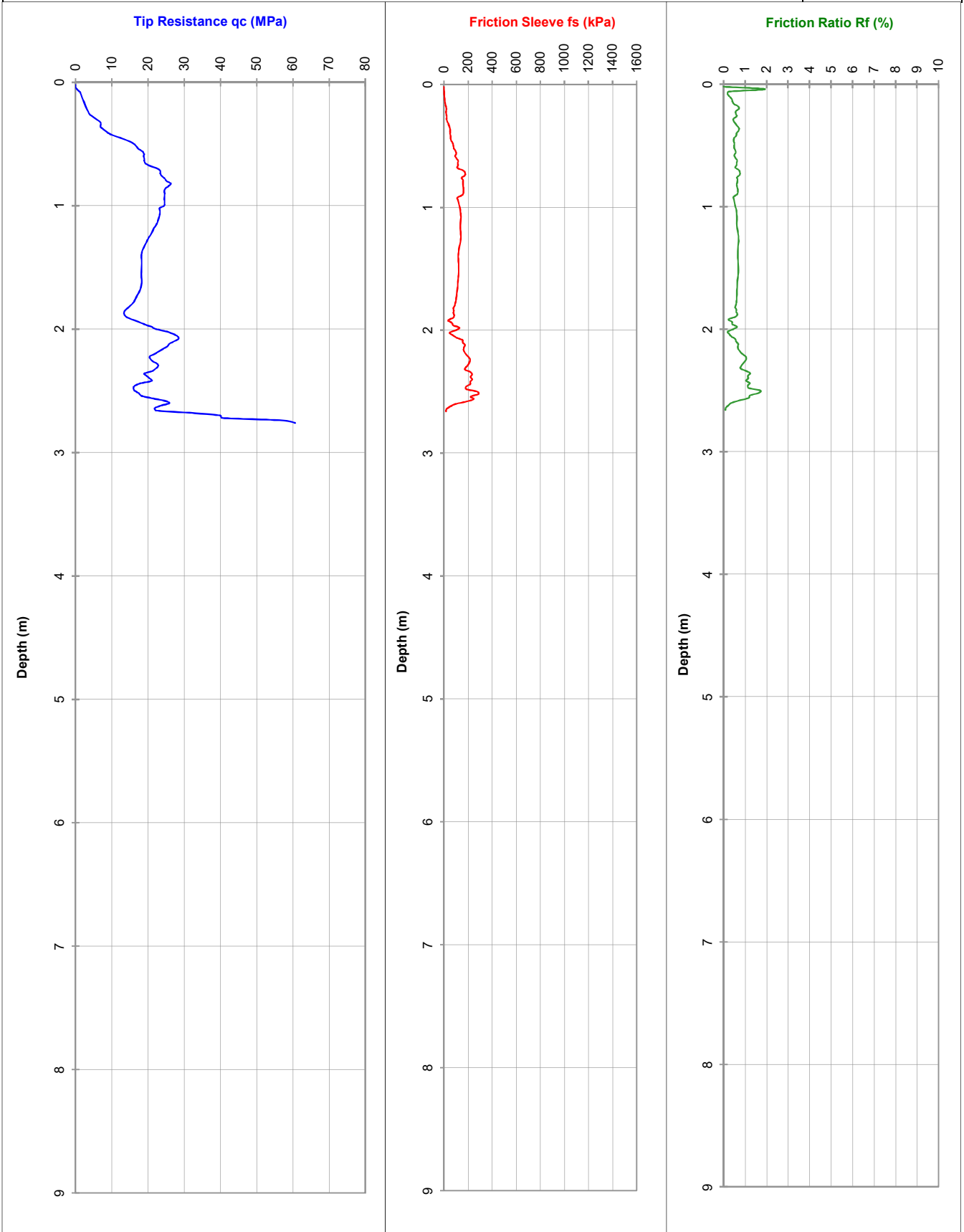
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 52A

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 2.5

Dummy probe to (m):

Refusal: 60 MPa - Inclination

Cone I.D.: EC40

File: GL0679M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

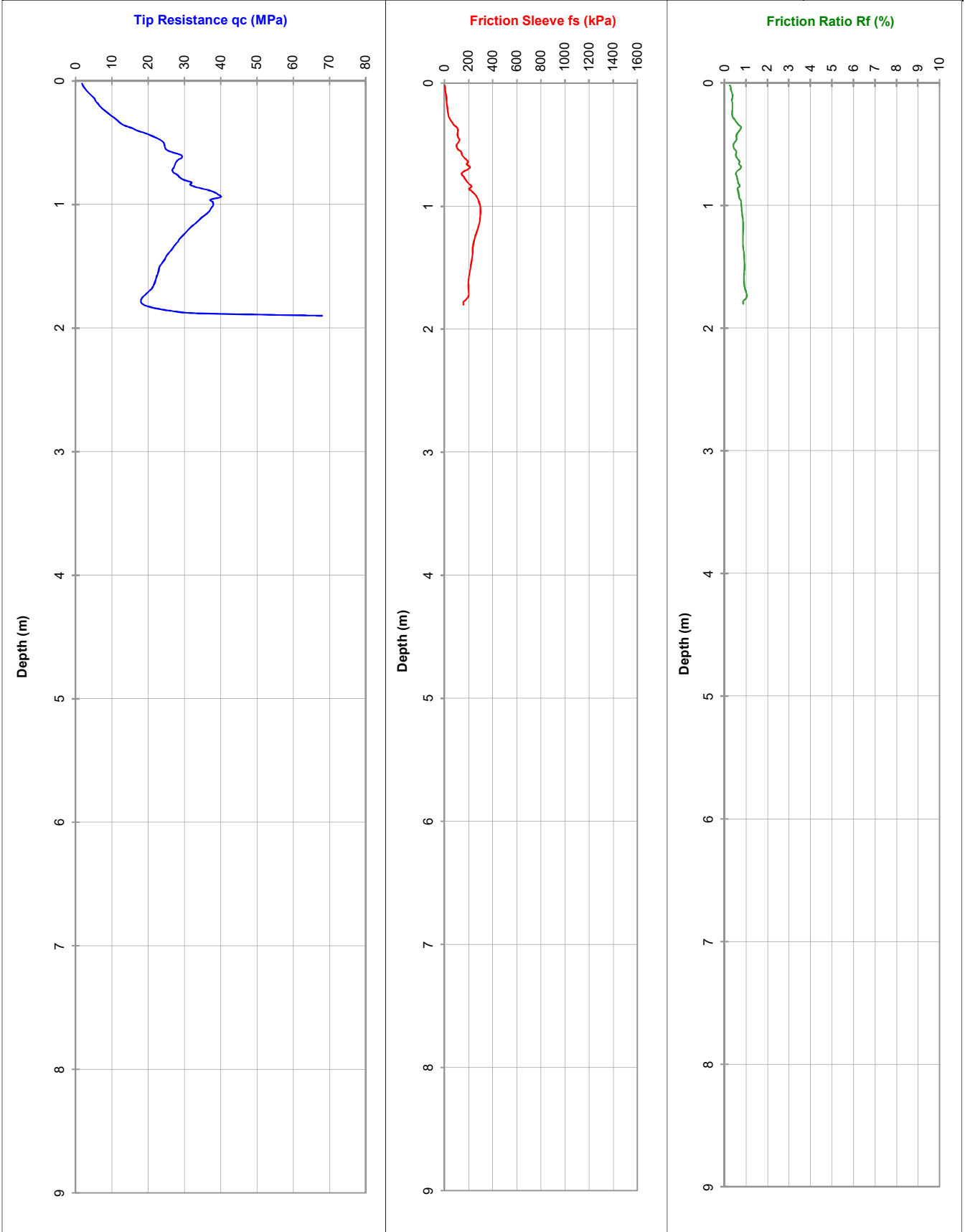
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 52B

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.5

Dummy probe to (m):

Refusal: 68 MPa

Cone I.D.: EC40

File: GL0680M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

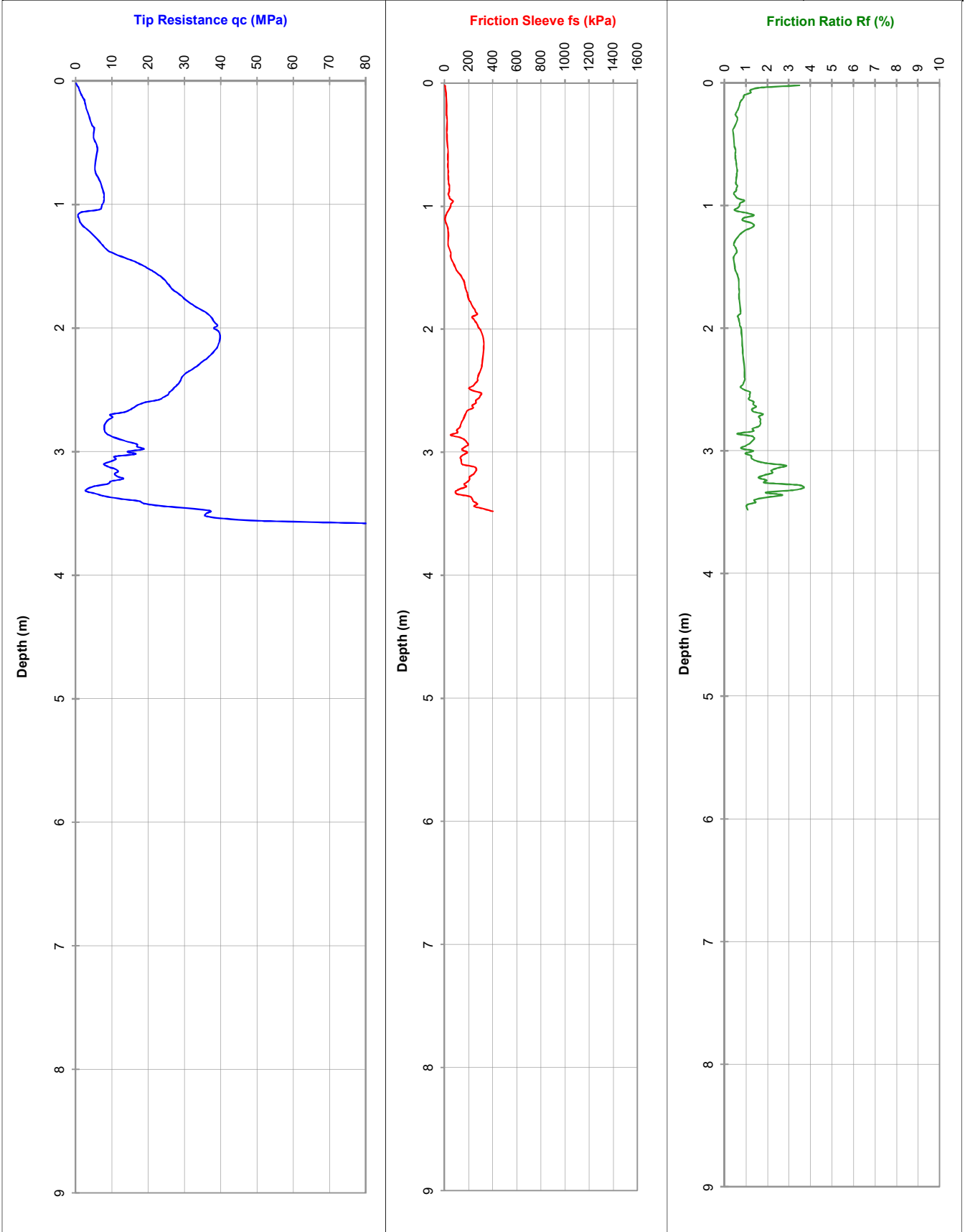
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 53

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.4

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0683M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

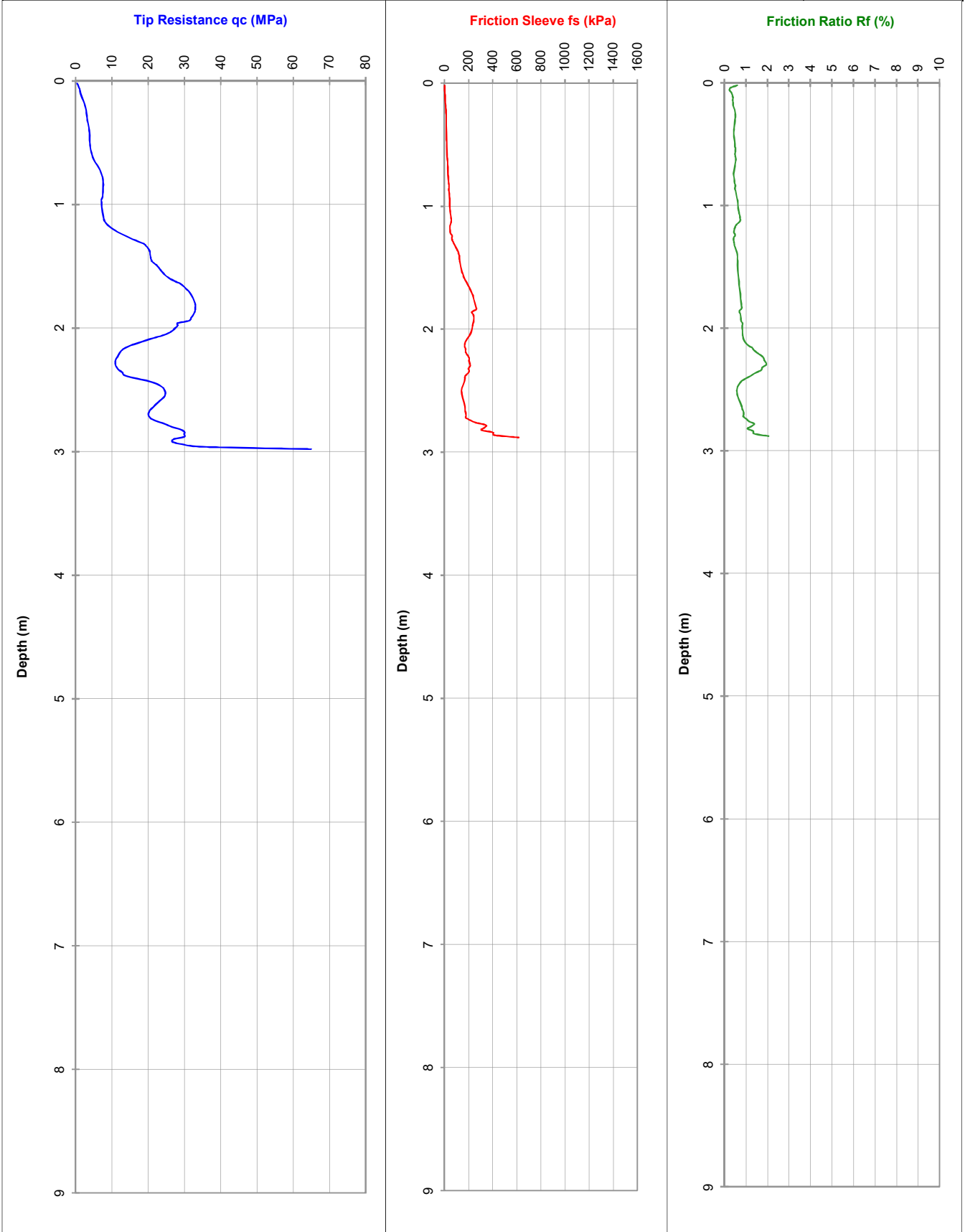
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 54

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 2.5

Dummy probe to (m):

Refusal: 65 MPa - Inclination

Cone I.D.: EC40

File: GL0681M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

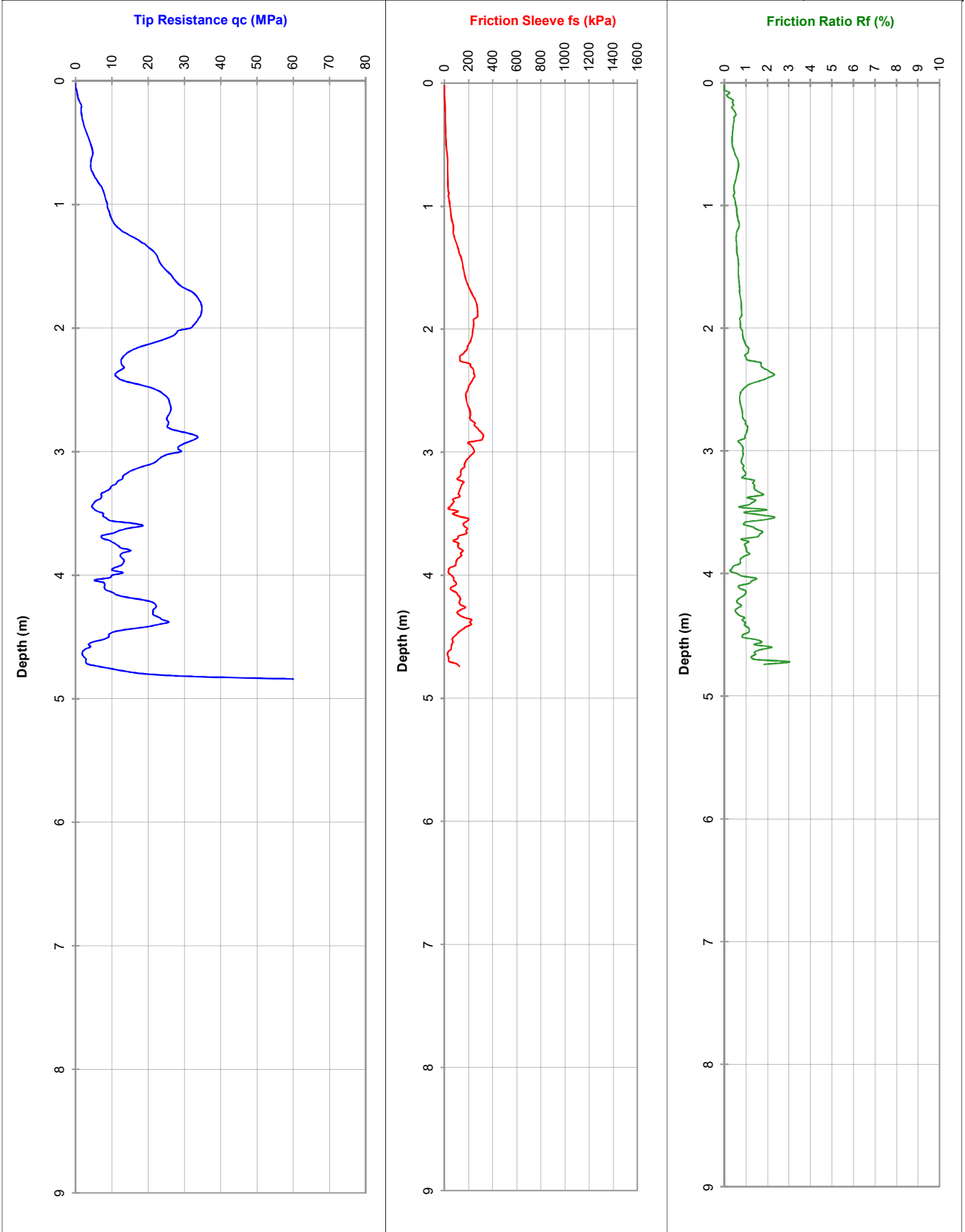
RL (m):

PGCPT 54A

LOCATION: Darch

Co-ords:

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.3

Dummy probe to (m):

Refusal: 60 Mpa

Cone I.D.: EC40

File: GL0682M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

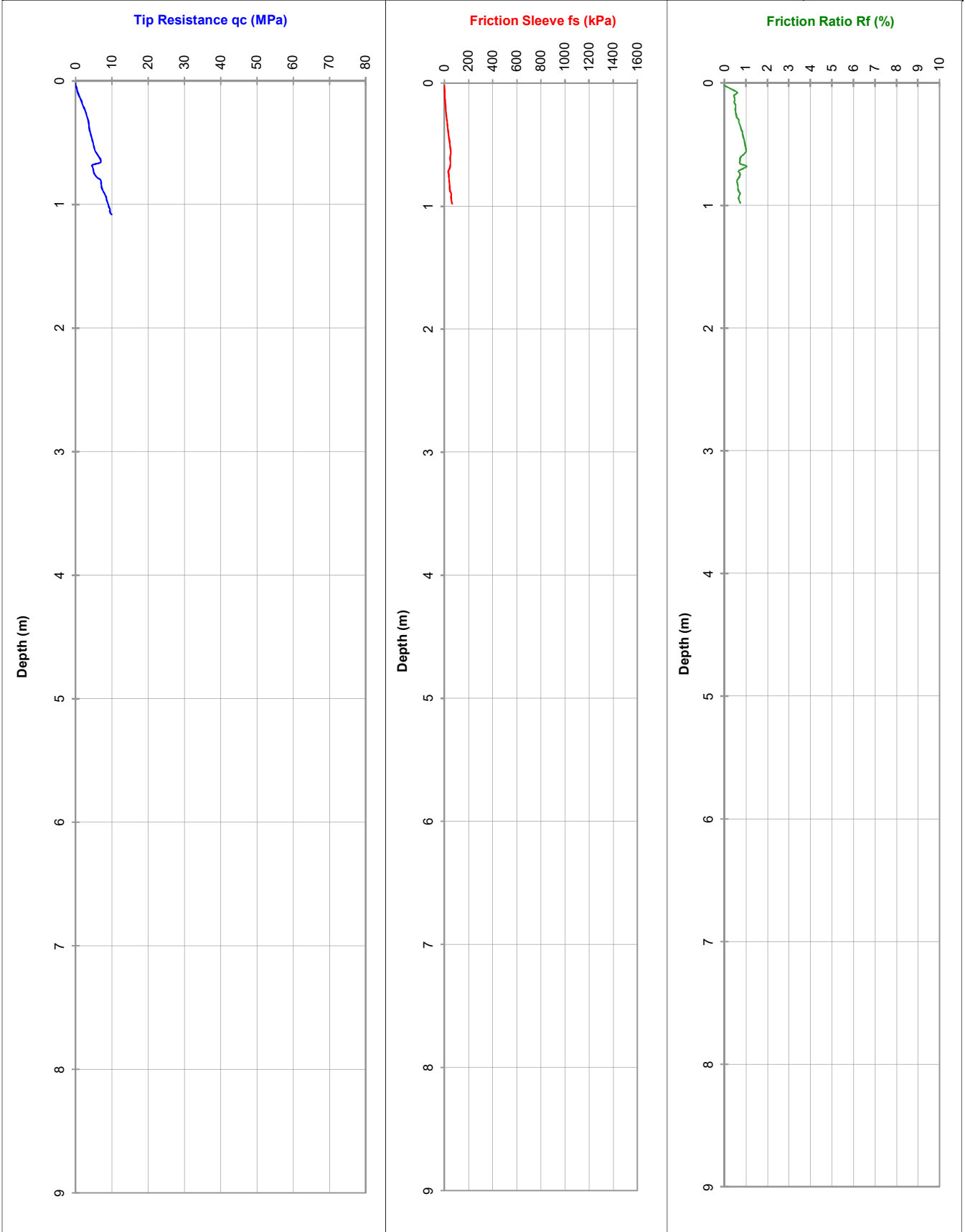
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 55

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 0.8

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC02

File: GL0675M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

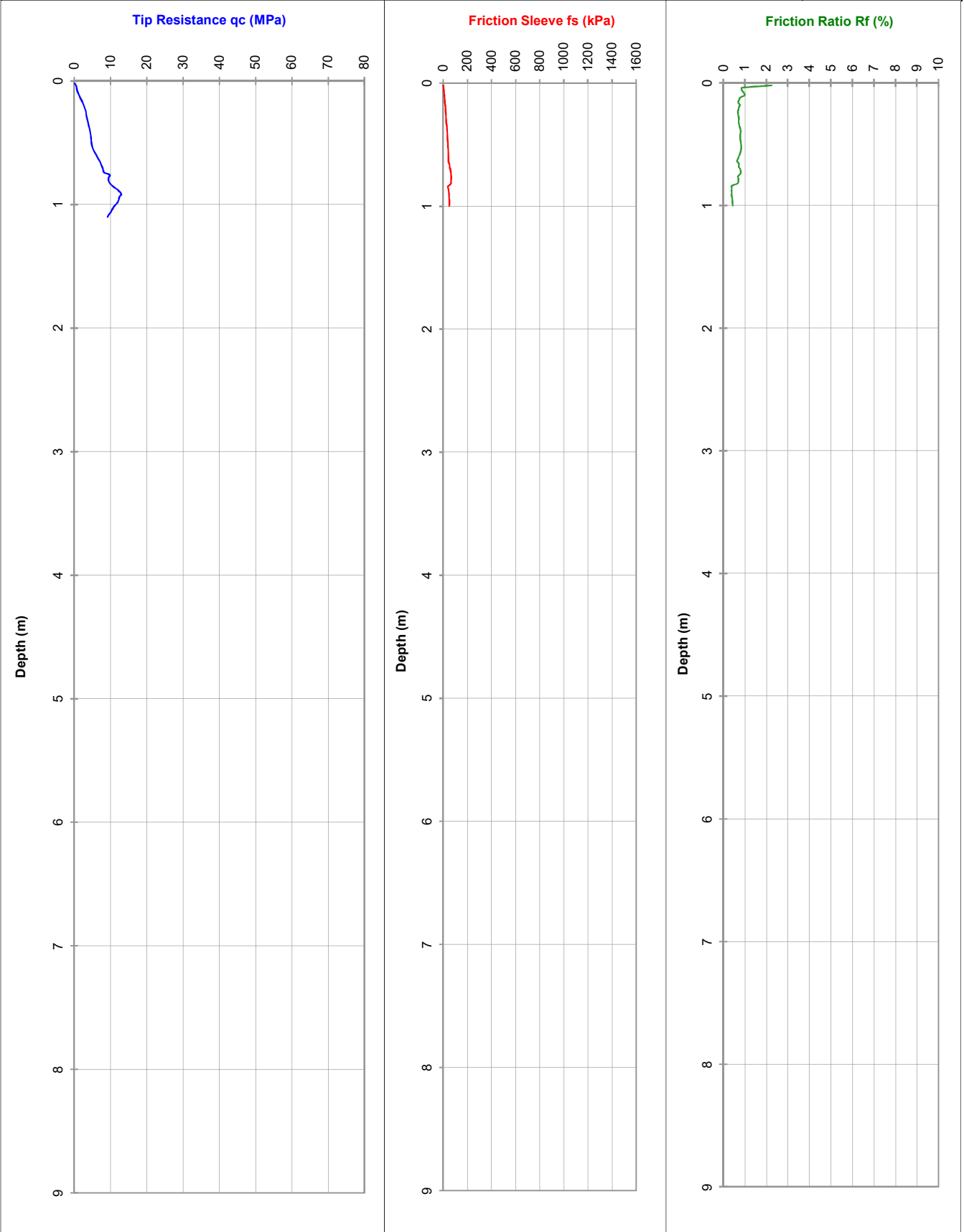
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 55A

17-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 0.8

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC02

File: GL0676M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

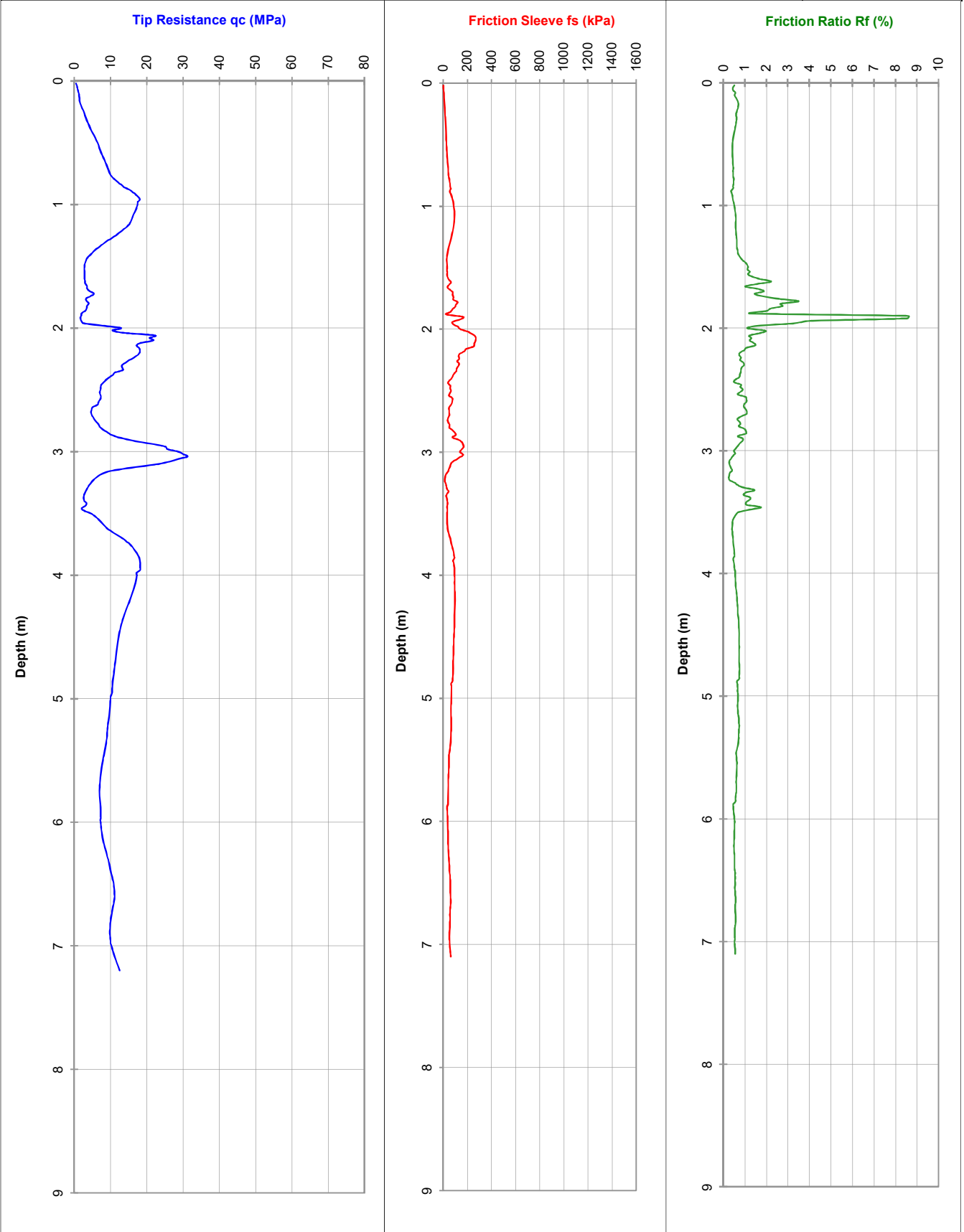
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 55B

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0678M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

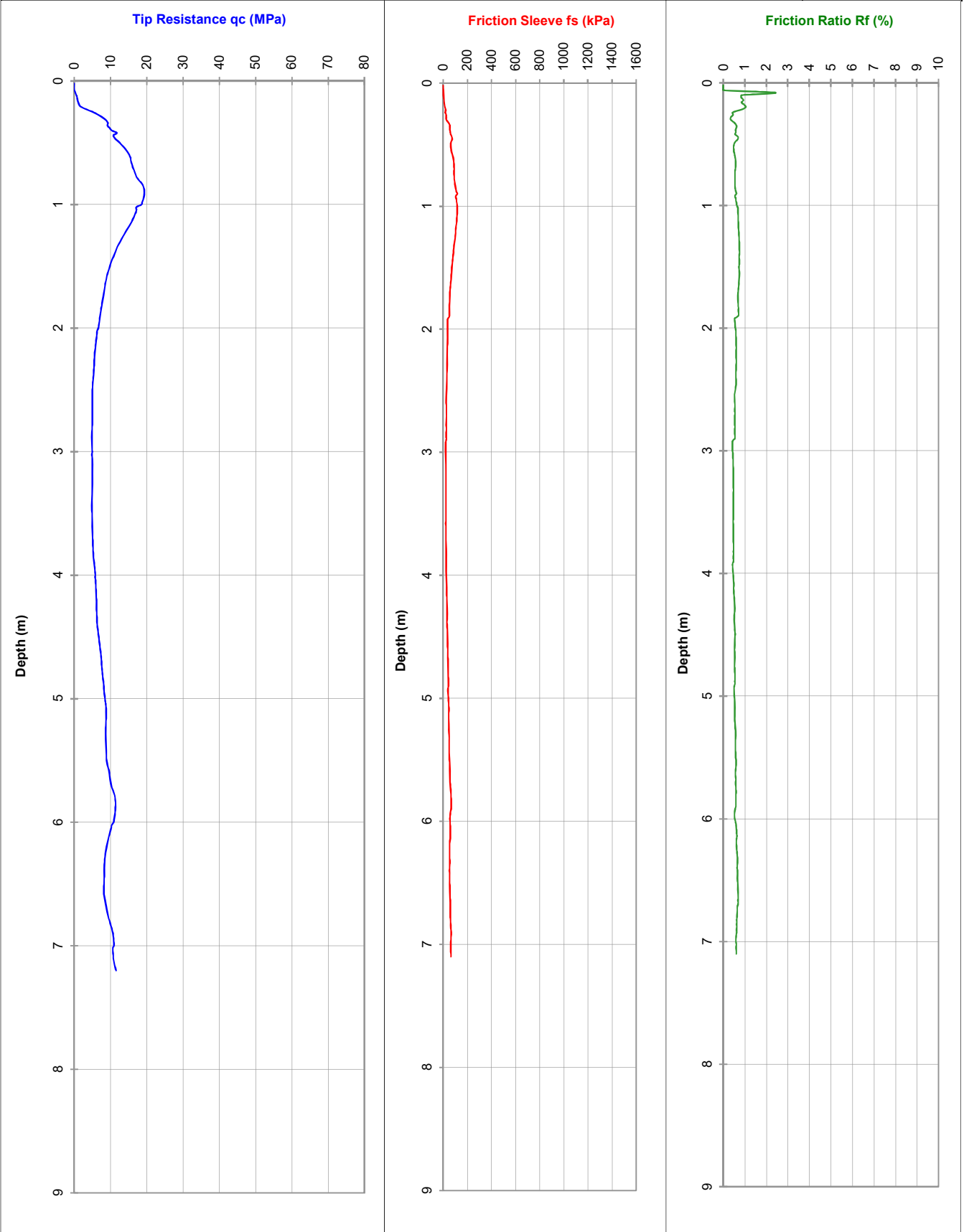
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 56

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0677M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

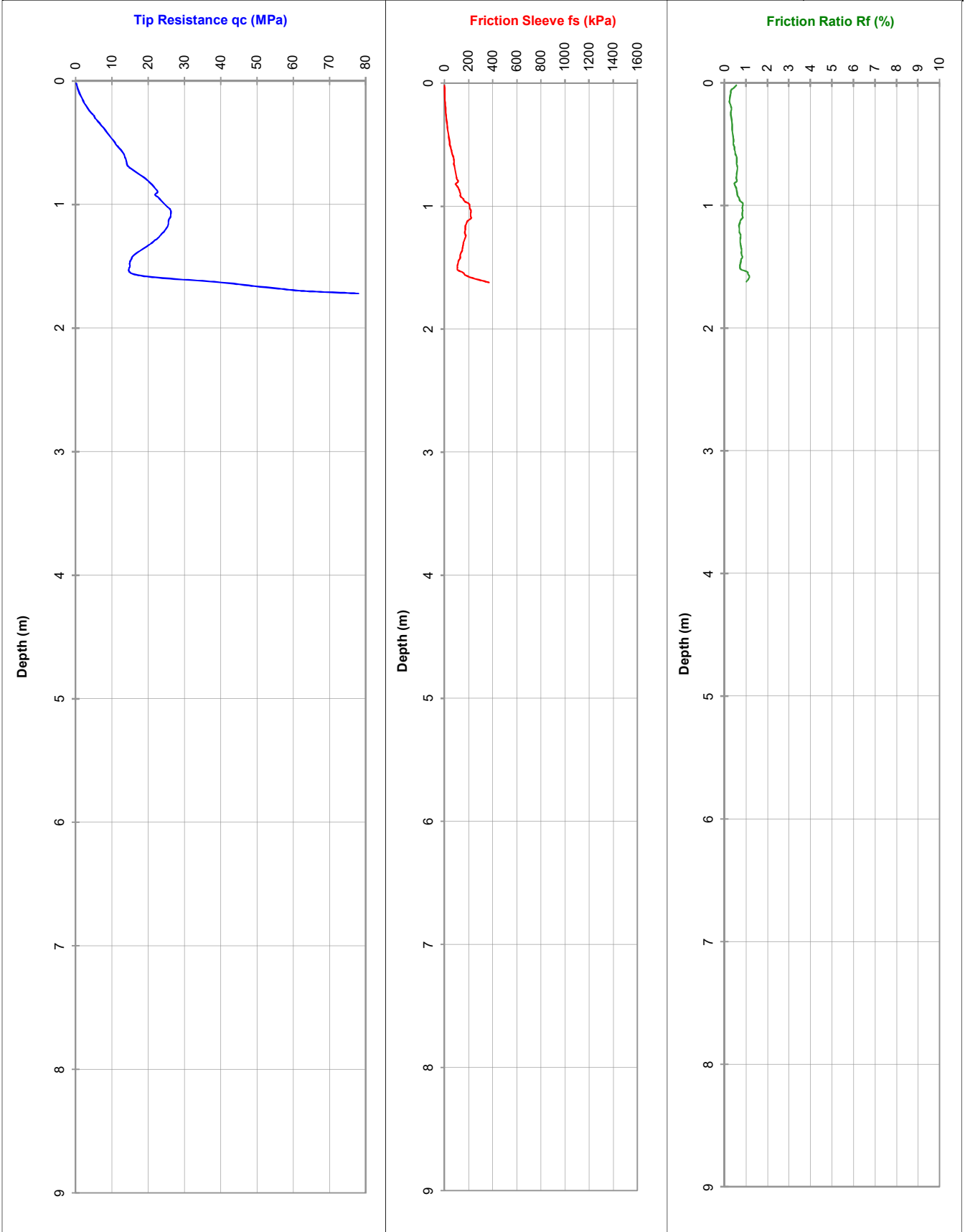
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 57

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.3

Dummy probe to (m):

Refusal: 78 MPa

Cone I.D.: EC40

File: GL0687M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

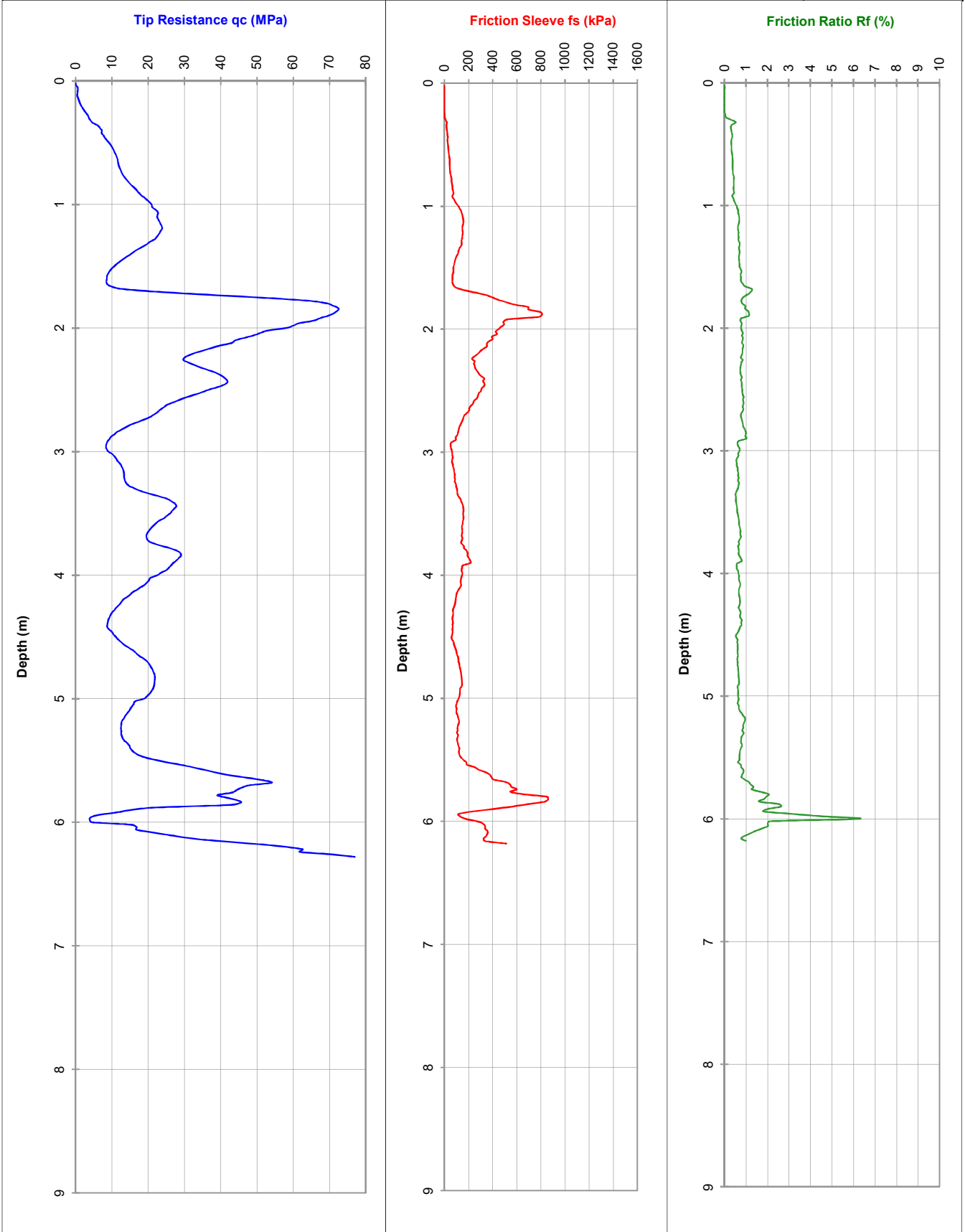
RL (m):

PGCPT 57A

LOCATION: Darch

Co-ords:

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.0

Dummy probe to (m):

Refusal: 77 MPa

Cone I.D.: EC40

File: GL0688M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

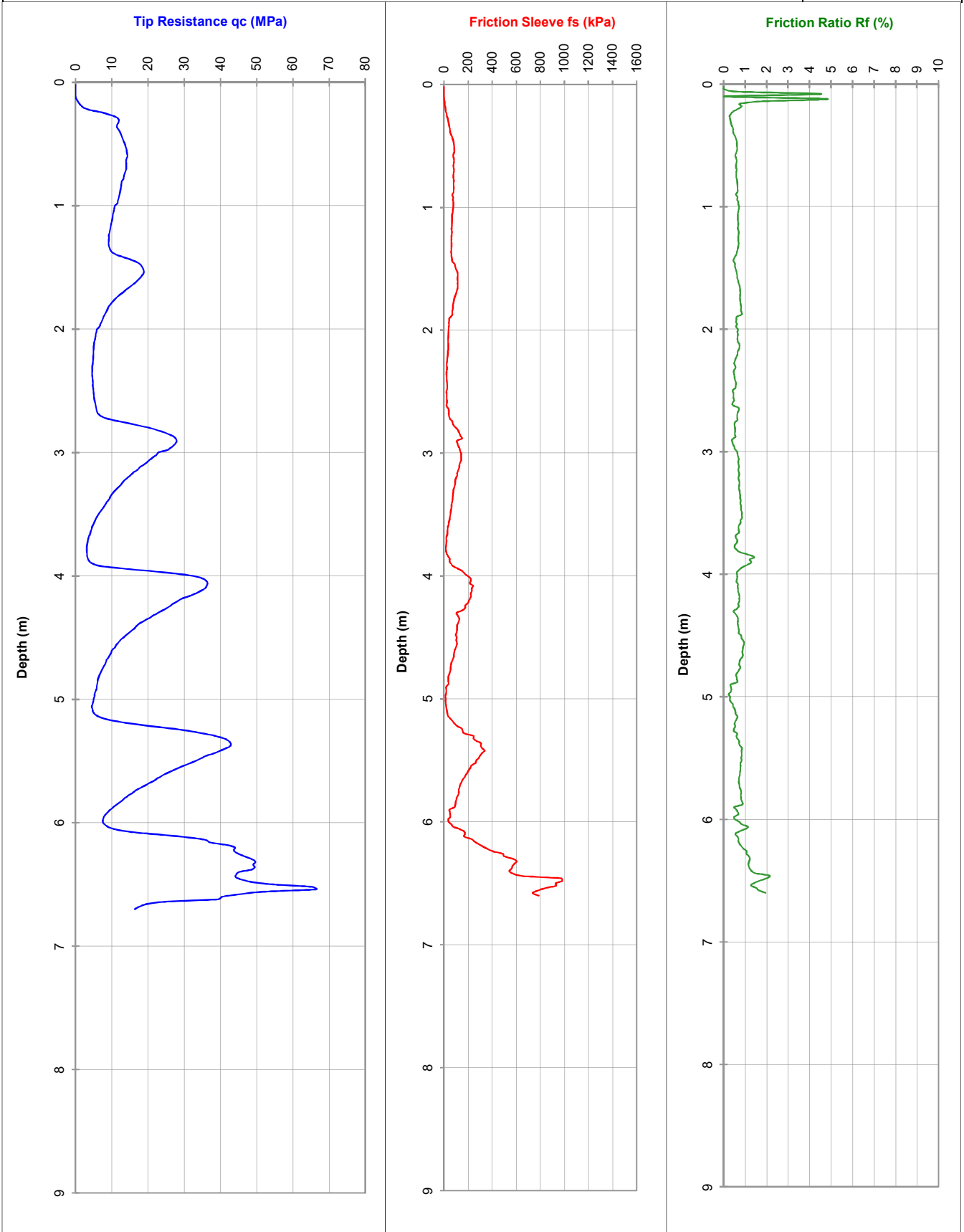
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 58

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.9

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL0686M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

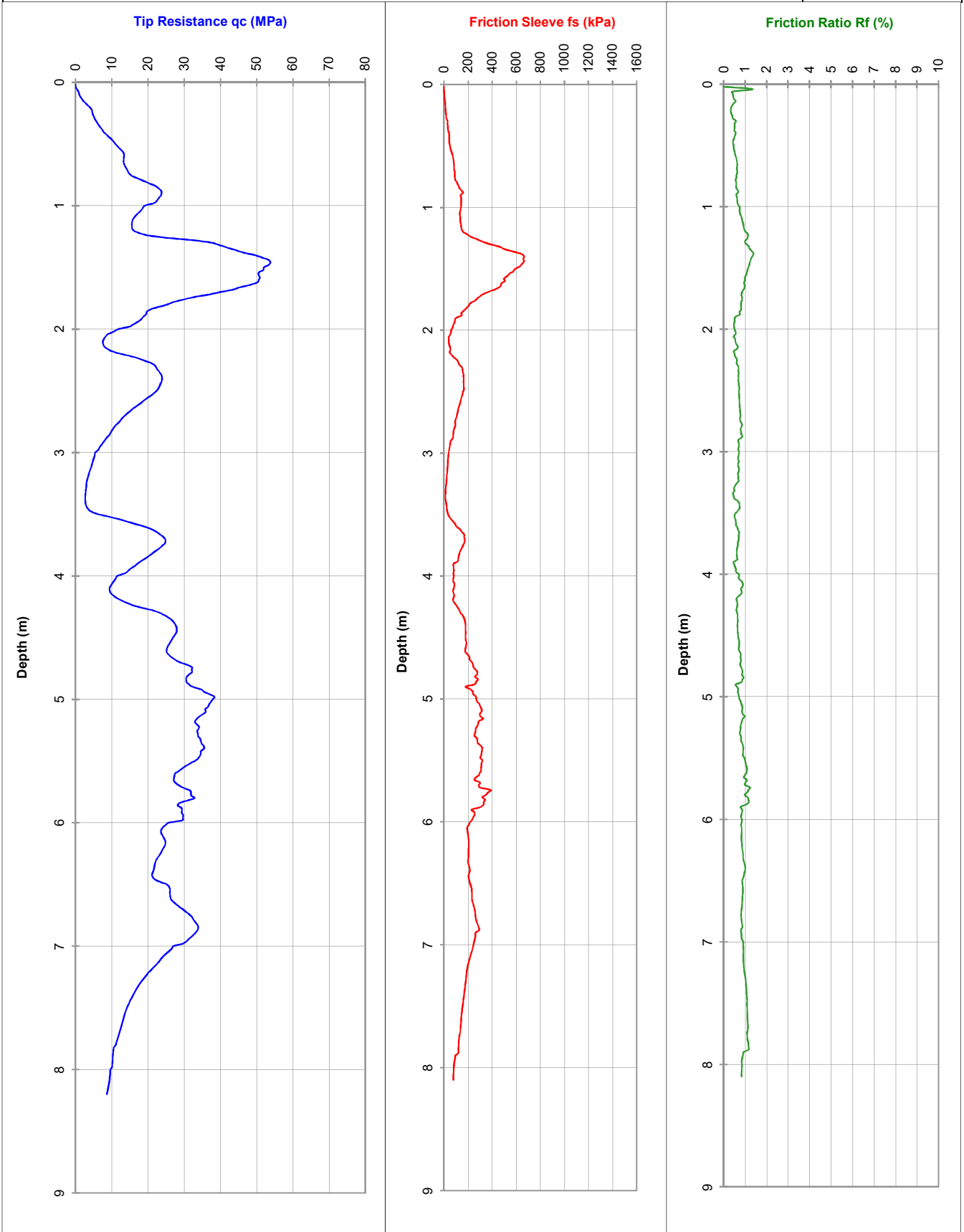
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 59

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 6.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0689M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

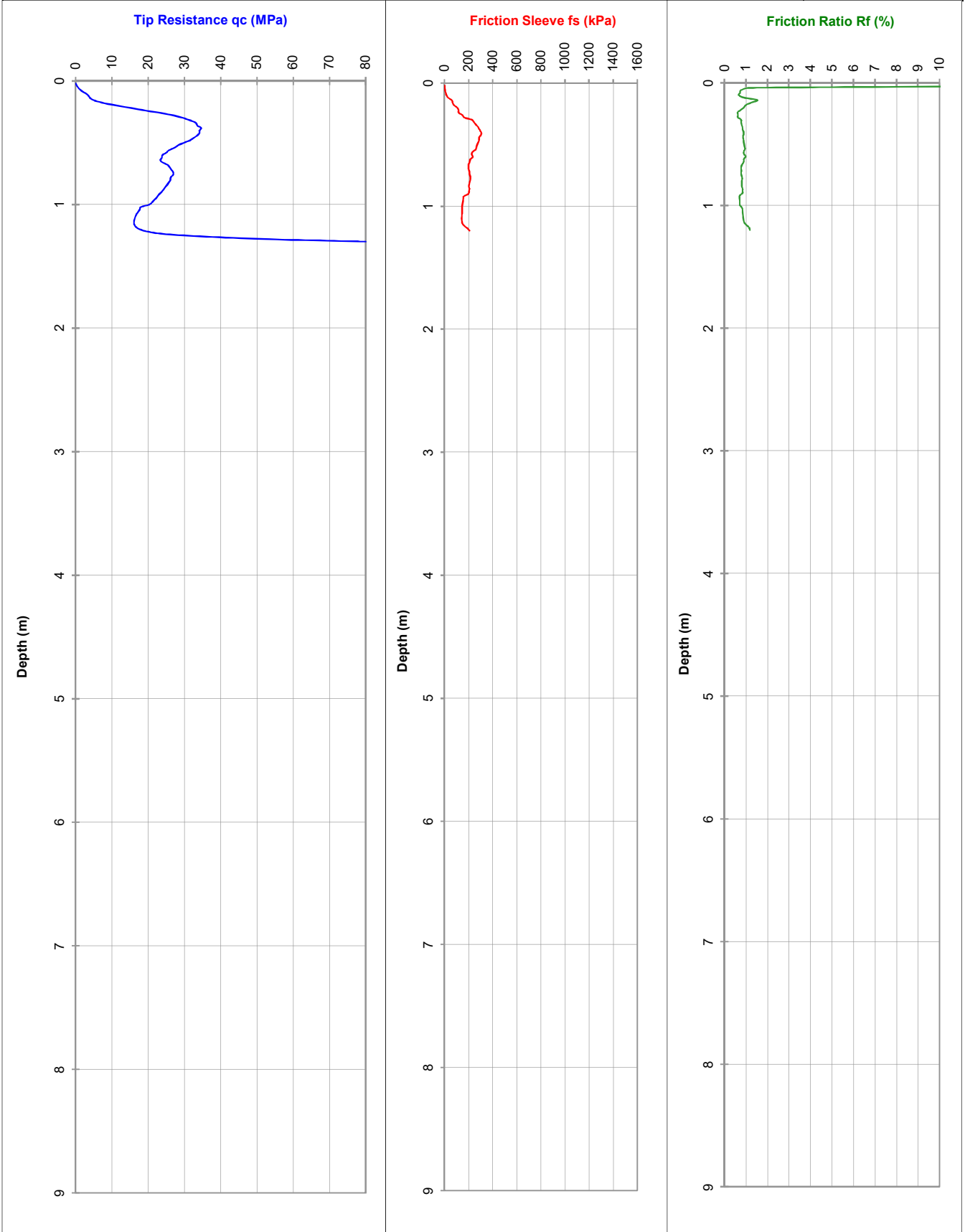
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 60

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.3

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0690M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

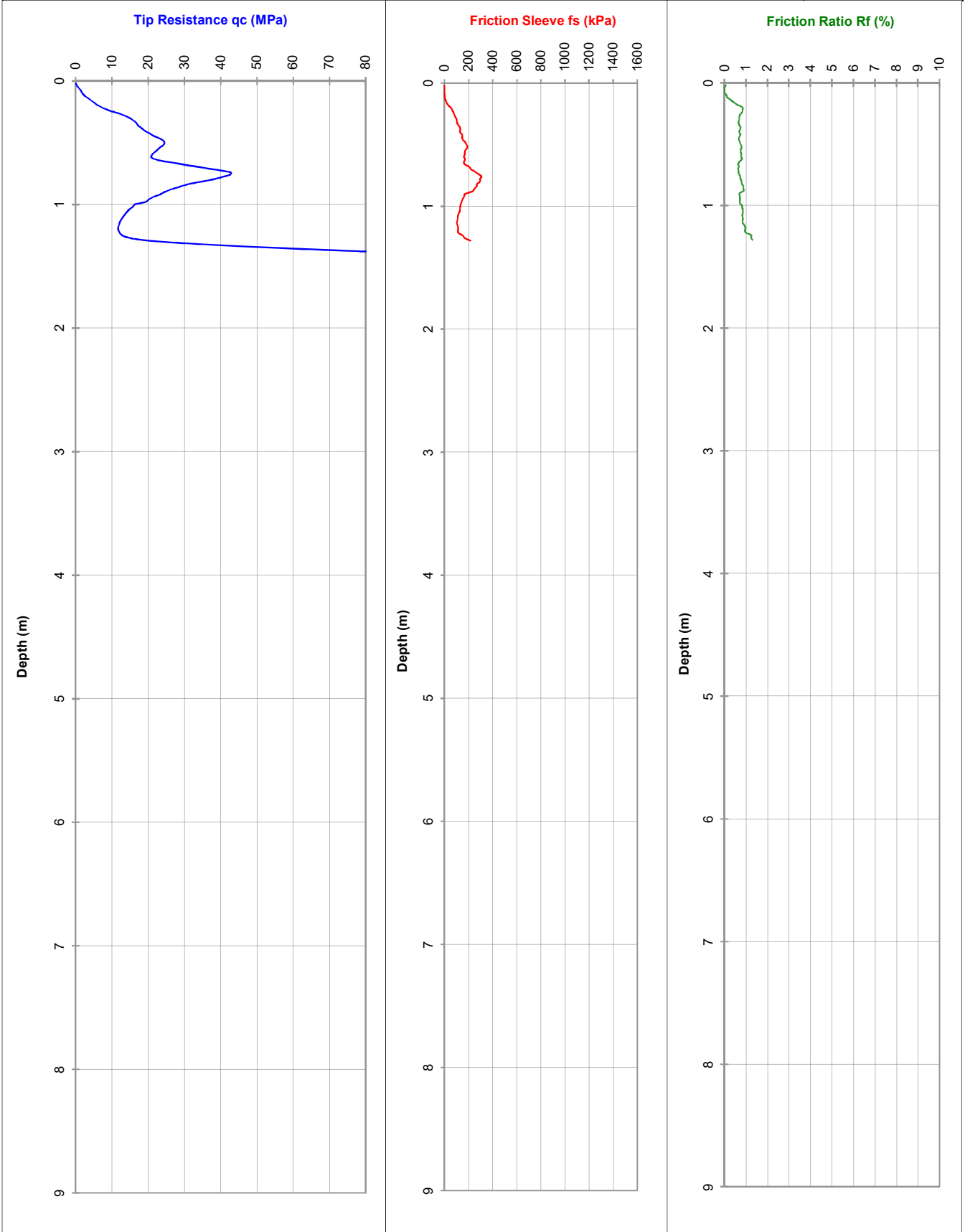
RL (m):

PGCPT 60A

LOCATION: Darch

Co-ords:

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.3

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0691M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

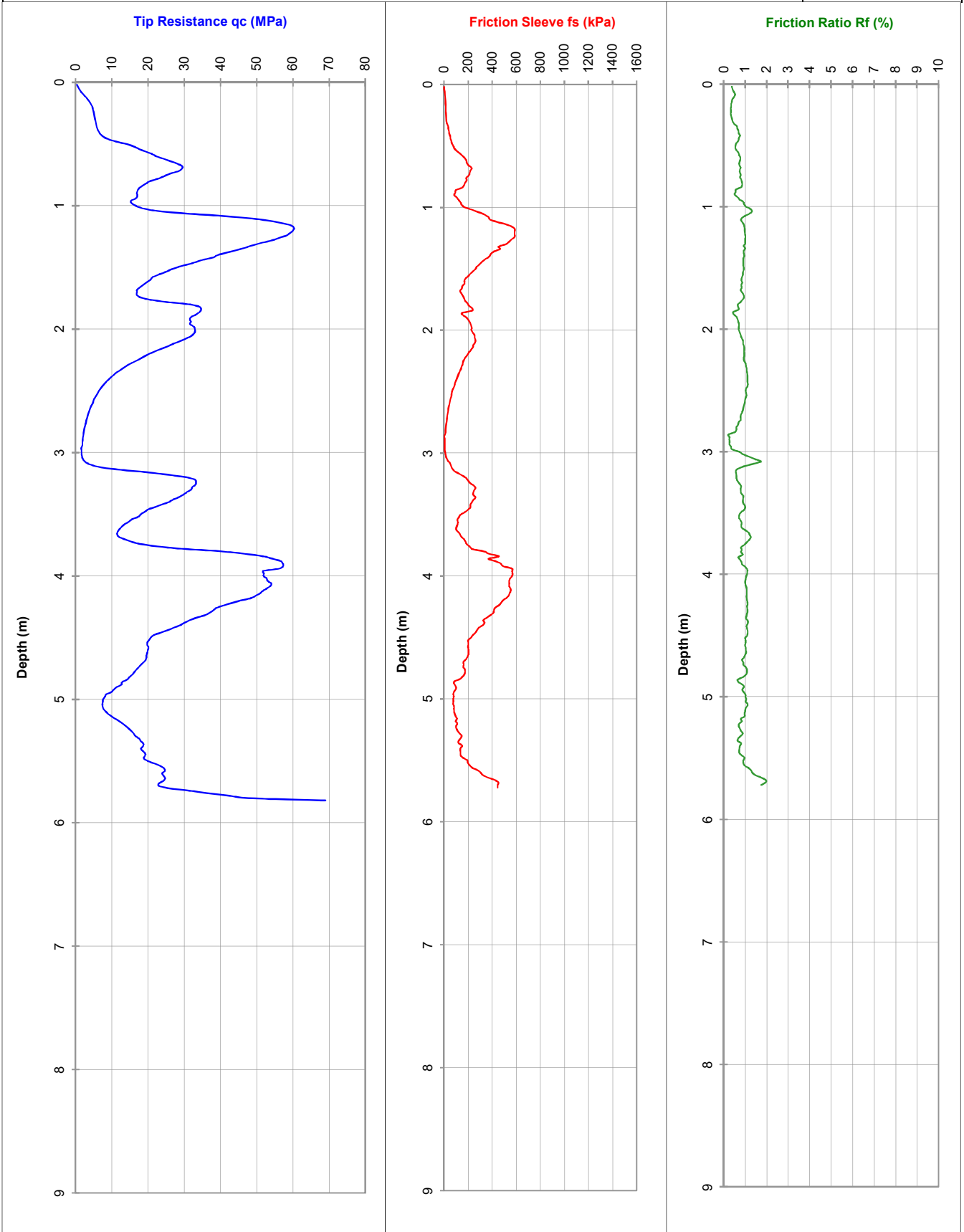
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 61

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.3

Dummy probe to (m):

Refusal: 69 MPa - Inclination

Cone I.D.: EC40

File: GL0693M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

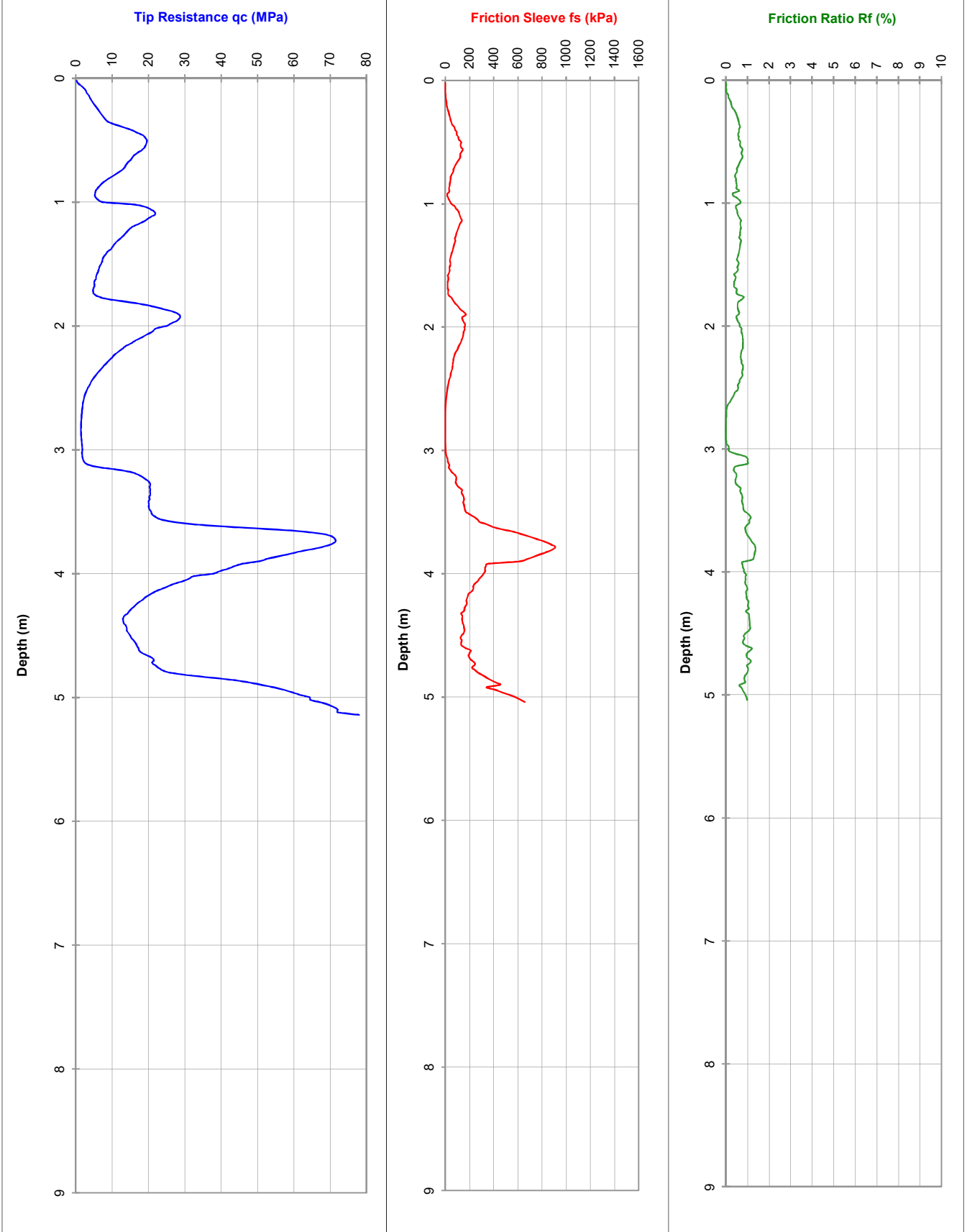
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 62

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.9

Dummy probe to (m):

Refusal: 78 MPa

Cone I.D.: EC40

File: GL0696M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

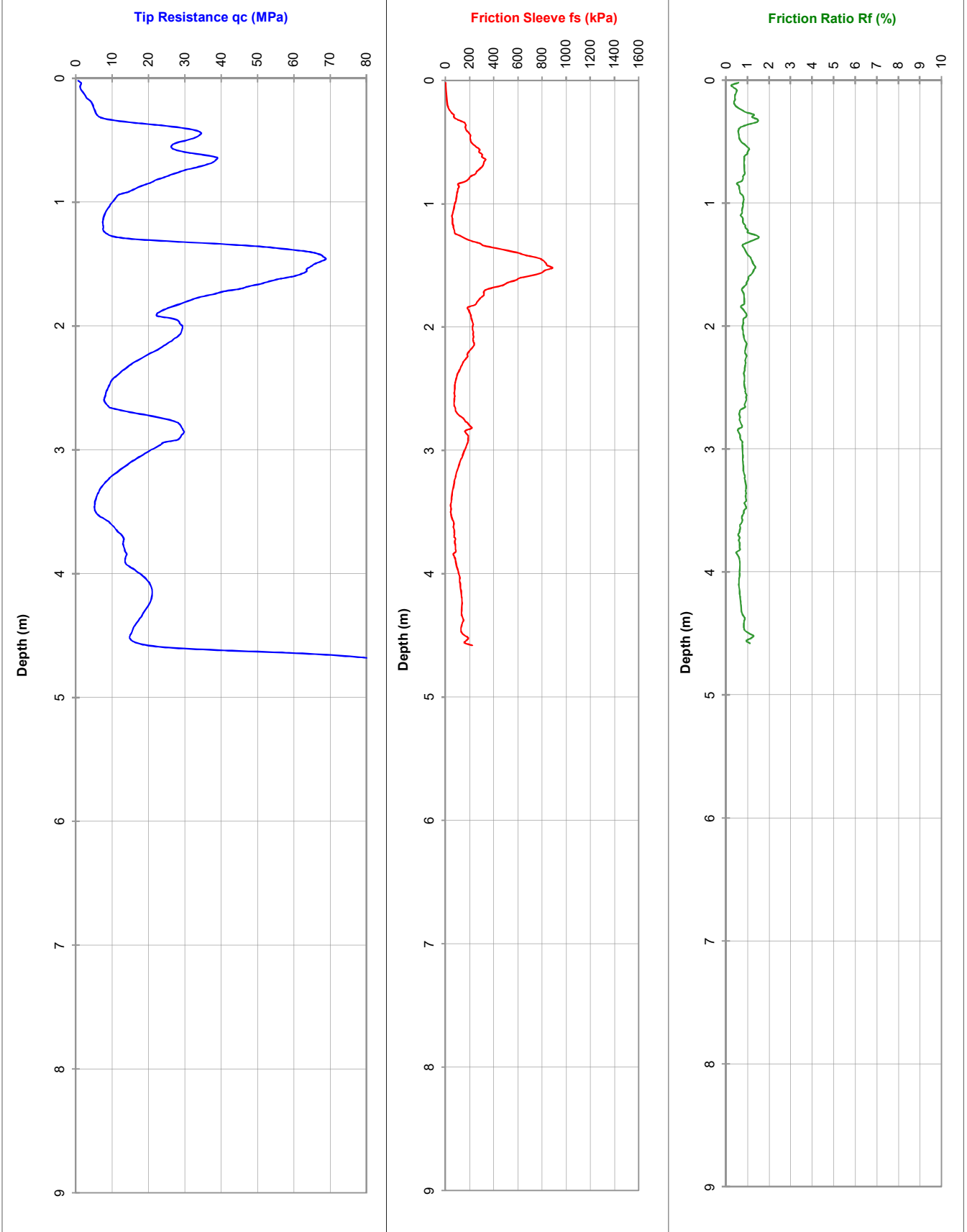
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 63

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 4.4

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0695M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

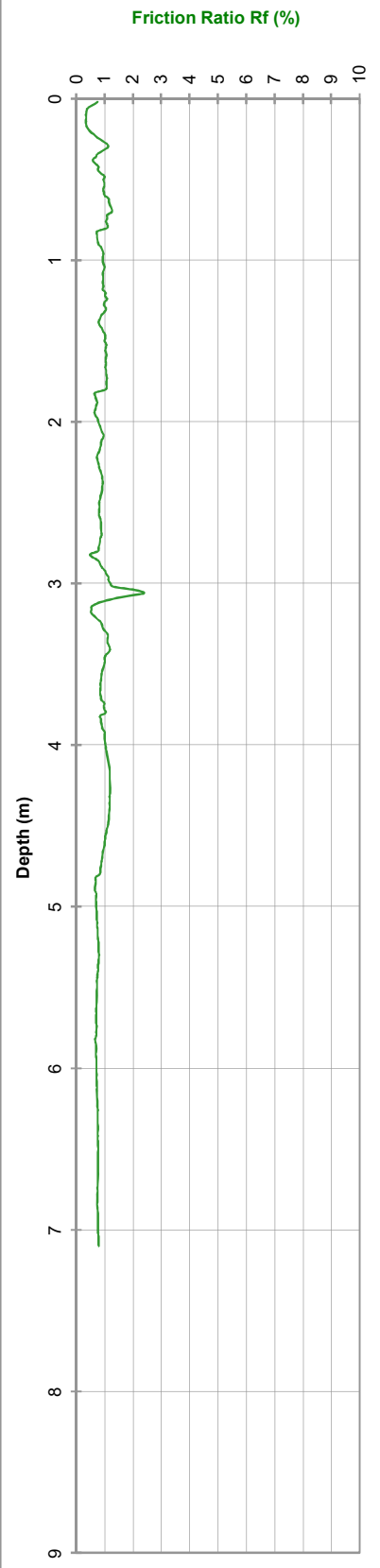
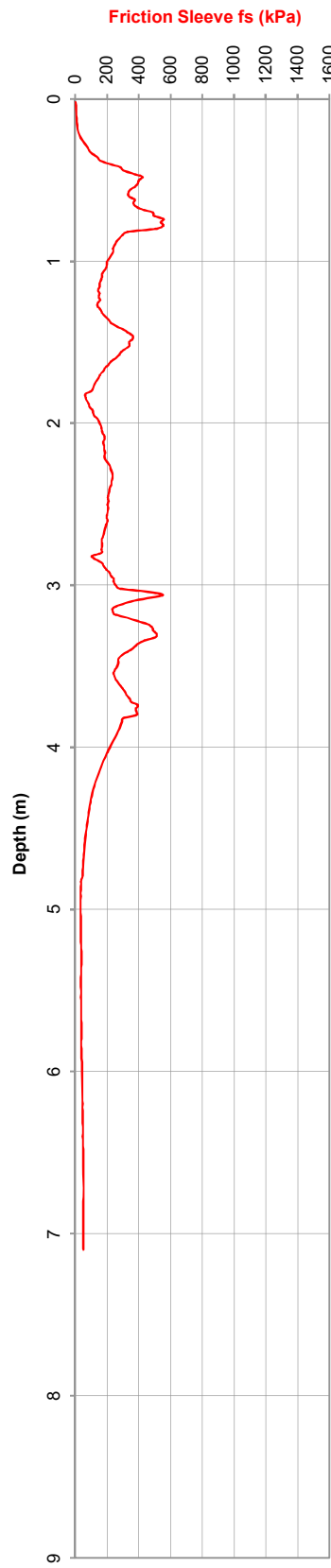
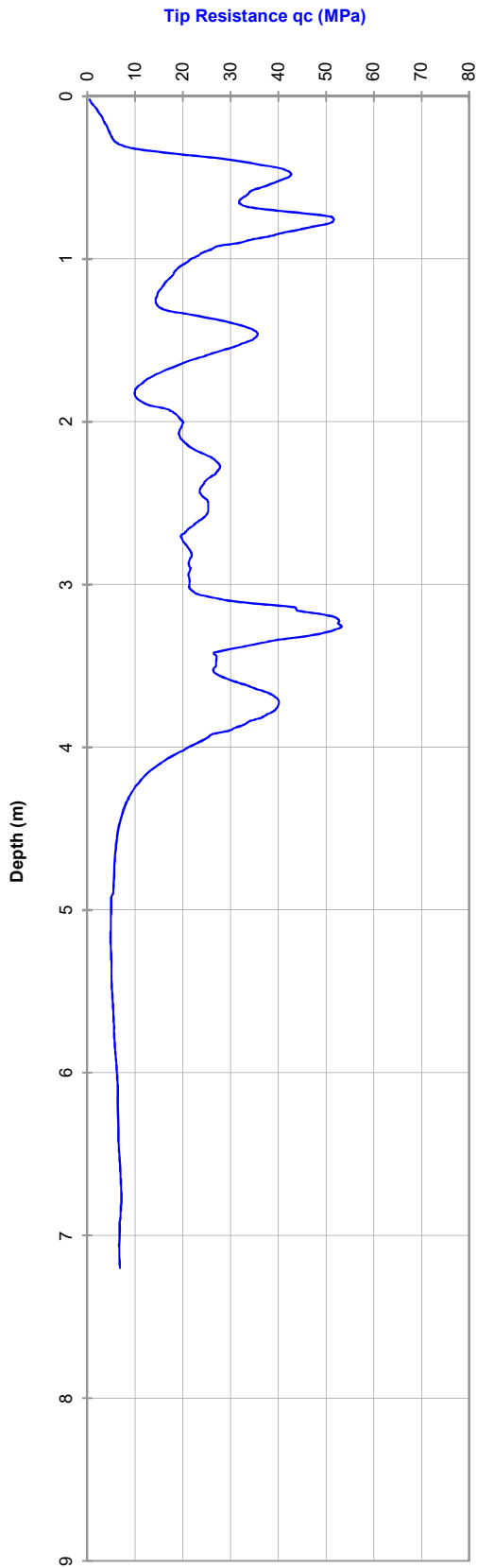
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 64

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 5.3

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0697M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

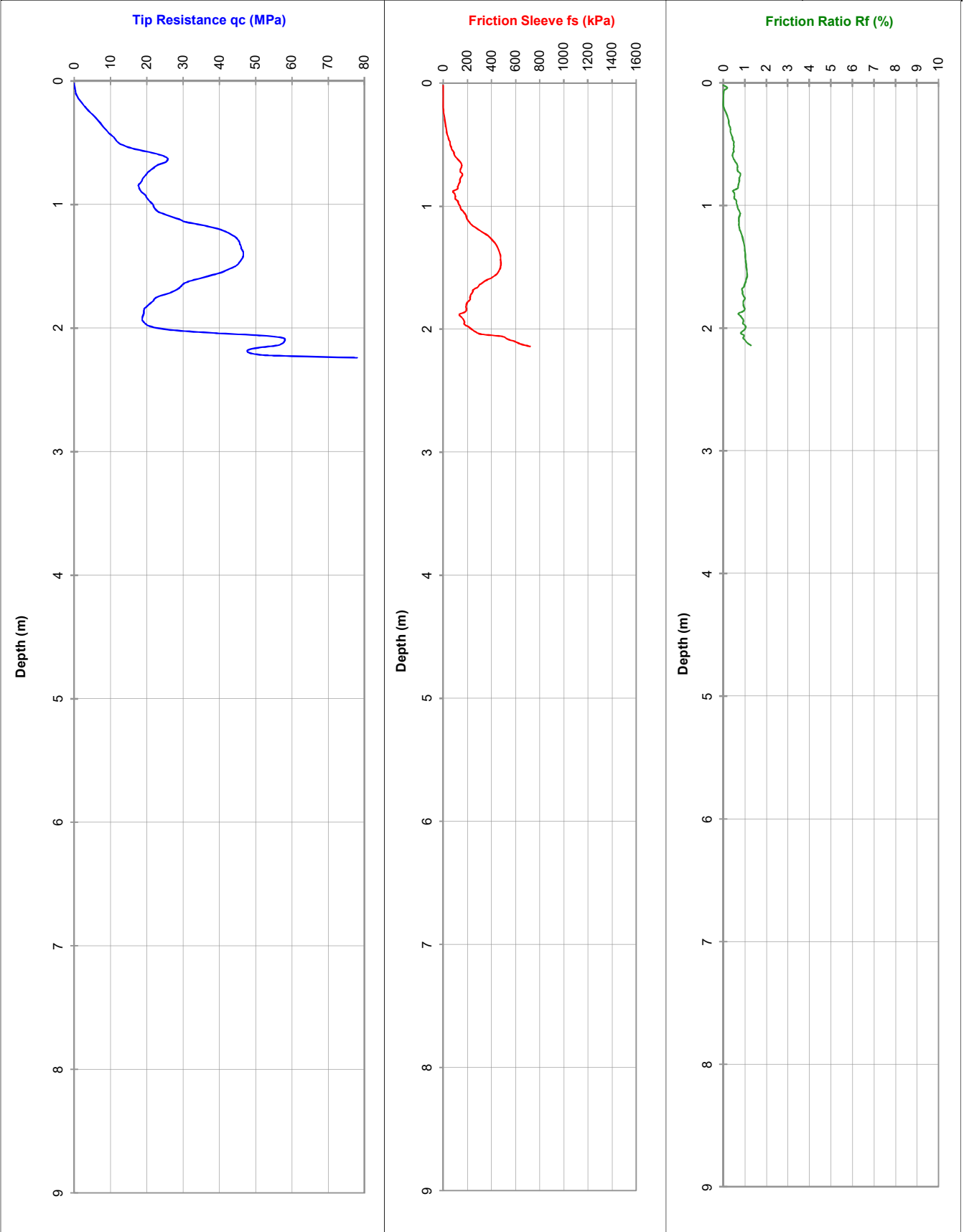
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 65

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 2.0

Dummy probe to (m):

Refusal: 78 MPa

Cone I.D.: EC40

File: GL0698M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

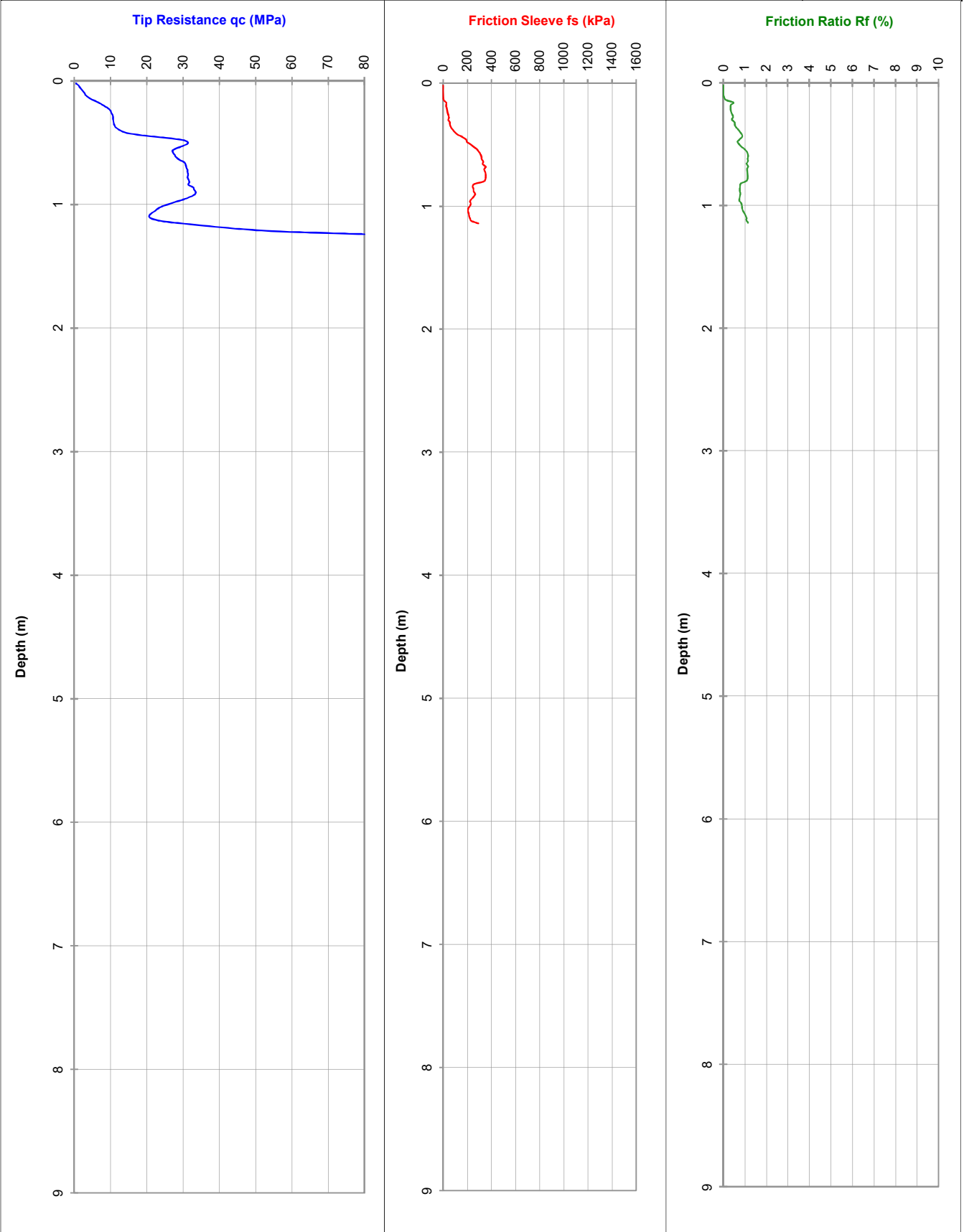
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 66

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.1

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0703M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

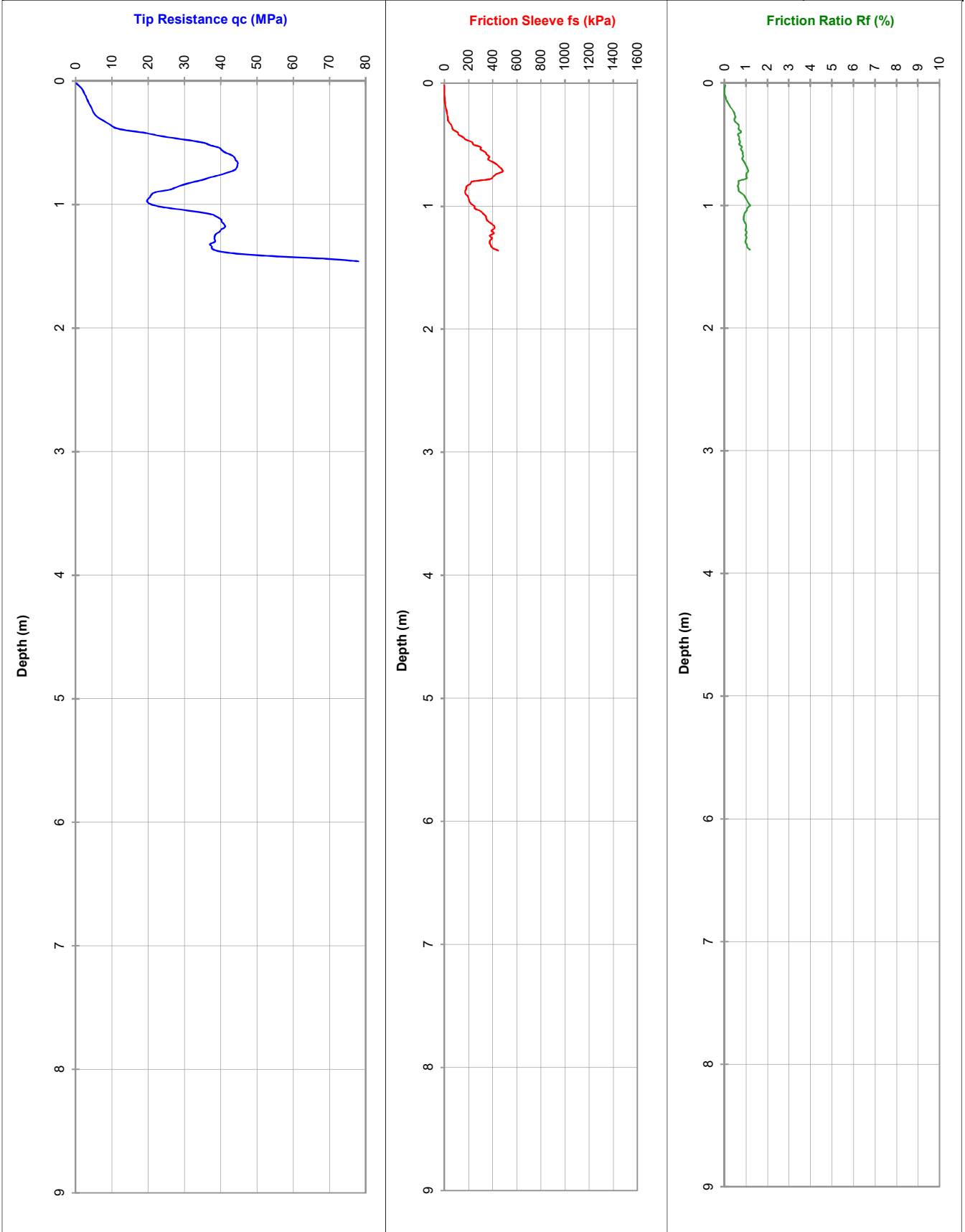
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 66A

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.1

Dummy probe to (m):

Refusal: 78 MPa

Cone I.D.: EC40

File: GL0704M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

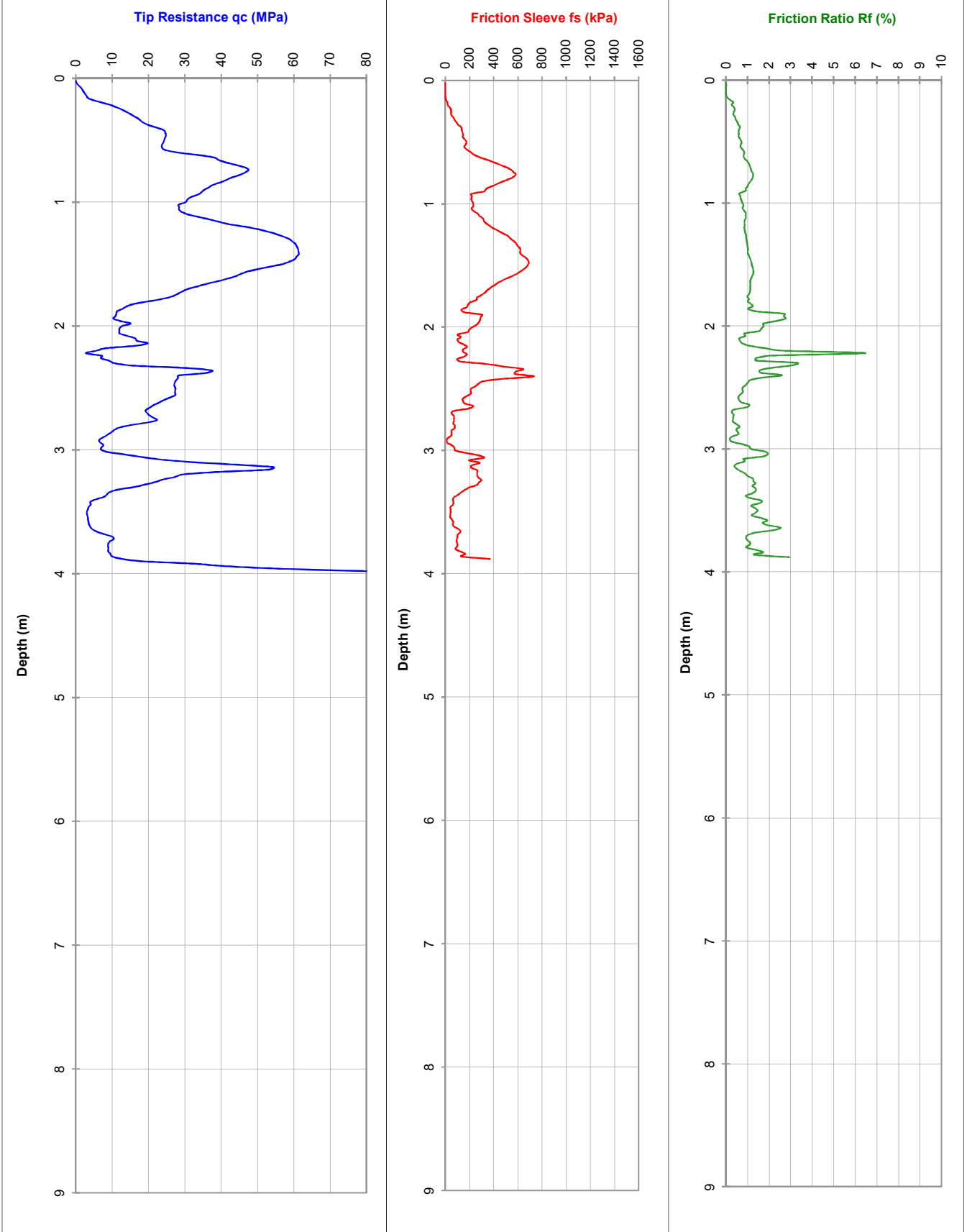
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 67

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.5

Dummy probe to (m):

Refusal: 80 MPa

Cone I.D.: EC40

File: GL0699M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

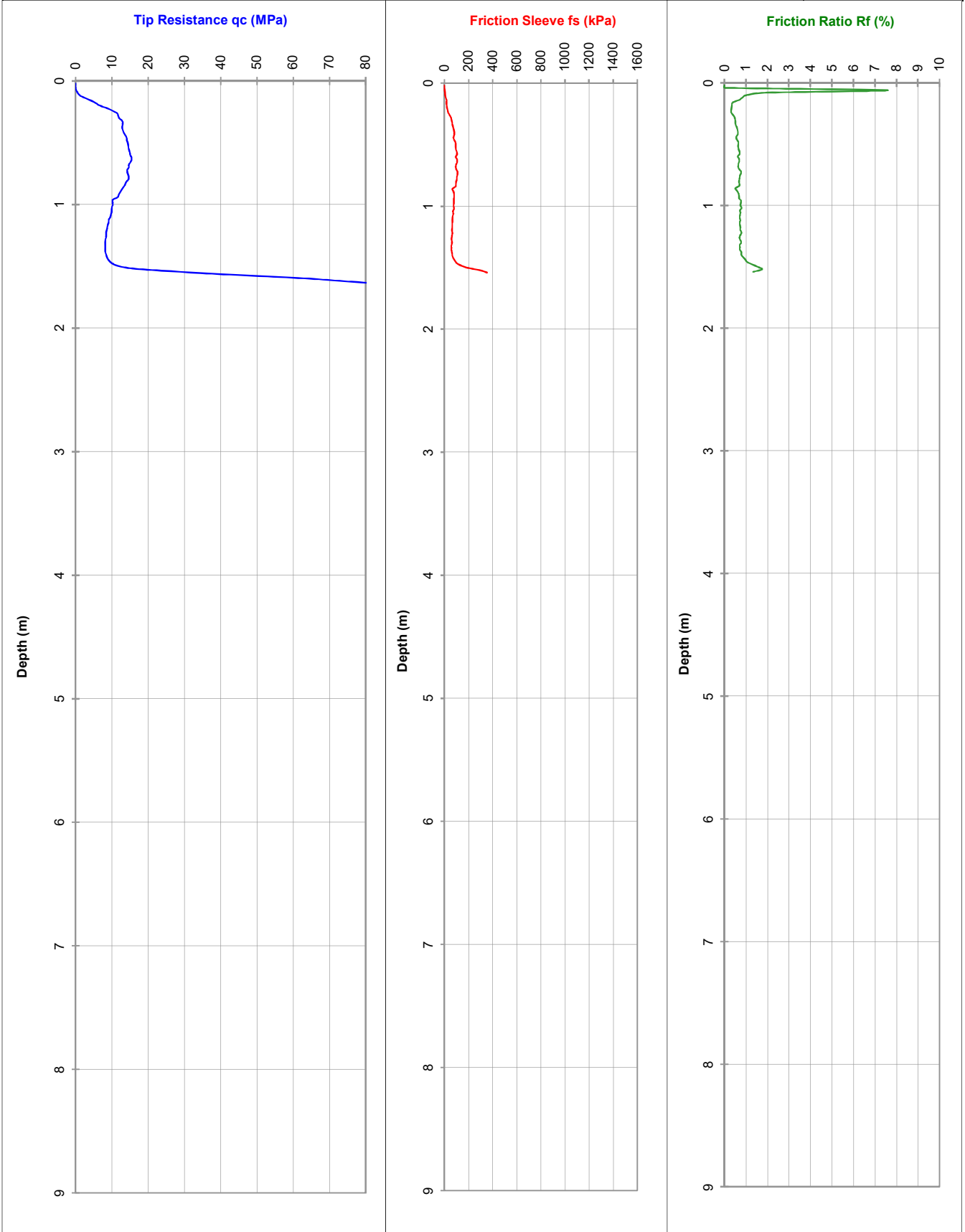
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 68

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 1.4

Dummy probe to (m):

Refusal: 84 MPa

Cone I.D.: EC40

File: GL0701M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

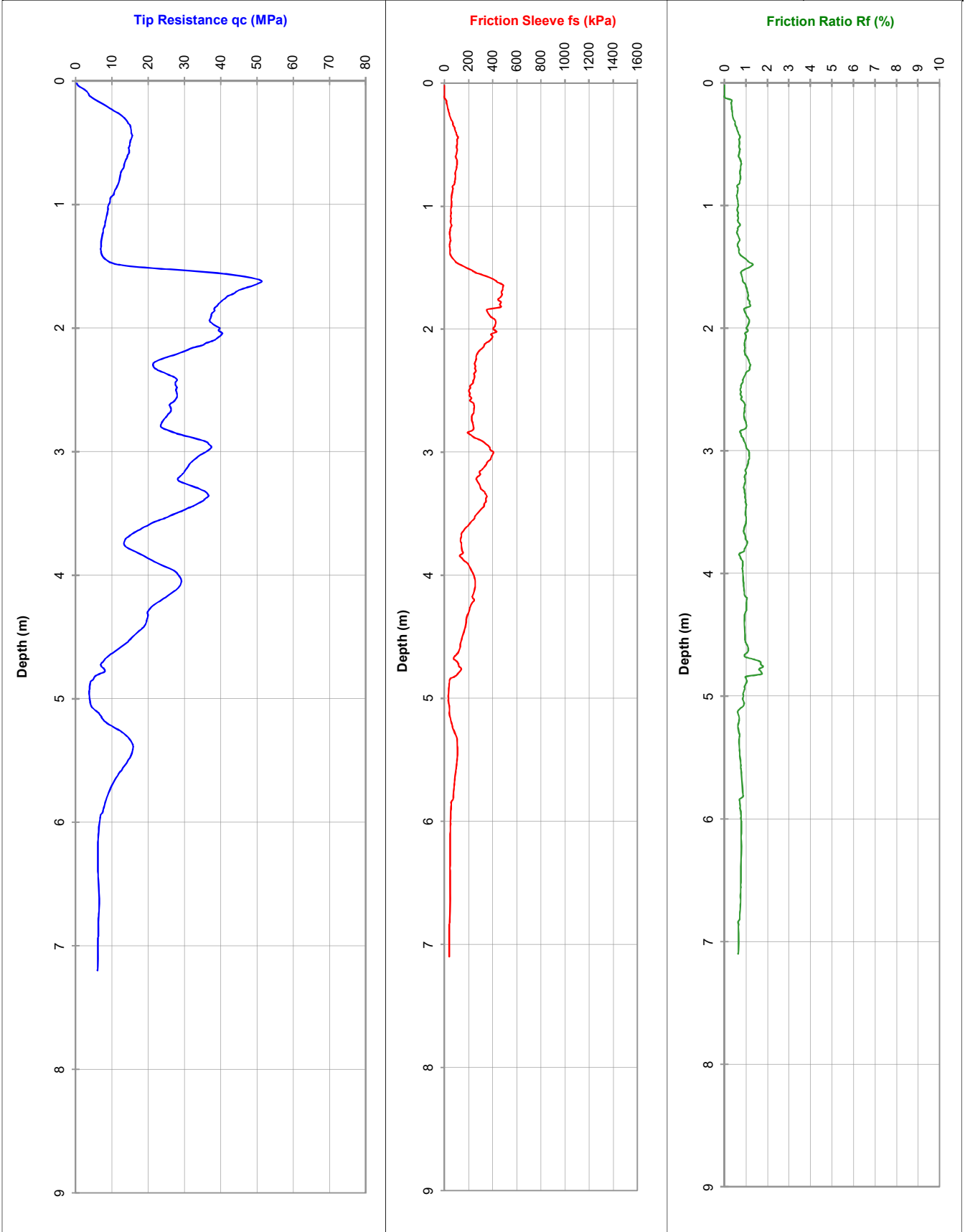
RL (m):

PGCPT 68A

LOCATION: Darch

Co-ords:

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 6.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL0702M

Rig Type: 12 Tonne Track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

Probe I.D

CLIENT: Parcel

Job No.: J1801113

PROJECT: Site Investigation

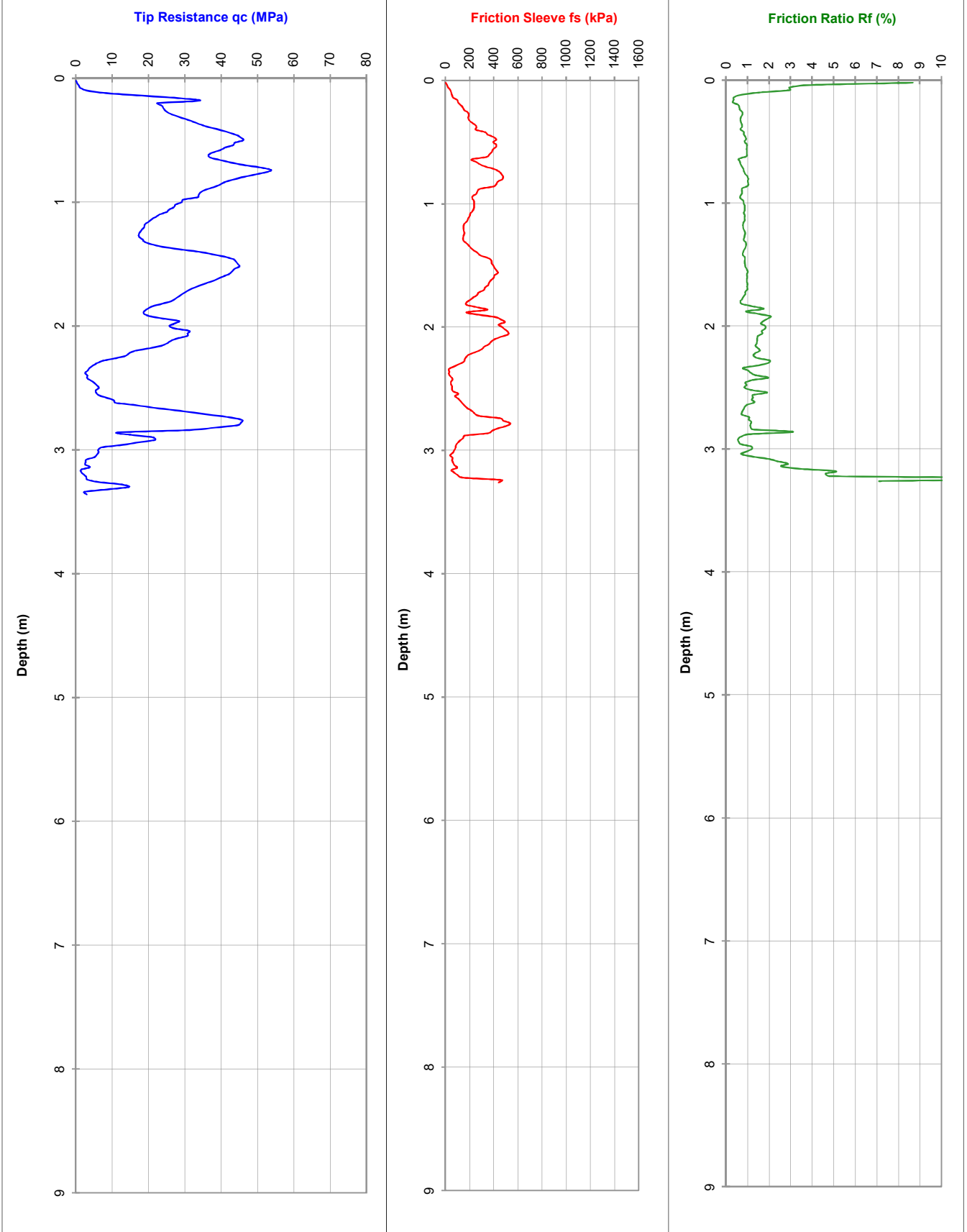
RL (m):

LOCATION: Darch

Co-ords:

PGCPT 69

18-Sep-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTP 2001 for friction reducer

Water (m): Dry to 3.3

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL0700M

Rig Type: 12 Tonne Track (M1)



Appendix E: Test Pit Reports

METHOD OF SOIL DESCRIPTION BOREHOLE AND TEST PIT REPORTS



GRAPHIC LOG & SOIL CLASSIFICATION SYMBOLS

Graphic	USCS	Soil Name
		FILL (various types)
		COBBLES / BOULDERS
	GP	GRAVEL (poorly graded)
	GW	GRAVEL (well graded)
	GC	Clayey GRAVEL
	GM	Silty GRAVEL
	SP	SAND (poorly graded)
	SW	SAND (well graded)
	SC	Clayey SAND

Graphic	USCS	Soil Name
	SM	Silty SAND
	ML	SILT (low liquid limit)
	MH	SILT (high liquid limit)
	CL	CLAY (low plasticity)
	CI	CLAY (medium plasticity)
	CH	CLAY (high plasticity)
	OL	Organic SILT (low liquid limit)
	OH	Organic SILT (high liquid limit)
	Pt	PEAT

NOTE: Dual classification given for soils with a fines content between 5% and 12%.

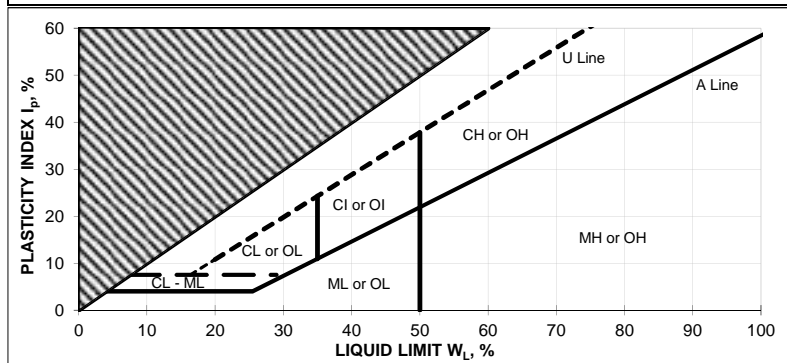
SOIL CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil descriptions are based on AS1726-2017. Material properties are assessed in the field by visual/tactile methods in combination with field and laboratory testing techniques (where used).

NOTE: AS 1726-2017 defines a fine grained soil where the total dry mass of fine fractions (<0.075 mm particle size) exceeds 35%.

PARTICLE SIZE		
Soil Name	Particle Size (mm)	
BOULDERS	>200	
COBBLES	63 to 200	
GRAVEL	Coarse	19 to 63
	Medium	6.7 to 19
	Fine	2.3 to 6.7
SAND	Coarse	0.6 to 2.36
	Medium	0.21 to 0.6
	Fine	0.075 to 0.21
FINES	SILT	0.002 to 0.075
	CLAY	<0.002

PLASTICITY - MODIFIED CASAGRANDE CHART - AS1726-2017



RESISTANCE TO EXCAVATION		
Symbol	Term	Description
VE	Very easy	All resistances are relative to the selected method of excavation
E	Easy	
F	Firm	
H	Hard	
VH	Very hard	

MOISTURE CONDITION	
Symbol	Term
D	Dry
M	Moist
W	Wet

CEMENTATION	
Cementation	Description
Weakly cemented	Soil may be easily disaggregated by hand in air or water
Moderately cemented	Effort is required to disaggregate the soil by hand in air or water

CONSISTENCY		
Symbol	Term	Undrained Shear Strength (kPa)
VS	Very Soft	0 to 12
S	Soft	12 to 25
F	Firm	25 to 50
St	Stiff	50 to 100
VSt	Very Stiff	100 to 200
H	Hard	>200

ORGANIC SOILS	
Material	Organic Content % of dry mass
Inorganic soil	<2%
Organic soil	2% to 25%
Peat	>25%

DENSITY		
Symbol	Term	Density Index (%)
VL	Very Loose	<15
L	Loose	15 to 35
MD	Medium Dense	35 to 65
D	Dense	65 to 85
VD	Very Dense	>85

EXPLANATORY NOTES TO BE READ WITH BOREHOLE AND TEST PIT REPORTS



METHOD OF DRILLING OR EXCAVATION

AC	Air Core	E	Excavator	PQ3	PQ3 Core Barrel
AD/T	Auger Drilling with TC-Bit	EH	Excavator with Hammer	PT	Push Tube
AD/V	Auger Drilling with V-Bit	HA	Hand Auger	R	Ripper
AT	Air Track	HMLC	HMLC Core Barrel	RR	Rock Roller
B	Bulldozer Blade	HQ3	HQ3 Core Barrel	SON	Sonic Rig
BH	Backhoe Bucket	N	Natural Exposure	SPT	Driven SPT
CT	Cable Tool	NMLC	NMLC Core Barrel	WB	Washbore
DT	Diatube	PP	Push Probe	X	Existing Excavation

SUPPORT

T Timbering

PENETRATION EFFORT (RELATIVE TO THE EQUIPMENT USED)

VE	Very Easy	E	Easy	F	Firm
H	Hard	VH	Very Hard		

WATER

▶	Water Inflow	▼	Water Level
◀	Water Loss (complete)		
◁	Water Loss (partial)		

SAMPLING AND TESTING

B	Bulk Disturbed Sample	P	Piston Sample
BLK	Block Sample	PBT	Plate Bearing Test
C	Core Sample	U	Undisturbed Push-in Sample
CBR	CBR Mould Sample		U50: 50 mm diameter
D	Small Disturbed Sample	SPT	Standard Penetration Test
ES	Environmental Soil Sample		Example: 3, 4, 5 N=9
EW	Environmental Water Sample		3,4,5: Blows per 150 mm
G	Gas Sample		N=9: Blows per 300 mm after
HP	Hand Penetrometer		150 mm seating interval
LB	Large Bulk Disturbed Sample	VS	Vane Shear; P = Peak
M	Mazier Type Sample		R = Remoulded (kPa)
MC	Moisture Content Sample	W	Water Sample

ROCK CORE RECOVERY

$$TCR = \text{Total Core Recovery (\%)} = \frac{CRL}{TCL} \times 100$$

$$RQD = \text{Rock Quality Designation (\%)} = \frac{ALC > 100}{TCL} \times 100$$

TCL Length of Core Run

CRL Length of Core Recovered

ALC>100 Total Length of Axial Lengths of Core Greater than 100 mm Long

Job Number: J1801113	Easting: 391212 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480067 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 42 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling		Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	41.75			SP	FILL: SAND (TOPSOIL), fine to coarse grained, sub-angular to sub-rounded, grey-brown, trace fines, trace organics				Density not assessed. Trace brick fragments in top 100 mm
				41.35			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, distinct layers from filling process noted				Limestone cobble (0.7-1.5 m depth) One star picket noted Two tree roots (approximately 150 mm diameter) at top of natural sand Total proportion of rubble, etc, <5% <1% deleterious/putrescible (steel, roots)
				39.15			SP	Becoming dark grey to grey SAND: fine to coarse grained, sub-angular to sub-rounded, white-grey		M		
				4	37.75			Hole terminated at 4.00 m Target depth Groundwater not encountered				
			5									
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391286 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480070 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	43.14		[Yellow cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, distinct layers from filling process noted				Density not assessed Limestone rubble (0.6 m to 1.0 m)
			1									
			2									
			3									
		4	39.54			[Red cross-hatched pattern]		FILL: Mixture of SAND (60-70%) and RUBBISH (30-40%), sand is fine to coarse grained, rounded to angular, pale brown and grey mottled, trace fines, rubbish is a mixture of largely intact bricks, plastic strapping, plastic grid tiles, plastic sheets, concrete slabs and pieces, trace glass, electrical wire, wooden stakes, plastic bags, steel bar, carpet, plastic bottles, total putrescible portion <1%				
		5	38.04			[Orange pattern]	SP	SAND: medium to coarse grained, rounded, pale grey to white		W		
		6	37.64					Hole terminated at 5.50 m Target depth Groundwater encountered at 5.1 m				
		7										
		8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391382 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480068 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	48.59		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace fines, trace organics in top 200 mm			Density not assessed Trace tile pieces and brick pieces on surface, limestone rubble at 0.2 m to 1.0 m depth (in patches)	
			1									
			2									
			3	45.39			[Red hatched box]	M	FILL: Mixed RUBBISH and SAND: sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles, trace MDF (300 mm x 50 mm), trace plastic strapping			Intermixing between clean layer and rubbish fill due to collapse
		4										
		5	43.79					FILL Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles, pieces of timber wood, ply wood (2-5%), metal piping (approximately 100 mm long, 50 mm diameter) (1%), plastics (sheeting, strapping (2-3%), plastic piping (<1%), carpet/mats (1000 mm x 1500 m) (<1%), estimate of putrescible materials 3-5%				
		6										
		7										
		8	41.39					Hole terminated at 7.20 m Target depth Groundwater not encountered				


Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391463 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480062 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	55.84				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, mottled grey/white, trace rootlets to 400 mm				Density not assessed Trace plastic strapping, thin plastic piping (10 mm diameter) in top 500 mm, trace gravelly/cobbly limestone, trace brick fragments	
			1										
			2										
			3										
			4	52.34				Mixture of SAND (70%) and RUBBISH (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown, rubbish is mostly brick fragments, concrete slabs (70-80%), trace plastic strapping, tiles and wood chunks				500 mm x 100 mm thick concrete slab, chunk of asphalt 400 mm x 180 mm thick	
			5	51.34				Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown, rubbish is mostly brick fragments, concrete slab, limestone gravel/cobbles (70%), plastic strapping, sheeting, bucket, bottles (2-3%), trace wood/timber, trace foam chunks				Thick concrete slab present at approximately 4.5 m (not excavated), log 200 mm long by 40 mm diameter	
			6										
			7	49.44				Hole terminated at 6.40 m Target depth Groundwater not encountered					
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391545 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480067 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.95			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets top 300 mm				Density not assessed
			3	56.45			M	FILL: Mixture of SAND (60%) and RUBBISH (40%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly brick fragments, concrete slabs, gravel (70-80%), plastic sheeting, trace plastic strapping, trace metal wiring, trace carpet sheets (200 mm long), trace wood chunks				Concrete slabs relatively large in size (400-600 mm long, 100 mm thick), large boulders (200-300 mm diameter)
			5	54.35			M	FILL Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly bricks, concrete slabs, cobbles (60-70%), long metal pipes (40 mm diameter, 2000 mm long) (2-3%), wood pieces (approximately 5%) varying in length to 1500 mm, large tree roots (20-40 mm diameter) (2-4%), trace electrical/metal wiring, trace soft drink cans				Large concrete slab present (700 mm x 100 mm)
			8	51.45				Hole terminated at 7.50 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391594 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480064 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.03				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown mottled white				Density not assessed Trace gravel from 0.4 m to 1.0 m
			1				SP					
			2	56.13				FILL: Mixture of SAND (60%) and RUBBISH (40%): sand is fine to coarse grained, sub-angular to sub-rounded, pale brown, rubbish consists of mostly bricks, concrete slabs, gravel (70-80%), trace rusted metal sheet chunks (1-2%), wood blocks (150 mm x 100 mm thick) (2-3%), trace wiring, car battery, trace plastic sheeting, strapping				
			3									
			4	53.93				M	FILL Mixture of SAND (50%) and RUBBISH (50%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly bricks, concrete slabs, cobbles (70-80%), plastic strapping, sheeting (2-3%), bottles, trace wood, trace crushed metal, metal rack, plastic toy			
		5										
		6										
		7										
		8		50.13				Hole terminated at 7.90 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391164 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480132 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
E			0	43.48		[Cross-hatched pattern]		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace rootlets in top 200 mm	M	Density not assessed		
			1				SP				Gravelly cobbles in patches from 1.7 m to 2.6 m	
			2							Becoming dark grey to grey		
			4	39.28				SP		SAND: fine to coarse grained, sub-angular to sub-rounded, white		Small 200-300 mm layer at 3.9 m depth with dark grey sand and cobbles (potential road base)
			5	38.88				Hole terminated at 4.60 m Target depth Groundwater not encountered				
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391276 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480121 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	45.34		[Yellow cross-hatched log]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace rootlets in top 200 mm				Density not assessed Trace cobbles, gravelly limestone (0.4 m to approximately 3.0 m depth) No significant deleterious material found
			1									
			2									
			3									
			4									
			5									
			6	39.24		[Orange cross-hatched log]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white				
			7	38.94				Hole terminated at 6.40 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391355 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480117 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	48.80		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled brown mottled white, trace rootlets top 400 mm, distinct layering from filling process noted				Density not assessed	
			1										
			2										
			3										
			4	45.40			[Red hatched pattern]	M	FILL: Mixture of SAND (80%) and RUBBISH (20%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles (80-90%), gravel (70-80%), trace plastic strapping and plastic sheeting				Large concrete slab present around 3.5 m depth (excavated through). Plastic sheeting/bags present in test pit wall.
		5	43.90						FILL: Mixture of SAND (50%) and RUBBISH (50%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, cobbles (70-80%), scrap metal (2-3%) including large piece 500 mm long large tarp (approximately 2 m long) (1-2%), trace foam pieces (small), trace carpet fibres dangling from test pit, plastic strapping and plastic bags/sheeting (1-2%), timber/wood stake fragments (1-2%), small chunks of tree roots (1-2%)				
		6											
		7											
		8	41.40					Hole terminated at 7.40 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391443 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480137 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.46				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled pale grey, trace rootlets top 300 mm				Density not assessed Large concrete slab excavated from around 4.4 m depth (1500 mm x 200 mm thick), other moderately large pieces (concrete) varying in length from 200 mm to 600 mm, plastic strapping and bags visible on test pit walls
			1				SP	Trace gravelly cobbles, minor brick fragments from 0.7 m depth				
			2	52.46				FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, brick fragments, limestone rubble (70-80%), trace plastic strapping, bottles, sheeting/bags, trace PVC pipe (60 mm diameter), trace wood pieces, trace organics, trace crushed aluminium can, trace scrap metal			M	
			4	50.06				FILL Mixture of RUBBISH (60%) and SAND (40%) sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, cobbles (60-70%), plastic strapping, plastic bottles, sheeting/bags (1-2%), plastic lids x 2 (800 mm x 200 mm), wood/timber and wood planks (approximately 800 mm x 200 mm) (2-3%), trace organics, trace tablecloth (500 mm x 500 mm), trace scrap metal, trace broken PVC pipes				
			5									
			6									
			7									
			8	46.76				Hole terminated at 7.70 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391526 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480130 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 60 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	59.50			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown mottled orange mottled grey				Density not assessed Pockets of limestone cobbles/gravel and brick fragments Buried piping at 0.8 m depth	
			1										
			2										
			3	56.60					FILL: Mixture of SAND (75%) and RUBBISH (25%): sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles/gravel (70%), large piece of metal with foam attached (crushed, 1500 mm x 300 mm), trace rootlets, trace plastic sheeting, trace glass		M		Layer of concrete slab around 2.9-3.0 m (large pieces excavated out around 0.6-1.4 m, 200 mm diameter (multiple pieces)
			4		55.10				FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly bricks, concrete slabs, cobbles/gravel (60-70%), trace plastic strapping and sheeting, organics (tree branches)/roots (1-2%), trace scrap metal				Plastic sheeting in test pit walls around 4.0-5.5 m depth Concrete brick pieces found (400 mm x 300 mm), large piece on concrete 1 m long
			5										
			6										
			7										
			8	52.00				Hole terminated at 7.50 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391127 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480194 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	45.56		[Yellow cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled white mottled pale yellow, trace rootlets in top 700 mm, distinct layers from filling process noted	M			Density not assessed	
			1										
				2									
				3									
			4	41.96		[Red cross-hatched pattern]		FILL: Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly concrete slabs, bricks, cobbles, gravel (80%), trace plastic strapping, sheeting, bags and bucket, wooden planks/pieces (2-3%), scrap metal (metal pipes, tape measure, metal carry, metal rods (1-2%), trace rubber, large concrete slab/boulder pieces. varying from, 0.5-1.5 m long, 100-300 mm thick)				Large concrete slabs present in test pit wall	
		5											
			6										
			7	38.86				Hole terminated at 6.70 m Target depth Groundwater not encountered					
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391215 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480193 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
E			0	45.99		[Green hatched pattern]		FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white blue-grey, fine to coarse grained gravel, trace rootlets in top 300 mm, with gravelly brick pieces				Density not assessed		
			1										Hard excavation - cemented gravel	
			2											
			3											
			4											
			5											
			6						Dark grey, trace boulders (in small quantities), trace plastic strapping					Trace plastic strapping in test pit wall
			7											
			8		38.29				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white				
					38.09					Hole terminated at 7.90 m Target depth Groundwater not encountered				


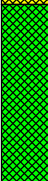


Sketch & Other Observations



[Dotted grid area for sketching and observations]

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391319 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480186 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	48.67			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 200 mm				Density not assessed
			1									
			2	46.97				FILL: Gravelly SAND, fine to coarse grained, white mottled brown, fine to coarse grained gravel				Hard excavation into this layer. Large cemented gravel boulder and crushed brick and gravel excavated.
			3									
			4	44.97			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey to pale grey/white, with fine to medium grained gravel, trace brick fragments, trace foam, trace organics		M		
		5										
		6	43.27					FILL: Mixture of SAND (65%) and RUBBISH (35%): sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments and small boulders (60-70%), plastic strapping, plastic bucket, large plastic tarp, plastic bags (approximately 2 m long) (3-5%), wood chunks/planks (3-5%)				Concrete slabs excavated in small chunks/boulders. Plastic strapping in test pit wall.
		7										
		8	41.27					Hole terminated at 7.40 m Target depth Groundwater not encountered				


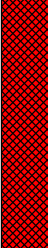
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391397 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northings: 6480195 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	51.86			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 300 mm, trace limestone rubble, gravel, small brick fragments				Density not assessed
			1									
			2									
			3									
			4									
			5	47.16				FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, brick fragments, cobbles (slabs vary in size from cobbles to boulders, 800 mm x 100 mm), wood planks/stakes (2-4%), glass bottles/shards (2-4%), plastic strapping, bags and bottles (2-4%), trace electrical wiring, scrap metal/metal wiring (1-2%), trace foam, trace organics/root chunks (1-2%), chunk of roots (200 mm x 100 mm)				Plastic strapping and bags present in test pit wall. Concrete slab chunks present in test pit wall.
		6										
		7										
			8	44.36				Hole terminated at 7.50 m Target depth Groundwater not encountered				



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391493 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480201 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.56		 SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white mottled orange, trace rootlets in top 300 mm, trace gravelly limestone, cobbles and small brick fragments				Density not assessed	
			4	54.26								 M
				8	49.96			Hole terminated at 7.60 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391563 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480168 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 60 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	59.56			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow mottled grey, trace limestone cobbles, gravel and small brick fragments				Density not assessed
			3	56.36				FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, several large PVC pipes (2-3, 100 mm x 800-1500 mm long) (3-5%), plastic strapping, bags (1-2%), large concrete slabs (400-800 mm x 100 mm), 1 x large reinforced slab (approximately 1.5 m wide), trace scrap metals, trace foam, wood chunks (1-2%), trace organics (1-2%), large stump (500 mm), trace wiring, thin PVC piping	M			Small voids in test pit wall (one or two visible)
			7	52.96				Hole terminated at 6.60 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391640 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480219 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.39		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, white mottled brown mottled yellow, trace rootlets in top 300 mm, trace limestone gravel and cobbles				Density not assessed
			4	54.89			[Red hatched pattern]	M	FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks and limestone cobbles/gravel, plastic sheeting/strapping, lids, bottles (2-4%), trace foam, trace tile fragments, scrap metal (rods/cans) (1-2%), clothes/rags (1-2%), trace organics, wood planks/stakes (2-3%)			One narrow void in test pit wall (approximately 800 x 100 mm). Two large reinforced concrete slabs (1-1.5 m x 100 mm).
			8	50.79					Hole terminated at 7.60 m Target depth Groundwater not encountered			

Sketch & Other Observations



Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391441 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480263 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description								
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS			
E			0	55.60			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled white, trace rootlets in top 300 mm, with fine to coarse grained gravel, cobbles, minor brick fragments	M			Density not assessed			
			1												
			2												
			3												
			4												
			5												
			5.40	50.40				FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, plastics (strapping/bags) (2-4%), trace tile pieces, wood stakes, chunks (2-4%), trace scrap metals, trace organics/roots							
			6												
			7	48.80				Hole terminated at 6.80 m Target depth Groundwater not encountered							
			8												

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391577 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480268 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.29				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, orange-brown mottled grey, trace rootlets in top 600 mm	M			Density not assessed
			1										
			2	56.39					FILL: Mixture of SAND (60%) and RUBBISH (40%); sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, large piece of metal and metal wiring/meshing (1-2 m x 100 mm), large piece of metal reinforcement (1 m x 200 mm) (metals 10-15%), asbestos fencing in fragments (10-15%), trace plastic				
			3	55.69					Hole terminated at 2.60 m Terminated due to presence of ACM Groundwater not encountered				
			4										
			5										
			6										
			7										
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391698 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480248 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.26			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey mottled white mottled brown, trace rootlets in top 600 mm, distinct layering from filling process noted				Density not assessed Trace limestone gravel and cobbles
			1									
			2	55.06					FILL: Mixture of RUBBISH (60-70%) and SAND (30-40%): sand is fine to coarse grained, sub-angular to sub-rounded, grey and black, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, scrap metal (1-2%) with one large piece of metal framing (700 x 400 x 100 mm), plastic strapping, bags and bottles (2-3%), small chunks of grass roots (1-2%), trace carpets/rugs, trace rubber mats, one large plastic garden pot, wood blocks/planks (1-2%)		M	Cleaner FILL layer present 2.2-3.0 m in parts. Large concrete lump with metal pipe attached (400 mm diameter boulder, 300 mm long pipe, 50 mm diameter). Minimal large concrete slab pieces.
			3									
			4									
			5									
			6									
			7	50.16				Hole terminated at 7.10 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391505 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480302 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	57.15		SP		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 400 mm				Density not assessed Trace gravel/cobbles, minor brick fragments throughout	
			1										
			2										
			3		53.85		M		FILL: Mixture of RUBBISH (60%) and SAND (40%): sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, gravel/cobbles, plastics (strapping, bags, bucket pieces) (1-2%), trace cloth, scrap metals (1-2%), trace wood stakes/planks, trace organics/tree materials (minor thin tree roots present), trace glass shards			Large concrete slabs (approximately 1000 x 100 mm)	
		4											
		5											
		6											
		7		50.65				Hole terminated at 6.50 m Target depth Groundwater not encountered					
		8											


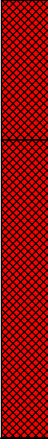
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391629 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480327 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.39			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange, trace rootlets in top 400 mm, trace gravel/cobbles				Density not assessed Long plastic pipe (300 x 120 mm)
			1									
			2									
			3	54.89			M	FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles, plastic strapping/bags (1-2%), trace tiles, scrap metals (1-2%), wood chunks (1-2%), trace organics/tree materials				
		4						FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, strapping and bottles (2-4%), wood (2-4%), trace PVC pipe				
		5	53.39									
		6										
		7										
		8	50.19					Hole terminated at 7.20 m Target depth Groundwater not encountered				

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391729 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480313 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.19			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow, trace rootlets in top 500 mm, trace limestone gravel and cobbles, trace brick fragments				Density not assessed
			1									
			2									
			3									
		4	53.09					FILL: Mixture of SAND (50% and RUBBISH (50%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic strapping, bags and mesh (1%), wood stakes/planks (1%), scrap metals (1-2%), trace tile pieces				One large brick wall chunk (500 x 500 x 200 mm). Multiple other small brick wall chunks (200 x 50 mm). 5-7 large concrete slabs varying in size (800-1500 mm x 100-150 mm)
		5										
		6										
		7		50.09				Hole terminated at 7.10 m Target depth Groundwater not encountered				
		8										








Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391432 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480361 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	56.37			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 200 mm				Density not assessed	
			1	55.37			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, fine to coarse grained gravel, small brick fragments and tile fragments				Cemented Gravelly SAND layer on top	
			2					SP					
			3	53.27				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, distinct layers from filling present		M		
			4					SP					
			5	51.17				SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey				
			6					SP					
		7						Trace rubbish: bricks, concrete slabs, trace plastic, trace wiring					
		8		49.27				Hole terminated at 7.10 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391699 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480365 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	56.80		[Pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange, trace rootlets in top 600 mm, distinct layers from filling process noted				Density not assessed
			1			[Pattern]		Trace gravel/cobbles				
			3	53.80			[Pattern]		FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly concrete slabs, bricks, limestone cobbles, wood planks/pieces (2-4%), scattering of small grass roots and tree materials (1-2%), plastic bags, strapping and bottles (1-2%), trace metal wiring, trace foam	M		Plastic strapping in test pit wall. One or two large concrete slabs (approximately 500 x 500 x 100 mm). PVC pipe (120 mm diameter, 500 mm long).
			7	50.10				Hole terminated at 6.70 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391753 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northings: 6480373 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	56.69		SP		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange mottled white, trace rootlets in top 300 mm				Density not assessed
			1					With fine to coarse grained limestone gravel/cobbles, trace asphalt chunks and brick fragments				
				2			M		FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange-brown, rubbish consists of plastic bags and strapping (1-2%), scrap metal (1-2%), wood (1-2%), trace organics			Potentially in-situ orange-brown sand from 2.7 m depth?. Rubbish layer placed on angled cut towards middle of site. One car tyre.
			3	53.29								
			4									
			5									
			6									
			7	50.09				Hole terminated at 6.60 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391510 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480430 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.50		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 600 mm, distinct layers from fill process noted, with fine to coarse grained limestone gravel, cobbles from 1.2 m depth, trace brick fragments				Density not assessed
			4	51.10			[Red hatched pattern]	M	FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, strapping and bottles, oversize items (3-5%), scrap metal, metal reinforcement (2-3%), organics, tree matter (1%), wooden planks/pieces (1-2%)			
			7	47.30				Hole terminated at 7.20 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391619 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480430 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.60		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 500 mm	M			Density not assessed
			1									
			2									
			3									
			4	51.50		[Red hatched pattern]		FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, gravel, trace scrap metal, trace plastic bottles and bags, trace wood, trace tiles			Long piece of wood (approximately 1 m x 100 mm). Small hollow concrete pipe (300 mm long x 100 mm diameter)	
		5							Rubbish content increasing to approximately 50%, sand becoming dark grey, plastic bags and tarps increase to 1-2%, scrap metal and metal debris (1%), wooden planks and pieces (2-3%), roots/tree matter (approximately 1%)			
		6										
			7									
			8	48.10				Hole terminated at 7.50 m Target depth Groundwater not encountered				

Sketch & Other Observations



Blank area for sketch and observations.

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391746 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480431 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.47			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled pale yellow/white, trace rootlets in top 200 mm, trace limestone gravel/cobbles and brick fragments.		Density not assessed.
			1					With fine to coarse grained limestone gravel/cobbles		
			2							
			3	52.97				FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly bricks, concrete slabs and cobbles, plastic strapping and bags (1-2%), wood (1-2%), trace PVC pipe pieces	M	
			4	51.47				FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly concrete slabs, bricks, cobbles, wood planks/pieces (2-3%), plastic bags, sheeting, strapping and bottles (2-4%), thin PVC pipe pieces (1%), roots/tree materials (1-2%)		
		5								
		6								
		7	48.87					Hole terminated at 6.60 m Target depth Groundwater not encountered		
		8								

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391442 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480460 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.67			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 300 mm				Density not assessed
			1	53.47				FILL: Gravelly SAND, fine to coarse grained, white mottled brown, fine to coarse grained limestone gravel/cobbles, crushed concrete, bricks				
			2									
			3									
			4	51.37				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange		M	
		5										
		6	48.87					FILL: Mixture of SAND (70-80%) and RUBBISH (20-30%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, gravel, wood pieces (2-3%), plastic sheeting and strapping (1%), trace PVC pipes, trace wiring, trace organics, tree matter, trace scrap metal				
		7										
		8	47.27					Hole terminated at 7.40 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391590 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480478 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.33			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange mottled white, trace rootlets in top 700 mm, trace gravel/cobbles		Density not assessed
			2	52.73			M	FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, plaster sheet bandage (shredded) (2-3%), plastic strapping, bags and tarps (1-2%), scrap metals (3-5%), wooden planks/pieces (2-3%), organics/tree matter (1%), trace asphalt chunks		Several large pieces of scrap metal (up to 1 m long). Several large concrete slabs (600-800 mm x 300-400 mm). Large metal barrel crushed.
			7	47.13				Hole terminated at 7.20 m Target depth Groundwater not encountered		

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391691 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480474 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.40		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 300 mm, trace limestone gravel/cobbles				Density not assessed
			4	51.70				[Red hatched pattern]	M	FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles/gravel, wood chunk/pieces (2-3%) including several long pieces up to 1 m long, scrap metal <1%, plastic bags, strapping and bottles (1-2%), trace foam, trace plumbing pipe		
			8	48.10				Hole terminated at 7.30 m Target depth Groundwater not encountered				



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391481 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480526 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	52.28		 SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow mottled white, trace rootlets in top 200 mm, trace limestone cobbles/gravel				Density not assessed	
			3.5	49.08								 M
			7.2	45.08			Hole terminated at 7.20 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391624 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480533 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.06		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 300 mm, trace limestone cobbles/gravel	M	Density not assessed
			4	50.36				[Red hatched box]		
			8	46.76				Hole terminated at 7.30 m Target depth Groundwater not encountered		

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391748 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480523 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.30		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey mottled orange, trace rootlets in top 300 mm				Density not assessed
			1									
			2									
			3			[Red hatched pattern]		FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, scrap metal/metal reinforcement (3-5%), several chunks of bark and tree roots, trace wiring, fabrics/carpet strands (1%), wood (2-3%)				One large tyre and wheel (possibly truck tyre). 2-3 large pieces of metal (0.8-1.2 m long). One meshed tarp (approximately 1 m x 1 m). Several large wooden planks (0.6-1.0 m long).
		4	51.20									
		5										
			6									
			7									
			8	48.00				Hole terminated at 7.30 m Target depth Groundwater not encountered				





Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391436 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480573 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	50.90				FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, white. fine to coarse grained limestone gravel and cobbles				Density not assessed
			1	49.90			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white				Old water pipe and power cables encased in PVC pipe connecting through test pit at 1.0 m depth. Trace gravel/cobbles.
			3									
			4	47.40				FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic strapping, bags and crushed crates (2-3%), wood pieces (approximately 1%), trace scrap metal, organics/tree roots (1-2%), trace PVC pipes (broken)	M			
			7									
			8	43.60				Hole terminated at 7.30 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391554 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480574 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 4 m

Excavation			Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	51.61		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white/grey, trace rootlets in top 200 mm, trace gravel/cobbles	D - M			Density not assessed
			1									
				4	48.21		[Red hatched box]	SP	FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs and bricks, scrap metal cans and metal wiring (1-2%), plastic bags, strapping and bottles (2-3%), trace foam pieces, wooden planks/pieces (2-3%), trace roots/tree matter	M		
			7	45.31				Hole terminated at 6.30 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391607 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480579 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 1.4 m

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	52.67		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, trace rootlets in top 300 mm, trace cobbles/gravel	D - M	Density not assessed
			1							
			2							
			3	49.97		[Red hatched box]	SP	FILL: Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks and limestone cobbles/gravel, scrap metal panels, drum, pieces and wiring) (4-6%), plastic cups, bags and strapping (1-3%), wooden planks/chunks (1-2%), organics/tree matter (1%), 1 piece of insulation sheeting (500 x 200 mm)	M	Large metal drum (crushed, approximately 1 m long x 800 mm wide)
		4								
		5								
		6								
		7		46.47				Hole terminated at 6.20 m Target depth Groundwater not encountered		
		8								

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391701 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480565 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 1.4 m

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.17			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, trace rootlets in top 400 mm, trace gravel/cobbles	D - M			Density not assessed
			1				SP	FILL: Mixture of RUBBISH (80%) and SAND (20%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown mottled grey, rubbish consists of mostly limestone cobbles/gravel, bricks and concrete slabs, one metal pipe (300 mm long, 40 mm diameter), trace plastic bottles and bags, one glass bottle				1.9-2.6 m: Layer of dark grey/black sand
			2	53.27				SP	FILL: Mixture of SAND (50%) and RUBBISH (50%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, gravel, cobbles, scrap metal (approximately 1%), wooden planks/pieces (1-2%), plastics bags, strapping and cylinders (1%), bunch of small twigs/roots, one clump of grass roots (1%)	M		
			3		51.77			SP				
			4									
			5									
			6	49.57				Hole terminated at 5.60 m Target depth Groundwater not encountered				
			7									
			8									



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391435 m	Contractor: ANH Contracting	Date: 03/05/2019
Client: Parcel Property	Northing: 6480181 m	Machine: 28 tonne excavator	Logged: ORW
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 4 m

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	53.59			SP	FILL: Gravelly SAND, fine to coarse grained, brown, gravel is fine to coarse grained, rounded to angular, includes limestone and crushed brick and concrete rubble, trace timber and plastic (<1%), trace organics	D - M			Density not assessed
			1	52.09						FILL: Mixed RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, black, with some organic fines (estimated approximately 5%), rubbish is mainly concrete and brick pieces to approximately 300 mm, about 4% timber to 300 mm, trace plastic sheets and strapping, trace metal pieces i.e rods, wire, etc (<1%)	M	
			2									
			3									
			4									
			5	49.09				Hole terminated at 4.50 m Target depth Groundwater not encountered				
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391132 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480111 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	42.98			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	M			Density not assessed.
			1	41.48			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			2	40.98				Hole terminated at 2.00 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391162 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480102 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	42.69			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	M			Density not assessed. Limestone rubble (0.1-0.4 m)
			1	41.19			SP	Becoming yellow/brown				
			2	40.69				Hole terminated at 2.00 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Blank area for sketching and additional observations.

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391206 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480143 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 44 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	44.35				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	D	Density not assessed.	
			1								
			2					SP	Becoming yellow/brown		M
			3								
			4								
			5								
			6								
			7								
			8	36.85			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines			
			8	36.35				Hole terminated at 8.00 m Target depth Groundwater not encountered			



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391237 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480133 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	44.74			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	D			Density not assessed.
			1									
			2									
			3									
			4						M			
			5									
			6	38.74			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			7	38.24				Hole terminated at 6.50 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391146 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480201 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	45.54				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc), pockets of fine to coarse grained, cemented gravel	M			Density not assessed.
			1				SP					
			2	43.74				FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of mostly concrete slabs, bricks, plastic strapping/bags, trace tiles Hole terminated at 2.00 m Target depth Groundwater not encountered				
				43.54			SP					
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Blank area for sketches and observations.

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391206 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480109 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	43.45		[Yellow cross-hatched log]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	D	Density not assessed.
			1						M	
			2							
			3							
			4							
			5	38.65 38.45		[Orange dot log]	SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines		
			6					Hole terminated at 5.00 m Target depth Groundwater not encountered		
			7							
			8							

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391164 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480074 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 42 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	42.04				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown/yellow/black, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)				Density not assessed.
			1				SP			M		
				40.44				SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			2	40.04				Hole terminated at 2.00 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391201 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480081 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 42 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	42.24		[Yellow cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc) - - - - - Becoming yellow/brown/black	D			Density not assessed.
			1						M			
			2									
			3	39.74		[Orange dotted pattern]	SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			3	39.24				Hole terminated at 3.00 m Target depth Groundwater not encountered				
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Blank area for sketch and observations.

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391237 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480080 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	42.65		[Yellow cross-hatched pattern]		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	D			Density not assessed.
			1				SP	Becoming yellow/brown/black		M		
			2	40.15		[Orange dotted pattern]	SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			3	39.65				Hole terminated at 3.00 m Target depth Groundwater not encountered				
			4									
			5									
			6									
			7									
			8									

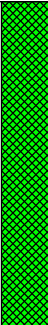

Sketch & Other Observations



Blank dotted area for sketches and observations.

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391166 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480182 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	45.14			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc), pockets of fine to coarse grained gravel in top 1.0 m	D	M		Density not assessed.
			1					Becoming black				
			2									
			3									
			4	41.64			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			4	41.14				Hole terminated at 4.00 m Target depth Groundwater not encountered				
			5									
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391235 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northing: 6480057 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 42 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	41.89			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/black/grey/white, trace fines, trace fine grained gravel, trace rubbish brick, tile)	D			Density not assessed.
			2	39.89			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines				
			4	38.39				Hole terminated at 3.50 m Target depth Groundwater inferred at 3.0 m	M			

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391163 m	Contractor: ANH Contracting	Date: 18/09/2019
Client: Galt Geotechnics	Northings: 6480053 m	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Surface RL: 42 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	41.72			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown/yellow/grey/black, trace fines, trace fine to medium grained gravel, trace (<1%) inert waste (brick, timber, plastic, etc)	M	Density not assessed.
			1	40.72			SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines		
			2	40.22				Hole terminated at 1.50 m Target depth Groundwater not encountered		
			3							
			4							
			5							
			6							
			7							
			8							

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 16/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace fine to medium grained gravel	D			Density not assessed.
			1							M		
			2									
			3									
			4					FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				Natural sand (Unit 2) adjacent to fill on the western side at 4.0 m. Natural sand encountered shallower as trench moved west.
			5					Hole terminated at 4.50 m Target depth Groundwater not encountered				
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 16/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)	M			Density not assessed.
			1					FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				
			2					Hole terminated at 4.00 m Target depth Groundwater not encountered				Natural sand (Unit 2) encountered at 3.5 m adjacent to the FILL.
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



[Dotted grid area for sketches and observations]

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Contractor: ANH Contracting	Date: 16/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.	
			1				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)	M				
			2						FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				Natural sand (Unit 2) encountered at 3.5 m adjacent to the FILL.
			4						Hole terminated at 4.50 m Target depth Groundwater not encountered				
			5										
			6										
			7										
			8										

Sketch & Other Observations



Dotted grid area for sketches and observations.

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113 Client: Parcel Property Project: Proposed Mixed Use Subdivision Location: 26 Driver Road, Darch	Contractor: ANH Contracting Machine: 30t Samsung SE 280 Operator: Neil Bucket: 1.2 m	Date: 16/09/2019 Logged: NC Checked Date: 04/10/2019 Checked By: ORW
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Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.
			1							M		
			2									
			3									
			4									
			5					FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				Natural sand (Unit 2) encountered adjacent to the 1b fill material
			6					Hole terminated at 5.00 m Target depth Groundwater not encountered				
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.
			1							M		
			2									
			3									
			4									
			5									
			6					FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				
			7					Hole terminated at 6.00 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0			SP		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	M			Density not assessed.
			1									
			2									
			3									
			4									
			5									
			6									
			7					Hole terminated at 6.00 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0					FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	M			Density not assessed.
			1				SP					
				2				SP	SAND: fine to medium grained, sub-angular to sub-rounded, pale grey/white, trace fines			
			3					Hole terminated at 4.50 m Target depth Groundwater not encountered				
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)				Density not assessed.
			1					FILL: Mixture of SAND (60%) and RUBBISH (40%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				
			2									
			3									
			4									
			5									
			6									
			7									
			8									
								Hole terminated at 8.00 m Target depth Groundwater inferred at 7.8 m				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)	M			Density not assessed.
			1					FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				
			2					Hole terminated at 2.50 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)	M			Density not assessed.
			1							FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc		
			2					Hole terminated at 2.50 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, mottled brown/yellow/grey/black, trace fines, trace rubbish (plastic, brick, concrete, tile)	M			Density not assessed.
			1					FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				
				2				Hole terminated at 3.00 m Target depth Groundwater not encountered				
			3									
			4									
			5									
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 17/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)				Density not assessed.
			1									
			2									
			3									
			4									
			5									
			6									
			7									
			8					Hole terminated at 7.00 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 18/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0					FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.
			1				SP		M			
			2									
			3									
			4									
			5									
			6									
			7					Hole terminated at 7.00 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 18/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0			SP		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.
			1			SP			M			
			2			SP						
			3			SP						
			4			SP						
			5			SP						
			6			SP						
			7			SP		Hole terminated at 7.00 m Target depth Groundwater not encountered				
			8			SP						

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Contractor: ANH Contracting	Date: 18/09/2019
Client: Parcel Property	Machine: 30t Samsung SE 280	Logged: NC
Project: Proposed Mixed Use Subdivision	Operator: Neil	Checked Date: 04/10/2019
Location: 26 Driver Road, Darch	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, with pockets of fine to coarse grained, weakly cemented gravel, trace rubbish (brick, concrete, plastic, tile)	D			Density not assessed.
			1									
			2									
			3									
			4							M		
			5									
			6									
			7					FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, grey/brown/black, rubbish consists of bricks, plastics, concrete, tiles, etc				Natural sand (Unit 2) encountered at 3.5 m adjacent to the FILL, located on western side of fill.
			8					Hole terminated at 7.50 m Target depth Groundwater not encountered				

Sketch & Other Observations





Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



Appendix F: Borehole Reports

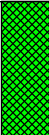
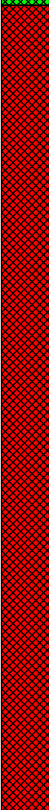

Job Number: J1801113	Easting: 391088 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.12			SP	FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
				45.52			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow, trace fines	D	
			4	42.12				Hole terminated at 4.00 m Target depth Groundwater not encountered		
			6							
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391138 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	45.79			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel (of brick, limestone and aggregate)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
								As above, mottled black		
			2	43.79				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of brick, limestone, aggregate, trace cobbles, trace plastic(sheets))		
								As above, trace wood	M	
			4					With fine to coarse grained gravel		
							SP	Inferred concrete slab (approximately 170 mm thick) With fine to medium grained brick fragments, and fine to coarse grained gravel		
								Trace glass, trace to with fine to coarse grained gravel, trace cobbles		
								Inferred concrete slab (approximately 80 mm thick) With fine to coarse grained gravel, trace plastic and glass		
			8	37.59				SAND: fine to medium grained, sub-angular to sub-rounded, grey-pale grey, trace fines	W	
							SP			
								Hole terminated at 10.50 m Target depth Groundwater encountered at 7.4 m		

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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Job Number: J1801113	Easting: 391288 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.36		[Green hatched pattern]	SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone etc), trace fines trace plastic	D			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	44.36		[Red hatched pattern]	SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel, trace fines		M		
			6	40.86		[Orange dotted pattern]		SAND: fine to coarse grained, sub-angular to sub-rounded, grey-brown, trace fines				
			8			[Orange dotted pattern]	SP	Pale grey Pale grey-pale brown		W		
			10					Hole terminated at 10.50 m Target depth Groundwater encountered at 7.8 m				
			12	35.86								

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

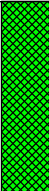
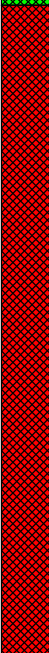

Job Number: J1801113	Easting: 391338 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 48 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	47.92		[Green Hatched Box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel, trace fines Trace to with fine to medium grained gravel, trace plastic Trace to with fine to coarse grained gravel		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2			[Green Hatched Box]	SP		M	
			4	43.92		[Red Hatched Box]	SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel, trace to with fine to coarse grained brick fragments, trace plastic (sheets), trace cobbles Dark grey-black, trace to with fine to coarse grained gravel, trace cobbles, plastic and metal As above, with organics and metal (wire)		
			6			[Red Hatched Box]	SP	With fine to coarse grained gravel, trace cobbles and cobble sized brick fragments As above, trace organics, plastic and metal		
			8			[Red Hatched Box]	SP	With organics/wood chips/fragments, plastic, wire and material (textiles) Trace to with fine grained gravel, trace fines	W	
			10	37.92		[Orange Box]	SP	Inferred dolerite boulder, recovered as cobbles SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		
			12	37.42				Hole terminated at 10.50 m Target depth Groundwater encountered at 9.3 m		

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391142 m	Contractor: Proline Drilling	Date: 16/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 44 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.43			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	42.43			M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel an occasional cobbles, trace organics (wood fragments)		
			4				SP	Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel		
			6					Trace plastic (sheets)		
			37.43				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines	W	
			8	36.43				Hole terminated at 8.00 m Target depth Groundwater encountered at 7 m		
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391189.47 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480155.91 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 44.43 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.43		[Green cross-hatch pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines ----- As above, trace cobbles ----- Trace to with fine to medium grained gravel, trace fine to medium grained brick and tile fragments, trace plastic, trace fines ----- Dark grey-black	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2			[Orange dotted pattern]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		
			4	39.93						
			6	38.43				Hole terminated at 6.00 m Target depth Groundwater not encountered		
			8							
			10							
			12							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391242 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	45.59				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2					Brown-pale brown, trace to with fine to medium grained gravel, trace cobbles and concrete fragments		
			4				SP	Trace fine to medium grained gravel, trace organics		
			6	39.59				SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines		
							SP	Grey-brown		
			8	38.09				Hole terminated at 7.50 m Target depth Groundwater not encountered		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391292 m	Contractor: Proline Drilling	Date: 29/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.93			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	45.33			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, fine to medium grained, sub-rounded gravel of limestone, brick, concrete, tile, trace fines		
			4	42.43			M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel, trace organics, trace fines As above, with fine to coarse grained gravel		
			6				SP	As above, trace to with organics (wood/wood fragments), trace fine to medium grained brick fragments and glass Inferred concrete slab (approximately 200-400 mm thick), recovered as fine to coarse grained gravel, trace cobbles Dark grey-black, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone, brick and glass) As above with plastic and organics With fine to coarse grained gravel (as above) and trace organics		
			8	38.43			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines	W	
			10	36.43				Hole terminated at 10.50 m Target depth Groundwater encountered at 9 m		
			12							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391342 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	49.29				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown-pale brown, trace to with fine to coarse grained gravel, trace fines, trace cobbles		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1								
			2				SP	Brown, trace tile fragments			
			3								
			4								
			5	44.29				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey, with fine to coarse grained gravel and cobbles, trace plastic, glass, metal and concrete cobbles, trace organics (wood fragments), trace brick fragments	M		
			6								
			7						Inferred granite boulder		
			8					SP	Trace plastic (sheets) and organics/wood fragments, trace cobbles and cobble sized concrete fragments, trace brick		
			9						As above, pale grey		
			10								
		11					As above, pale grey				
							Dark grey	W			

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391342 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12	37.39			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, pale grey-brown, trace fines	W	
			13							
			14	35.79				Hole terminated at 13.50 m Target depth Groundwater encountered at 11 m		
			15							
			16							
			17							
			18							
			19							
			20							
			21							
			22							
			23							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions




Job Number: J1801113	Eastings: 391181 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	42.95			SP	FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	Yellow-pale brown, trace plastic		
			39.95				SP	Brown, trace to with fine to coarse grained gravel, trace fine to coarse grained concrete fragments		
			4	38.95			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, trace fines Grey-brown		
			4	38.95				Hole terminated at 4.00 m Target depth Groundwater not encountered		
			6							
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391331 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	46.91			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel (of brick, concrete, limestone, aggregate and laterite), trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			2								
			4	43.41			SP	Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel of brick, concrete, limestone and aggregate), trace cobbles, organics (wood/wood fragments) and fines With fine to coarse grained gravel, trace metal, plastic, glass and organics			
			6								
			8					Inferred concrete slab (approximately 40 mm thick)			
			8					Inferred concrete slab (approximately 40 mm thick) With fine to coarse grained gravel and organics, trace metal, plastic and cobbles			
			8					As above, with glass, brick fragments and cobbles, trace concrete cobbles			
			10	37.91			SP	SAND: fine to coarse grained sub-angular to sub-rounded, grey, trace fines Pale grey			
			10.5	36.41				Hole terminated at 10.50 m Target depth Groundwater encountered at 8.3 m			

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391281 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.89			SP	FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	Yellow-pale brown, trace plastic		
			41.89				SP	Brown, trace to with fine to coarse grained gravel, trace fine to coarse grained concrete fragments		
			4	40.89			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, trace fines Grey-brown		
			4	40.89				Hole terminated at 4.00 m Target depth Groundwater not encountered		
			6							
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391431 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Hole Dia: 90 mm	Checked By: ORW

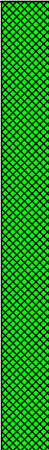

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	53.12			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	51.12				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, grey-brown, with fine to coarse grained gravel, trace to with fines, trace organics, trace fine to medium grained concrete fragments		
								Inferred concrete slab (approximately 75 mm thick) Dark grey, with organics, trace cobbles and brick fragments		
								As above, dark grey to black, trace plastic (sheets) and metal (wire/strapping), trace organics	M	
							SP	As above, with inferred concrete slab (approximately 150 mm) thick		
								Trace plastic (sheets)		
								Inferred concrete slab, recovered as gravelly SAND, fine to coarse grained concrete gravel fragments and cobbles		
								Trace brick, with fine to coarse grained gravel, plastic, metal (wire/strapping), glass		
								Trace to with fine to coarse grained gravel and cobbles		
				42.12				Hole terminated at 11.00 m Refusal on inferred granite/metal Groundwater not encountered		11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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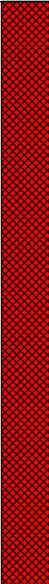

AC

Job Number: J1801113	Eastings: 391406 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480247 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	54.20			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			2								
			4	50.70				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, grey-brown, trace to with fine to coarse grained gravel, trace cobbles, trace fines	M		
								As above, with fine to coarse grained gravel (of brick, aggregate, concrete and limestone), trace cobbles and organics			
								As above, trace plastic and material (textiles)			
								Inferred concrete slab (approximately 60 mm thick)			
								Inferred concrete slab (approximately 60 mm thick) With fine to coarse grained gravel, trace cobbles, metal, plastic and organics			
								SP			
								With organics (wood chips/wood fragments)			
								With fine to coarse grained gravel and cobbles			
								As above, trace plastic			
								With organics (wood chips/wood fragments) With fine to coarse grained gravel and cobbles			
			12						11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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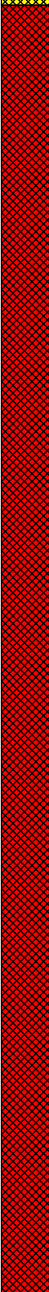
Job Number: J1801113	Easting: 391406 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480247 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Inferred concrete slab (approximately 60 mm thick) With fine to coarse grained gravel and cobbles, trace brick cobbles		
								Trace to with fine to coarse grained gravel, trace cobbles and metal		
			14				SP	With fine to coarse grained gravel (predominantly concrete fragments) Trace rubber fragments and plastic	M	
								With fine to coarse grained gravel, trace cobbles, trace plastic (sheets)		
				37.70			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, pale yellow-pale brown, with fine to coarse grained limestone gravel and cobbles	W	
								Trace fine to medium grained limestone gravel		
			18	36.20				Hole terminated at 18.00 m Target depth Groundwater not encountered		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391470 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480201 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	56.43			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel (of brick, concrete, limestone, aggregate), trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	54.43			SP	Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown-grey, trace to with fine to coarse grained gravel (of brick, concrete, limestone, aggregate and laterite), trace plastic and metal, trace cobbles As above, dark grey, with organics (wood chips/fragments), trace glass Trace to with fine to coarse grained gravel As above, with plastic (sheets and hard plastic fragments) Trace plastic, with fine to coarse gravel, trace concrete cobbles As above, with organics (wood chips/fragments) With fine to coarse grained gravel, trace metal and plastic, trace organics and cobbles, trace glass	M	
			12							


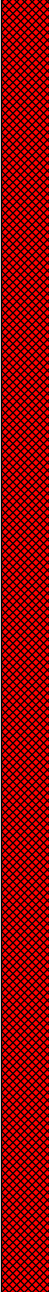
Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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Job Number: J1801113	Eastings: 391470 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480201 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	12			SP		With fine to coarse grained gravel and glass				
			14			SP		With fine to coarse grained gravel, trace metal, plastic, organics, cobbles and glass	M			
			16			SP		Predominantly fine to medium grained, angular to sub-angular gravel				
			18			SP		With fine to coarse grained gravel, trace plastic, organics and cobbles		W		
			38.13			SP		SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines				
			36.93					Hole terminated at 19.50 m Target depth Groundwater encountered at 16.5 m				
			20									
			22									
			24									
Comments:									See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			

Job Number: J1801113	Eastings: 391515 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480104 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 17/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.51			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.51			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown to dark grey, with fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace organics, trace cobbles and plastic				
			4					Predominantly fine to coarse grained gravel (of brick, concrete, limestone, aggregate and bitumen), with fine to coarse grained sand, trace metal and plastic				
			6					Dark grey to black, with fine to coarse grained gravel (of brick, concrete, aggregate, glass, tile and limestone), trace metal and plastic, trace occasional cobbles		M		
			8					Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace cobbles and plastic				
			10					With fine to coarse grained gravel, trace organics (wood chips/fragments), trace cobbles and plastic				
								As above, with organics				
								Trace organics				
								Inferred concrete slab/boulder (approximately 100 m thick) With fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace organics, plastic, metal and cobbles				
			12									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391612 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480096 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.23				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
							SP	Pale brown-grey				
			2	56.23				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of bricks, concrete, aggregate, glass and tile), trace cobbles, plastic and metal				
								As above, trace material (textiles)				
								With fine to medium grained gravel (of brick, concrete, aggregate, glass and tile), trace to with cobbles, trace plastic				
			6					Predominantly fine to coarse grained gravel (as above), with fine to coarse grained sand, trace organics		M		
								With fine to coarse grained gravel (as above), trace cobbles, plastic, organics and metal			SP	
			8					As above, grey-brown				
								As above, dark brown to dark grey/black, trace to with cobbles and organics, trace metal and plastic				
			12									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391612 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480096 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			12					Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace organics and plastic				
								With fine to coarse grained gravel, trace to with plastic, trace organics, cobbles and plastic				
			14						As above, trace asbestos (in small fragments)			
								SP				
			16						With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace material (textiles), trace plastic, metal and cobbles		M	
									Predominantly fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), with fine to coarse grained sand, trace cobbles and organics			
			18						As above, fine to coarse grained gravel (predominantly brick and tile fragments)			
									With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace plastic, metal and cobbles			
			38.63						SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-grey, with fines			
									SP			
		37.23						Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m				
		22										
		24										
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions				



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Job Number: J1801113	Eastings: 391655 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northing: 6480149 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	56.95			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines	D		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
								Pale brown			
			2					Brown, trace to with gravel			
				53.95				M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone and tile), trace organics, plastic and cobbles		
			4					Inferred concrete slab (approximately 120 mm thick), recovered as fine to coarse grained Gravelly SAND and COBBLES			
								Predominantly fine to coarse grained brick fragments (gravel), trace concrete, plastic and organics			
			6					Dark brown to dark grey, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace metal, plastic, organics and cobbles			
								As above, trace to with plastic and organics			
			8					Predominantly fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace plastic			
								Dark grey to black, with fine to coarse grained gravel (as above), trace plastic, organics and metal			
			10					As above, trace to with organics (wood chips/fragments)			
								Grey, trace to with fine to medium grained gravel, with organics			
		12									

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391583 m	Contractor: Parcel Property	Date: 12/06/2019
Client: Parcel Property	Northing: 6480181 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.84			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines	D			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.84			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown to dark brown, with fine to coarse grained gravel (of brick, concrete, aggregate, tile, etc), trace cobbles, organics and fines				
			4					As above, trace asbestos fragments				
			4					With fine to coarse grained gravel (as above), trace to with cobbles As above, pale brown, trace cobbles				
			6					Brown to dark brown, with fine to coarse grained gravel, trace cobbles, trace plastic (hard plastic fragments and sheets), trace organics and metal	M			
			8					Predominantly fine to coarse grained gravel (of bricks, concrete, tiles, glass and aggregate), trace cobbles, organics and plastic				
			10					With fine to medium grained gravel (of bricks, concrete, tiles, glass and aggregate), trace cobbles and plastic				
			10					Inferred concrete slab (approximately 90 mm thick)				
			12					Inferred concrete slab (approximately 110 mm thick), recovered as Gravelly SAND and COBBLES Predominantly fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), with fine to coarse grained sand, trace plastic and metal				

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions


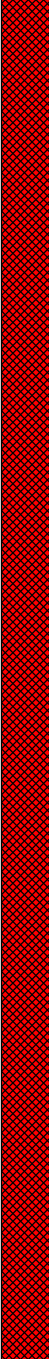
Job Number: J1801113	Eastings: 391583 m	Contractor: Parcel Property	Date: 12/06/2019
Client: Parcel Property	Northings: 6480181 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12			[Red hatched pattern]		As above, gravel predominantly fine to coarse grained brick fragments				
			14			[Red hatched pattern]		With fine to coarse grained, gravel (of brick, concrete, aggregate and tile) Trace to with material (textiles) Inferred concrete slab (approximately 120 mm thick) With fine to coarse grained gravel (predominantly fine to coarse grained brick fragments), trace concrete, glass and tile gravel				
			16			[Red hatched pattern]	SP	As above, trace plastic (sheets), with fine to coarse grained gravel (of brick, concrete, glass, tile and aggregate) Predominantly fine to coarse grained brick gravel, trace organics With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace organics, plastic, cobbles and metal	M			
			18			[Red hatched pattern]						
			20	39.24 39.14		[Red hatched pattern]	SP	LIMESTONE: well cemented, pale brown-yellow, possible FILL SAND: fine to coarse grained, sub-angular to sub-rounded, pale brown-yellow, trace fines	W			
			22	37.84		[Red hatched pattern]		Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m				
			24			[Red hatched pattern]						

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391559 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	58.70			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
								Brown-yellow			
				57.20					Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of brick, aggregate etc) trace cobbles, plastic and organics (wood chips/fragments)		
				2					As above, with organics (wood chips/fragments), dark brown		
				4					Trace to with fine to coarse grained gravel, trace organics and cobbles		
									Inferred concrete slab (approximately 60 mm thick) Red, with fine to coarse grained gravel, trace cobbles, plastic, glass and organics		
				6				SP			M
									As above, brown, trace metal and tile fragments		
				8					As above, trace to with organics		
									Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel, trace metal, cobbles, plastic and organics		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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GALT LIB 1.01.GLB Log_GG_NON_CORED J1801113.GPJ <<Drawingfile>> 2/10/2019 11:21 10.0000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013:02:21 Pjt: GALT 1.01 2013:02:21

Job Number: J1801113	Eastings: 391559 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	As above, trace brick and concrete cobbles		
			14					As above with organics (wood chips/fragments)		
								Inferred concrete slab (approximately 120 mm thick)		
								With fine to coarse grained gravel and organics, trace plastic and cobbles (predominantly brick and concrete)		
			16				As above, trace organics			
			18							
			19.8	39.10						
			20					LIMESTONE: moderately to well cemented, pale brown-yellow		
			21.0	38.30				SAND: fine to coarse grained, sub-angular to sub-rounded, yellow-brown, trace fine grained limestone gravel, trace fines		
			21.0	37.70				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.8 m		
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391610 m	Contractor: Proline Drilling	Date: 12/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	58.57			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.57			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel (of brick, concrete, aggregate and tile), trace plastic and metal, trace organics	M	
								As above, with fine to medium grained gravel		
								Dark brown to dark grey, with fine to coarse grained gravel, trace plastic, rubber, metal and organics		
								As above, trace brick cobbles		
								As above, with organics (wood chips/fragments)		
								With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic		
								As above, with glass		
								With fine to medium grained gravel (of brick, concrete, aggregate and tile), trace plastic and glass		
								As above, with plastic		
								Trace plastic		
								As above, with inferred concrete slab (approximately 90 mm thick), recovered as Gravelly SAND and COBBLES		

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391610 m	Contractor: Proline Drilling	Date: 12/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					With fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace brick cobbles (up to 120 mm thick), trace plastic and organics				
			14					As above, trace metal				
			16				SP	Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace cobbles, plastic and organics	M			
			18					Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace cobbles, plastic, glass and metal				
			20	38.57			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace fines Brown to pale brown	W			
			21	37.57				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m				
			22									
			24									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391710 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northing: 6480261 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	57.08				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel (of brick, aggregate, concrete and tile), trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	As above, trace to with fine to coarse grained gravel		
			4	54.08				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace organics (wood chips/fragments)		
			6					As above, with low to medium plasticity fines		
			8					Dark brown to dark grey, with organics, trace non-plastic fines		
			10					Brown-grey, with fine to coarse grained gravel, trace plastic and cobbles	M	
			11					Inferred concrete slab (approximately 100 mm thick), recovered as fine to coarse grained GRAVEL and COBBLES		
			12					Dark grey to black, with fine to coarse grained gravel (of concrete, bricks, tile and aggregate), trace organics (wood chips/fragments), trace plastic and metal		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391710 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northings: 6480261 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					As above, with organics (wood chips/fragments)		
								Trace organics		
			14					Grey, inferred concrete slab/boulder, recovered as fine to coarse grained Gravelly SAND and COBBLES		
								Dark brown, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic, organics, metal and material (textiles)		
							SP	Predominantly fine to coarse grained gravel, with fine to coarse grained sand	M	
								With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic		
								As above, trace cobbles, metal and organics		
									W	
				38.58				Hole terminated at 18.50 m Refusal on unknown material Groundwater inferred at 18.0 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions


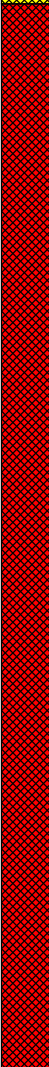
Job Number: J1801113	Easting: 391491 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480277 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	As above, trace plastic (sheets) and metal, trace organics	M	
			14					With fine to coarse grained brick fragments		
			16					As above, trace wood, trace plastic		
			18	38.76			SP	With fine to coarse grained gravel and cobbles (of brick, concrete, aggregate, limestone and tile)	W	
					SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines					
			20	37.26				Pale grey		
			22					Hole terminated at 19.50 m Target depth Groundwater encountered at 17.2 m		
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391459 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480311 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	56.80			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to coarse grained gravel, trace fines, trace organics				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			4	53.00				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey-brown, trace to with fine to coarse grained gravel and cobbles, trace plastic (sheets), trace organics, trace to with fines With fine to coarse grained brick fragments and cobbles Trace to with concrete cobbles, organics and plastic (sheets) As above, with fine to coarse grained gravel and cobbles		M		
			10.50									10.50: Drilling water added, sand washed from sample
Comments:												See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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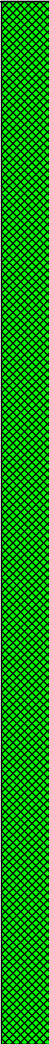

Job Number: J1801113	Easting: 391459 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480311 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	12			SP		With concrete cobbles and hard plastics		13.50: Drilling water added to borehole, sand wash from sample
			14					With fine to coarse grained gravel and cobbles, fine to coarse grained brick fragments, trace metal, plastic and organics (wood)	M	
			16					With fine to coarse grained brick fragments and cobbles, trace to with organics (wood)		
			18	38.80		SP		With fine to coarse grained gravel and cobbles		
			18					With fine to coarse grained brick fragments	W	
			20	37.30				Hole terminated at 19.50 m Target depth Groundwater encountered at 16.7 m		
			22							
			24							

Comments:

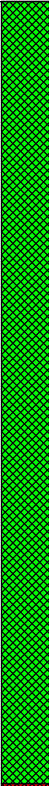

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northing: 6480321 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	57.17			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of concrete, aggregate, limestone, brick and tile), trace fines, trace organics in top 0.5 m	D		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2					As above, dark brown			
			4								
			6					Brown-grey, with fine to medium grained gravel			
			8	49.17			SP	UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, brown-brown/grey, trace to fine grained gravel, fine with to medium grained brick fragments, trace organics, trace plastic, trace cobbles	M		
			10					Dark grey-black, trace plastic (sheets)			
								Trace metal			
								Trace organics/wood chips, wood fragments			
								Trace organics and plastic			
								Trace to with plastic, with cobbles			
								As above, with organics, trace tile fragments, trace asbestos			11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress
								Trace to with metal strapping			
			12								

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391427 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480367 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	56.12			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone, tile), trace to with fines, trace plastic (sheets)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2					Trace to with fine to medium grained gravel		
			6	50.12			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey/black, with fine to coarse grained gravel (of brick, concrete, aggregate, tile fragments), trace cobbles, trace plastic (sheets), trace to with organics (wood chips / wood fragments)	M	
		8					Inferred concrete slab (approximately 150 mm thick), recovered as fine to coarse grained gravel and cobbles With fine to coarse grained gravel, trace organics/wood chips/fragments			
		10					With fine to coarse grained gravel, trace cobbles, with organics, trace plastic, engine components, metal, glass, tile and brick fragments			
		12					With fine to coarse grained gravel, trace cobbles, organics and glass			

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391427 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480367 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	12			[Red hatched pattern]				
								As above, trace metal		
			14				SP	With fine to coarse grained gravel, trace cobbles, trace fines	M	
			16					As above, inferred concrete slab (approximately 120 mm thick) With fine to coarse grained gravel and cobbles		
			17					As above, trace plastic, glass and fine to medium grained brick fragments		
			38.62			[Orange dotted pattern]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines	W	
			18	38.12				Hole terminated at 18.00 m Target depth Groundwater encountered at 17 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391520 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480393 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling	Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	55.74			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to medium grained gravel, trace fines	D - M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			54.24				SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey, trace to with fine to coarse grained gravel, trace plastic metal and organics, with fines	M	
			2					With concrete slabs recovered as Gravelly SAND/Sandy GRAVEL, fine to coarse grained sand, fine to medium grained concrete gravel and cobbles With fine to coarse grained gravel and organics		
			4					With hard plastic and plastic sheets, trace to with organics (wood fragments and wood chips)		
								Trace to with fine to medium grained brick and concrete fragments		
								Trace to with organics		
			6				SP	With fine to medium grained angular gravel		
			8					As above, with organics/roots, metal, plastic, rubber, trace cobbles		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391520 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480393 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	With concrete cobbles and plastic (sheets)	M	
			14		Trace metal					
			16					Trace concrete cobbles		
			16					Trace granite cobbles		
			38.74				SP	With fine to coarse grained gravel and brick fragments, trace cobbles		
					SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines					
			18	37.74				Hole terminated at 18.00 m Target depth Groundwater encountered at 16.4 m		
			20							
			22							
			24							
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions		

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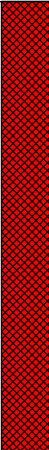


Job Number: J1801113	Eastings: 391680 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480388 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	56.45			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to medium grained gravel, trace fines				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions. 3.50-4.50: Typical interbedded sand fill with gravel 7.50-9.00: Typical interbedded sand fill with gravel
				55.05				Brown, trace to with fine to medium grained gravel				
			2					UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel and occasional cobbles, trace brick fragments, fine to coarse grained concrete fragments and cobbles, trace organics, trace to with fines				
								With fine to coarse grained gravel only				
			4					As above, trace to with cobbles, fine to coarse grained brick fragments, organics, metal, plastic, granite cobbles/boulders				
								With fine to coarse grained gravel, trace fine to medium grained brick fragments, plastic (sheets) and hard plastic fragments	M			
			6				SP	With fine to coarse grained gravel only				
								As above, with fine grained brick fragments and organics (wood fragments and wood chips), trace occasional cobbles				
			8					As above, trace metal and plastic				
								As above, trace to with organics (wood fragments, wood chips and roots)				
			10					As above, trace cobbles, trace to with fine to coarse grained brick fragments and brick cobbles				
			12									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

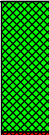


Job Number: J1801113	Easting: 391680 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480388 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	As above, with metal (strapping) and plastic (hard and soft sheets)	M	
			40.95						SP	UNCONTROLLED FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown, fine to coarse grained gravel, with occasional cobbles, trace metal and plastic
			39.95				SP			SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines
				38.45						Becoming pale brown
			18					Hole terminated at 18.00 m Target depth Groundwater encountered at 16.7 m		
			20							
			22							
			24							

Comments:

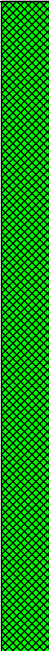
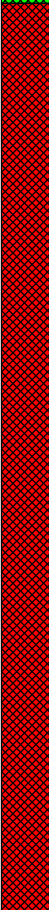
See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.65			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, with fine to coarse grained gravel, trace plastic, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			45.65					UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, with fine to coarse grained gravel, trace cobbles, trace organics, trace glass, metal, ceramic (tile), fine to medium grained brick fragments and plastic		
			2					Inferred concrete slab (approximately 60 mm thick) With interbedded layer of predominately fine to coarse grained gravel (of brick, tile, glass and aggregate)		
			4					Inferred concrete slab (approximately 60 mm thick)	M	
			6					Trace metal and plastic (sheets)		
			39.15				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark grey, trace fines		
			8					Yellow	W	
			37.65					Hole terminated at 9.00 m Target depth Groundwater encountered at 7.6 m		
			10							
			12							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391441 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480457 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	54.81				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	Brown-dark brown		
			4					Yellow-brown Brown		
				49.81				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel and occasional cobbles, trace to with organics (wood fragments/wood chips) Dark grey, trace to with fine to coarse grained brick fragments		7.50: Drilling water added to borehole, sand washed from sample 9.00-9.80: Drilling water added to borehole, sand washed from sample
			6				M	Trace plastic, rope/twine		
			8				SP	Dark grey to black, with fine to coarse grained gravel and cobbles, trace concrete cobbles, trace organics		
			10					As above, trace metal, plastic, glass and PVC		
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391441 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480457 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	12			[Red hatched pattern]		With fine to coarse grained gravel, trace metal and cobbles, trace organics				
						[Red hatched pattern]	SP	As above, with fine to coarse grained brick fragments		M		13.50: Drilling water added to borehole, sand washed from sample
						[Red hatched pattern]		As above, with organics				15.00: Drilling water added to borehole, sand washed from sample
					39.31		[Orange dotted pattern]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines		W	
			18	36.81				Hole terminated at 18.00 m Target depth Groundwater encountered at 15.2 m				
			20									
			22									
			24									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions




Job Number: J1801113	Easting: 391517 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	53.97				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	M		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
							SP	As above, pale brown-yellow	D - M		
								Brown-dark brown/grey			
			2								
				51.37				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fine to coarse grained gravel, trace to with organics (wood fragments/wood chips), trace plastic (sheets) and materials (rags/clothing)			
								Trace occasional cobbles and cobble sized concrete fragments			
								Trace plastic (sheets)			
			4								
								Trace metal	M		
							SP				
			6								
								Trace to with fine to coarse grained brick fragments, trace glass and metal, trace organics			
			8								
			10								
			12								

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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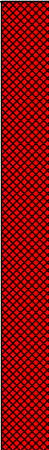

Job Number: J1801113	Eastings: 391517 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	With fine to coarse grained gravel and cobbles, fine to coarse grained and cobble sized brick and concrete fragments	M	
								Trace plastic		
			14				SP	With inferred concrete slabs, recovered as Gravelly SAND / Sandy GRAVEL, fine to coarse grained SAND, fine to coarse grained concrete fragments and cobbles, trace metal	W	
			38.97					SAND: fine to coarse grained, sub-angular to sub-rounded, brown/yellow, trace fines		
			16	37.97				Hole terminated at 16.00 m Target depth Groundwater encountered at 15.2 m		
			18							
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391609 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480461 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▲	12					With fine to coarse grained gravel only	M	13.00-15.50: Typical interbedded sand fill with gravel
			14		SP		With fine to coarse grained brick fragments, cobbles, metal fragments, plastic and material (clothing/rags)			
			16	39.25					SP	
18	36.75					Hole terminated at 18.00 m Target depth Groundwater encountered at 14.7 m				
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions




Job Number: J1801113	Easting: 391683 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480447 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Possible Sandy GRAVEL (to 13.5 m)	M	13.00-16.00: Drilling water added
			14				SP	Trace to with fine to coarse grained gravel, with fines, trace metal (strapping) and plastic, trace fine to coarse grained brick fragments and occasional cobbles/cobble sized concrete fragments		
			40.04					Possible Sandy GRAVEL (to 16.0 m)	W	
			16		SP		SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines			
				37.54				Yellow		
			18					Hole terminated at 18.00 m Target depth Groundwater encountered at 15.7 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480517 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	49.67			SP	FILL: Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, brown, fine to coarse grained gravel, trace metal, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			48.67					UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, dark grey-dark brown, with fine to coarse grained gravel, trace cobbles, trace plastic, metal and organics With organics and plastic (sheets)		
			2					With fine to coarse grained gravel, trace cobbles and organics (wood chips/fragments), trace plastic		
			4					Inferred concrete slab (approximately 60 mm thick)		
								Inferred limestone boulder (approximately 140 mm thick)		
								With fine to coarse grained gravel, trace plastic, trace fine to medium grained brick fragments		
			6				SP	As above, predominantly coarse grained gravel and cobbles, trace to with plastic and metal	D	
								With fine to coarse grained gravel, trace metal fragments		
								Inferred concrete slab (approximately 90 mm thick)		
								With fine to coarse grained gravel, trace cobbles, trace metal fragments		
								As above, trace organics and plastic (sheets)		
								Trace to with fine to coarse grained gravel, trace cobbles		
			10				With fine to coarse grained gravel (of brick, concrete, aggregate, limestone and tile) trace organics, trace metal and plastic			
			39.07				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines		
							Yellow			
Comments:						Hole terminated at 12.00 m Target depth Groundwater not encountered		See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions		

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Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480517 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			12	37.67									
			14										
			16										
			18										
			20										
			22										
			24										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391515 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480576 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	51.88				FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown-grey, trace to with fine to medium grained gravel, trace wood, trace organics/rootlets in top 300 mm, trace fine to medium grained concrete fragments, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP			
			4	48.58				UNCONTROLLED FILL: fine to coarse grained, sub-angular to sub-rounded, dark grey to black, trace to with fine to medium grained gravel, trace plastic (sheeting/bags), trace fine to medium grained concrete fragments, trace fines With wood fragments, fabric (i.e. clothing, rags, etc) and cobbles Wood, material, cobbles not present Below 5.0 m, trace to with fine to coarse grained gravel and occasional cobbles and pockets of plastic (sheeting/bags and bottles), trace wood fragments, trace brick and limestone fragments	M	
			6					SP	M - W	
			8					With fine to coarse grained gravel Trace metal (sheeting) Trace wire, recovered as bundles and metal strapping	M	
			10							11.00: Drilling water added to borehole, sand washed from sample
			12	40.38				SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines	W	

Comments:


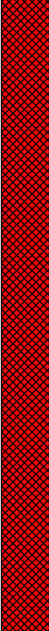
Hole terminated at 12.00 m
Target depth
Groundwater encountered at 11.5 m

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391515 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480576 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			12	39.88									
			14										
			16										
			18										
			20										
			22										
			24										
Comments:										See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			



Job Number: J1801113	Eastings: 391609 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northings: 6480561 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	53.32			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines, trace organics (roots/twigs)	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions. 5.00: Drilling water added to borehole, sand washed from sample
			2	51.32				Trace to with fine to medium grained gravel		
			4					UNCONTROLLED FILL: SAND/Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown to pale red, trace to with fine to medium grained gravel, trace fines, trace brick fragments Trace to with material (sheets/rags) and medium to coarse grained brick fragments Grey-brown, trace plastic (sheets), metal and cobble sized concrete fragments		
								Trace polystyrene, hard plastic fragments and brick fragments		
								With hard plastic fragments, polystyrene not present		
								Pale grey, with fine to coarse grained gravel, trace polystyrene	D	
								Brown		
								SP As above, with occasional cobbles and cobble sized concrete fragments, trace metal, trace fine to medium grained brick fragments		
								With wood fragments (organics) up to 80 mm diameter and wood chips		
								With metal, brick fragments, material (clothing, rags, etc), plastic, trace organics and polystyrene	M	
							As above, trace cobble sized concrete fragments			
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391609 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northing: 6480561 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP		M		
			14	39.32				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey to pale grey, trace fines, with fine to medium grained, angular gravel	W	
			38.32					Hole terminated at 15.00 m Target depth Groundwater encountered at 13.5 m			
			16								
			18								
			20								
			22								
			24								

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391684 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northing: 6480516 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	55.14			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics, trace fines				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	53.14			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fine to medium grained gravel and occasional coarse grained gravel, trace brick fragments and wood, trace fines				
			4					Dark grey, trace metal fragments				
			4					Brown to dark brown, trace cobbles				
			6					With fine to medium grained gravel, trace organics				
			6					Trace cobbles and cobble sized brick fragments and plastic				
			8					With fine to medium grained gravel, trace metal and wire				
			8					With fine to medium grained gravel, brick fragments, metal, cobble sized concrete fragments, plastic sheets, organics (wood and clumps of fibrous organic material)				8.00: Drilling water added
			10									
			12									

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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GALT LIB 1.01.GLB Log_GG_NON_CORED J1801113.GPJ <<Drawingfile>> 2/10/2019 11:22 10.0000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013:02:21 Proj: GALT 1.01 2013:02:21


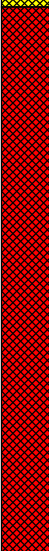

Job Number: J1801113	Eastings: 391725 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480494 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Trace cobble sized brick fragments		16.00: Drilling water added to borehole, sand washed from sample
			14		SP		Trace metal strapping	M		
16		SP	Trace to with cobble sized concrete fragments							
16	38.78		SP	Trace to with organics (wood shavings/fragments)	W					
			18	37.28				SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines Yellow		
			18					Hole terminated at 18.00 m Target depth Groundwater encountered at 15.5 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391415 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480596 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	51.20			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown-yellow, trace organics/rootlets in top 300 mm, trace fine to medium grained gravel, trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			49.70				SP	UNCONTROLLED FILL: fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace concrete, plastic, metal and jars	D - M	
								Trace occasional cobbles and cobble sized concrete fragments		
								Trace to with plastic strapping, trace to with organics (wood chips), trace ceramic fragments		
				45.50			SP	SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines Yellow	M	
								Pale yellow to pale brown		
								Yellow to pale orange		
								Fine to coarse grained, pale grey		
									W	

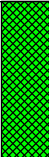


Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391415 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480596 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			12				SP	Predominantly fine to medium grained, trace coarse grained sand	W		
				36.20				Hole terminated at 15.00 m Target depth Groundwater encountered at 10.9 m			
			14								
			16								
			18								
			20								
			22								
			24								
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			

Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northings: 6480417 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	49.69			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of concrete, brick, limestone, aggregate), trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			1	48.69				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of concrete, brick, aggregate), trace cobbles, trace fines, trace plastic (sheets) Trace to with brick and concrete cobbles	M	
			4				SP	Trace organics (wood), trace to with fine to medium grained brick fragments		
			5					Inferred concrete slab (approximately 60 mm thick) With plasterboard, low plasticity fines		
			6					Trace to with fine grained gravel		
			7	43.19				SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fines Pale brown-pale yellow	W	
			8				SP	Yellow		
			9							
			10							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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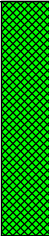
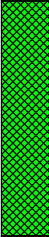

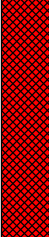
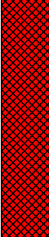



Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northing: 6480417 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10				•	SP	Pale grey	W			
				39.19					Hole terminated at 10.50 m Target depth Groundwater encountered at 6.5 m				
			11										
			12										
			13										
			14										
			15										
			16										
			17										
			18										
			19										
			20										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391388 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

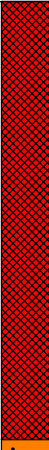

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	51.49			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete aggregate and limestone), trace fines, trace metal and plastic		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			1	49.99			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel, trace fines, trace brick fragments and organics (wood)		
			2					UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-grey, trace fines, trace to with fine to coarse grained gravel and occasional cobbles, trace brick and concrete		
			3	48.49				With fine to coarse grained gravel		
			4					As above, grey, trace plastic (sheets)		
			5					As above, trace organics (wood), metal and occasional cobbles	M	
			6					With organics (wood chips/fragments), brick and tile fragments, metal, plastic and fines		
			7				SP	Brown, with fine to coarse grained gravel and cobbles, trace metal (wire) and synthetic fibre bundles		
			8					Inferred concrete slab (approximately 120 mm thick), grey		
			9					Brown, with organics (wood chips), fragments		
			10					With cobbles		
								Inferred concrete slab (approximately 190 mm thick), grey		
								Brown, with fine to coarse grained gravel, trace cobbles, metal and organics (wood chips/fragments), trace brick fragments		

6.00: Drilling water added to borehole, sand washed from sample

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

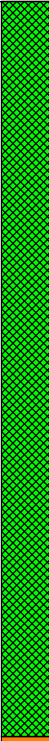

Job Number: J1801113	Easting: 391388 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	10				SP	Trace metal (possibly mechanical components, wire and plastic (sheets), trace brick and tile fragments, trace organics (wood/wood fragments)	M			
			11									
			12				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow-brown, trace fines	W			
			13	38.69								
			14									
			15									
			16	35.49				Hole terminated at 16.00 m Target depth Groundwater encountered at 12.9 m				
			17									
			18									
			19									
			20									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391238 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	45.31			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel (of brick, concrete, limestone, aggregate and tile), trace to with fines			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1									M
			2									
			3									
			4					As above, trace cobbles				
			5	40.61			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fines				
			6						Grey			
			7						Dark brown (inferred very weakly to weakly cemented (Coffee Rock))			W
			8						Moderately to well cemented, recovered as fine to coarse grained gravel and cobbles			
			9						Dark brown, very weakly to weakly cemented			
		10										

Comments:



See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391238 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10					SP					
				34.81					Hole terminated at 10.50 m Target depth Groundwater encountered at 7 m				
			11										
			12										
			13										
			14										
			15										
			16										
			17										
			18										
			19										
			20										

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391381 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	49.98			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines, trace organics (in top 100 mm)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			1					As above, trace to with fine to coarse grained gravel, trace concrete and brick cobbles		
			2							
			3	47.48			M	Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown to with fine to coarse grained gravel, trace fines Inferred concrete slab (approximately 80 mm thick) Dark grey-dark brown, with fine to coarse grained gravel (of brock, concrete, limestone, aggregate), trace concrete cobbles		
			4					As above, trace concrete and brick cobbles, trace glass, plastic, material (textiles), and metal fragments, trace organics		
			5							
			6							
			7							
			8						W	
			9							
			10							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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AC

Job Number: J1801113	Easting: 391381 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10					Inferred concrete slab (approximately 60 mm thick)				
			11				SP	With fine to coarse grained gravel (of brick, concrete, limestone, aggregate), trace concrete and brick cobbles, trace glass, plastic and metal fragments, with organics (wood chips/fragments)				
			12	37.98				Inferred concrete slab (100 mm thick)				
			13				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		W		
			14					Yellow				
			15	34.98				Hole terminated at 15.00 m Target depth Groundwater encountered at 12.3 m				
			16									
			17									
			18									
			19									
			20									

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391231 m	Contractor: Proline Drilling	Date: 29/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 44 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	43.98			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1								
			2	42.58			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel (of brick, concrete, aggregate), trace fines			
			3					Trace to with fine coarse grained gravel			
			4								
			5	39.48			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark grey, trace fines	M		
			6					Pale grey			
			7								
			8					Brown-dark brown, very weak to weakly cemented, with well cemented gravel			
			9	34.98				Hole terminated at 9.00 m Target depth Groundwater encountered at 5.9 m			
			10								


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



PointID : LG01 Depth Range: 0.00 - 4.00 m

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		CHECKED	DATE 21/06/2019	
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		PROJECT No J1801113	FIGURE No 1/1	




PointID : LG02 Depth Range: 0.00 - 4.00 m



PointID : LG02 Depth Range: 4.00 - 8.00 m


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		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG02 Depth Range: 8.00 - 10.50 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG02	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	




PointID : LG03 Depth Range: 0.00 - 4.00 m



PointID : LG03 Depth Range: 4.00 - 4.50 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG03	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	




PointID : LG04 Depth Range: 0.00 - 4.00 m



PointID : LG04 Depth Range: 4.00 - 8.00 m


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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG04	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG04 Depth Range: 8.00 - 10.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG04</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG05 Depth Range: 0.00 - 4.00 m



PointID : LG05 Depth Range: 4.00 - 8.00 m


GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG05	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG05 Depth Range: 8.00 - 10.50 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG05	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



PointID : LG06 Depth Range: 0.00 - 4.00 m



PointID : LG06 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG06	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/1



PointID : LG07 Depth Range: 0.00 - 4.00 m



PointID : LG07 Depth Range: 4.00 - 6.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG07	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	



PointID : LG08 Depth Range: 0.00 - 4.00 m



PointID : LG08 Depth Range: 4.00 - 7.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <DrawingFile>> 21062019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG08	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/1



PointID : LG09 Depth Range: 0.00 - 4.00 m



PointID : LG09 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21



TITLE


Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG09

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : LG09 Depth Range: 8.00 - 10.50 m

GALTLIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.000 Dargal DGD, CPT, Photo, Monitoring Tools | Lib: GALTLIB 1.01 2013-02-21 Pj: GALTLIB 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG09</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG10 Depth Range: 0.00 - 4.00 m



PointID : LG10 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\galt\1.01\2013-02-21\Proj\GALT.1.01\2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG10	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	




PointID : LG10 Depth Range: 8.00 - 12.00 m



PointID : LG10 Depth Range: 12.00 - 13.50 m


GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG10	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



PointID : LG12 Depth Range: 0.00 - 4.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG12	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	



PointID : LG13 Depth Range: 0.00 - 4.00 m



PointID : LG13 Depth Range: 4.00 - 8.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Pj: GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG13	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG13 Depth Range: 8.00 - 10.50 m

GALTLIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALTL1.01.2013-02-21 Pj: GALTL1.01.2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG13</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG14 Depth Range: 0.00 - 4.00 m



PointID : LG14 Depth Range: 4.00 - 4.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <DrawingFile>> 21062019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013.02.21 Pj: GALT 1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG14	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	




PointID : LG15 Depth Range: 0.00 - 4.00 m



PointID : LG15 Depth Range: 4.00 - 8.00 m


GALT LUB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG15	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG15 Depth Range: 8.00 - 11.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG15	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	




PointID : LG16 Depth Range: 0.00 - 4.00 m



PointID : LG16 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Pjt: GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG16	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG16 Depth Range: 8.00 - 12.00 m



PointID : LG16 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datapel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG16

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113


FIGURE No

2/3



PointID : LG16 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargal DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG16	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE	Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3	




PointID : LG17 Depth Range: 0.00 - 4.00 m



PointID : LG17 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG17	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG17 Depth Range: 8.00 - 12.00 m



PointID : LG17 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013.02.21 Pj: GALT 1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG17	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG17 Depth Range: 16.00 - 19.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG17	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG18 Depth Range: 0.00 - 4.00 m



PointID : LG18 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG18	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG18 Depth Range: 8.00 - 12.00 m



PointID : LG18 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG18	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	




PointID : LG18 Depth Range: 16.00 - 20.00 m



PointID : LG18 Depth Range: 20.00 - 21.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG18	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3




PointID : LG19 Depth Range: 0.00 - 4.00 m



PointID : LG19 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO SAMPLE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG19	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG19 Depth Range: 8.00 - 12.00 m



PointID : LG19 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG19	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG19 Depth Range: 16.00 - 20.00 m



PointID : LG19 Depth Range: 20.00 - 21.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datapel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG19	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3



PointID : LG20 Depth Range: 0.00 - 4.00 m



PointID : LG20 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG20

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3



PointID : LG20 Depth Range: 8.00 - 12.00 m



PointID : LG20 Depth Range: 12.00 - 16.00 m


GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG20	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG20 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG20</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : LG21 Depth Range: 0.00 - 4.00 m



PointID : LG21 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Pjt: GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG21	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG21 Depth Range: 8.00 - 12.00 m



PointID : LG21 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 | Pjt: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG21	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	




PointID : LG21 Depth Range: 16.00 - 20.00 m



PointID : LG21 Depth Range: 20.00 - 21.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG21	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3




PointID : LG22 Depth Range: 0.00 - 4.00 m



PointID : LG22 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013.02.21 Pj: GALT 1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG22	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG22 Depth Range: 8.00 - 12.00 m



PointID : LG22 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG22	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	




PointID : LG22 Depth Range: 16.00 - 20.00 m



PointID : LG22 Depth Range: 20.00 - 21.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG22	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG23 Depth Range: 0.00 - 4.00 m



PointID : LG23 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG23

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3




PointID : LG23 Depth Range: 8.00 - 12.00 m



PointID : LG23 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\galt\1.01\2013-02-21\Proj\GALT.1.01\2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG23	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	




PointID : LG23 Depth Range: 16.00 - 20.00 m



PointID : LG23 Depth Range: 20.00 - 21.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG23	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG24 Depth Range: 0.00 - 4.00 m



PointID : LG24 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\galt\G1c1b1\2013-02-21\PIJ-GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG24	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG24 Depth Range: 8.00 - 12.00 m



PointID : LG24 Depth Range: 12.00 - 16.00 m


GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG24	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3



PointID : LG24 Depth Range: 16.00 - 18.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG24</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG25 Depth Range: 0.00 - 4.00 m



PointID : LG25 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\gdp\ DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG25	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG25 Depth Range: 8.00 - 12.00 m



PointID : LG25 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Pj: GALT.1.01.2013.02.21



TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG25	DRAWN	DATE	21/06/2019	
	CHECKED	DATE	21/06/2019	
	SCALE	Not To Scale		A4
	PROJECT No	J1801113	FIGURE No	2/3



PointID : LG25 Depth Range: 16.00 - 19.50 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG25</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG26 Depth Range: 0.00 - 4.00 m



PointID : LG26 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG26

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3




PointID : LG26 Depth Range: 8.00 - 12.00 m



PointID : LG26 Depth Range: 12.00 - 16.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG26	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG26 Depth Range: 16.00 - 19.50 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG26	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	




PointID : LG27 Depth Range: 0.00 - 4.00 m



PointID : LG27 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG27	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG27 Depth Range: 8.00 - 12.00 m



PointID : LG27 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21




TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG27	DRAWN	DATE	21/06/2019	
	CHECKED	DATE	21/06/2019	
	SCALE	Not To Scale		A4
	PROJECT No	J1801113	FIGURE No	2/3



PointID : LG27 Depth Range: 16.00 - 19.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG27	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG28 Depth Range: 0.00 - 4.00 m



PointID : LG28 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG28

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3




PointID : LG28 Depth Range: 8.00 - 12.00 m



PointID : LG28 Depth Range: 12.00 - 16.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013.02.21 Pj: GALT 1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG28	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG28 Depth Range: 16.00 - 18.00 m

GALTLIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALTLIB 1.01 2013-02-21 Pj: GALTLIB 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG28</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG29 Depth Range: 0.00 - 4.00 m



PointID : LG29 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG29	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG29 Depth Range: 8.00 - 12.00 m



PointID : LG29 Depth Range: 12.00 - 16.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG29	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG29 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pjt: GALT 1.01.2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG29</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG30 Depth Range: 0.00 - 4.00 m



PointID : LG30 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG30

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3




PointID : LG30 Depth Range: 8.00 - 12.00 m



PointID : LG30 Depth Range: 12.00 - 16.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:25 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG30	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG30 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG30	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	




PointID : LG31 Depth Range: 0.00 - 4.00 m



PointID : LG31 Depth Range: 4.00 - 8.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO SAMPLE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\galt\101\2013-02-21 Pj\GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG31	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG31 Depth Range: 8.00 - 9.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG31	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	




PointID : LG32 Depth Range: 0.00 - 4.00 m



PointID : LG32 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG32	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG32 Depth Range: 8.00 - 12.00 m



PointID : LG32 Depth Range: 12.00 - 16.00 m


GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG32	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG32 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG32	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	




PointID : LG33 Depth Range: 0.00 - 4.00 m



PointID : LG33 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG33	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	




PointID : LG33 Depth Range: 8.00 - 12.00 m



PointID : LG33 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:26 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG33	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



PointID : LG34 Depth Range: 0.00 - 4.00 m



PointID : LG34 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG34

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3




PointID : LG34 Depth Range: 8.00 - 12.00 m



PointID : LG34 Depth Range: 12.00 - 16.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG34	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG34 Depth Range: 16.00 - 18.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG34	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG35 Depth Range: 0.00 - 4.00 m



PointID : LG35 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG35

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3



PointID : LG35 Depth Range: 8.00 - 12.00 m



PointID : LG35 Depth Range: 12.00 - 16.00 m


GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02.21 Pj: GALT 1.01.2013-02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG35	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG35 Depth Range: 16.00 - 18.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG35	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3



PointID : LG36 Depth Range: 0.00 - 4.00 m



PointID : LG36 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Pj: GALT.1.01.2013.02.21




TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG36	DRAWN	DATE	21/06/2019	
	CHECKED	DATE	21/06/2019	
	SCALE	Not To Scale		A4
	PROJECT No J1801113	FIGURE No	1/2	



PointID : LG36 Depth Range: 8.00 - 12.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 D:\gdp\ DGID, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG36</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG37 Depth Range: 0.00 - 4.00 m



PointID : LG37 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG37	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	



PointID : LG38 Depth Range: 0.00 - 4.00 m



PointID : LG38 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG38

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 1/2	




PointID : LG38 Depth Range: 8.00 - 12.00 m



PointID : LG38 Depth Range: 8.00 - 15.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG38	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



PointID : LG39 Depth Range: 0.00 - 4.00 m



PointID : LG39 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datapel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - LG39

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3




PointID : LG39 Depth Range: 8.00 - 12.00 m



PointID : LG39 Depth Range: 12.00 - 16.00 m


GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013.02.21 Pj: GALT 1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG39	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG39 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG39	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	



PointID : LG40 Depth Range: 0.00 - 4.00 m



PointID : LG40 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 D:\galt\101\2013-02-21 Pj\GALT\1.01\2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG40	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG40 Depth Range: 8.00 - 12.00 m



PointID : LG40 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21



TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG40	DRAWN	DATE	21/06/2019	
	CHECKED	DATE	21/06/2019	
	SCALE	Not To Scale		A4
	PROJECT No	J1801113	FIGURE No	2/3



PointID : LG40 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - LG40</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : MW01 Depth Range: 0.00 - 4.00 m



PointID : MW01 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW01	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	




PointID : MW01 Depth Range: 8.00 - 12.00 m



PointID : MW01 Depth Range: 12.00 - 15.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW01	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	2/2	



PointID : MW02 Depth Range: 0.00 - 4.00 m



PointID : MW02 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21



TITLE


Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - MW02

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : MW02 Depth Range: 8.00 - 10.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01.2013-02-21 Pj: GALT 1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW02	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	




PointID : MW03 Depth Range: 0.00 - 4.00 m



PointID : MW03 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW03	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : MW03 Depth Range: 8.00 - 12.00 m



PointID : MW03 Depth Range: 12.00 - 16.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - MW03

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

2/2




PointID : MW04 Depth Range: 0.00 - 4.00 m



PointID : MW04 Depth Range: 0.40 - 8.00 m


GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0.000 Dataplot DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW04	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : MW04 Depth Range: 8.00 - 10.50 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21/06/2019 11:26 10.0.0.000 D:\galt\101\2013-02-21 Pj\GALT\1.01\2013-02-21 Pj\GALT\1.01\2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW04	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



PointID : MW05 Depth Range: 0.00 - 4.00 m



PointID : MW05 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013-02-21 Pj: GALT.1.01.2013-02-21



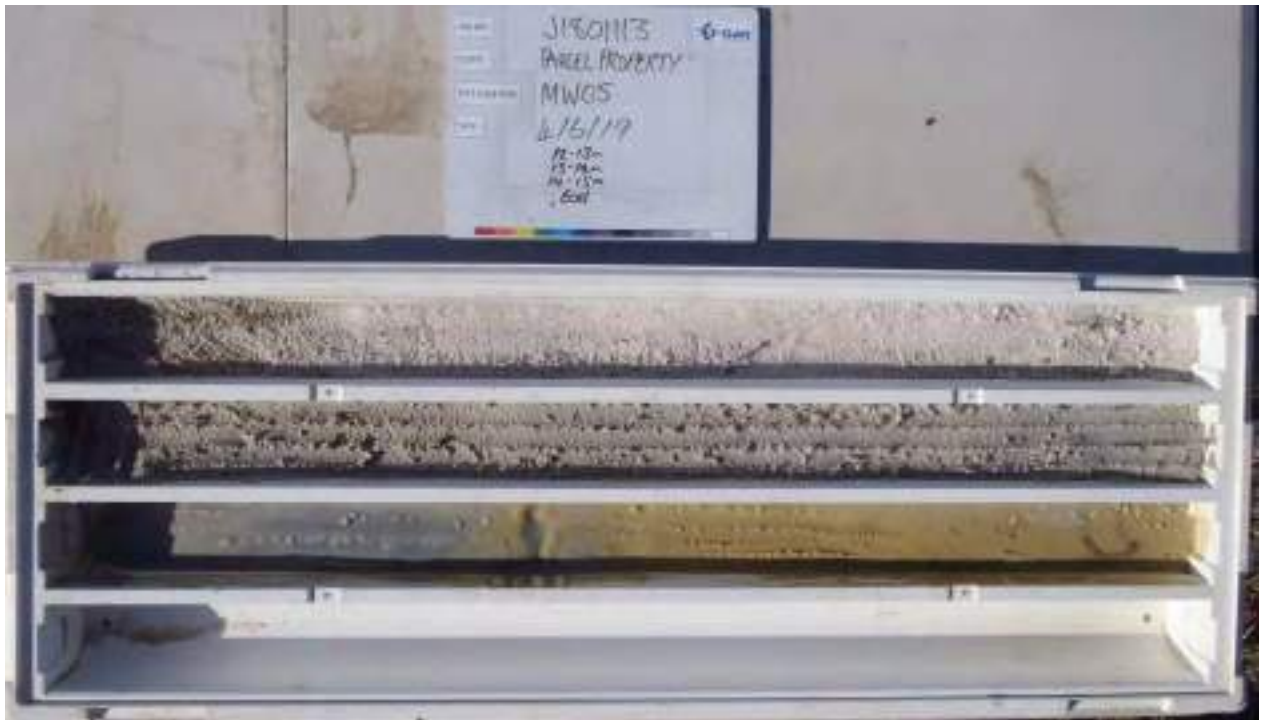
TITLE

Parcel Property
26 Driver Road, Darch Proposed
Mixed Use Subdivision Sample
Photo - MW05

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2




PointID : MW05 Depth Range: 8.00 - 12.00 m



PointID : MW05 Depth Range: 12.00 - 15.00 m

GALT LIB 1.01.GLB G18121 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21062019 11:26 10.0.0.000 D:\gdp\ DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW05	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	




PointID : MW06 Depth Range: 0.00 - 4.00 m



PointID : MW06 Depth Range: 4.00 - 8.00 m


GALT LIB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Dargel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW06	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : MW06 Depth Range: 8.00 - 9.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO Sample PHOTO 2 PER PAGE J1801113.GPJ <-DrawingFile>> 21062019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pj: GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Sample Photo - MW06	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/2	



Appendix G: Infiltration Test Results

Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

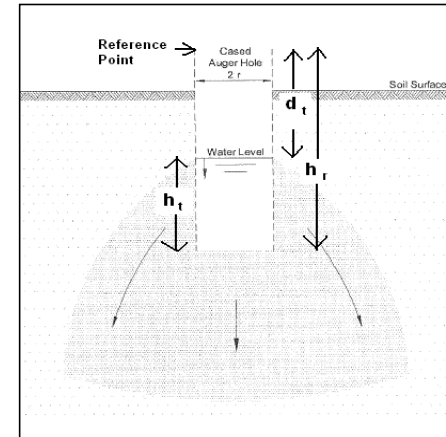
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel
Project: Proposed Residential S
Location: Driver Road, Darch
Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name: IT01	Parameter	Description	Value	Units
Test Depth: 0.74 m	K	Permeability		m/s
Material: Unit 1A - SAND	r	radius of test hole	0.044	m
Spreadsheet Legend	t	time since start of measurement		s
	h _r	reference point height above base	0.93	m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.35	0.58	2.6E-04	22.4
40	0.43	0.5	2.1E-04	18.0
60	0.47	0.46	1.7E-04	14.5
80	0.5	0.43	1.4E-04	12.4
100	0.53	0.4	1.3E-04	11.2
120	0.55	0.38	1.2E-04	10.1
140	0.57	0.36	1.1E-04	9.4
160	0.59	0.34	1.0E-04	8.8
180	0.605	0.325	9.6E-05	8.3
AVERAGE			1.5E-04	12.8

Test 2

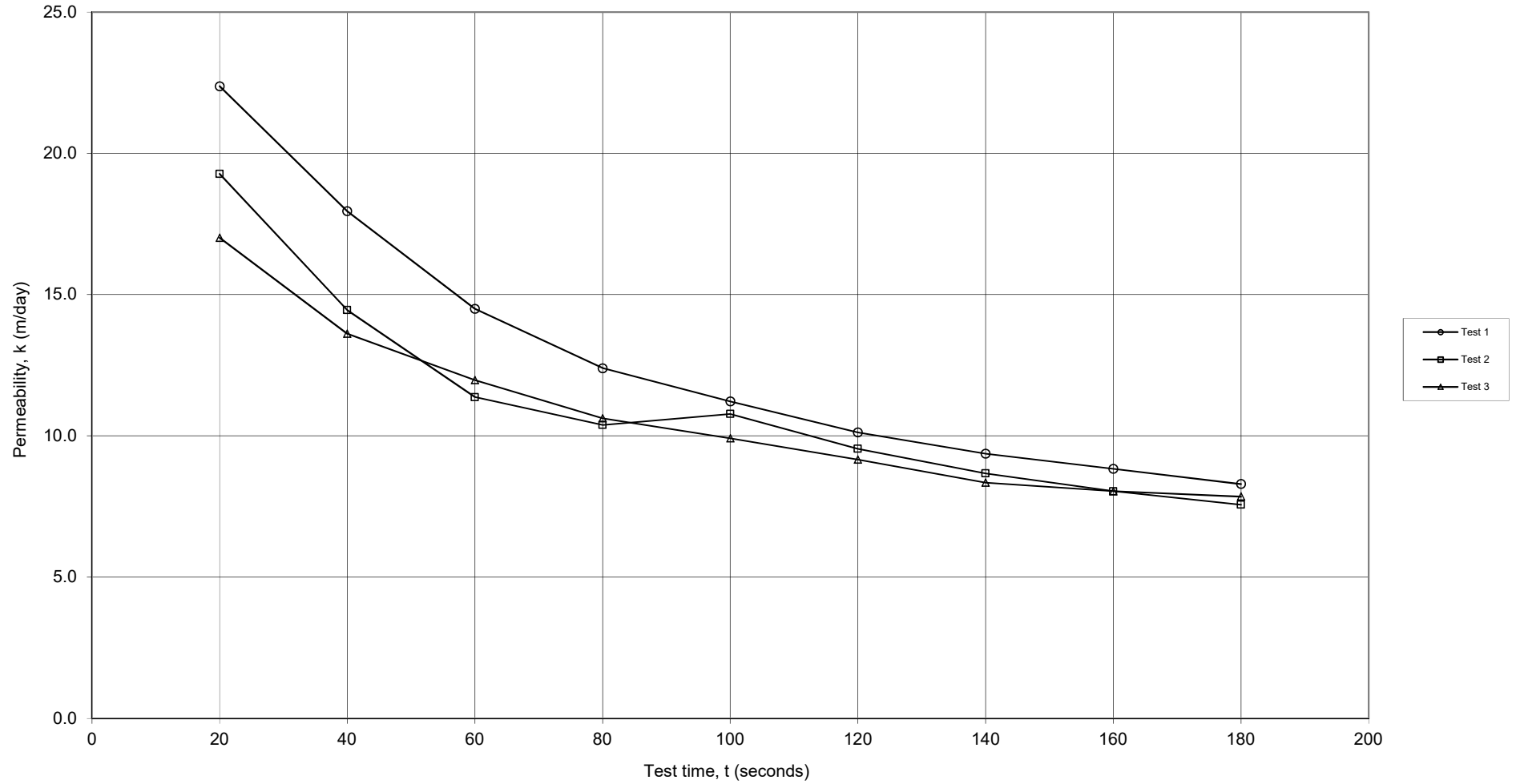
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.33	0.6	2.2E-04	19.3
40	0.39	0.54	1.7E-04	14.5
60	0.42	0.51	1.3E-04	11.4
80	0.46	0.47	1.2E-04	10.4
100	0.52	0.41	1.2E-04	10.8
120	0.535	0.395	1.1E-04	9.5
140	0.55	0.38	1.0E-04	8.7
160	0.565	0.365	9.3E-05	8.0
180	0.58	0.35	8.8E-05	7.6
AVERAGE			1.3E-04	11.1

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.315	0.615	2.0E-04	17.0
40	0.38	0.55	1.6E-04	13.6
60	0.43	0.5	1.4E-04	12.0
80	0.465	0.465	1.2E-04	10.6
100	0.5	0.43	1.1E-04	9.9
120	0.525	0.405	1.1E-04	9.2
140	0.54	0.39	9.7E-05	8.3
160	0.565	0.365	9.3E-05	8.0
180	0.59	0.34	9.1E-05	7.9
AVERAGE			1.2E-04	10.7

Permeability by Inverse Auger Hole Method

IT01



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

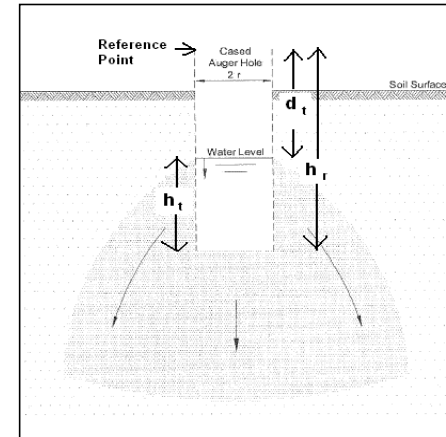
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT02	Parameter	Description	Value	Units
Test Depth:	0.62 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.455	0.475	2.8E-04	24.3
40	0.52	0.41	2.2E-04	18.8
60	0.565	0.365	1.9E-04	16.0
80	0.6	0.33	1.7E-04	14.3
100	0.625	0.305	1.5E-04	12.8
120	0.645	0.285	1.4E-04	11.7
140	0.66	0.27	1.2E-04	10.7
160	0.68	0.25	1.2E-04	10.2
180	0.69	0.24	1.1E-04	9.5
AVERAGE			1.6E-04	14.2

Test 2

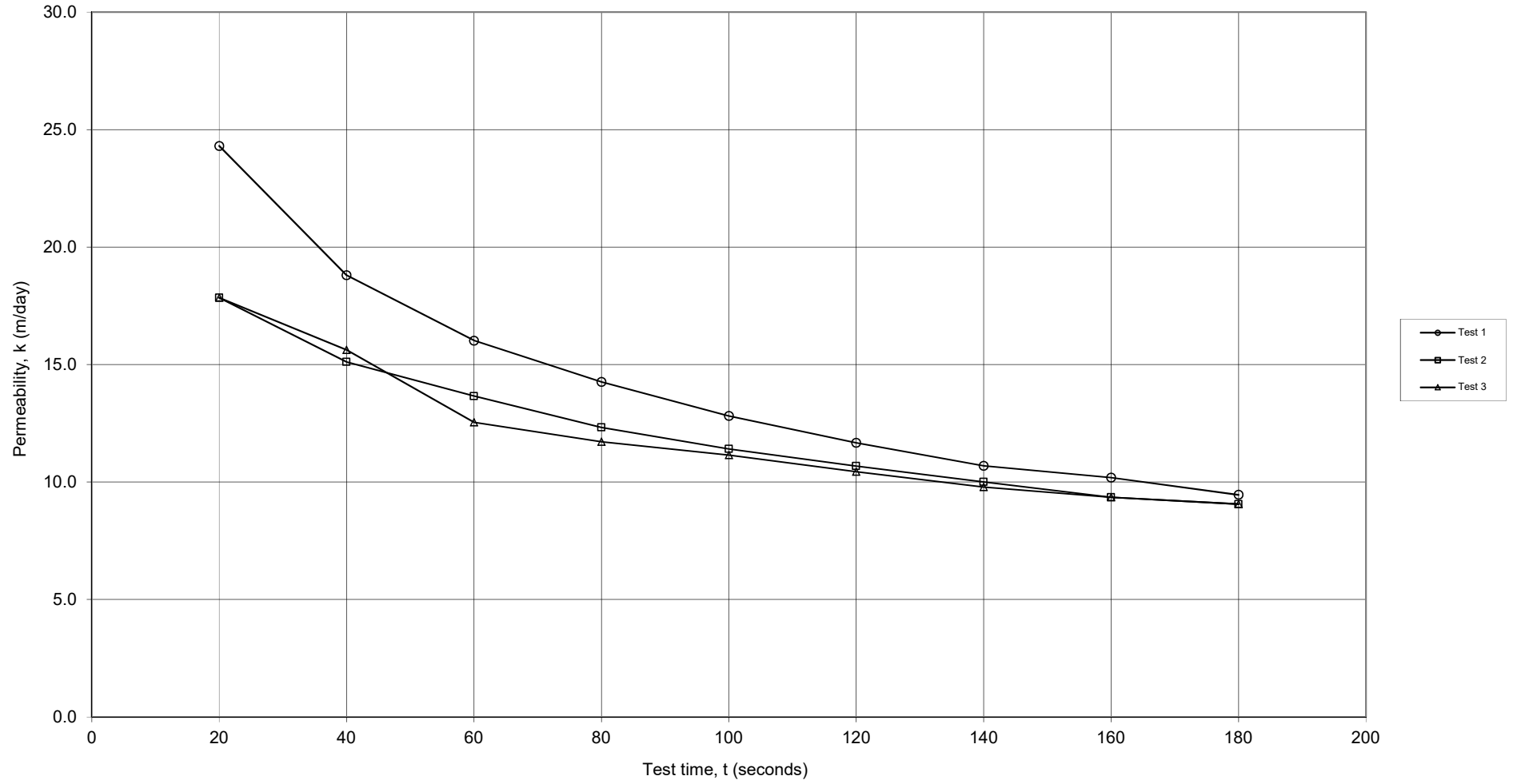
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.42	0.51	2.1E-04	17.8
40	0.485	0.445	1.7E-04	15.1
60	0.535	0.395	1.6E-04	13.7
80	0.57	0.36	1.4E-04	12.3
100	0.6	0.33	1.3E-04	11.4
120	0.625	0.305	1.2E-04	10.7
140	0.645	0.285	1.2E-04	10.0
160	0.66	0.27	1.1E-04	9.3
180	0.68	0.25	1.0E-04	9.1
AVERAGE			1.4E-04	12.2

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.42	0.51	2.1E-04	17.8
40	0.49	0.44	1.8E-04	15.6
60	0.52	0.41	1.5E-04	12.5
80	0.56	0.37	1.4E-04	11.7
100	0.595	0.335	1.3E-04	11.1
120	0.62	0.31	1.2E-04	10.4
140	0.64	0.29	1.1E-04	9.8
160	0.66	0.27	1.1E-04	9.3
180	0.68	0.25	1.0E-04	9.1
AVERAGE			1.4E-04	11.9

Permeability by Inverse Auger Hole Method

IT02



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

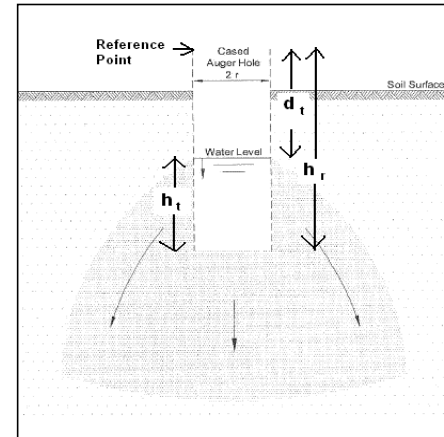
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT03	Parameter	Description	Value	Units
Test Depth:	0.76 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.42	0.51	4.2E-04	36.6
40	0.525	0.405	3.3E-04	28.7
60	0.595	0.335	2.9E-04	24.8
80	0.635	0.295	2.5E-04	21.4
100	0.67	0.26	2.2E-04	19.4
120	0.7	0.23	2.1E-04	17.9
140	0.73	0.2	2.0E-04	17.1
160	0.75	0.18	1.9E-04	16.1
180	0.765	0.165	1.7E-04	15.1
AVERAGE			2.5E-04	21.9

Test 2

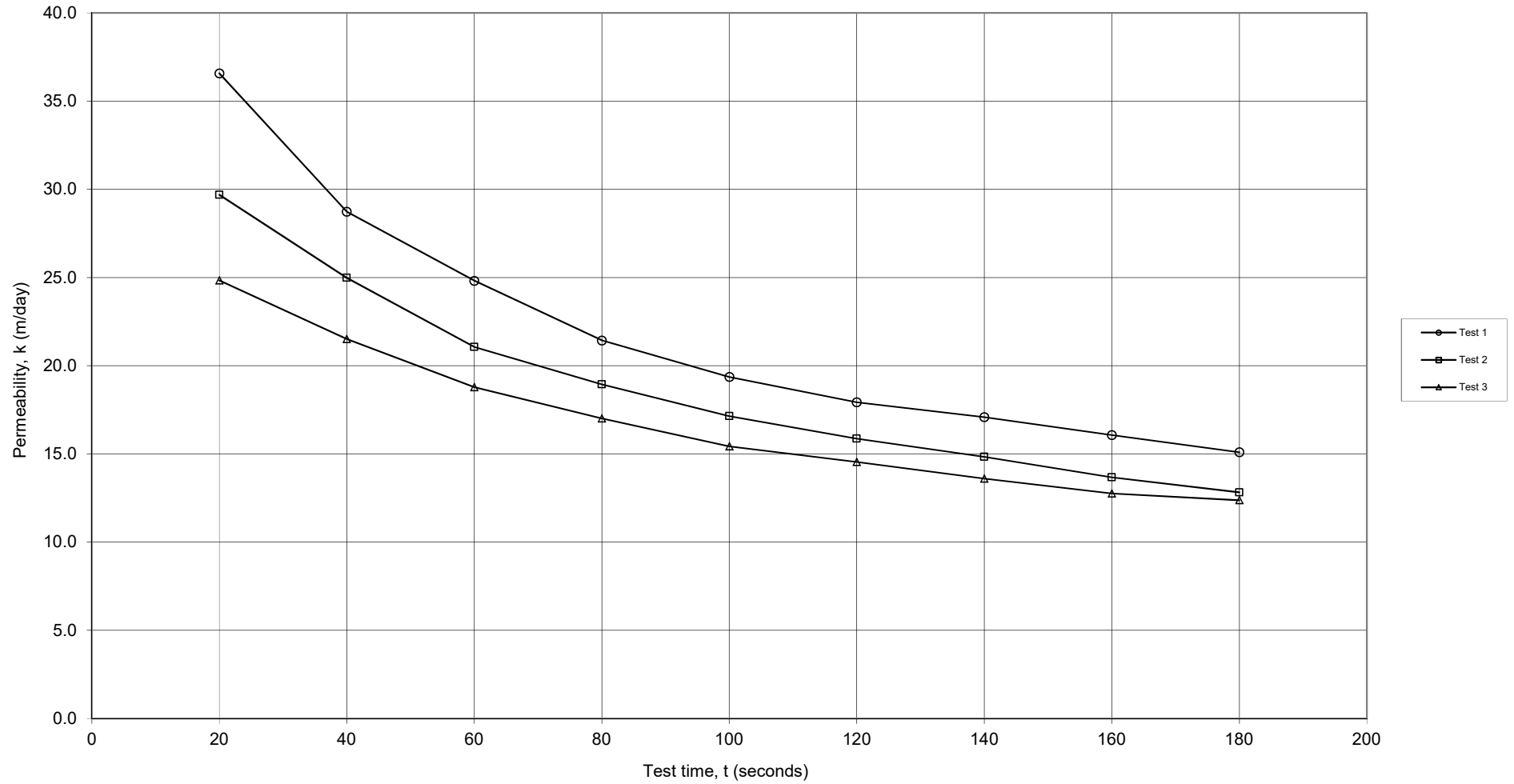
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.38	0.55	3.4E-04	29.7
40	0.49	0.44	2.9E-04	25.0
60	0.55	0.38	2.4E-04	21.1
80	0.6	0.33	2.2E-04	18.9
100	0.635	0.295	2.0E-04	17.1
120	0.665	0.265	1.8E-04	15.9
140	0.69	0.24	1.7E-04	14.8
160	0.705	0.225	1.6E-04	13.7
180	0.72	0.21	1.5E-04	12.8
AVERAGE			2.2E-04	18.8

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.35	0.58	2.9E-04	24.8
40	0.455	0.475	2.5E-04	21.5
60	0.52	0.41	2.2E-04	18.8
80	0.57	0.36	2.0E-04	17.0
100	0.605	0.325	1.8E-04	15.4
120	0.64	0.29	1.7E-04	14.5
140	0.665	0.265	1.6E-04	13.6
160	0.685	0.245	1.5E-04	12.8
180	0.71	0.22	1.4E-04	12.4
AVERAGE			1.9E-04	16.8

Permeability by Inverse Auger Hole Method

IT03



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

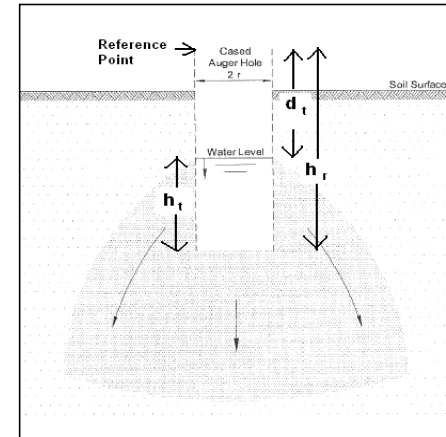
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT04	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.39	0.54	3.5E-04	30.1
40	0.475	0.455	2.6E-04	22.9
60	0.535	0.395	2.3E-04	19.5
80	0.58	0.35	2.0E-04	17.3
100	0.61	0.32	1.8E-04	15.5
120	0.64	0.29	1.7E-04	14.3
140	0.665	0.265	1.6E-04	13.4
160	0.68	0.25	1.4E-04	12.4
180	0.705	0.225	1.4E-04	12.0
AVERAGE			2.0E-04	17.5

Test 2

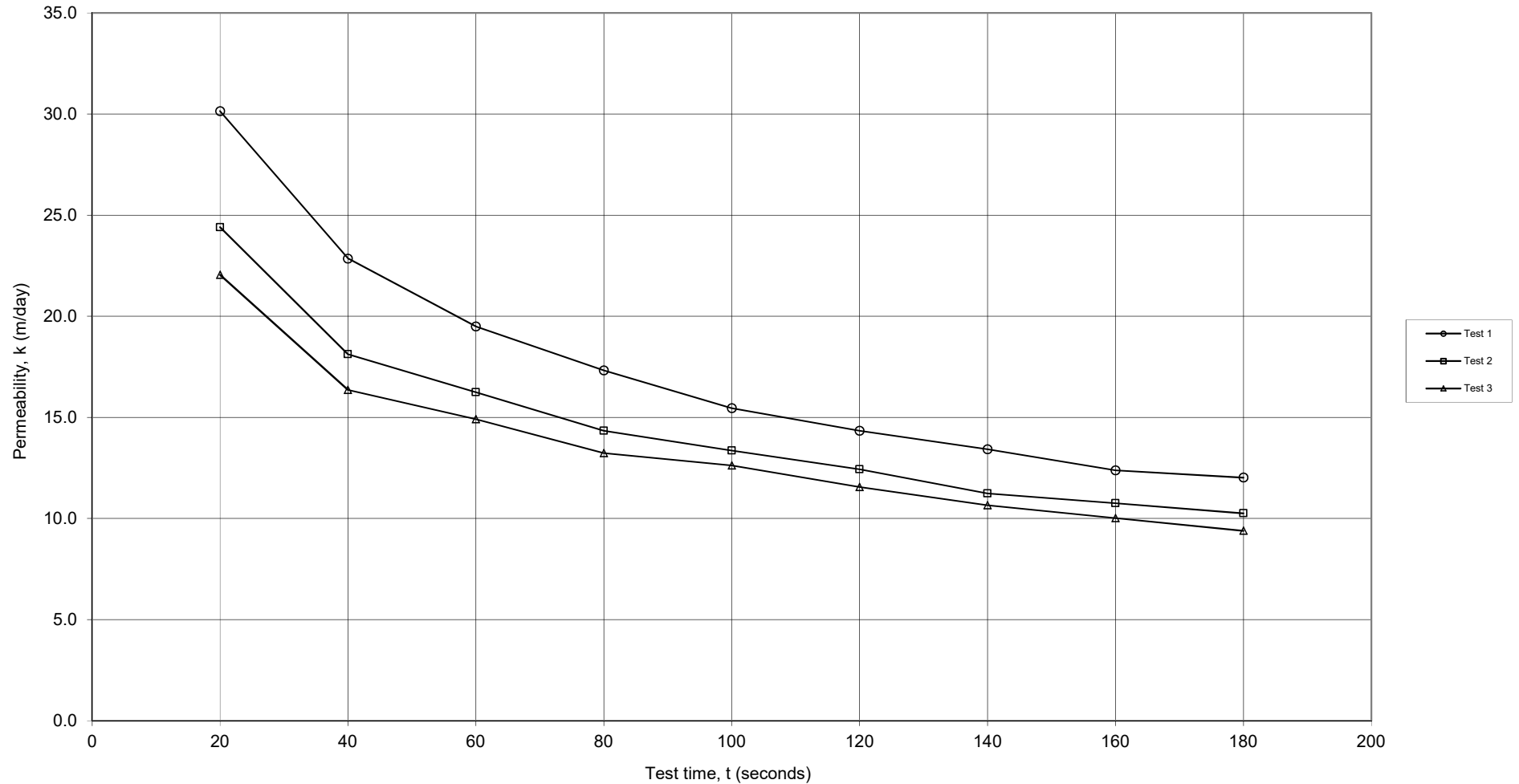
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.355	0.575	2.8E-04	24.4
40	0.425	0.505	2.1E-04	18.1
60	0.49	0.44	1.9E-04	16.2
80	0.53	0.4	1.7E-04	14.3
100	0.57	0.36	1.5E-04	13.4
120	0.6	0.33	1.4E-04	12.4
140	0.615	0.315	1.3E-04	11.2
160	0.64	0.29	1.2E-04	10.8
180	0.66	0.27	1.2E-04	10.3
AVERAGE			1.7E-04	14.6

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.34	0.59	2.6E-04	22.0
40	0.405	0.525	1.9E-04	16.4
60	0.47	0.46	1.7E-04	14.9
80	0.51	0.42	1.5E-04	13.2
100	0.555	0.375	1.5E-04	12.6
120	0.58	0.35	1.3E-04	11.6
140	0.6	0.33	1.2E-04	10.7
160	0.62	0.31	1.2E-04	10.0
180	0.635	0.295	1.1E-04	9.4
AVERAGE			1.6E-04	13.4

Permeability by Inverse Auger Hole Method

IT04



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

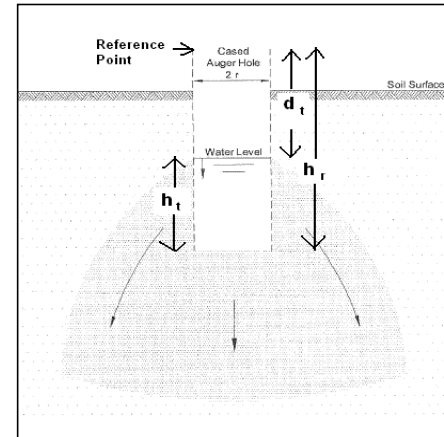
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT05	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
Required input		h_r	reference point height above base	0.93	m
Calculated field		d_t	depth from reference point to water at time t		m
Comment field		h_t	Water column height at time t		m
Field not used		h_0	h_t at t=0		m
Fixed field					



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.31	0.62	2.0E-04	17.5
40	0.38	0.55	1.6E-04	14.2
60	0.415	0.515	1.3E-04	11.5
80	0.44	0.49	1.1E-04	9.7
100	0.47	0.46	1.0E-04	8.9
120	0.495	0.435	9.6E-05	8.3
140	0.515	0.415	8.9E-05	7.7
160	0.535	0.395	8.5E-05	7.3
180	0.55	0.38	8.0E-05	6.9
AVERAGE			1.2E-04	10.2

Test 2

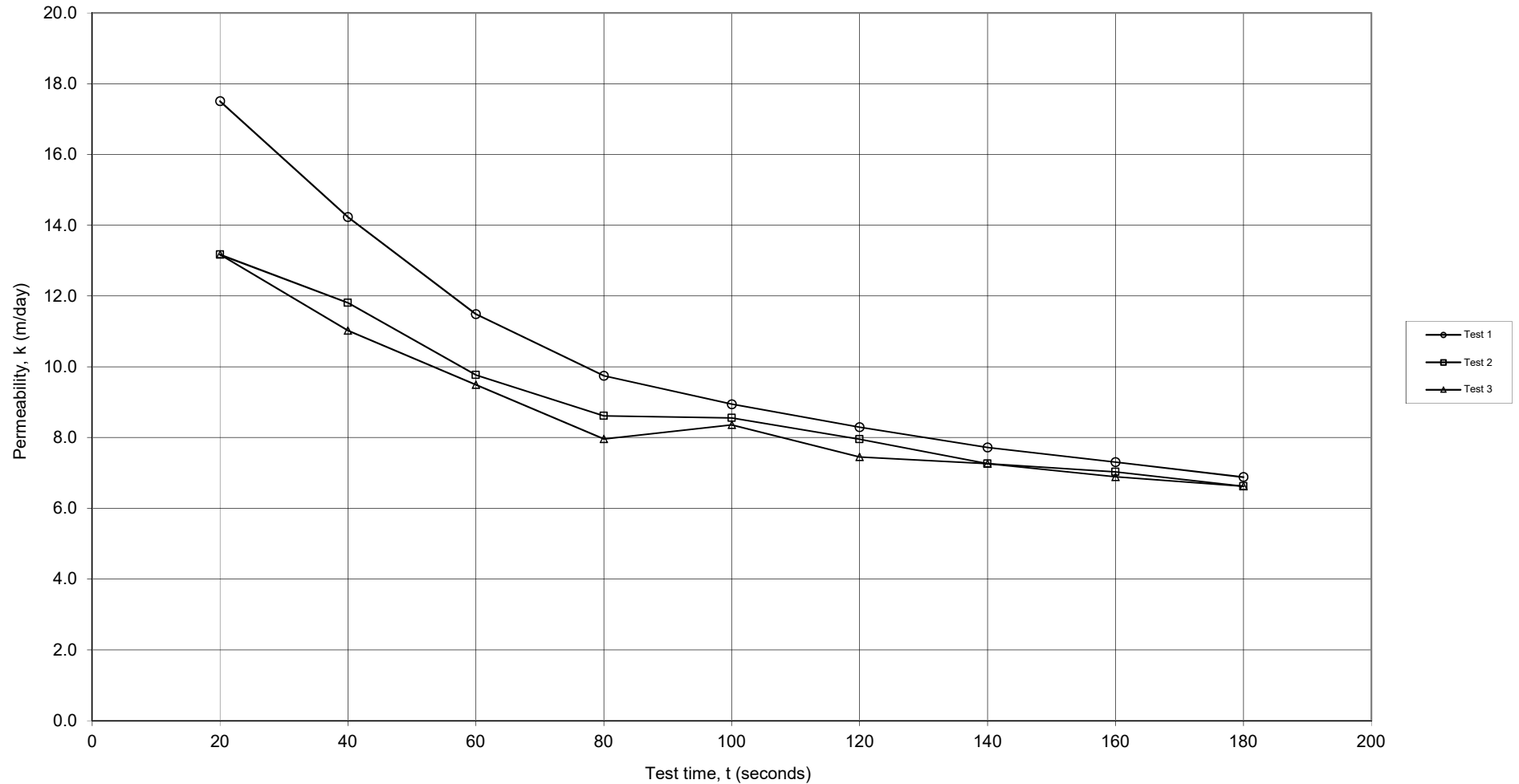
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.28	0.65	1.5E-04	13.2
40	0.35	0.58	1.4E-04	11.8
60	0.385	0.545	1.1E-04	9.8
80	0.415	0.515	1.0E-04	8.6
100	0.46	0.47	9.9E-05	8.6
120	0.485	0.445	9.2E-05	8.0
140	0.5	0.43	8.4E-05	7.3
160	0.525	0.405	8.1E-05	7.0
180	0.54	0.39	7.7E-05	6.6
AVERAGE			1.0E-04	9.0

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.28	0.65	1.5E-04	13.2
40	0.34	0.59	1.3E-04	11.0
60	0.38	0.55	1.1E-04	9.5
80	0.4	0.53	9.2E-05	8.0
100	0.455	0.475	9.7E-05	8.4
120	0.47	0.46	8.6E-05	7.5
140	0.5	0.43	8.4E-05	7.3
160	0.52	0.41	8.0E-05	6.9
180	0.54	0.39	7.7E-05	6.6
AVERAGE			1.0E-04	8.7

Permeability by Inverse Auger Hole Method

IT05



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

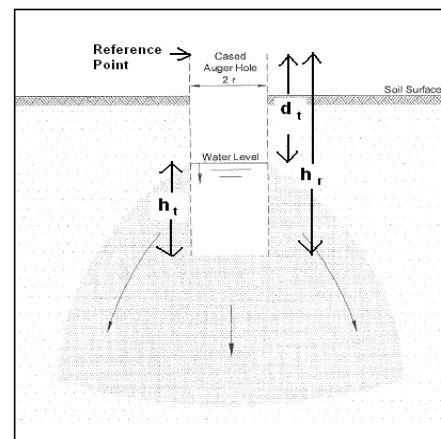
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No:	J1801113
Client:	Parcel
Project:	Proposed Residential S
Location:	Driver Road, Darch
Calc by:	PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT06	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h _r	reference point height above base	0.93	m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.375	0.555	3.1E-04	27.0
40	0.44	0.49	2.2E-04	19.2
60	0.51	0.42	2.0E-04	17.4
80	0.55	0.38	1.8E-04	15.3
100	0.575	0.355	1.6E-04	13.5
120	0.6	0.33	1.4E-04	12.3
140	0.62	0.31	1.3E-04	11.4
160	0.635	0.295	1.2E-04	10.5
180	0.65	0.28	1.1E-04	9.8
AVERAGE			1.8E-04	15.2

Test 2

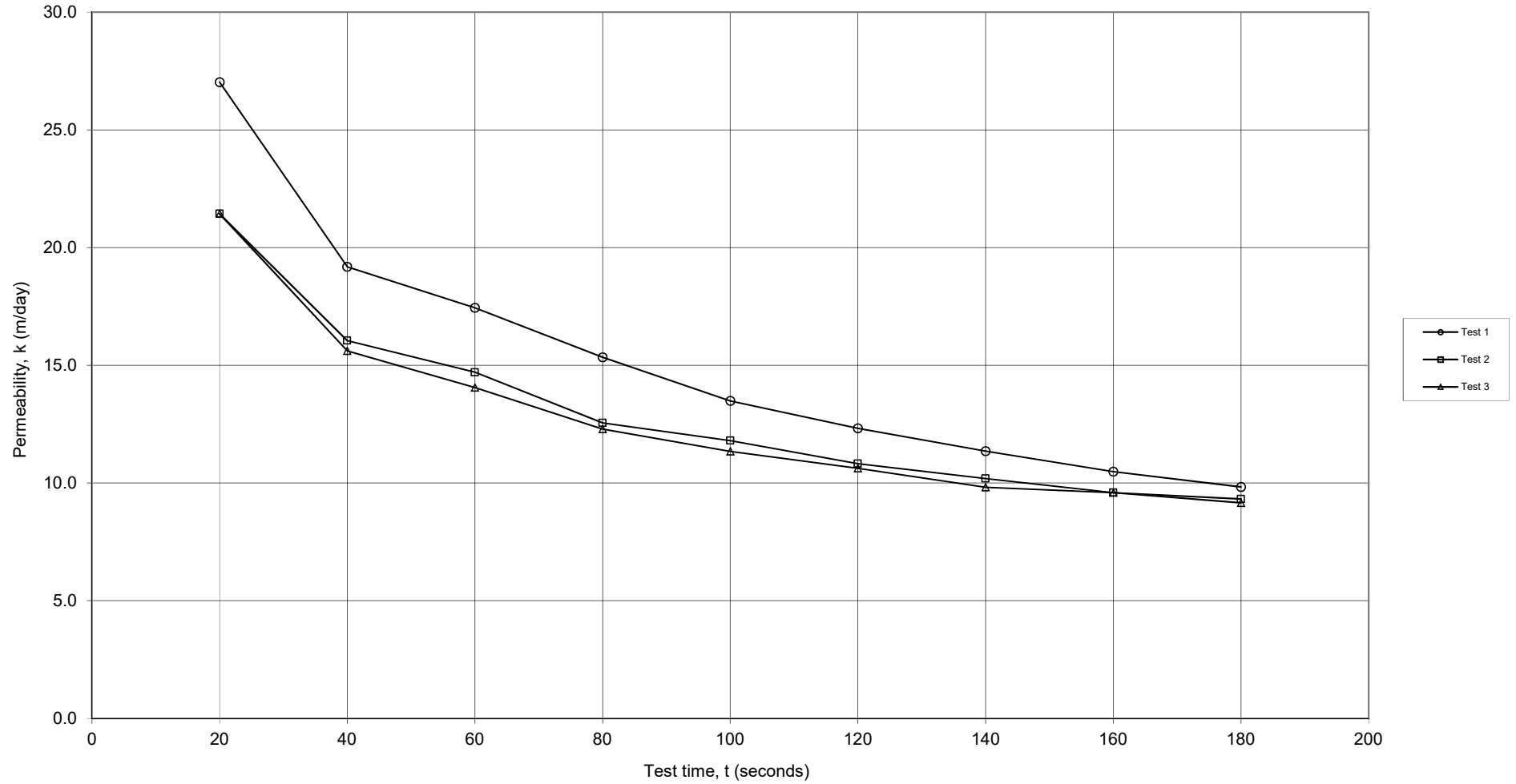
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.34	0.59	2.5E-04	21.4
40	0.405	0.525	1.9E-04	16.0
60	0.47	0.46	1.7E-04	14.7
80	0.5	0.43	1.5E-04	12.6
100	0.54	0.39	1.4E-04	11.8
120	0.565	0.365	1.3E-04	10.8
140	0.59	0.34	1.2E-04	10.2
160	0.61	0.32	1.1E-04	9.6
180	0.635	0.295	1.1E-04	9.3
AVERAGE			1.5E-04	12.9

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.34	0.59	2.5E-04	21.4
40	0.4	0.53	1.8E-04	15.6
60	0.46	0.47	1.6E-04	14.1
80	0.495	0.435	1.4E-04	12.3
100	0.53	0.4	1.3E-04	11.3
120	0.56	0.37	1.2E-04	10.6
140	0.58	0.35	1.1E-04	9.8
160	0.61	0.32	1.1E-04	9.6
180	0.63	0.3	1.1E-04	9.2
AVERAGE			1.5E-04	12.7

Permeability by Inverse Auger Hole Method

IT06



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

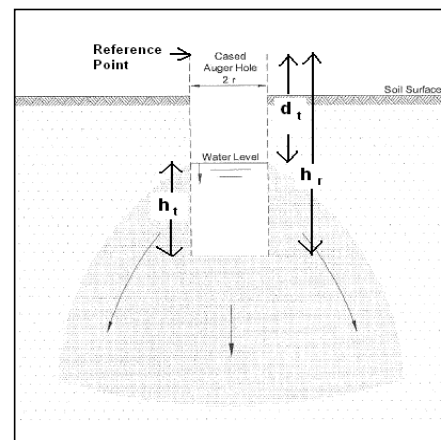
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT07	Parameter	Description	Value	Units
Test Depth:	0.60 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
Required input		h_r	reference point height above base	0.93	m
Calculated field		d_t	depth from reference point to water at time t		m
Comment field		h_t	Water column height at time t		m
Field not used		h_0	h_t at t=0		m
Fixed field					



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.47	0.46	2.8E-04	24.2
40	0.53	0.4	2.1E-04	18.4
60	0.57	0.36	1.8E-04	15.4
80	0.605	0.325	1.6E-04	13.9
100	0.62	0.31	1.4E-04	11.9
120	0.635	0.295	1.2E-04	10.7
140	0.645	0.285	1.1E-04	9.6
160	0.66	0.27	1.0E-04	9.0
180	0.68	0.25	1.0E-04	8.7
AVERAGE			1.6E-04	13.5

Test 2

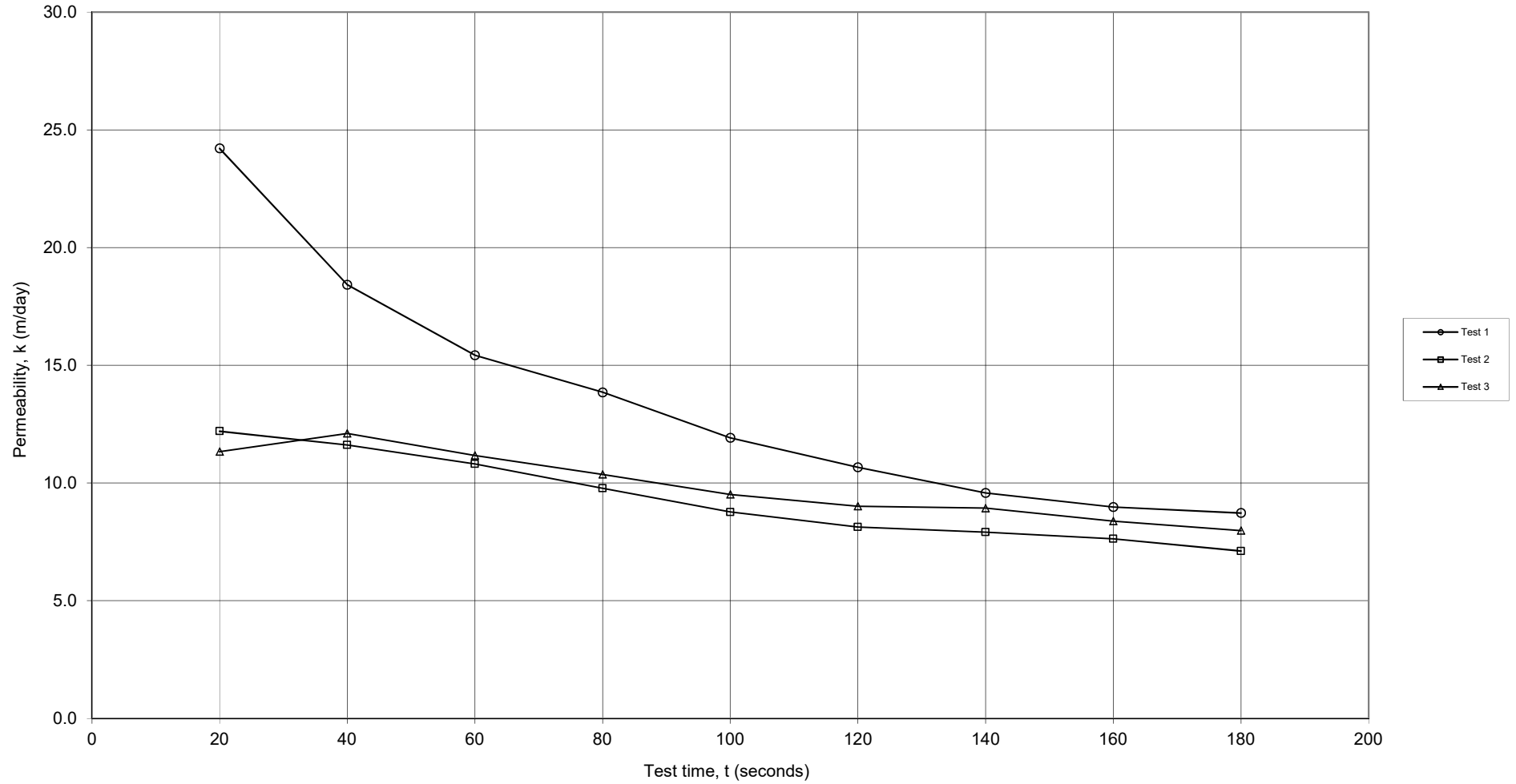
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.405	0.525	1.4E-04	12.2
40	0.465	0.465	1.3E-04	11.6
60	0.51	0.42	1.3E-04	10.8
80	0.54	0.39	1.1E-04	9.8
100	0.56	0.37	1.0E-04	8.8
120	0.58	0.35	9.4E-05	8.1
140	0.605	0.325	9.2E-05	7.9
160	0.625	0.305	8.8E-05	7.6
180	0.635	0.295	8.2E-05	7.1
AVERAGE			1.1E-04	9.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.4	0.53	1.3E-04	11.3
40	0.47	0.46	1.4E-04	12.1
60	0.515	0.415	1.3E-04	11.2
80	0.55	0.38	1.2E-04	10.4
100	0.575	0.355	1.1E-04	9.5
120	0.6	0.33	1.0E-04	9.0
140	0.63	0.3	1.0E-04	8.9
160	0.645	0.285	9.7E-05	8.4
180	0.66	0.27	9.2E-05	8.0
AVERAGE			1.1E-04	9.9

Permeability by Inverse Auger Hole Method

IT07



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

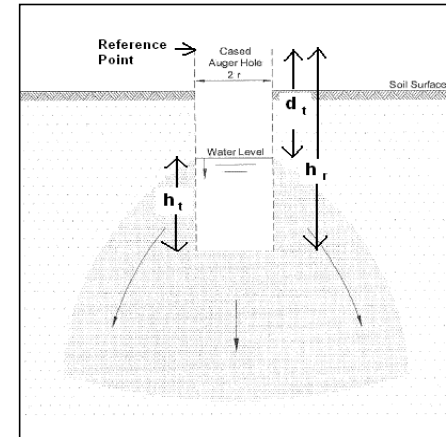
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT08	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.35	0.58	2.7E-04	23.0
40	0.41	0.52	1.9E-04	16.5
60	0.47	0.46	1.7E-04	14.7
80	0.505	0.425	1.5E-04	12.8
100	0.54	0.39	1.4E-04	11.8
120	0.565	0.365	1.3E-04	10.8
140	0.58	0.35	1.1E-04	9.8
160	0.6	0.33	1.1E-04	9.2
180	0.61	0.32	9.9E-05	8.5
AVERAGE			1.5E-04	13.0

Test 2

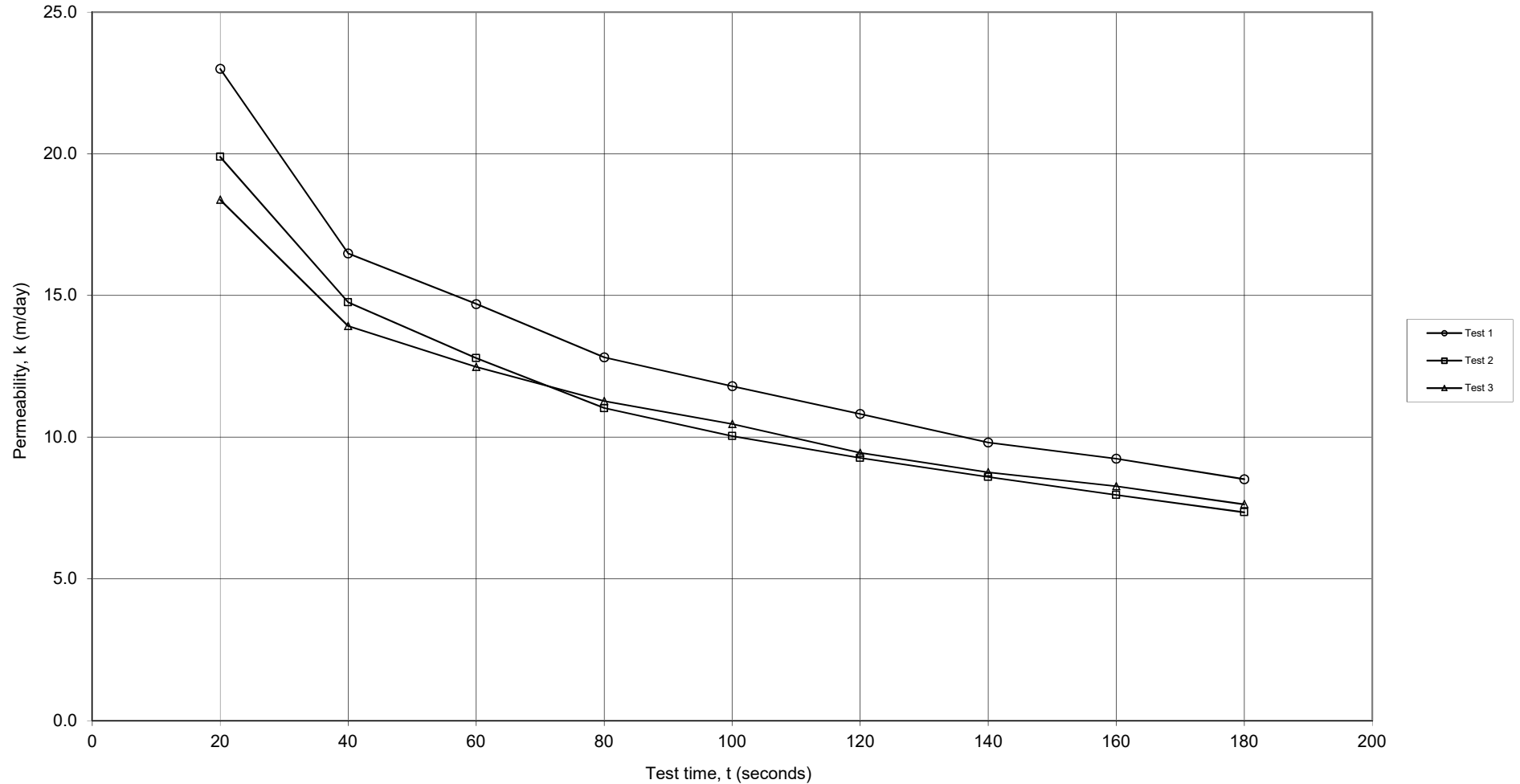
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.33	0.6	2.3E-04	19.9
40	0.39	0.54	1.7E-04	14.8
60	0.44	0.49	1.5E-04	12.8
80	0.47	0.46	1.3E-04	11.0
100	0.5	0.43	1.2E-04	10.0
120	0.525	0.405	1.1E-04	9.3
140	0.545	0.385	9.9E-05	8.6
160	0.56	0.37	9.2E-05	8.0
180	0.57	0.36	8.5E-05	7.4
AVERAGE			1.3E-04	11.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.32	0.61	2.1E-04	18.4
40	0.38	0.55	1.6E-04	13.9
60	0.435	0.495	1.4E-04	12.5
80	0.475	0.455	1.3E-04	11.3
100	0.51	0.42	1.2E-04	10.5
120	0.53	0.4	1.1E-04	9.5
140	0.55	0.38	1.0E-04	8.8
160	0.57	0.36	9.6E-05	8.3
180	0.58	0.35	8.8E-05	7.6
AVERAGE			1.3E-04	11.2

Permeability by Inverse Auger Hole Method

IT08



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

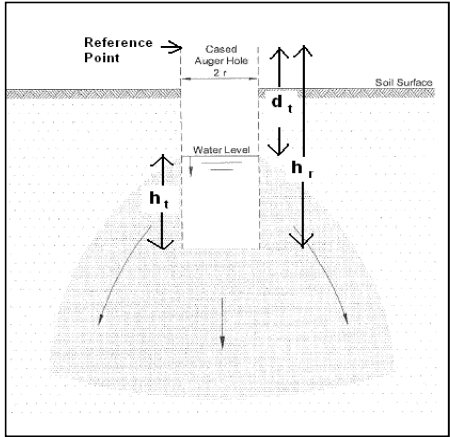
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT09	Parameter	Description	Value	Units
Test Depth:	0.72 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h _r	reference point height above base	0.93	m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.39	0.54	3.1E-04	26.4
40	0.45	0.48	2.1E-04	18.5
60	0.475	0.455	1.6E-04	14.0
80	0.495	0.435	1.3E-04	11.5
100	0.525	0.405	1.2E-04	10.5
120	0.55	0.38	1.1E-04	9.7
140	0.57	0.36	1.0E-04	9.0
160	0.58	0.35	9.5E-05	8.2
180	0.59	0.34	8.8E-05	7.6
AVERAGE			1.5E-04	12.8

Test 2

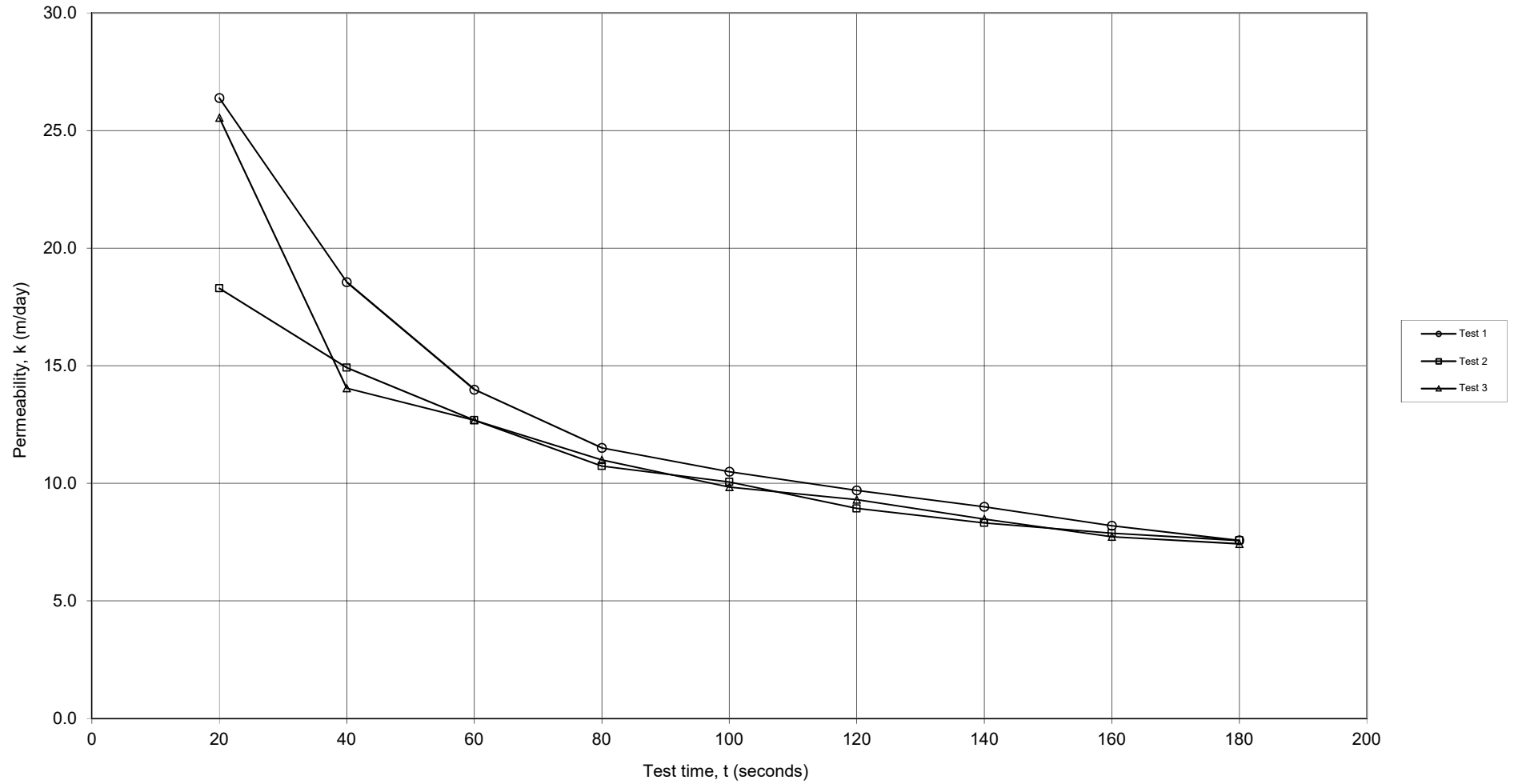
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.34	0.59	2.1E-04	18.3
40	0.41	0.52	1.7E-04	14.9
60	0.455	0.475	1.5E-04	12.7
80	0.48	0.45	1.2E-04	10.7
100	0.515	0.415	1.2E-04	10.1
120	0.53	0.4	1.0E-04	8.9
140	0.55	0.38	9.6E-05	8.3
160	0.57	0.36	9.1E-05	7.9
180	0.59	0.34	8.8E-05	7.6
AVERAGE			1.3E-04	11.0

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.385	0.545	3.0E-04	25.5
40	0.4	0.53	1.6E-04	14.0
60	0.455	0.475	1.5E-04	12.7
80	0.485	0.445	1.3E-04	11.0
100	0.51	0.42	1.1E-04	9.8
120	0.54	0.39	1.1E-04	9.3
140	0.555	0.375	9.8E-05	8.5
160	0.565	0.365	8.9E-05	7.7
180	0.585	0.345	8.6E-05	7.4
AVERAGE			1.4E-04	11.8

Permeability by Inverse Auger Hole Method

IT09



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

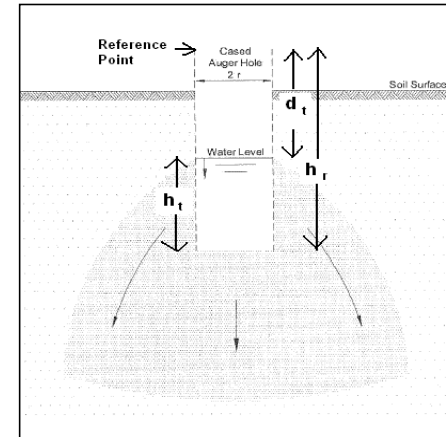
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT10	Parameter	Description	Value	Units
Test Depth:	0.71 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.28	0.65	9.4E-05	8.1
40	0.335	0.595	9.4E-05	8.1
60	0.375	0.555	8.7E-05	7.5
80	0.405	0.525	8.0E-05	6.9
100	0.425	0.505	7.2E-05	6.2
120	0.445	0.485	6.7E-05	5.8
140	0.46	0.47	6.2E-05	5.4
160	0.48	0.45	6.0E-05	5.2
180	0.495	0.435	5.8E-05	5.0
AVERAGE			7.5E-05	6.5

Test 2

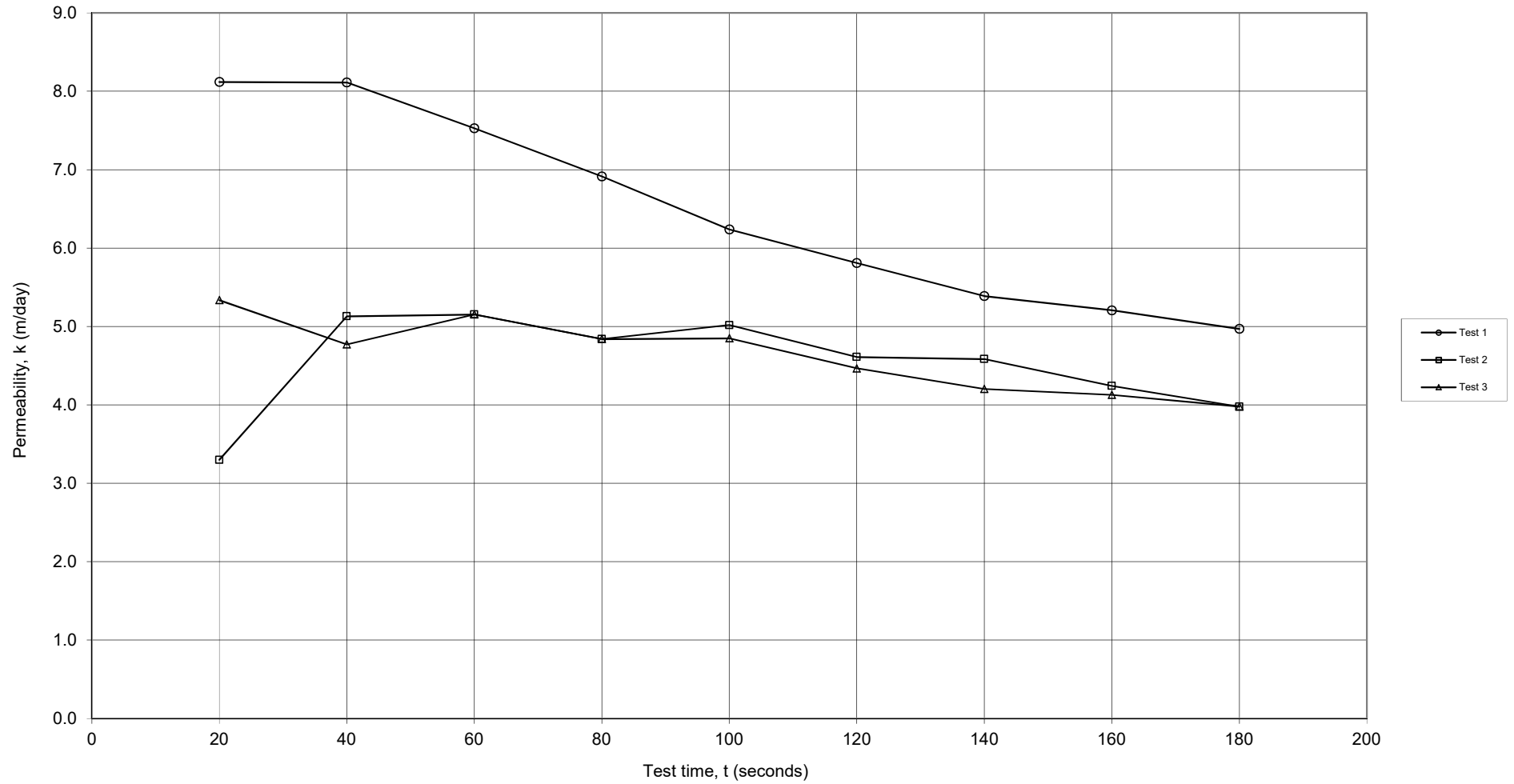
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.245	0.685	3.8E-05	3.3
40	0.295	0.635	5.9E-05	5.1
60	0.33	0.6	6.0E-05	5.2
80	0.355	0.575	5.6E-05	4.8
100	0.39	0.54	5.8E-05	5.0
120	0.405	0.525	5.3E-05	4.6
140	0.43	0.5	5.3E-05	4.6
160	0.44	0.49	4.9E-05	4.2
180	0.45	0.48	4.6E-05	4.0
AVERAGE			5.3E-05	4.5

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.26	0.67	6.2E-05	5.3
40	0.29	0.64	5.5E-05	4.8
60	0.33	0.6	6.0E-05	5.2
80	0.355	0.575	5.6E-05	4.8
100	0.385	0.545	5.6E-05	4.8
120	0.4	0.53	5.2E-05	4.5
140	0.415	0.515	4.9E-05	4.2
160	0.435	0.495	4.8E-05	4.1
180	0.45	0.48	4.6E-05	4.0
AVERAGE			5.4E-05	4.6

Permeability by Inverse Auger Hole Method

IT10



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

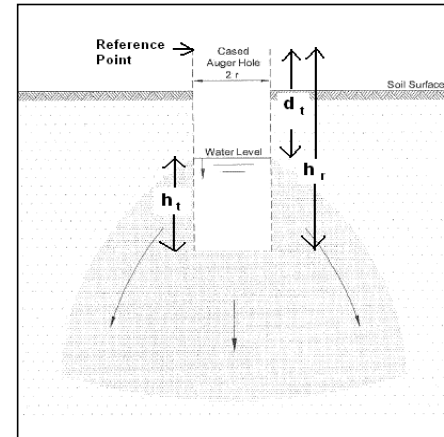
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT11	Parameter	Description	Value	Units
Test Depth:	0.84 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	1.12	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.43	0.69		
20	0.57	0.55	2.4E-04	20.8
40	0.63	0.49	1.8E-04	15.7
60	0.68	0.44	1.6E-04	13.7
80	0.7	0.42	1.3E-04	11.3
100	0.72	0.4	1.1E-04	9.9
120	0.74	0.38	1.0E-04	9.0
140	0.755	0.365	9.6E-05	8.3
160	0.77	0.35	8.9E-05	7.7
180	0.785	0.335	8.4E-05	7.3
AVERAGE			1.3E-04	11.5

Test 2

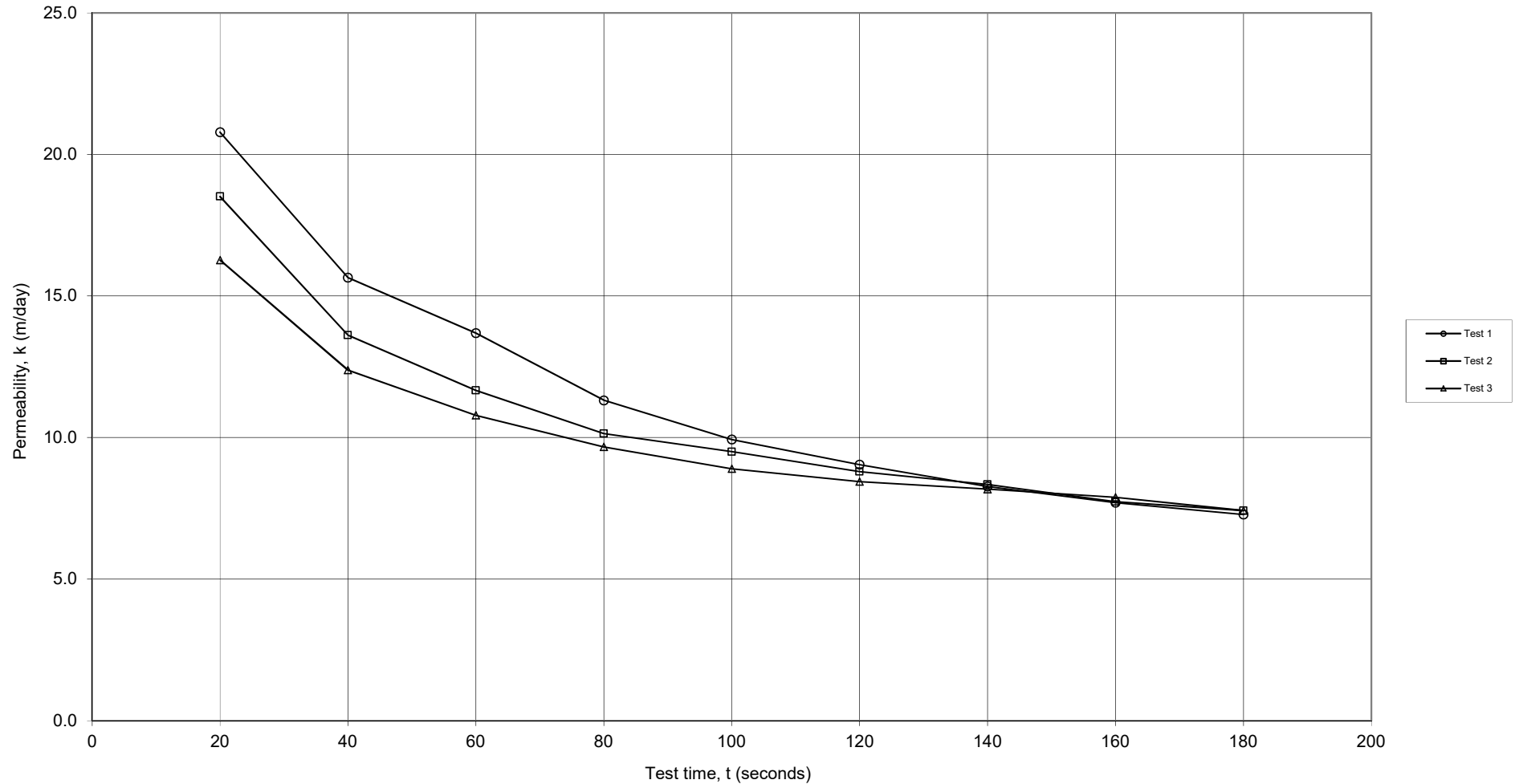
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.515	0.605	2.1E-04	18.5
40	0.57	0.55	1.6E-04	13.6
60	0.615	0.505	1.4E-04	11.7
80	0.645	0.475	1.2E-04	10.1
100	0.68	0.44	1.1E-04	9.5
120	0.705	0.415	1.0E-04	8.8
140	0.73	0.39	9.7E-05	8.3
160	0.745	0.375	9.0E-05	7.7
180	0.765	0.355	8.6E-05	7.4
AVERAGE			1.2E-04	10.6

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.5	0.62	1.9E-04	16.3
40	0.555	0.565	1.4E-04	12.4
60	0.6	0.52	1.2E-04	10.8
80	0.635	0.485	1.1E-04	9.7
100	0.665	0.455	1.0E-04	8.9
120	0.695	0.425	9.8E-05	8.4
140	0.725	0.395	9.5E-05	8.2
160	0.75	0.37	9.1E-05	7.9
180	0.765	0.355	8.6E-05	7.4
AVERAGE			1.2E-04	10.0

Permeability by Inverse Auger Hole Method

IT11



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

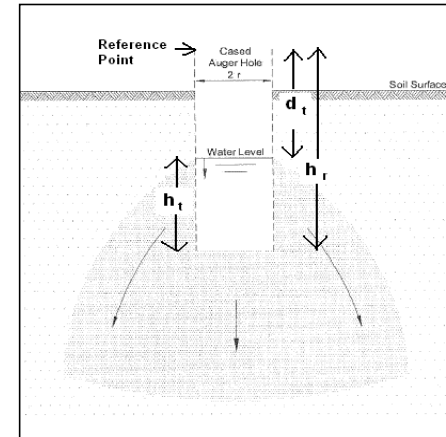
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT12	Parameter	Description	Value	Units
Test Depth:	0.79 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	1.12	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.36	0.76		
20	0.53	0.59	2.7E-04	23.3
40	0.59	0.53	1.9E-04	16.5
60	0.64	0.48	1.6E-04	14.0
80	0.69	0.43	1.5E-04	13.0
100	0.73	0.39	1.4E-04	12.2
120	0.76	0.36	1.3E-04	11.3
140	0.79	0.33	1.3E-04	10.8
160	0.81	0.31	1.2E-04	10.2
180	0.82	0.3	1.1E-04	9.4
AVERAGE			1.6E-04	13.4

Test 2

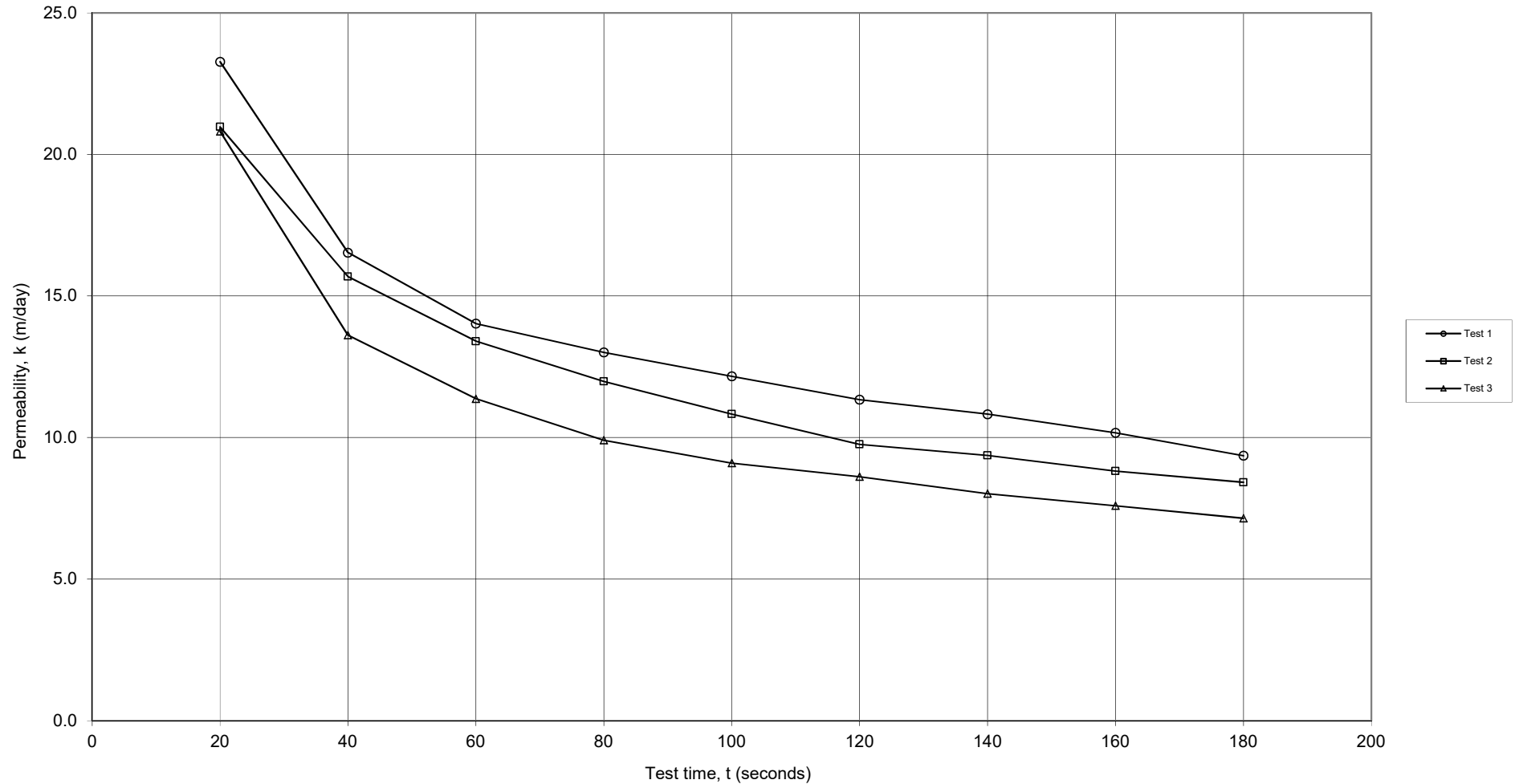
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.36	0.76		
20	0.515	0.605	2.4E-04	21.0
40	0.58	0.54	1.8E-04	15.7
60	0.63	0.49	1.6E-04	13.4
80	0.67	0.45	1.4E-04	12.0
100	0.7	0.42	1.3E-04	10.8
120	0.72	0.4	1.1E-04	9.8
140	0.75	0.37	1.1E-04	9.4
160	0.77	0.35	1.0E-04	8.8
180	0.79	0.33	9.7E-05	8.4
AVERAGE			1.4E-04	12.1

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.53	0.59	2.4E-04	20.8
40	0.57	0.55	1.6E-04	13.6
60	0.61	0.51	1.3E-04	11.4
80	0.64	0.48	1.1E-04	9.9
100	0.67	0.45	1.1E-04	9.1
120	0.7	0.42	1.0E-04	8.6
140	0.72	0.4	9.3E-05	8.0
160	0.74	0.38	8.8E-05	7.6
180	0.755	0.365	8.3E-05	7.1
AVERAGE			1.2E-04	10.7

Permeability by Inverse Auger Hole Method

IT12



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

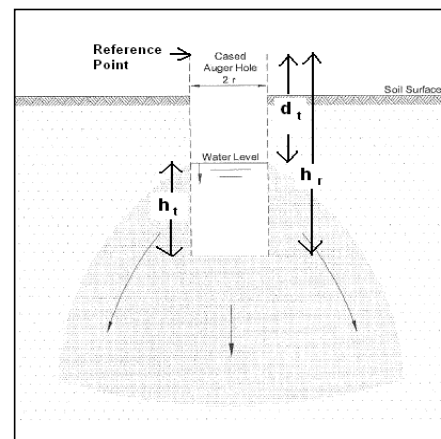
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT13	Parameter	Description	Value	Units
Test Depth:	0.74 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	1.12	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.48	0.64	1.5E-04	13.4
40	0.55	0.57	1.4E-04	12.0
60	0.585	0.535	1.1E-04	9.9
80	0.605	0.515	9.6E-05	8.3
100	0.63	0.49	8.7E-05	7.5
120	0.65	0.47	8.0E-05	6.9
140	0.67	0.45	7.5E-05	6.5
160	0.69	0.43	7.2E-05	6.2
180	0.705	0.415	6.8E-05	5.9
AVERAGE			9.8E-05	8.5

Test 2

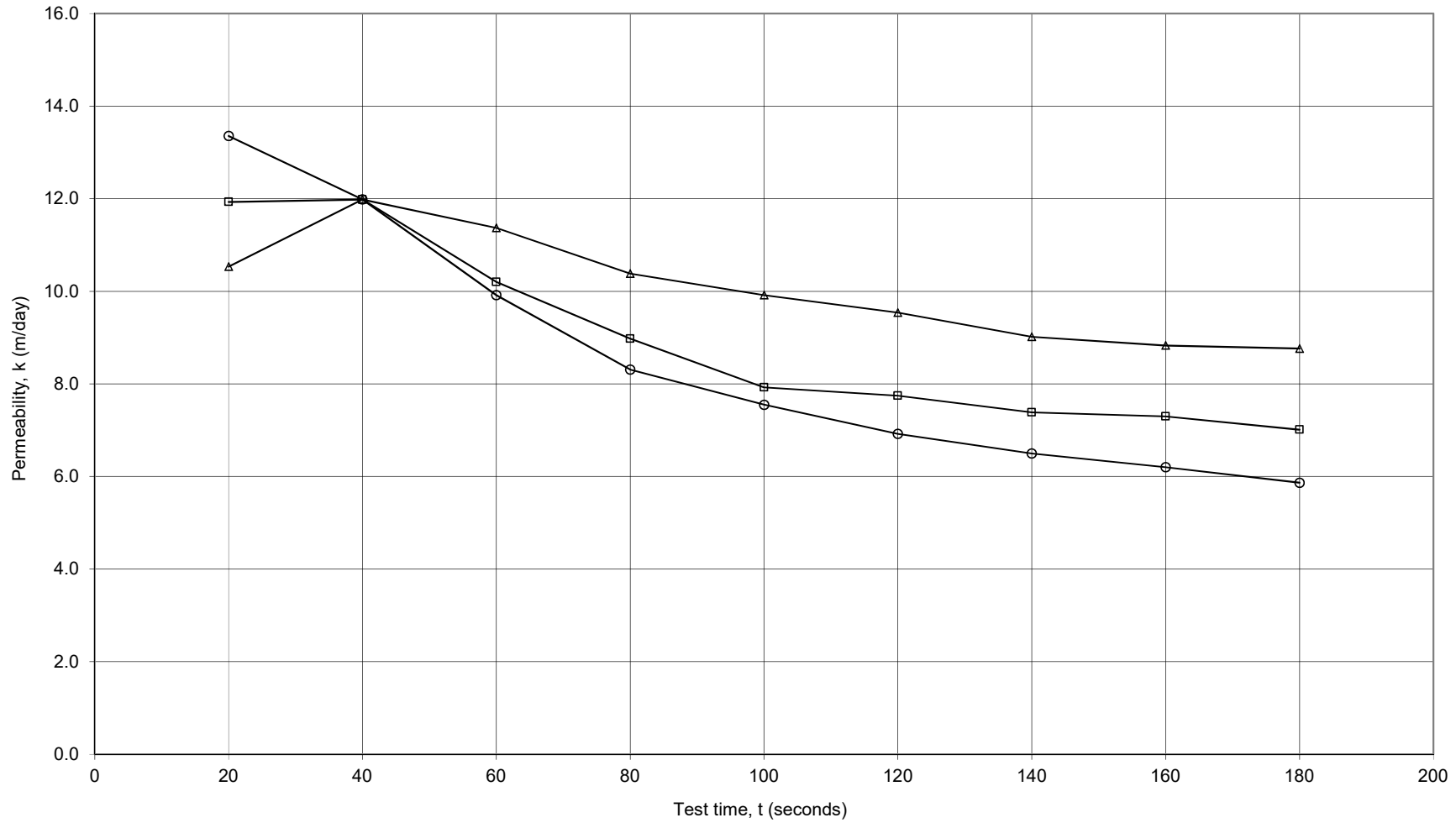
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.47	0.65	1.4E-04	11.9
40	0.55	0.57	1.4E-04	12.0
60	0.59	0.53	1.2E-04	10.2
80	0.62	0.5	1.0E-04	9.0
100	0.64	0.48	9.2E-05	7.9
120	0.675	0.445	9.0E-05	7.7
140	0.7	0.42	8.5E-05	7.4
160	0.73	0.39	8.4E-05	7.3
180	0.75	0.37	8.1E-05	7.0
AVERAGE			1.0E-04	8.9

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.46	0.66	1.2E-04	10.5
40	0.55	0.57	1.4E-04	12.0
60	0.61	0.51	1.3E-04	11.4
80	0.65	0.47	1.2E-04	10.4
100	0.69	0.43	1.1E-04	9.9
120	0.725	0.395	1.1E-04	9.5
140	0.75	0.37	1.0E-04	9.0
160	0.78	0.34	1.0E-04	8.8
180	0.81	0.31	1.0E-04	8.8
AVERAGE			1.2E-04	10.0

Permeability by Inverse Auger Hole Method

IT13



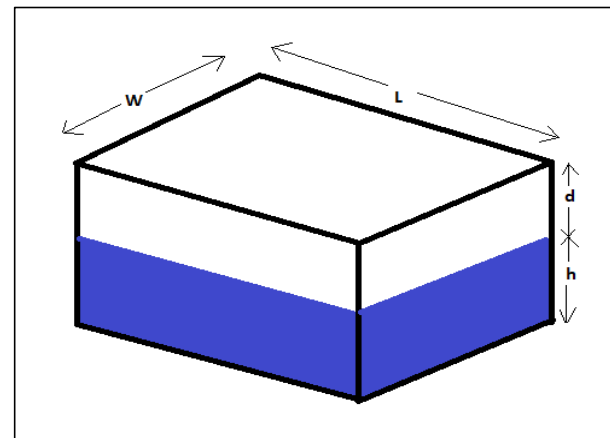
Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT14	Parameter	Description	Value	Units
Test Depth: 1.80 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.2	m
	w	Width of test pit (in test zone)	1.5	m
	r	equivalent radius of test hole	1.02	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field



Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.56		
1140		0.24	1.6E-04	13.7
AVERAGE			1.6E-04	13.7

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

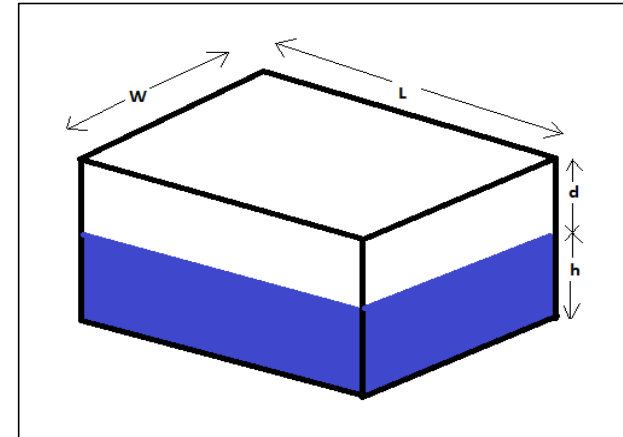
Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT15	Parameter	Description	Value	Units
Test Depth: 2.10 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.6	m
	w	Width of test pit (in test zone)	1.2	m
	r	equivalent radius of test hole	1.00	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.46	5.7E-05	4.9
AVERAGE			5.7E-05	4.9

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel Property
Project: SI Driver Road
Location: Darch
Calc by: ORW

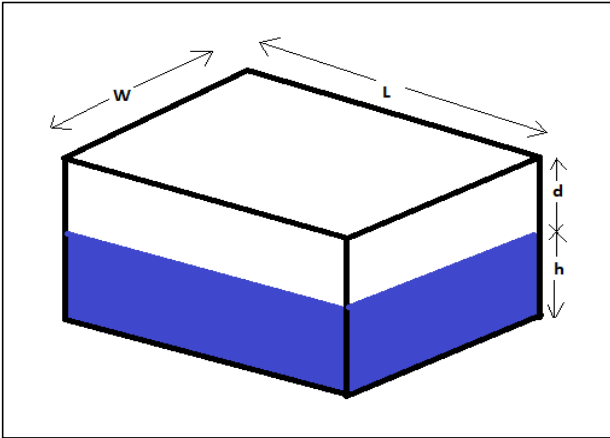
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name: IT16	Parameter	Description	Value	Units
Test Depth: 1.90 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.4	m
	w	Width of test pit (in test zone)	1.4	m
	r	equivalent radius of test hole	1.03	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.48	4.9E-05	4.2
AVERAGE			4.9E-05	4.2

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel Property
Project: SI Driver Road
Location: Darch
Calc by: ORW

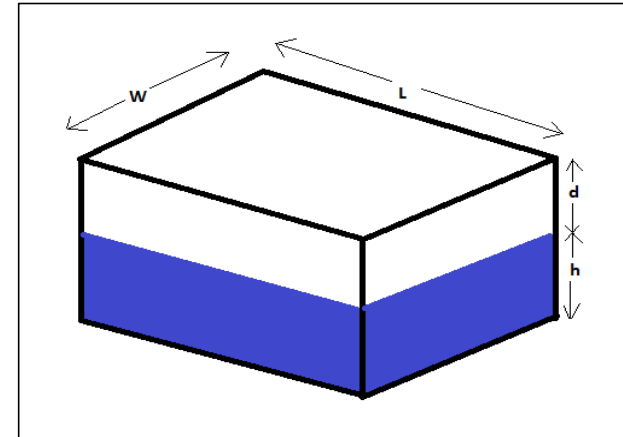
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name: IT17	Parameter	Description	Value	Units
Test Depth: 1.40 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.1	m
	w	Width of test pit (in test zone)	1.5	m
	r	equivalent radius of test hole	1.00	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.22		
420		0	4.3E-04	37.5
AVERAGE			4.3E-04	37.5

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel Property
 Project: SI Driver Road
 Location: Darch
 Calc by: ORW

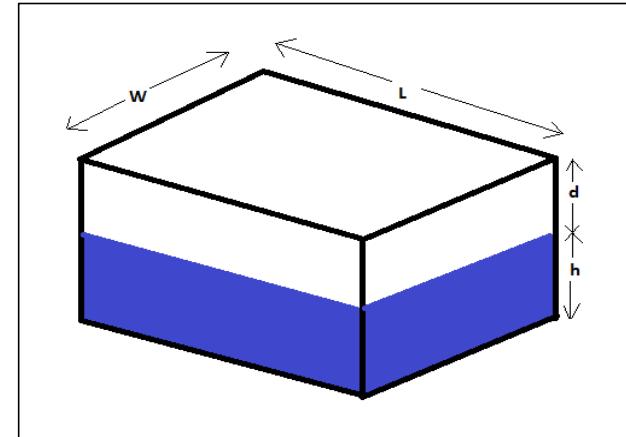
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name:	IT18	Parameter	Description	Value	Units
Test Depth:	1.70 m	K	Hydraulic Conductivity		m/s
Material:	Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.3	m
		w	Width of test pit (in test zone)	1.6	m
		r	equivalent radius of test hole	1.08	m
		t	time since start of measurement		s
		h _r	reference point height above base		m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.32		
900		0.11	1.7E-04	14.5
AVERAGE			1.7E-04	14.5

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

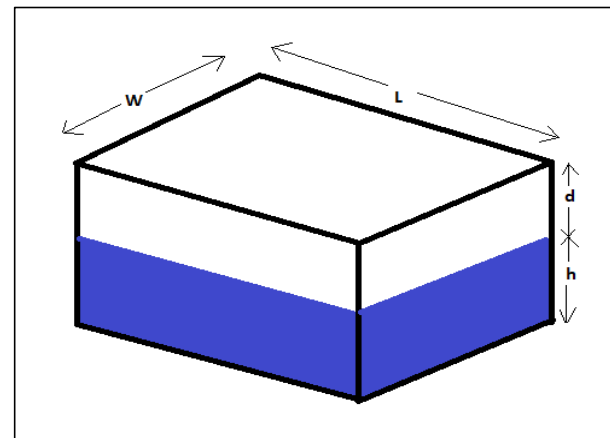
Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT19	Parameter	Description	Value	Units
Test Depth: 1.70 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.7	m
	w	Width of test pit (in test zone)	0.9	m
	r	equivalent radius of test hole	0.88	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field



Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.32	1.1E-04	9.9
AVERAGE			1.1E-04	9.9

Test 2

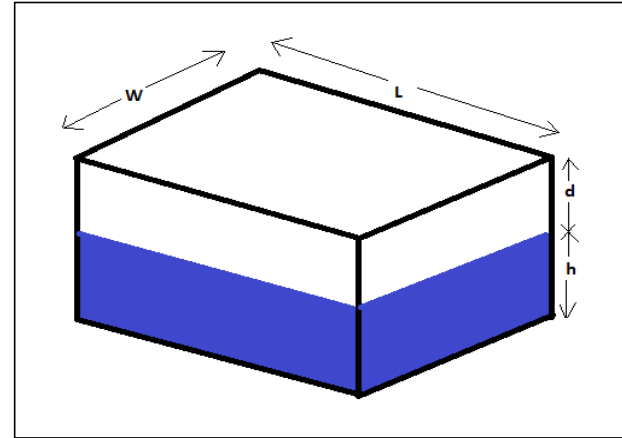
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				



Test Name:	Parameter	Description	Value	Units
IT20	K	Hydraulic Conductivity		m/s
Test Depth: 0.60 m	l	Length of test pit (in test zone)	2.6	m
Material: Unit 1C - Gravelly sand	w	Width of test pit (in test zone)	0.9	m
	r	equivalent radius of test hole	0.86	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.39		
1080		0.27	6.3E-05	5.4
AVERAGE			6.3E-05	5.4

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel Property
Project: SI Driver Road
Location: Darch
Calc by: ORW

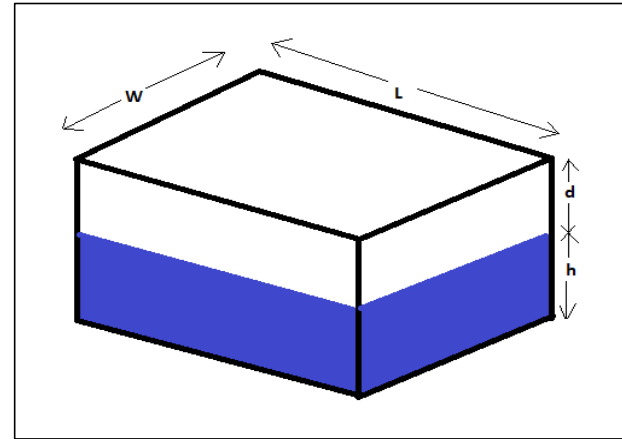
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name: IT21	Parameter	Description	Value	Units
Test Depth: 0.80 m	K	Hydraulic Conductivity		m/s
Material: Unit 1C - Gravelly sand	l	Length of test pit (in test zone)	1.7	m
	w	Width of test pit (in test zone)	1	m
	r	equivalent radius of test hole	0.74	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.5		
1140		0.07	2.2E-04	19.1
AVERAGE			2.2E-04	19.1

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

**PERTH SAND PENETROMETER FIELD TEST DATA
(AS 1289.6.3.3)**

Client: Parcel Property **Job No:** J1801113
Project: Lot 2 Driver Road - Permeability Tests **Date:** 26-Jul-19
Location: Darch **Engineer:** PA



Test No:	IT01	IT02	IT03	IT04	IT05	IT06	IT07	IT08	IT09
Material:	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)
Depth (mm)	No of Penetrometer Blows per 150 mm Depth Interval								
0-150	SET	SET	SET	SET	SET	SET	SET	SET	SET
150-300	7	2	2	2	1	2	2	2	2
300-450	15 R	3	5	5	2	2	7	4	5
450-600		7	8	9	11	5	11	12	11
600-750		13	14	10	15 R	11	12	6	15 R
750-900		10	14	11		15 R	14	4	
900-1050		12	15 R	12			14	5	
1050-1200									
1200-1350									
1350-1500									
1500-1650									
1650-1800									
1800-1950									
1950-2100									
2100-2250									
2250-2400									
2400-2550									
2550-2700									
2700-2850									
2850-3000									
3000-3150									
3150-3300									
3300-3450									
3450-3600									
3600-3750									
3750-3900									
3900-4050									
4050-4200									
4200-4350									
4350-4500									
4500-4650									
4650-4800									
4800-4950									
4950-5100									
5100-5250									
5250-5400									
5400-5550									

Note: R- Refusal

**PERTH SAND PENETROMETER FIELD TEST DATA
(AS 1289.6.3.3)**

Client: Parcel Property
Project: Lot 2 Driver Road - Permeability Tests
Location: Darch

Job No: J1801113
Date: 26-Jul-19
Engineer: PA



Test No:	IT10	IT11	IT12	IT13					
Location:	Unit 1a (SAND)	Unit 1b (Screened FILL)							
Depth (mm)	No of Penetrometer Blows per 150 mm Depth Interval								
0-150	SET	SET	SET	SET					
150-300	2	12	3	0					
300-450	4	15	2	1					
450-600	9	15 R	2	1					
600-750	14		2	1					
750-900	15 R		5	2					
900-1050			15	4					
1050-1200									
1200-1350									
1350-1500									
1500-1650									
1650-1800									
1800-1950									
1950-2100									
2100-2250									
2250-2400									
2400-2550									
2550-2700									
2700-2850									
2850-3000									
3000-3150									
3150-3300									
3300-3450									
3450-3600									
3600-3750									
3750-3900									
3900-4050									
4050-4200									
4200-4350									
4350-4500									
4500-4650									
4650-4800									
4800-4950									
4950-5100									
5100-5250									
5250-5400									
5400-5550									

Note: R- Refusal

Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

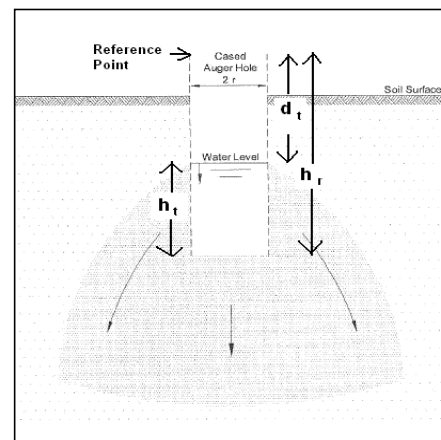
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP01	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.6	0.3	1.2E-03	102.0
40	0.67	0.23	7.3E-04	62.9
60	0.74	0.16	6.1E-04	52.4
80	0.79	0.11	5.5E-04	47.1
100	0.82	0.08	4.9E-04	42.7
120	0.84	0.06	4.5E-04	39.1
140	0.87	0.03	4.6E-04	39.8
160	0.9	0	5.2E-04	45.1
AVERAGE			6.2E-04	53.9

Test 2

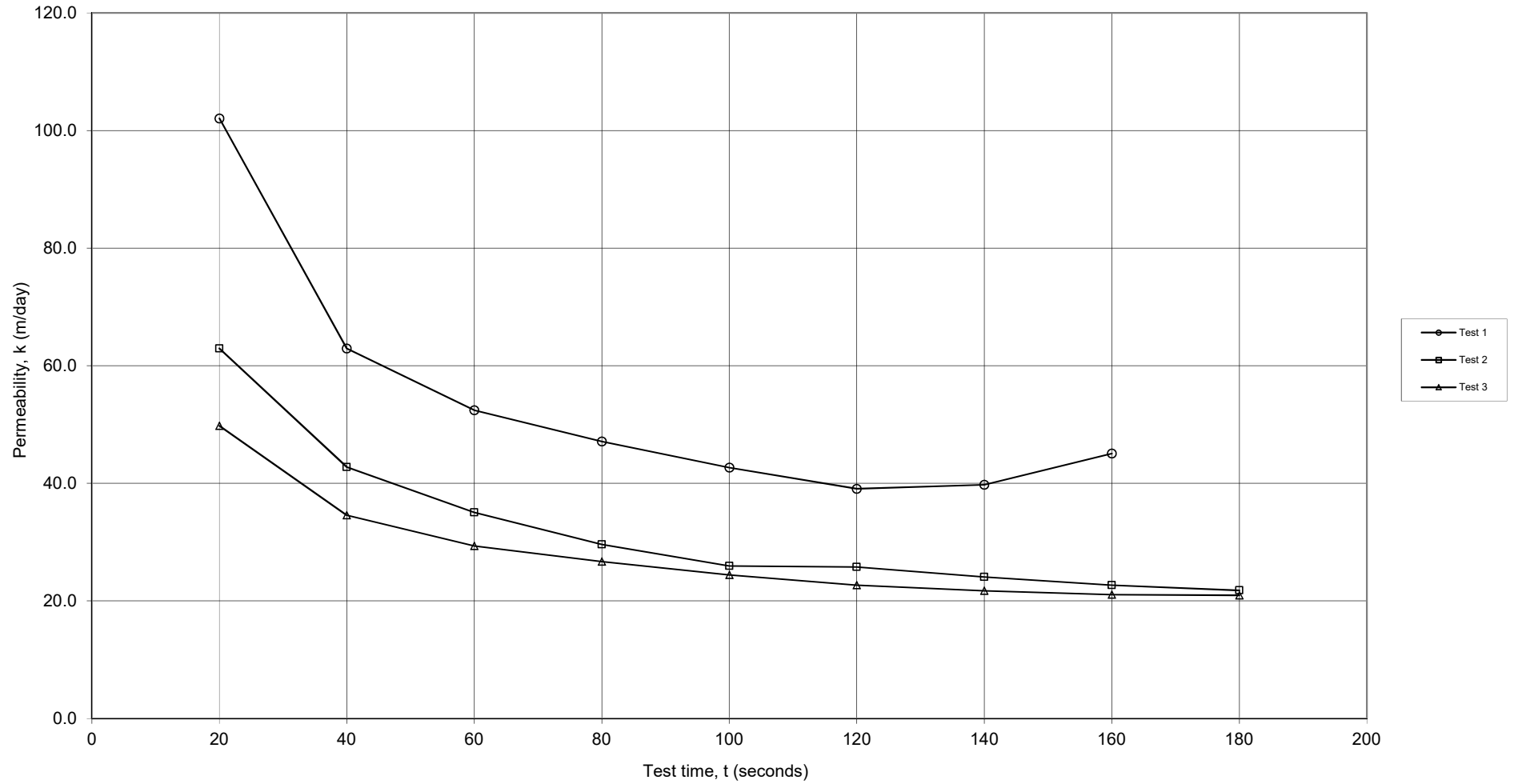
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.44	0.46	7.3E-04	62.9
40	0.54	0.36	4.9E-04	42.7
60	0.61	0.29	4.1E-04	35.0
80	0.65	0.25	3.4E-04	29.6
100	0.68	0.22	3.0E-04	25.9
120	0.735	0.165	3.0E-04	25.8
140	0.76	0.14	2.8E-04	24.1
160	0.78	0.12	2.6E-04	22.7
180	0.8	0.1	2.5E-04	21.8
AVERAGE			3.7E-04	32.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.37	0.53	5.8E-04	49.8
40	0.47	0.43	4.0E-04	34.6
60	0.55	0.35	3.4E-04	29.3
80	0.615	0.285	3.1E-04	26.7
100	0.66	0.24	2.8E-04	24.4
120	0.695	0.205	2.6E-04	22.7
140	0.73	0.17	2.5E-04	21.7
160	0.76	0.14	2.4E-04	21.1
180	0.79	0.11	2.4E-04	20.9
AVERAGE			3.2E-04	27.9

Permeability by Inverse Auger Hole Method

GP01



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

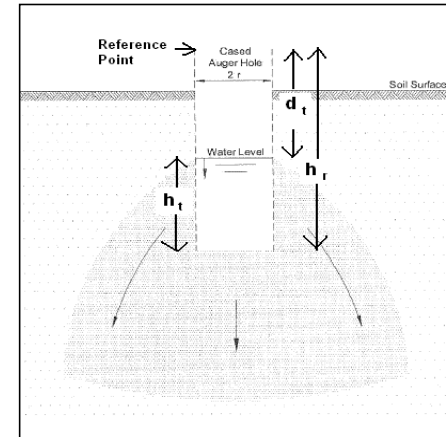
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP02	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.51	0.39	9.0E-04	78.1
40	0.66	0.24	7.1E-04	61.0
60	0.75	0.15	6.3E-04	54.3
80	0.78	0.12	5.2E-04	45.3
100	0.83	0.07	5.2E-04	44.7
120	0.84	0.06	4.5E-04	39.1
140	0.88	0.02	4.9E-04	42.7
160	0.895	0.005	4.9E-04	42.6
180	0.9	0	4.6E-04	40.1
AVERAGE			5.8E-04	49.8

Test 2

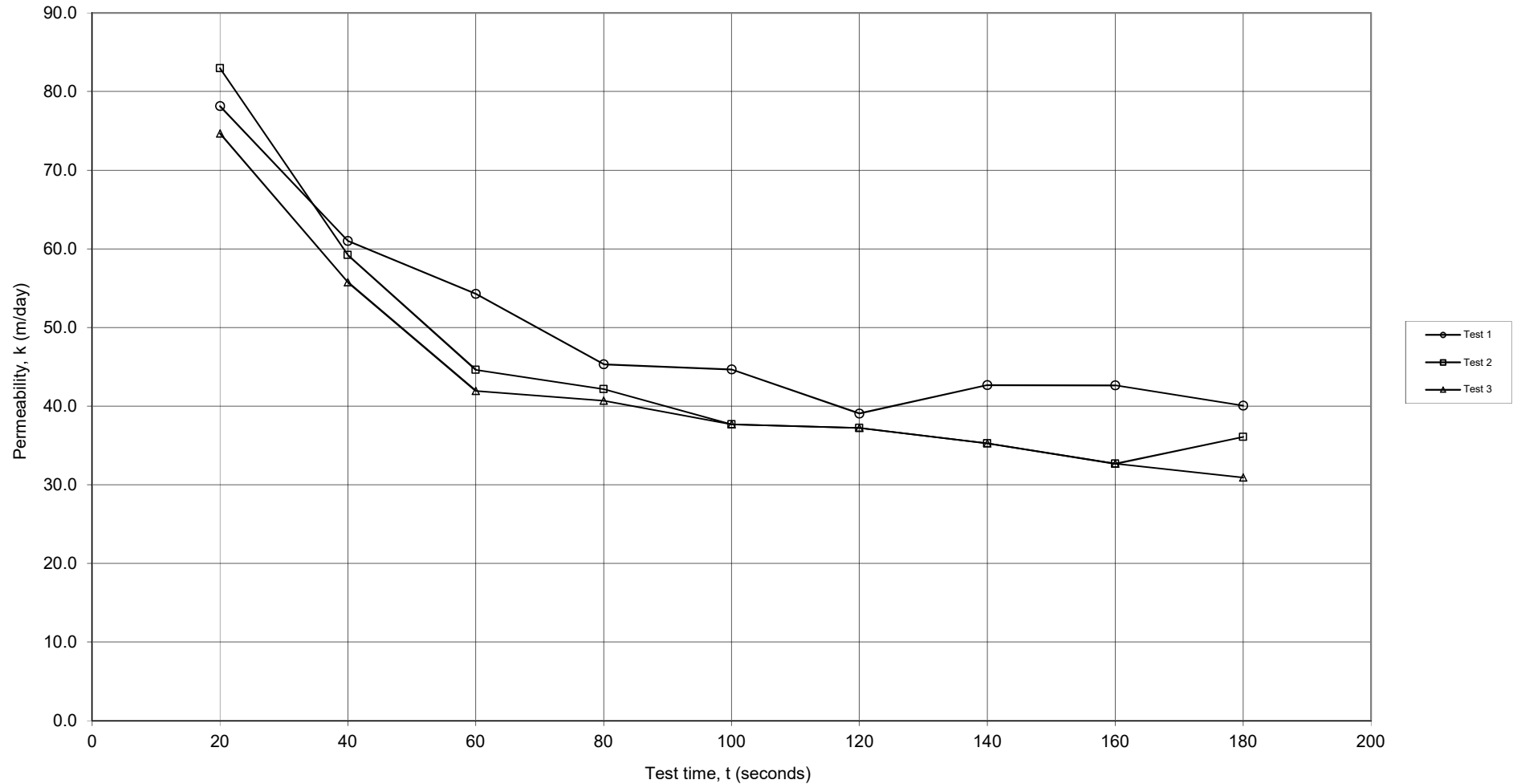
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.53	0.37	9.6E-04	83.0
40	0.65	0.25	6.9E-04	59.2
60	0.69	0.21	5.2E-04	44.6
80	0.76	0.14	4.9E-04	42.1
100	0.79	0.11	4.4E-04	37.7
120	0.83	0.07	4.3E-04	37.2
140	0.85	0.05	4.1E-04	35.3
160	0.86	0.04	3.8E-04	32.7
180	0.89	0.01	4.2E-04	36.1
AVERAGE			5.2E-04	45.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.495	0.405	8.6E-04	74.7
40	0.63	0.27	6.5E-04	55.8
60	0.67	0.23	4.9E-04	41.9
80	0.75	0.15	4.7E-04	40.7
100	0.79	0.11	4.4E-04	37.7
120	0.83	0.07	4.3E-04	37.2
140	0.85	0.05	4.1E-04	35.3
160	0.86	0.04	3.8E-04	32.7
180	0.87	0.03	3.6E-04	30.9
AVERAGE			5.0E-04	43.0

Permeability by Inverse Auger Hole Method

GP02



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

Spreadsheet author: ORW 17-Oct-09

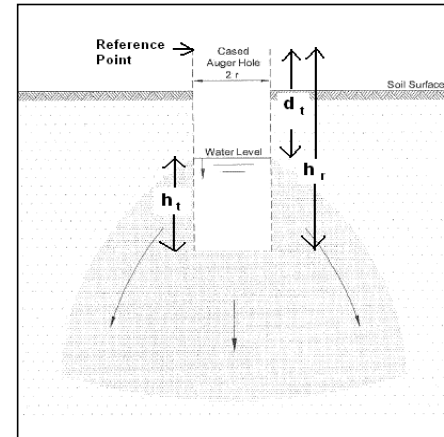
REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP03	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m

Spreadsheet Legend	
Required input	Light blue background
Calculated field	Light green background
Comment field	Light orange background
Field not used	White background with X
Fixed field	Yellow background



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.51	0.39	9.0E-04	78.1
40	0.65	0.25	6.9E-04	59.2
60	0.68	0.22	5.0E-04	43.2
80	0.71	0.19	4.1E-04	35.6
100	0.75	0.15	3.8E-04	32.6
120	0.785	0.115	3.6E-04	30.8
140	0.81	0.09	3.4E-04	29.2
160	0.83	0.07	3.2E-04	27.9
180	0.85	0.05	3.2E-04	27.4
AVERAGE			4.7E-04	40.5

Test 2

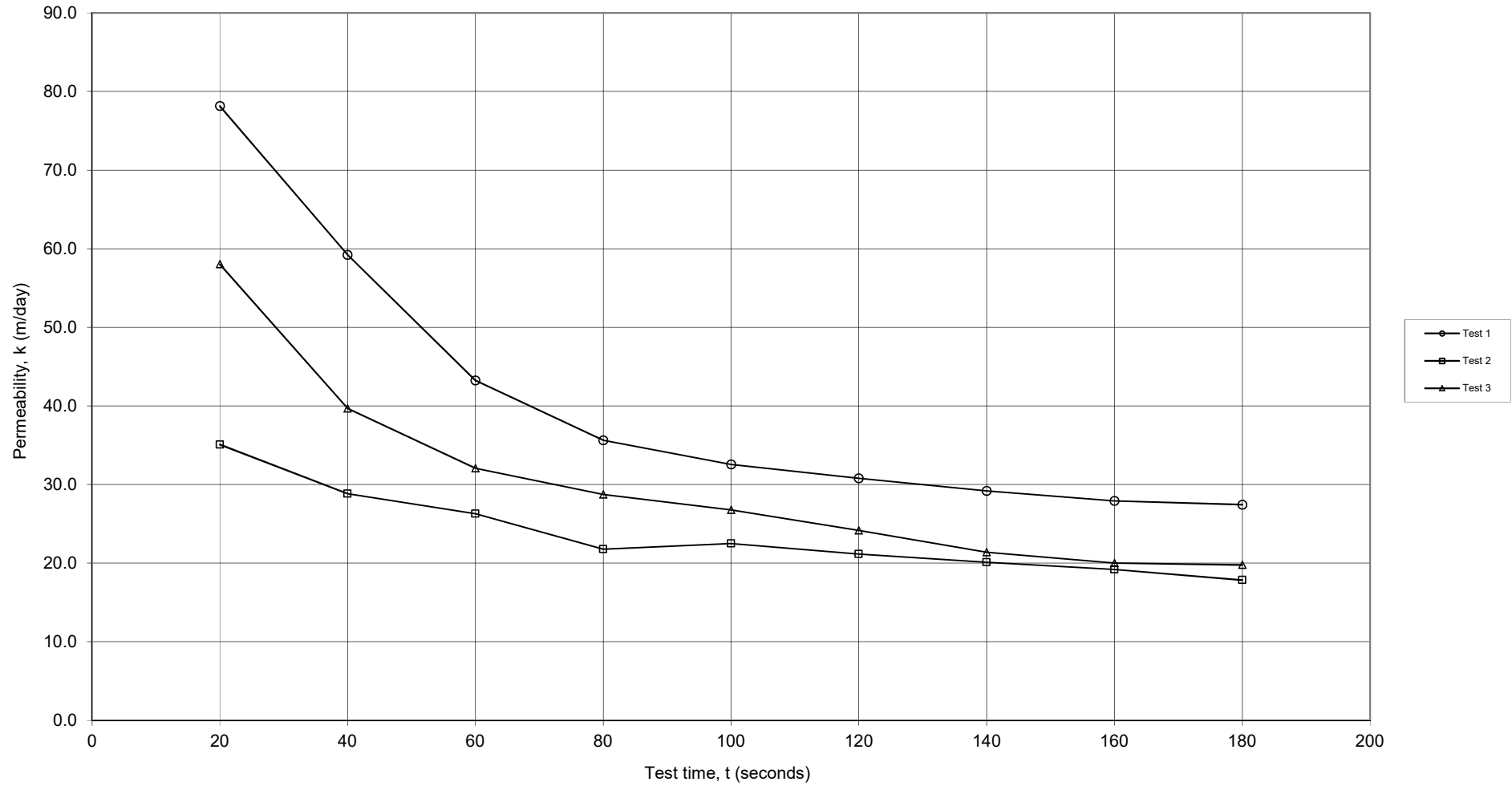
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.23	0.67		
20	0.44	0.46	4.1E-04	35.1
40	0.54	0.36	3.3E-04	28.8
60	0.615	0.285	3.0E-04	26.3
80	0.64	0.26	2.5E-04	21.8
100	0.705	0.195	2.6E-04	22.5
120	0.735	0.165	2.4E-04	21.1
140	0.76	0.14	2.3E-04	20.1
160	0.78	0.12	2.2E-04	19.2
180	0.79	0.11	2.1E-04	17.8
AVERAGE			2.7E-04	23.6

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.415	0.485	6.7E-04	58.0
40	0.515	0.385	4.6E-04	39.7
60	0.58	0.32	3.7E-04	32.1
80	0.64	0.26	3.3E-04	28.7
100	0.69	0.21	3.1E-04	26.8
120	0.715	0.185	2.8E-04	24.1
140	0.725	0.175	2.5E-04	21.4
160	0.745	0.155	2.3E-04	20.0
180	0.775	0.125	2.3E-04	19.8
AVERAGE			3.5E-04	30.1

Permeability by Inverse Auger Hole Method

GP03



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

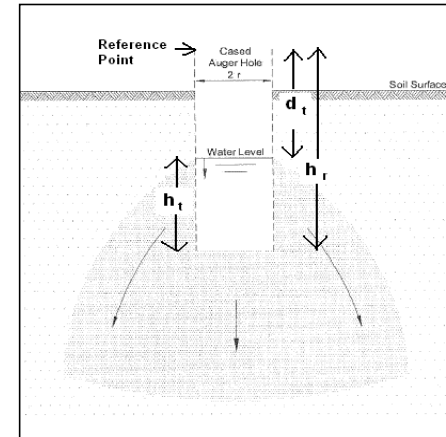
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP04	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.52	0.38	9.3E-04	80.5
40	0.53	0.37	4.8E-04	41.5
60	0.69	0.21	5.2E-04	44.6
80	0.73	0.17	4.4E-04	38.0
100	0.76	0.14	3.9E-04	33.7
120	0.77	0.13	3.4E-04	29.1
140	0.78	0.12	3.0E-04	25.9
160	0.785	0.115	2.7E-04	23.1
180	0.8	0.1	2.5E-04	21.8
AVERAGE			4.4E-04	37.6

Test 2

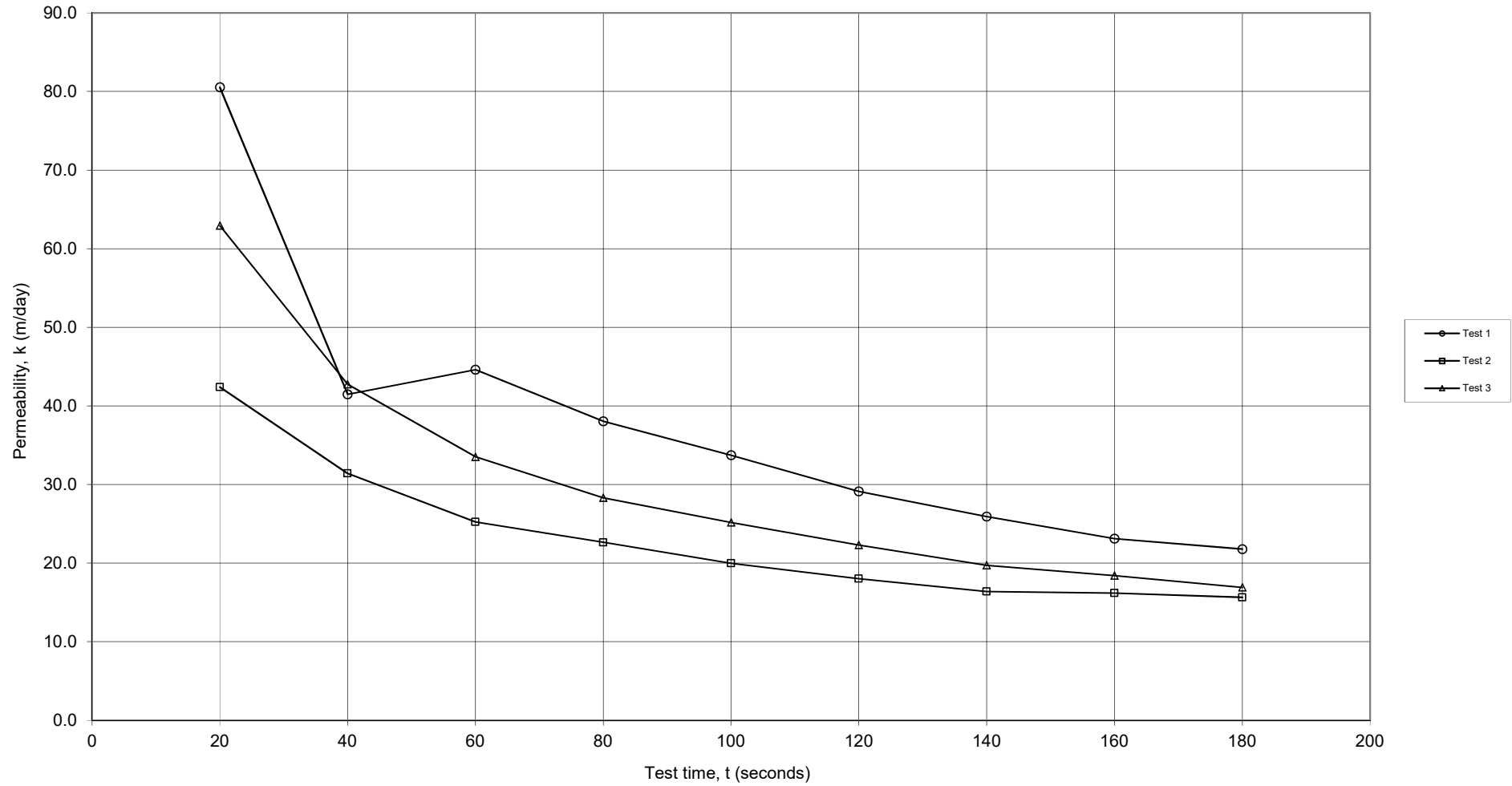
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.23	0.67		
20	0.475	0.425	4.9E-04	42.4
40	0.56	0.34	3.6E-04	31.4
60	0.605	0.295	2.9E-04	25.2
80	0.65	0.25	2.6E-04	22.6
100	0.675	0.225	2.3E-04	20.0
120	0.695	0.205	2.1E-04	18.0
140	0.71	0.19	1.9E-04	16.4
160	0.74	0.16	1.9E-04	16.2
180	0.76	0.14	1.8E-04	15.6
AVERAGE			2.7E-04	23.1

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.44	0.46	7.3E-04	62.9
40	0.54	0.36	4.9E-04	42.7
60	0.595	0.305	3.9E-04	33.5
80	0.635	0.265	3.3E-04	28.3
100	0.67	0.23	2.9E-04	25.2
120	0.69	0.21	2.6E-04	22.3
140	0.7	0.2	2.3E-04	19.7
160	0.72	0.18	2.1E-04	18.4
180	0.73	0.17	2.0E-04	16.9
AVERAGE			3.5E-04	30.0

Permeability by Inverse Auger Hole Method

GP04



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

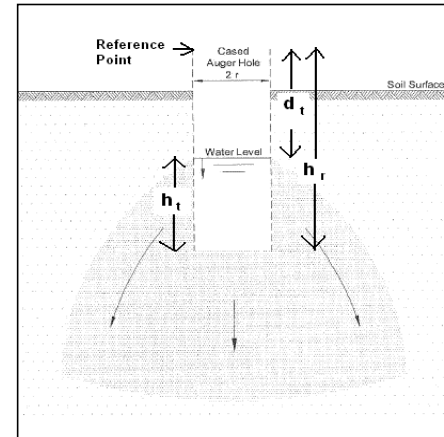
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP05	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.67	0.23	1.5E-03	125.8
40	0.775	0.125	1.0E-03	89.0
60	0.85	0.05	9.5E-04	82.3
80	0.9	0	1.0E-03	90.1
AVERAGE			1.1E-03	96.8

Test 2

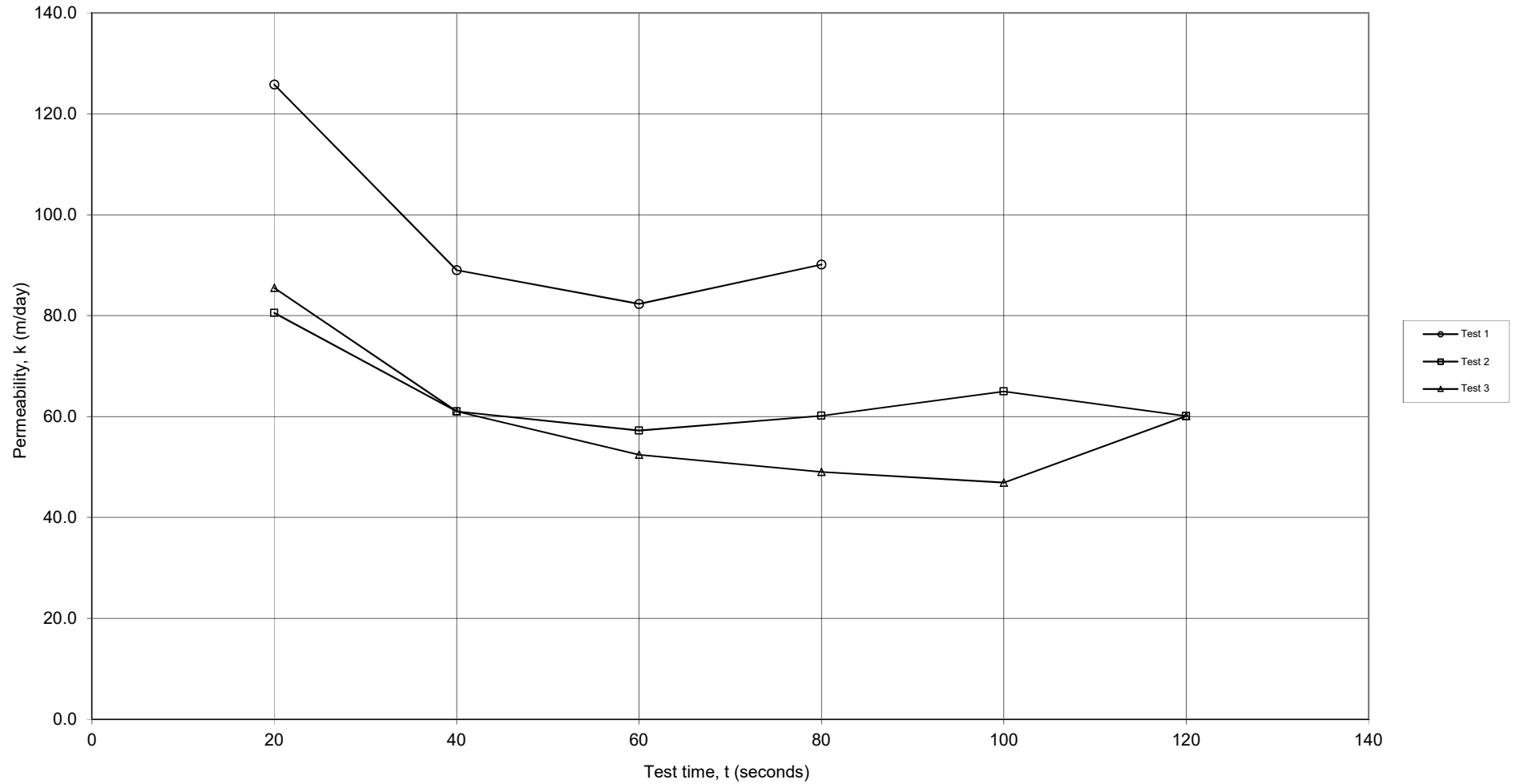
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.52	0.38	9.3E-04	80.5
40	0.66	0.24	7.1E-04	61.0
60	0.765	0.135	6.6E-04	57.2
80	0.845	0.055	7.0E-04	60.1
100	0.89	0.01	7.5E-04	65.0
120	0.9	0	7.0E-04	60.1
AVERAGE			7.4E-04	64.0

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.54	0.36	9.9E-04	85.5
40	0.66	0.24	7.1E-04	61.0
60	0.74	0.16	6.1E-04	52.4
80	0.8	0.1	5.7E-04	49.0
100	0.84	0.06	5.4E-04	46.9
120	0.9	0	7.0E-04	60.1
AVERAGE			6.8E-04	59.2

Permeability by Inverse Auger Hole Method

GP05



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

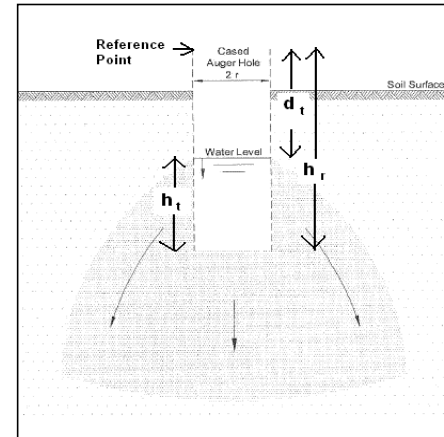
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP06	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.53	0.37	9.6E-04	83.0
40	0.645	0.255	6.7E-04	58.3
60	0.74	0.16	6.1E-04	52.4
80	0.8	0.1	5.7E-04	49.0
100	0.85	0.05	5.7E-04	49.4
120	0.88	0.02	5.8E-04	49.8
140	0.9	0	6.0E-04	51.5
AVERAGE			6.5E-04	56.2

Test 2

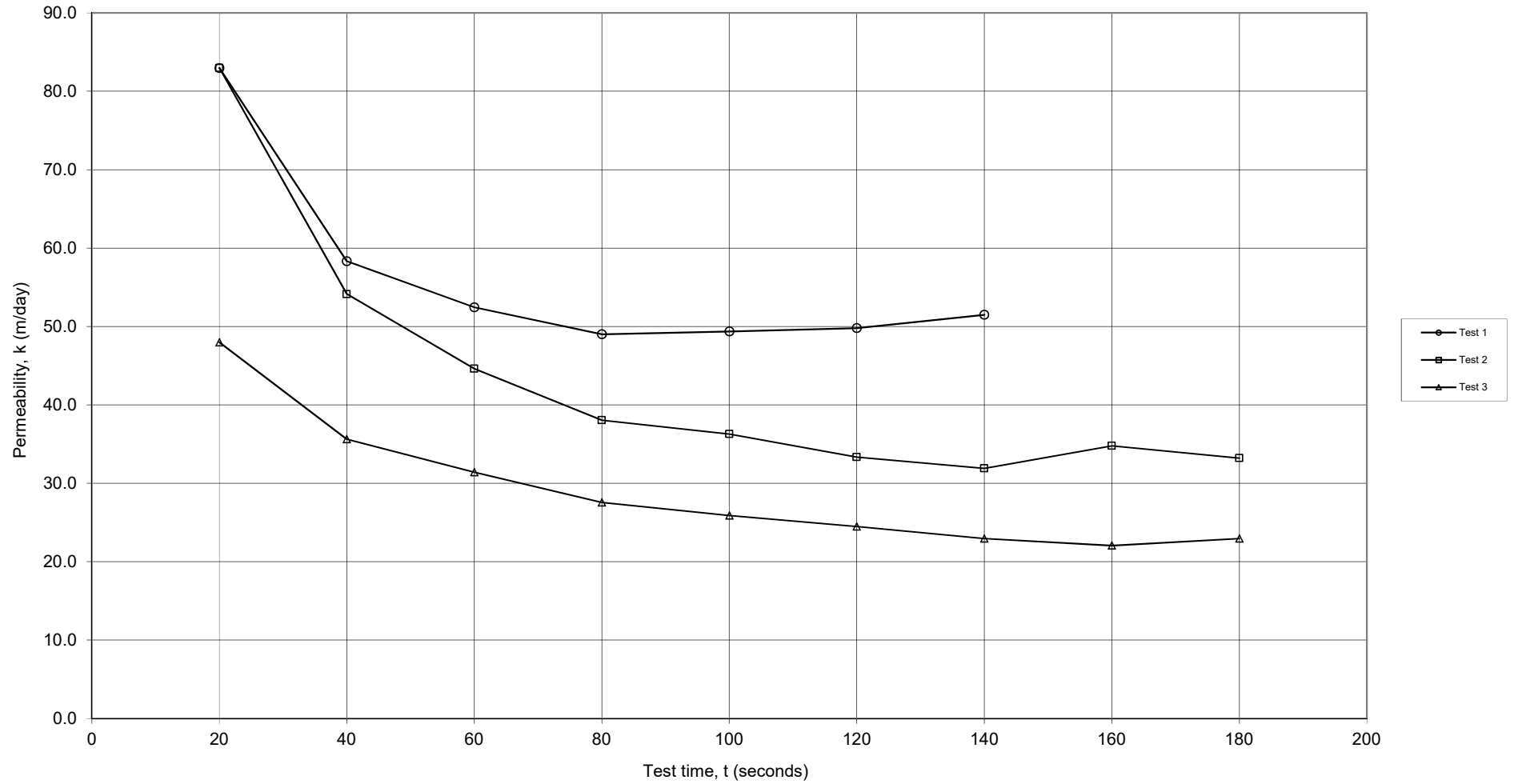
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.53	0.37	9.6E-04	83.0
40	0.62	0.28	6.3E-04	54.1
60	0.69	0.21	5.2E-04	44.6
80	0.73	0.17	4.4E-04	38.0
100	0.78	0.12	4.2E-04	36.3
120	0.805	0.095	3.9E-04	33.3
140	0.83	0.07	3.7E-04	31.9
160	0.87	0.03	4.0E-04	34.8
180	0.88	0.02	3.8E-04	33.2
AVERAGE			5.0E-04	43.2

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.23	0.67		
20	0.5	0.4	5.6E-04	48.0
40	0.59	0.31	4.1E-04	35.6
60	0.66	0.24	3.6E-04	31.4
80	0.7	0.2	3.2E-04	27.6
100	0.74	0.16	3.0E-04	25.9
120	0.77	0.13	2.8E-04	24.5
140	0.79	0.11	2.7E-04	22.9
160	0.81	0.09	2.6E-04	22.1
180	0.84	0.06	2.7E-04	23.0
AVERAGE			3.4E-04	29.0

Permeability by Inverse Auger Hole Method

GP06



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

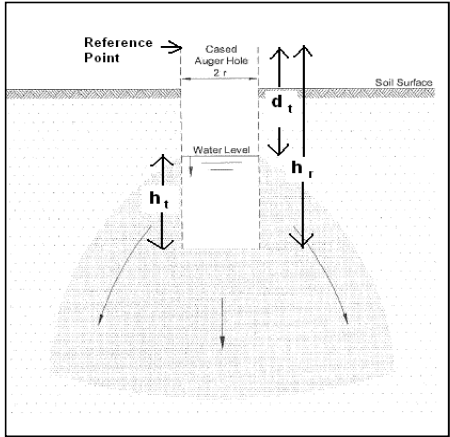
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel
Project: Proposed Residential S
Location: Driver Road, Darch
Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Parameter	Description	Value	Units
K	Permeability		m/s
r	radius of test hole	0.045	m
t	time since start of measurement		s
h _r	reference point height above base	0.9	m
d _t	depth from reference point to water at time t		m
h _t	Water column height at time t		m
h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.48	0.42	8.3E-04	71.3
40	0.57	0.33	5.4E-04	46.7
60	0.64	0.26	4.4E-04	38.3
80	0.68	0.22	3.8E-04	32.4
100	0.71	0.19	3.3E-04	28.5
120	0.74	0.16	3.0E-04	26.2
140	0.76	0.14	2.8E-04	24.1
160	0.79	0.11	2.7E-04	23.6
180	0.8	0.1	2.5E-04	21.8
AVERAGE			4.0E-04	34.8

Test 2

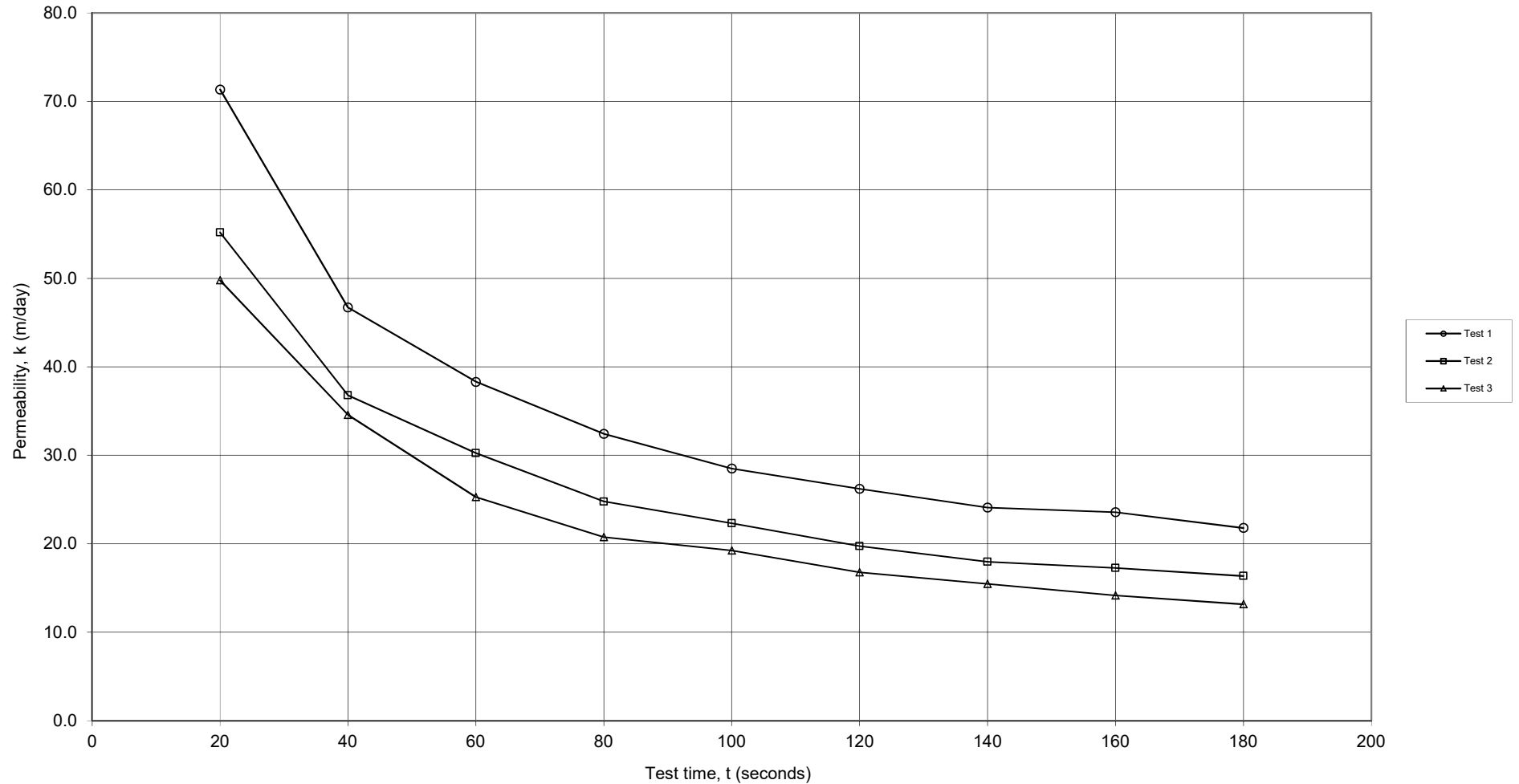
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.4	0.5	6.4E-04	55.2
40	0.49	0.41	4.3E-04	36.8
60	0.56	0.34	3.5E-04	30.2
80	0.59	0.31	2.9E-04	24.8
100	0.63	0.27	2.6E-04	22.3
120	0.65	0.25	2.3E-04	19.7
140	0.67	0.23	2.1E-04	18.0
160	0.7	0.2	2.0E-04	17.3
180	0.72	0.18	1.9E-04	16.4
AVERAGE			3.1E-04	26.7

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.37	0.53	5.8E-04	49.8
40	0.47	0.43	4.0E-04	34.6
60	0.5	0.4	2.9E-04	25.3
80	0.53	0.37	2.4E-04	20.7
100	0.58	0.32	2.2E-04	19.2
120	0.595	0.305	1.9E-04	16.8
140	0.62	0.28	1.8E-04	15.5
160	0.635	0.265	1.6E-04	14.1
180	0.65	0.25	1.5E-04	13.2
AVERAGE			2.7E-04	23.2

Permeability by Inverse Auger Hole Method

GP07



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

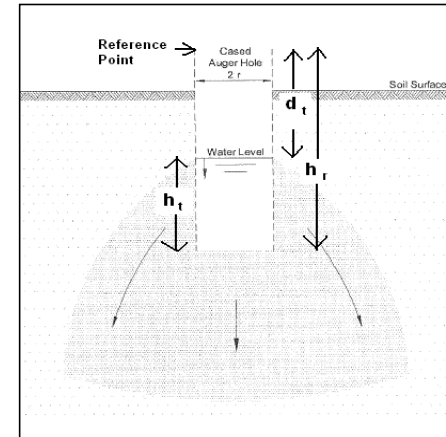
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP08	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.55	0.35	1.0E-03	88.0
40	0.67	0.23	7.3E-04	62.9
60	0.74	0.16	6.1E-04	52.4
80	0.78	0.12	5.2E-04	45.3
100	0.82	0.08	4.9E-04	42.7
120	0.85	0.05	4.8E-04	41.2
140	0.87	0.03	4.6E-04	39.8
160	0.9	0	5.2E-04	45.1
AVERAGE			6.0E-04	52.2

Test 2

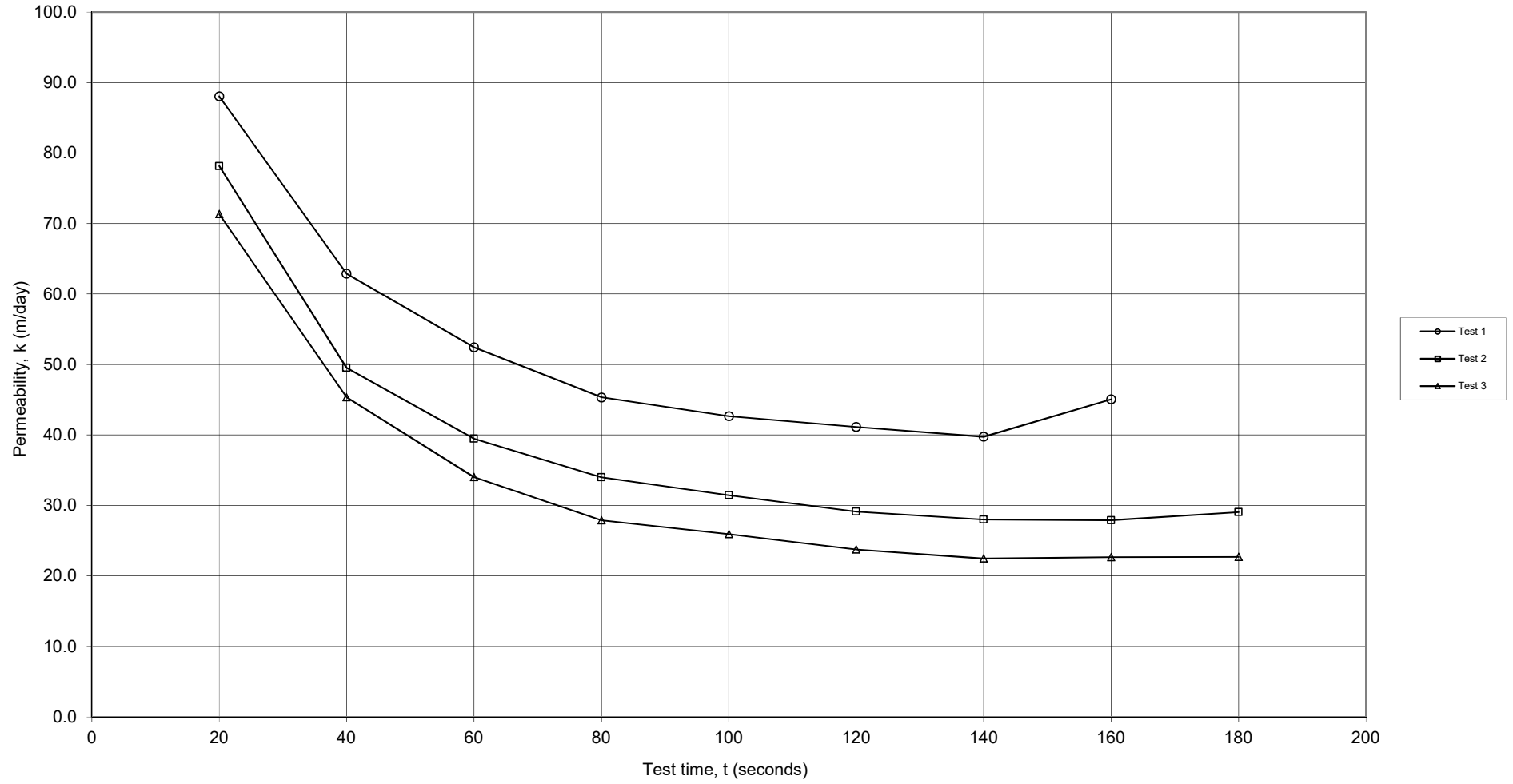
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.51	0.39	9.0E-04	78.1
40	0.59	0.31	5.7E-04	49.5
60	0.65	0.25	4.6E-04	39.5
80	0.695	0.205	3.9E-04	34.0
100	0.74	0.16	3.6E-04	31.5
120	0.77	0.13	3.4E-04	29.1
140	0.8	0.1	3.2E-04	28.0
160	0.83	0.07	3.2E-04	27.9
180	0.86	0.04	3.4E-04	29.0
AVERAGE			4.5E-04	38.5

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.48	0.42	8.3E-04	71.3
40	0.56	0.34	5.2E-04	45.3
60	0.6	0.3	3.9E-04	34.0
80	0.63	0.27	3.2E-04	27.9
100	0.68	0.22	3.0E-04	25.9
120	0.71	0.19	2.7E-04	23.8
140	0.74	0.16	2.6E-04	22.5
160	0.78	0.12	2.6E-04	22.7
180	0.81	0.09	2.6E-04	22.7
AVERAGE			3.8E-04	32.9

Permeability by Inverse Auger Hole Method

GP08



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

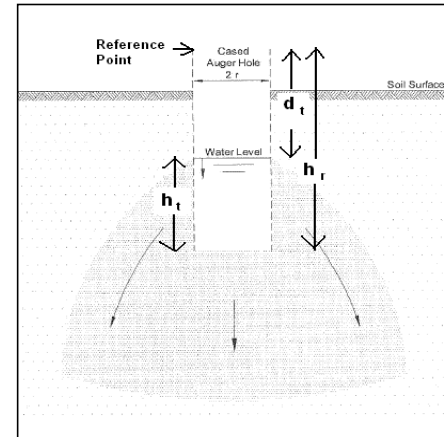
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP09	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.6	0.3	1.2E-03	102.0
40	0.69	0.21	7.7E-04	66.9
60	0.76	0.14	6.5E-04	56.2
80	0.8	0.1	5.7E-04	49.0
100	0.835	0.065	5.3E-04	45.7
120	0.87	0.03	5.4E-04	46.4
140	0.9	0	6.0E-04	51.5
AVERAGE			6.9E-04	59.7

Test 2

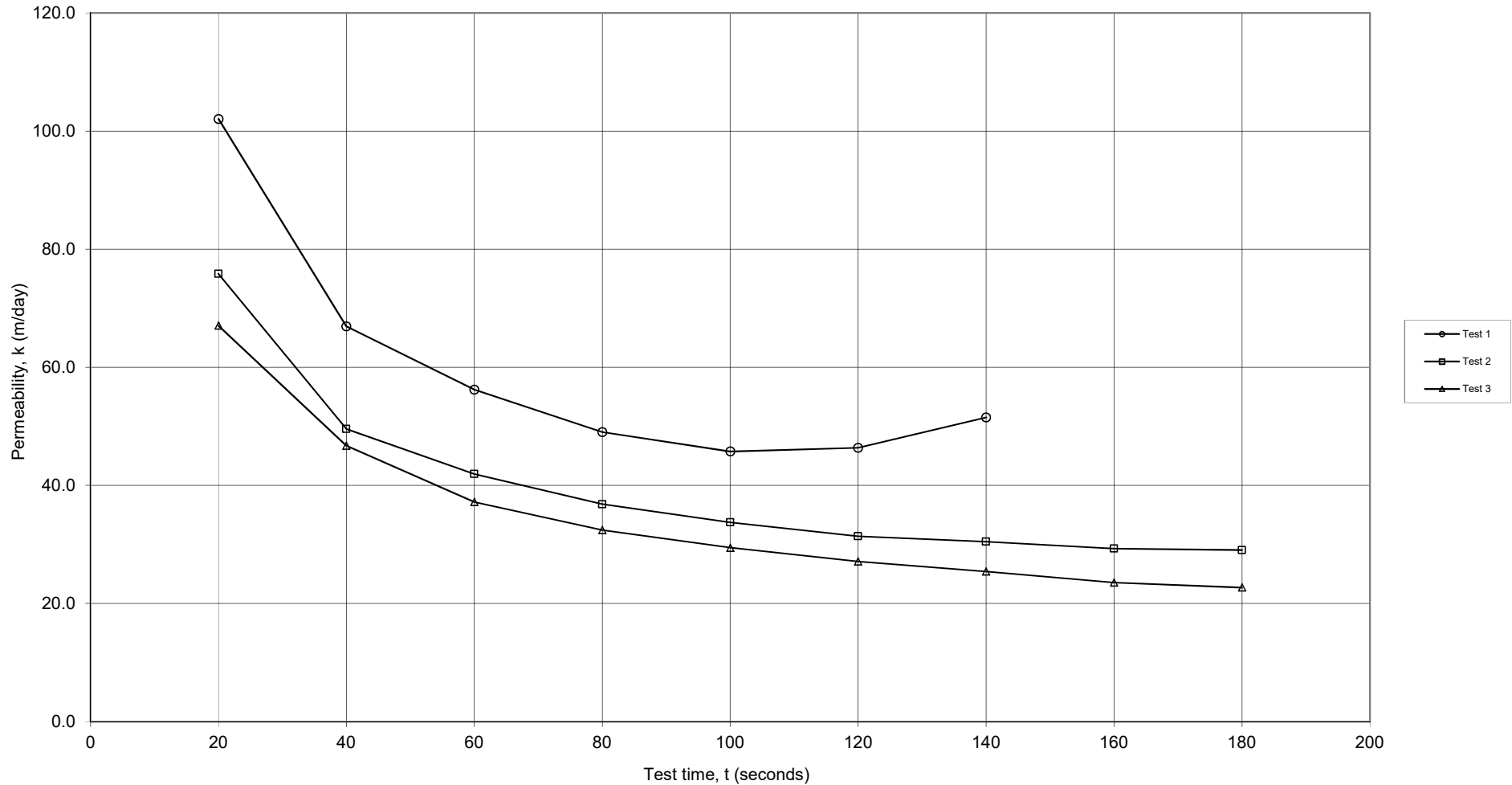
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.5	0.4	8.8E-04	75.8
40	0.59	0.31	5.7E-04	49.5
60	0.67	0.23	4.9E-04	41.9
80	0.72	0.18	4.3E-04	36.8
100	0.76	0.14	3.9E-04	33.7
120	0.79	0.11	3.6E-04	31.4
140	0.82	0.08	3.5E-04	30.5
160	0.84	0.06	3.4E-04	29.3
180	0.86	0.04	3.4E-04	29.0
AVERAGE			4.6E-04	39.8

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.46	0.44	7.8E-04	67.0
40	0.57	0.33	5.4E-04	46.7
60	0.63	0.27	4.3E-04	37.2
80	0.68	0.22	3.8E-04	32.4
100	0.72	0.18	3.4E-04	29.4
120	0.75	0.15	3.1E-04	27.1
140	0.775	0.125	2.9E-04	25.4
160	0.79	0.11	2.7E-04	23.6
180	0.81	0.09	2.6E-04	22.7
AVERAGE			4.0E-04	34.6

Permeability by Inverse Auger Hole Method

GP09



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

Spreadsheet author: ORW 17-Oct-09

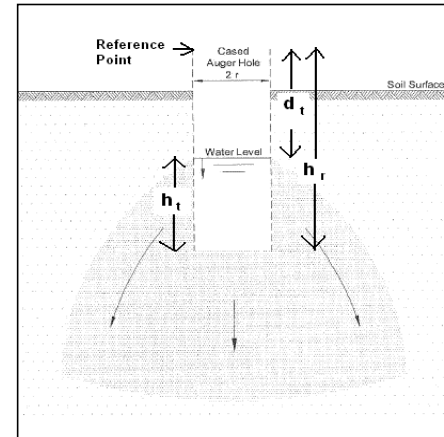
REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: ORW

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	GP10	Parameter	Description	Value	Units
Test Depth:	0.90 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.045	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.9	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m

Spreadsheet Legend	
Required input	Light blue background
Calculated field	Light green background
Comment field	Light orange background
Field not used	White background with X
Fixed field	Yellow background



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.61	0.29	1.2E-03	105.1
40	0.72	0.18	8.5E-04	73.6
60	0.78	0.12	7.0E-04	60.4
80	0.82	0.08	6.2E-04	53.3
100	0.86	0.04	6.1E-04	52.3
120	0.89	0.01	6.3E-04	54.1
140	0.9	0	6.0E-04	51.5
AVERAGE			7.4E-04	64.3

Test 2

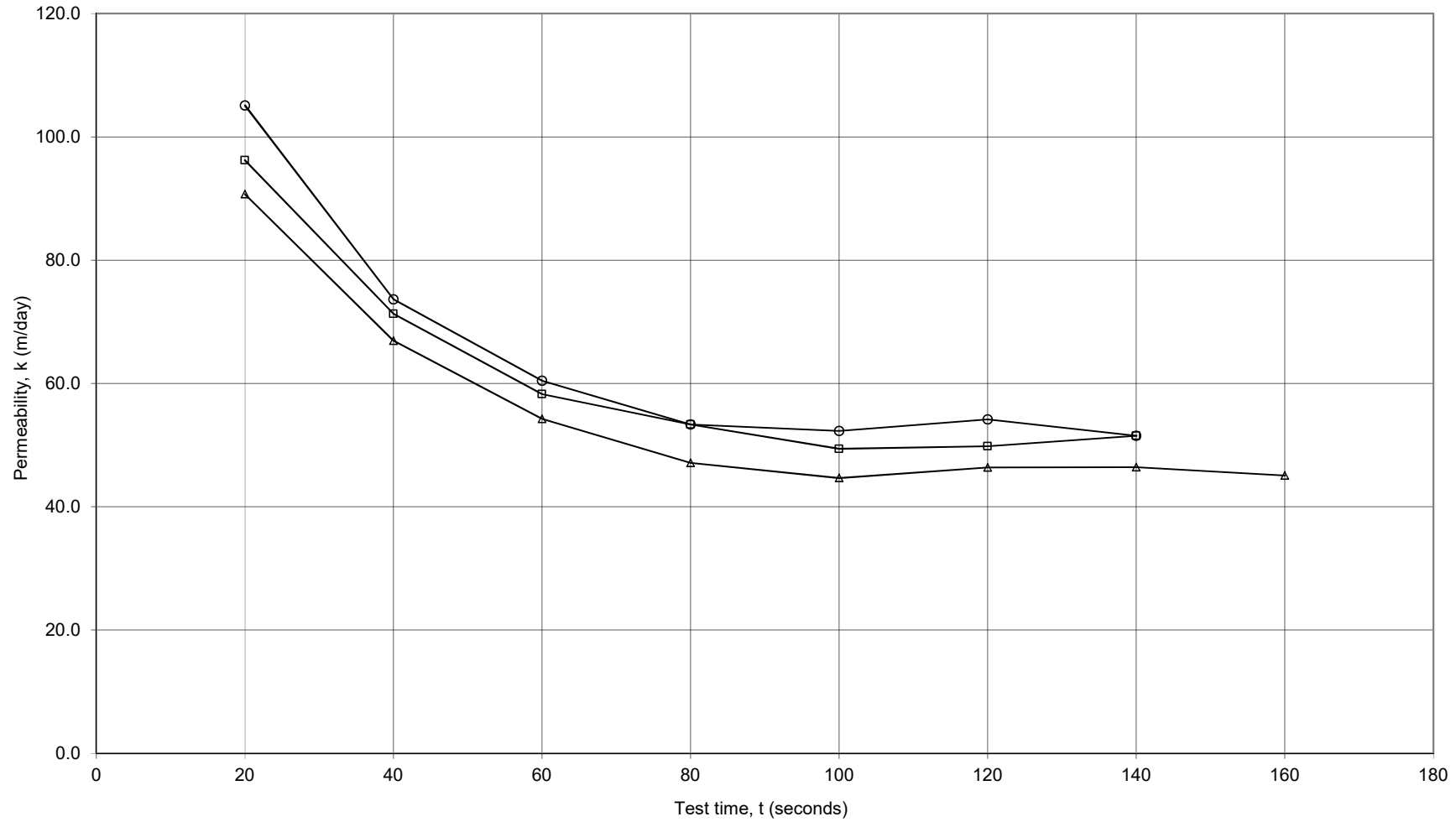
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.58	0.32	1.1E-03	96.2
40	0.71	0.19	8.2E-04	71.3
60	0.77	0.13	6.7E-04	58.3
80	0.82	0.08	6.2E-04	53.3
100	0.85	0.05	5.7E-04	49.4
120	0.88	0.02	5.8E-04	49.8
140	0.9	0	6.0E-04	51.5
AVERAGE			7.1E-04	61.4

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0	0.9		
20	0.56	0.34	1.0E-03	90.7
40	0.69	0.21	7.7E-04	66.9
60	0.75	0.15	6.3E-04	54.3
80	0.79	0.11	5.5E-04	47.1
100	0.83	0.07	5.2E-04	44.7
120	0.87	0.03	5.4E-04	46.4
140	0.89	0.01	5.4E-04	46.4
160	0.9	0	5.2E-04	45.1
AVERAGE			6.4E-04	55.2

Permeability by Inverse Auger Hole Method

GP10





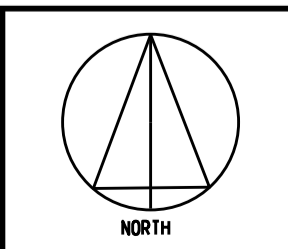
Appendix H: 2008-2018 Survey Comparison



MEASUREMENTS	

ION SERVICES PTY LTD
 LICENSED SURVEYORS
 14/23 GIBBERD ROAD, BALCATTA WA 6021
 TELEPHONE 081 9240 2300
 FACSIMILE 081 9240 2303

DATE : 12 - 6 - 2018
 SCALE : 1 : 1500 @ A1
 DATUM : PCG94
 VERT : AHD



JOB		Monitoring Points - 2008 to 2018 Lot 2 urniss Road, Landsdale	
CLIENT		Non Organic Disposals	
FB	LB	REF No: 7025/518/a1_rev1	



Appendix I: Understanding Your Report

UNDERSTANDING YOUR REPORT

GALT FORM PMP11 Rev3

1. EXPECTATIONS OF THE REPORT

This document has been prepared to clarify what is and is not provided in your report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with the conditions on site.

Geotechnical engineering and environmental science are less exact than other engineering and scientific disciplines. We include this information to help you understand where our responsibilities begin and end. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of projects and we can help you to manage your risk.

2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following:

- ✦ the project objectives as we understood them and as described in this report;
- ✦ the specific site mentioned in this report; and
- ✦ the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this report if any of the following conditions apply:

- ✦ the report was not written for you;
- ✦ the report was not written for the site specific to your development;
- ✦ the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- ✦ the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the project team. Furthermore, we recommend that we be able to review work produced by other members of the project team that relies on information provided in our report.

3. SOIL LOGS

Our reports often include logs of intrusive and non-intrusive investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party because of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

5. CHANGE IN SUBSURFACE CONDITIONS

The recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including anthropogenic events (such as construction or contaminating activities on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use professional judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from professional judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

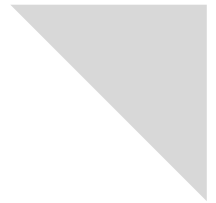
7. ENVIRONMENTAL AND GEOTECHNICAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not addressed in geotechnical reports. Similarly, geotechnical issues are not addressed in environmental reports. The investigation techniques used for geotechnical investigations can differ from those used for environmental investigations. It is the client's responsibility to satisfy themselves that geotechnical and environmental considerations have been taken into account for the site.

Geotechnical advice presented in a Galt Environmental report has been provided by Galt Geotechnics under a sub-contract agreement. Similarly, environmental advice presented in a Galt Geotechnics report has been provided by Galt Environmental under a sub-contract agreement.

Unless specifically noted otherwise, no parties shall draw any inferences about the applicability of the Western Australian state government landfill levy from the contents of this document.

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APPENDIX 3

LETTERS OF ADVICE – GALT GEOTECH AND SENVERSA



ROWE
GROUP
DESIGN

Parcel Property
Level 3, 14 Walters Drive
OSBORNE PARK WA 6017

Attention: Steve Claudio / Jeremy Cordina

**SUMMARY OF CONTAMINATION ASSESSMENT
PROPOSED MIXED-USE DEVELOPMENT
LOT 2 (NO. 26) DRIVER ROAD, DARCH**

Dear Steve and Jeremy,

1. INTRODUCTION

This letter presents a summary of Galt Environmental Pty Ltd's (Galt's) contamination assessment of the proposed mixed-use development located at Lot 2 (No. 26) Driver Road, Darch (the site).

The information provided in this letter is intended to support the Structure Plan amendment lodged with City of Wanneroo.

2. BACKGROUND

The site forms part of the previous Lot 8000, which incorporated the current Lot 2 (subject site) and the adjacent Lot 1, which is located to the northwest of the subject site.

The site was originally mined for sand supplies for the building industry. The sand supplies have been removed and the area was operated as a disposal area for non-organic waste (mainly building rubble). The site has now been entirely filled apart from the adjacent Lot 1. Land use activities recently undertaken on Lot 1 (note Lot 1 is not considered part of this study) consist of operating a crushing plant to crush concrete rubble delivered to site, however these activities have ceased as of the time of writing of this letter.

Filling began in about 1989, initially in the north east corner of the site followed by filling along the eastern boundary. The filling process to the west and along the eastern boundary (south of the north east corner of fill) was inspected on an ongoing basis by Soil and Rock Engineering Pty Ltd (SRE). A section in the south west corner of the site adjacent Driver Road was also filled under the direction of SRE personnel.

It is understood that the majority of the initial fill was placed to City of Wanneroo requirements, initially under the guidance of City of Wanneroo personnel then by SRE for a number of years.

We further understand that the remaining area (southern section):

- ✦ was progressively filled with non-organic waste; and
- ✦ the fill was placed in an engineered manner which involved placing in loose layers up to about 0.5 m thick and compacting using multiple passes of rubber tired and tracked earthmoving equipment inclusive of a rubbish compactor.

A mixed-used development comprising residential, commercial and public open space (POS) is proposed for the site.

3. SUMMARY OF CONTAMINATION ISSUES

The Department of Water and Environmental Regulation (DWER) contaminated sites database indicates that the site is classified as 'Contaminated – restricted use'. The detailed summary of records (DSR) document indicates the following:

"The Site contains up to 25m thickness of construction and demolition waste including metal, plastic, plaster board and wood fragments, asbestos containing materials and hydrocarbon residues.

Soils within the waste body contain lead, copper and zinc contamination and fragments of asbestos containing materials.

Groundwater underlying the Site is impacted by arsenic, manganese and total chromium contamination.

Landfill gas is present within the Site that contains methane and carbon dioxide."

Addressing these issues has formed the central scope for contamination assessments undertaken to date.

4. INVESTIGATION PROCESS

The investigation process and reporting structure is consistent with the Department of Environment Regulation (DER) (2014) *Assessment and management of contaminated sites* guideline document and has been discussed with the accredited contaminated sites Auditor (Ms. Vanessa Bryant) appointed to the project.

This approach has been developed to:

- ✦ establishing long term landfill gas (LFG) and groundwater trends across the entire site;
- ✦ provide project efficiencies in terms of producing data for future stages of development; and
- ✦ ensuring the spatial layout of test locations (both LFG and groundwater monitoring wells) are sufficient to provide robust data on site conditions.

Galt has been engaged since May 2019 to undertake a range of site investigations to date. These investigations have been undertaken in consultation with the accredited Auditor and include the following:

- ✦ detailed review of all previous investigations undertaken at the site;
- ✦ development of sampling analysis and quality plans (SAQP);
- ✦ installation of groundwater and LFG monitoring bores;
- ✦ periodic groundwater, surface water and LFG sampling; and
- ✦ collection soil samples and analysis for potential contaminants.

5. SUMMARY OF FINDINGS

Based on the results of investigations undertaken to date, the following key findings have been made:

Condition of fill

- ✦ The depth of fill is greatest in the eastern half of the site where it has an average thickness of about 16 m (varying up to about 21 m).
- ✦ The depth of fill in the south west section of the site is significantly less with an average thickness of about 8 m.

- ✦ The fill consists primarily of sand and building rubble with minor inclusions of geotechnically deleterious materials (such as wood fragments).
- ✦ Asbestos containing material has not been detected at any test location.

Landfill gas

- ✦ The fill is generating some ground gas. However, the concentrations of gases recorded indicate that the site is broadly a mixture of Characteristic Situation 1 & 2. We note that these characterisations of gas risk are considered to be at the lowest end of the risk spectrum which goes up to Characteristic Situation 6 with the highest rating still potentially being suitable for residential development. The 'Modified Wilson and Card classification system' presented in the CIRIA C665 guideline (the industry standard for ground gas assessments) is shown in Figure 1 below.

	Characteristic situation (CIRIA R149)	Comparable classification in DETR et al (1999)	Risk classification	Gas screening value (GSV) (CH ₄ or CO ₂) (l/hr) ² Threshold
	1	A	Very low risk	<0.07
	2	B	Low risk	<0.7
	3	C	Moderate risk	<3.5
	4	D	Moderate to high risk	<15
	5	E	High risk	<70
	6	F	Very high risk	>70

Figure 1: Extract from CIRIA C665 showing Characteristic Situations

- ✦ The entirety of the site will be suitable for each of the nominated land uses (residential, commercial and POS) with appropriate remedial and gas protection measures. The gas protection measures will be approved by the Auditor and DWER.

Groundwater

- ✦ Low concentrations of per- and poly-fluoroalkyl substances (PFAS) and metals have been noted at monitoring wells across the site. However, these concentrations are several orders of magnitude below the assessment criteria for irrigation water.
- ✦ As a precaution, it will be recommended that groundwater abstraction for the purposes of drinking water be restricted via memorials on lot titles.
- ✦ Based on the current testing results, groundwater will be suitable for irrigation purposes.

6. CONCLUDING REMARKS

Based on our findings to date, we make the following concluding remarks:

- ✦ no extensive soil contamination has been identified at the site;
- ✦ groundwater is suitable for irrigation of the POS;
- ✦ some LFG is being generated, however the site is considered to be at the lowest end of the risk spectrum;
- ✦ the site will be suitable for the proposed development subject to the implementation of appropriate remediation and gas protection measures approved by the Auditor and DWER; and
- ✦ soil, groundwater and LFG investigations are ongoing and will be reporting in due course in accordance with the relevant guidelines and standards.

7. CLOSURE

We trust this information meets your needs at this time. Please contact us on (08) 6272 0200 if you require any further information.

Yours Faithfully,

GALT ENVIRONMENTAL PTY LTD



Brad Palmer

Environmental Scientist

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27 November 2019

Jeremy Cordina
Parcel Property
14 Walters Drive
Osborne Park
WA 6017

Dear Jeremy,

Re: Audit Process and Contamination Status 26 Driver Road, Darch, WA

1. Introduction

Ms Vanessa Bryant of Senversa Pty Ltd (Senversa) was engaged by Parcel Property as a Western Australia (WA) Department of Water and Environmental Regulation (DWER) accredited contaminated sites auditor to undertake a mandatory audit of 26 Driver Road, Darch WA 6065 (the Site).

The site was originally briefly used for market gardening in the 1960s prior to extensive use as a sand quarry commencing circa 1968. The resultant quarry void was subject to landfill operations from 1987. Landfilling operations at the site were licenced for disposal of Class 1 (inert) fill such as construction and demolition waste; however, environmental investigations at the site identified significant quantities of metal, wood, plaster board and plastic. Further, asbestos containing materials (ACM), hydrocarbon residues and motor vehicle wastes have also been identified in the landfill mass. The inclusion of such materials has resulted in the generation of landfill gas (LFG) and presence of several potential contaminants of concern (PCOC) in underlying soil and groundwater.

Two diesel and one waste oil underground storage tank (UST) were also understood to have been present (up until approximately 2008/2009) in the southwestern portion of the site as well as a vehicle maintenance shed. The former fuel bowser and underground tank is no longer present (was located on western side of maintenance shed). It is understood that the soil was tested and removed during the tank removal and 1 m of sand surrounding the tank was removed and the exaction backfilled with new clean fill. The removed sand was relocated to the top of the block and passively remediated.

Site filling activities ceased in approximately 2010.

The site was classified on 24 November 2009 as 'Contaminated – restricted use'. The current DWER basic summary of records is based on information received up to 14 September 2009.

It is understood that the design of the site is currently at concept stage and likely subject to changes based on environmental, geotechnical and other planning and engineering constraints. However, broadly speaking, the following land uses are expected for the site.

- residential (presumably single dwellings) across the northern and western portions (this includes a sales village to be located in a strip along Mirrabooka Avenue);
- Commercial along Furniss Road to tie in with the existing commercial precinct to the north; and
- Public open space (POS) in the central portion.



2. Audited Documentation

A large number of investigations have been completed to date. The following reports have been reviewed by myself as part of the audit process.

- Soil & Rock Engineering Pty Ltd (2000), Quality Plan for Filling Operations, Landsdale Non-Organic Waste Facility
- Soil & Rock Engineering Pty Ltd (2001) Audit Report No.1 Landsdale Non-Organic Landfill Development
- RPS Bowman Bishaw Gorman (RPS), (2005) Preliminary Site Investigation – Lot 1441 Driver Road
- WSP (2008a) Preliminary Site Investigation, 50 Driver Road, Darch
- WSP (2008b) 50 Driver Road – Summary of Landfill Gas Data from Perimeter Monitoring Wells
- WSP (2009a) Tier 1 Risk Assessment - 50 Driver Road, Darch
- WSP (2009b) Sampling, Analysis and Quality Plan - 50 Driver Road, Darch
- WSP (2009c) Landfill Gas Monitoring Report 1 - 50 Driver Road, Darch
- WSP (2009d) Landfill Gas Monitoring Report 2 - 50 Driver Road, Darch
- WSP (2009e) Landfill Gas Monitoring Report 3 - 50 Driver Road, Darch
- WSP (2009f) Groundwater Monitoring Report - 50 Driver Road, Darch
- WSP (2010) 50 Driver Road – Strategy for Monitoring Landfill Gas
- WSP (2012a) 2011 Annual Landfill Gas Monitoring Report
- WSP (2012b) Groundwater Monitoring Report – 50 Driver Road, Darch
- Environmental Strategies (2013) 2013 Landfill Gas Monitoring – 50 Driver Road, Darch
- Golder Associates (2014) Furniss Road Landfill, Darch – Data Gaps Analysis and Preliminary Conceptual Site Model
- Environmental Strategies (2015) 2014 Annual Environmental Report, Non-Organic Disposals
- Endpoint Pty Ltd (2016) 2015 Annual Environmental Report, Non-Organic Disposals
- Endpoint Pty Ltd (2017) 2016 Annual Environmental Report, Non-Organic Disposals
- Endpoint Pty Ltd (2018) 2017 Annual Compliance Report, Non-Organic Disposals
- Strategen (2018a) 26 Driver Road, Darch WA. Site Reconnaissance – Landfill Gas & Groundwater Monitoring Bore Network
- Strategen (2018b) 26 Driver Road, Darch WA. Environmental Due Diligence Report

Subsequently, Galt Environmental were engaged to close out data gaps and to complete required investigations and remediation for the site. To date, the following additional reports have been reviewed.

- Galt Environmental (2019) Preliminary Site Investigation and Data Gap Analysis – Former Landfill Lot 2 (No. 26) Driver Road, Darch, Revision 0 dated 27 September 2019.
- Galt Environmental (2019) Sampling Analysis and Quality Plan – Phase 1 Commercial Precinct, Former Landfill, 26 Driver Road, Darch, Revision 0 dated 27 September 2019.
- Galt Environmental (2019) Summary of Contamination Assessment, Proposed Mixed Use Development, Lot 2 (no 26) Driver Road, Darch, dated 26 November 2019.



3. Current Status

A large volume of environmental investigations and monitoring has been undertaken at the site from 2005 to present, for varying reasons including licence monitoring conditions, progressing the site towards reclassification by DWER and due diligence. In short summary, the key site contamination issues for the site are as follows.

- The site is underlain by fill material to depths up to 25m.
- Groundwater beneath the site contains metals (arsenic, manganese, total chromium) and nutrients including sulphate.
- Landfill gas, including methane and carbon dioxide, is present within the site, resulting from deterioration of organic material.
- ACM and asbestos fibres on the site surface and within the landfill mass requires appropriate management.

Five key data gaps remain for the site as follows.

- 1) Confirmation of the nature of the capping material i.e. whether the fill was visually free of rubble etc. or certified clean fill.
- 2) The potential for off-site influences such as landfill gas migration and groundwater migration beneath the site from neighbouring Lot 1.
- 3) Previous investigations have mainly focused on the site perimeter (for groundwater and landfill gas), the former underground storage tanks (USTs) and the northern and eastern portion of the site. Further assessment particularly for soil, groundwater and landfill gas assessment is needed in the south-western portion of the site.
- 4) Further investigation targeting the former maintenance workshop/shed and vehicle and equipment storage areas in the southwestern portion of the site.
- 5) Although there are a large number of LFG monitoring bores across the site, additional points are required to meet the CIRIA C665 density requirements for residential use with high end sensitivity.

The current scope of works being undertaken by Galt Environmental aim to close out these remaining data gaps. Galt Environmental (2019) *Summary of Contamination Assessment, Proposed Mixed Use Development, Lot 2 (no 26) Driver Road, Darch*, dated 26 November 2019, provides an accurate summary of the current site conditions, process and likely outcomes.

4. Audit Process

Works being undertaken by Galt Environmental and the auditing of those works, follows the general framework outlined in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 16 May 2013 (ASC NEPM), DWER Contaminated sites guidelines and other key guideline documents.

At the completion of assessment, a mandatory auditor's report (MAR) will be prepared which will fully document the works completed, assessment of the quality/completeness of investigations and recommendations for site suitability and site classification under the *Contaminated Sites Act 2003*. It would be prudent that conditions are applied at the **subdivision phase** to ensure that any lots created are suitable for their intended land use.

The results to date indicate that landfill gas is likely to fall under characteristic 1 or 2 which will require some gas management. These can easily be incorporated into building designs to mitigate risk and would require memorials on title and a site management plan. It is also likely that abstraction of



groundwater within the shallow superficial aquifer will be restricted so that it is not used for drinking or non-potable purposes.

5. Closure

In summary, contaminated site investigation works are being undertaken in accordance with the requirements of DWER and NEPM and are being independently reviewed using an audit process. This audit is voluntary as there are no current requirements under the *Contaminated Sites Act 2003*, however, the audit still follows the same framework for a mandatory audit, providing oversight and rigor to the process.

Some contamination has been identified to date which requires further assessment, remediation and management. However, to date, nothing has been detected (or suspected) that is not able to be easily mitigated by remediation or management.

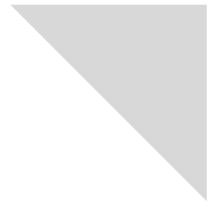
It would be prudent that conditions are applied at the subdivision phase to ensure that any lots created are suitable for their intended land use.

I'd be happy to further discuss with you or any other interested parties, including the City of Wanneroo. In the meantime, should you require any further information or have any questions regarding this site, please do not hesitate to contact me at vanessa.bryant@senversa.com.au or via mobile on 0419 951 532.

Yours sincerely,

Vanessa Bryant

Senior Principal
Contaminated Sites Auditor (WA)



APPENDIX 4

LOCAL WATER MANAGEMENT STRATEGY



ROWE
GROUP
DESIGN

Lot 2 Driver Rd, Darch

Local Water Management Strategy

Prepared for Parcel Property

By Urbaqua

October 2019

Disclaimer and Limitation

This document is published in accordance with and subject to an agreement between Urbaqua and the Client, Parcel Property, for who it has been prepared for their exclusive use. It has been prepared using the standard of skill and care ordinarily exercised by environmental professionals in the preparation of such Documents.

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1 INTRODUCTION

Urbaqua has been commissioned by Parcel Property to prepare this Local Water Management Strategy (LWMS) in support of the Local Structure Plan for Lot 2 Driver Rd, Darch (herein referred to as Study Area). The Study Area is located approximately 16.3km north of the Perth CBD. The site is 24.7 hectares in size and is bound by:

- Mirrabooka Avenue to the east;
- Furniss Road to the north;
- Driver Road and an operational landfilling operation (Non-Organic Disposals) to the west (Lot 1);
- Residential properties to the south.

The Study Area is currently classified by the Department of Water and Environmental Regulation (DWER) as 'Contaminated – restricted use' under the Contaminated Sites Act 2003 with land use at the site restricted to a managed landfill site only. The site has since undergone groundwater and gas testing to assess the suitability of the site for development. The vision is to redevelop the Study Area into an urban precinct with residential lots, commercial lots and public open space. The LWMS is prepared to support the planning process and guide sustainable water management during redevelopment.

1.1 Principles and design objectives

Consistent with *State Planning Policy 2.9: Water Resources* (WAPC, 2006) and *Better urban water management* (WAPC, 2008) a local water management strategy (LWMS) is required to be submitted to support any rezoning of land in a Local Planning Scheme or adoption of a Local Structure Plan to ensure that appropriate water management strategies are identified. The position of this strategy within the state government planning framework is defined in *Better urban water management* (WAPC, 2008) and is outlined in Figure 1.

The LWMS should be prepared in accordance with the Department of Water's *Interim: Developing a local water management strategy* (2008a) and should demonstrate to the satisfaction of the WAPC in accordance with any approved DWMS:

- How the key principles and strategies of this plan have been addressed;
- How the urban structure will address water use and management;
- Existing and required water management infrastructure; and,
- Detailed land requirements for water management.

The principles and strategies contained within Section 5 of this LWMS will be implemented as part of detailed land use planning and development requirements and are consistent with the framework and requirements in *Better urban water management* (WAPC, 2008) as demonstrated in Appendix 1.

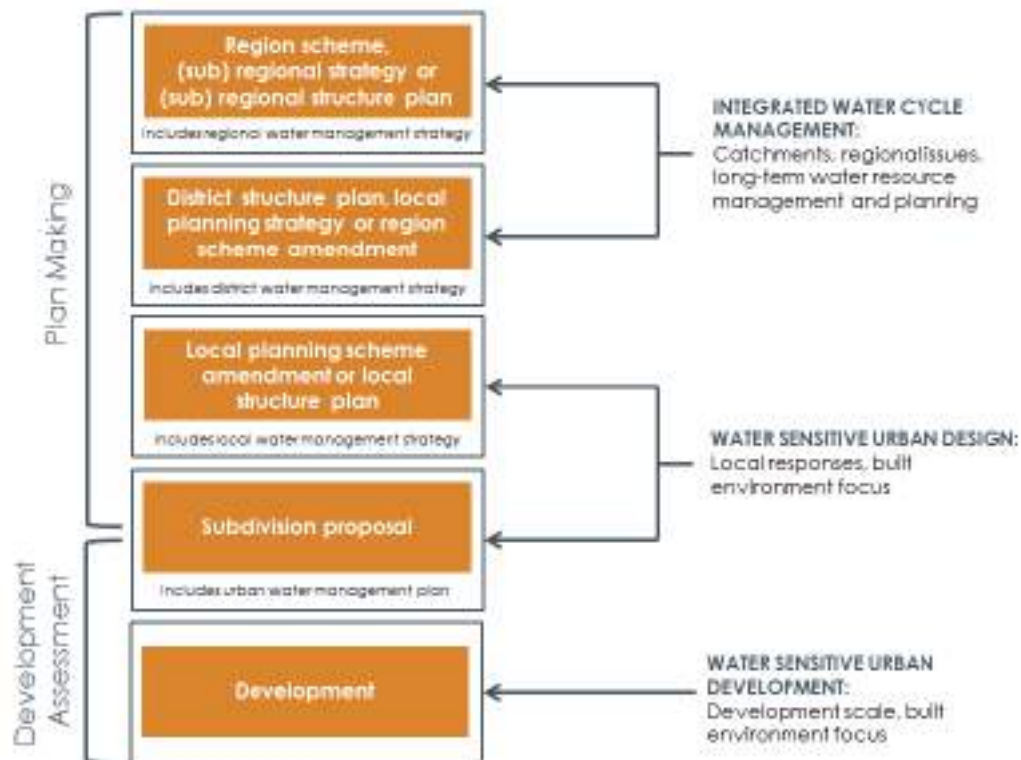


Figure 1: Integrating water planning with land planning processes (WAPC, 2008a)

1.2 Planning background

The site is currently zoned as 'Urban' under the Metropolitan Regional Scheme and as 'Urban Development' under the City's District Planning Scheme No. 2.

The current East Wanneroo Structure Plan – Cell 6 has the Site zoned as 'Landfill Precinct' with the section along the northern boundary zoned as 'Business Precinct'. This LWMS is being submitted as part of the amendment to rezone the Site as 'Residential'.

The land to the south of the Site was used for agricultural purposes during the 1980's and 1990's. The land directly to the east was developed for residential use in the late 1990's, followed by the land to the south and west in the early-mid 2000's. The land directly to the north was developed for light-industrial use in the late 2000's (Landgate, 2019).

1.3 Guiding documents

A number of guiding documents have been considered that are relevant to this strategy area. In addition to State Planning Policy 2.9, these documents inform the strategies and management principles contained within this Local Water Management Strategy:

- Developing a Local Water Management Strategy (DoW, 2008a);
- Stormwater Management Manual for Western Australia (DoW, 2004-09);
- Better Urban Water Management (WAPC, 2008a);
- Development Design Specification: Stormwater Drainage Design (City of Wanneroo, 2019); and,
- Decision Process for Stormwater Management in Western Australia (DWER, 2017).

2 PROPOSED DEVELOPMENT

Development of the Study Area to create a vibrant urban precinct provides opportunities to incorporate water sensitive urban design. This section outlines the key elements of the current land use and proposed re-development that influence water management.

2.1 Previous land use

The site was originally mined for sand supplies for the building industry in the early 1970's. The sand was progressively removed and the area was operated as a disposal area for non-organic waste (mainly building rubble). The site has now been entirely filled apart from an area in the north west corner which is outside of Lot 2 (Lot 1) (Galt Geotechnics, 2019a).

2.2 Development

The local structure plan amendment will guide the future urban regeneration of the study area. Proposed development will feature:

- Residential lots across the eastern, southern and western sections;
- A Group Housing Site in the south east;
- Light industrial lots along Furniss Road to the north; and,
- District level Public Open Space.

The concept design is presented in Figure 3 and included in Appendix 2.

Development will increase impervious areas and increase stormwater runoff. There is however, an opportunity to integrate water sensitive urban design into the development and provide improved water quality and sustainability outcomes.

Parcel Property - Lot 2 Driver Road, Darch Local Water Management Strategy

Figure 2 - Study area



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0 100
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Parcel Property - Lot 2 Driver Road, Darch Local Water Management Strategy

Figure 3 - Concept plan



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3 DESIGN CRITERIA

Table 1 outlines the key design objectives to be achieved within the Study Area.

Table 1: Design Criteria

Design Element	Criteria
Water sustainability	<ul style="list-style-type: none"> • Maximise local infiltration to replenish surface groundwater aquifers; • Reach a target for domestic scheme water use of 100kL/year per person; and • Provide alternative water sources for domestic irrigation and in-house domestic non-drinking water demands.
Surface water management	<ul style="list-style-type: none"> • The first 15mm of rainfall is to be retained within all lots through a combination of raingardens, water tanks or soakwell systems (DWER, 2017); • Minor event runoff from events larger than 15 mm total depth are to be managed to provide serviceability requirements; • Roads and public open spaces are to be designed to cater for the surface overflow for more severe storm events with habitable floors at least 0.3 m above the 1% AEP flood or storage level at any location; • Water quality treatment systems and stormwater management structures should be designed in accordance with the Stormwater Management Manual for Western Australia (Department of Water, 2004-07) and Australian Runoff Quality: A guide to water sensitive urban design (Engineers Australia, 2006).
Groundwater management	<ul style="list-style-type: none"> • Provide an appropriate separation distance between finished lot levels and groundwater to maintain the expected level of amenity with all soakwell devices designed with a minimum of 0.3 m separation from the maximum groundwater level.
Management of disease vectors and nuisance insects	<ul style="list-style-type: none"> • Limit the creation of new sites for breeding of nuisance insects; • Prevent standing water in drainage infrastructure (infiltration within 96hrs); and • Improve water quality throughout the development.
Implementation	<ul style="list-style-type: none"> • Provide a framework to implement water management strategies outlined in the LWMS; • Water management measures during construction to prevent damage to existing infrastructure and receiving environments.

4 EXISTING SITE CHARACTERISTICS

A summary of the existing environmental conditions in the Study Area are provided in this section, including determination of the opportunities and constraints for water management.

4.1 Climate

The climate is typical of the south western region of Western Australia and is characterised by the Koppen Climate Classification as Dry Subtropical featuring mild winters and hot to very hot summers. The dominate rainfall mechanisms are frontal systems caused by cold fronts associated with low pressure systems that extend across southern Australian between May and October. During the summer months, thunderstorms and ex-tropical cyclones can bring intense rainfall.

Average annual rainfall recorded at the nearest long term Bureau of Meteorology (BoM) weather station (Perth Metro WA (no. 9225) approximately 12.3 km south of the Study Area) since 1993 is 733.2 mm (Figure 5). Since 2000, the average annual rainfall is 707.5 mm, an approximately 3.5% decrease.

The significant decrease in annual rainfall is associated with a decrease in winter rainfall. Rainfall in the June and July has decreased by approximately 7%. There has been an increase in summer rainfall associated with thunderstorms and ex-tropical cyclones, but this rainfall is often intense occurs over a short duration and does not affect the loss of winter rainfall.

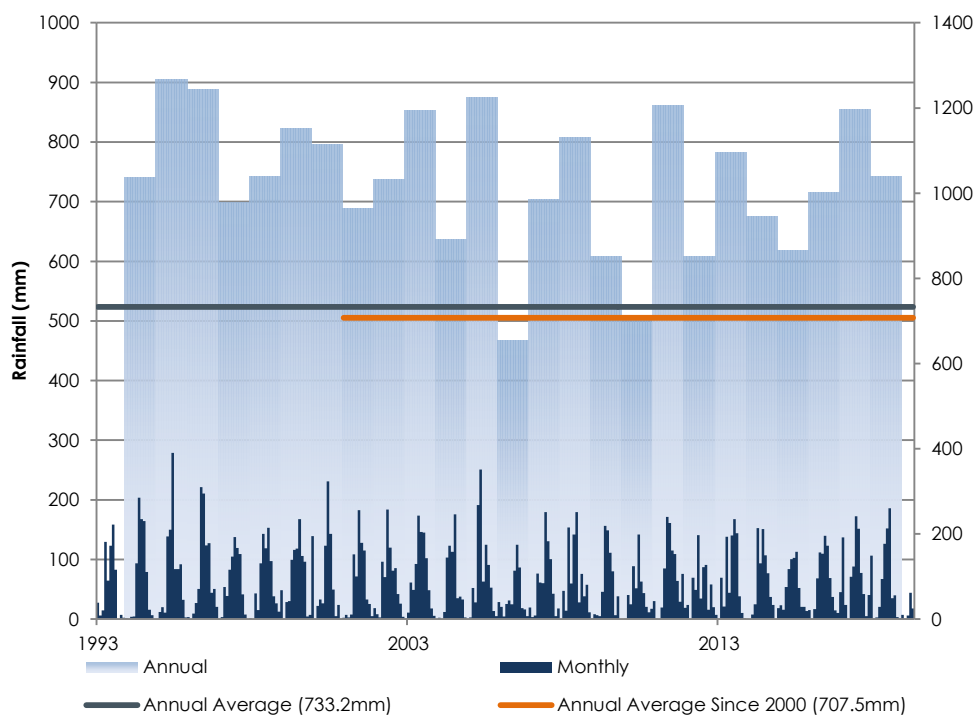


Figure 4: Rainfall summary data (Perth Metro WA, BoM, 2019)

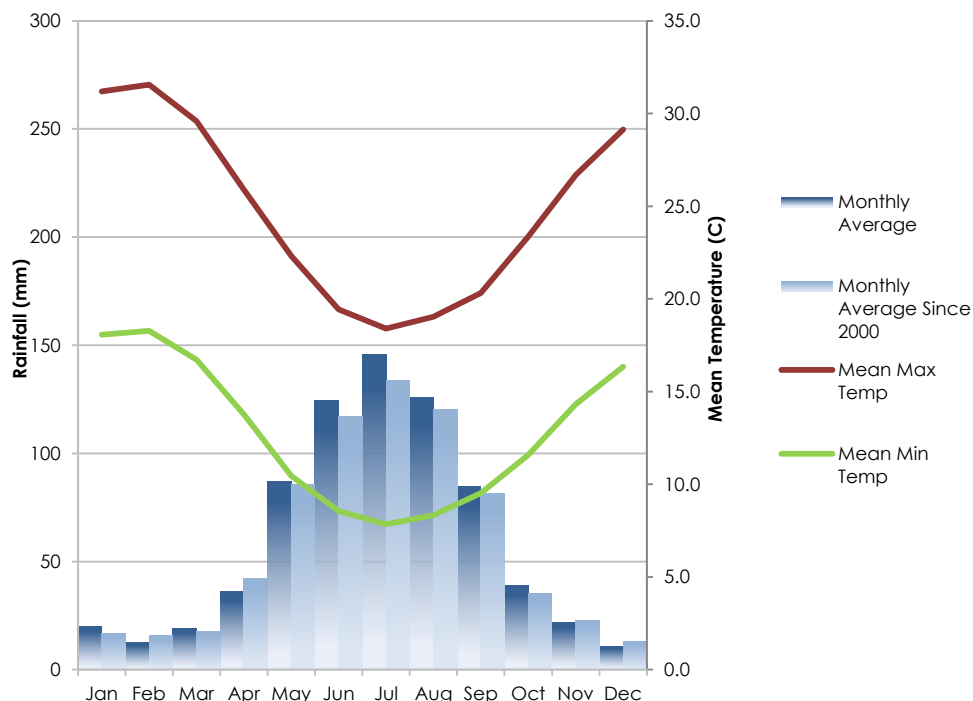


Figure 5: Climate summary data (Perth Metro WA, BoM, 2019)

Temperatures recorded at the Perth Metro WA (BoM station 9225) show that the average monthly maximum temperatures range between 18.4°C in July and 31.6°C in February, while average monthly minimum temperatures range between 7.8°C in July and 18.3°C in February.

4.2 Topography

Topography at the Site varies according to the progress of landfill activities. The highest point of 58 mAHD is located east of the centre of the Site. From there it slopes downwards to the south-west reaching a minimum of 42 mAHD. The Site also slopes downwards to the north reaching 52 mAHD at Furness Rd (Figure 6).

4.3 Geology and soils

Stormwater management is influenced by the soils of the Study Area and their ability to retain and infiltrate runoff.

4.3.1 Surface geology and soils

Regional surface geological mapping indicates the site is Sand S7 (Figure 6). A comprehensive geotechnical assessment was undertaken by Galt Geotechnics in June 2019 (Appendix 3). The investigation found soils within the Study Area mainly consisted of deep uncontrolled fill covered with a layer of either sand fill or screened fill that varied across the Site (Galt Geotechnics, 2019a). A summary of the geotechnical units described in the geotechnical assessment are provided in Table 2. The site is considered unsuitable for development in its current condition due to the presence of deep uncontrolled fill which is locally loose and subject to creep settlements. It is possible to improve the site to a sufficient standard through engineering treatments, as described in Section 5.2.

Parcel Property - Lot 2 Driver Road, Darch Local Water Management Strategy

Figure 6 - Surface geology and topography



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Table 2: Geotechnical units (Galt Geotechnics, 2019a)

Unit	Description
Unit 1a – Sand fill	FILL SAND (SP): Fine to coarse grained, sub-angular to sub-rounded, yellow/brown, trace fines, trace fine to medium grained gravel, trace organics, trace (less 1%) deleterious waste (steel, timber, plastic etc), variable density typically ranging between loose and dense (often medium to dense), present across most of the site to depths between 1 m and 6.8 m.
Unit 1b – Uncontrolled fill	<p>FILL: SAND / BUILDING DEBRIS / RUBBISH: Comprises a mixture of SAND (SP) – approximately 40% to 80%, Inert BUILDING DEBRIS – approximately 20% to 70% and RUBBISH – less than 10%.</p> <ul style="list-style-type: none"> SAND can be described as fine to coarse grained, sub-angular to sub-rounded, grey/brown, trace fines. BUILDING DEBRIS can be described as inert building demolition / site clean-up materials, typically comprising bricks, concrete slabs and limestone gravel/cobbles. Particle sizes typically ranging from 0.05 m to 0.5 m diameter, although large concrete pieces (up to ~1.5 m long) are present. RUBBISH can be described as plastic (strapping, bags, buckets, bottles), organics (wood fragments, timber, grass, roots), scrap metal (pipes, rods, reinforcing bars, star pickets, canisters, etc).
Unit 1c – Screened fill	Screened fill is a layer of typically gravelly sand which appears to be a <10 mm product left over from screening operations on Lot 1. It incorporates sand and gravel-sized particles of brick, concrete and limestone. It includes a trace of rubbish (glass, plastic, wood fragments, etc) but these inclusions are not considered significant to its structural performance.
Unit 2 – Natural sand	SAND (SP), fine to medium grained, sub-angular to sub-rounded, yellow/pale yellow/pale brown becoming white or pale grey at depth, traces fines, typically medium dense becoming dense / very dense with depth, present to the maximum depth of investigation (19 m).

A series of infiltration tests were undertaken by Galt Geotechnics (Appendix 4), a summary the mean hydraulic conductivity of each of the soil types is shown in Table 3.

Table 3: Mean hydraulic conductivity (Galt Geotechnics, 2019b)

Unit	Mean Infiltration Rate	Max infiltration Rate	No. of Tests
Unit 1a – Sand fill	8.3 m/day	>15 m/day	30
Unit 1b – Uncontrolled fill	10.4 m/day	>15 m/day	6
Unit 1c – Screened fill	10.2 m/day	>15 m/day	11

4.3.2 Acid sulfate soils

A review of the Department of Water and Environment Regulation Acid Sulfate Soils (ASS) risk mapping (DWER, 2019a) identifies the Study Area as having no known risk of ASS occurring within 3 m of the surface.

4.4 Groundwater resources

Determining the groundwater depth, quality and availability are crucial for forming total cycle water management strategies. These components are outlined below.

4.4.1 Public Drinking Water Source Area

There are no Public Drinking Water Source Areas within the Study Area.

4.4.2 Groundwater allocation

The Study Area is located within the Swan Coastal Plain Subarea, Whitfords Subarea and Perth North Confined Subarea. The Department of Water and Environmental Regulation's Water Register (DWER, 2019b) shows that there is no groundwater available for allocation from the Superficial Aquifer within the Study Area. An Aquifer Allocation Report was requested from DWER in June 2019 and the details are shown in Table 4.

Table 4: Groundwater resource allocation availability (as of June 2019)

Mgmt Area	Mgmt Sub Area	Resource	Allocation Limit	Allocated Volume	Remaining Volume
Perth	Whitfords	Perth, Whitfords, Perth - Superficial Swan	7,240,000 kL	8,852,255 kL	0 kL
Perth	Perth North Confined	Perth, Perth North Confined, Perth - Yarragadee North.	70,000 kL	80,000 kL	0 kL
Perth	Perth North Confined	Perth, Perth North Confined, Perth - Leederville.	1,364,220 kL	1,375,360 kL	0 kL

There is currently one existing groundwater Licence's within the Study Area as shown in Table 5.

Table 5: Existing groundwater licences within the Study Area

Licence Number	Licence Allocation	Groundwater Area	Groundwater Subarea	Issue Date	Expiry Date
GWL64710	2,250kL	Perth	Whitfords	13/02/2018	11/02/2028

4.4.3 Groundwater levels

The Perth Groundwater Atlas (DWER, 2019c) indicates that groundwater flows in a south-west direction through the site, with maximum groundwater levels varying between 38 mAHD and 42 mAHD. Minimum groundwater levels across the catchment vary between 38 mAHD and 39 mAHD. Regional mapping therefore indicates that depth to groundwater varies between 3.5 m and 20.0 m across the site.

As part of the environmental monitoring for the site, Galt undertook groundwater level measurements in 36 sites in June and October 2019. Observed water levels are presented in Table 5, along with a comparison to long term DWER monitoring bore MM14 (Ref 61610714), approximately 2 km west of the Study Area. The trend in groundwater levels for MM14 is presented in Figure 7.

There is a clear step up in groundwater levels from approximately 2008 onwards. This is associated with a change in land use, particularly in the Madeley and Darch areas, from irrigated market gardens to residential development. A review of aerial photography in 2003 and 2012 indicates that residential areas (inclusive of Public Open Space) in these two suburbs (outside of the Study Area) increased from 28% to 97%. From 2012 to 2018 there has been minimal increase in residential areas in these suburbs and therefore further significant increases in groundwater are considered unlikely. Development of the Study Area will have limited impact on regional groundwater levels as all rainfall on the site is currently infiltrated, with minimal irrigation, unlike previous surrounding market garden uses.

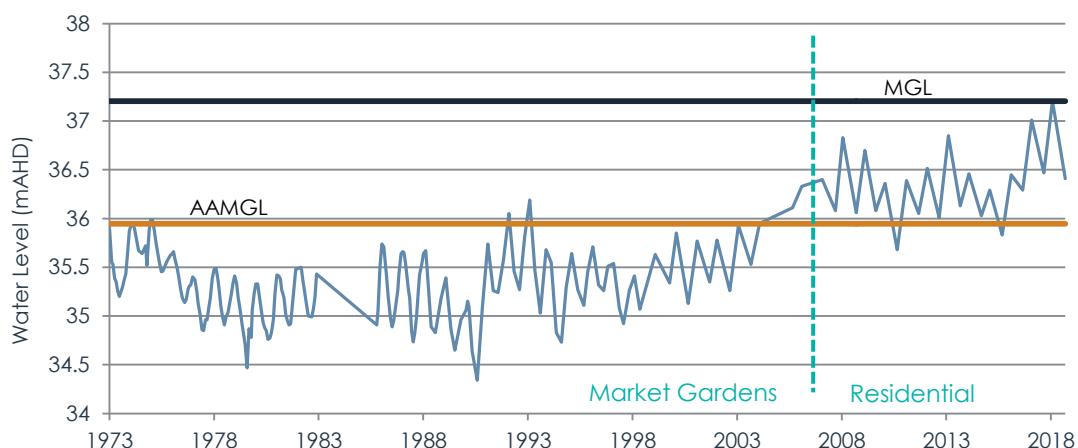


Figure 7: Groundwater levels in DWER Bore MM14

Following the step change in groundwater levels, the higher groundwater levels observed in 2008, 2013, 2017 and 2018 and correlate with years of higher annual rainfall. The Maximum Groundwater Level (MGL) (37.21 mAHD) were observed in 2018.

Maximum groundwater levels are recorded in October each year. Owing to recent trends, measurements recorded in October 2019 are considered to be within 200 mm of the 2018 MGL, and this correction is applied in Table 6. The groundwater levels are presented in Figure 8. These results indicate that the minimum depth to groundwater at these bore locations is 5.70 mAHD.

Table 6: Recorded groundwater levels October 2019

Monitoring bore	Easting	Northing	Ground level (mAHD)	Water Level Oct 2019 (mAHD)	Max Water Level (mAHD)	Depth to Max Water Level (m)
LG02	391138	6480220	45.84	38.44	38.64	7.20
LG04	391288	6480220	46.23	38.43	38.63	7.60
LG05	391338	6480220	47.79	38.49	38.69	9.10
LG06	391142	6480160	44.33	37.33	37.53	6.80
LG09	391292	6480160	46.86	37.86	38.06	8.80
LG10	391342	6480160	49.13	38.13	38.33	10.80
LG13	391330	6480107	46.82	38.52	38.72	8.10
LG17	391470	6480201	56.43	39.93	40.13	16.30
LG18	391514	6480104	58.30	38.50	38.70	19.60
LG19	391611	6480096	58.14	38.64	38.84	19.30
LG20	391655	6480149	56.96	38.96	39.16	17.80
LG21	391582	6480181	58.84	39.34	39.54	19.30
LG22	391559	6480211	58.71	38.91	39.11	19.60
LG23	391609	6480211	58.62	39.12	39.32	19.30
LG24	391709	6480261	57.13	39.13	39.33	17.80
LG25	391491	6480277	56.77	39.57	39.77	17.00
LG26	391459	6480311	56.65	39.95	40.15	16.50
LG27	391405	6480320	57.06	38.86	39.06	18.00
LG28	391427	6480366	56.10	39.10	39.30	16.80
LG29	391520	6480392	55.70	39.30	39.50	16.20
LG30	391679	6480387	56.42	39.72	39.92	16.50
LG31	391404	6480466	46.29	38.69	38.89	7.40
LG32	391441	6480456	54.82	39.62	39.82	15.00
LG33	391517	6480466	53.94	38.74	38.94	15.00
LG34	391609	6480461	54.54	39.84	40.04	14.50
LG35	391682	6480446	55.50	39.80	40.00	15.50
LG37	391514	6480575	51.39	39.89	40.09	11.30
LG38	391609	6480561	53.26	39.76	39.96	13.30
LG39	391684	6480515	55.33	39.83	40.03	15.30
LG40	391725	6480494	55.29	39.79	39.99	15.30
MW01	391414	6480596	50.73	39.83	40.03	10.70
MW02	391404	6480416	45.04	38.54	38.74	6.30
MW03	391388	6480220	51.30	38.40	38.60	12.70
MW04	391238	6480220	45.31	38.31	38.51	6.80
MW05	391380	6480107	49.99	37.69	37.89	12.10
MW06	391230	6480107	44.11	38.21	38.41	5.70

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Figure 8 - Groundwater levels



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4.4.4 Groundwater Quality

As part of the environmental investigations, groundwater quality monitoring was also undertaken by Galt. Concentrations of all hydrocarbons, chlorinated solvents, halogenated benzenes, PFAS compounds were either below the laboratory limit of reporting and/or conformed to the relevant assessment criteria. Minor exceedances above the relevant assessment criteria of some heavy metals (arsenic, boron, copper, iron, manganese, mercury, nickel and zinc) were noted at several monitoring well locations, mainly those in the central portion of the site.

Further details are available in the *Preliminary Site Investigation* (Galt, 2019c).

4.5 Surface water resources

Existing surface water features within and adjacent to the Study Area may require protection from redevelopment or provide opportunities for modification to deliver the community an asset with social and ecological benefits. The surface water features are outlined below.

4.5.1 Natural water resources

Within the Study Area there are no natural water bodies owing to the relatively steep slopes, sandy soils and clearance to groundwater. There is no existing drainage infrastructure within the Study Area.

4.5.2 Surrounding Drainage

The surrounding residential developments feature formal pit and pipe drainage systems discharging to sumps and basins throughout the suburb. Two sumps are in close proximity to the Study Area, with one sump on the southern boundary (Cristata Terrace) and one across Driver Road (Carlow Way), as shown in Figure 9. The Cristata Sump is approximately 3 m deep and the Carlow Sump is approximately 6 m deep. Visual inspection of the sumps identified pipe outlets near the respective sump inverts, indicating that they are designed to be deep due to these levels rather than for stormwater runoff volumes.

Further investigation of the sumps was therefore undertaken to identify whether the sumps contained additional capacity for runoff within the Study Area. This investigation included catchment inspection and delineation (in lieu of As-Con drawings), stormwater modelling and installation of water level loggers to determine the water levels in the sumps in response to recorded rainfall events.

The loggers were installed in early August 2019 and recorded approximately 80 mm over the course of the month (including three events of greater than 15 mm). The sump water levels and rainfall are shown in Figure 10 and Figure 11 respectively, noting the rise in water level following heavy rainfall, and decline as the water infiltrates. Standing water was observed in each sump (38.65 mAHD in Cristata Tce and 38.71 mAHD in Carlow Way) indicating either expressed groundwater, or water that has infiltrated slowly (less than design rates) due to clogging. This was considered in modelling, with no infiltration rate applied to model. The logger data indicates the maximum water level rise in each sump over the month was 0.35 m and 0.60 m in Cristata and Carlow respectively.

The water level loggers were accompanied by a feature survey of the sumps (Appendix 5). The respective capacity in each sump was estimated as 2,445 m³ and 3,110 m³ in Cristata and Carlow respectively.

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Figure 9 - Surface water features



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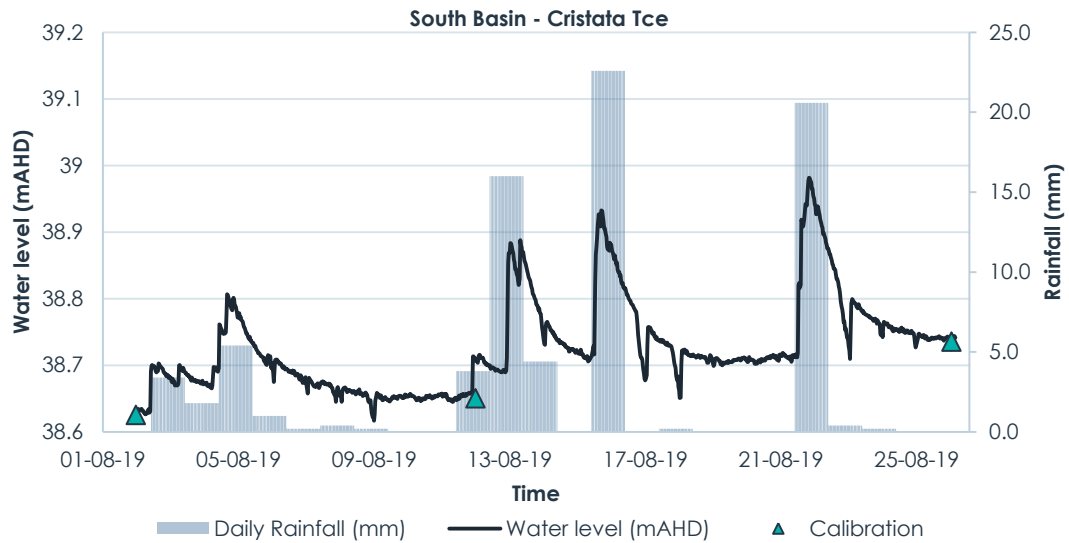


Figure 10: Cristata Terrace Sump Observed Water Levels (August 2019)

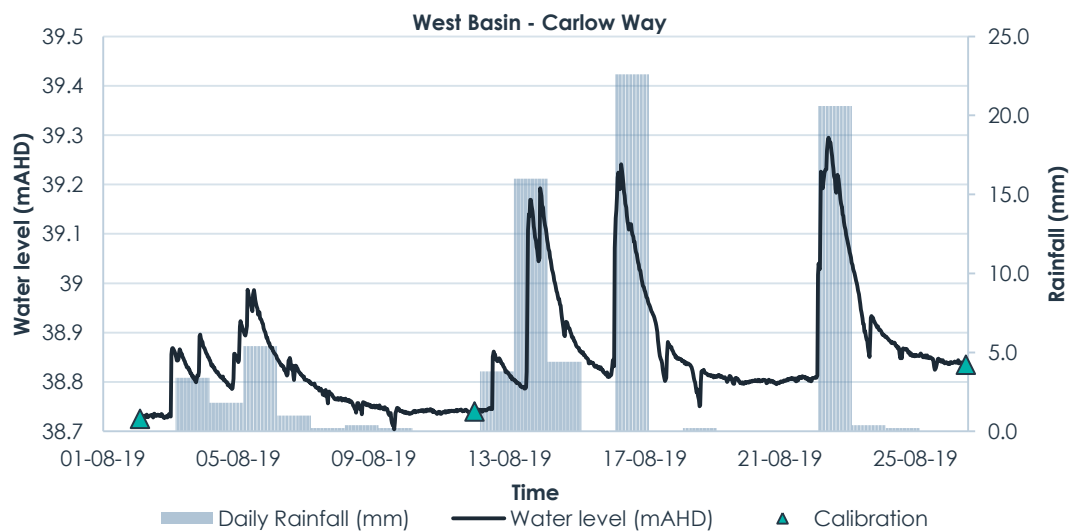


Figure 11: Carlow Way Sump Observed Water Levels (August 2019)

Each sump was then modelled using XP-Storm, a hydrological and hydraulic model, to determine the existing storage and any available capacity. Modelling was guided by the observed water level results to determine anticipated runoff from the catchment, assuming current infiltration and groundwater conditions.

The XP-Storm model has been developed to assess catchments flows and storages for the observed 15 mm rainfall event and the 20% and 1% AEPs (approximately 5 and 100 years ARI) design events. The larger design events were then assumed to have improvement to each sump to provide an assumed design infiltration rate of 5 m/day. Practically this would be achieved through cleaning out any fine sediment from the base of the sump (removing clogging), raising the base of each sump to ensure there is separation to groundwater, or a combination of both. Owing to the shape of each sump, there is minimal loss in volume associated with raising each base by 1.0 to 1.5 m.

The storm events in the XP-Storm model are based on temporal patterns and rainfall depths provided for the different storm events (BoM, 2019). The storm durations assessed for 20% and

1% AEPs was 10, 15 and 30 minutes and 1, 2, 3, 6, 12, 24 and 48 hours, including 10 temporal patterns for each storm event. The Critical duration for the sumps was identified as 6 hours.

The modelling results and available storages are provided in Table 7, and indicate varying available capacity. The Cristata Sump has less than 20% available capacity in the 1% AEP event, whilst the Carlow Sump has over 80% available under current conditions. The use of this spare capacity is discussed further in Section 5.3.

Table 7: Sump Modelling Results

	West Sump (Carlow Way)	South Sump (Cristata Tce)
Total Catchment Area	1.66 ha	8.59 ha
Base Elevation	37.6 mAHD	37.6 mAHD
Base Area	0 m ²	5 m ²
Top Area	1,135 m ²	1,240 m ²
Total Volume	3,110 m ³	2,445 m ³
Total Depth	5.8 m	3.2 m
20% AEP event Water Level	38.84 mAHD	38.97 mAHD
20% AEP event Volume	132.8 m ³	630.8 m ³
1% AEP event Water Level	39.65 mAHD	39.65 mAHD
1% AEP event Volume	404.5 m ³	2050.8 m ³
Available capacity (1% AEP)	2,705 m ³	394 m ³
Infiltration Rate	5 m/day	5 m/day
Roads/Lots Initial Loss	5mm/15mm	5mm/15mm

Galt sampled standing water observed in the base of the sumps in September 2019. The concentration of contaminants of potential concern (including landfill leachate), with the exception of dissolved iron, were below the relevant assessment criteria in samples collected from the sumps.

4.5.3 Wetlands

There are no existing wetland areas mapped within the Study Area reflecting the existing surrounding development, sandy soils, slopes and clearance to groundwater. The nearest wetland area (site ID 8136), is mapped as a Resource Enhancement (RE) (DBCA, 2019), however this is up-gradient of the Study Area (Figure 12).

4.6 Environmental and social

As the Study Area was previously operated as a Class I landfill, there are minimal environmental values. Vegetation is generally limited to verges and there are no Bushforever sites located within the Study Area (Figure 12).

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Figure 12 - Environmental and heritage features



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Previous investigations regarding the potential contamination on site left a number of gaps with regards to onsite and offsite soil, groundwater and landfill gas conditions (Galt, 2019c). As part of the audit process and clearance for the intended development, Galt are undertaking gas and groundwater monitoring to determine the location of any onsite issues, and measures required for mitigation. This includes installation of gas monitoring wells and groundwater bores, with results to be presented in the Detailed Site Investigation. This process is undertaken separately to the BUWM documentation however any significant risks or management requirements will be outlined in the subsequent UWMP.

4.7 Summary

Based on the review of geological, hydrological and environmental information for the Study Area, the key considerations for water management are as follows:

- There is no allocation available within the superficial aquifer;
- Existence of deep groundwater, sandy soils and high infiltration rates within the Study Area favour disposing of stormwater via infiltration;
- There are no existing surface water features or drainage infrastructure within the Study Area;
- Existing sumps adjacent to the site have available capacity for additional drainage;
- The previous landfill site requires engineering and geotechnical treatment to prevent irregular creep settlement;
- Groundwater monitoring onsite did not indicate any significant issues to prevent development.

5 WATER MANAGEMENT STRATEGY

Water management strategies for the Study Area have been prepared in accordance with the guiding documents, policies and strategies (Section 1), the intended development concept (Section 2) and the site considerations (Section 4). Strategies for water sustainability, stormwater, groundwater, and water quality improvement are outlined in this Section.

5.1 Water sustainability initiatives

The key objectives for water sustainability are:

- Ensure the efficient use of all water resources in the redeveloped urban form and aim to achieve highest value use of fit-for-purpose water; and
- Maintain opportunities for future generations by using water more efficiently.

5.1.1 Water supply

The Study Area is located in an area served by the Water Corporation's integrated water supply scheme. All dwellings will be connected reticulated drinking water distribution network.

The total POS area of 5.0 ha requires a total water of 33,750kL/yr for irrigation, based on the DWER standard irrigation rate of 6,750 kL/ha/yr for POS in the North West Corridor. A breakdown of the landscaped areas is provided in Appendix 6.

Currently there is a licence associated with the site for only 2,250 kl/yr, which is sufficient for areas outside of the District POS (4.8 ha). Additional allocation will be sought from either trading with an existing licence holder in the subarea and/or working with the City of Wanneroo to transfer a portion of their existing allocation for the site. Confirmation of the final licence will be provided in the Urban Water Management Plan.

5.1.2 Wastewater treatment and disposal

The Study Area is located in an area served by the Water Corporation's integrated sewerage scheme and will be connected to a reticulated sewerage network.

5.1.3 Water conservation and efficiency measures

To reduce the consumption of scheme water newly constructed houses will be recommended to meet the Water Corporation's Waterwise homes and gardens criteria. That is:

- All showerheads installed will be better than the minimum WELS 3 Star rating;
- All taps installed will be better than the minimum WELS 4 Star rating;
- All toilets will be dual flush and exceed the minimum WELS 4 Star rating; and
- All water using appliances installed are rated WELS 4 Star or above.

Landscaping of public open space will contribute to water efficiency by using waterwise native plantings outside of playing fields. Water sensitive irrigation designs will be applied throughout all POS areas.

5.2 Groundwater management

The key objectives for groundwater management are:

- Protecting infrastructure and assets from flooding and inundation by high seasonal groundwater levels, perching and/or soil moisture;
- Protecting groundwater dependent ecosystems from the impacts of urban runoff; and,
- Managing and minimising changes in groundwater levels and groundwater quality following redevelopment.

The following planning measures are adopted to achieve the above objectives:

- Ensure infiltration of stormwater runoff, consistent with existing conditions; and,
- Use of bio-retention areas within raingardens, tree pits and swales to improve groundwater quality compared with the existing conditions.

Groundwater levels throughout the Study Area demonstrate that there is sufficient clearance to groundwater across the site, with a minimum clearance of 3 m, and the majority of the site with > 10 m of clearance. As discussed in Section 4.4.3, there has been a step up in groundwater levels in the region associated with residential development. No further increase is anticipated, however a minor increase will have limited impact on the clearance to groundwater for majority of the site.

As discussed in Section 4.3, engineering and geotechnical works are required to ensure the site is suitable for development by preventing irregular creep settlement. Full details of the remedial works are provided in the Geotechnical Report (Appendix 3), but include the following to achieve a site classification of "Class S":

- Place a thin layer of geo-fabric across the (compacted) uncontrolled fill;
- Place a thin layer of gravel fill (e.g. limestone) approximately 250 mm thick over the top of the gravel;
- Place a thin layer of approved fill approximately 250 mm over the top of the gravel;
- Place another thin layer of geo-fabric and gravel across the approved fill; and,
- Place approved fill to the required design level.

The configuration above presents a potential limitation for infiltration across the site, as the geo-fabric can potentially become clogged and the limestone material may also be limited. Note however that this configuration applies only to the building pad, and soakwell installation will be possible at the front (and back) of lots as necessary. Furthermore, the slopes on the site will allow for groundwater through flow and prevent any localised mounding. Therefore with the treatments described above, infiltration across the site can be maintained to predevelopment conditions.

5.3 Stormwater management

The key objectives for surface water management are:

- Protection of the receiving environments from the impacts of urban runoff; and,
- Protection of infrastructure and assets from flooding and inundation.

The following planning measures are adopted to achieve the above objectives:

- Residential, industrial or commercial premises in existing or proposed areas must have their floor levels elevated 300 mm above the 1% AEP flood level in the local drainage

system and 500 mm above the 1% AEP flood level in basins/sumps (where there is no overflow relief) (DWER, 2017);

- Runoff from up to the 20% AEP (approx. 5 yr ARI) event in residential lots are to be managed in accordance with the serviceability requirements of the *Decision Process for Stormwater Management in WA* (DWER, 2017) minor/major system;
- The design of the redeveloped urban areas should incorporate current best practice in water-sensitive urban design to mitigate the potential impacts on regional water quantity and quality from redevelopment and the legacy conditions within the catchment;
- Manage the first 15mm of rainfall through retention/detention and treatment within the Study Area boundaries;
- Modification of the existing local drainage systems to suit the urban form; and,
- Internal management of drainage up to the 1% AEP event within the Group Housing Site and Business Lots (Figure 3).

Post development catchments are shown in Figure 15, with a breakdown in Table 1 below.

Table 8: Catchment Area Breakdown

Land use	Catchment 1	Catchment 2	Catchment 3	Catchment 3a	Catchment 4
R20/R30 Lots	4.62 ha	0.67 ha	6.15 ha	1.66 ha	5.98 ha
R60 Lots	-	0.29 ha	-	-	-
Road reserve	1.53 ha	2.05 ha	1.95 ha	0.59 ha	1.78 ha
POS	0.052 ha	4.81 ha	0.098 ha	0.098 ha	0.20 ha
Total Area	6.20 ha	7.82 ha	8.20 ha	2.35 ha	7.96 ha

5.3.1 Small event management

The development will retain the first 15 mm of rainfall on-site within lots and streets. Residential lots will be required to install soakwells with grated lids within the front setback, which will be graded to allow for runoff into the street when the capacity of soakwells is exceeded. Installation of soakwells within cottage lots (R60) may be difficult owing to the lot size and other retention/detention systems may be utilised, including combined soakwells or above ground rain gardens. Direct connections to the road drainage system will be considered during detailed design and presented in the UWMP. Installation of soakwells is possible with the geotechnical treatment, as discussed in Section 5.2.

Road reserves will be required to provide for on-site retention within the roadside raingardens, swales and/or bio-retention areas within the POS. These systems (e.g. see Figure 12 and Figure 13) will be installed with at least 0.5 m of amended soil. The soil profile will be in accordance with Adoption Guidelines for Stormwater Bio-filtration (CRC, 2015). These systems are expected to provide for treatment and infiltration of the first 15 mm of rainfall. Planting of these raingardens will meet the deep sandy soil profiles, noting that ongoing irrigation is unlikely. Preferably trees will be installed to prevent urban heating impacts.

Roadside swales will be installed along larger road reserves provide water quality treatment and conveyance to the flood storage areas in Catchments 1 and 3. Further details on these catchments are discussed in Section 5.3.3.

Within the Group Housing Site retention of runoff within lots will be achieved through a combination of raingardens, water tanks or soakwell systems. Rainfall captured from roof areas is suitable for non-potable reuse in-house (toilets, laundry) and ex-house (garden areas), and will assist in future achieving the water sustainability objectives. The suitability of a roof runoff capture and reuse system (tank) will be determined during detailed design of each building. Where these systems are not viable, roof runoff will be captured and infiltrated in underground infiltration systems (soakwells) within the lot boundaries. These types of systems can be considered on residential and industrial lots, but will be at the discretion of the owner to install.



Figure 13: Typical roadside tree pit or raingarden



Figure 14: Typical roadside swale

The retention and infiltration of runoff close to source through the various systems is supported by the existence of sandy soil and clearance to groundwater within the Study Area. Locations

for small event management outside of the POS will be determined in the UWMP, depending on final road designs.

5.3.2 *Minor event management*

Runoff from up to the 20% AEP (~5yr ARI) event which is in excess of the capacity of on-site retention systems will be conveyed through a combination of piped drainage and swales into POS and drainage areas. Surface conveyance will be used wherever possible, with piped drains used only where swales cannot be reasonably accommodated in order to ensure there is no flooding on the road surface. This will include the utilisation of flush kerbing or broken kerbing where practical.

Larger raingardens (Figure 15) will be installed within the road reserve in the North East and South West portions of the Study Area. These raingardens retain/detain a significant portion of the 20% AEP event and reduce the storage areas required downstream. These systems will be approximately 80 m² (2 m wide and 40 m long) and approximately 300 mm deep. These areas will be irrigated to ensure healthy plant growth, with tree planting encouraged. In steeper areas, this volume will be achieved using a cascading system. Further details will be provided in the UWMP following detailed design.

The use of soakage pits through any piped drainage system is recommended to further improve infiltration through the site.

5.3.3 *Major event management*

Major flood runoff (1% AEP) will be conveyed via overland flow within the Study Area prior to discharge to drainage areas throughout the development. Catchments for these events are provided in Figure 15, with a description of each catchment provided below. In order to size the various components of the system, XP-Storm modelling was completed.

The XP-Storm model was been developed to assess catchments flows and storages for the 20% and 1% AEPs (approximately 5 and 100 years ARI) storm events based on temporal patterns and rainfall depths provided for the different storm events (BoM, 2019). The storm durations assessed for 20% and 1% AEPs was 10, 15 and 30 minutes and 1, 2, 3, 6, 12, 24 and 48 hours, including 10 temporal patterns for each storm event. The Critical duration for the sites was identified as 3 hours.

Infiltration through the system was assumed to be 5 m/day, which is at the lower end of the measured infiltration rates across the site (Appendix 4). This rate reflects the uncontrolled fill which will be compacted. For raingardens, a higher rate of 8 m/day is assumed as these will be within feature more fill material beneath them.

Modelling results and the size of the respective stormwater systems are provided in Table 9 below and presented in Figure 15.

Table 9: 20% and 1% AEP Modelling Results

	1	2	3/3a	4
Type	Modified Sump	Basin	Basin	Basin
Side Slopes	N/A	1:8	1:8	1:8
Base Elevation	38.6 mAHD	53.5 mAHD	50.5 mAHD	TBC
Base Area	1,090 m ²	250 m ²	800 m ²	750 m ²
Top Area	1,680 m ²	1,000 m ²	1,960 m ²	1,880 m ²
Total Volume	3,050 m ³	590 m ³	1,340 m ³	1,280 m ³
Total Depth	2.2 m	1.0 m	1.0 m	1.0 m
20% AEP Event Depth	0.50 m	0.35 m	0.20 m	0.34 m
20% AEP Event Area	1,220 m ²	460 m ²	990 m ²	1,080 m ²
20% AEP Event Volume	580 m ³	125 m ³	180 m ³	310 m ³
1% AEP Event Depth	2.1 m	0.94 m	0.98 m	1.0 m
1% AEP Event Area	1,660 m ²	950 m ²	1,930 m ²	1,880 m ²
1% AEP Event Volume	2,870 m ³	530 m ³	1,300 m ³	1,280 m ³
Critical Duration	6 hrs	6 hrs	6 hrs	6 hrs
Infiltration Rate	5 m/day			
Notes	Small raingardens throughout the catchment (in the Study Area)			
Roads/Lots Initial Loss	25mm / 15mm			

Catchment 1

Catchment 1 is located in the South-West of the development and stormwater management will be achieved through a combination of large raingardens within the road reserve and modification of the existing sump on Cristata Terrace (Figure 15). Initial discussions with the City of Wanneroo outlined a preference to modify the existing sump into a drainage basin with no fencing and safe access (1:8 side slopes) to allow for drainage from the Study Area. Following the investigation of the sump, the required footprint for storage from the current catchment (without any drainage from the Study Area) would result in considerable loss of developable land within the Study Area.

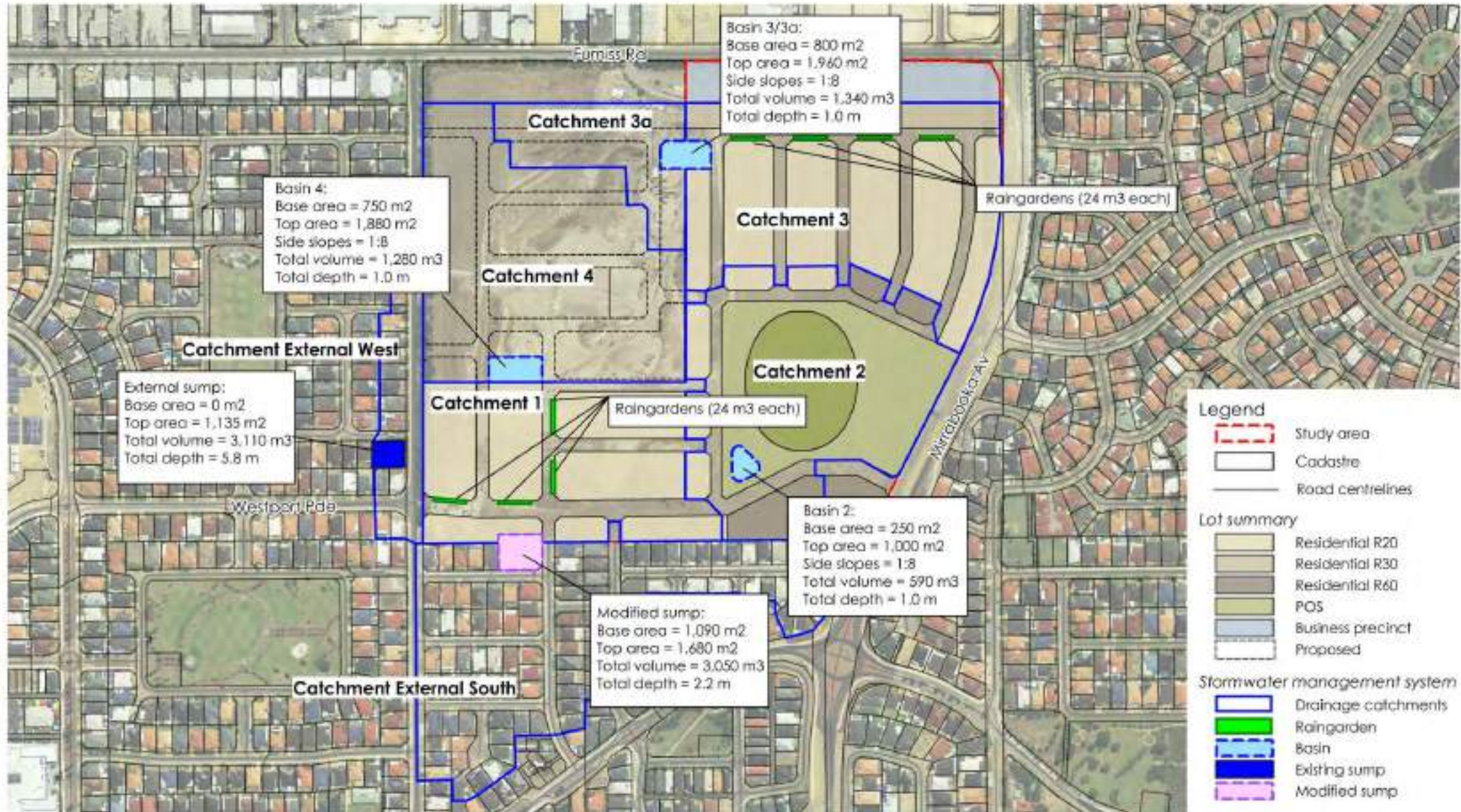
A standalone drainage basin was also considered for Catchment 1, leaving the existing sump in its current form. This would result in two adjacent systems for the City to manage going forward and no improvement to the existing sump.

The preferred approach is to modify and expand the existing sump to ensure sufficient capacity for both the existing catchment and Catchment 1. The sump can be improved to suit its urban surroundings by:

- Replacement of the existing fencing with a lower, see-through fence (design to be agreed with the City);
- Raising of the sump base (to at least 38.6 mAHD) to prevent expressed groundwater (and mosquito risks);

Parcel Property - Lot 2 Driver Road, Darch Local Water Management Strategy

Figure 15 - Stormwater management system



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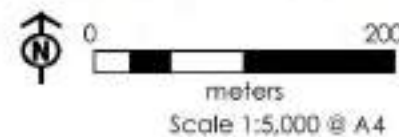


Parcel Property - Lot 2 Driver Road, Darch Local Water Management Strategy

Figure 16 - Stormwater event plan



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- Removal of existing weeds and planting of native vegetation to improve water quality treatment;
- Cleaning out any fine sediment within the sump; and,
- Other landscaping treatments to improve the overall amenity.

Expansion of the sump into the Study Area is required to ensure sufficient volumes are achieved. The sump form (including existing slopes) would be replicated in this area. Table 9 provides the required dimensions for the sump.

Catchment 2

Catchment 2 includes the District POS and surrounding roads and lots. Runoff from the lots and roads are directed towards a drainage basin in the South-West of the District POS. This location is the lower part of the POS and away from the playing fields and clubrooms. The 1% AEP is contained within basin and does not flood the playing grounds during the 1% AEP event. The size of the basin is provided in Table 9 and features 1:8 side slopes consistent with City of Wanneroo requirements.

Catchment 3/3a

Stormwater in Catchment 3 will be managed through a combination of larger raingardens and a shared drainage basin in the North-West. The basin is shared as future development of Lot 1 will utilise this low point for drainage (Catchment 3a) and an integrated design is considered a better long term outcome than two separate (and adjacent) basins. The proposed basin features 1:8 side slopes and a maximum depth of 1.0 m.

Catchment 4

Catchment 4 is the remainder of Lot 1. For completeness, this area was modelled to provide an indicative basin area, as shown in Figure 15 and Table 9. It is not anticipated that any significant drainage from this Catchment will enter the Study Area (and Catchment 1). As an alternative approach, drainage from Catchment 1 may be directed to the sump on Carlow Way where there is sufficient capacity. Final design of this system will be confirmed by the proponent for Lot 1.

Business Precinct / Group Housing Site

Stormwater from the Business Precinct and Group Housing Site will be managed internally within respective lots. This includes retention of up to the 1% AEP event through either underground storage, above-ground storage (basin or swales) or a combination of both.

Minimum habitable floor levels for lots in all catchments should be at least 300 mm above the top water level (typically top of kerb height) at any locations where stormwater is stored within the site (raingardens and swales) and at least 500 mm above the 1% AEP top water level in respective sumps and basins.

5.4 Water quality management

Site specific targets have been proposed for estuarine catchments of the Swan Coastal Plain as a part of background work undertaken by the Department of Water and Environmental Regulation during the development of the UNDO water quality modelling tool. The targets were developed based on consideration of the sensitivity of the receiving water body and the proximity of the development site. Applying this approach, the Study Area would lie outside the

suggested 'proximity zones' of the estuarine portion (>1000 m). This would indicate that the following targets could be applied:

- 3.6 kg/ hectare / year of Nitrogen
- 0.2 kg/ hectare / year of Phosphorous

UNDO (Urban Nutrient Decision Outcomes) is a simple empirical decision support model with a flexible framework that evaluates nutrient reduction decisions for new urban developments on the Swan Coastal Plain. It has been developed by the Department of Water to provide urban development proponents with an easy to use tool for assessment by local and state government authorities.

An UNDO model has been developed for the Study Area and was run for existing conditions and the proposed redevelopment scenarios. For both scenarios, the Study Area is assumed to be located within the Spearwood dune with over 5 m clearance to groundwater.

Results of UNDO modelling, in the form of a report which is generated by the software containing details of all assumptions and inputs, are provided in Appendix 8 (existing conditions) and Appendix 9 (proposed development).

The outcomes of UNDO modelling indicate that on-site retention of the frequent rainfall event within raingardens and soakwells on lots and roadside raingardens will provide discharge loads of:

- 3.00 kg/ hectare / year of total nitrogen
- 0.03 kg/ hectare / year of total phosphorous

These loads are well within the recommended targets for developments within the Swan Coastal Plain that have been developed for a discussion paper as a part of supporting information for the UNDO modelling tool by the Department of Water and Environmental Regulation.

5.5 Management of disease vectors and nuisance insects

The construction of above ground water quality treatment systems (raingardens and roadside swales) is proposed within the Study Area. These systems will drain by infiltration through sandy soil with relatively high infiltration rate which minimise standing water times.

Standing water was observed within the sump on Cristata Terrace and has the potential for mosquitoes and midges to breed. As part of upgrades for this sump, the base on the sump will be raised and fine sediment removed to improve infiltration performance and prevent standing water for mosquito breeding.

Physical, chemical and biological control methods can be used to manage mosquito populations. Methods which may to be employed (and their order of priority) include:

- Improving water quality, minimising nutrient loads and thereby reducing potential for algal blooms and fish kills; and,
- Should Mosquitos and Chironomid Midges become a nuisance, pesticides (larvicides and/or adulticides) will be used as required to kill mosquito larvae in breeding sites.

6 IMPLEMENTATION

The success of the water management strategies outlined in this document depends on their implementation through further planning, detailed design, construction and maintenance.

6.1 Urban Water Management Plans

Urban Water Management Plans (UWMPs) are the final water management documents within the state government planning framework outlined in Section 1.1. These documents are prepared as a condition of the subdivision (in support of local development plans) to demonstrate that designs achieve the objectives, strategies and design criteria outlined in this LWMS.

The UWMP will be prepared in consultation with the City of Wanneroo and be based on local site investigations appropriate to the proposal and level of risk to water resources. The UWMP should be consistent with the requirements of the DWER's *Urban water management plans: Guidelines for preparing plans and for complying with subdivision conditions* (DoW, 2008b).

Specifically, the UWMP should include detailed engineering and landscaping designs and design of bio-retention systems and non-structural controls measures to manage impacts from construction.

6.1 Monitoring

Pre and post-development monitoring is discussed below.

6.1.1 Pre-development monitoring

It is considered that there is no value in additional groundwater level monitoring prior to construction. Monitoring data is collected as part of the contamination investigation is considered sufficient to characterise the groundwater characteristics. Specific groundwater investigations surrounding the Cristata Sump may be undertaken to inform detailed design, including levels for the base of the sump.

6.1.2 Post-development monitoring

Similarly owing to the depth to groundwater pre- and post-development, groundwater monitoring following development is not considered necessary. As demonstrated above, water quality treatment will occur throughout the development in the form of raingardens and swales.

Previous land uses pose a more significant risk to groundwater quality and this will be monitored as per the contamination requirements outside of the BUWM process.

6.1 Construction

Construction activities have the potential to directly and indirectly impact local water resources and water management measures are required.

6.1.1 Licencing

Water will be required for construction activities such as dust suppression. Water for construction purposes could be sourced from groundwater allocation sought in Section 5.1.1

6.1.2 Construction Management

To ensure downstream waterways are protected, developers, builders and landscapers must implement best management practices to control erosion and sedimentation. Contractors and staff should be notified of specific construction management requirements including appropriate disposal of waste material, erosion control and dust suppression.

6.2 Roles and responsibilities

Key tasks, roles and responsibilities relating to delivery of urban water management objectives are outlined in Table 10.

Table 10: Summary of roles and responsibilities

Task	Responsibility	Planning stage
Preparation of the UWMP	Landowner/ developer	Subdivision (UWMP)
Assessment / Approval of the UWMP	City of Wanneroo / DWER	Subdivision (UWMP)
Potable water supply planning and connection to main distribution network	Water Corporation	Subdivision (UWMP)
Design of water distribution networks	Landowner/ developer	Subdivision (UWMP)
Water and wastewater planning and connection to main distribution networks	Water Corporation	Subdivision (UWMP)
Design of wastewater reticulation networks	Landowner/ developer	Subdivision (UWMP)
Design of drainage networks including design of water quality treatment areas	Landowner/ developer	Subdivision (UWMP)
Development of detailed Landscaping plan incorporating stormwater management strategies	Landowner/ developer	Subdivision (UWMP)
Confirmation of ongoing management and maintenance requirements and agreement with the City for handover of responsibilities	Landowner/ developer/ City of Wanneroo	Subdivision (UWMP)

7 REFERENCES

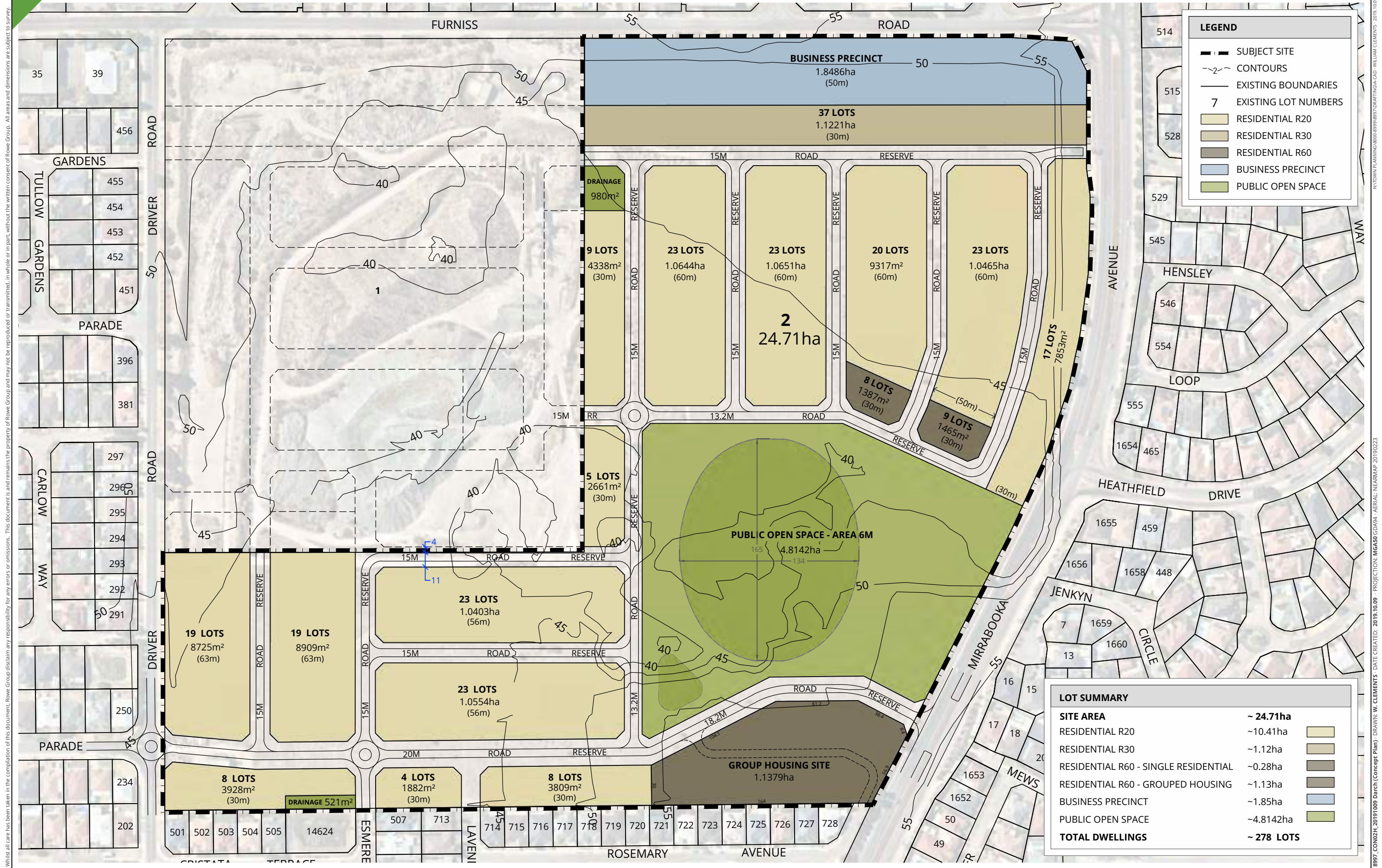
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APPENDIX 1 – LWMS CHECKLIST

Local water management strategy Item	Deliverable	☑	Comments
Executive summary			
Summary of the development design strategy, outlining how the design objectives are proposed to be met	Table 1: Design elements & requirements for BMPs and critical control points	☑	
Introduction			
Total water cycle management – principles & objectives Planning background Previous studies		☑	
Proposed development			
Structure plan, zoning and land use. Key landscape features Previous land use	Site context plan Structure plan	☑ ☑	
Landscape – proposed POS areas, POS credits, water source, bore(s), lake details (if applicable)	Landscape Plan	☑	
Design criteria			
Agreed design objectives		☑	
Pre-development environment			
Existing information and more detailed assessments (monitoring). How do the site characteristics affect the design?		☑	
Site Conditions – existing topography/ contours, aerial photo underlay, major physical features	Site condition plan	☑	
Geotechnical – topography, soils including acid sulphate soils and infiltration capacity, test pit locations	Geotechnical plan	☑	
Environmental – areas of significant vegetation, wetlands and buffers, waterways and buffers, contaminated sites	Environmental Plan plus supporting data where appropriate	☑	
Surface Water – topography, 100 year floodways and flood fringe areas, water quality of flows entering and leaving (if applicable)	Surface Water Plan	☑	
Groundwater – topography, pre development groundwater levels and water quality, test bore locations	Groundwater Plan plus details of groundwater monitoring and testing	☑	
Water sustainability initiatives			
Water supply & efficiency measures – private and public open spaces		☑	
Fit-for-purpose strategy and agreed actions. If non-potable supply, support with water balance		☑	
Wastewater management		☑	
Stormwater management strategy			
Flood protection – peak flow rates, volumes and top water levels at control points, 100 year flow paths and 100 year detentions storage areas	major event Plan Long section of critical points	☑	
Manage serviceability – storage and retention required for the critical 5 year ARI storm events Minor roads should be passable in the 5 year ARI event	minor event Plan	☑	

Local water management strategy Item	Deliverable	<input checked="" type="checkbox"/>	Comments
Protect ecology – detention areas for the 1 yr 1 hr ARI event, areas for water quality treatment and types of (including indicative locations for) agreed structural and non-structural best management practices and treatment trains. Protection of waterways, wetlands (and their buffers), remnant vegetation and ecological linkages	small event Plan Typical cross sections	<input checked="" type="checkbox"/>	
Groundwater management strategy			
Post development groundwater levels and fill requirements (including existing and likely final surface levels), outlet controls, and any subsoils	Groundwater/subsoil Plan	<input checked="" type="checkbox"/>	
Actions to address acid sulfate soils or contamination		<input checked="" type="checkbox"/>	
The next stage – subdivision and urban water management plans			
Content and coverage of future urban water management plans to be completed at subdivision. Include areas where further investigations are required prior to detailed design.		<input checked="" type="checkbox"/>	
Monitoring			
Recommended future monitoring plan including timing, frequency, locations and parameters, together with arrangements for ongoing actions		<input checked="" type="checkbox"/>	
Implementation			
Developer commitments		<input checked="" type="checkbox"/>	
Roles, responsibilities, funding for implementation		<input checked="" type="checkbox"/>	
Review		<input checked="" type="checkbox"/>	

APPENDIX 2 – CONCEPT PLAN



LEGEND

- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- 7 EXISTING LOT NUMBERS
- RESIDENTIAL R20
- RESIDENTIAL R30
- RESIDENTIAL R60
- BUSINESS PRECINCT
- PUBLIC OPEN SPACE

LOT SUMMARY

SITE AREA	~ 24.71ha	
RESIDENTIAL R20	~10.41ha	
RESIDENTIAL R30	~1.12ha	
RESIDENTIAL R60 - SINGLE RESIDENTIAL	~0.28ha	
RESIDENTIAL R60 - GROUPED HOUSING	~1.13ha	
BUSINESS PRECINCT	~1.85ha	
PUBLIC OPEN SPACE	~4.8142ha	
TOTAL DWELLINGS	~ 278 LOTS	

CONCEPT PLAN
 LOT 2 (No. 26) DRIVER ROAD
 DARCH

0 62.5 m
 SCALE @ A3: 1:2500
 8997-CON-02-H

ROWE GROUP DESIGN

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8997_CON02_H_20191009 Darch (Concept Plan) - DRAWN: W. CLEMENTS - DATE CREATED: 2019.10.09 - PROJECTION: MGA50 GD494 - AERIAL: NEARMAP 20190223

APPENDIX 3 – GEOTECHNICAL ASSESSMENT DARCH (GALT, 2019A)



Report on
GEOTECHNICAL ASSESSMENT – STAGE 1
PROPOSED MIXED-USE DEVELOPMENT
26 DRIVER ROAD, DARCH

Submitted to:
Parcel Property
Level 3, 14 Walters Drive
OSBORNE PARK WA 6017

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Table A2: Summary of Tests – Test Pits

Table A3: Summary of Tests - Boreholes

FIGURES

FIGURE 1: SITE AND LOCATION PLAN

FIGURE 2: THICKNESS OF SAND FILL (UNITS 1A&1C)

FIGURE 3: THICKNESS OF UNCONTROLLED FILL (UNIT 1B)

FIGURE 4: INDICATIVE SITE CLASSIFICATION

APPENDICES

APPENDIX A: SITE PHOTOGRAPHS

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APPENDIX C: CURRENT CONCEPT SUBDIVISION PLAN

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APPENDIX H:	UNDERSTANDING YOUR REPORT

1. INTRODUCTION

This report presents the outcomes of Galt Geotechnics Pty Ltd's (Galt's) the Stage 1 geotechnical assessment for the proposed mixed use development of 26 Driver Road, Darch ("the site").

The location of the site relative to the surrounding area is shown on Figure 1, Site Plan.

This report supersedes our original, J1801113 005 R Rev0, dated 24 June 2019, and now includes updated Figures 2-3 to reflect the changed structure plan.

2. BACKGROUND

The site was originally mined for sand supplies for the building industry. The sand was progressively removed and the area was operated as a disposal area for non-organic waste (mainly building rubble). The site has now been entirely filled apart from an area in the north west corner designated Lot 1 (which lies outside the site and scope of the current study). Land use activities previously done on Lot 1 consist of operating a crushing plant to crush concrete rubble and demolition debris delivered to site. At present, no further activities are taking place on Lot 1. Lot 1 is not specifically addressed in this study, which applies to the landfilled area. Figure 1 shows the site boundary and the location of Lot 1 (also known as 115 Furniss Road, Darch)

Filling began in about 1989, initially in the north east corner of the site followed by filling along the eastern boundary. The filling process to the west and along the eastern boundary (south of the north east corner of fill) was done under the direction of Soil and Rock Engineering Pty Ltd. A section in the south west corner of the site adjacent to Driver Road was also filled under the direction of Soil and Rock Engineering personnel.

It is understood that most of the initial fill was placed to City of Wanneroo requirements, initially under the guidance of City of Wanneroo personnel then controlled by a Civil Engineer for a number of years. We also understand that records for this phase of the work have been lost.

We also understand that the following apply to the remaining area (southern section):

- ✦ it was progressively filled with non-organic waste processed through a crushing plant; and
- ✦ the fill was placed in an engineered manner which involved placing in loose layers up to about 0.5 m thick and compacting using multiple passes of rubber tired and tracked earthmoving equipment inclusive of a rubbish compactor.

From anecdotal evidence from former site staff, we understand that the site was always intended for subsequent development, i.e. all filling was done with the objective of producing a stable site for later construction.

Photographs of the site are presented in Appendix A.

3. PREVIOUS STUDIES

There have been several environmental and geotechnical studies conducted by others at the site since the mid-2000s. The studies were primarily conducted to characterise the fill and assess the potential environmental risks to surrounding residents whilst the site continued to operate as a landfill. A detailed geotechnical assessment has not been done, however a desktop study and a field investigation was done by CMW Geosciences in 2017, reported in their report:

- ✦ CMW Geosciences (ref. PER2017-0193AB, Rev0, dated 14 March 2018): "Proposed landfill re-development – Desktop review plus draft borehole and CPT logs".

We have included the CMW borehole and CPT reports from this investigation in Appendix B.

4. PROPOSED DEVELOPMENT

Based on plans provided to us, we understand that the following land uses are proposed for the site:

- ✦ residential (presumably single dwellings) across the eastern, southern and western portions (this includes a sales village to be located in a strip along Mirrabooka Avenue);
- ✦ light industrial lots along Furniss Road to tie in with the existing light industrial precinct to the north; and
- ✦ public open space (POS) in the central portion.

We understand that the proposed sub-division layout design is currently at a preliminary stage and likely subject to changes based on environmental, geotechnical and other planning and engineering constraints. The current concept plan (subject to change) is included in Appendix C.

Based on our discussions with Parcel Property, we understand that the preferred staging plan for the development is as follows:

- ✦ Stage 1 – Development of the commercial precinct in the northern portion of the site along with the Sales Village along Mirrabooka Avenue.
- ✦ Stage 2 – Construction of the primary POS in the central portion of the site.
- ✦ Stage 3 – Development of the residential lots across the balance of the site.

5. PROJECT OBJECTIVES

The objectives of the assessment were to:

- ✦ assess subsurface soil and groundwater conditions across the site, with a particular emphasis on:
 - The thickness, composition and density of any fill present on the site
 - The presence and level of groundwater as this may influence the development
 - Development of geotechnical -sections to be able to inform civil design and development (not specifically addressed in this report, although contour plots are included);
- ✦ provide a site classification(s) in accordance with AS 2870-2011 “Residential Slabs and Footings”;
- ✦ provide recommendations for site preparation measures to achieve a site classification of “Class A”, “Class S” or “Class M”; and
- ✦ recommend further geotechnical studies to progress the project to detailed design, if required.

This study addresses the larger site but provides specific advice relating to the Stage 1 development based on the current concept plan included in Appendix C. Some revisions to our advice may be necessary dependent on the final configuration of the lots, depending on the areas of the development which lie on filled and unfilled portions of the site.

There are potential environmental constraints to the development, which are being addressed by Galt in separate reports.

6. FIELDWORK

Fieldwork specifically for the geotechnical assessment was undertaken between 29 April and 21 May 2019 and comprised:

- ↻ cone penetration testing (CPTs) at 29 locations (PGCPT01 to PGCPT29), extending to a depth of up to 5 m; and
- ↻ excavation of test pits at 43 locations (PGTP01 to PGTP43), extending to depths of between 2.6 m and 7.9 m.

This assessment also refers to the borehole drilling for the environmental campaign. That is,

- ↻ drilling of boreholes at 45 locations (LG01 to LG40 (excluding LG11) and MW01 to MW06), extending to depths of between 4 m and 19.8 m using air core drilling techniques.

The borehole drilling was used to obtain material thicknesses and does not influence the engineering recommendations made in this report.

A plan showing the test locations is included as Figure 1. A summary of the tests is presented in Tables A1 to A3 at the end of the text of this report.

Cone Penetration Tests

Cone penetration tests were carried out by Probedrill Pty Ltd using 7 tonne and 11 tonne track mounted CPT rigs. The tests were carried out in accordance with AS1289.6.5.1. The results of the CPTs are presented in Appendix D along with a method of interpretation proposed by Robertson et al (1986).

Test Pits

Test pits were excavated using a 28 tonne Samsung SE280LC-2 tracked excavator equipped with a 1,200 mm toothed bucket. Test pit reports are presented in Appendix E along with a method of soil description and a list of explanatory notes and abbreviations used in the reports.

Boreholes

Aircore boreholes were drilled using a Commaccio track mounted drill rig, supplied and operated by Proline Drilling.

Borehole reports are presented in Appendix F. The method of soil description and a list of explanatory notes and abbreviations used in the reports is included in Appendix C.

7. SITE CONDITIONS

7.1 Regional Geology

The Perth sheet of the 1:50,000 scale Environmental Geology series map (compiled and published by the Geological Survey of Western Australia) indicates that the area is underlain by sand derived from the weathering of Tamala limestone, described as:

- ↻ SAND, pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin.

The geology at the site appeared to comprise a mix of sand derived from Tamala limestone and Bassendean sand. We infer that the sand from Tamala limestone probably overlies the Bassendean sand in this area.

8. GEOTECHNICAL GROUND MODEL

Galt has developed a site-specific geotechnical ground model based on the test pit reports, CPT plots and borehole reports from the geotechnical investigations that have been carried both as part of this study and historically;

The geotechnical ground model is an approximation of actual site conditions. The geotechnical ground model has been created to not only describe the origin of different geotechnical units, but also to create a classification system where the units are separated according to their engineering characteristics in a well-defined and logical manner.

The geotechnical ground model comprises three main units based on the material classification and engineering characteristics.

The main geotechnical units within the vicinity of the site are as follows:

- ✦ **Unit 1:** In-situ Fill
 - **Unit 1a:** Sand Fill
 - **Unit 1b:** Uncontrolled Fill
 - **Unit 1c:** Screened Fill
- ✦ **Unit 2:** Natural Sand

It should be noted that there may be large variations in the engineering parameters within each of these units due to localised variations in materials, interbedding, lenses and layering of materials, composition of fill, etc.

8.1 Unit 1a – Sand Fill

The sand fill is a layer of sand and gravelly sand placed, generally as a capping layer over the uncontrolled fill (Unit 1b). The fill material is up to about 6.8 m thick, although typically around 1.5 m to 3 m thick and appears to have been placed in several stages.

Anecdotally, this sand was originally imported as unsuitable material for plasterer's sand or brickie's sand from sand quarries. Later, once sand prices rose, the import switched to import of sand where site re-levelling, etc was done and excess sand was derived from development sites.

That is, the sand is notionally clean sand, generally derived from quarry sources but also including spoil excavated from numerous sites.

Unit 1a – Sand Fill can be described as:

- ✦ **FILL: SAND (SP),** fine to coarse grained, sub-angular to sub-rounded, yellow / brown, trace fines, trace fine to medium grained gravel, trace to with fines, trace organics, trace (less 1%) deleterious waste (steel, timber, plastic etc), variable density typically ranging between loose and dense (often medium dense to dense), present across most of the site to depths of between 1 m and 6.8 m.

The thickness of the Sand Fill (both Unit 1a described here, and Unit 1c described in Section 8.3) encountered across the site is shown on Figure 2 – Thickness of Sand Fill (Unit 1a & 1c).

8.2 Unit 1b – Uncontrolled Fill

The uncontrolled fill (Unit 1b) is typically encountered under the sand fill (Unit 1a/1c) across most of the site.

Unit 1b – Uncontrolled Fill can be described as:

- ✦ **FILL: SAND / BUILDING DEBRIS / RUBBISH:** Comprises a mixture of SAND (SP) – approximately 40% to 80%, Inert BUILDING DEBRIS – approximately 20% to 70% and RUBBISH – less than 10%.
 - SAND can be described as fine to coarse grained, sub-angular to sub rounded, grey/brown, trace fines.

- BUILDING DEBRIS can be described as inert building demolition / site clean-up materials, typically comprising bricks, concrete slabs and limestone gravels/cobbles. Particle sizes typically ranging from 0.05 m to 0.5 m diameter, although large concrete pieces (up to ~1.5 m long) are present.
- RUBBISH can be described as plastic (strapping, bags, buckets, bottles), organics (wood fragments, timber, grass, roots), scrap metal (pipes, rods, reinforcing bars, star pickets, canisters, etc).

The thickness of the Unit 1b Uncontrolled Fill encountered across the site is shown on Figure 3 –Thickness of Uncontrolled Fill (Unit 1b).

We have referred to this material as ‘uncontrolled fill’ due to its composition, however anecdotal evidence and our own observations indicate that effort was provided during the extensive filling process to select appropriate materials for incorporation in the fill (i.e. largely excluding putrescible and deleterious materials, which comprise a relatively small proportion of the overall fill) and to provide compaction to the fill. We dug over 40 large test pits and noted that the material was well-packed with minimal large voids in all instances.

8.3 Unit 1c – Screened Fill

The screened fill is a layer of typically gravelly sand which appears to be a <10 mm product left over from screening operations on Lot 1. It incorporates sand and gravel-sized particles of brick, concrete and limestone. It includes a trace of rubbish (glass, plastic, wood fragments, etc) but these inclusions are not considered significant to its structural performance.

This material is distinguished from Unit 1a in that it appears to have been derived from a different source but its structural performance is expected to be similar and it has therefore been grouped together with Unit 1a in the thickness of the capping sand.

8.4 Unit 2 – Natural Sand

The natural sand was encountered at surface in the south western corner and at localized areas along the boundary of the site. Across most of the site this natural sand was mined out to around the depth of the water table and has subsequently been covered with the above fill units (Unit 1a and 1b).

Unit 2 – Natural Sand can be described as:

- ✦ SAND (SP), fine to medium grained, sub-angular to sub-rounded, yellow/pale yellow / pale brown becoming white or pale grey at depth, trace fines, typically medium dense becoming dense / very dense with depth, present to the maximum depth of investigation (19 m).

We noted localized pockets of ‘coffee rock’ (iron indurated sand) present around the level of the groundwater table.

8.5 Groundwater

The Perth Groundwater Atlas (1997) shows the maximum historical groundwater level to be around RL 39 m in the south west corner rising to RL 41 m AHD in the north east corner.

The groundwater level encountered in the test holes during our investigation was typically between the depths of 5.1 m and 19.8 m below the existing ground surface, or about RL 37.4 m to RL 40.4 m AHD. During our investigation, the groundwater level typically fell from the north of the site to the southwest.

9. GEOTECHNICAL ASSESSMENT

9.1 Suitability for Development

We consider that the site is unsuitable for the proposed mixed-use development in its current condition. This is due to the presence of deep uncontrolled fill, which is locally loose and also contains putrescible/deleterious material and will be subject to irregular creep settlements.

We consider that it will be possible to improve the site to a sufficient standard for the proposed residential / industrial development, with appropriate engineering treatments.

9.2 Creep Settlement

Secondary compression of granular soils is generally what is referred to as creep. Creep is a time dependent increase in strain, and thus deformations occurs, under a constant effective stress.

Creep deformations continue at a lessening rate for an undefined length of time (up to several decades) with the creep settlements potentially amounting to a considerable portion of the total settlement.

The creep settlement potential of different fill types for a 10 year period, as a percentage of the total depth of fill is typically in the following ranges:

- ☞ Well compacted sand and gravel 0.2% to 1.0%
- ☞ Minimally compacted clay and sand 1.0% to 2.0%
- ☞ Uncompacted sand 2.0% to 4.0%

Estimates of the total and ongoing settlements that could be expected to occur within the next 50 years for varying creep percentages are presented in Table 1. The creep experienced to date is based on survey monitoring done by Ion Services for the previous owners of the site between 2000 and 2018 (data provided to us). A comparison survey was done for settlements between 2008 and 2018 (drawing included in Appendix G).

Table 1: Creep Settlement – 15 m Fill Thickness

Fill Compaction	Estimated Total Creep Settlement (mm)	Estimated Post Earthworks Creep Settlement to date (mm) ¹	Estimated Creep Settlement next 50 years (mm) ²
Well Compacted (Creep 0.25%)	60 - 80	40 - 60	10 - 30
Well Compacted (Creep 0.5%)	120 - 160	80 - 120	30 - 50
Minimally Compacted (Creep 1.0%)	250 - 300	160 - 220	80 - 100

- Note:
1. The estimated post creep settlements to date have been calculated based on a period of 15-20 years since the fill was placed (assumed to have been completed in late 1990s).
 2. A design period for the creep of 50 years from 2020 has been assumed. The settlements above could be expected to increase by about 20% for a design life of 100 years.

When assessed for the 10 year period between 2008 and 2018 (period in which Ion Services undertook survey monitoring in the northern deep fill area) the estimated settlements are expected to be in the order of:

- ↻ 10 mm to 15 mm for Well Compacted (0.25% creep);
- ↻ 20 mm to 25 mm for Well Compacted (0.5% creep);
- ↻ 40 mm to 50 mm for Minimally Compacted (1.0% creep);

The “Well Compacted – 0.5% creep” values presented above are generally in line with the settlements for the monitoring locations provided by Ion Services (typically in the range of 15 mm to 25 mm).

We consider that ongoing total settlements over the next 50 years are likely to be in the order of 30 mm to 50 mm with differential settlements over a normal house lot to be in the order of 25% to 50% of the total settlement (i.e. 10 mm to 20 mm). A site classification of “Class S” is therefore considered applicable for most of the residential lots, provided the site preparation requirements in Section 9.4 are undertaken.

It is noted that where sharp changes in the quarry topography occur (i.e. along the quarry boundaries a varying thickness of fill is present) greater differential settlement will result under these lots. This is typically applicable to the industrial lots along the northern boundary, and some of the residential lots along the eastern and southern boundaries. The differential settlement under these lots could be expected to be in the order of 20 mm to 40 mm (as thin fill or natural areas will experience essentially nil settlement), and therefore a site classification of “Class M” is considered applicable provided the site preparation requirements in Section 9.4 are undertaken.

Further work is recommended to assess the extent of the affected “Class M” lots along the southern boundary.

9.3 Site Classification

We consider that most of the site currently has a site classification of “Class P” in accordance with AS2870-2011, “Residential slabs and footings” due to presence of uncontrolled fill underlying the site.

We consider that the site can be improved to the following site classifications provided the remedial works in Section 9.4 are undertaken:

- ↻ “Class A” for part of the south west corner of the site and selected display home lots along the north eastern boundary.
- ↻ “Class S” for a majority of the residential lots within the site.
- ↻ “Class M” for the proposed industrial lots along the northern boundary and residential lots along the eastern and part of the southern boundary.

A plan showing the indicative site classification for the lots is shown in Figure 4 – Site Classification. Note where the site classification boundary is shown with question marks, further intrusive testing is required at a later stage to better define the boundary. Reconfiguration of the subdivision plan will also require reconsideration of site classes, mainly on the lots which straddle the areas underlain and not underlain by Unit 1b (Uncontrolled Fill). We note that the nominal “Class A” area to the southwest is partly underlain by Unit 1b (uncontrolled fill), which would either need removal or change of the site class in this area to “Class S” or “Class M”.

9.4 Site Improvement Measures

9.4.1 General

The following sections detail the specific remedial works required for each area to make them suitable for the proposed development.

The extents of these areas are contingent on the ground conditions underlying specific lots. We cannot provide specific boundaries until a finalized structure plan is provided to us.

9.4.2 Area 1 – Majority of Site

Area 1 covers most of the site and is based on areas that are only underlain by deep Unit 1b uncontrolled fill (i.e. not areas which straddle the edge of the Unit 1b area and are partly underlain by natural sand or compacted sand fill without any Unit 1b present). Broadly speaking, the remedial measures required here include installation of layered geogrids with gravel fill below the sand fill. This is intended to minimize future differential settlements at the site surface.

The following remedial works are considered necessary to achieve a site classification of “Class S”:

- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (topsoil was imported to site by the previous owners and we expect that around 100 mm to 200 mm is present in most areas).
- ✦ Excavate sand fill (Unit 1a/1c) to expose the top of the underlying uncontrolled fill (Unit 1b). This boundary is distinct and a colour change (to dark grey/black) will be noted along with the appearance of rubbish within the uncontrolled fill.
- ✦ Stockpile the excavated sand fill (Unit 1a/Unit 1c) for potential reuse as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc) or oversized inert material (greater than 250 mm diameter) within the Unit 1a fill must be removed. We do not expect a significant volume of deleterious / oversized material will require removal from the Unit 1a/1c fill.
- ✦ Saturate the exposed surface with a minimum of 40L per m² (note: actual volume of water to be assessed during trials at start of earthworks, however expected to range between 40 L and 80 L per m²). The intention of saturating surface is to fill / expose any near surface voids, as well as moisture conditioning the material for compaction.
- ✦ Compact the exposed surface using an 18 tonne pad foot vibratory roller or larger in accordance with the assessed Method Specification (refer Section 9.6).
- ✦ Place layer of geofabric (Bidim A34 or similar) and geogrid (Secugrid 40/40 or similar) or a combined product (Combigrid 40/40 or equivalent) across the exposed surface of the uncontrolled fill. Geogrid layers must overlap by a minimum of 300 mm and be cable tied at minimum 0.5 m centers.
- ✦ Place a thin layer of gravel fill (limestone gravel or similar, refer to Section 9.5.3) approximately 250 mm thick over the top of the geogrid layer and compact using a 10 tonne smooth drum roller or larger. Allow 4 passes with vibrations or 10 passes without vibrations. Compaction without vibration may be more suitable when in close proximity to existing houses.
- ✦ Place a thin layer of approved fill (see Section 9.4.6) approximately 250 mm thick over the top of the gravel and compact using a 10 tonne smooth drum roller or larger.
- ✦ Repeat placement of subsequent layer of geogrid and gravel. (end up with two layers of geogrid and gravel)
- ✦ Place approved fill (see Section 9.4.6) to the required design levels, placed and compacted in accordance with Section 9.6.
- ✦ Compact the exposed finished surface level in accordance with Section 9.6 to a depth of at least 0.9 m below the finished surface level.

9.4.3 Area 2 - South West Corner and Northern Display Village

Area 2 includes areas of the site that are underlain by predominantly natural sands and sand fill only. It also includes areas where a thin layer (typically less than 3 m) of uncontrolled fill (Unit 1b) is present. These areas include the south west corner and northern part of the proposed display village along the eastern boundary. The remedial measures here are aimed at confirming that no deleterious material is present below lot areas and checking and re-compacting the sand fill.

The following remedial works to achieve a site classification of “Class A” are recommended:

- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (around 100 mm to 200 mm of topsoil is expected).
- ✦ Where fill is present, excavate to expose the underlying natural sand. The removal of both sand fill (Unit 1a/1c) and uncontrolled fill (Unit 1b) is likely to be required. We expect the removal of the uncontrolled fill to be limited to a few metres in depth (refer to Figure 3 for approximate depth and extent). Removal of uncontrolled fill under road reserves is not required.
- ✦ Stockpile the sand fill (Unit 1a/1c) for reuse as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc) or oversized inert material (greater than 250 mm diameter) must be removed. We do not expect a significant volume of material requiring removal from the Unit 1a/1c fill.
- ✦ Screen the uncontrolled fill (Unit 1b) removed for potential reuse as low permeability general fill (Section 9.4.6) or remove offsite. Any deleterious materials (timber, steel, plastic, etc) must be disposed of offsite.
- ✦ Compact the exposed natural surface to achieve the level of compaction specified in Section 9.6.
- ✦ Place permanent fill to the required design levels using approved fill (see Section 9.4.6), placed and compacted in accordance with Section 9.6.
- ✦ Compact the exposed finished surface level in accordance with Section 9.6 to a depth of at least 0.9 m below the finished surface level.

We note that compaction in sand can be difficult to achieve when the groundwater level is within 1 m of the surface being compacted. This may be the case after the removal of the sand fill / uncontrolled fill in the south western corner. Further advice should be sought if the required compaction cannot be achieved. To help minimise the need for dewatering, we recommend site preparation works occur in summer, preferably late summer, when the groundwater table can be expected to be at or near its seasonal low.

9.4.4 Area 3 – Northern, Eastern and Southern Boundaries

Area 3 includes the lots along the northern, eastern and southern boundaries which are underlain partly by natural sand and partly by deep uncontrolled fill (lots located along the crest of the old quarry slopes). These areas are expected to experience larger differential settlements than other areas (this is essentially not able to be corrected with any cost-effective earthworks scheme, hence a site classification of “Class M” will apply). Remedial measures are aimed at minimization of localized differential settlement and include construction of a layered geogrid-reinforced fill zone below sand fill.

These areas require the following remedial works to achieve a site classification of “Class M”:

- ✦ Remove any vegetation from the site, including grubbing out of roots. The topsoil strip must be sufficiently thick to remove all shallow roots (around 100 mm to 200 mm of topsoil is expected).
- ✦ Excavate sand fill (Unit 1a/1c) to expose the top of the underlying uncontrolled fill (Unit 1b) or natural sand (Unit 2). Areas that are only underlain by natural sand (typically adjacent to the site boundary) do not need to be excavated.
- ✦ Stockpile the sand fill (Unit 1a/1c) for reuse as structural fill. Any deleterious material encountered (i.e. wood, steel, plastic, etc) or oversized inert material (greater than 250 mm diameter) within the Unit 1a/1c fill must be removed. We do not expect a significant volume of deleterious / oversized material will require removal from the Unit 1a/1c fill.
- ✦ Saturate the exposed surface of the uncontrolled fill (Unit 1b), where present, with a minimum of 40L per m² (note: actual volume of water to be assessed during trials at start of earthworks, however expected to range between 40 L and 80 L per m²). The intention of saturating surface is to fill / expose any near surface voids, as well as moisture conditioning the material for compaction.

- ✦ Compact the exposed surface of the uncontrolled fill (Unit 1b) using an 18 tonne vibratory pad foot roller or larger in accordance with the assessed Method Specification (refer Section 9.6).
- ✦ Moisture condition and compact the exposed natural sand – Unit 2 (where present) in accordance with Section 9.6 to a depth of at least 0.9 m.
- ✦ Place layer of geofabric (Bidim A34 or similar) and geogrid (Secugrid 40/40 or similar) or a combined product (Combigrid 40/40 or equivalent) across the exposed surface of the uncontrolled fill (not required over natural sand). Geogrid layers must overlap by a minimum of 300 mm and be cable tied at minimum 0.5 m centers.
- ✦ Place a thin layer of gravel fill (limestone gravel or similar, refer to Section 9.5.3) approximately 250 mm thick over the top of the geogrid layer and compact using a 10 tonne smooth drum roller or larger. Allow 4 passes with vibrations or 10 passes without vibrations. Compaction without vibration may be more suitable when in close proximity to existing houses.
- ✦ Place a thin layer of approved fill (see Section 9.4.6) approximately 250 mm thick over the top of the gravel and compact using a 10 tonne smooth drum roller or larger.
- ✦ Repeat placement of subsequent layer of geogrid and gravel (end up with two layers of geogrid and gravel).
- ✦ Place approved fill (see Section 9.4.6) to the required design levels, placed and compacted in accordance with Section 9.6.
- ✦ Compact the exposed finished surface level in accordance with Section 9.6 to a depth of at least 0.9 m below the finished surface level.

9.4.5 Area 4 – Public Open Space

Area 4 (public open space) located in the center of the site does not require any specific site preparation requirements if the area is to remain undeveloped (i.e. no structures / pavements). A site classification of “Class P” would remain applicable for this area.

If structures were proposed, the site preparation requirements for Area 1 would be applicable, and a site classification of “Class S” would be applicable (subject to confirmation by Galt). The site preparation works would need to extend a minimum of 5 m beyond the footprint of any structures or pavements.

9.4.6 Remediation of Test Pits

We consider that specific remediation of the test pits is required, due to the disturbance done at each location (43 test pits were done, locations are as per Figure 1, with more being done in the southwest of the site in September 2019). This is to ensure that loosened material excavated during the test pitting does not cause an issue for future settlement.

Bucket tamping of the excavated material was done in layers and the various materials excavated were restored to the pit as well as possible with the excavator used.

The following process is to be adopted:

- ✦ Excavate all overlying sand fill (Unit 1a / 1c) over the disturbed footprint, which should be obvious when the earthworks are done (footprint approximately 6 m by 8 m) and stockpile.
- ✦ Excavate into the Unit 1b material over the disturbed footprint by at least 1 m and batter the sides no steeper than 1V:2H.
- ✦ Re-place and compact the Unit 1b material as per the method specification developed in accordance with Section 9.6. Alternatively, this may be replaced with compacted, approved sand fill and the excess Unit 1b material disposed of elsewhere on site or off-site. Fill back to the surrounding Unit 1b surface.
- ✦ Construct the geogrid reinforced layers and sand fill as per the recommendations in Section 9.4.2.

9.5 Approved Fill

9.5.1 Imported Sand Fill

Imported granular fill must comply with the material requirements as stated in AS 3798-2007, "Guidelines on Earthworks for Commercial and Residential Developments". Sand fill must comprise clean sand that is free of organic matter and has a fines content of less than 5%.

Clean imported sand fill (no demolition debris, <2% organics, <5% fines) is recommended for use in the top 1 m of the site, mainly from an aesthetic and stormwater disposal perspective. The existing Unit 1a and Unit 1c fill should be structurally adequate for inclusion in the profile, however careful scrutiny of permeability and organic content is recommended if this is done (refer to Section 9.5.2).

Any organic-rich sand or sand containing significant proportions of fines (material less than 0.075 mm in size) must not be used.

Where doubt exists, a geotechnical engineer must be engaged to inspect and approve the use of potential fill materials.

9.5.2 Existing Fill

The sand fill (Unit 1a) is also considered suitable for use as structural fill including as use as structural fill above the geogrid mattress layer and for replacing material where the uncontrolled fill (Unit 1b) is removed. Due to the variable fines content of the Unit 1a material, it may not be suitable for use in areas where stormwater disposal is required. Permeability testing of the material is recommended prior to use as permeable structural fill.

The fine screened fill (Unit 1c) is likewise considered suitable as a structural fill. The fines and organic contents may be variable and without further assessment, we recommend these materials not be used in areas where permeability is important. We suggest use of Unit 1c materials below about 1.5 m to 2 m depth from finished surface for this reason.

The uncontrolled fill (Unit 1b) is not recommended for reuse as structural fill. The uncontrolled fill could be considered for use as low permeability general fill provided:

- ↻ The material is screened to remove the deleterious materials (plastic, wood, steel, etc) and oversized inert material (>250 mm diameter);
- ↻ The organic content of the screened fill is less than 2%; and
- ↻ The inert oversize portion (bricks, concrete, etc) is crushed and the maximum particle size was less than 250 mm.

The re-use of the screened uncontrolled fill at a depth of greater than 2 m below the finished surface is recommended, due to the expected low permeability of the material.

We consider that the existing fill could alternatively be screened with a screening plant to produce a geotechnically suitable structural fill (material passing 20 mm). There would be a very large proportion of reject material from this process.

In general, we consider it is likely to be easier and more cost effective to avoid processing of Unit 1b material.

9.5.3 Gravel Fill

Gravel fill is required to engage the geogrid for areas underlain by Unit 1b (Uncontrolled Fill). Various materials can be used, however we suggest the use of <75 mm crushed limestone (“all in”, not spalls/no-fines gravel). We note that, when compacted, this material may have a relatively low permeability, which should be considered in the civil design.

Alternate materials are possible (such as screened, crushed construction debris), however if poorly graded or single sized products are used, then it will be necessary to either:

- ✦ Mix in sand to fill the voids, or
- ✦ Use a separator geotextile layer above each layer of gravel fill to stop sand from washing into the voids in the gravel layer.

Please contact us for further advice during the specification of the earthworks so that we may comment further on specific material types.

9.6 Compaction

9.6.1 General

Approved granular fill must be compacted using suitable compaction equipment to achieve a dry density ratio of at least 95% MMDD (maximum modified dry density) as determined in accordance with AS 1289 5.2.1.

Fill must be placed in horizontal layers of not greater than 0.35 m loose thickness. Each layer must be compacted by suitable compaction equipment, and carefully controlled to ensure even compaction over the full area and depth of each layer.

Care will need to be taken when compacting in the vicinity of existing structures. This is particularly important if vibratory compaction is being carried out. Tynan (1973)¹ provides assistance with the selection of compaction equipment for use adjacent to structures. Of particular concern are the nearby existing houses along the southern boundary.

We recommend:

- ✦ Vibration monitoring along the southern boundary.
- ✦ Setting of a vibration limit for the houses (a guideline value would be peak particle velocity, PPV<10 mm/s at the boundary).
- ✦ Dilapidation survey of the houses adjacent to the site.

Large compaction equipment (self-propelled vibrating rollers, etc.) must not be used within 2 m behind retaining walls. Hand compaction plant must be used.

9.6.2 Clean Sand Fill – Performance Specification

Where sand is used as fill and the Perth sand penetrometer (PSP) is used for compaction control (only applicable for a material with <5% gravel and <5% fines), the following minimum PSP blow counts may be assumed to correlate to the required dry density ratio of 95% MMDD:

- ✦ Depth range 0 m to 0.15 m: SET
- ✦ Depth range 0.15 m to 0.45 m: 8 blows

¹ Tynan (1973) Ground Vibration and Damage Effects on Buildings, Australia Road Research Board, Special Report No. 11.

- ☞ Depth range 0.45 m to 0.75 m: 10 blows
- ☞ Depth range 0.75 m to 1.05 m: 12 blows (or 6 blows for depth range 0.75 m to 0.9 m).

If difficulties are experienced in achieving the required blow count, an on-site PSP calibration should be undertaken to determine the site-specific blow count correlating to the required dry density ratio.

Over-excavation and replacement of loose materials must be done where the minimum dry density ratio cannot be achieved.

After compaction, verify that the required level of compaction has been achieved by testing to a minimum depth of 0.9 m:

- ☞ On each lift of fill on a 40 m grid;
- ☞ At each spread footing location;
- ☞ at 15 m centres along gravity retaining wall footings and strip footings (where present); and
- ☞ at 10 m centres below on-ground slabs and pavements.

A performance specification is considered appropriate for Unit 1a material. The elevated gravel content in Unit 1c material means that the use of a PSP is not appropriate in this material for compaction control. A method specification is likely to be required (refer below).

9.6.3 Development of Method Specification – Unit 1c (Screened Fill)

The Unit 1c (Screened Fill) has a high gravel content and therefore is unsuitable for testing with a PSP. We recommend development of a method specification that will allow production of a compacted fill with a minimum dry density ratio (DDR) of 95% MMDD. The method specification should be developed by constructing trial pads and incorporating nuclear density gauge (NDG) testing to determine the watering rate and number of compactor passes required to achieve the required DDR.

As a minimum, we consider the following is required:

- ☞ Minimum trial pad dimensions: 10 m by 10 m
- ☞ Maximum loose layer thickness: 350 mm (only with vibrations)
- ☞ Maximum loose layer thickness (no vibrations): 200 mm
- ☞ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).
- ☞ Minimum number of NDG tests per pad: 3 for any given number of compactor passes
- ☞ Minimum passes of compactor (using 10 tonne vibratory smooth drum roller or heavier roller), regardless of outcomes of NDG testing: 6

9.6.4 Development of Method Specification – Unit 1b (In situ Uncontrolled Fill)

A method specification will need to be assessed for the compaction of the in-situ uncontrolled fill layer given that conventional compaction testing will be unsuitable for the material. This will need to be assessed by a geotechnical engineer with the contractor during the initial site works.

COMPACTION OF UPPER SURFACE OF UNIT 1B MATERIAL TO REMAIN IN SITU

At this preliminary stage we consider that the following work will be required as a minimum:

- ☞ Saturating the exposed surface with a minimum 40 L/m².
- ☞ Compacting the exposed surface using an 18 tonne pad foot roller or larger.

- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

HANDLING AND COMPACTION OF RE-HANDLED UNIT 1B MATERIAL

Should re-working of Unit 1b material be required (e.g. to excavate in one area and fill in another), a method specification will need to be developed. We consider the following is required as minimum:

- ⚡ Minimum trial pad dimensions: 10 m by 10 m
- ⚡ Maximum particle size: 250 mm (or 2/3 of layer thickness)
- ⚡ All wood or similar deleterious material to be removed by hand-picking and discarded.
- ⚡ Only compaction with vibrations to be done.
- ⚡ Maximum loose layer thickness: 350 mm (only with vibrations)
- ⚡ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).
- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions of 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

9.6.5 Development of Method Specification – Gravel Fill for Geogrids

The gravel fill used for engaging the geogrids will need to be placed and compacted to a method specification to achieve a minimum DDR of 95% MMDD. A tentative method specification is provided below, based on the assumption of using imported <75 mm “all in” crushed limestone. As density testing using the NDG is unreliable in these coarse materials, we recommend development of the method specification based on settlements of a trial pad. Alternate materials will require a review of this method specification:

- ⚡ Minimum trial pad dimensions: 10 m by 10 m
- ⚡ Maximum loose layer thickness: 350 mm (only with vibrations)
- ⚡ Maximum loose layer thickness (no vibrations): 200 mm
- ⚡ Minimum watering rate (unless otherwise indicated by trial): 10 litres/m²/100 mm thickness (i.e. 35 l/m² for 350 mm thick loose layer).
- ⚡ A minimum of 6 passes or until settlement/deformation of the surface of the area stops (this is to be assessed with high-accuracy survey control at a minimum of 9 points on a pad with minimum dimensions of 10 m by 10 m), after each 2 passes of the compactor, to the point where the average settlement for 2 additional passes is <2 mm. Cross rolling of the area may be required to ensure that adequate compaction is achieved.

10. FURTHER WORK

The following additional work is recommended to build upon the findings of the current report:

- ⚡ Additional CPTs / test pitting along the southern boundary to confirm the extent of the “Class M” lots.
- ⚡ Additional CPTs / test pits along the interface of the “Class A” and “Class S” lots in the south west corner to confirm the extent of the “Class A” lots.
- ⚡ Ongoing earthworks verification including assessment of method specifications for filling.

We consider that a high degree of engineering oversight is required for the earthworks at this site. 'Level 1' (full time) supervision as defined in AS3798-2007 is probably not necessary, however frequent visits are strongly recommended and occasional full-time supervision (such as when working on boundary areas and the early periods of implementing method specifications) will be needed.

11. CONCLUSION

We draw your attention to Appendix H of this report, Understanding your Report. The information provided within is intended to inform you as to what your realistic expectations of this report should be. Guidance is also provided on how to minimise risks associated with groundworks for this project. This information is provided not to reduce the level of responsibility accepted by Galt, but to ensure that all parties who rely on this report are aware of the responsibilities each assumes in so doing.

GALT GEOTECHNICS PTY LTD

A handwritten signature in black ink, appearing to read "O. Woodland".

Owen Woodland CPEng

Geotechnical Engineer

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Tables

Table A1: Summary of Tests – Cone Penetration Tests

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
PGCPT01	5.2	1.0	>4.2	NE	Dry to 4.0 m	Target Depth
PGCPT02	0.3	0.3	NE	NE	Dry to 0.3 m	Refusal
PGCPT03	0.1	0.1	NE	NE	Dry to 0.1 m	Refusal
PGCPT04	2.6	1.2	>1.4	NE	Dry to 2.6 m	Refusal
PGCPT05	2.6	2.5	>0.1	NE	Dry to 2.6 m	Refusal
PGCPT06	5.2	1.6	NE	1.6	Dry to 4.2 m	Target Depth
PGCPT07	5.2	2.0	3.0	5.0	Dry to 3.5 m	Target Depth
PGCPT08	1.4	1.2	>0.2	NE	Dry to 1.2 m	Refusal
PGCPT09	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT10	2.8	1.5	>0.8	NE	Dry to 1.3 m	Refusal
PGCPT11	5.2	NE	NE	0.0	Dry to 4.0 m	Target Depth
PGCPT12	2.0	1.7	>0.3	NE	Dry to 1.9 m	Refusal
PGCPT13	2.5	1.1	>1.4	NE	Dry to 2.4 m	Refusal
PGCPT14	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT15	3.5	1.8	>2.7	NE	Dry to 3.0 m	Refusal
PGCPT16	5.2	NE	NE	0.0	Dry to 4.1 m	Target Depth
PGCPT17	3.2	3.0	>0.2	NE	Dry to 3.2 m	Target Depth
PGCPT18	3.3	1.8	>1.5	NE	Dry to 3.2 m	Target Depth
PGCPT19	5.2	NE	NE	0.0	Dry to 3.9 m	Target Depth
PGCPT20	5.2	2.1	1.7	3.8	Dry to 4.0 m	Target Depth
PGCPT21	3.7	2.3	>1.4	NE	Dry to 2.6 m	Refusal
PGCPT22	5.2	NE	NE	0.0	Dry to 4.2 m	Target Depth
PGCPT23	2.7	1.9	>0.8	NE	Dry to 2.6 m	Refusal
PGCPT24	2.2	1.2	>1.0	NE	Dry to 0.0 m	Refusal
PGCPT25	2.6	2.4	>0.2	NE	Dry to 2.5 m	Refusal
PGCPT26	2.0	1.9	>0.1	NE	Dry to 1.9 m	Refusal
PGCPT27	2.3	1.4	>0.9	NE	Dry to 2.3 m	Refusal
PGCPT28	3.0	1.9	>1.1	NE	Dry to 2.9 m	Refusal
PGCPT29	3.0	1.5	>1.5	NE	Dry to 2.3 m	Refusal

- Notes:**
1. GNE: Groundwater not encountered within the excavated depth,
 2. NE: Not encountered within the excavated depth
 3. Approximate depth to groundwater based on soil moisture

Table A2: Summary of Tests – Test Pits

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
PGTP01	4.0	2.6	NE	2.6	GNE	Target Depth
PGTP02	5.5	3.6	1.5	5.1	5.1	Target Depth
PGTP03	7.2	3.2	>4.0	NE	GNE	Target Depth
PGTP04	6.4	3.5	>2.9	NE	GNE	Target Depth
PGTP05	7.5	2.5	>5.0	NE	GNE	Target Depth
PGTP06	7.9	1.9	>6.0	NE	GNE	Target Depth
PGTP07	4.6	4.2	NE	4.2	GNE	Target Depth
PGTP08	6.4	6.1	NE	6.1	GNE	Target Depth
PGTP09	7.4	3.4	>4.0	NE	GNE	Target Depth
PGTP10	7.7	2.0	>5.7	NE	GNE	Target Depth
PGTP11	7.5	2.9	>4.6	NE	GNE	Target Depth
PGTP12	7.5	3.0	>4.5	NE	GNE	Target Depth
PGTP13	6.7	3.6	>3.1	NE	GNE	Target Depth
PGTP14	7.9	5.6	2.1	7.7	GNE	Target Depth
PGTP15	7.4	5.4	>2.0	NE	GNE	Target Depth
PGTP16	7.5	4.7	>2.8	NE	GNE	Target Depth
PGTP17	7.6	3.3	>4.3	NE	GNE	Target Depth
PGTP18	6.6	3.2	>3.4	NE	GNE	Target Depth
PGTP19	7.6	3.5	>4.1	NE	GNE	Target Depth
PGTP20	6.8	5.2	>1.6	NE	GNE	Target Depth
PGTP21	2.6	1.9	>0.7	NE	GNE	Terminated (Asbestos Fill)
PGTP22	7.1	2.2	>4.9	NE	GNE	Target Depth
PGTP23	7.1	2.2	>4.9	NE	GNE	Target Depth
PGTP24	7.2	2.5	>4.7	NE	GNE	Target Depth
PGTP25	7.1	4.1	>3.0	NE	GNE	Target Depth
PGTP26	7.1	6.8	>0.3	NE	GNE	Target Depth
PGTP27	6.9	1.7	>5.2	NE	GNE	Target Depth
PGTP28	6.7	3.0	>3.7	NE	GNE	Target Depth
PGTP29	6.6	3.4	>3.2	NE	GNE	Target Depth
PGTP30	7.2	3.4	>3.8	NE	GNE	Target Depth
PGTP31	7.5	4.1	>3.4	NE	GNE	Target Depth

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
PGTP32	6.6	2.5	>4.1	NE	GNE	Target Depth
PGTP33	7.4	5.8	>1.6	NE	GNE	Target Depth
PGTP34	7.2	1.6	>5.6	NE	GNE	Target Depth
PGTP35	7.3	3.7	>3.6	NE	GNE	Target Depth
PGTP36	7.2	3.2	>4.0	NE	GNE	Target Depth
PGTP37	7.3	3.7	>3.6	NE	GNE	Target Depth
PGTP38	7.3	4.1	>3.2	NE	GNE	Target Depth
PGTP39	7.3	3.5	>3.8	NE	GNE	Target Depth
PGTP40	6.3	3.4	>2.9	NE	GNE	Target Depth
PGTP41	6.2	2.7	>3.5	NE	GNE	Target Depth
PGTP42	5.6	1.9	>3.7	NE	GNE	Target Depth
PGTP43	4.5	1.5	>3.0	NE	GNE	Target Depth

- Notes:**
1. GNE: Groundwater not encountered within the excavated depth
 2. NE: Not encountered within the excavated depth
 3. Approximate depth to groundwater based on soil moisture

Table A3: Summary of Tests – Boreholes

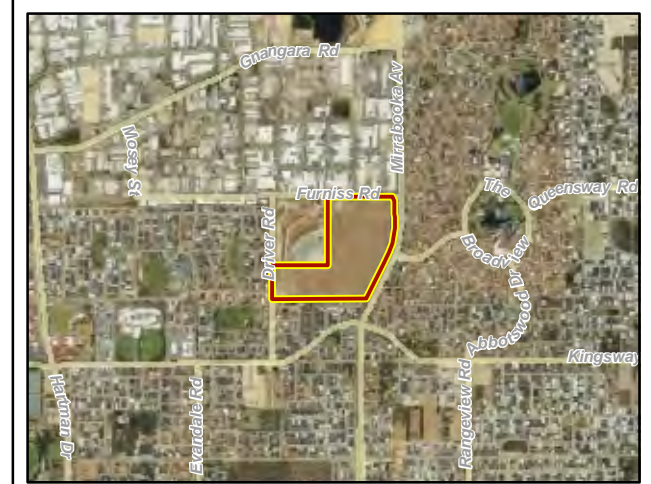
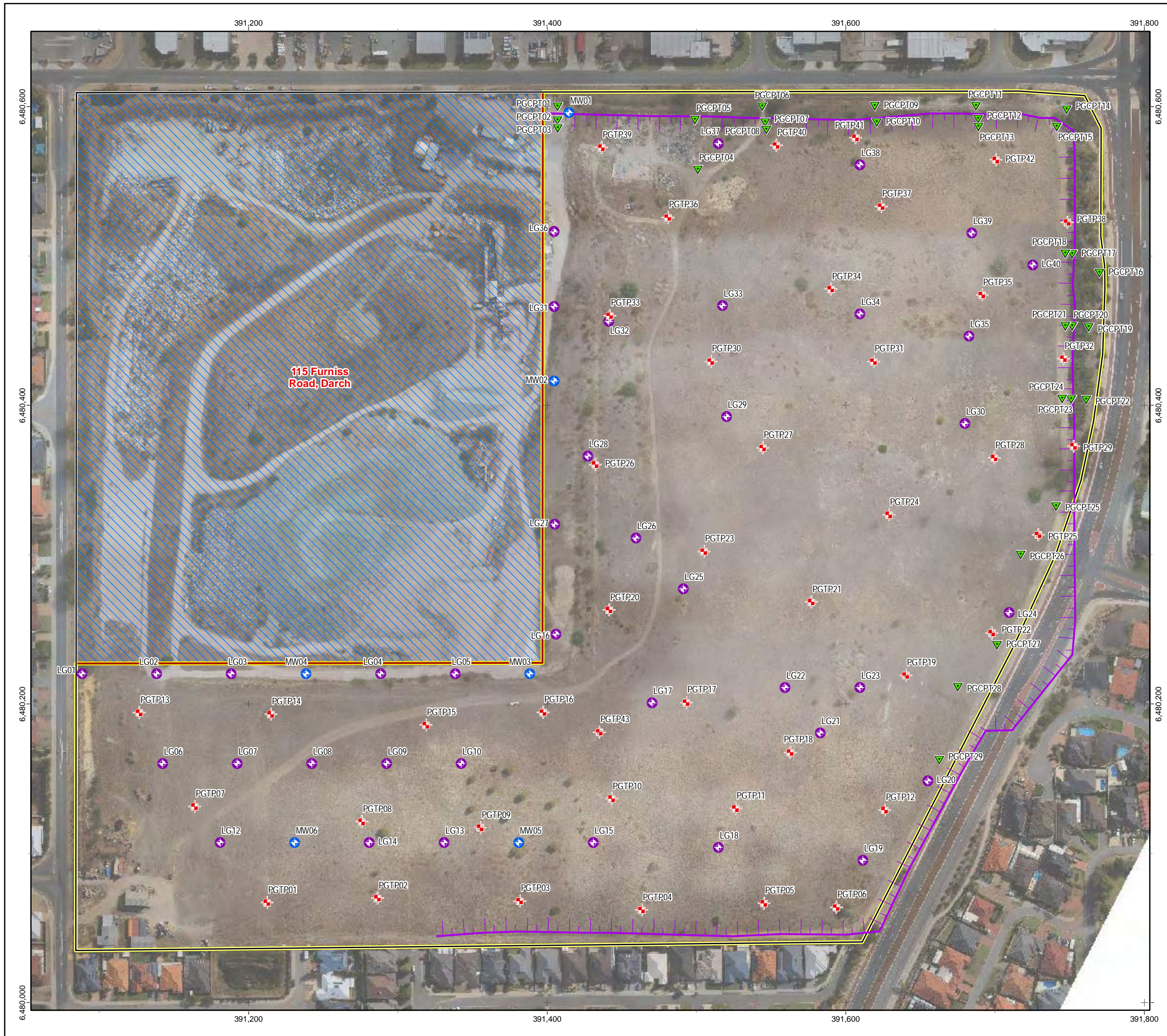
Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
BHMMW01	15.0	1.5	4.2	5.7	10.9	Target Depth
BHMMW02	10.5	1.0	5.3	6.3	6.5	Target Depth
BHMMW03	16.0	3.0	9.8	12.8	12.9	Target Depth
BHMMW04	10.5	4.7	NE	4.7	7.0	Target Depth
BHMMW05	15.0	2.5	9.5	12.0	12.3	Target Depth
BHMMW06	9.0	1.4	3.1	4.5	5.9	Target Depth
BHLG01	4.0	0.6	NE	0.6	GNE	Target Depth
BHLG02	10.5	2.0	6.2	8.2	7.4	Target Depth
BHLG03	4.5	2.6	NE	2.6	GNE	Target Depth
BHLG04	10.5	2.0	3.5	5.5	7.8	Target Depth
BHLG05	10.5	4.0	6.0	10.0	9.3	Target Depth
BHLG06	8.0	2.0	5.0	7.0	7.0	Target Depth
BHLG07	6.0	2.5	2.0	4.5	GNE	Target Depth
BHLG08	7.5	6.0	NE	6.0	GNE	Target Depth
BHLG09	10.5	4.5	4.0	8.5	9.0	Target Depth
BHLG10	13.5	5.0	7.0	12.0	11.0	Target Depth
BHLG12	4.0	3.0	NE	3.0	GNE	Target Depth
BHLG13	10.5	3.5	5.5	9.0	8.3	Target Depth
BHLG14	4.5	4.0	NE	4.0	GNE	Target Depth
BHLG15	11.0	2.0	>9.0	NE	GNE	Refusal
BHLG16	18.0	3.5	13.0	16.5	GNE	Target Depth
BHLG17	19.5	2.0	16.3	18.3	16.5	Target Depth
BHLG18	21.0	2.0	18.0	20.0	19.8	Target Depth
BHLG19	21.0	2.0	17.6	19.6	19.5	Target Depth
BHLG20	18.0	3.0	13.5	16.5	18.0	Target Depth
BHLG21	21.0	2.0	17.7	19.7	19.5	Target Depth
BHLG22	21.0	1.5	18.9	20.4	19.8	Target Depth
BHLG23	21.0	2.0	18.0	20.0	19.5	Target Depth
BHLG24	18.5	3.0	>15.5	>18.5	18.0	Refusal
BHLG25	19.5	2.0	16.0	18.0	17.2	Target Depth
BHLG26	19.8	3.8	14.2	18.0	16.7	Target Depth

Test Name	Test Depth (m)	Thickness (m) of Fill Over Sand		Depth to Natural Sand (m)	Depth to Groundwater (m)	Notes
		Sand Fill (Unit 1a/1c)	Uncontrolled Fill (Unit 2)			
BHLG27	19.5	8.0	10.5	18.5	18.2	Target Depth
BHLG28	18.0	6.0	11.5	17.5	17.0	Target Depth
BHLG29	18.0	1.5	15.5	17.0	16.4	Target Depth
BHLG30	18.0	1.5	15.5	17.0	16.4	Target Depth
BHLG31	9.0	1.0	6.5	7.5	GNE	Target Depth
BHLG32	18.0	5.0	10.5	15.5	15.2	Target Depth
BHLG33	16.0	2.6	12.4	15.0	15.2	Target Depth
BHLG34	18.0	2.0	13.5	15.5	14.7	Target Depth
BHLG35	18.0	3.0	12.5	15.5	15.7	Target Depth
BHLG36	12.0	1.0	9.6	10.6	GNE	Target Depth
BHLG37	12.0	3.3	8.2	11.5	11.5	Target Depth
BHLG38	15.0	2.0	12.0	14.0	13.5	Target Depth
BHLG39	18.0	2.0	14.1	16.1	15.5	Target Depth
BHLG40	18.0	3.0	13.5	16.5	15.5	Target Depth

- Notes:**
- 1 NE: Not encountered within the excavated depth
 - 2 Depth to groundwater based on soil moisture (not direct measurement of water level)



Figures



Legend

- Site Boundary
- Approximate Crest of Historical Excavation

Test Locations (May/June 2019)

- + Test Pit
- ▼ Cone Penetration Test
- + Gas Monitoring Well
- + Groundwater Monitoring Well

N

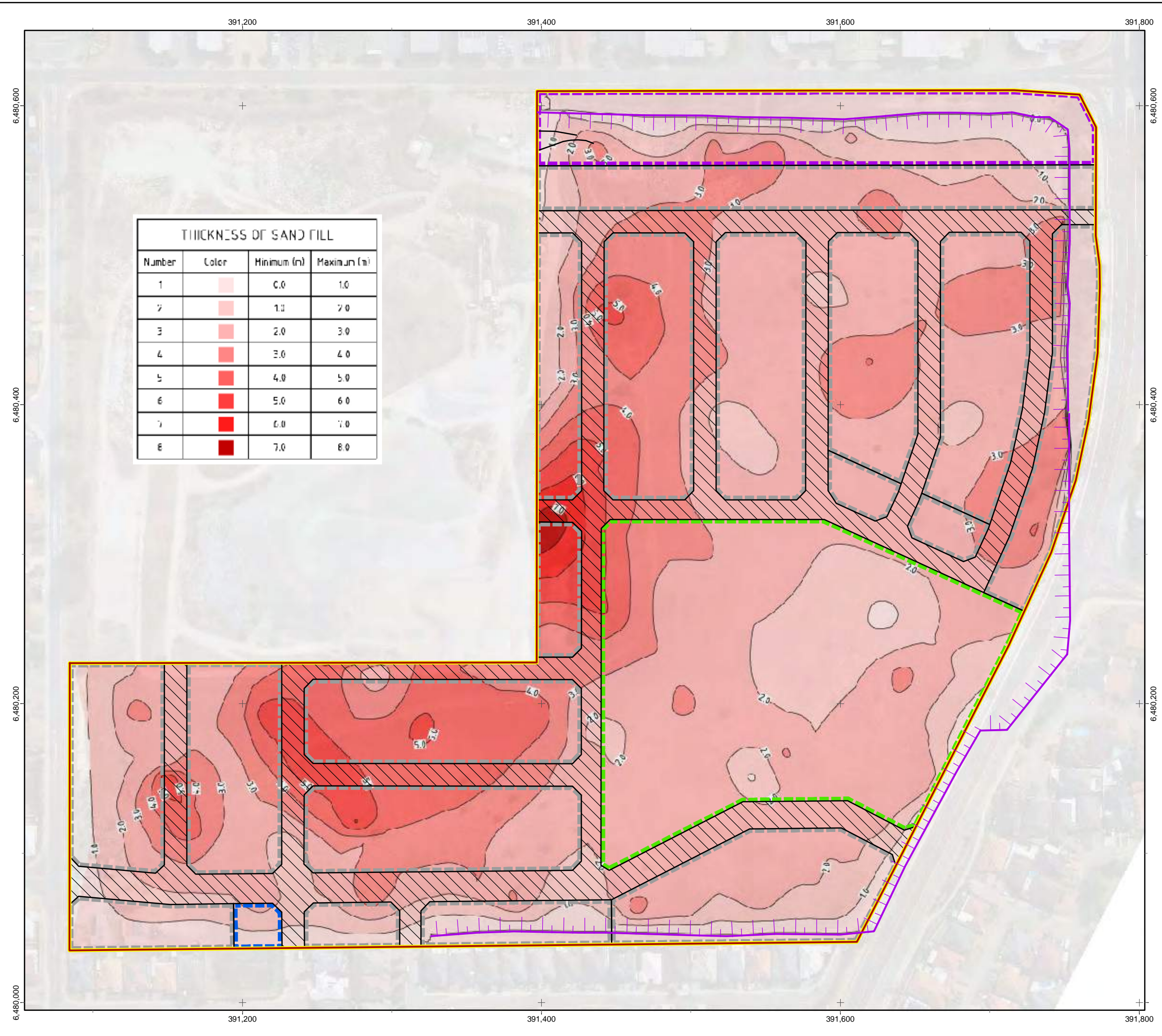
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Aerial Imagery and Cadastre sourced from Landgate/SLIP

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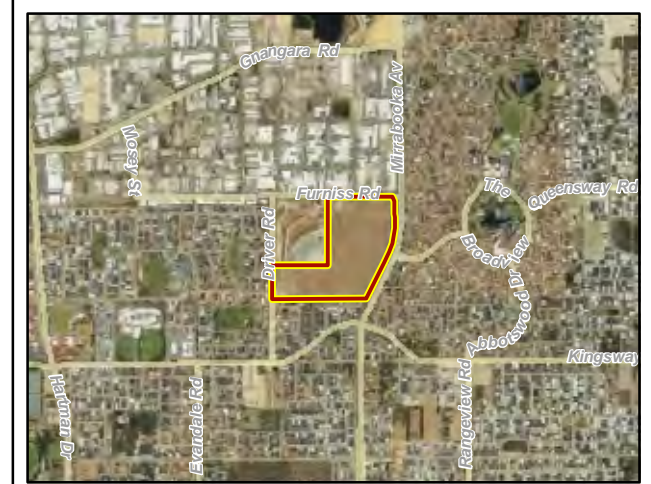
Galt Geotechnics Pty Ltd
 ACN : 138 490 865
 Tel : +61 (0)8 6272-0200
 Address : 50 Edward Street
 Osborne Park WA 6017

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CLIENT	PARCEL PROPERTY		
PROJECT	PROPOSED MIXED USE SUBDIVISION		
LOCATION	26 DRIVER ROAD DARCH		
TITLE	SITE AND LOCATION PLAN		
Job No	J1801113	Fig No	FIGURE 1
Rev	B		



THICKNESS OF SAND FILL			
Number	Color	Minimum (m)	Maximum (m)
1	Lightest Pink	0.0	1.0
2	Light Pink	1.0	2.0
3	Light Red	2.0	3.0
4	Light Red	3.0	4.0
5	Red	4.0	5.0
6	Dark Red	5.0	6.0
7	Dark Red	6.0	7.0
8	Dark Red	7.0	8.0



Legend

- Site Boundary (Orange outline)
- Design Concept**
 - COMMERCIAL (Purple hatched)
 - DRAINAGE (Blue hatched)
 - LOTS (Grey hatched)
 - POS (Green dashed line)
 - ROAD (Diagonal hatched)
- Approximate Crest of Historical (Purple dashed line)

0 40 80 120 160 200
Meters

N

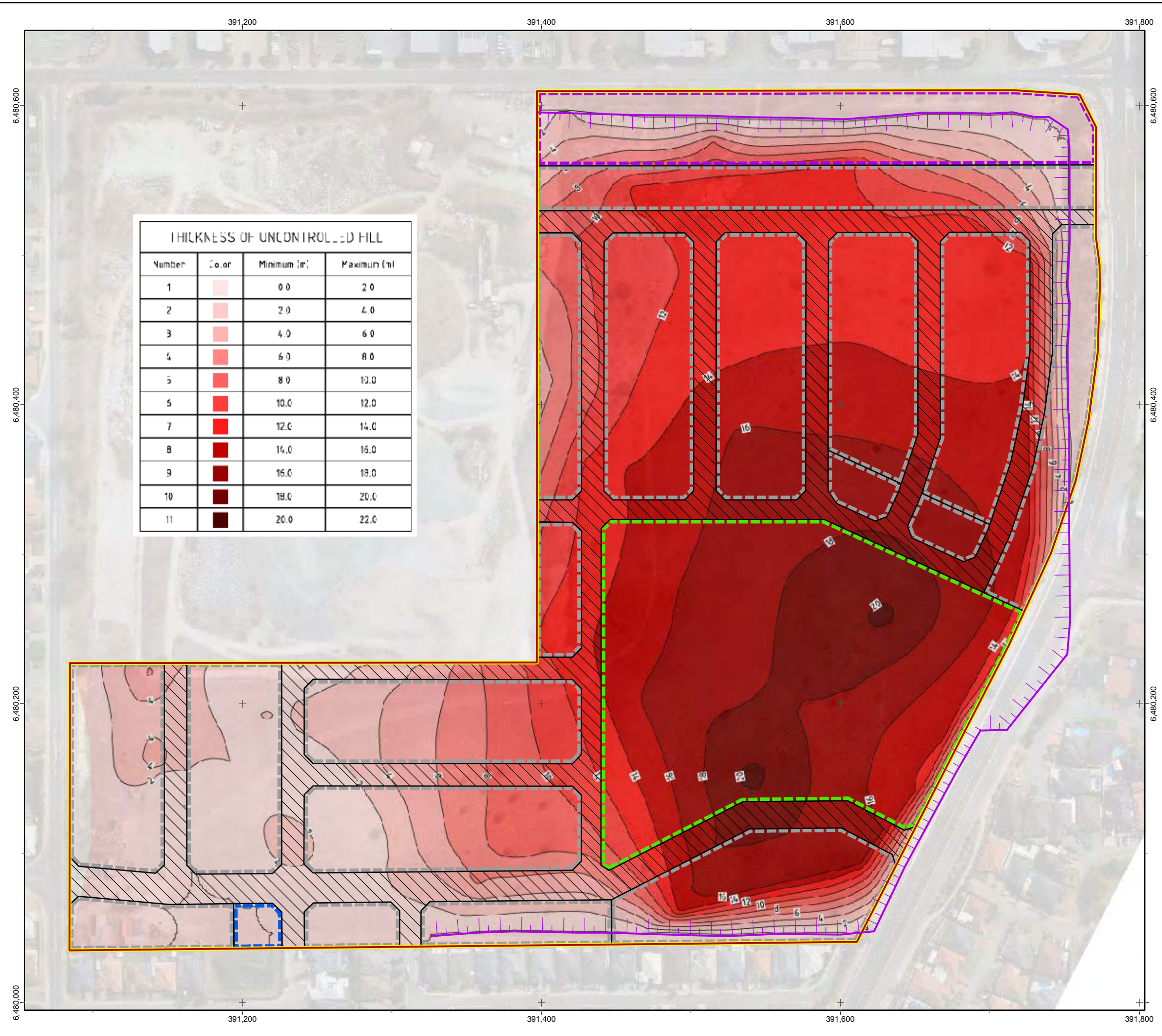
NOTES
Aerial Imagery and Cadastre sourced from Landgate/SLIP

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PROJECTION	GDA 1994 MGA Zone 50	

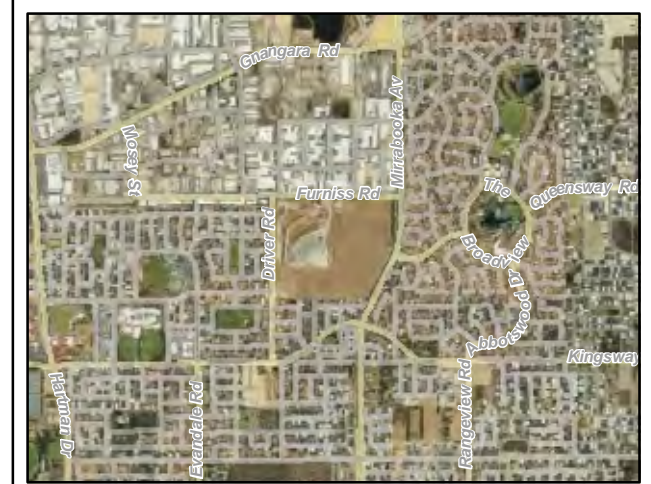
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CLIENT	PARCEL PROPERTY		
PROJECT	PROPOSED MIXED USE SUBDIVISION		
LOCATION	26 DRIVER ROAD DARCH		
TITLE	SAND FILL THICKNESS (UNIT 1A & 1C)		
Job No	J1801113	Fig No	FIGURE 2
Rev	B		



THICKNESS OF UNCONTROLLED FILL			
Number	Color	Minimum (m)	Maximum (m)
1	Lightest Pink	0.0	2.0
2	Light Pink	2.0	4.0
3	Light Red	4.0	6.0
4	Light Red	6.0	8.0
5	Red	8.0	10.0
6	Red	10.0	12.0
7	Dark Red	12.0	14.0
8	Dark Red	14.0	16.0
9	Dark Red	16.0	18.0
10	Dark Red	18.0	20.0
11	Darkest Red	20.0	22.0



Legend

- Site Boundary
- Design Concept (Concept_8997_CON02F_20190902)
 - COMMERCIAL
 - DRAINAGE
 - LOTS
 - POS
 - ROAD
- Approximate Crest of Historical Excavation

0 40 80 120 160 200 Meters

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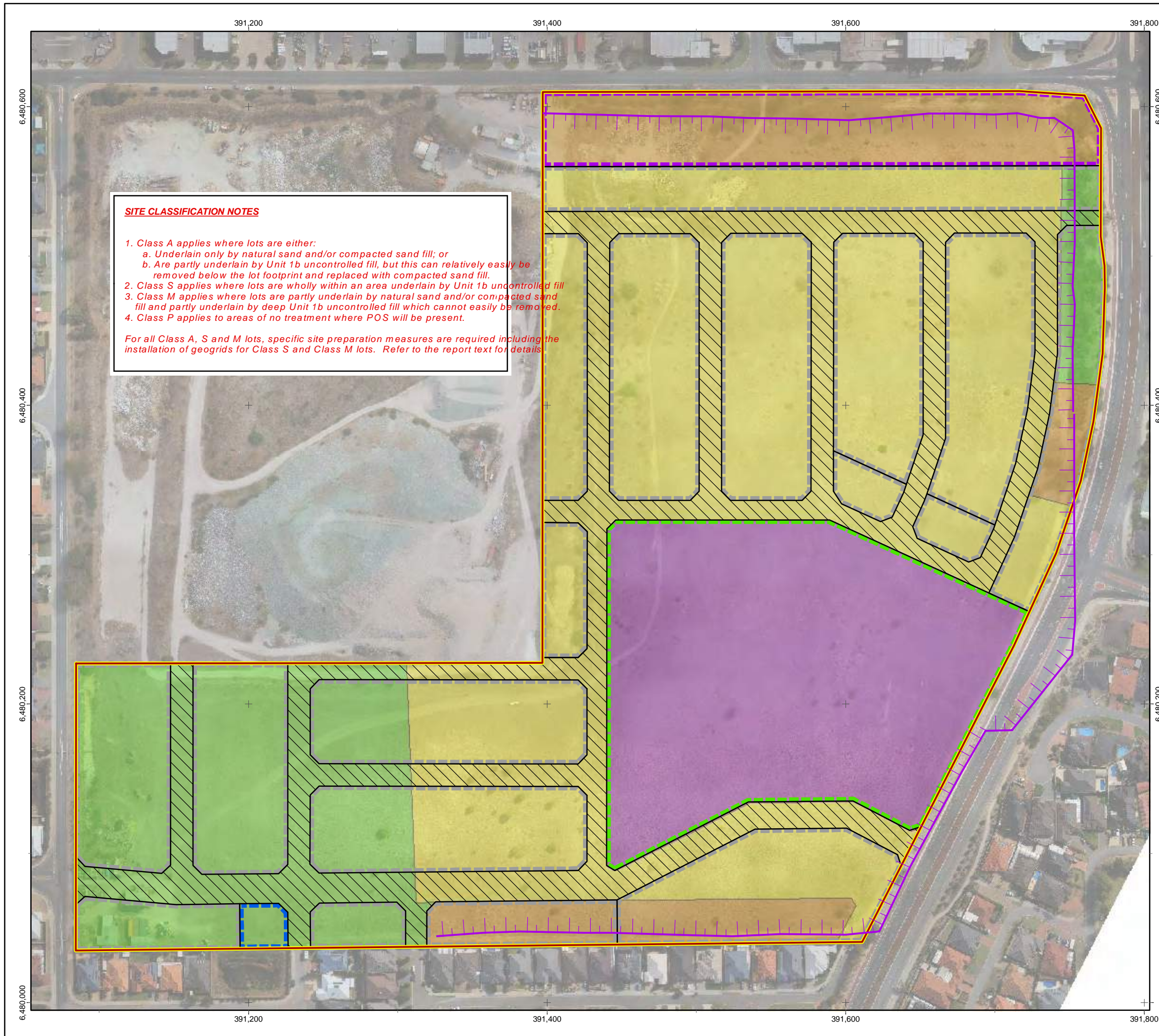
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Aerial Imagery and Cadastre sourced from Landgate/SLIP

	SCALE	1:2,500 (A3)
	DRAWN	DAC
	DATE DRAWN	17/09/2019
	CHECKED	ORW
	DATE CHECKED	17/09/2019
PROJECTION	GDA 1994 MGA Zone 50	

Galt Geotechnics Pty Ltd
 ACN : 138 490 865
 Tel : +61 (0)8 6272-0200
 Address : 50 Edward Street
 Osborne Park WA 6017

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CLIENT	PARCEL PROPERTY
PROJECT	PROPOSED MIXED USE SUBDIVISION
LOCATION	26 DRIVER ROAD DARCH
TITLE	UNCONTROLLED FILL THICKNESS (UNIT 1B)
Job No	J1801113
Fig No	FIGURE 3
Rev	B



SITE CLASSIFICATION NOTES

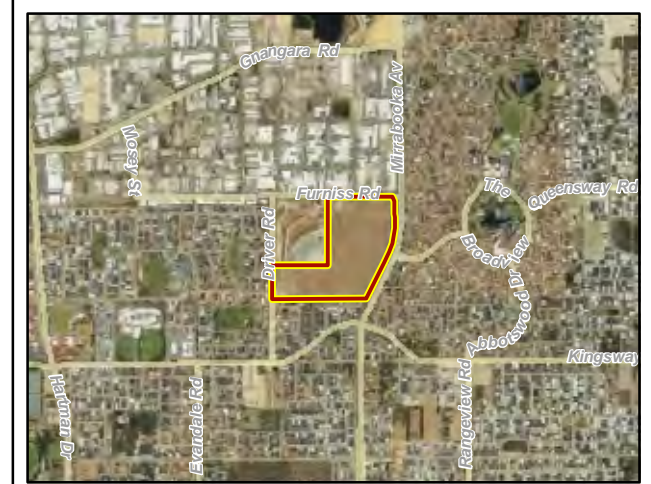
1. Class A applies where lots are either:
 a. Underlain only by natural sand and/or compacted sand fill; or
 b. Are partly underlain by Unit 1b uncontrolled fill, but this can relatively easily be removed below the lot footprint and replaced with compacted sand fill.

2. Class S applies where lots are wholly within an area underlain by Unit 1b uncontrolled fill

3. Class M applies where lots are partly underlain by natural sand and/or compacted sand fill and partly underlain by deep Unit 1b uncontrolled fill which cannot easily be removed.

4. Class P applies to areas of no treatment where POS will be present.

For all Class A, S and M lots, specific site preparation measures are required including the installation of geogrids for Class S and Class M lots. Refer to the report text for details.



Legend

- Site Boundary
- Design Concept (Concept_8997_CON02F_20190902)**
- COMMERCIAL
- DRAINAGE
- LOTS
- POS
- ROAD
- SITE CLASSIFICATION (17/09/2019)**
- CLASS "A"
- CLASS "M"
- CLASS "P"
- CLASS "S"
- Approximate Crest of Historical Excavation

0 40 80 120 160 200
Meters

NOTES
 Aerial Imagery and Cadastre sourced from Landgate/SLIP

	SCALE	1:2,500	(A3)
	DRAWN	DAC	
	DATE DRAWN	17/09/2019	
	CHECKED	ORW	
	DATE CHECKED	17/09/2019	
PROJECTION	GDA 1994 MGA Zone 50		

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CLIENT	PARCEL PROPERTY		
PROJECT	PROPOSED MIXED USE SUBDIVISION		
LOCATION	26 DRIVER ROAD DARCH		
TITLE	INDICATIVE SITE CLASSIFICATION		
Job No	J1801113	Fig No	FIGURE 4
Rev	B		



Appendix A: Site Photographs



Photograph 1: Test Pitting



Photograph 2: CPT Rig



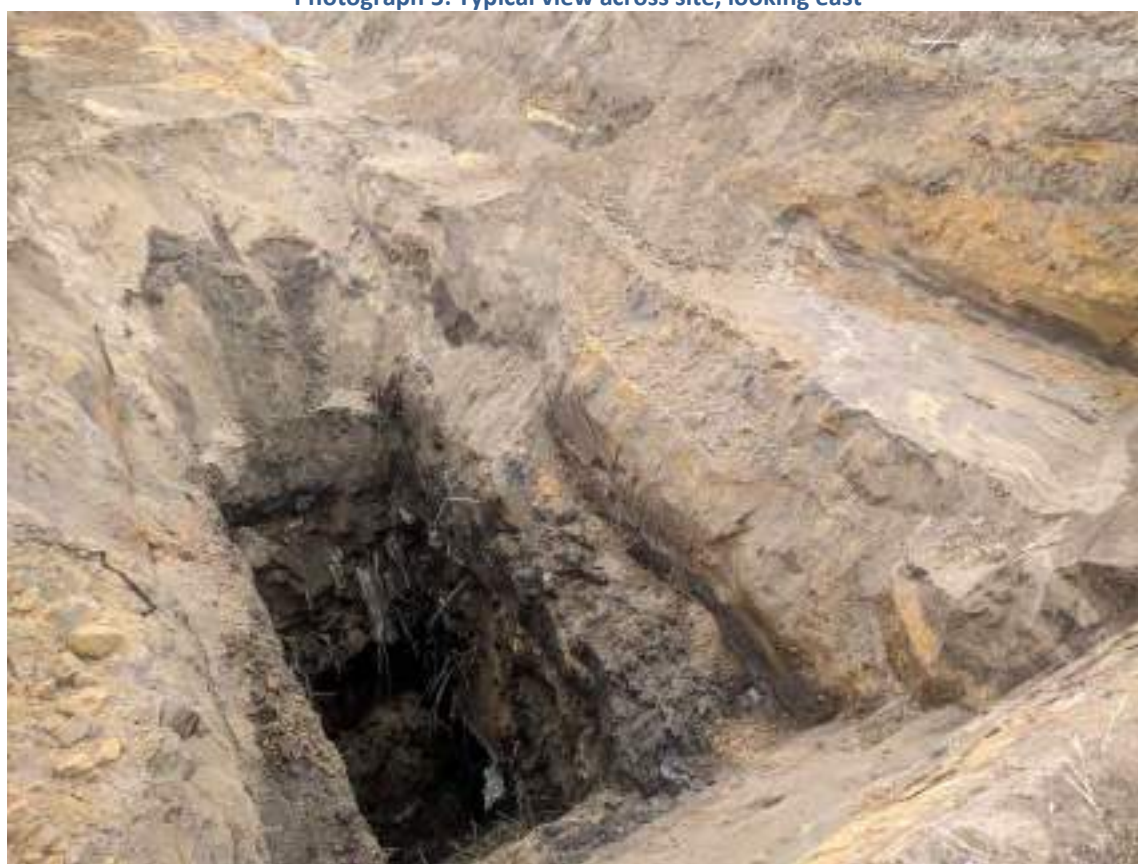
Photograph 3: CPT Rig



Photograph 4: Borehole Drilling



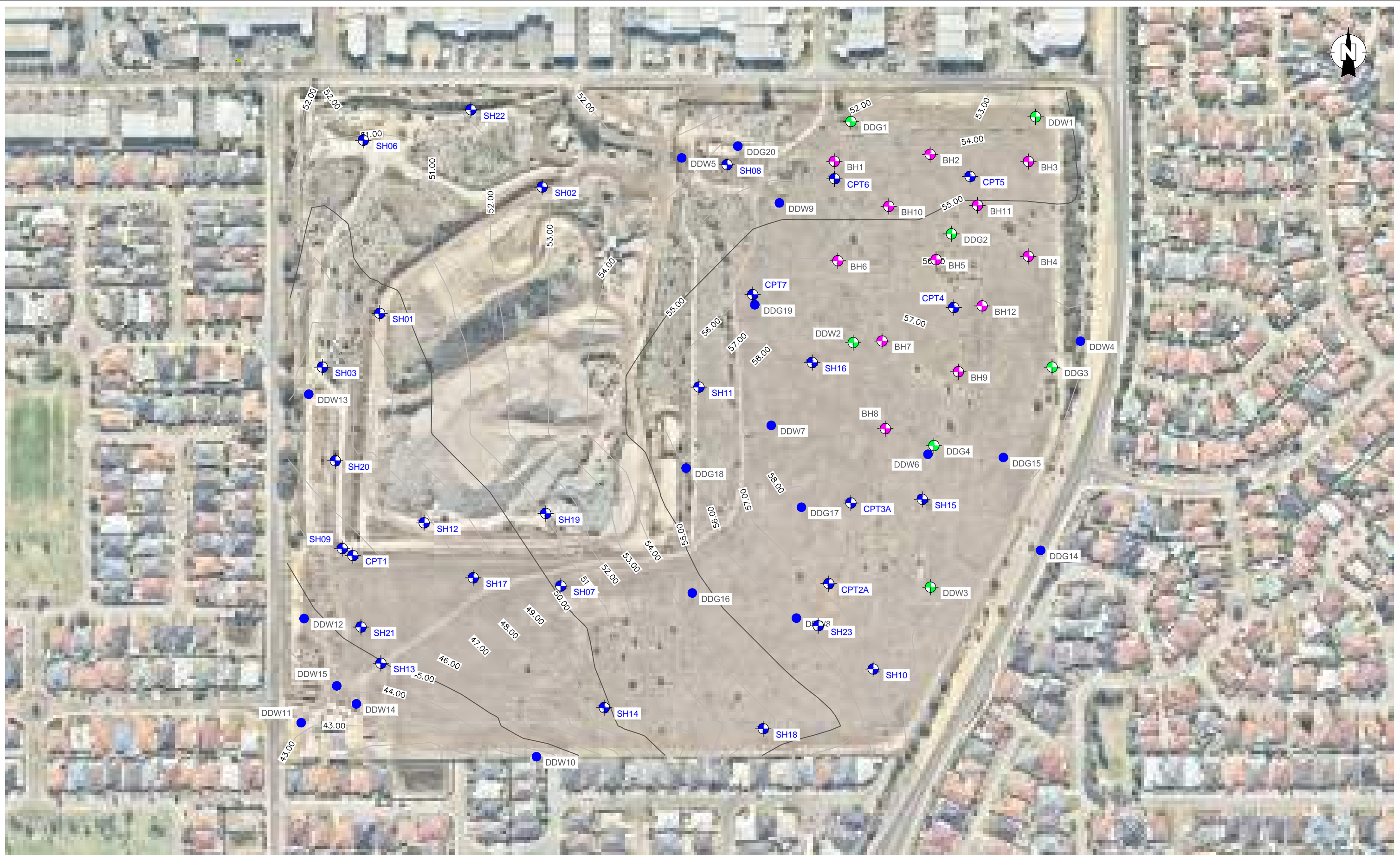
Photograph 5: Typical view across site, looking east



Photograph 6: Typical profile of sand fill overlying uncontrolled fill including rubbish



Appendix B: CMW Geosciences 2017 Data

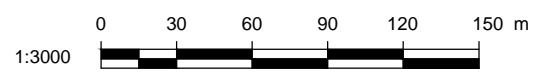


LEGEND:

	BH1	BOREHOLE LOCATION (GOLDER JUNE 2004)
	DDW15	MONITORING WELL LOCATION (GOLDER JUNE 2008)
	DDG1	BOREHOLE LOCATION (RPS FEB 2005)
	CPT/SH	CMW TEST LOCATION

NOTES:

1. IMAGE FROM NEARMAP 28.04.17
2. CONTOURS SUPPLIED



CLIENT:	HANDLE PROPERTY GROUP	DRAWN:	DE	PROJECT:	PER2017-0193
PROJECT:	LANDFILL REDEVELOPMENT DRIVER ROAD, DARCH, WA	CHECKED:	MW	FIGURE:	01
TITLE:	SITE INVESTIGATION PLAN	REVISION:	0	SCALE:	1:3000
		DATE:	03.08.17	SHEET:	A3 L

BOREHOLE LOG - SH01

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391165m N.6480418m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		1.8-2.0	B		1	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, pale brown mottled grey; gravel, angular, medium to coarse grained, of concrete and brick; with silt, trace cobbles.</p> <p>... at 2.10m, wood fragment</p>				
					2					
					3					
					4	<p>FILL: Sandy GRAVEL: angular to subrounded, fine to coarse grained, red brown, of brick; sand, fine to coarse grained, with cobbles.</p> <p>FILL: SAND: subangular to subrounded, fine to medium grained, dark brown; with gravel, fine to coarse grained, of brick, concrete, tile, plastic, asphalt and glass; with cobbles; trace organic fines.</p> <p>... from 5.00m to 5.10m, trace rootlets</p> <p>... from 7.20m to 7.30m, trace rootlets</p> <p>... at 8.40m, wood fragments</p>				
					5				M	
		7.2-7.3	B		6					
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:


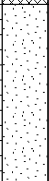
BOREHOLE LOG - SH01

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391165m N.6480418m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11		FILL: SAND: subangular to subrounded, fine to medium grained, dark brown; with gravel, fine to coarse grained, of brick, concrete, tile, plastic, asphalt and glass; with cobbles; trace organic fines. ... at 10.20m, trace wood chips ... at 10.40m, decomposed wood fragments			
					11		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH02

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391304m N.6480526m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		0.8-0.9	B		1		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, pale brown mottled grey; gravel, angular, medium to coarse grained, of concrete and brick; with silt, trace cobbles. ... from 0.80m to 1.10m, trace fragments of wood; trace organic fines			
		2.8-3.0	B		2		FILL: SAND: subangular to subrounded, fine to medium grained, black mottled dark brown; trace gravel of brick, concrete, tile, plastic and glass; trace organic fines.			
					3		FILL: Sandy GRAVEL: angular to subrounded, fine to coarse grained gravel, red brown, of brick.			
					4		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, mottled grey brown; gravel, angular, medium to coarse grained, pale brown, of concrete and brick; trace silt, trace cobbles, trace boulders. ... at 5.20m, piece of chipboard			
					5		... at 6.70m, piece of chipboard ... at 6.90m, asbestos sheeting			
					6		... at 7.40m, cardboard and woody fragments			
					7		... at 8.80m, metal strapping			
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH02

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 23/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391304m N.6480526m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		11.4-11.5	B		11	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, mottled grey brown; gravel, angular, medium to coarse grained, pale brown, of concrete and brick; trace silt, trace cobbles, trace boulders.</p> <p>... at 11.20m, woody fibres ... at 11.30m, copper wire/electronic waste</p> <p>FILL: SAND: subangular to subrounded, fine to medium grained, black mottled brown; trace gravel of brick, concrete, tile, plastic and glass; trace organic fines.</p> <p>... from 12.20m to 12.70m, clay laminations, orange-brown, medium plasticity</p> <p>... from 13.30m to 13.60m, Sandy GRAVEL, pale grey, with fines</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained sand, white streaked pale grey. (Bassendean Sand)</p> <p>Borehole terminated at 14.5 m</p>				
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH03

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391116m N.6480372m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1 2 3 4 5 6 7 8 9 10		<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled brown; with gravel of brick and concrete, with cobbles, trace fines.</p> <p>... at 4.00m, wood fragment</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained sand, yellow. (Bassendean Sand)</p> <p>... from 7.80m to 9.00m, pale grey</p> <p>Borehole terminated at 9.0 m</p>			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 1 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		1.7-1.8	1 B		1		FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete.			
					2		... from 2.30m to 3.00m, black colour			
					3		... from 3.20m to 3.30m, PVC fragments			
					4					
					5					
		5.8-6.0	2 B		6		... at 6.00m, fragments of metal			
					7		... from 7.20m to 7.35m, trace wood fragments			
					8					
		8.3-8.5	3 B		9		... at 8.80m, chipboard			
					10		... from 9.50m to 10.20m, fragments of metal and wood			

Termination Reason: Target Depth Reached

Remarks:

BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 2 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		12.5-12.8	5 B		11	<p>FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete.</p> <p>... from 11.60m to 11.80m, fragments of wood and plastic strapping</p> <p>... from 12.30m to 12.45m, wood pieces</p> <p>... from 14.50m to 15.00m, fragments of wood, wire and plastic strapping</p> <p>... from 17.50m to 17.70m, fragments of wood</p>				
		17.1-17.3	6 B		12					
		19.2-19.4	7 B		13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

D to M

Termination Reason: Target Depth Reached

Remarks:

BOREHOLE LOG - SH04

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 22/08/2017



1:50 Sheet 3 of 3

Logged by: TM Position: E.391550m N.6480195m (MGA 50) Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		FILL: SAND: fine to medium grained, dark grey to grey mottled yellow-brown and white; trace gravel of limestone, brick and concrete.			
					21		SP: SAND: fine to medium grained, pale grey, trace fines. (Bassendean Sand)	W		
							Borehole terminated at 21.0 m			
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target Depth Reached

Remarks:

BOREHOLE LOG - SH06

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391151m N.6480566m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled brown; with gravel of brick, concrete and plastic; trace cobbles, trace fines.			
		2.0-2.1	B		2		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, insulation fibres and plastic; with fines, trace cobbles.			
		3.5-3.6	B		4		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled brown; trace gravel of brick, concrete and plastic; trace cobbles, trace fines.			
					5					
					6					
					7					
					8					
					8		... at 8.00m, trace wood fragments			
					9					
					10					

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH06

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391151m N.6480566m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		10.7-11.2	B		11		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled brown; trace gravel of brick, concrete and plastic; trace cobbles, trace fines. ... at 10.20m, decomposed wood board ... from 10.60m to 11.70m, black; with plastic, metal, wood and brick; strong HS2 odour			
					12		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of limestone.			
					13					
					14		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	M to W		
					14		Borehole terminated at 14.0 m			
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH07

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391320m N.6480185m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		7.8-7.9	B		1 2 3 4 5 6 7 8 9 10	<p>SW: SAND: subangular to subrounded, fine to coarse grained sand, dark grey; trace gravel.</p> <p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.</p> <p>... from 6.30m to 6.45m, crushed glass</p> <p>... at 7.30m, wood fibres</p> <p>Borehole terminated at 10.0 m</p>			0.00m: Grass on the surface	
										9.00-9.50m: potential loose zone/perched groundwater. Continual collapse of the borehole

Termination Reason: Hole collapse due to perched groundwater

Remarks:

BOREHOLE LOG - SH08

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391462m N.6480545m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		9.5-9.6	B		1 2 3 4 5 6 7 8 9 10	<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, limestone, insulation fibres and plastic; trace fines, trace cobbles.</p> <p>... at 7.40m, fibreglass fragments</p>				

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH08

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391462m N.6480545m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, limestone, insulation fibres and plastic; trace fines, trace cobbles.			
					12					
					13		SW: SAND: subangular to subrounded, fine to coarse grained sand, pale grey streaked dark grey. (Bassendean Sand)			
					14					
					15		Borehole terminated at 15.0 m			
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH09

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391133m N.6480217m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		2.5-2.6	B		1 2		FILL: SAND: subangular to subrounded, fine to coarse grained, brown streaked grey brown; trace gravel, of concrete and brick; trace fines.			0.00m: Grass on the surface
		7.0-7.1	B		3 4 5 6 7 8		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, brown mottled grey black; gravel, angular to subrounded, fine to coarse grained, of concrete, bitumen, limestone and brick; trace silt, with cobbles, trace boulders. ... at 2.20m, wood fragments ... from 7.20m to 7.20m, fibrous insulation ... from 7.50m to 7.90m, with glass and carpet			
					9		SW: SAND: subangular to subrounded, fine to coarse grained sand, white streaked pale grey. (Bassendean Sand)			
					10		Borehole terminated at 9.0 m			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH10

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391587m N.6480114m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.8-6.9	B		1 2 3 4 5 6 7 8 9 10		<p>SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled yellow brown; trace gravel of brick and concrete; trace cobbles.</p> <p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; with cobbles, trace boulders, trace fines.</p> <p>... from 5.60m to 5.70m, wood fragments and copper wire</p> <p>... at 6.60m, metal sheeting ... at 6.70m, plastic bag</p> <p>... at 8.90m, wood fragments</p> <p>... from 9.80m to 10.00m, carpet</p>			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH10

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391587m N.6480114m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		16.1-16.2	B		11	<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; with cobbles, trace boulders, trace fines.</p> <p>... at 11.40m, wood fragments</p> <p>... at 12.40m, wood fragments</p> <p>... at 15.80m, wood fragments</p> <p>... from 18.20m to 18.50m, trace root matter</p>				
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					
						<p>SW: SAND: subangular to subrounded, fine to coarse grained, pale grey streaked dark grey. (Bassendean Sand)</p> <p>Borehole terminated at 19.5 m</p>				

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH11

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391438m N.6480355m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		2.1-2.2	B		1 2 3 4	<p>SW: SAND: subangular to subrounded, fine to coarse grained, brown; trace gravel of brick and concrete.</p>			0.00m: Grass on the surface	
		8.2-8.3	B		5 6 7 8 9 10	<p>... from 5.00m to 5.80m, becoming dark brown streaked black</p> <p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines.</p> <p>... at 6.90m, wood fragment</p> <p>... at 7.40m, styrofoam fragment</p> <p>... at 7.90m, aluminium can</p> <p>... at 8.50m, wood fragment</p>	D to M			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH11

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 25/08/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391438m N.6480355m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		15.2-15.3	B		11		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines. ... at 10.00m, plastic sheeting ... from 11.00m to 12.00m, trace carpet and wood fragments			
					12					
					13					
					14		FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained, grey and red; gravel, angular to subrounded, fine to coarse grained, of brick and concrete; with cobbles, trace boulders, trace fines.			
					15		FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown black mottled grey brown; trace gravel of brick and concrete; trace cobbles, trace boulders, trace fines. ... at 15.70m, metal fragments			
					16					
					17					
					18					
					19		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)		W	
					20		Borehole terminated at 19.5 m			

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH12

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 24/08/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391203m N.6480239m Hole Diameter: 114mm Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Envirotech

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of concrete.			
					2		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	D to M		
					3					
					4					
					4.5		Borehole terminated at 4.5 m	W		
					5					
					6					
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH14

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391357m N.6480081m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.7-6.8	B		1 2 3 4 5 6 7 8 9 10					

D to
M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH14

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391357m N.6480081m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	•••••	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)	M		
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50

Sheet 1 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					0		FILL: SAND: subangular to subrounded, fine to coarse grained, brown mottled pale brown; trace gravel of concrete.			
					1		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					2					
					3					
					4					
					5					
					6		... at 5.90m, wood fragments			
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		18.2-18.3	B		11 12 13 14 15 16 17 18 19 20		<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.</p>	D to M		

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH15

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50

Sheet 3 of 3

Checked by: MW Position: E.391629m N.6480259m Hole Diameter: 114mm
 Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					22		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					23					
					24		Borehole terminated at 24.0 m			
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 1 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		6.7-6.8	B		1		FILL: SAND: subangular to subrounded, fine to coarse grained, pale brown mottled pale brown; trace gravel of limestone and concrete.			
					2		FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					3					
					4		... from 3.80m to 4.00m, with glass fragments			
					5				D to M	
					6		... from 5.50m to 5.80m, chipboard			
					7					
					8					
					9		... at 9.10m, wood fragment			
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 2 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	... from 10.90m to 11.10m, with glass fragments	FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark brown mottled black; gravel, angular, medium to coarse grained, of concrete, brick, bitumen, tile, glass, metal and plastic; trace fines, trace cobbles.			
					12					
					13					
					14					
					15					
					16					
					17					
					18	... from 17.70m to 17.90m, wood fragments	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
					19			M to W		
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH16

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 05/09/2017



1:50 Sheet 3 of 3

Logged by: DJP Position: E.391535m N.6480376m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)			
							Borehole terminated at 21.0 m			
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH17

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391245m N.6480192m Plant used: Commachio C205
 Checked by: MW Elevation: Angle from horizontal: 90°

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11		SAND: subangular to subrounded, fine to coarse grained sand, brown, trace fine to medium grained gravel, of iron cemented sand. (Bassendean Sand)			
					11		... from 11.00m to 12.00m, becoming white			
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH18

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391493m N.6480063m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1		SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled yellow brown; trace gravel, trace fines.	D to M		
				2						
				3	FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark grey brown streaked red; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.		W			
				4						
				5						
				6						
				7						
				8						
				9						
				10						

Termination Reason: Equipment refusal

Remarks:

BOREHOLE LOG - SH18

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391493m N.6480063m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		17.3-17.4	B		11 12 13 14 15 16 17 18 19 20	<p>FILL: Gravely SAND: angular to subangular, fine to coarse grained, dark grey brown streaked red; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.</p> <p>... at 11.40m, wood fragments</p> <p>FILL: SAND: fine to medium grained sand, pale brown, with silt.</p> <p>Borehole terminated at 18.5 m</p>	M		18.00m: increase in ground vibrations / hard drilling	

Termination Reason: Equipment refusal

Remarks:

BOREHOLE LOG - SH19

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391307m N.6480247m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		3.8-4.3	B		1 2 3 4 5 6 7 8 9 10		<p>FILL: Gravelly SAND: angular to subangular, fine to coarse grained, dark grey brown mottled black; gravel, angular, medium to coarse grained, of brick, concrete and plastic; trace fines, trace cobbles.</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained, brown mottled dark grey brown; trace gravel, with fines. ... from 3.80m to 4.30m, blue grey, trace clay</p> <p>SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)</p>	M		
Borehole terminated at 9.0 m										

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH20

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391127m N.6480292m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					1 2 3 4 5 6 7 8 9 10	<p>FILL: SAND: subangular to subrounded, fine to coarse grained, dark brown mottled black; with gravel of brick and concrete; trace cobbles, trace fines.</p> <p>... at 4.10m, carpet</p> <p>... at 6.10m, plastic sheet</p>				

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH20

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 06/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391127m N.6480292m Hole Diameter: 114mm Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	SW: SAND: subangular to subrounded, fine to coarse grained, white streaked pale grey. (Bassendean Sand)		W		
					12		Borehole terminated at 12.0 m			
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH21

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 1

Logged by: DJP Position: E.391149m N.6480150m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		4.6-4.7	B		1 2 3 4 5 6 7 8 9 10		<p>FILL: SAND: subangular to subrounded, fine to coarse grained sand, grey brown mottled brown, trace fine to medium grained gravel, trace fines.</p> <p>... from 4.60m to 4.90m, pale brown, silty sand lens</p> <p>SAND: subangular to subrounded, fine to coarse grained sand, brown, trace fine to medium grained gravel, of iron cemented sand. (Bassendean Sand)</p>	D to M		
Borehole terminated at 9.0 m										

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH22

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 2

Logged by: DJP Position: E.391243m N.6480592m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
		3.5-3.6	B		1	<p>FILL: SAND: angular to subangular, fine to coarse grained sand, angular, medium to coarse grained gravel, dark brown mottled black, with fine to coarse grained gravel, with cobbles, of concrete, brick, bitumen, tile, and plastic; trace boulders, of concrete. ... at 0.60m, plastic liner</p> <p>... at 3.40m, wood fragments</p> <p>... at 4.50m, plastic strapping</p> <p>... at 6.40m, steel wire</p>				
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					

D to M

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH22

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 2 of 2

Logged by: DJP Position: E.391243m N.6480592m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					11	[Cross-hatched pattern]	FILL: SAND: angular to subangular, fine to coarse grained sand, angular, medium to coarse grained gravel, dark brown mottled black, with fine to coarse grained gravel, with cobbles, of concrete, brick, bitumen, tile, and plastic; trace boulders, of concrete. ... at 10.50m, wood fragment			
					12	[Dotted pattern]	SAND: subangular to subrounded, fine to coarse grained sand, white. (Bassendean Sand)			
					13					
					14				M to W	
					15		Borehole terminated at 15.0 m			
					16					
					17					
					18					
					19					
					20					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH23

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 1 of 3

Logged by: DJP Position: E.391540m N.6480151m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					0		FILL: SAND: subangular to subrounded, fine to coarse grained sand, brown mottled yellow brown, trace fine to coarse grained gravel, trace cobbles, of brick and concrete.			
					1		FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained sand, dark brown black mottled grey brown, trace fine to coarse grained gravel, with cobbles, trace boulders, of brick, glass and concrete; trace fines.			
					2					
					3					
					4					
					5					
					6					
					7					
					8					
					9					
					10					

Termination Reason: Target depth reached

Remarks:

BOREHOLE LOG - SH23

Client: Handle Property Group
 Project: Landfill Redevelopment Driver Rd
 Location: Driver Rd, Darch
 Project ID: PER2017-0193
 Date: 08/09/2017



1:50 Sheet 3 of 3

Logged by: DJP Position: E.391540m N.6480151m Plant used: Fraste Multidrill
 Checked by: MW Elevation: Angle from horizontal: 90° Contractor: Ecoprobe

Well	Groundwater	Samples & Insitu Tests		RL (m)	Depth (m)	Graphic Log	Material Description Soil Type, Plasticity or Particle Characteristics, Colour, Secondary and Minor Components	Moisture Condition	Consistency/ Relative Density	Structure & other observations
		Depth	Type & Results							
					21		FILL: Gravelly SAND: subangular to subrounded, fine to coarse grained sand, dark brown black mottled grey brown, trace fine to coarse grained gravel, with cobbles, trace boulders, of brick, glass and concrete; trace fines.			
					22		SAND: subangular to subrounded, fine to coarse grained sand, white. (Bassendean Sand)			
					23			M to W		
					24		Borehole terminated at 24.0 m			
					25					
					26					
					27					
					28					
					29					
					30					

Termination Reason: Target depth reached

Remarks:

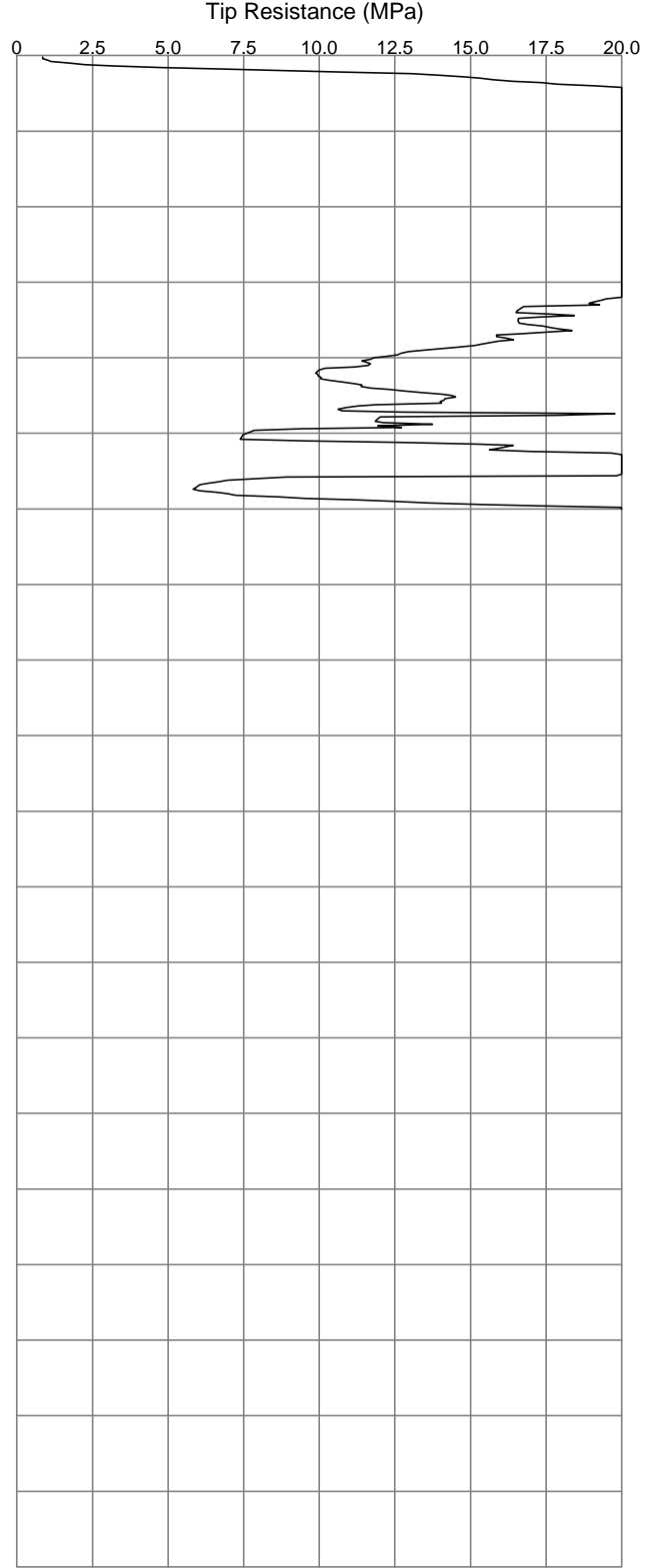
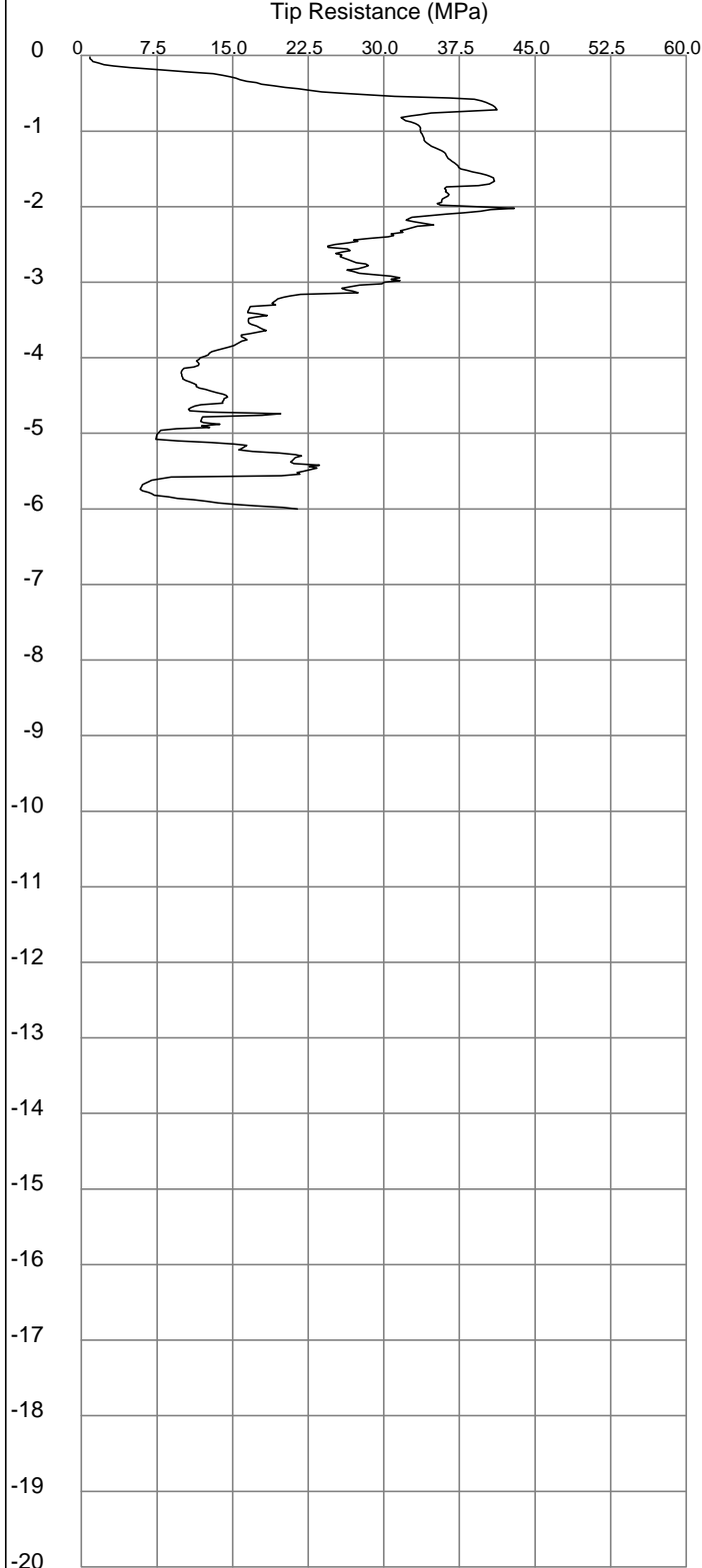


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Hole open to depth (m) -	Total depth (m) 6.00	Operator Brad	Sounding No. CPT 01
R/L = 45.54m AHD		Groundwater Level (m) -	Cone No. 100709M	File 1	Date Completed 28-8-2017
Co ordinate: X= 391142.38 Y= 6480211.86		Pre Drilled depth (m)	Probe Rig PR001		
Co-ordinates in MGA94 Z50					



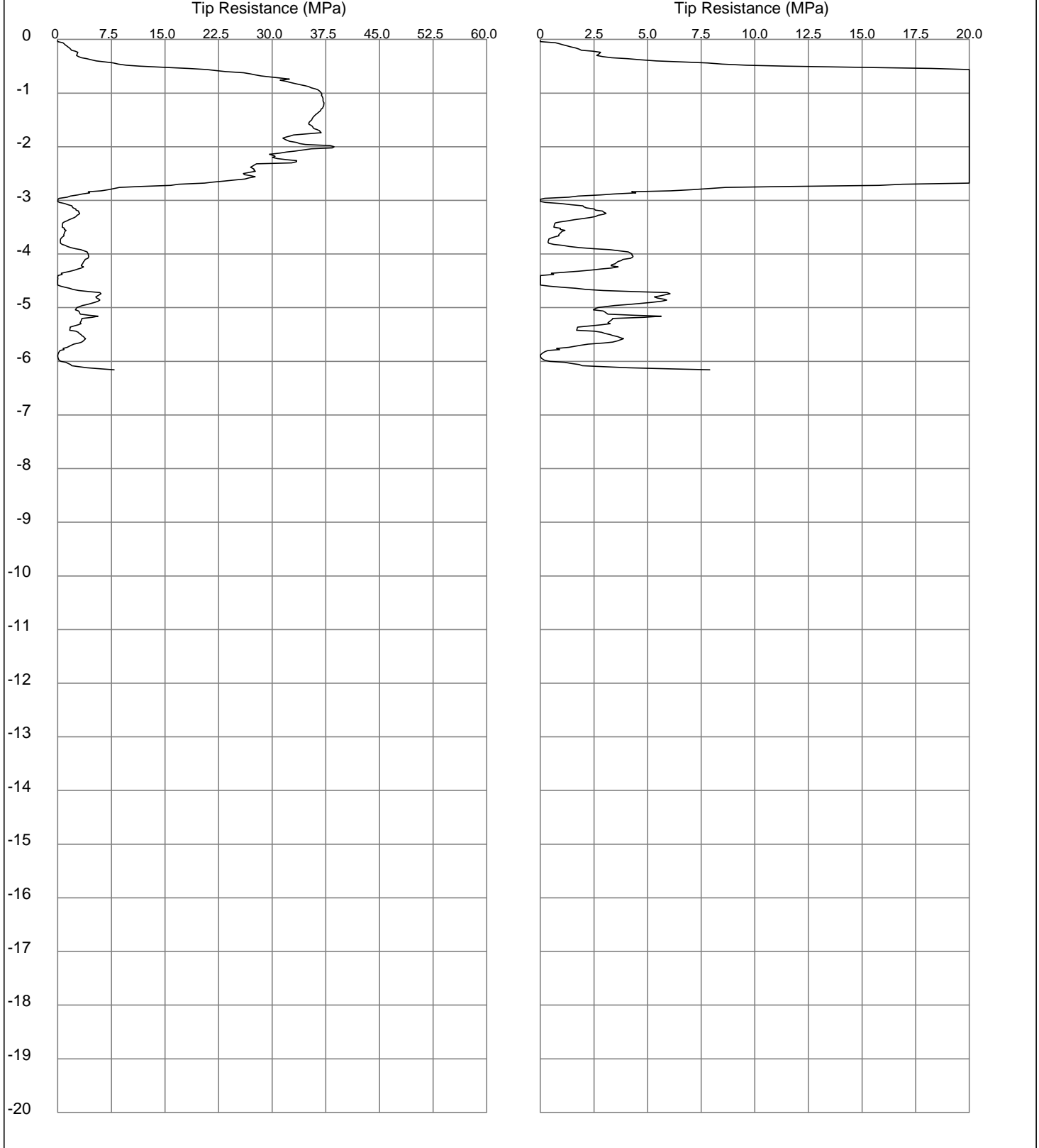


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 02	
R/L = 58.56m AHD	Hole open to depth (m) -	Total depth (m) 6.16	Operator Brad
Co ordinate: X= 391549.35 Y= 6480187.70	Groundwater Level (m) -	Cone No. 100709M	File 2
Co-ordinates in MGA94 Z50	Pre Drilled depth (m) -	Probe Rig PR001	Date Completed 28-8-2017



Telephone: (08) 9456 0595

TESTED IN ACCORDANCE WITH AS 1289.6.5.1999

FRICITION REDUCER USED -42 MM

PR001 - 20 TONNE REACTION FRAME PR002 - 16 TONNE REACTION FRAME

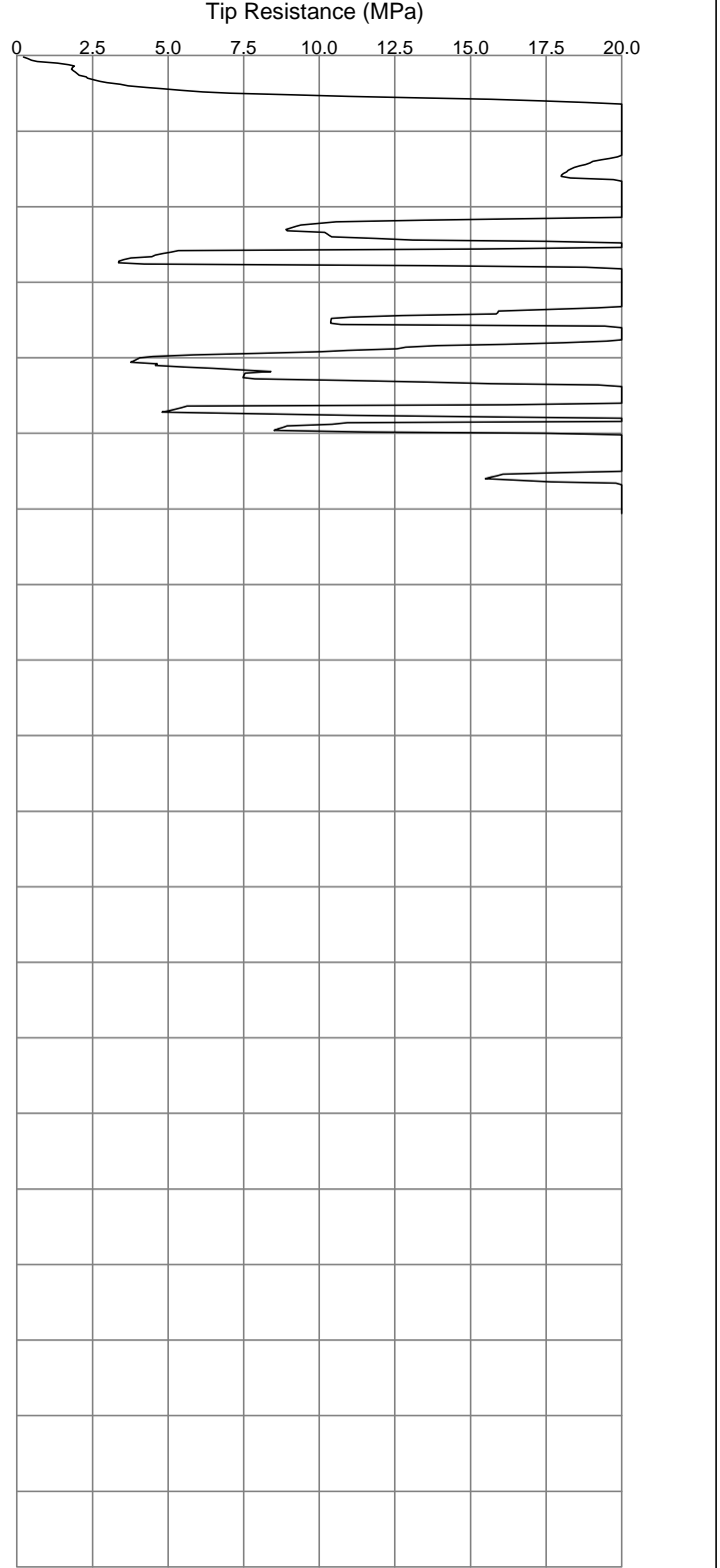
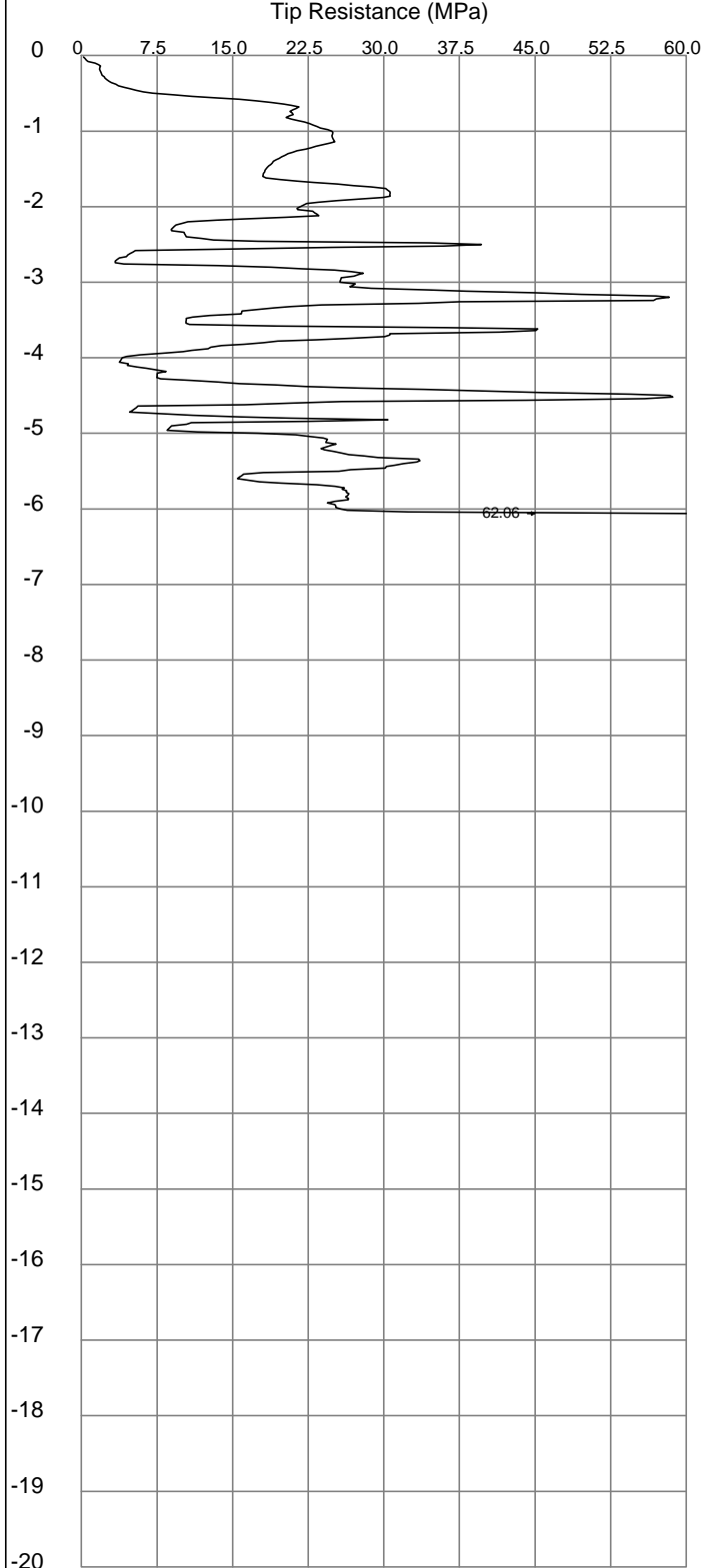


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 02A	
R/L = 58.45m AHD	Hole open to depth (m) -	Total depth (m) 6.06	Operator Brad
Co ordinate: X= 391549.70 Y= 6480187.48	Groundwater Level (m) -	Cone No. 100709M	File 3
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



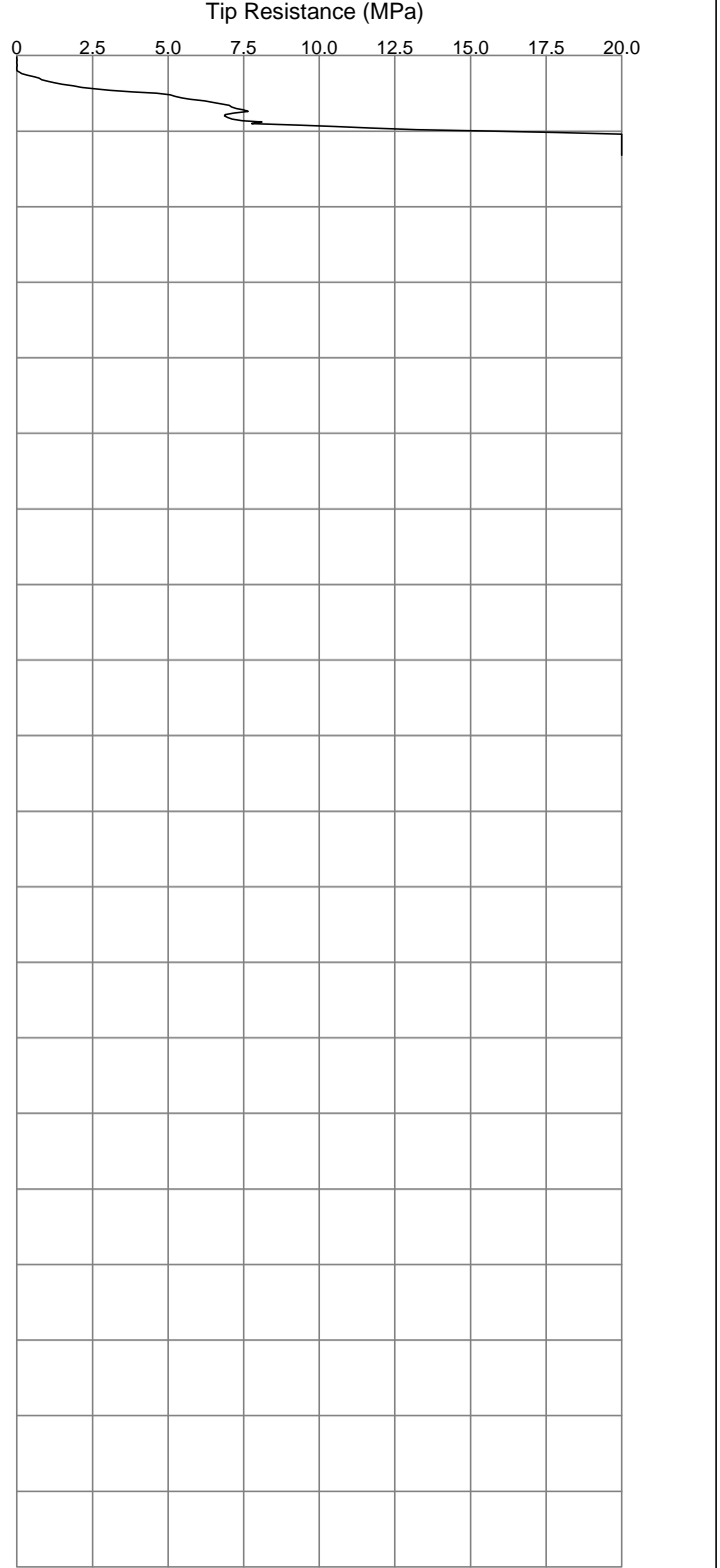
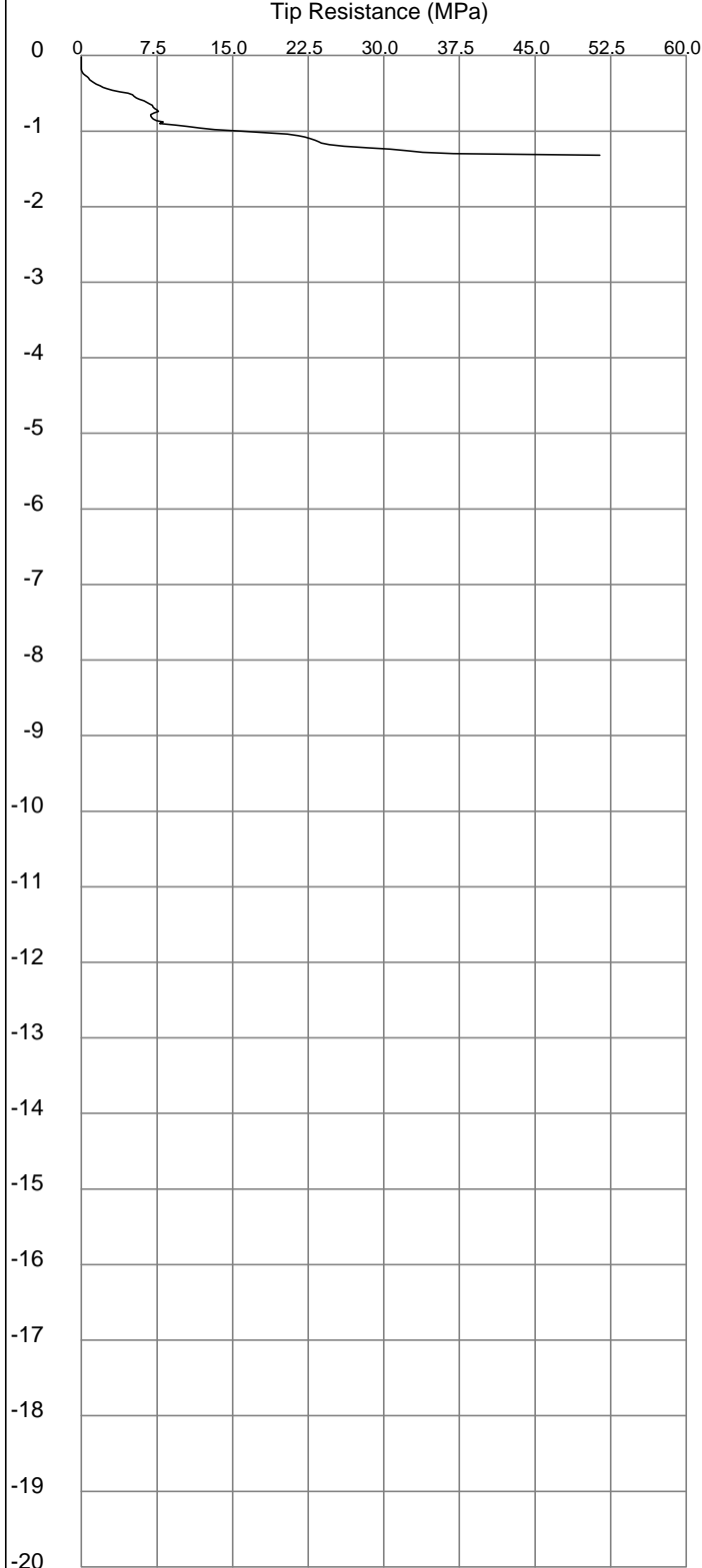


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 03	
R/L = 57.56m AHD	Hole open to depth (m) -	Total depth (m) 1.32	Operator Brad
Co ordinate: X= 391567.17 Y= 6480253.55	Groundwater Level (m) -	Cone No. 100709M	File 4
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



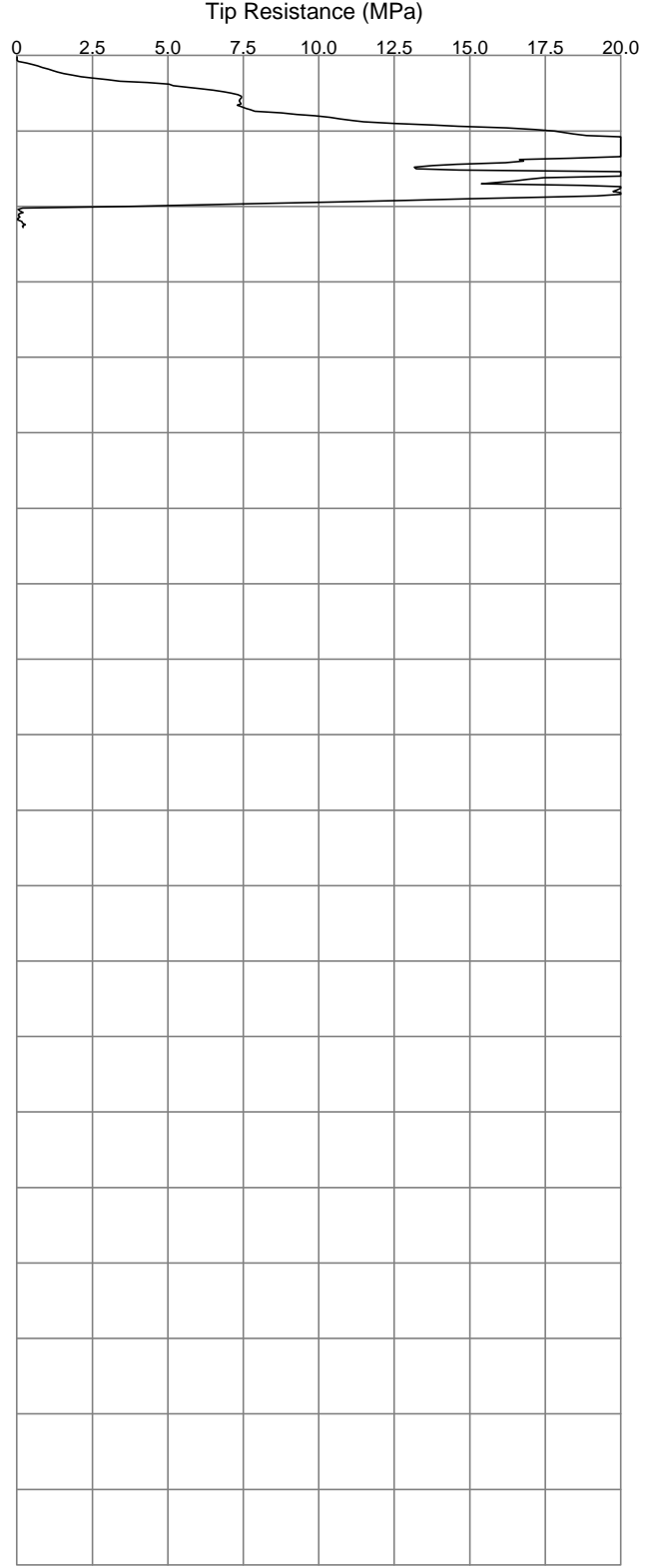
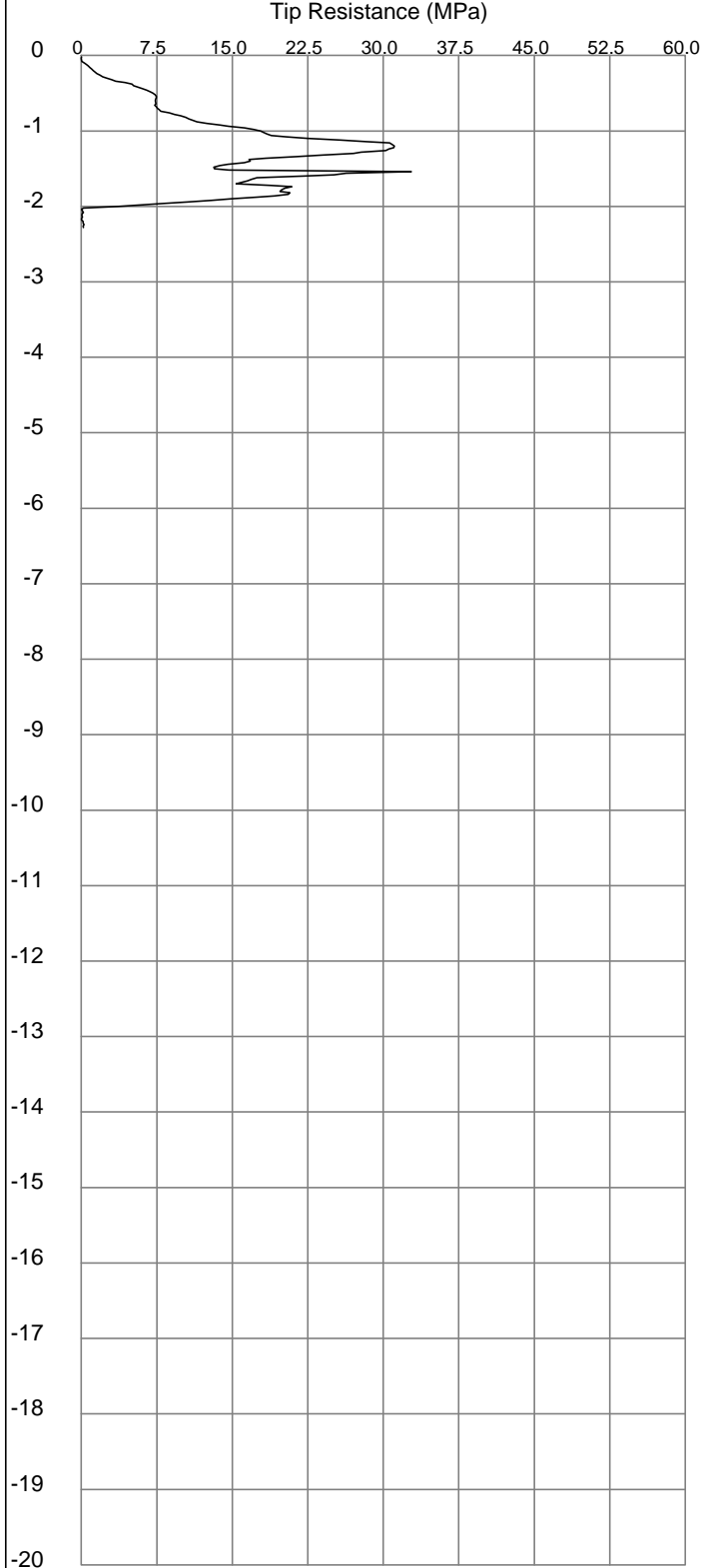


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 03A	
R/L = 57.46m AHD	Hole open to depth (m) -	Total depth (m) 2.28	Operator Brad
Co ordinate: X= 391568.09 Y= 6480256.79	Groundwater Level (m) -	Cone No. 100709M	File 5
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



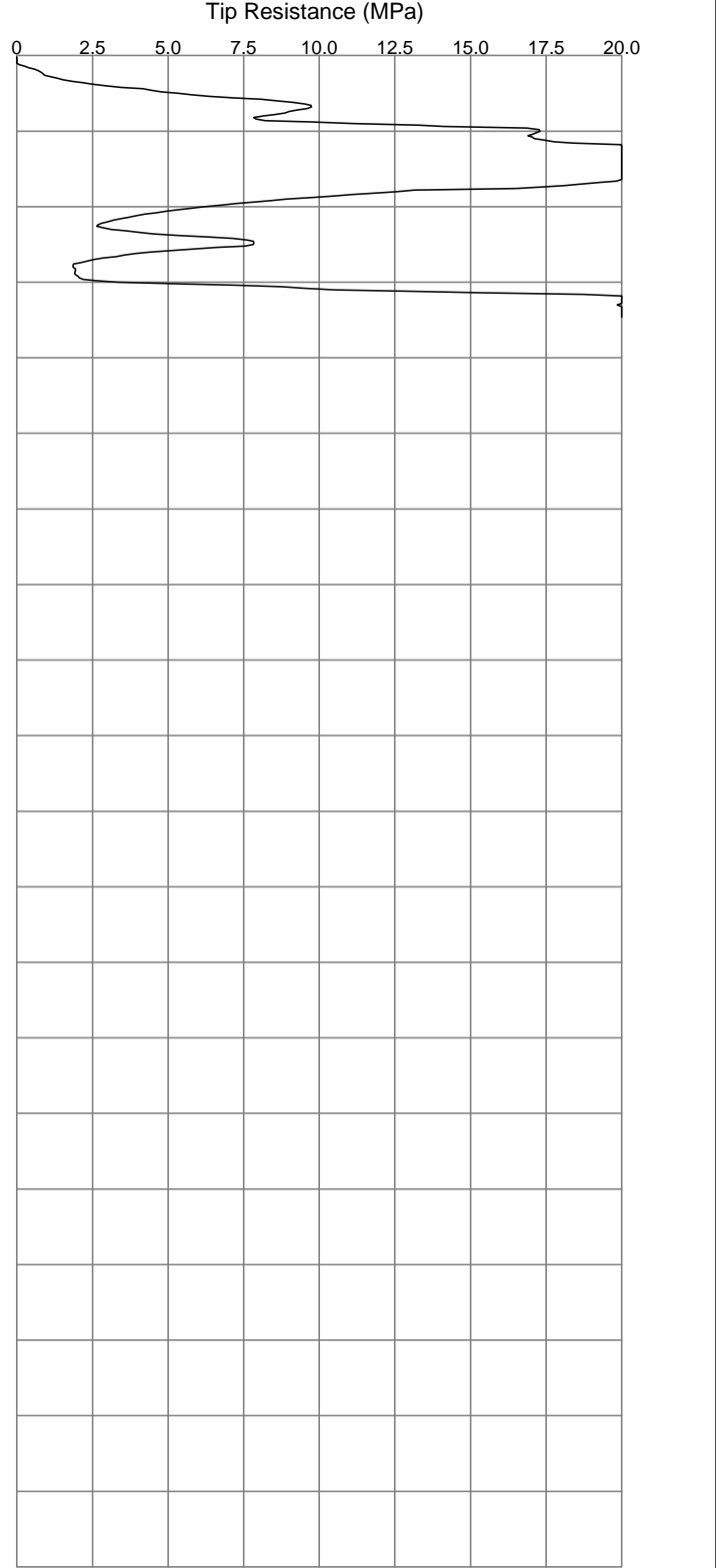
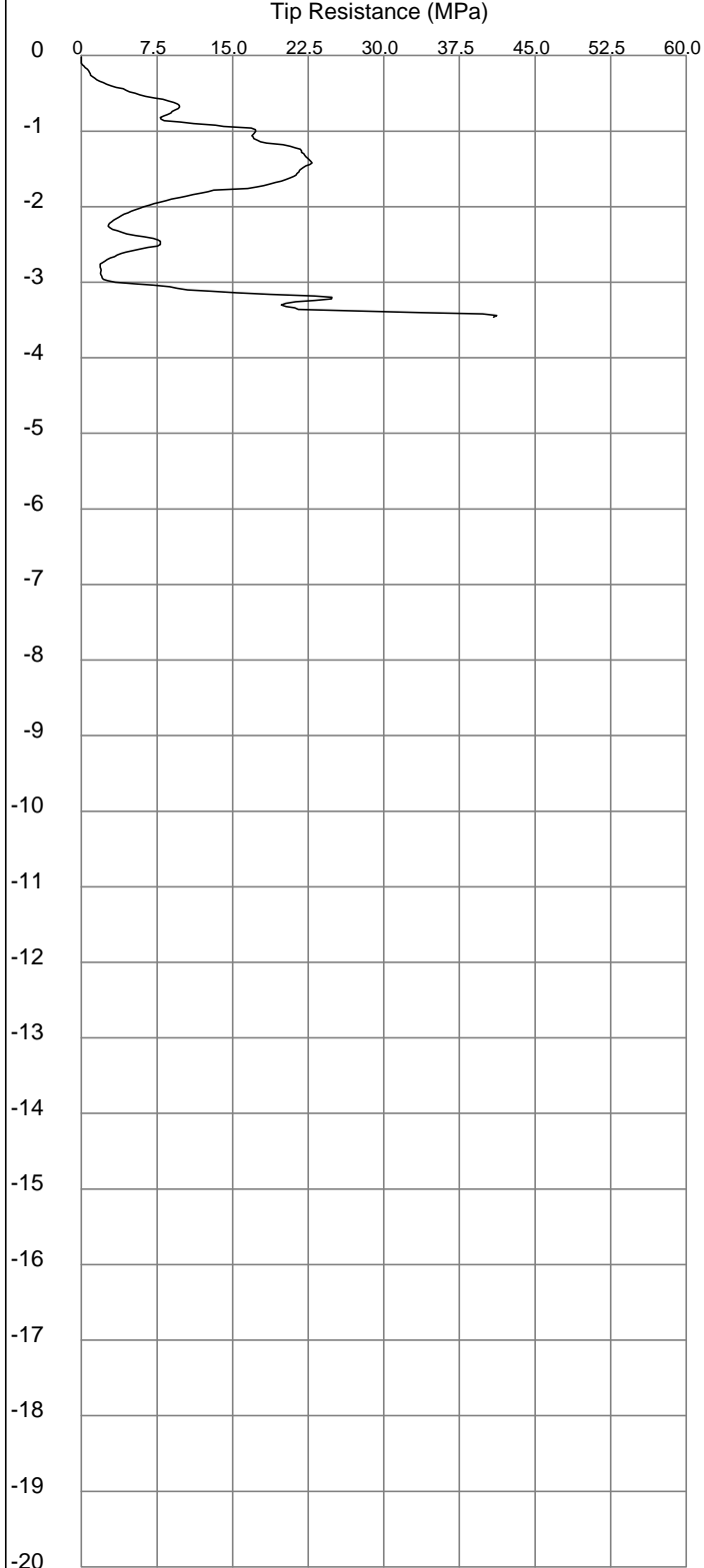


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 04	
R/L = 55.11m AHD	Hole open to depth (m) -	Total depth (m) 3.46	Operator Brad
Co ordinate: X= 391656.71 Y= 6480423.06	Groundwater Level (m) -	Cone No. 100709M	File 6
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



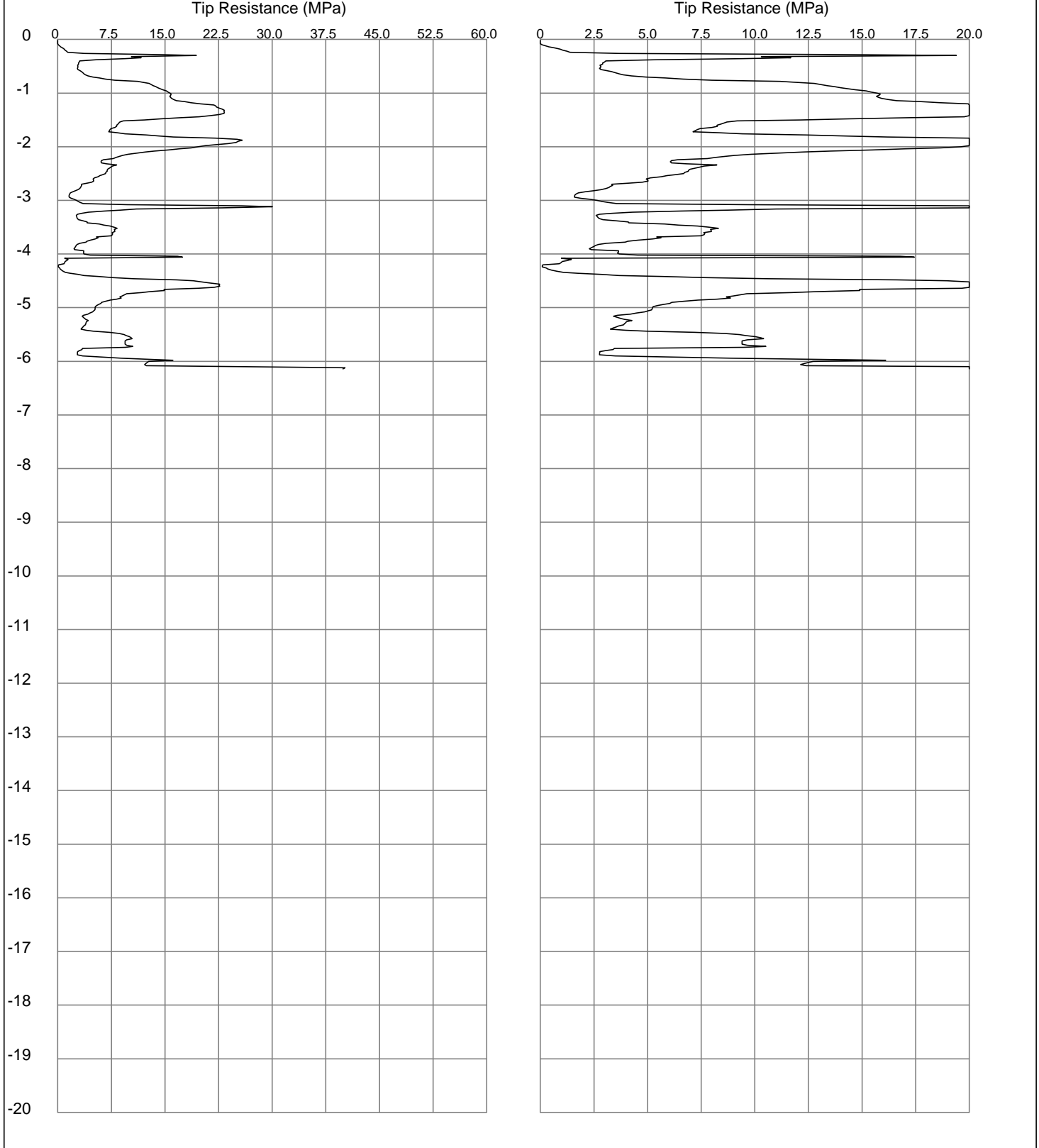


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 05	
R/L = 53.88m AHD	Hole open to depth (m) -	Total depth (m) 6.14	Operator Brad
Co ordinate: X= 391670.88 Y= 6480535.93	Groundwater Level (m) -	Cone No. 100709M	File 7
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



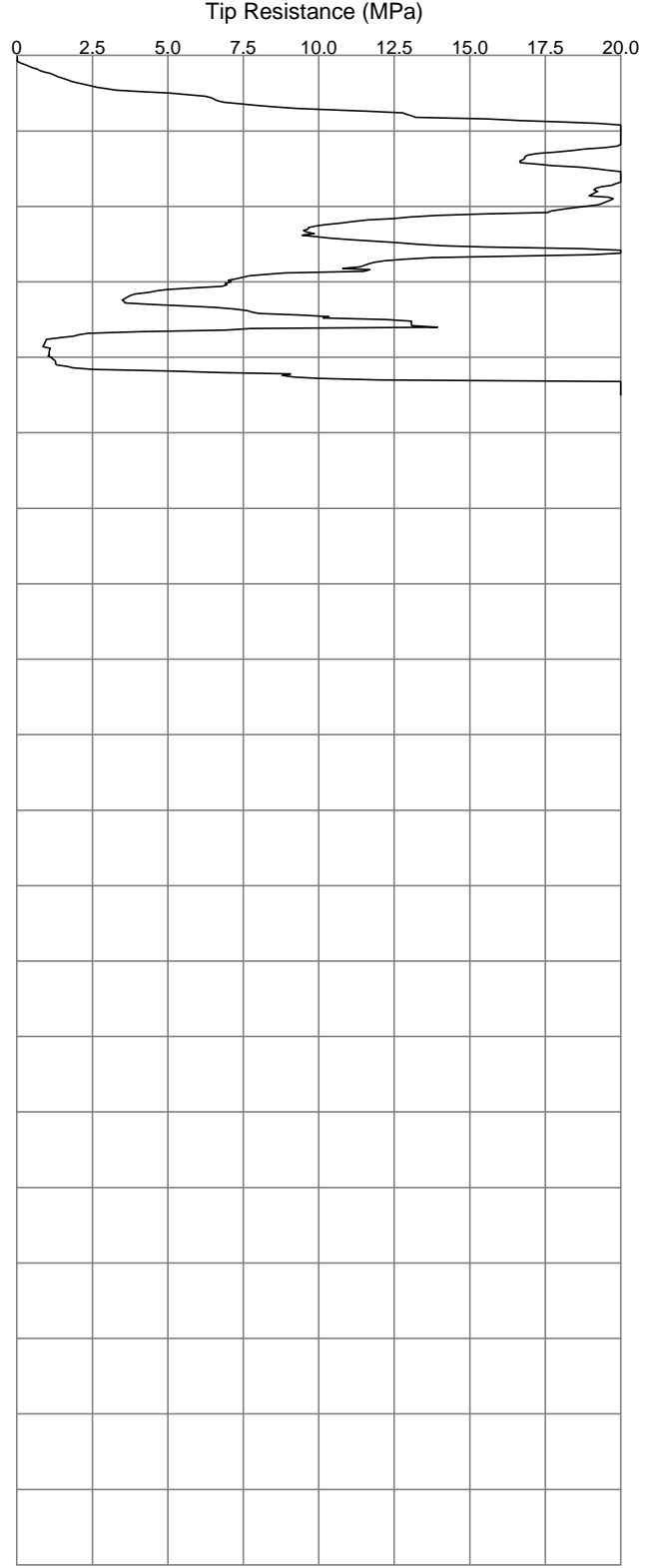
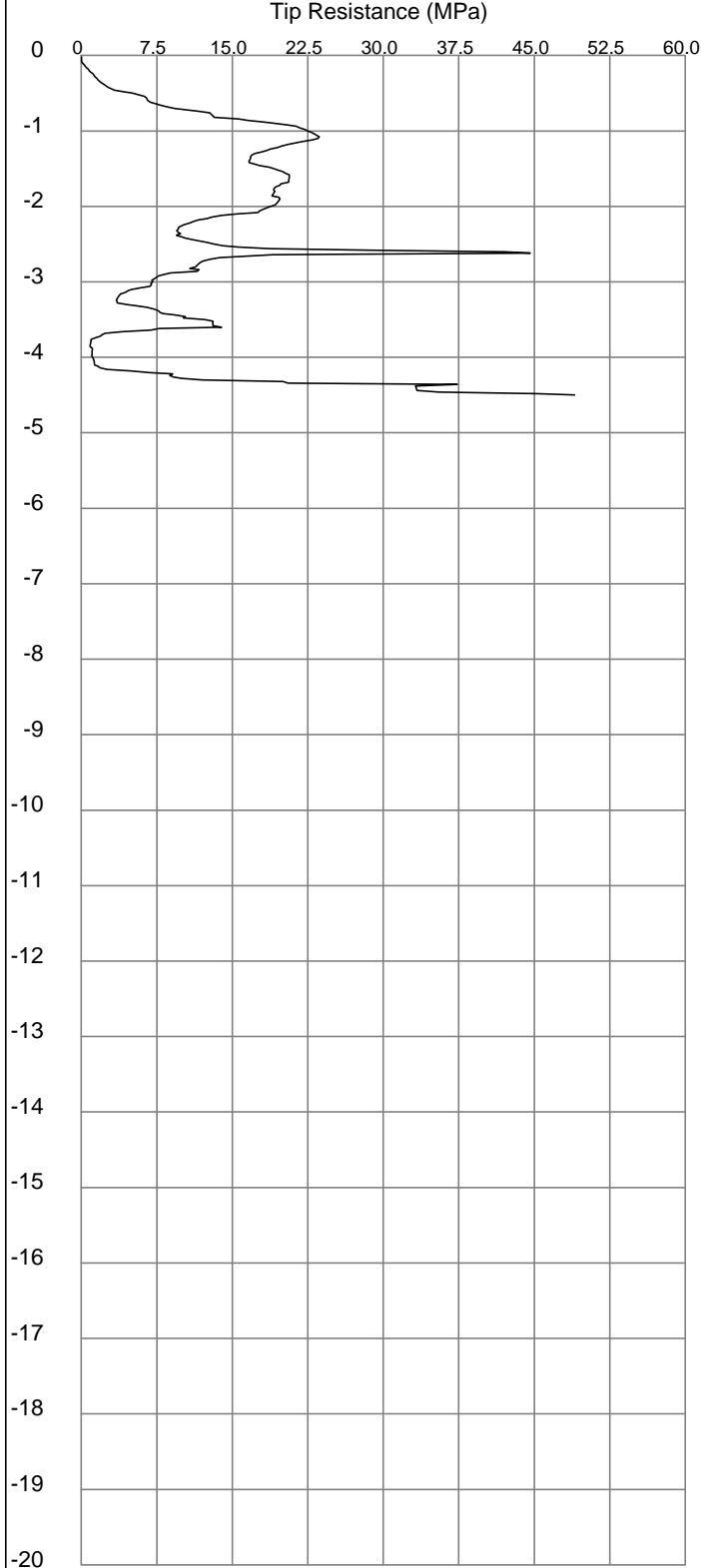


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 06	
R/L = 51.89m AHD	Hole open to depth (m) -	Total depth (m) 4.50	Operator Brad
Co ordinate: X= 391554.02 Y= 6480533.14	Groundwater Level (m) -	Cone No. 100709M	File 8
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



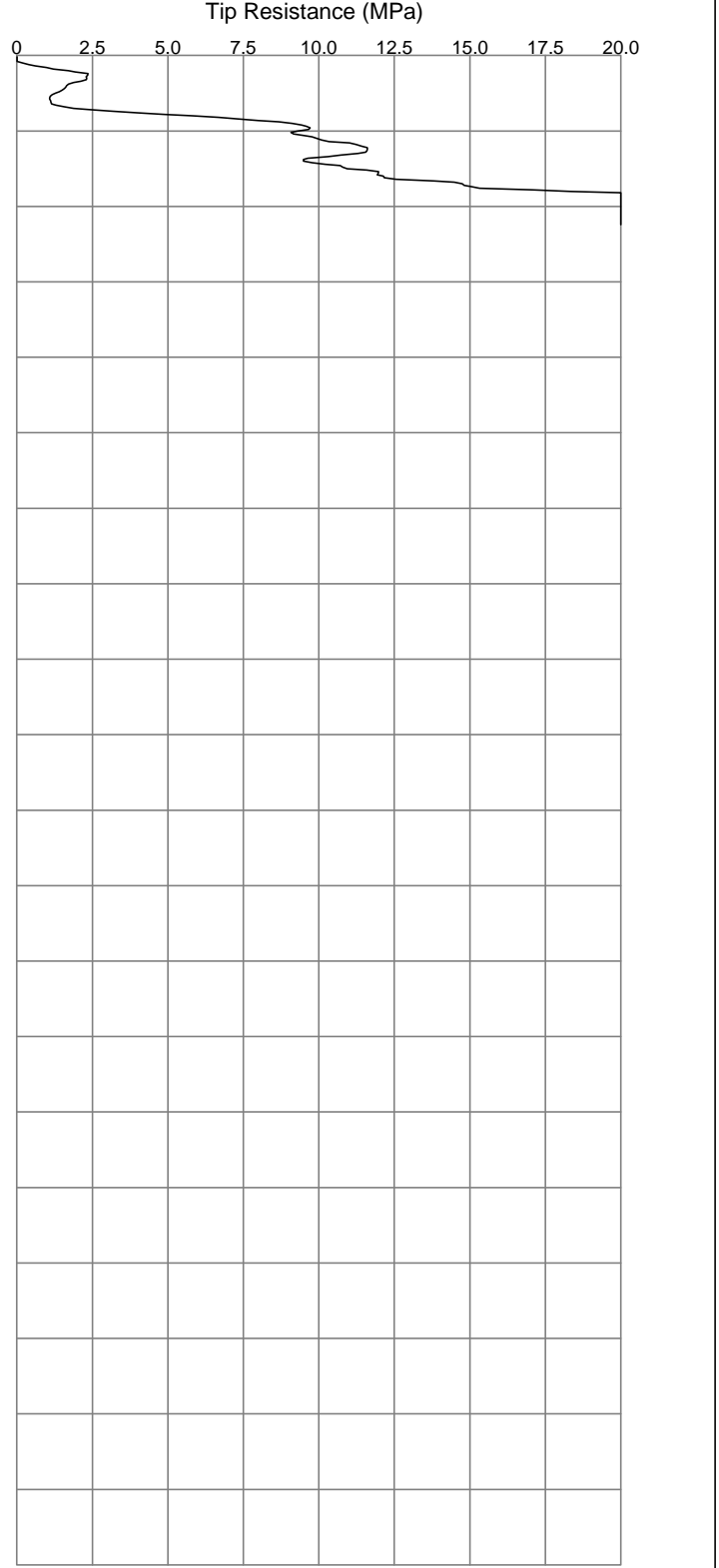
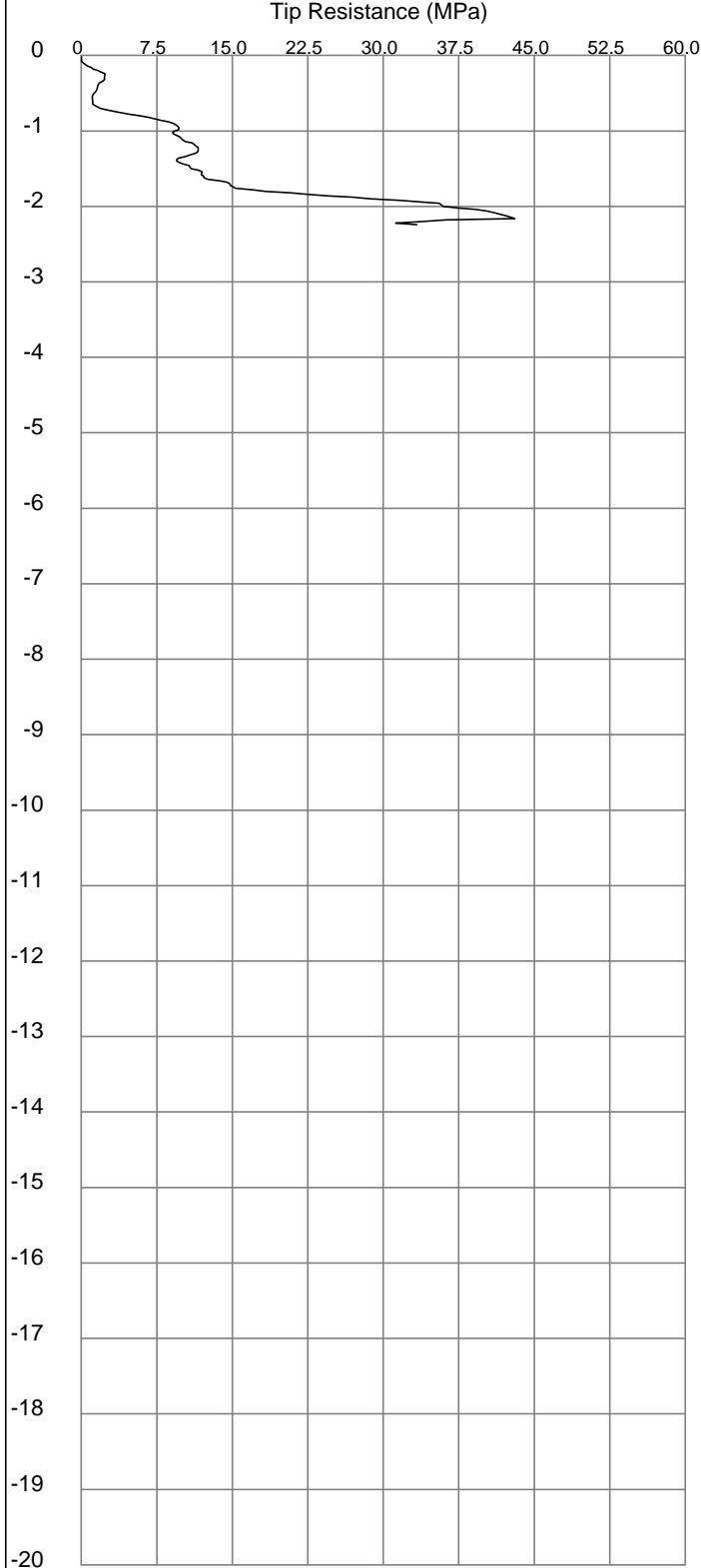


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Damage to cone	Sounding No. CPT 07	
R/L = 52.96m AHD	Hole open to depth (m) -	Total depth (m) 2.24	Operator Brad
Co ordinate: X= 391484.92 Y= 6480434.75	Groundwater Level (m) -	Cone No. 100709M	File 9
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 28-8-2017



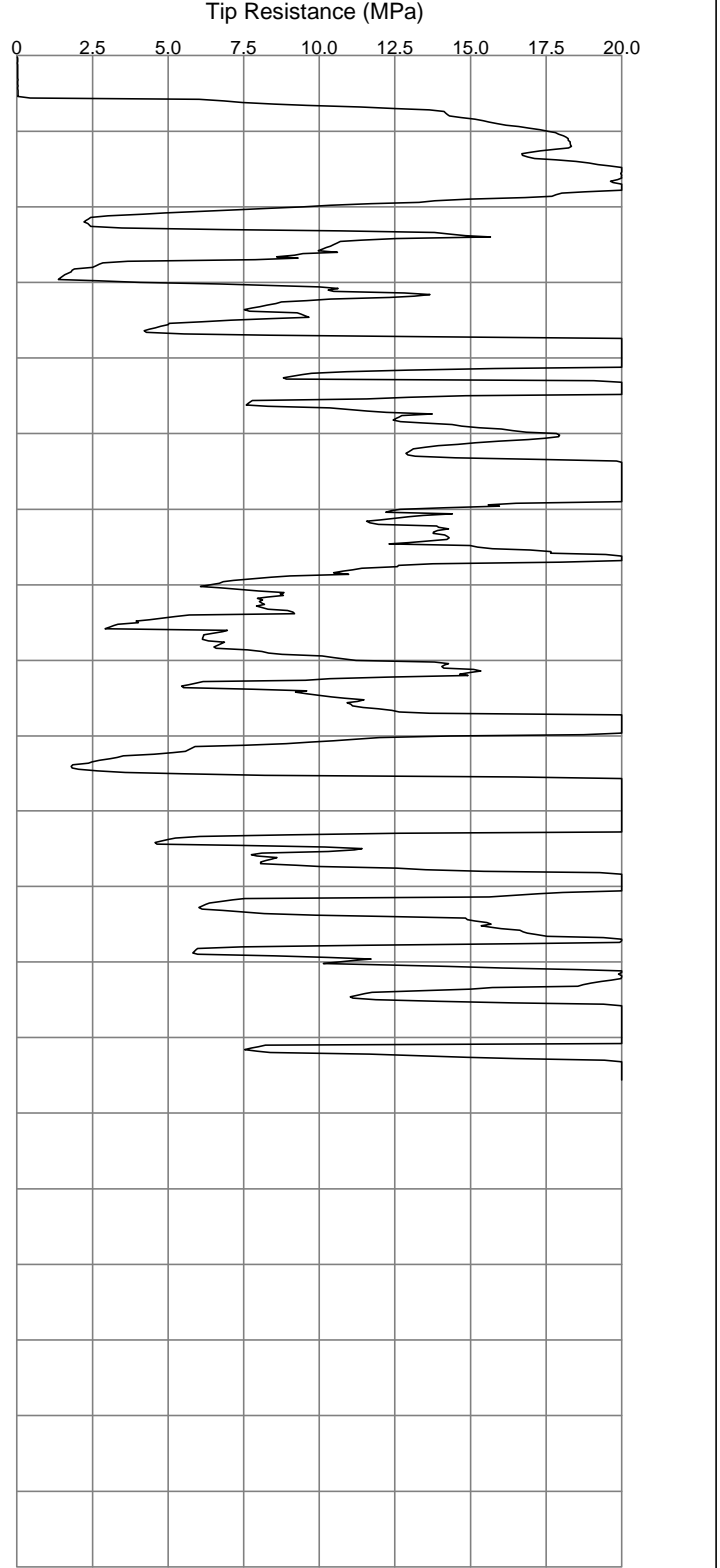
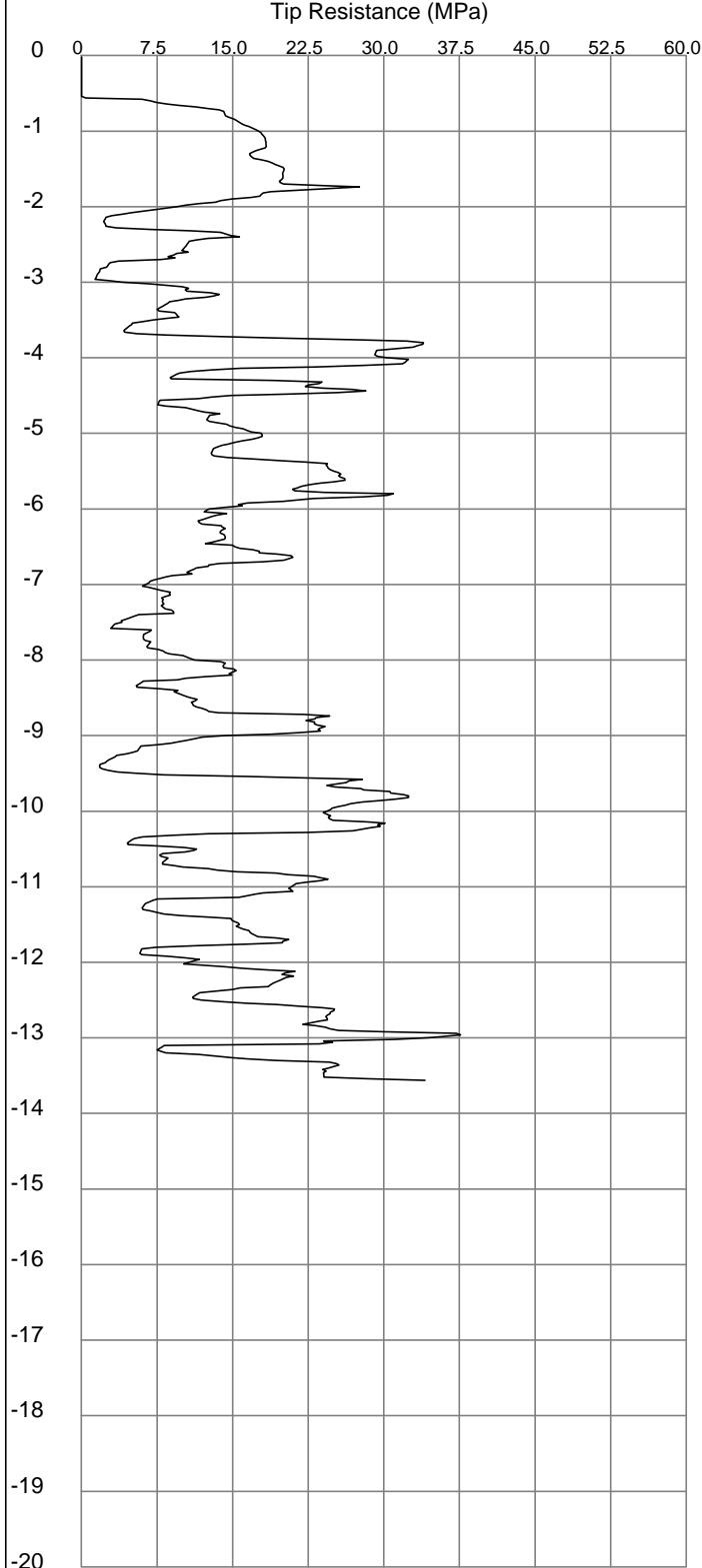


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Sounding No. CPT 08	
R/L = 58.43m AHD	Hole open to depth (m) 6.50	Total depth (m) 13.56	Operator Brad
Co ordinate: X= 391554.96 Y= 6480071.87	Groundwater Level (m) -	Cone No. 100709M	File 10
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



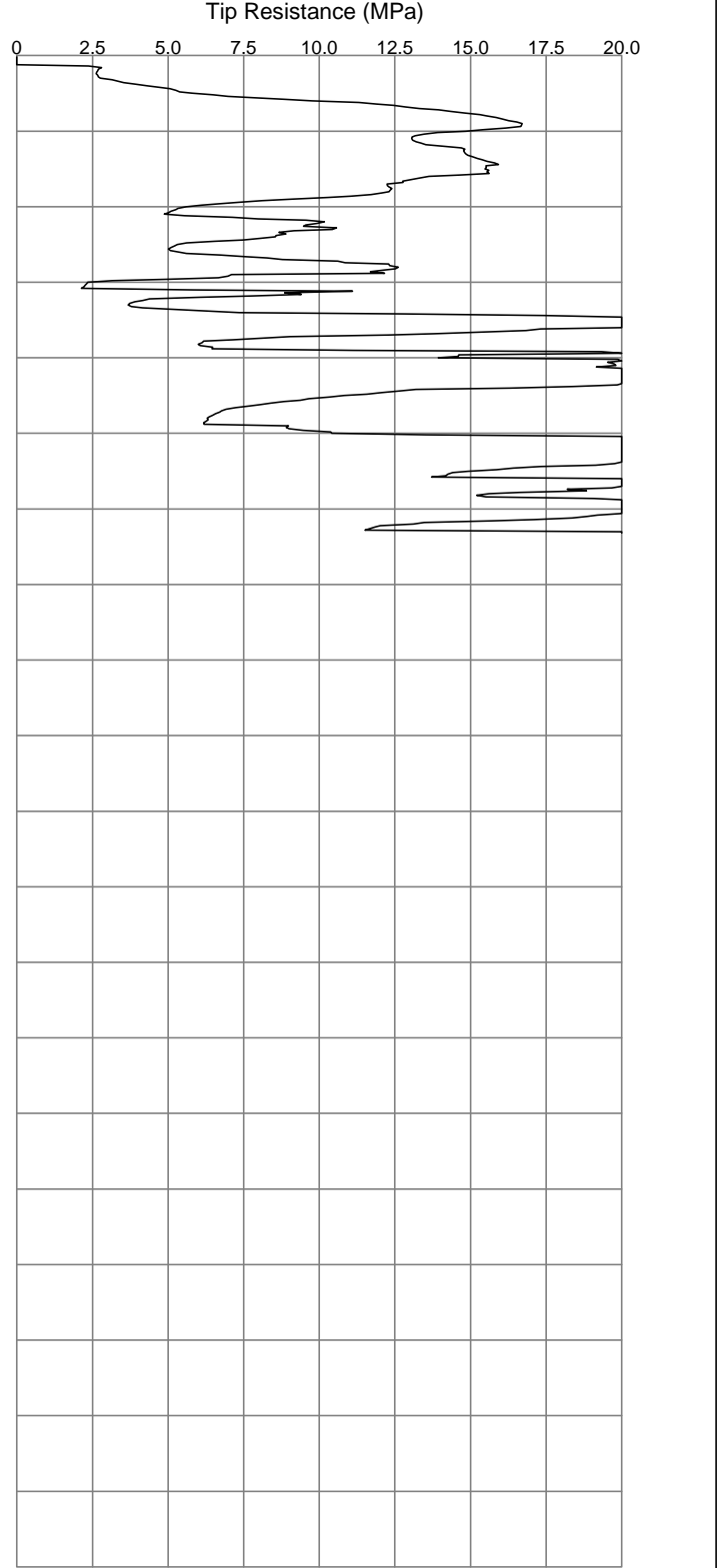
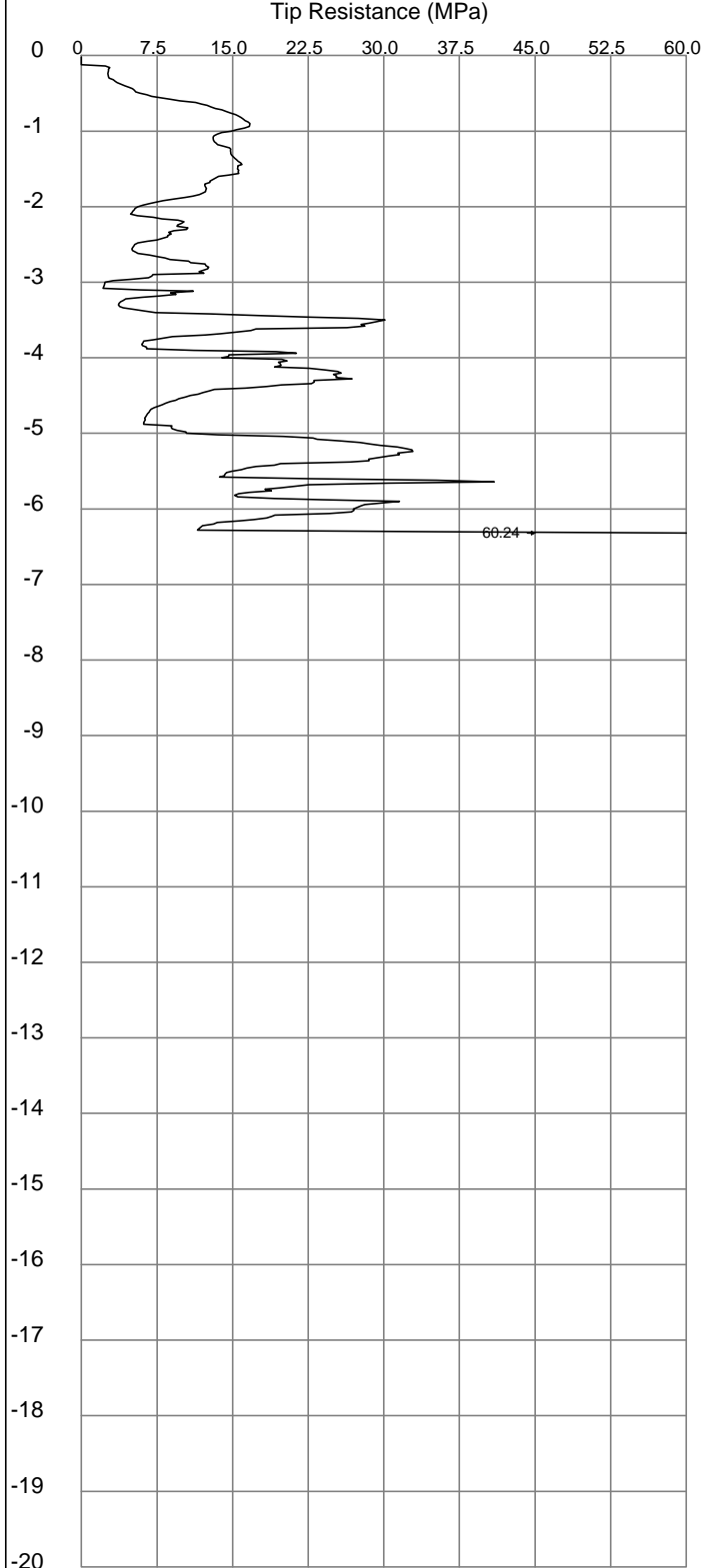


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 09	
R/L = 50.92m AHD	Hole open to depth (m) -	Total depth (m) 6.32	Operator Brad
Co ordinate: X= 391396.69 Y= 6480147.23	Groundwater Level (m) -	Cone No. 100709M	File 11
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



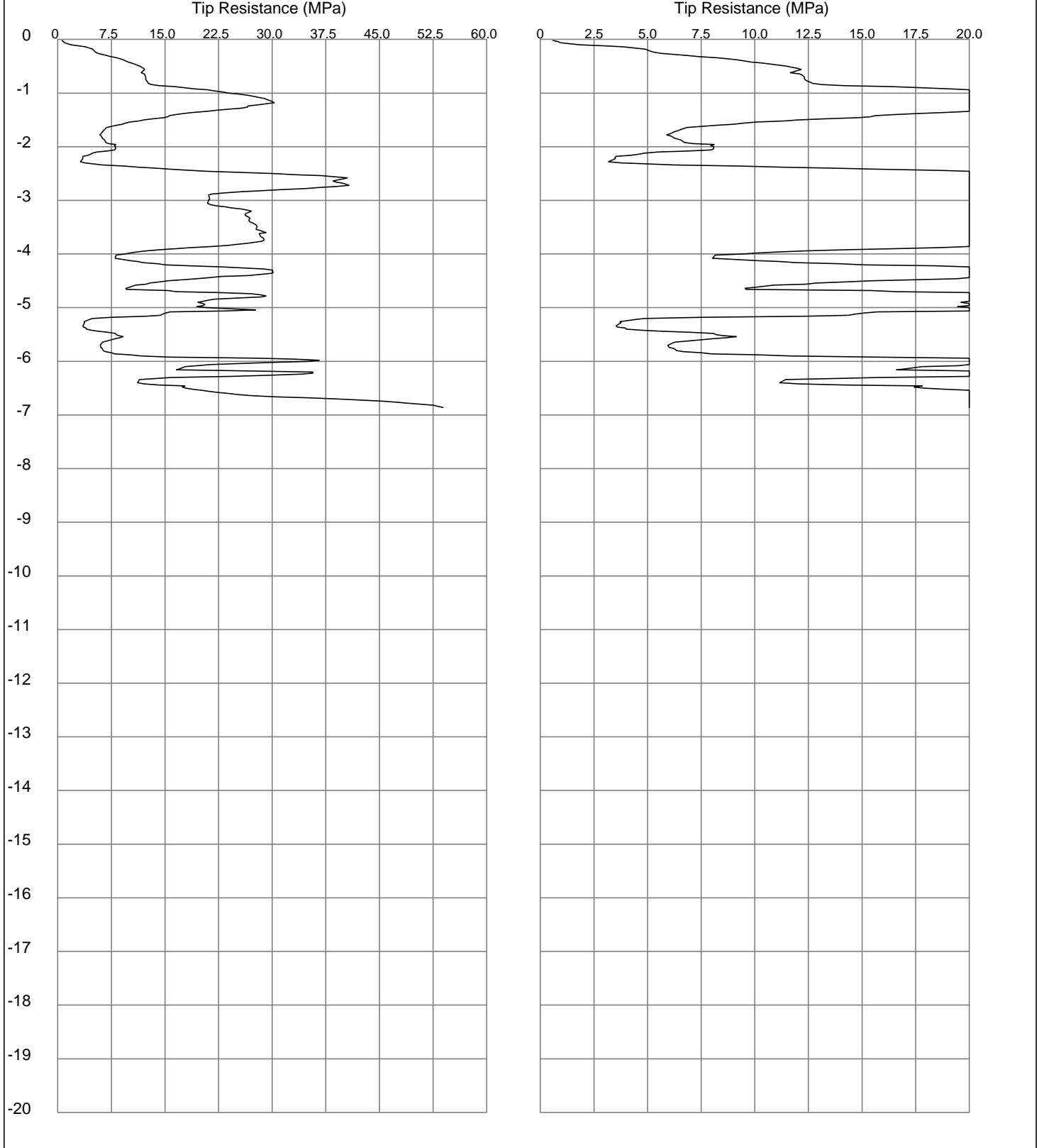


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Hole open to depth (m) -	Total depth (m) 6.86	Operator Brad	Sounding No. CPT 10
R/L = 44.38m AHD		Groundwater Level (m) -	Cone No. 100709M		File 12
Co ordinate: X= 391284.99 Y= 6480100.95		Pre Drilled depth (m) -	Probe Rig PR001		Date Completed 13-9-2017
Co-ordinates in MGA94 Z50					



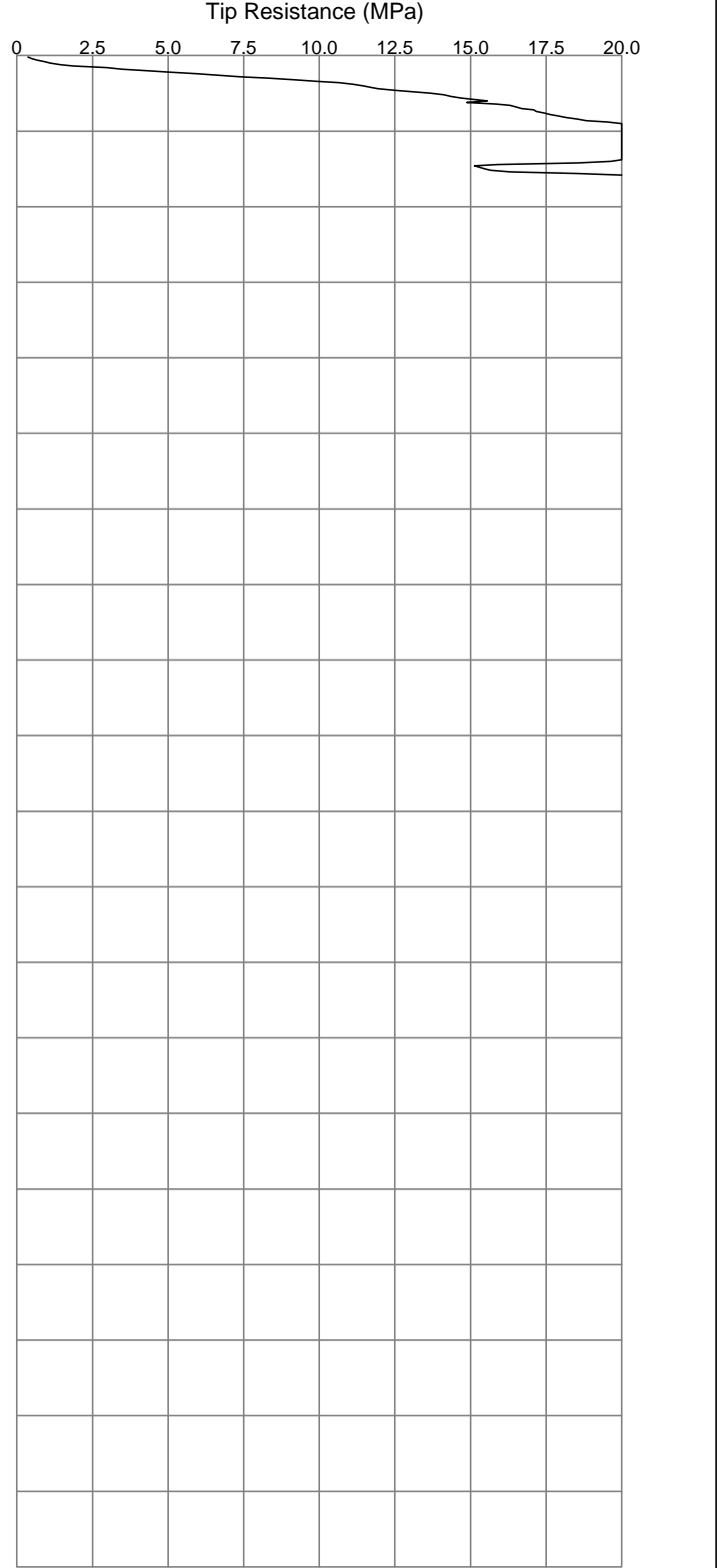
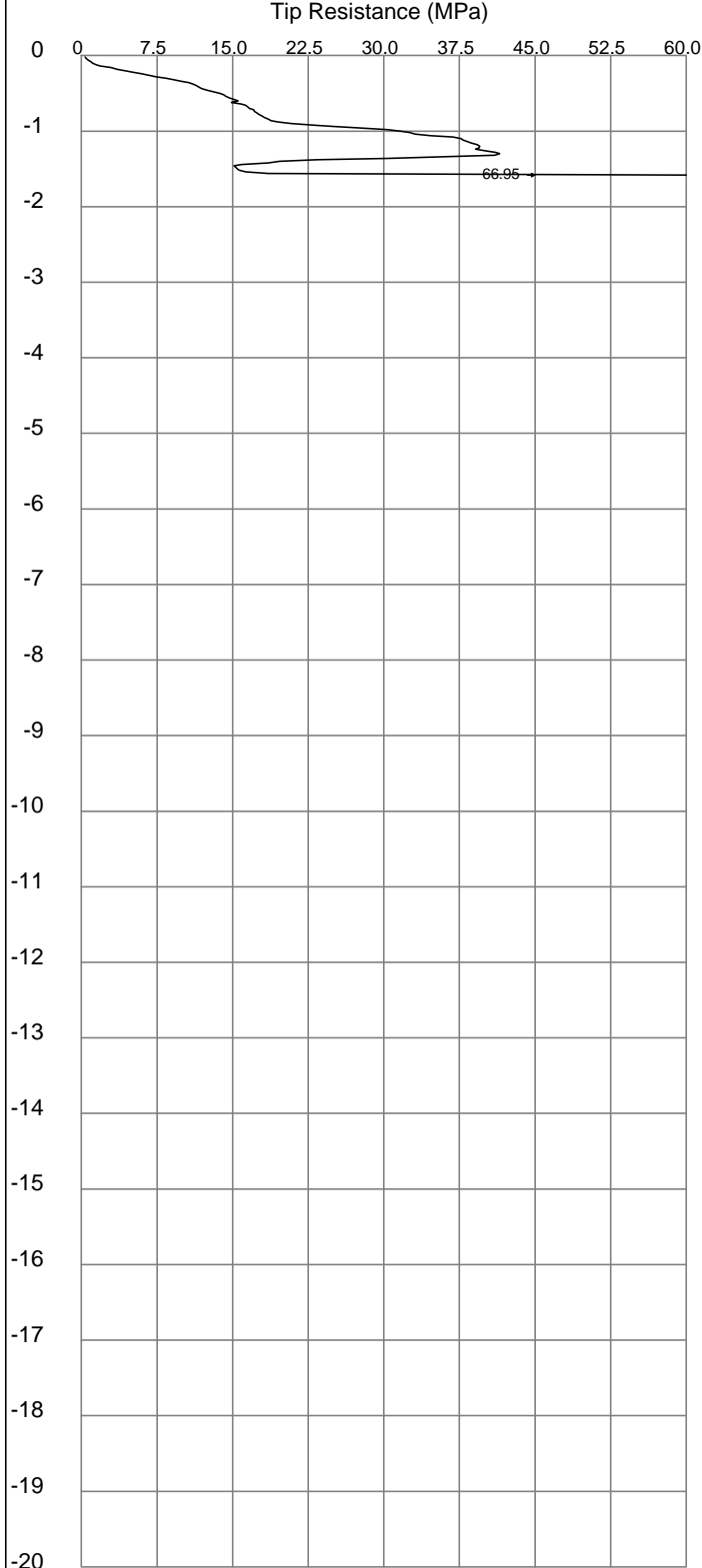


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 11	
R/L = 42.46m AHD	Hole open to depth (m) -	Total depth (m) 1.58	Operator Brad
Co ordinate: X= 391152.37 Y= 6480101.53	Groundwater Level (m) -	Cone No. 100709M	File 13
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



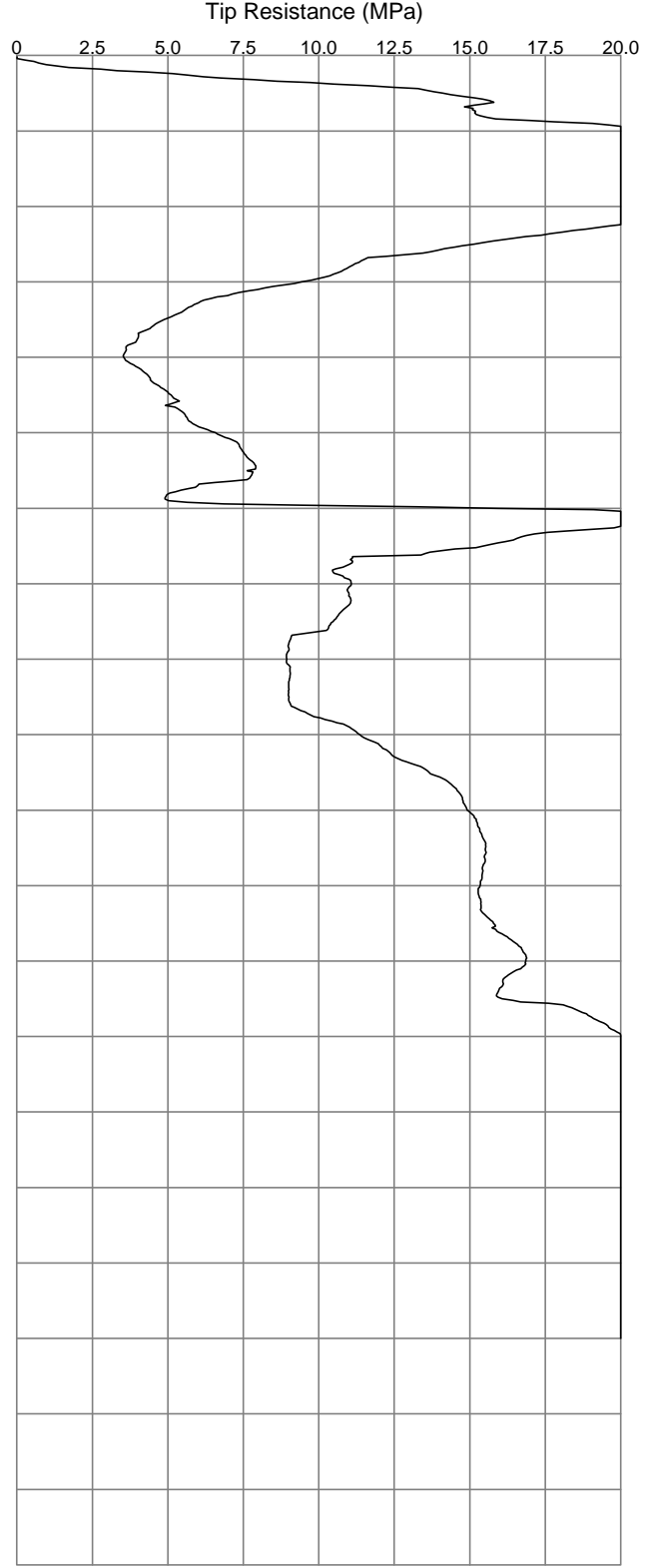
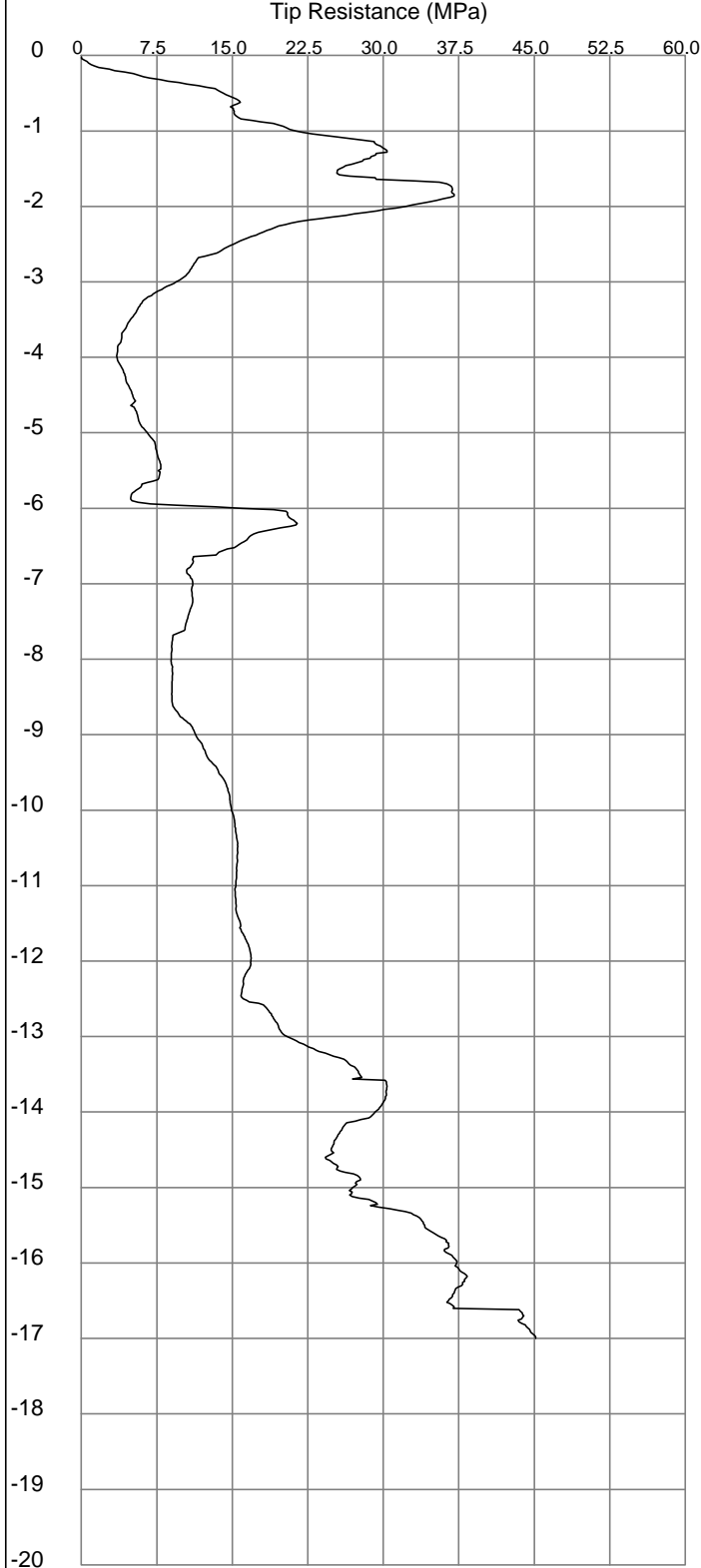


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks	Hole open to depth (m) 4.10	Total depth (m) 17.00	Operator Brad	Sounding No. CPT 11A
R/L = 42.44m AHD		Groundwater Level (m) 4.00	Cone No. 100709M		File 14
Co ordinate: X= 391149.07 Y= 6480101.94		Pre Drilled depth (m)	Probe Rig PR001		Date Completed 13-9-2017
Co-ordinates in MGA94 Z50					



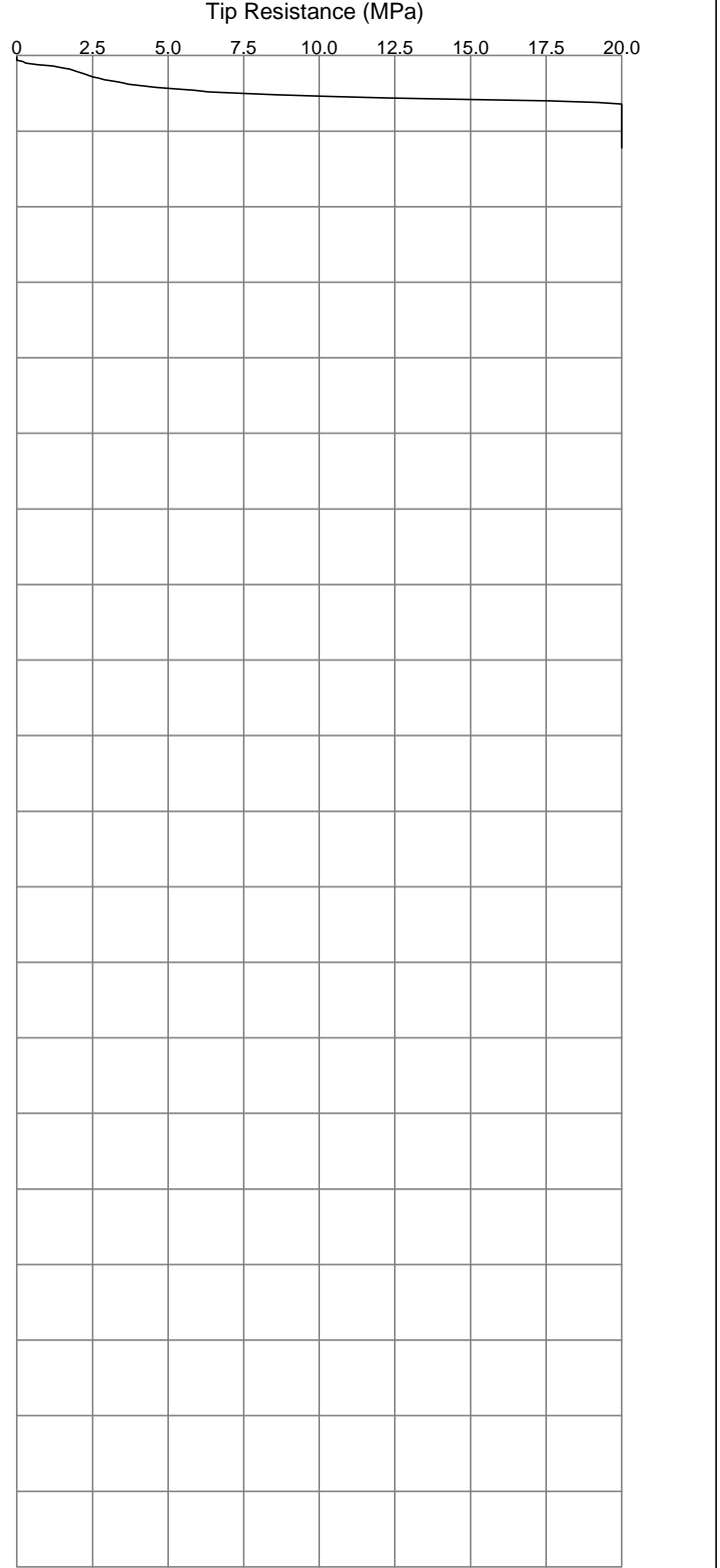
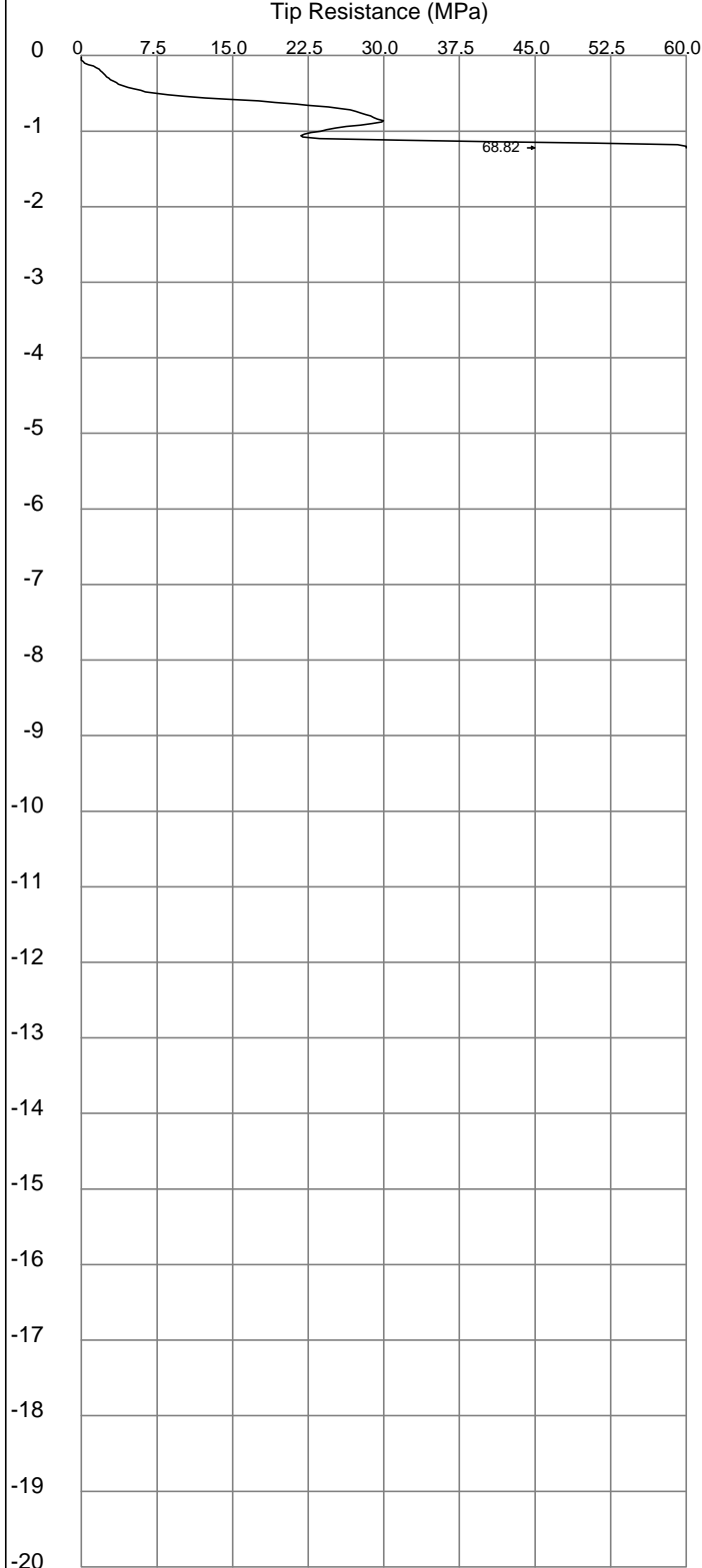


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 12	
R/L = 45.98m AHD	Hole open to depth (m) -	Total depth (m) 1.22	Operator Brad
Co ordinate: X= 391249.88 Y= 6480181.88	Groundwater Level (m) -	Cone No. 100709M	File 15
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



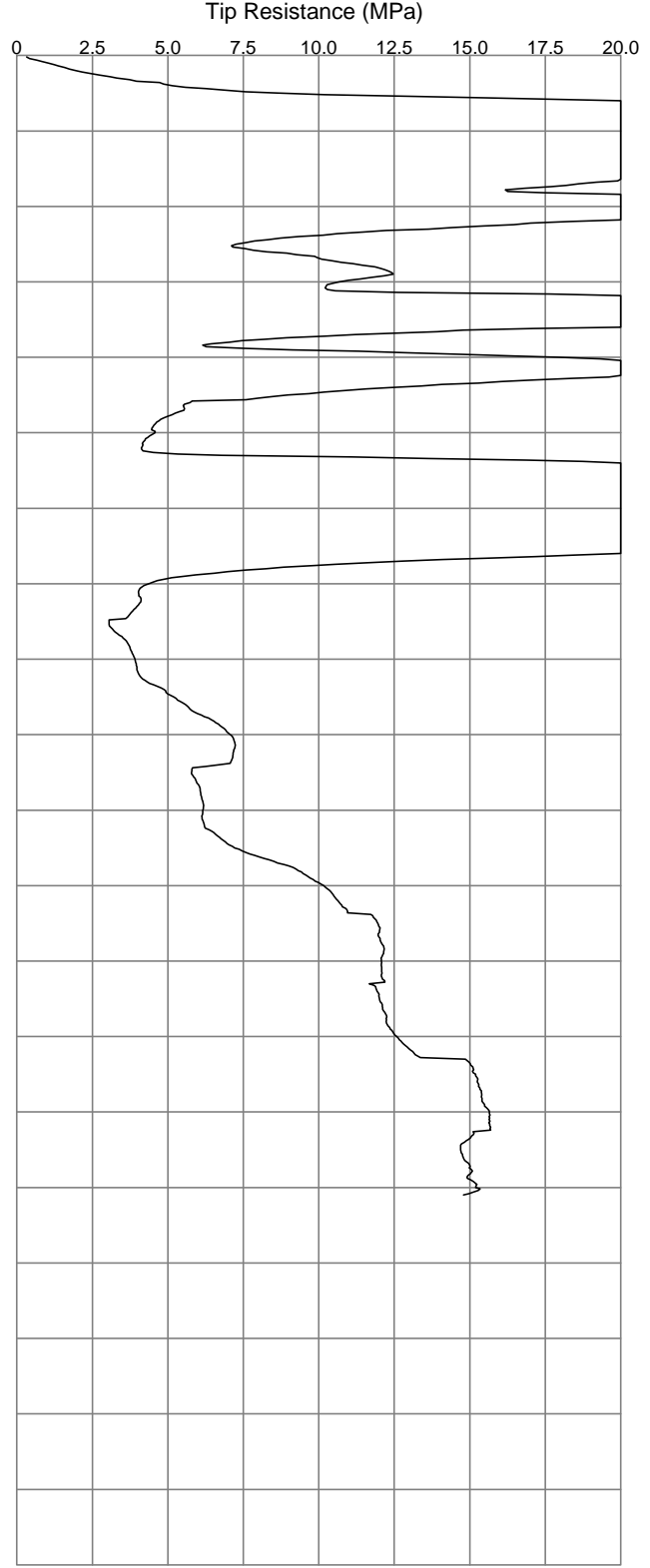
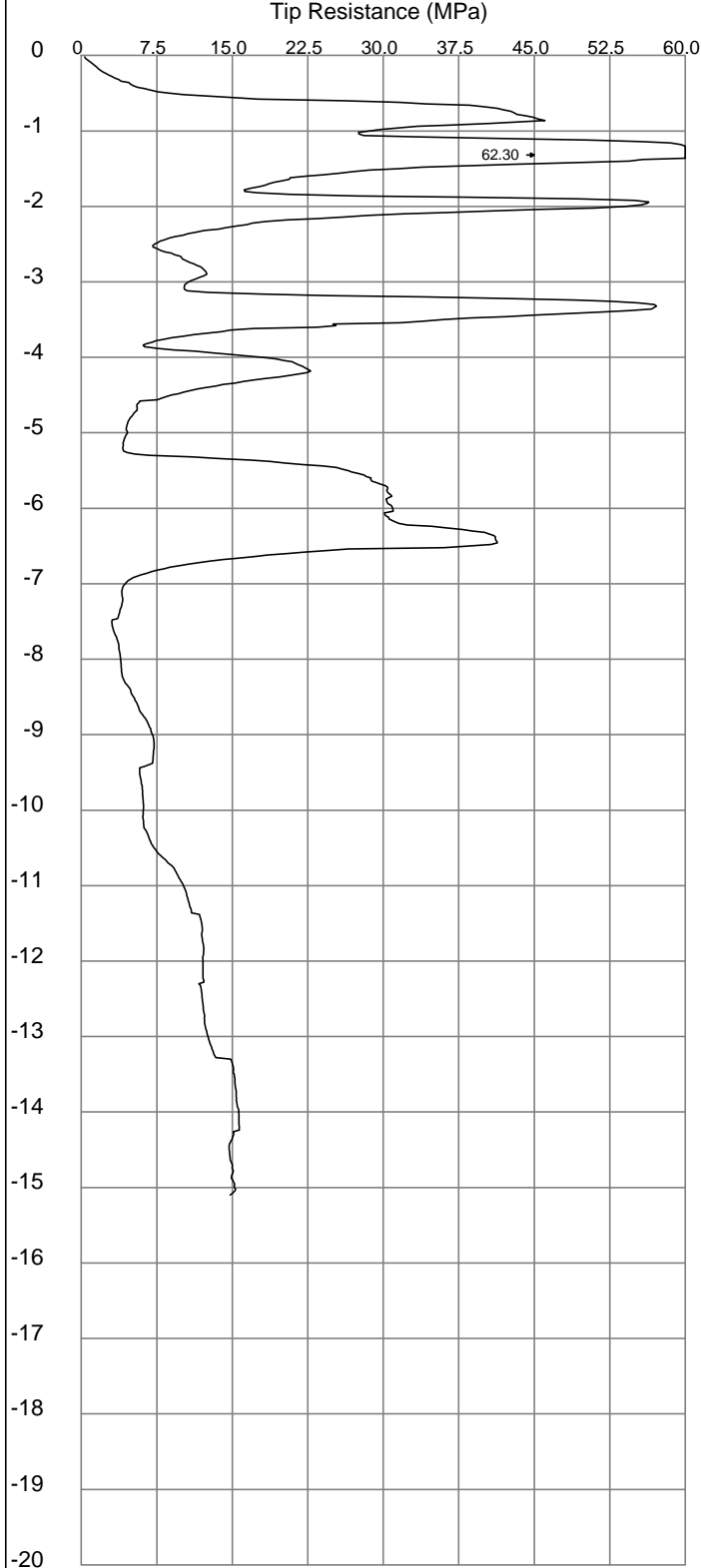


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks	Hole open to depth (m) -	Total depth (m) 15.10	Operator Brad	Sounding No. CPT 12A
R/L = 46.08m AHD		Groundwater Level (m) -	Cone No. 100709M		File 16
Co ordinate: X= 391253.42 Y= 6480184.58		Pre Drilled depth (m)	Probe Rig PR001		Date Completed 13-9-2017
Co-ordinates in MGA94 Z50					



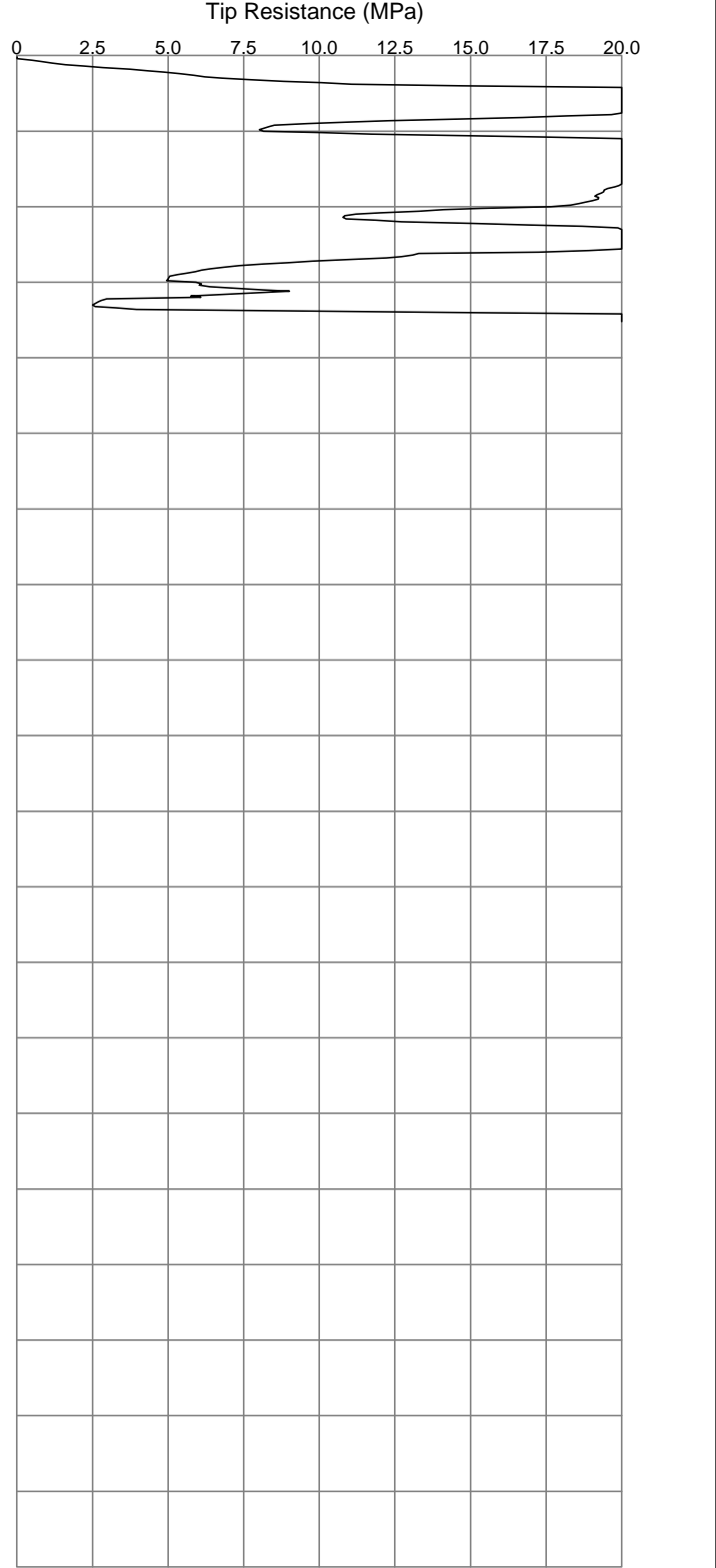
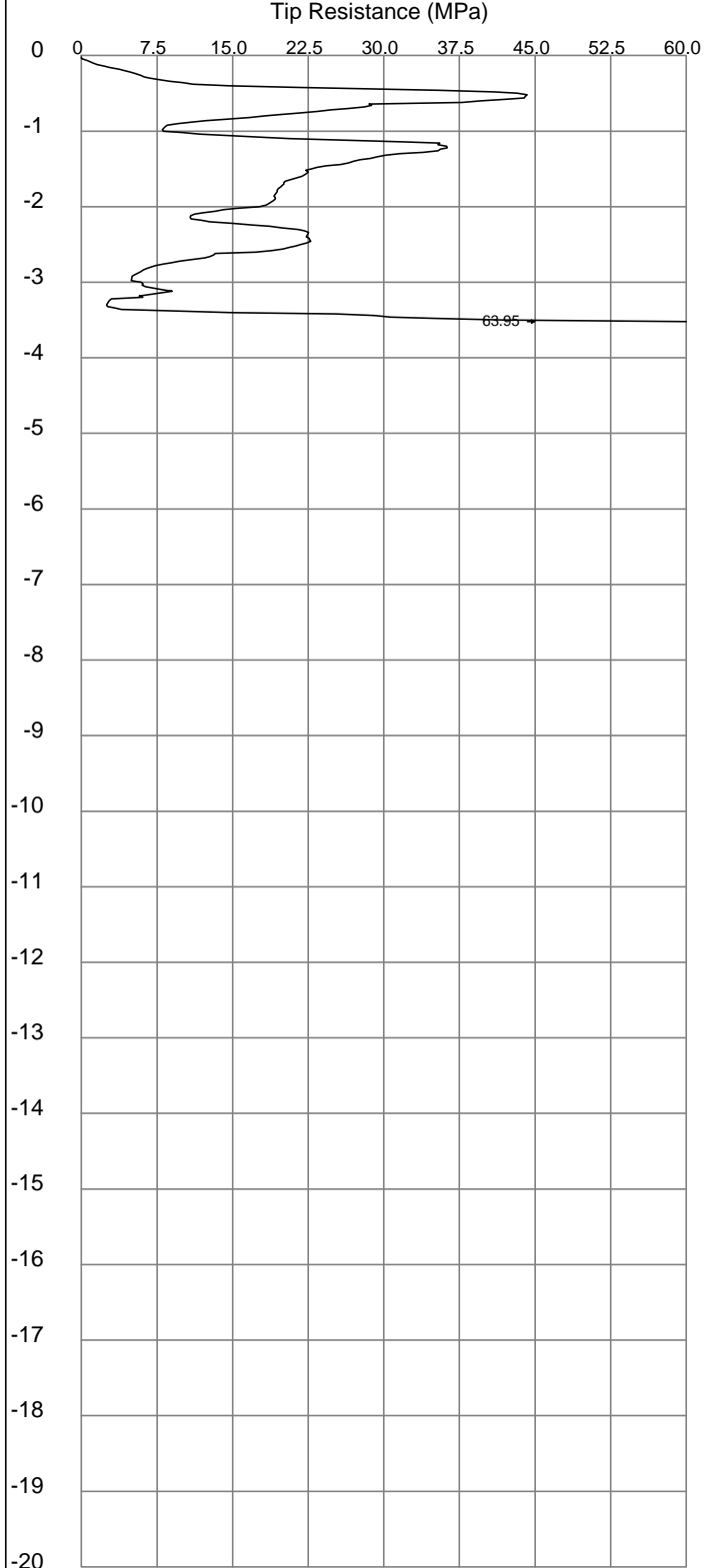


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 13	
R/L = 54.4 m AHD	Hole open to depth (m) -	Total depth (m) 3.52	Operator Brad
Co ordinate: X= 391435.84 Y= 6480236.17	Groundwater Level (m) -	Cone No. 100709M	File 17
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



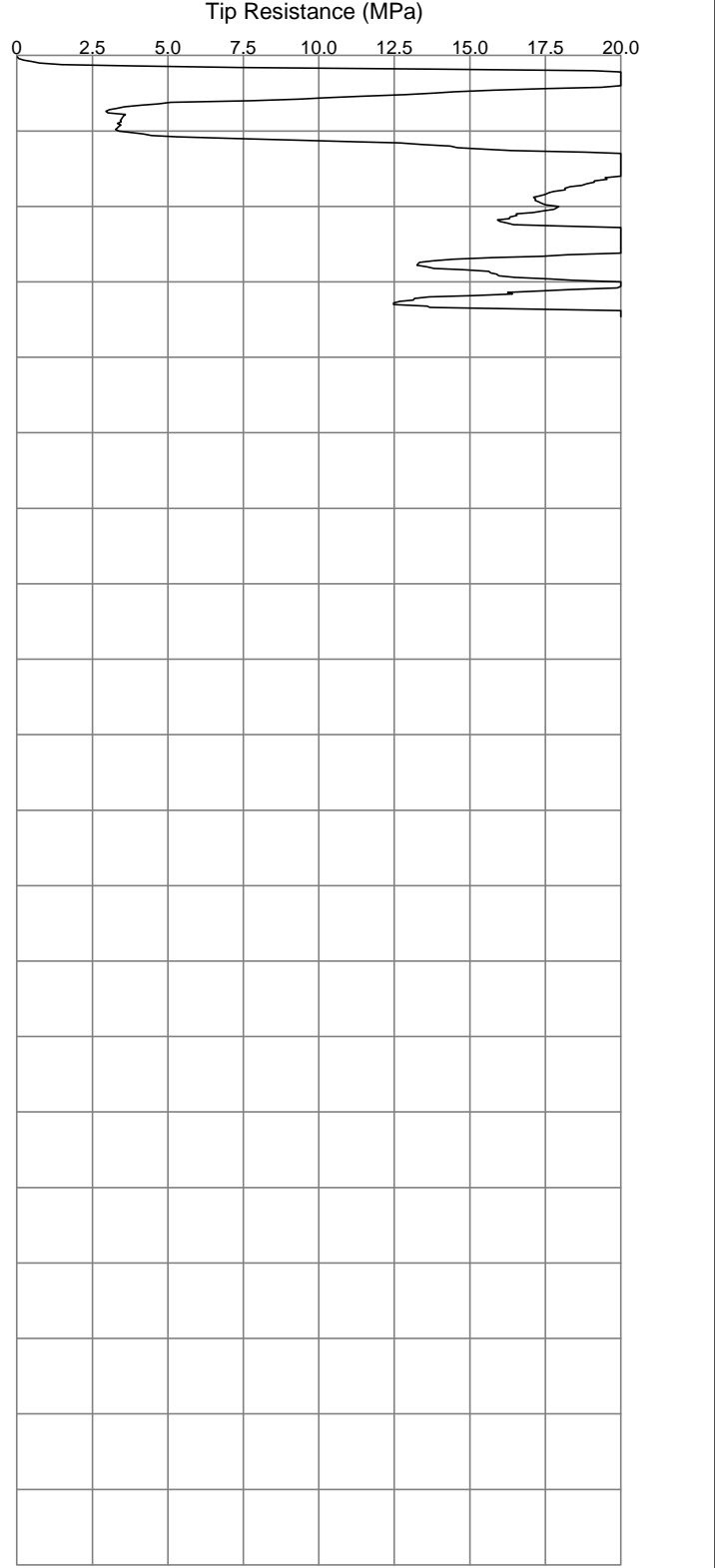
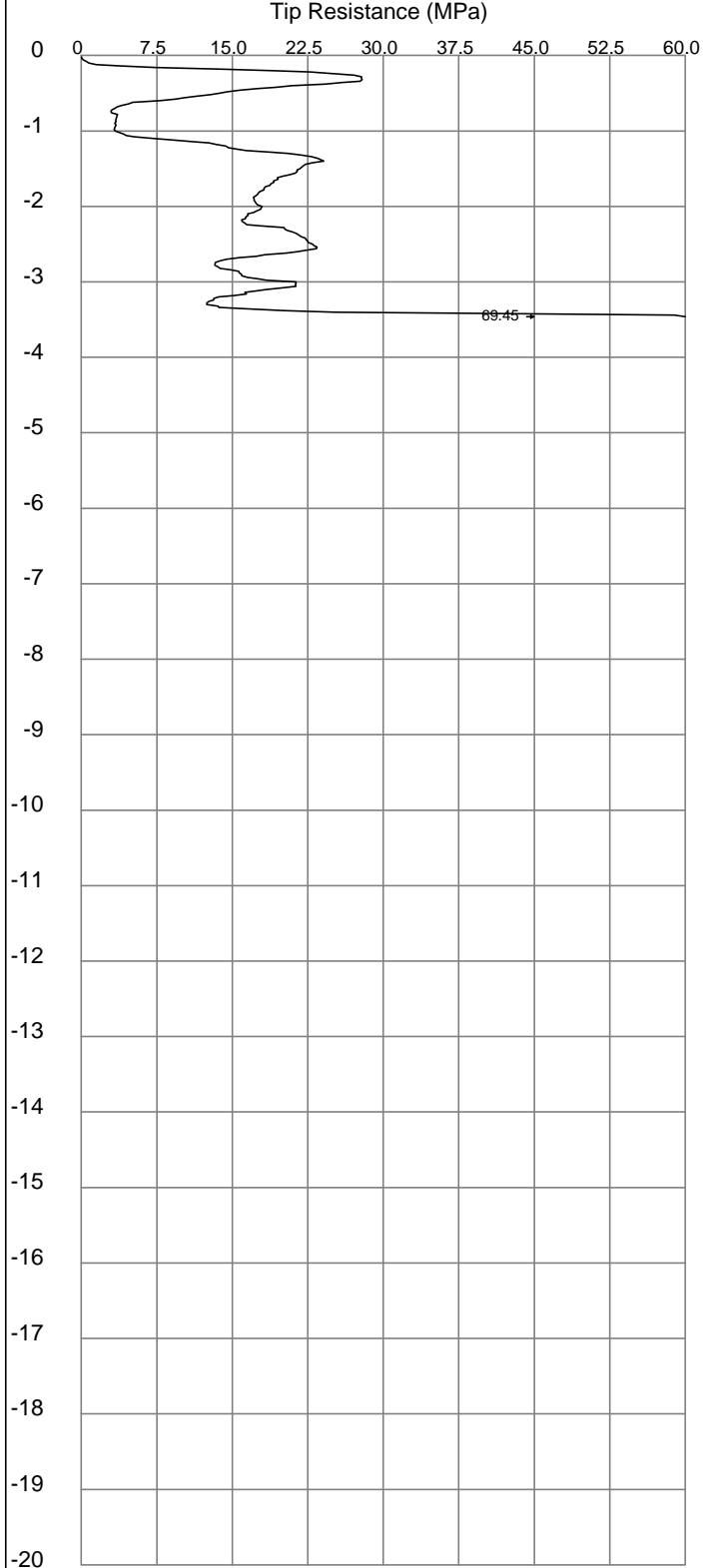


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 13A	
R/L = 54.54m AHD	Hole open to depth (m) -	Total depth (m) 3.46	Operator Brad
Co ordinate: X= 391435.56 Y= 6480241.73	Groundwater Level (m) -	Cone No. 100709M	File 18
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



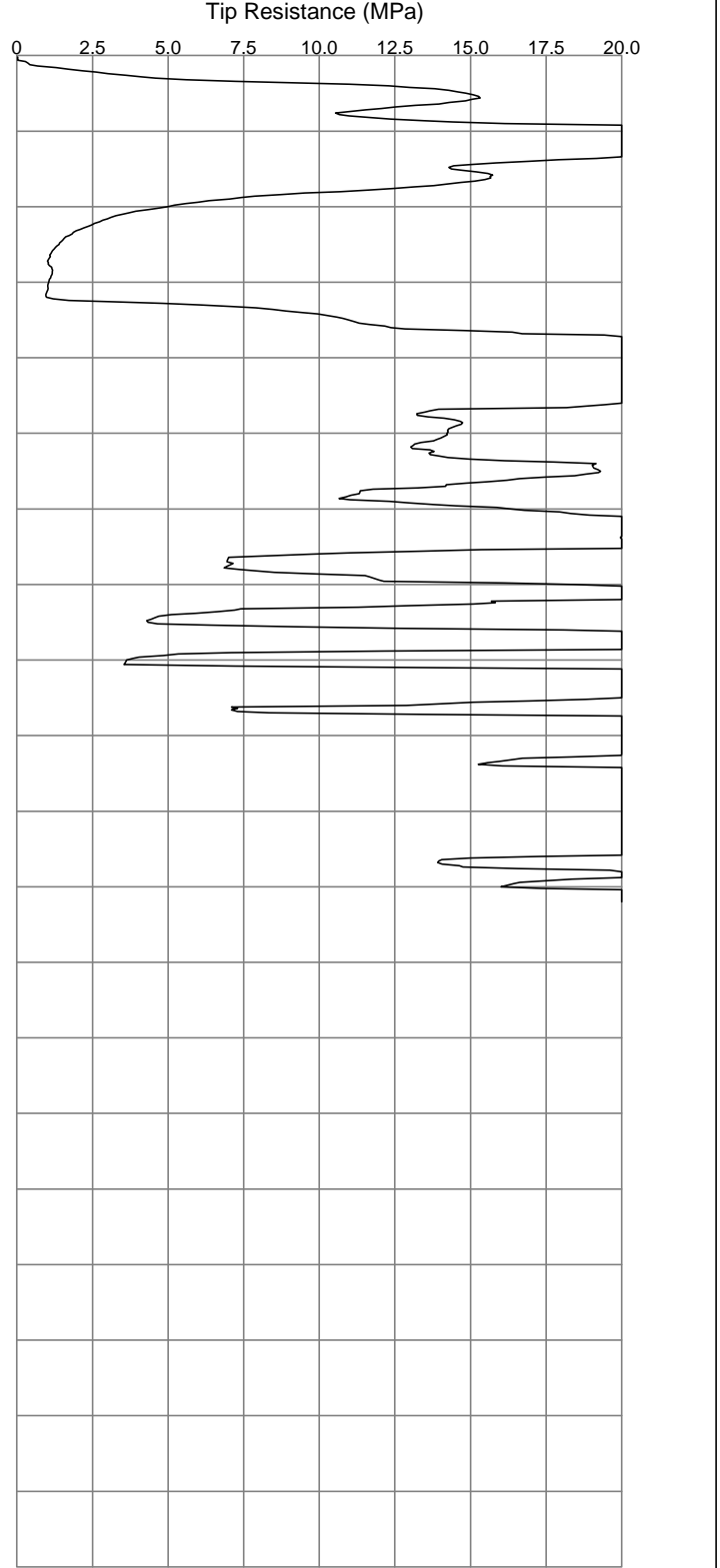
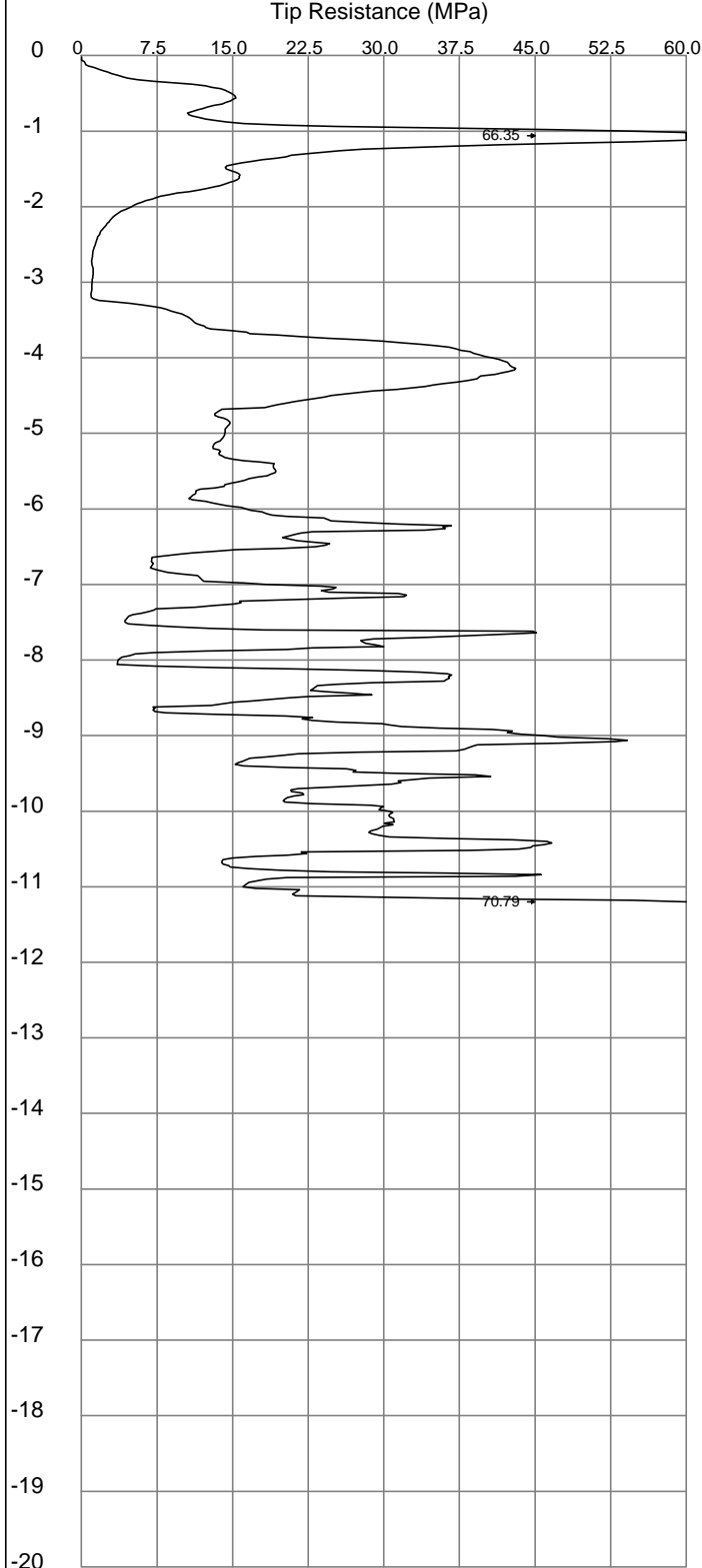


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 14	
R/L = 56.24m AHD	Hole open to depth (m) -	Total depth (m) 11.20	Operator Brad
Co ordinate: X= 391436.44 Y= 6480349.29	Groundwater Level (m) -	Cone No. 100709M	File 19
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



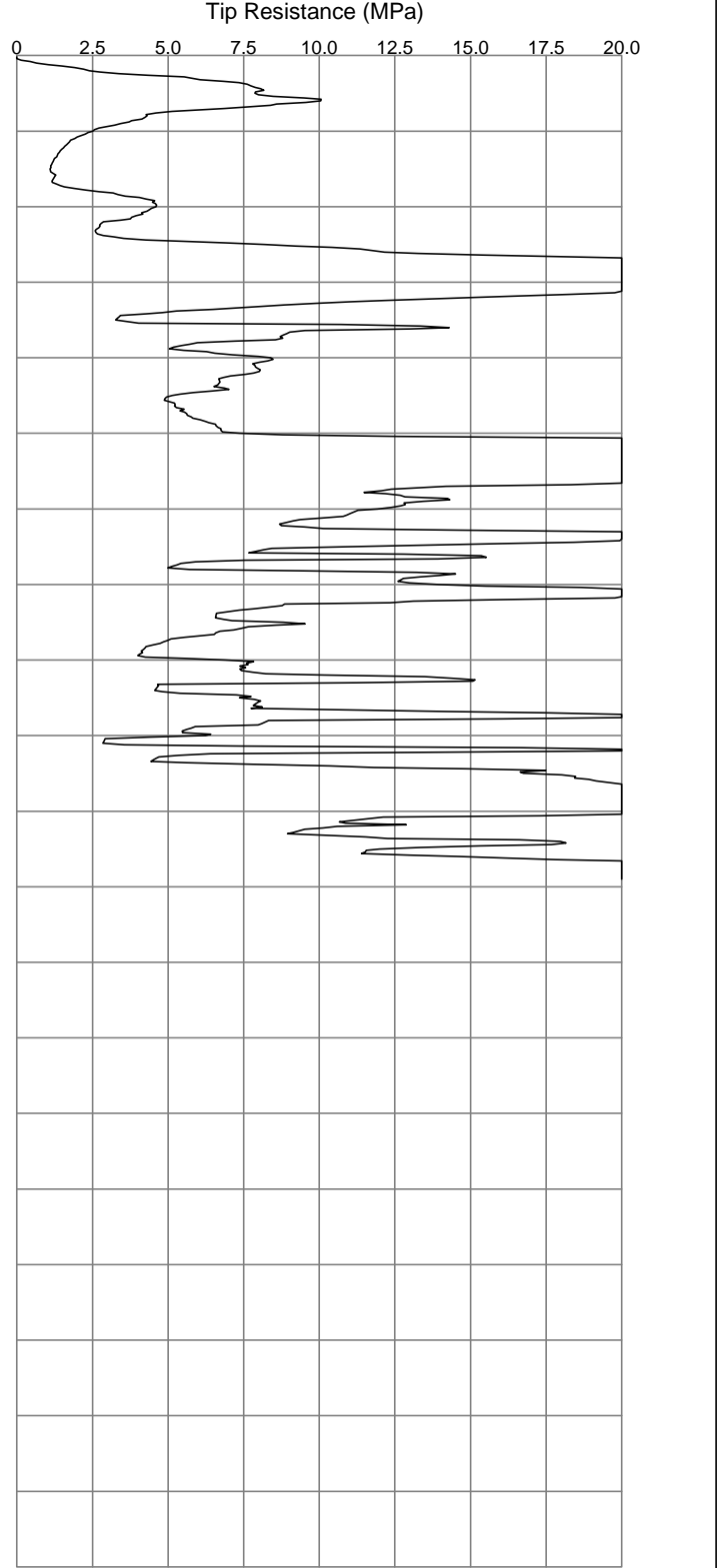
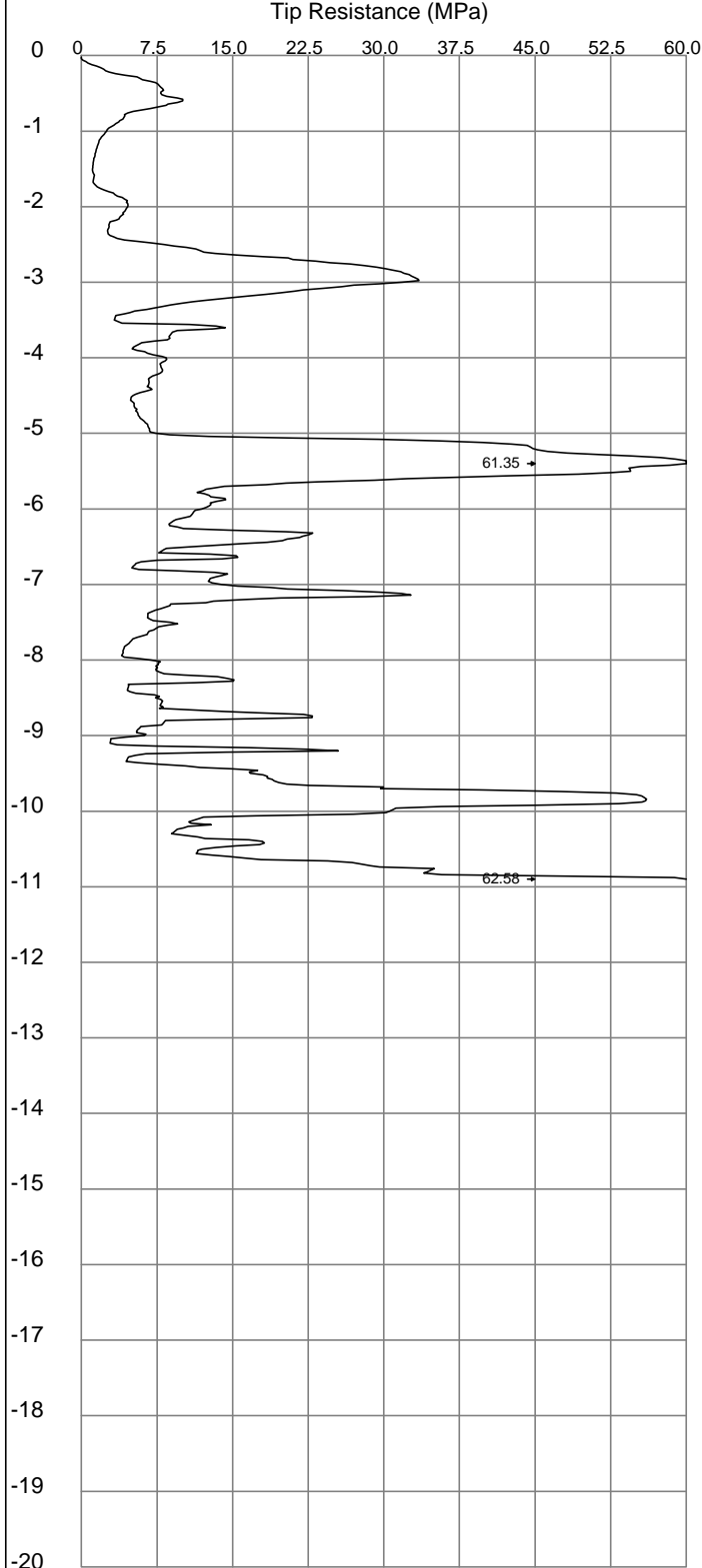


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 15	
R/L = 54.1 m AHD	Hole open to depth (m) -	Total depth (m) 10.90	Operator Brad
Co ordinate: X= 391434.00 Y= 6480472.03	Groundwater Level (m) -	Cone No. 100709M	File 20
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



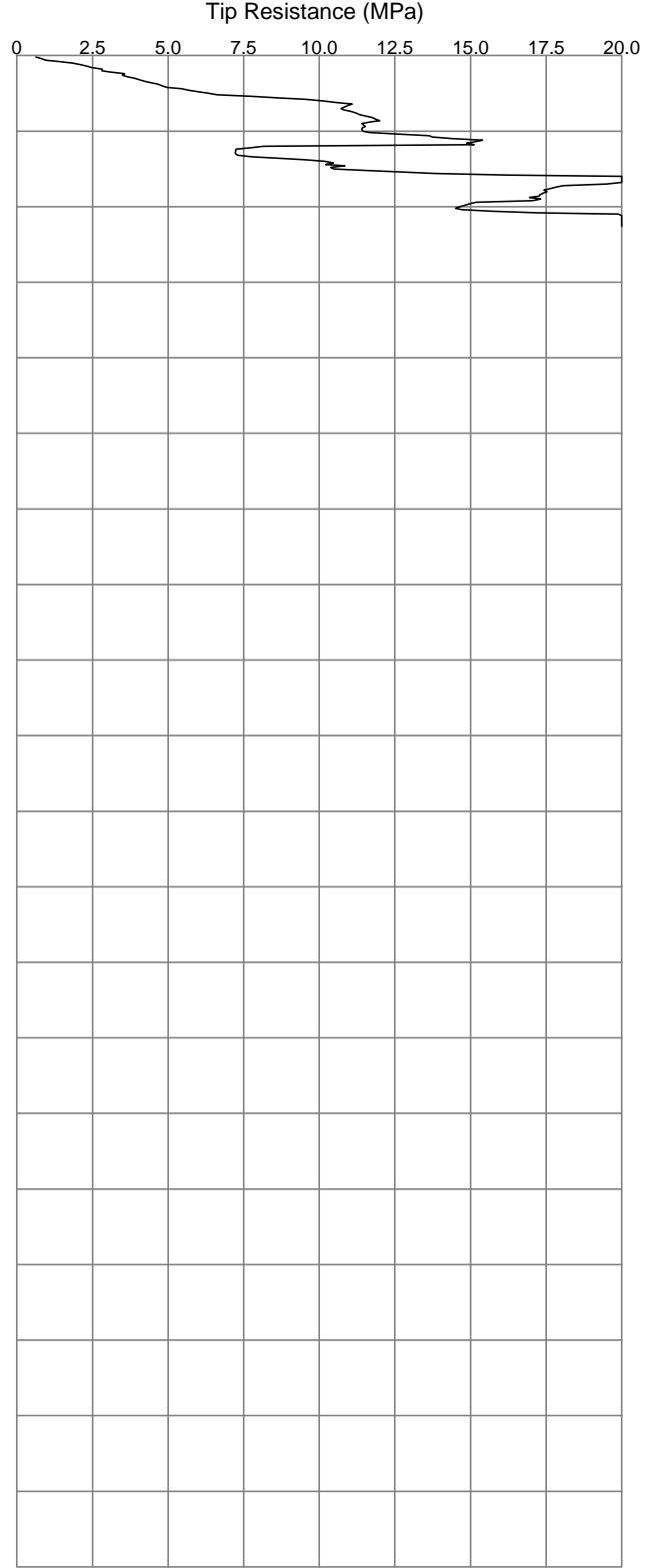
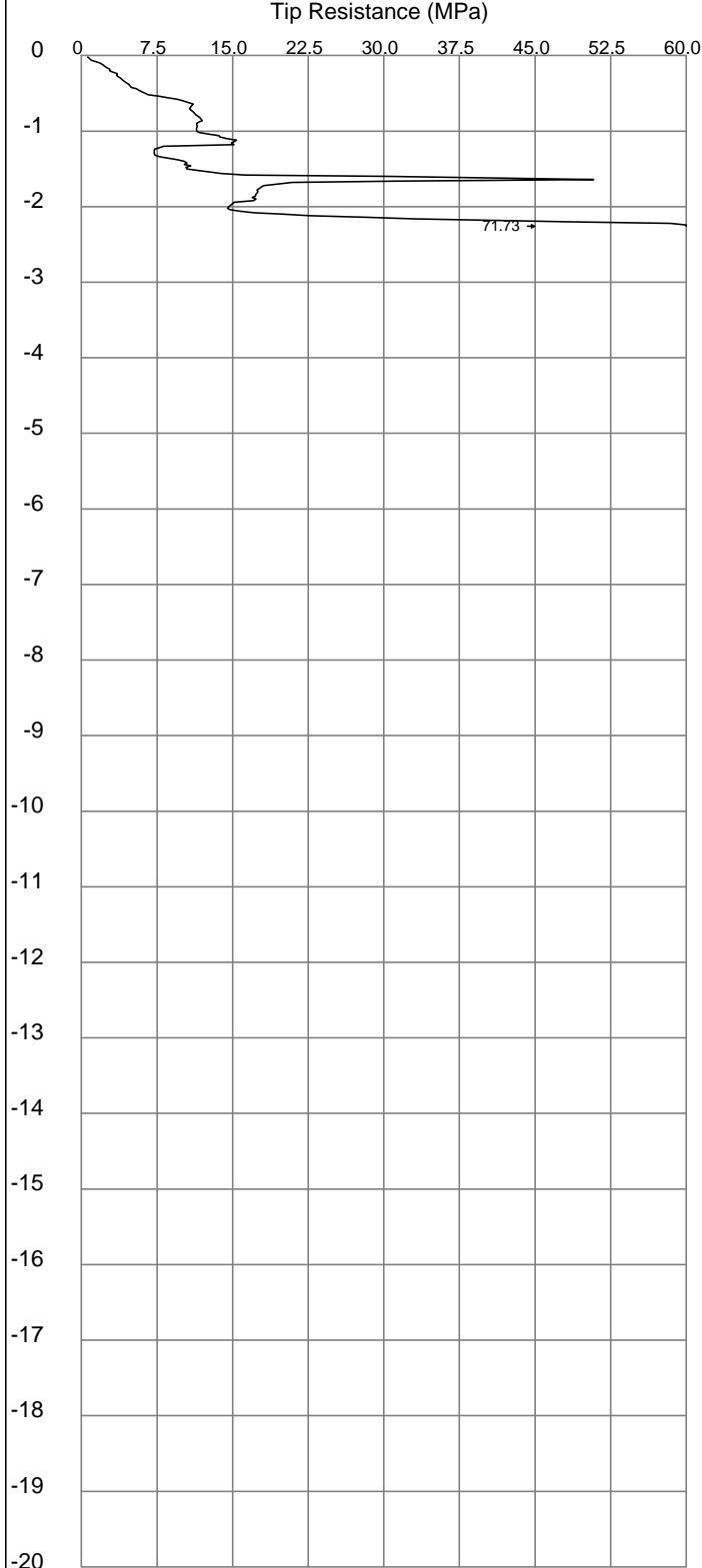


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 15	
R/L = 56.77m AHD	Hole open to depth (m) -	Total depth (m) 2.26	Operator Brad
Co ordinate: X= 391683.57 Y= 6480325.76	Groundwater Level (m) -	Cone No. 100709M	File 21
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



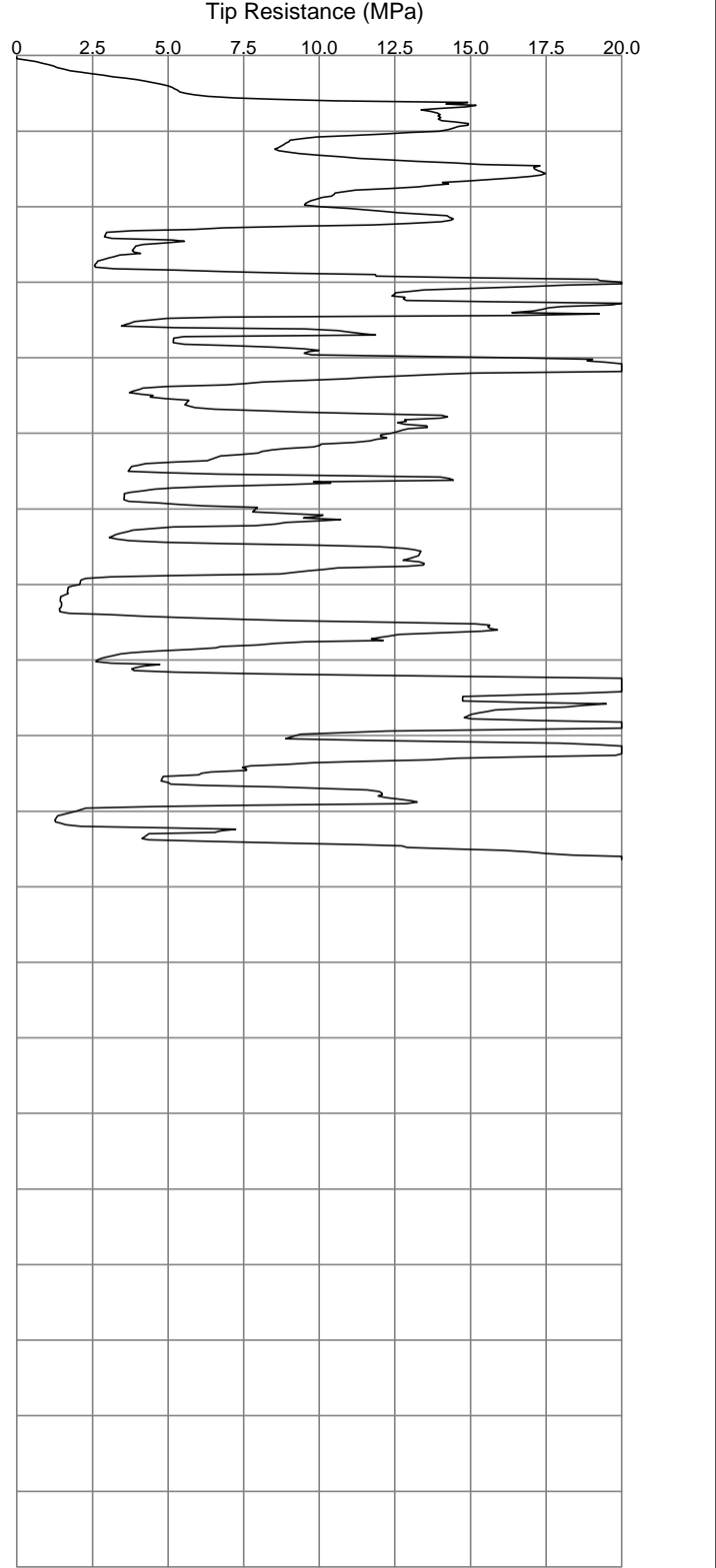
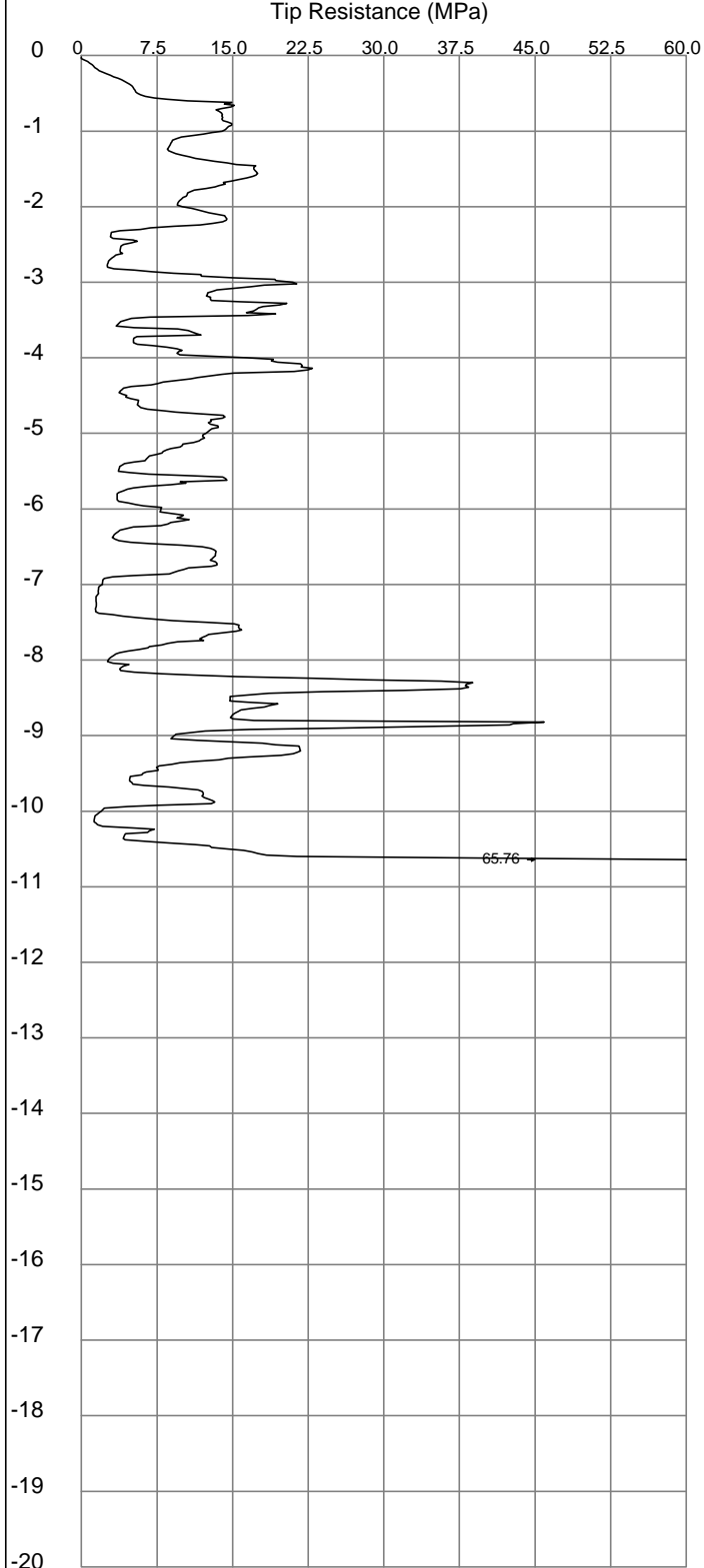


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 16A	
R/L = 56.8 m AHD	Hole open to depth (m) -	Total depth (m) 10.64	Operator Brad
Co ordinate: X= 391688.85 Y= 6480324.41	Groundwater Level (m) -	Cone No. 100709M	File 22
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



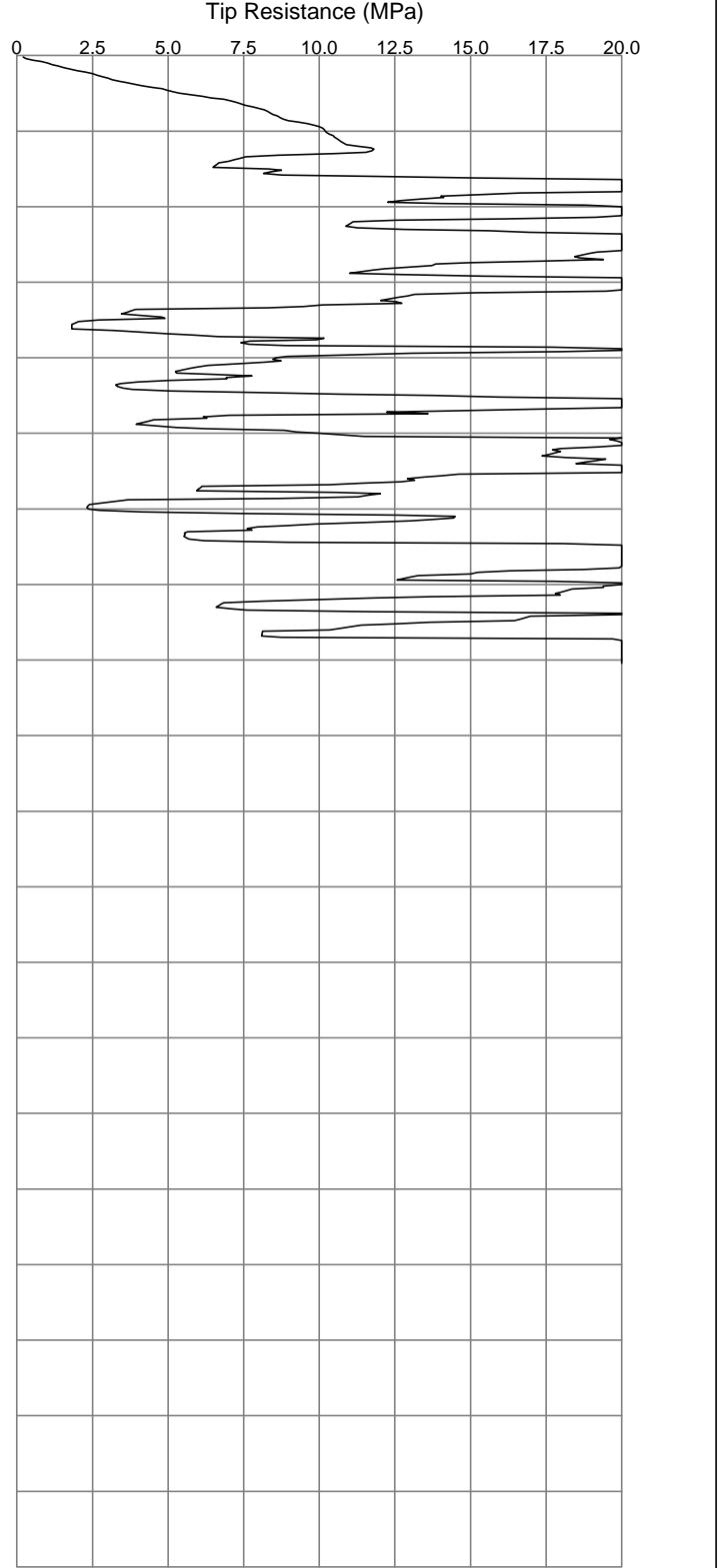
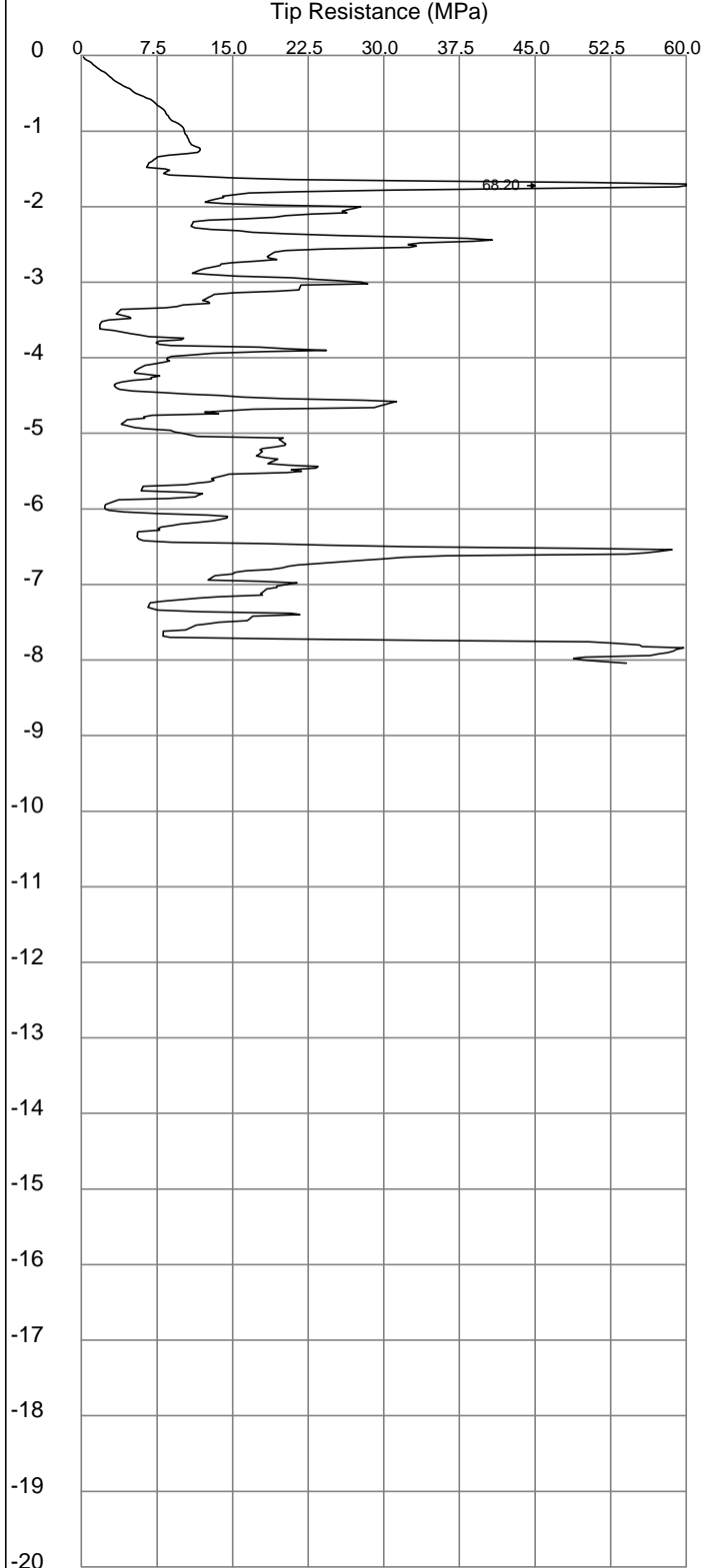


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum thrust	Sounding No. CPT 17	
R/L = 56.17m AHD	Hole open to depth (m) -	Total depth (m) 8.04	Operator Brad
Co ordinate: X= 391552.10 Y= 6480378.74	Groundwater Level (m) -	Cone No. 100709M	File 23
Co-ordinates in MGA94 Z50	Pre Drilled depth (m) -	Probe Rig PR001	Date Completed 13-9-2017



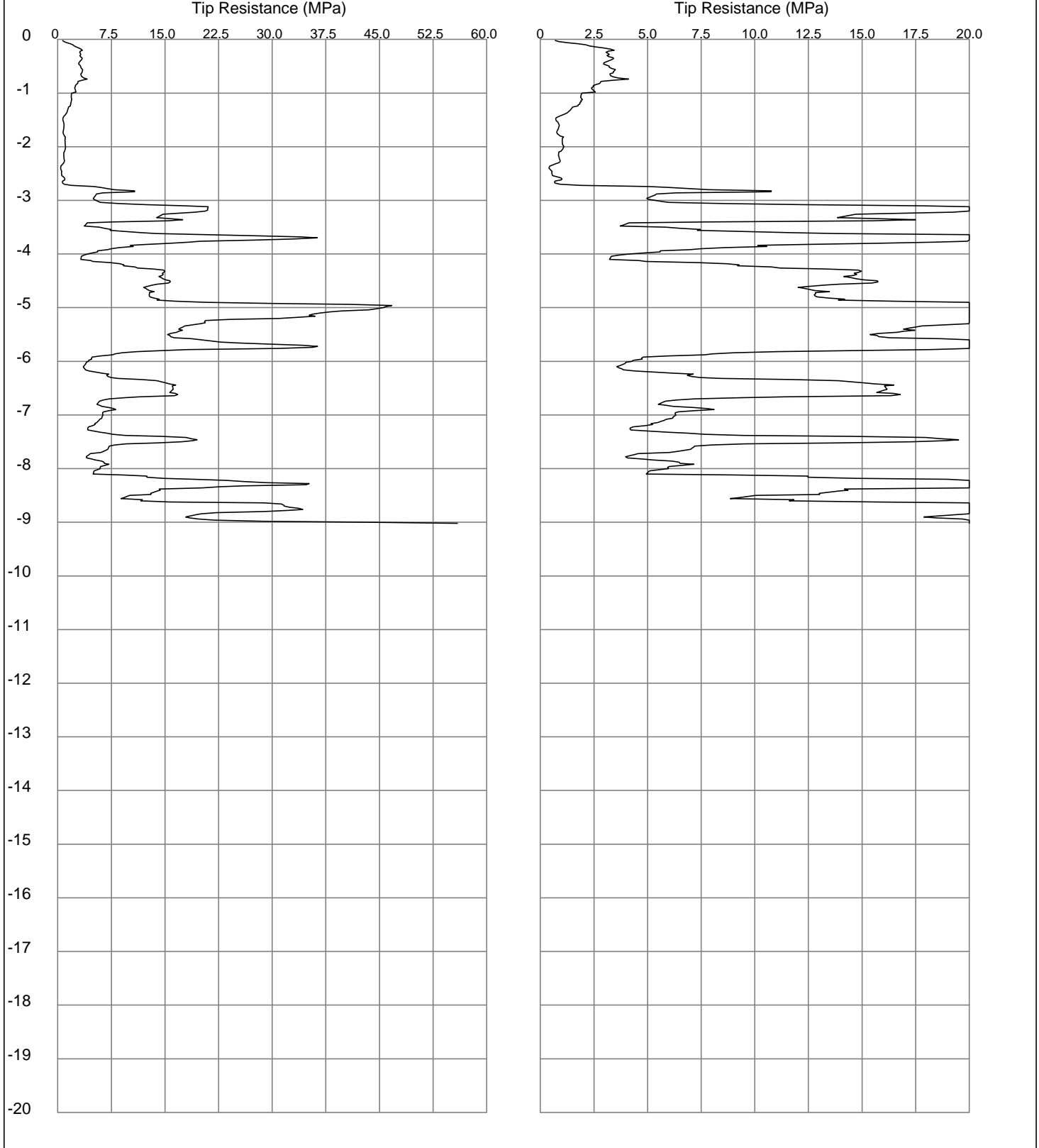


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 18	
R/L = 51.23m AHD	Hole open to depth (m) 8.60	Total depth (m) 9.02	Operator Brad
Co ordinate: X= 391464.47 Y= 6480539.08	Groundwater Level (m) 4.10	Cone No. 100709M	File 24
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



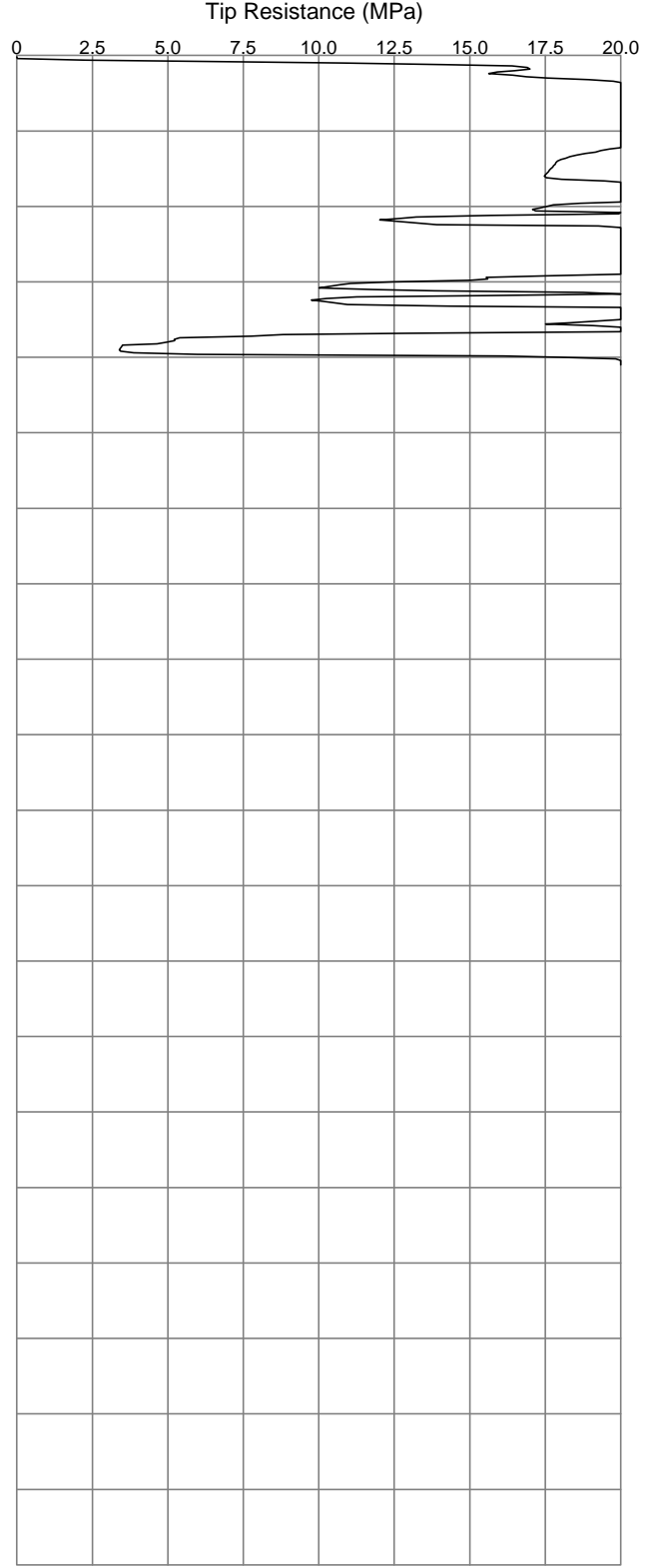
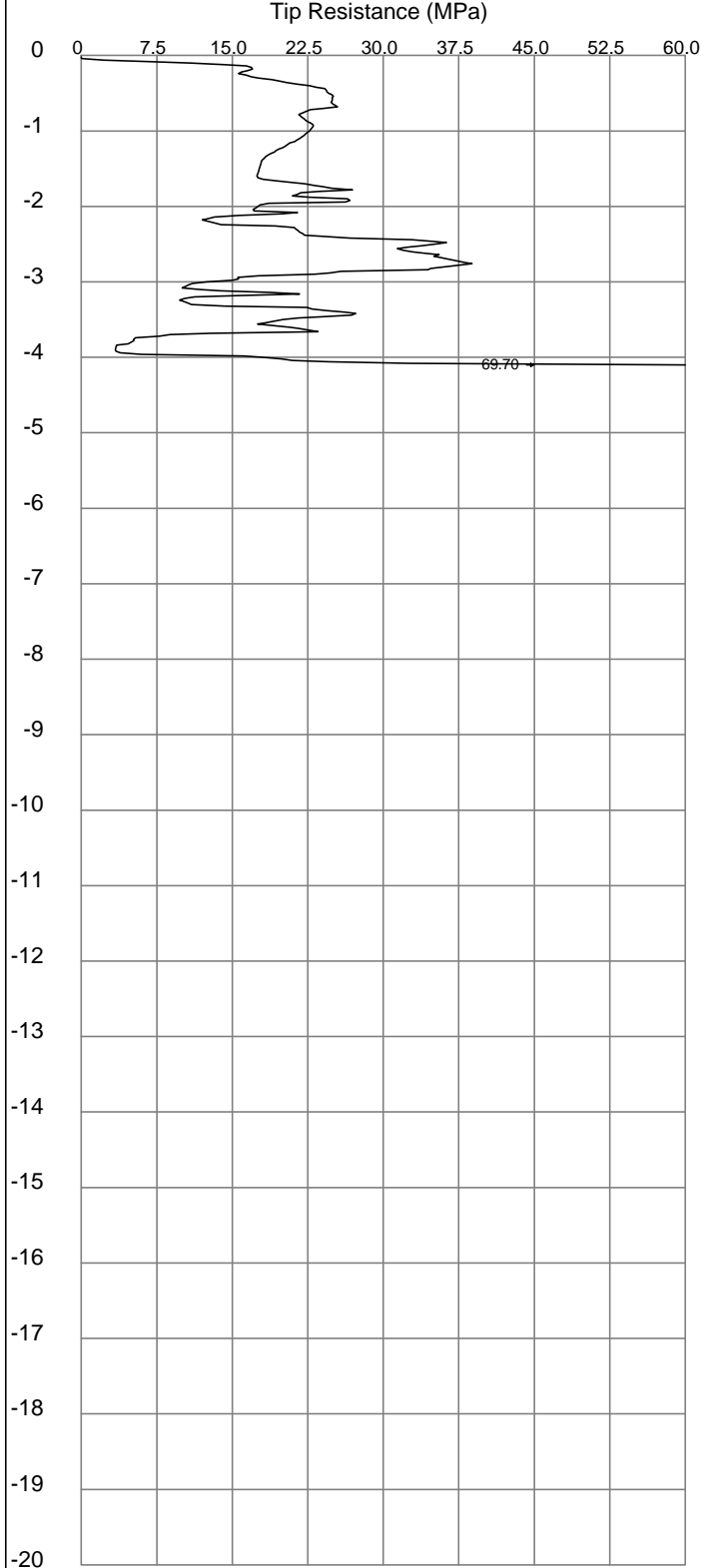


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 19	
R/L = 47.59m AHD	Hole open to depth (m) -	Total depth (m) 4.10	Operator Brad
Co ordinate: X= 391134.23 Y= 6480349.93	Groundwater Level (m) -	Cone No. 100709M	File 25
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



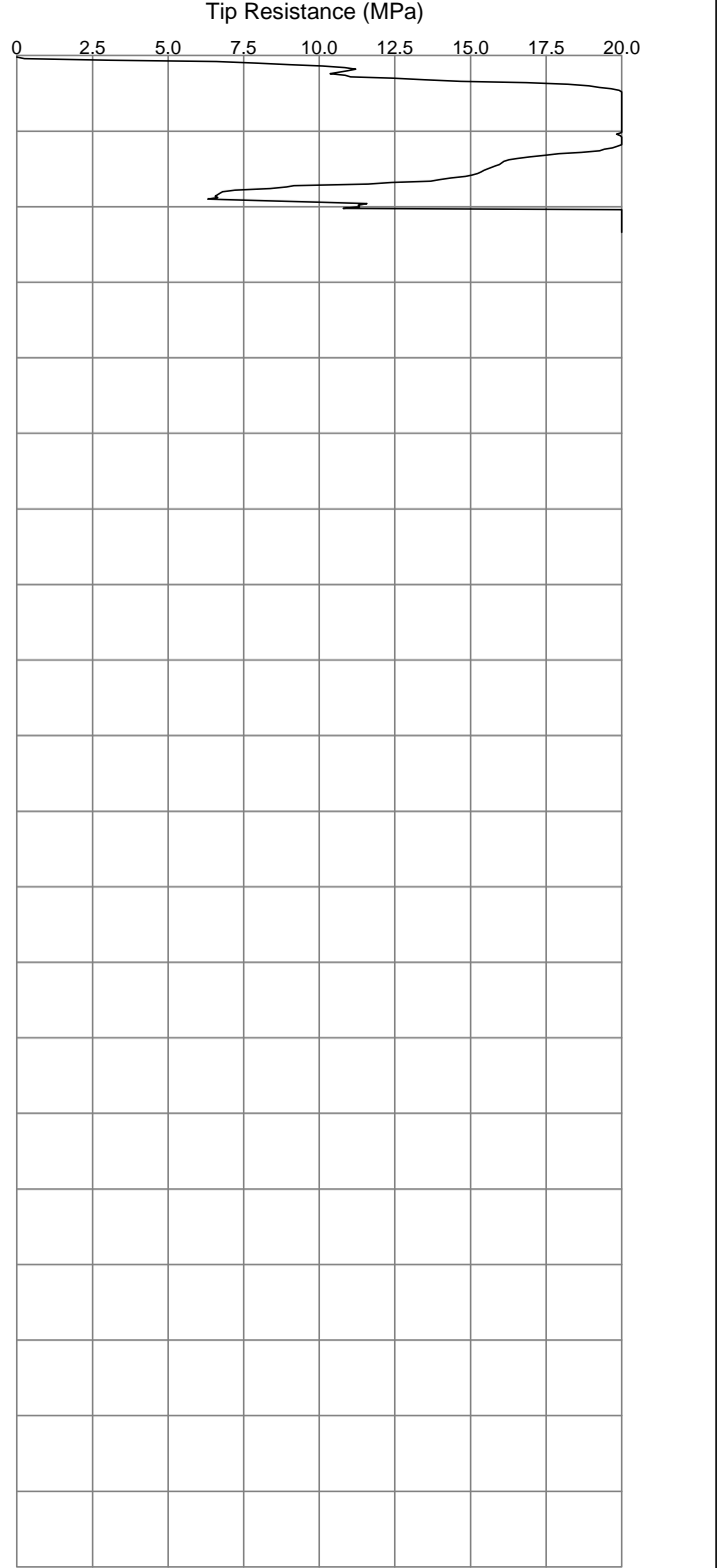
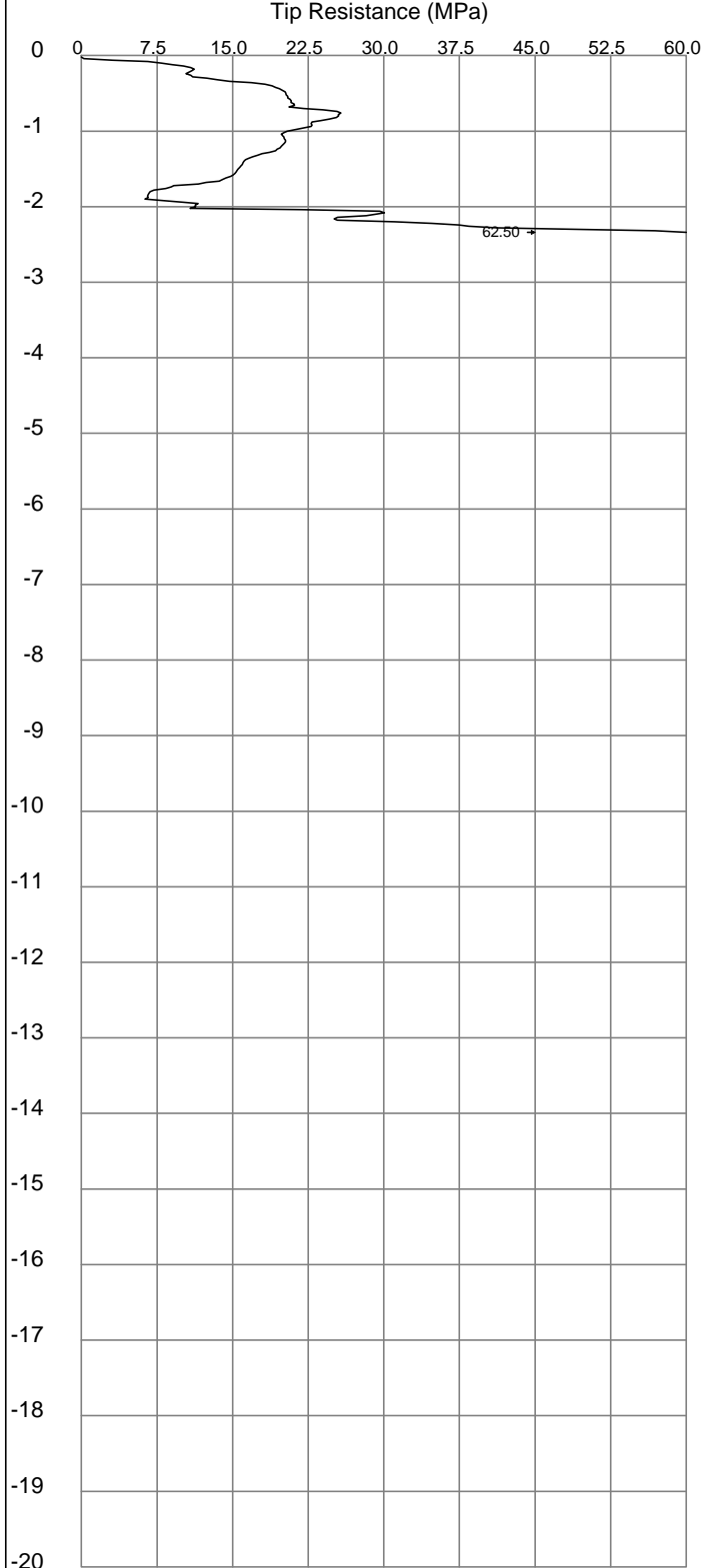


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 19A	
R/L = 47.73m AHD	Hole open to depth (m) -	Total depth (m) 2.34	Operator Brad
Co ordinate: X= 391134.63 Y= 6480354.21	Groundwater Level (m) -	Cone No. 100709M	File 26
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



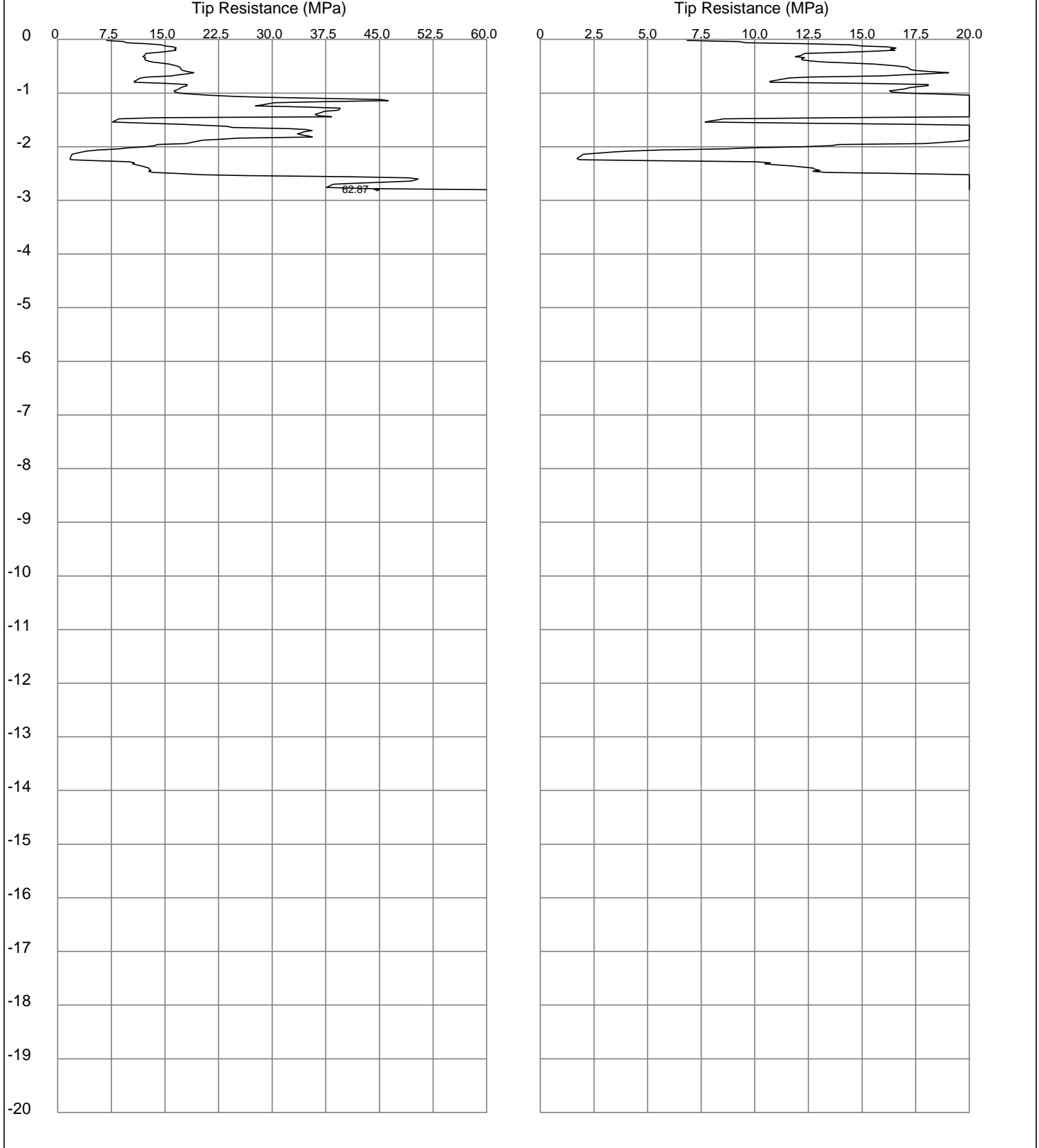


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 20	
R/L = 51.62m AHD	Hole open to depth (m) -	Total depth (m) 2.80	Operator Brad
Co ordinate: X= 391158.86 Y= 6480565.98	Groundwater Level (m) -	Cone No. 100709M	File 27
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



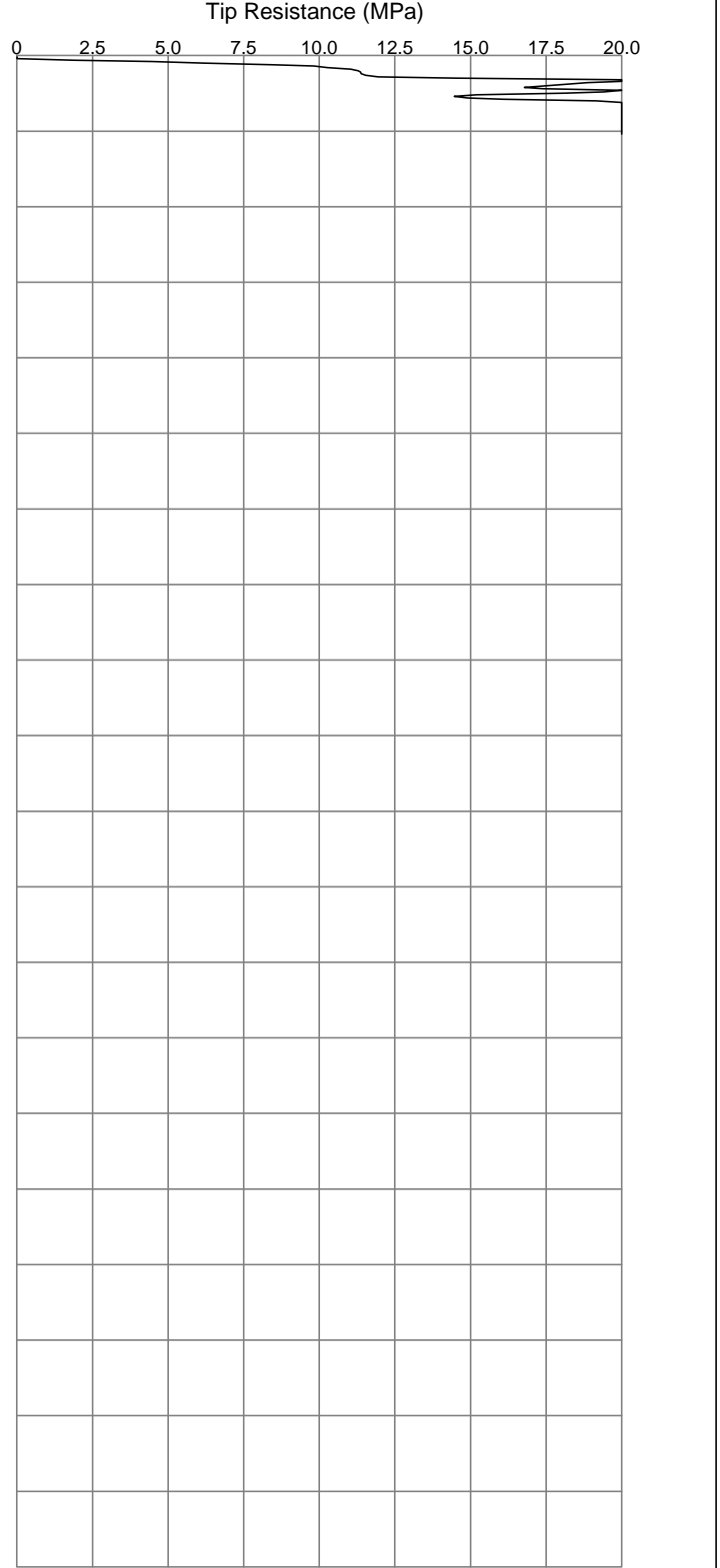
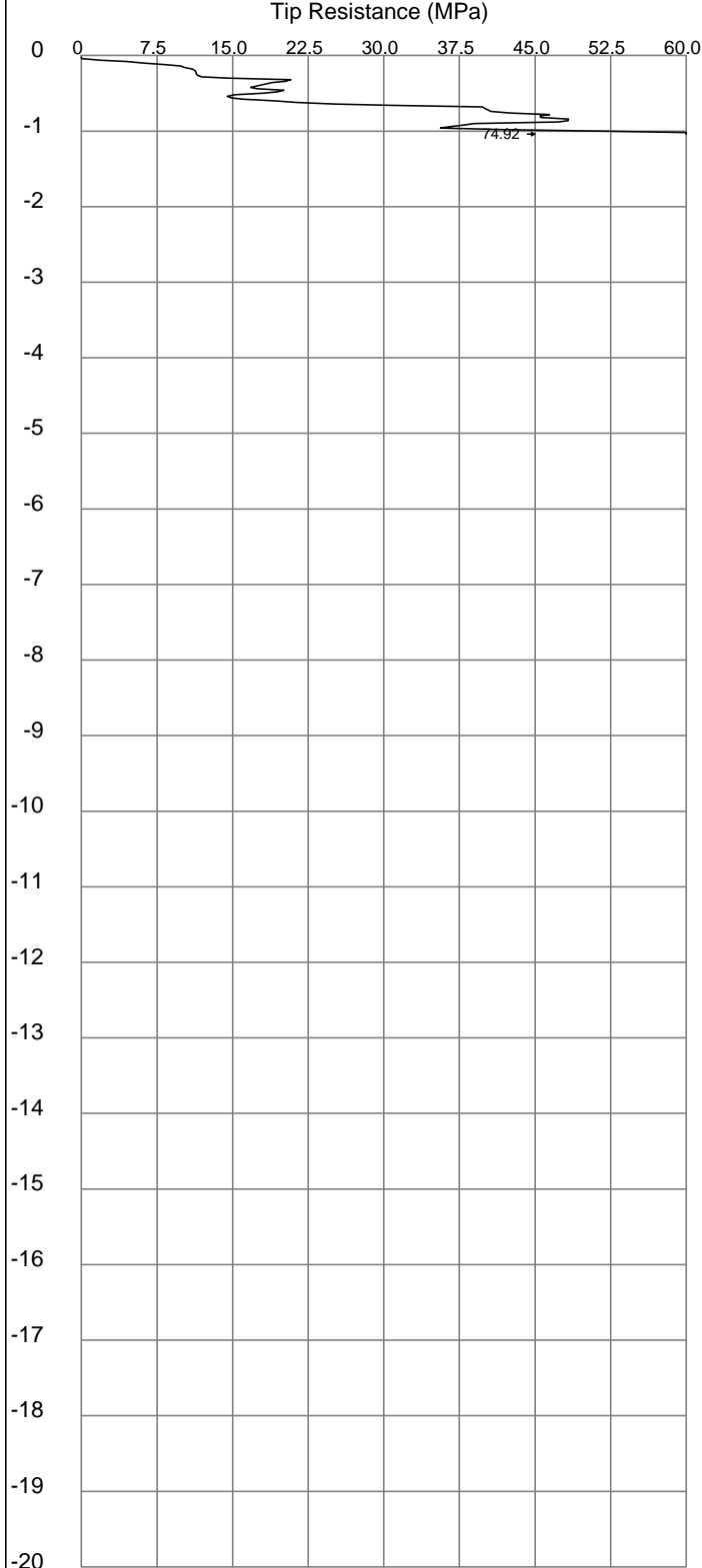


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 20A	
R/L = 51.49m AHD	Hole open to depth (m) -	Total depth (m) 1.04	Operator Brad
Co ordinate: X= 391161.61 Y= 6480584.48	Groundwater Level (m) -	Cone No. 100709M	File 28
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



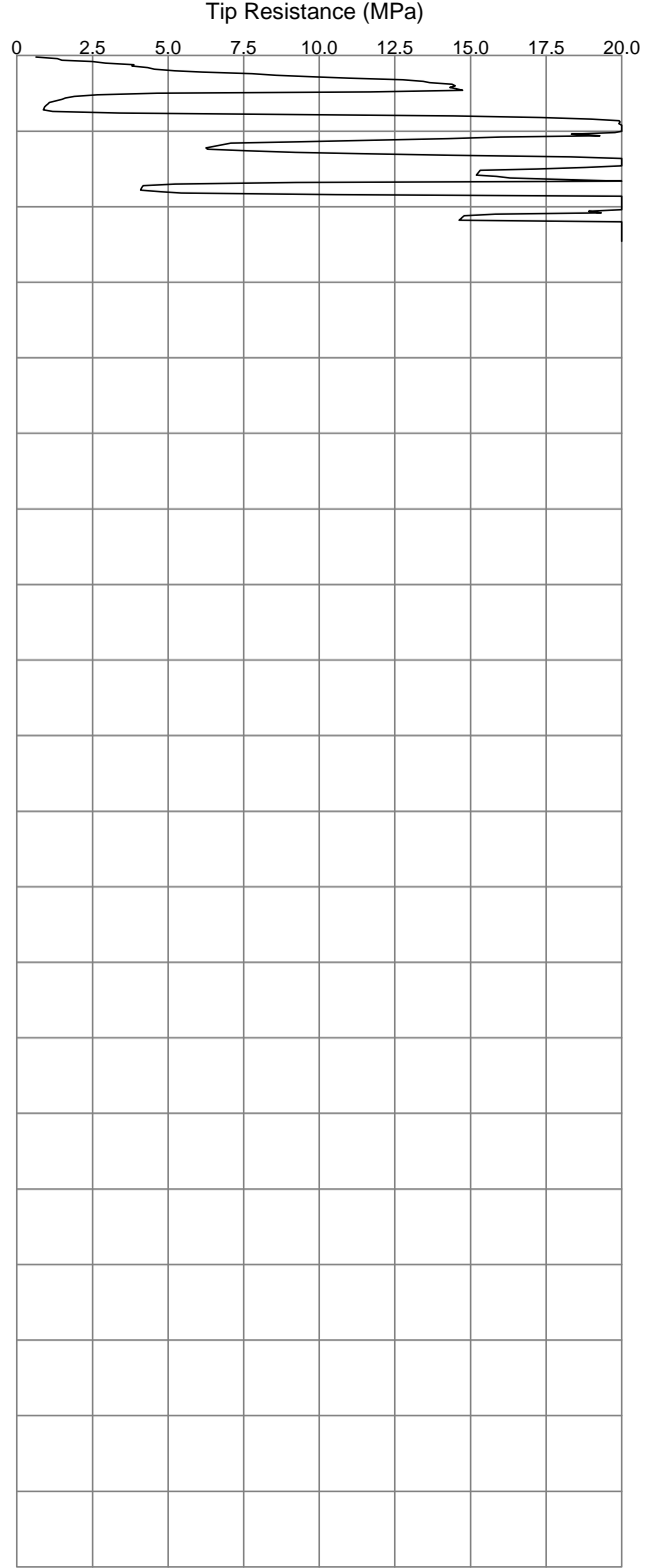
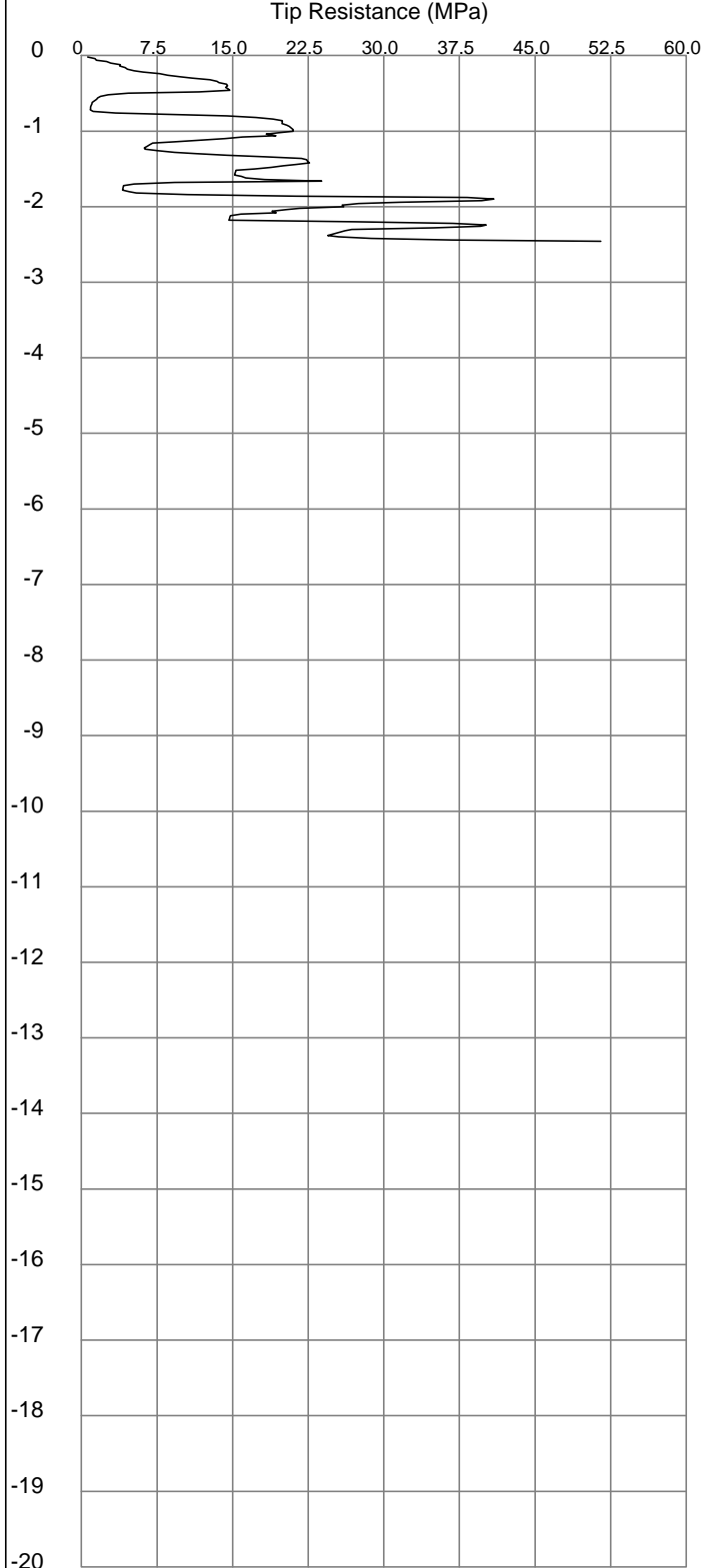


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 21	
R/L = 50.89m AHD	Hole open to depth (m) -	Total depth (m) 2.46	Operator Brad
Co ordinate: X= 391227.13 Y= 6480586.23	Groundwater Level (m) -	Cone No. 100709M	File 29
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



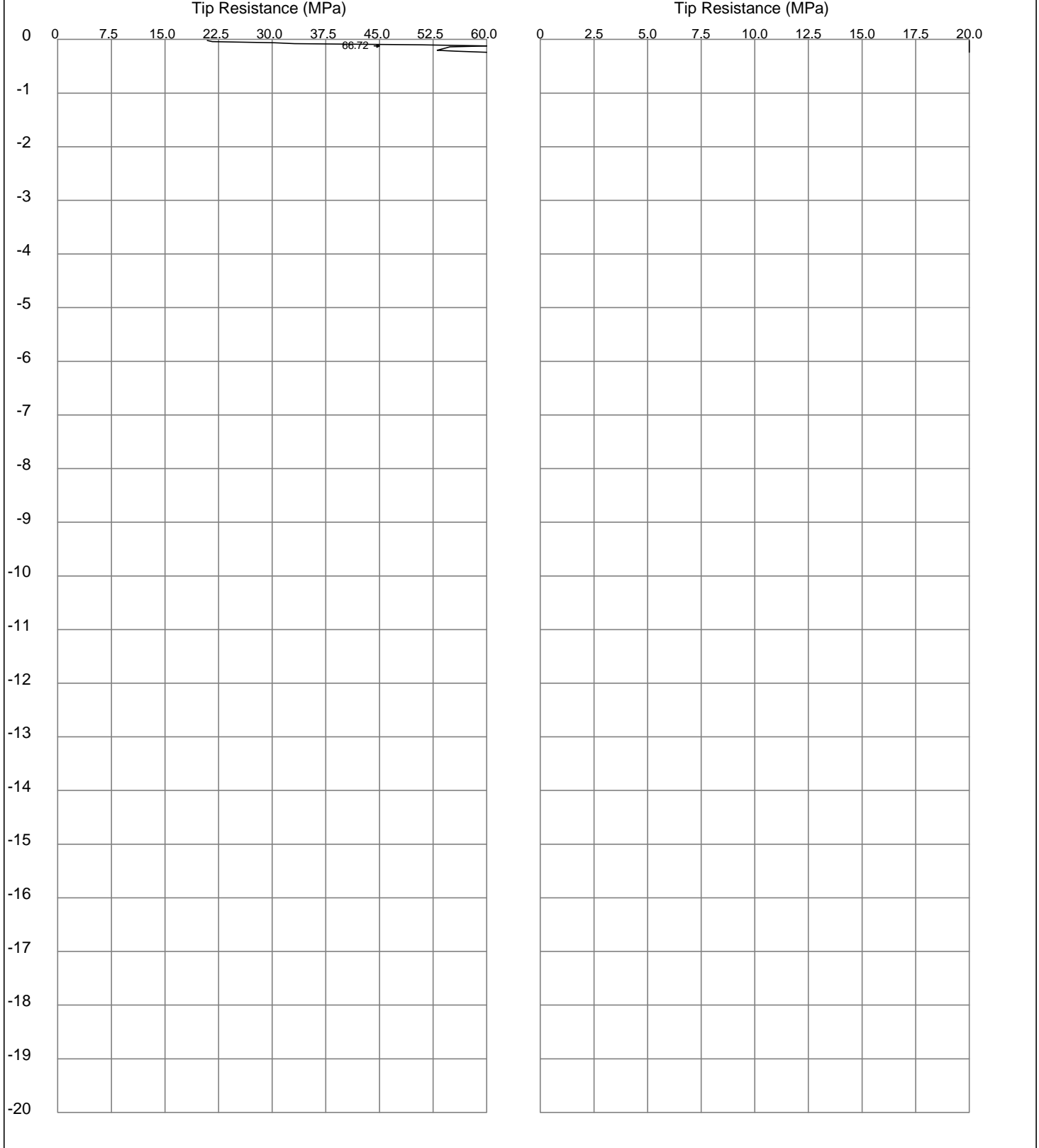


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 22	
R/L = 40.84m AHD	Hole open to depth (m) -	Total depth (m) 0.24	Operator Brad
Co ordinate: X= 391299.98 Y= 6480410.19	Groundwater Level (m) -	Cone No. 100709M	File 30
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



Telephone: (08) 9456 0595

TESTED IN ACCORDANCE WITH AS 1289.6.5.1999

FRICITION REDUCER USED -42 MM

PR001 - 20 TONNE REACTION FRAME PR002 - 16 TONNE REACTION FRAME

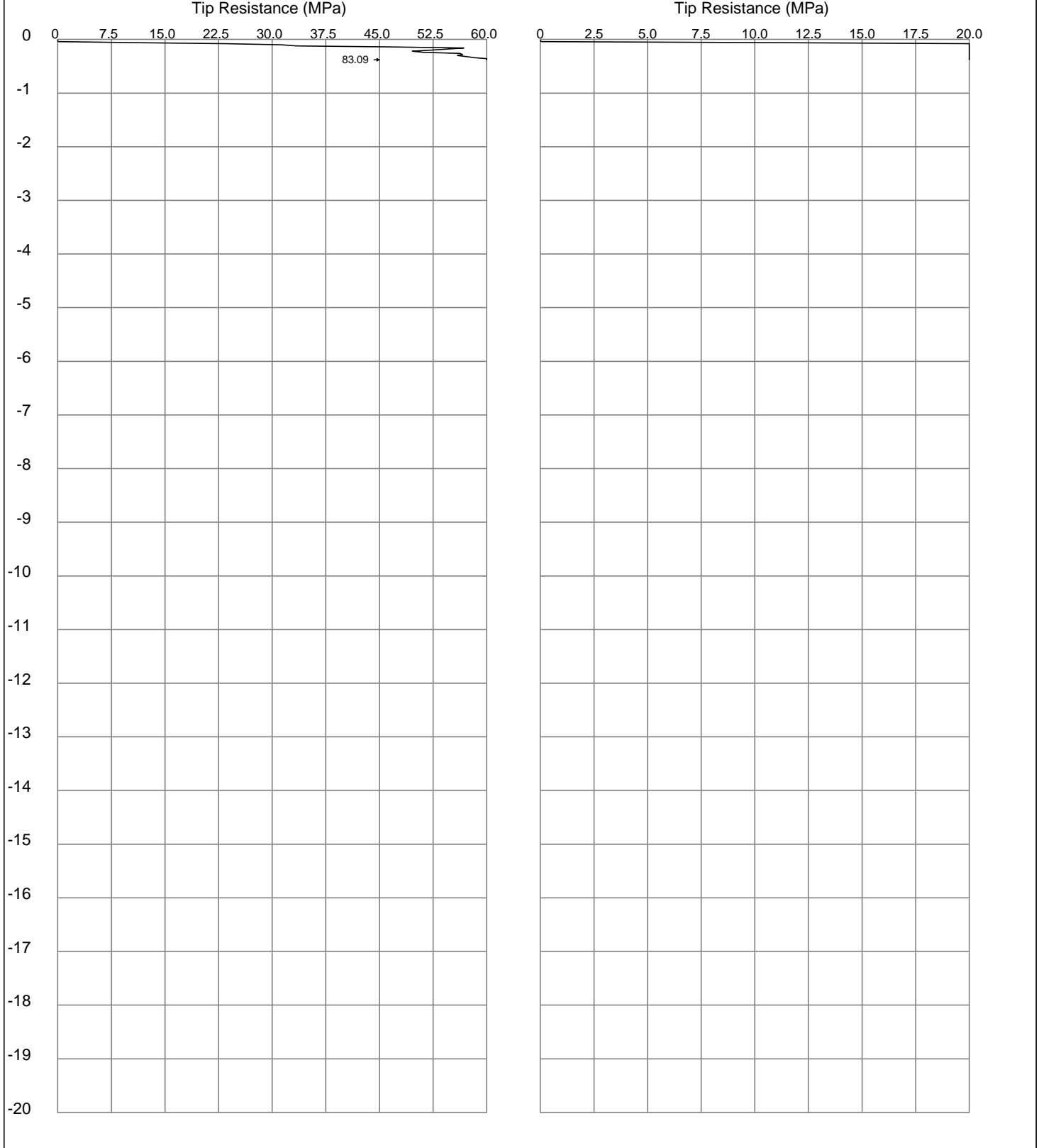


MECHANICAL CONE PENETRATION TEST

Contracted by **CMW Geosciences Pty Ltd**

Description **DRIVER RD LANDFILL**

Project no. 3925	Remarks Refusal criteria; Maximum cone resistance	Sounding No. CPT 22A	
R/L = 40.87m AHD	Hole open to depth (m) -	Total depth (m) 0.38	Operator Brad
Co ordinate: X= 391309.87 Y= 6480416.81	Groundwater Level (m) -	Cone No. 100709M	File 31
Co-ordinates in MGA94 Z50	Pre Drilled depth (m)	Probe Rig PR001	Date Completed 13-9-2017



Telephone: (08) 9456 0595

TESTED IN ACCORDANCE WITH AS 1289.6.5.1999

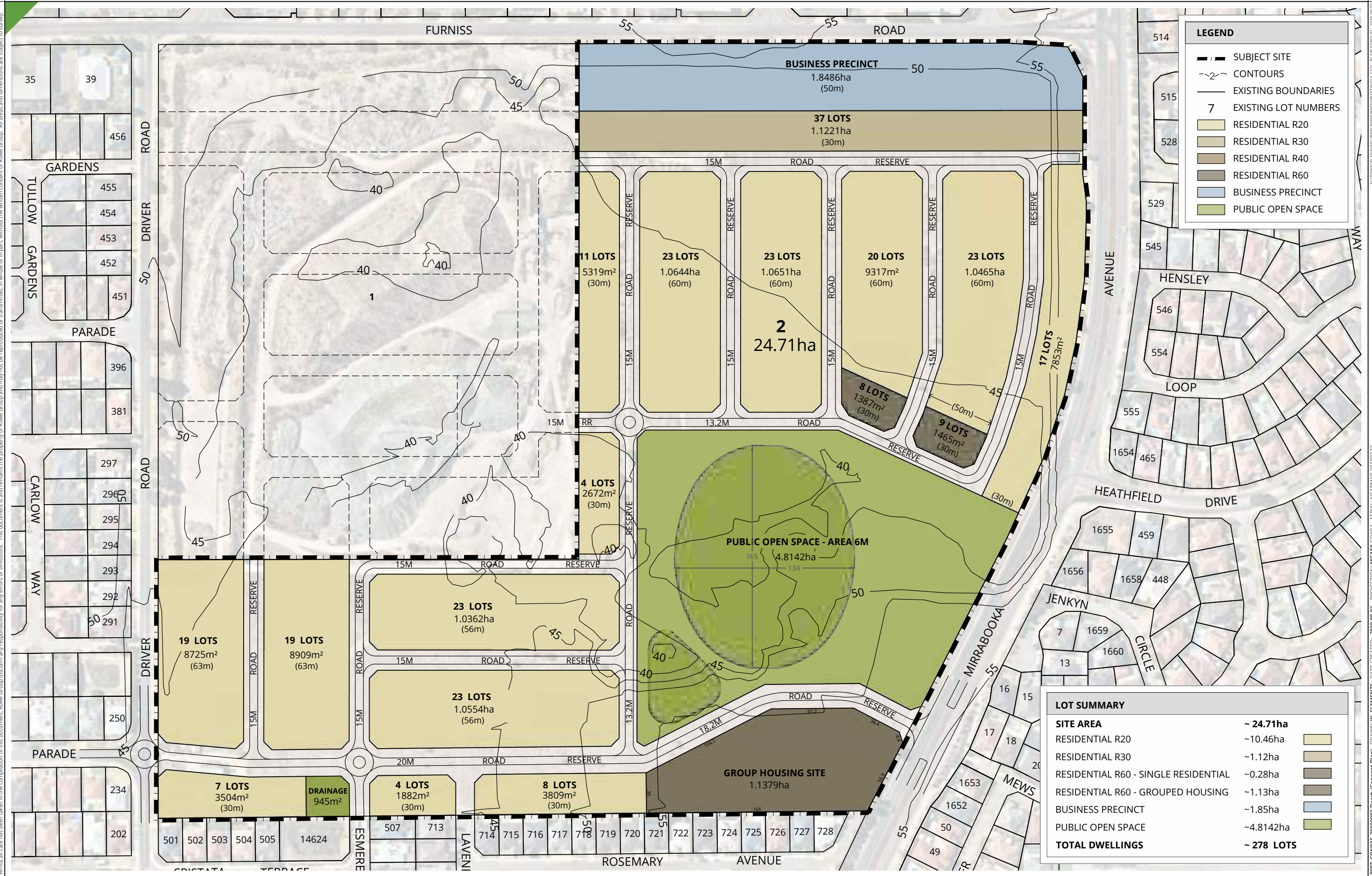
FRICITION REDUCER USED -42 MM

PR001 - 20 TONNE REACTION FRAME PR002 - 16 TONNE REACTION FRAME



Appendix C: Current Concept Subdivision Plan

While all care has been taken in the compilation of this document, Rowe Group disclaims any responsibility for any errors or omissions. This document is and remains the property of Rowe Group and may not be reproduced or transmitted, in whole or in part, without the written consent of Rowe Group. All areas and dimensions are subject to survey.



LEGEND

- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- 7 EXISTING LOT NUMBERS
- RESIDENTIAL R20
- RESIDENTIAL R30
- RESIDENTIAL R40
- RESIDENTIAL R60
- BUSINESS PRECINCT
- PUBLIC OPEN SPACE

LOT SUMMARY

SITE AREA	~ 24.71ha	
RESIDENTIAL R20	~10.46ha	
RESIDENTIAL R30	~1.12ha	
RESIDENTIAL R60 - SINGLE RESIDENTIAL	~0.28ha	
RESIDENTIAL R60 - GROUPED HOUSING	~1.13ha	
BUSINESS PRECINCT	~1.85ha	
PUBLIC OPEN SPACE	~4.8142ha	
TOTAL DWELLINGS	~ 278 LOTS	

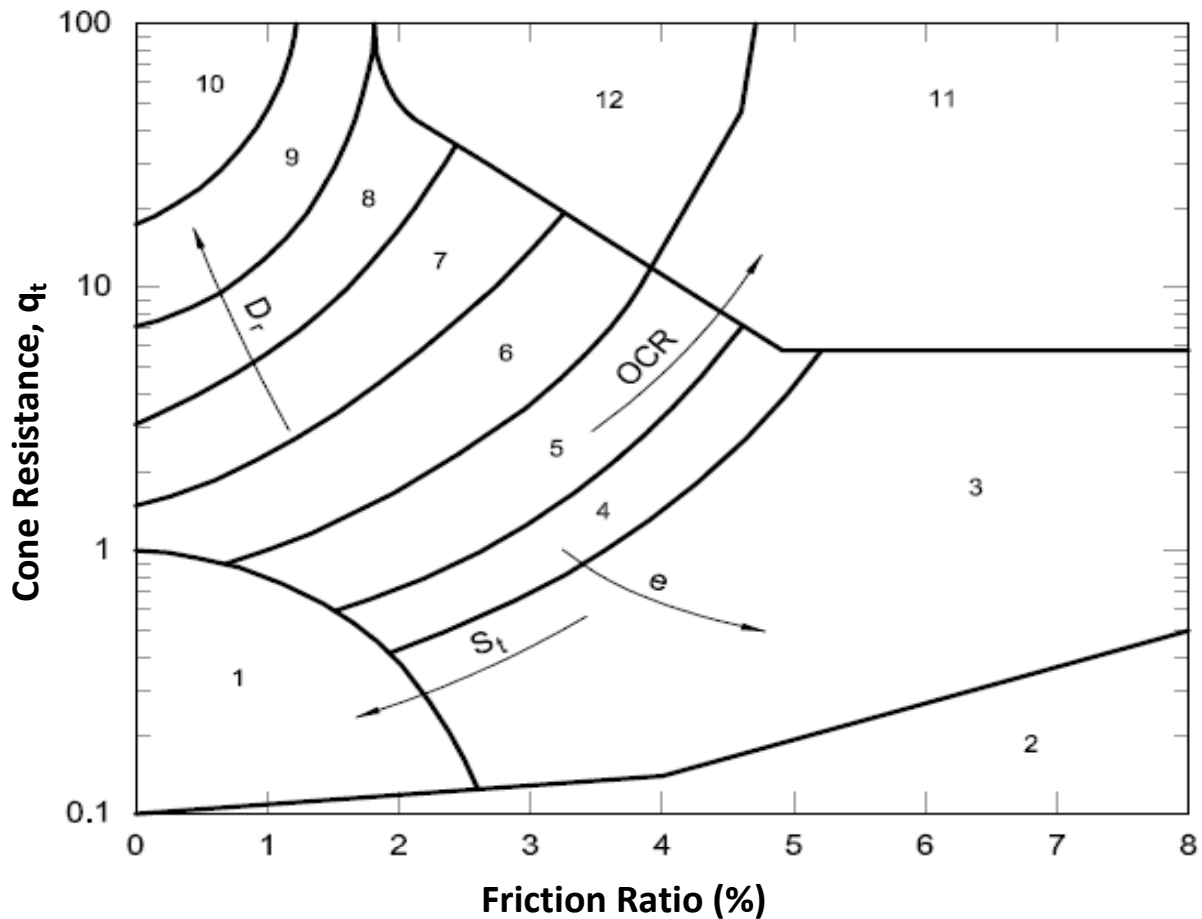
CONCEPT PLAN
 LOT 2 (No. 26) DRIVER ROAD
 DARCH

SCALE @ A3: 1:2500
8997-CON-02-F

8997_CON02_20190902_Darch (Concept Plan) - DRAWN: W. CLEMENTS - DATE CREATED: 2019.09.02 - PROJECTION: MGA50 GD94 - AERIAL: NEARMAP 20190223



Appendix D: Cone Penetration Test Results



DEFINITIONS

- q_t : Cone tip resistance corrected for pore water pressure
 S_t : Sensitivity
 e : Void ratio
 D_r : Relative density
 OCR : Overconsolidation ratio
 OC : Overconsolidated

SOIL BEHAVIOUR TYPE ZONES

- | | |
|------------------------------|--|
| 1. Sensitive fine grained | 7. Silty sand to sandy silt |
| 2. Organic material | 8. Sand to silty sand |
| 3. Clay | 9. Sand |
| 4. Silty clay to clay | 10. Gravelly sand to sand |
| 5. Clayey silt to silty clay | 11. Very stiff fine grained material (OC/cemented) |
| 6. Sandy silt to clayey silt | 12. Sand to clayey sand (OC/cemented) |

NOTES

- A. Some overlap in type zones is expected
 B. Local correlations are preferred and may indicate soil type boundaries that are different from those shown above

Reference: Robertson, P.K., Campanella, R.G., Gillespie, D. and Grieg, J. (1986) "Use of Piezometer Cone Data". Proceedings of the ASCE Speciality Conference In Situ '86: Use of In Situ Tests in Geotechnical Engineering, Blacksburg, pp 1263-80, American Society of Civil Engineers (ASCE)



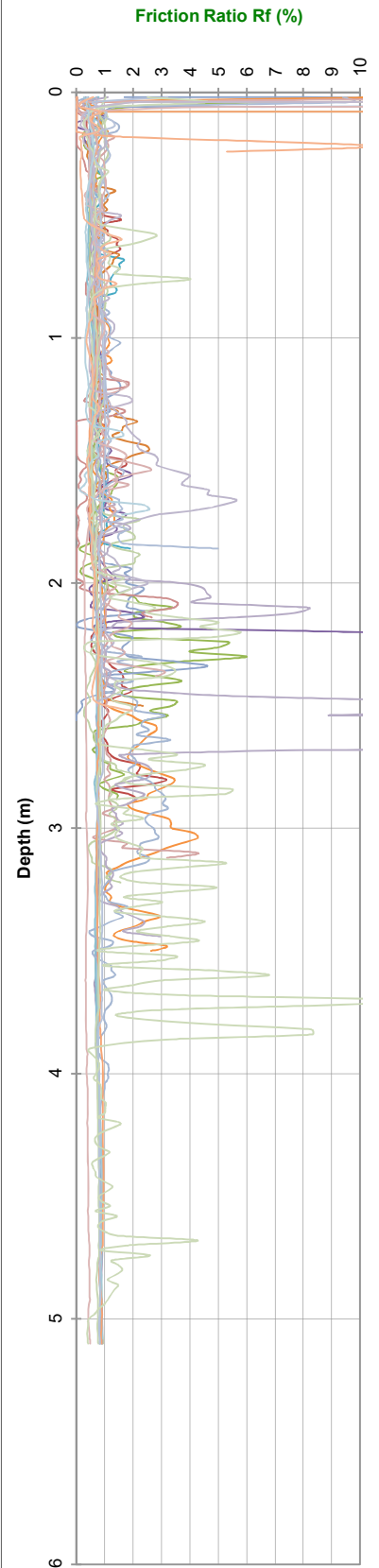
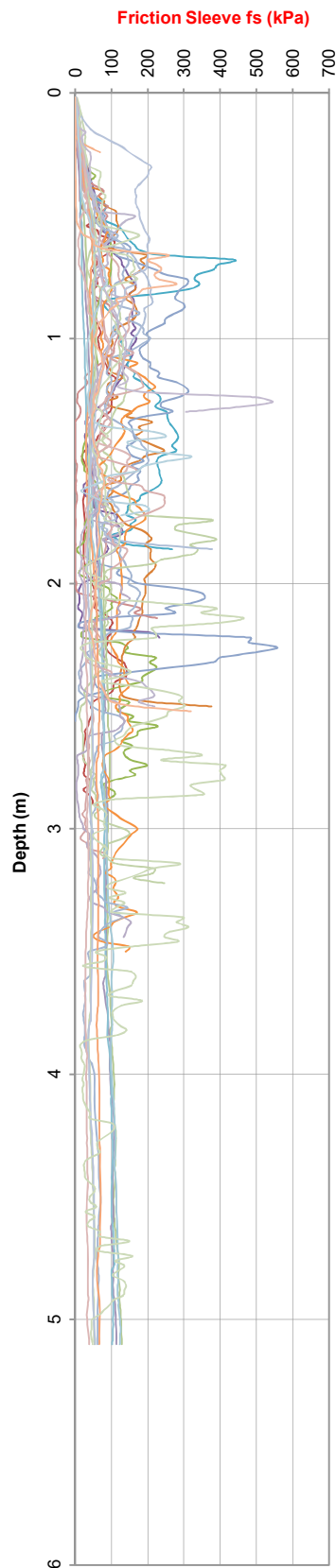
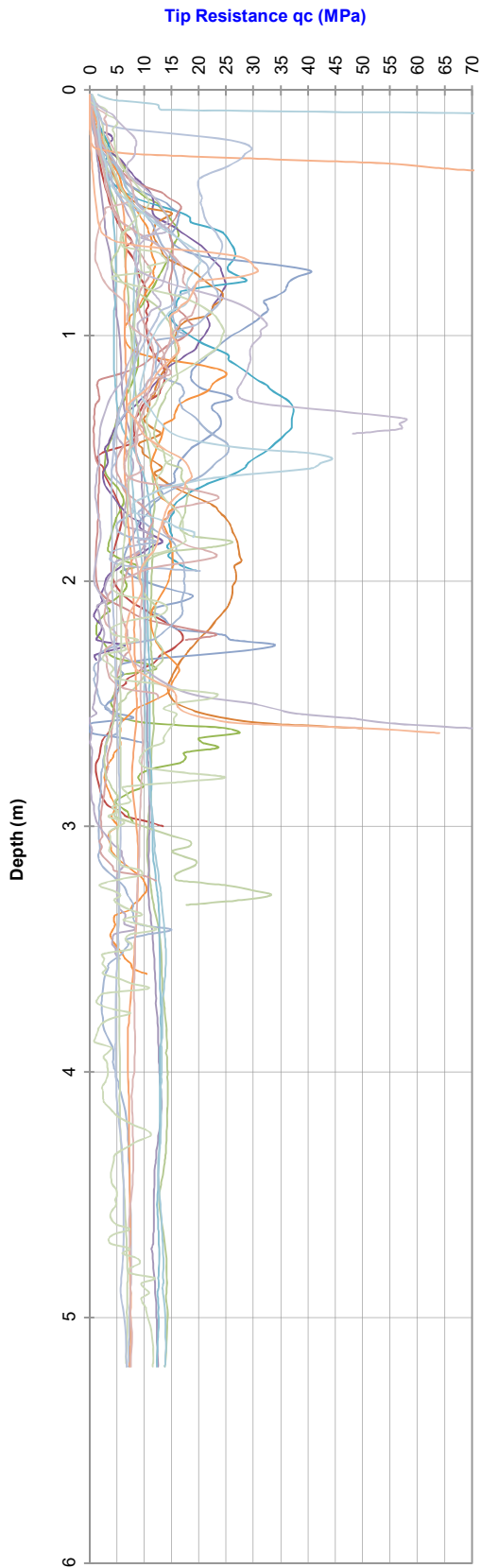
CONE PENETRATION TESTING (CPT) SOIL TYPE INTERPRETATION

ELECTRIC FRICTION-CONE PENETROMETER

CLIENT: Parcel Property
PROJECT: Proposed Mixed-Use Development
LOCATION: 26 Driver Road, Darch

Job No.: J1801113
Date/s: 21/05/2019

ALL DATA



ELECTRIC FRICTION-CONE PENETROMETER

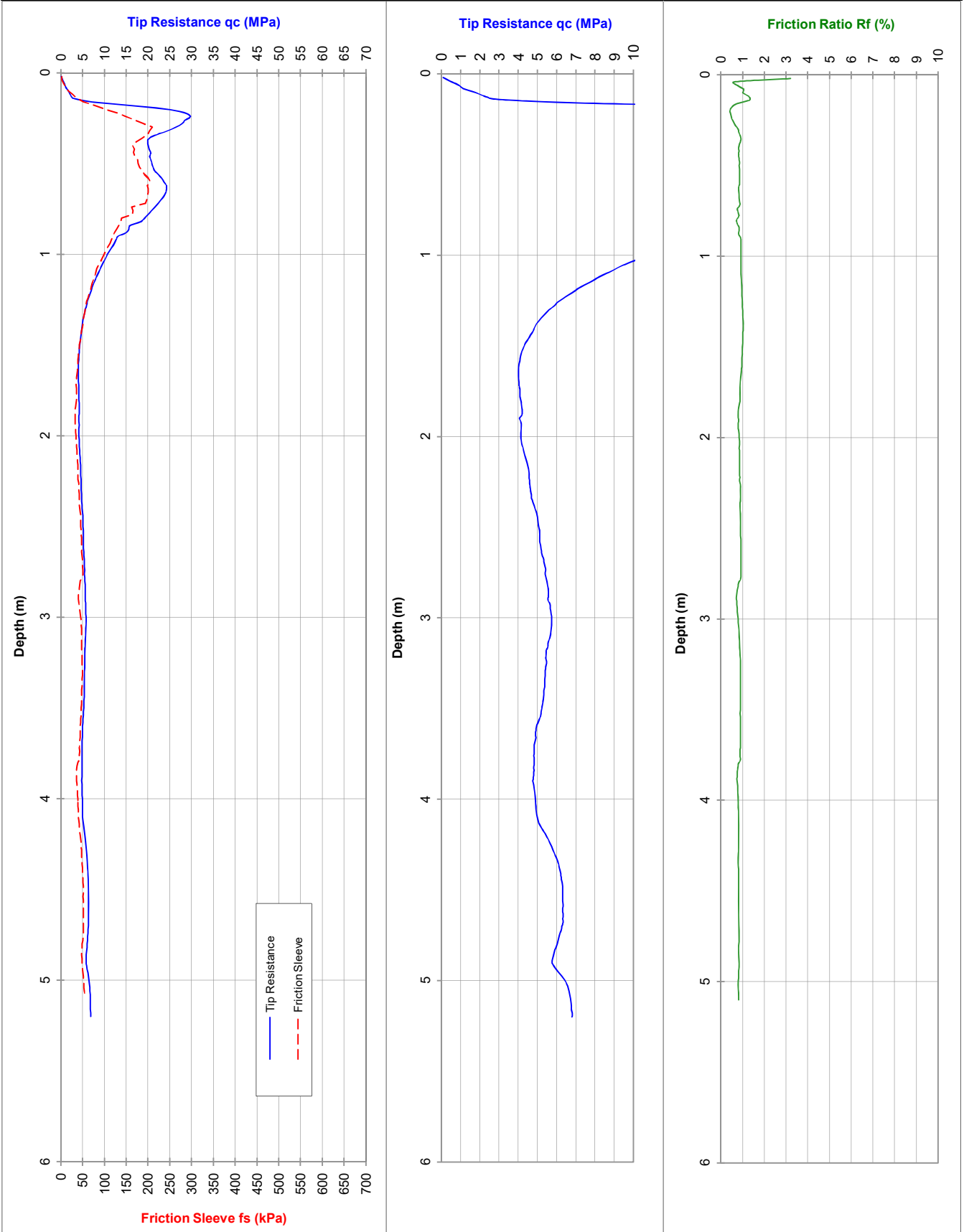
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 01

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0620M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

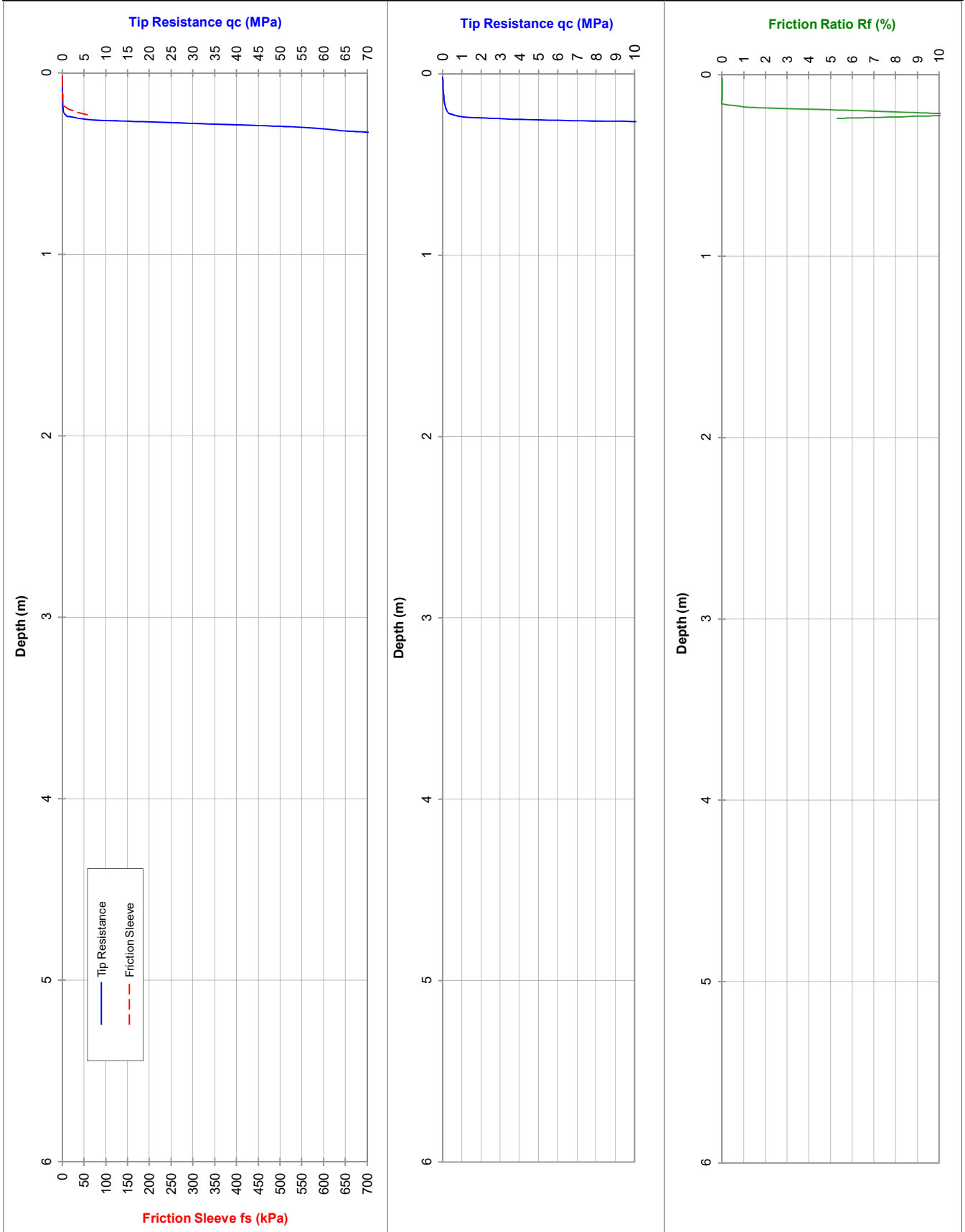
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 02

21-May-19



ELECTRIC FRICTION-CONE PENETROMETER

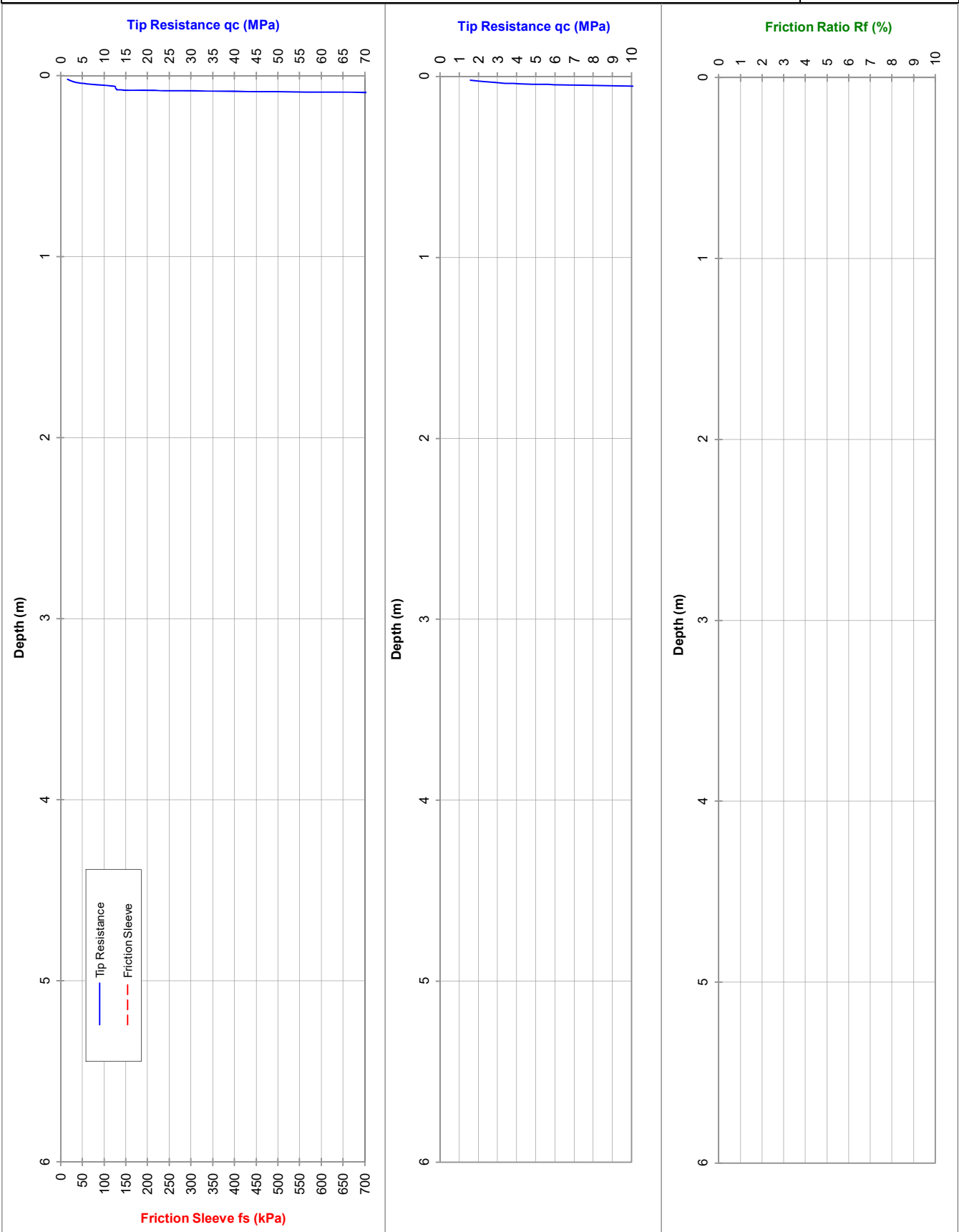
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 03

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 0.1

Dummy probe to (m):

Refusal: 100MPa

Cone I.D.: EC20

File: GL0618M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

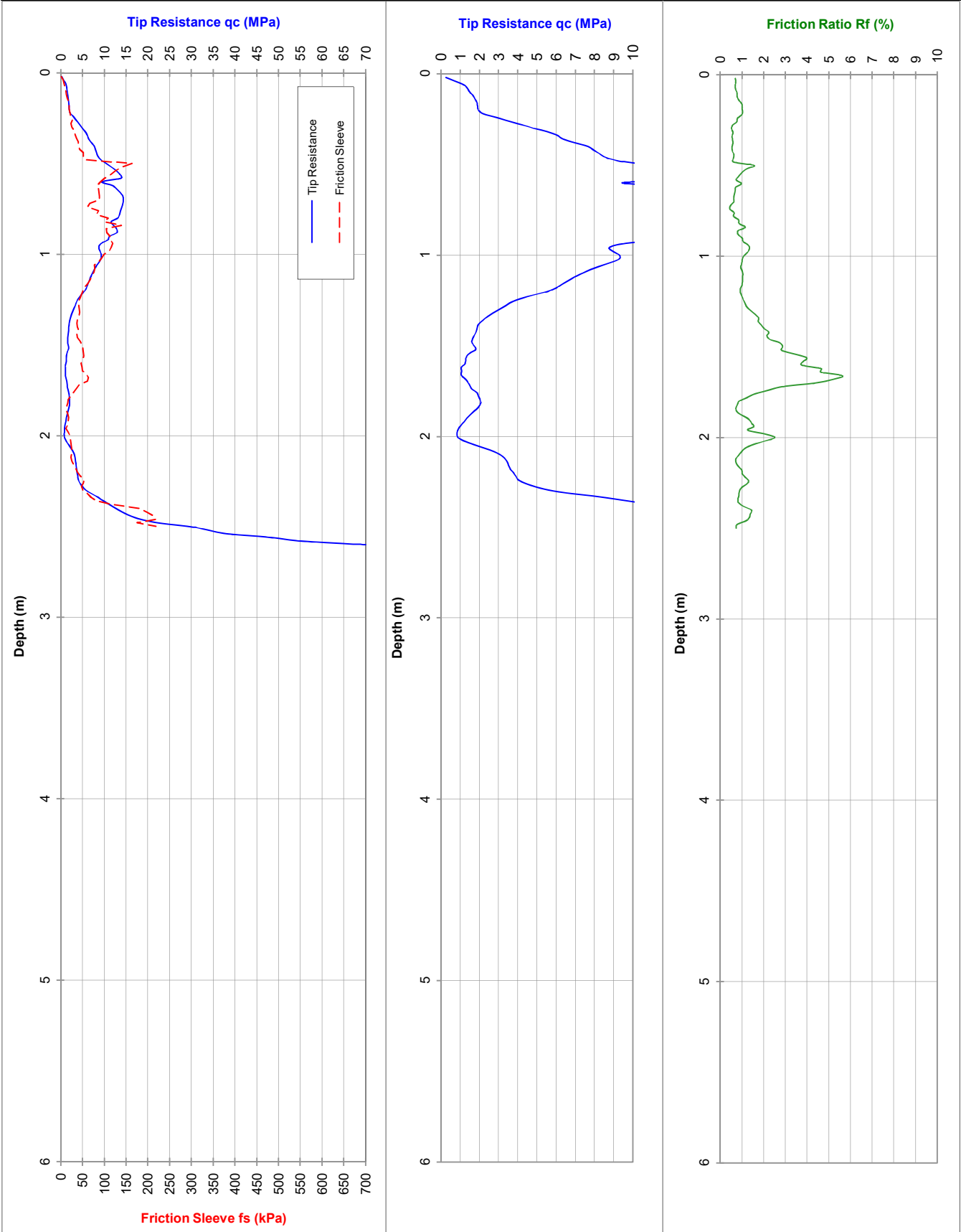
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 04

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: 70MPa

Cone I.D.: EC20

File: GL0617M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

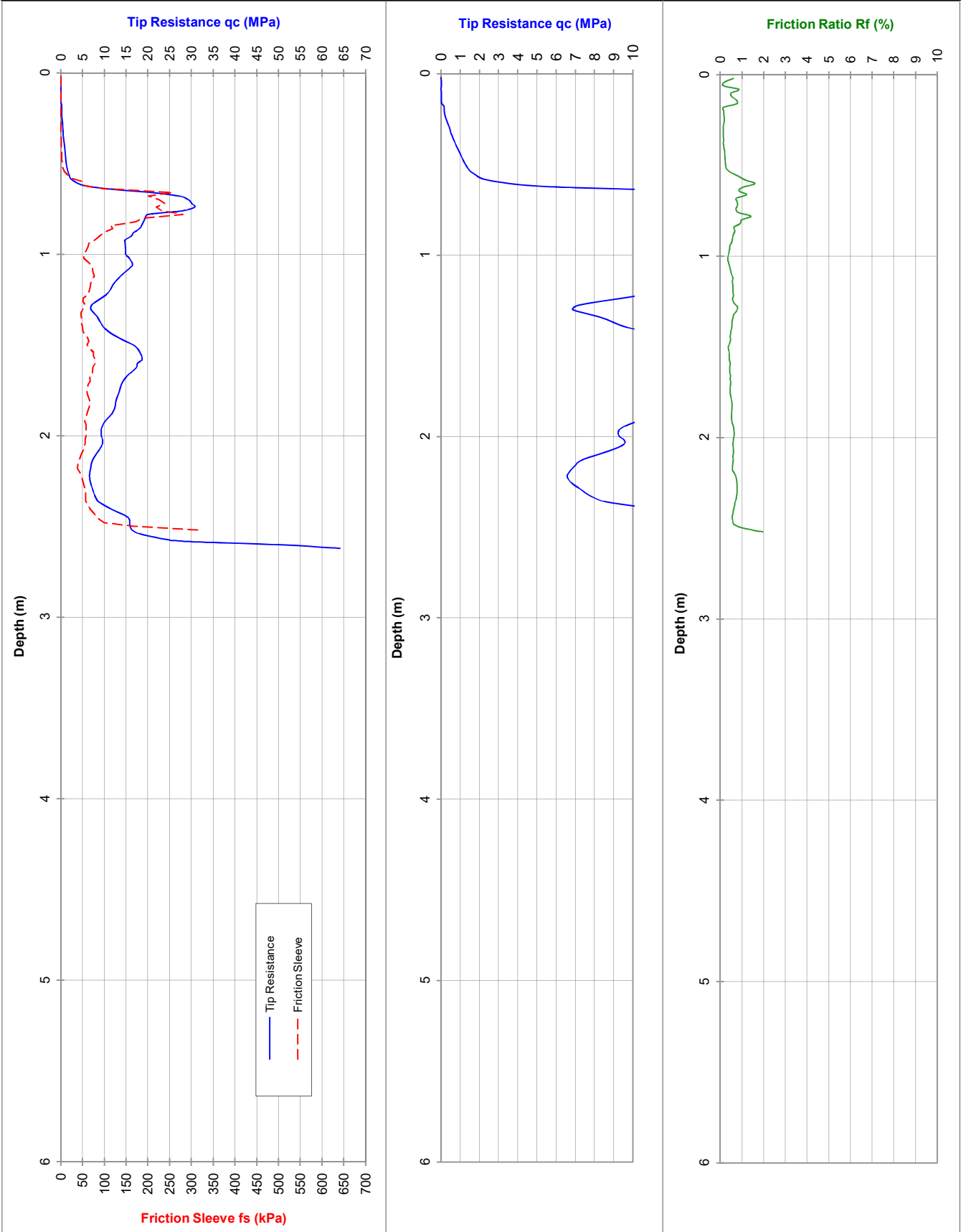
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 05

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: 64MPa

Cone I.D.: EC40

File: GL1080T

Rig Type: 7 tonne Track

ELECTRIC FRICTION-CONE PENETROMETER

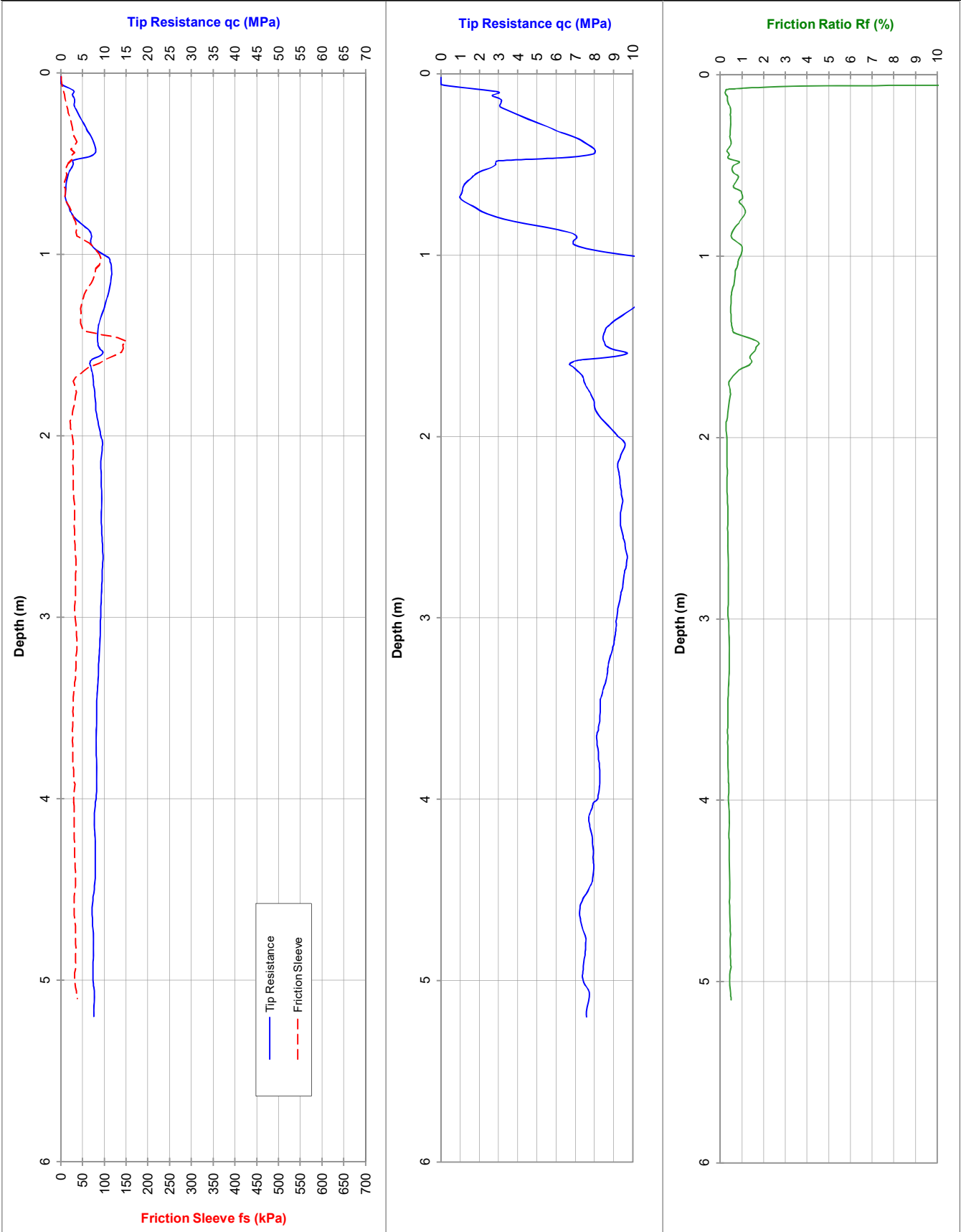
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 06

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL1076TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

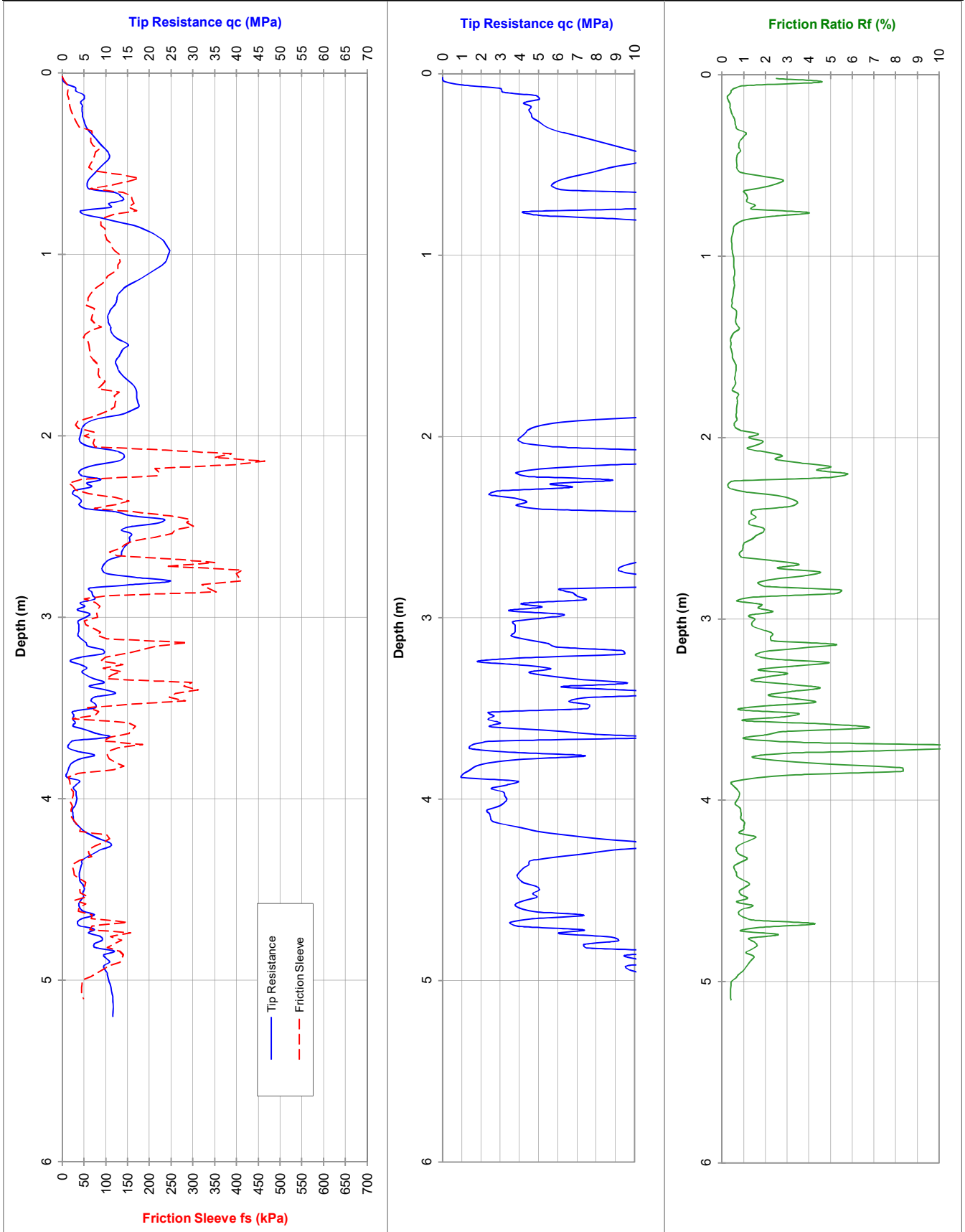
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 07

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.5

Dummy probe to (m):

Refusal:

Cone I.D.: EC40

File: GL1077TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

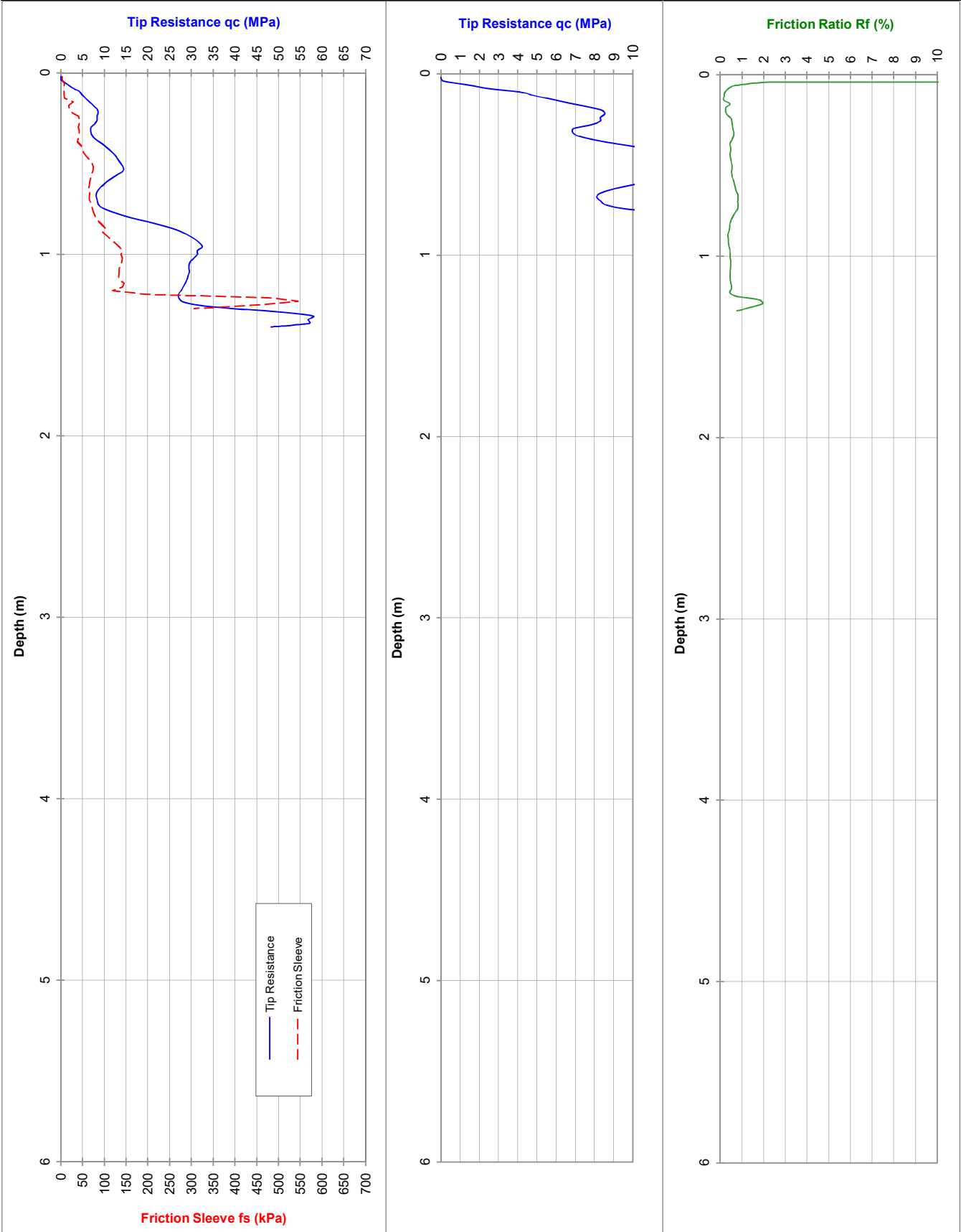
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 08

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL1078TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

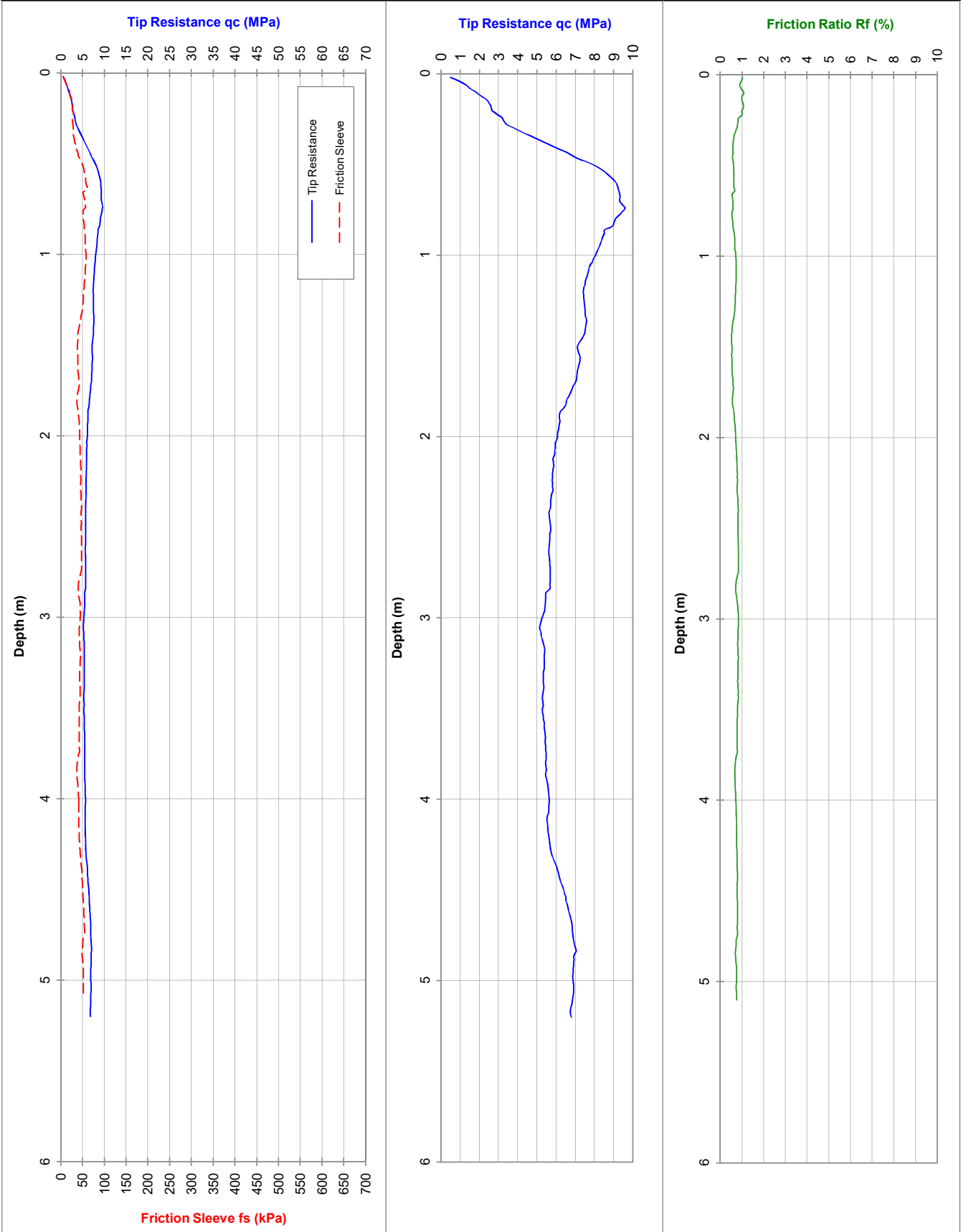
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 09

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0616M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

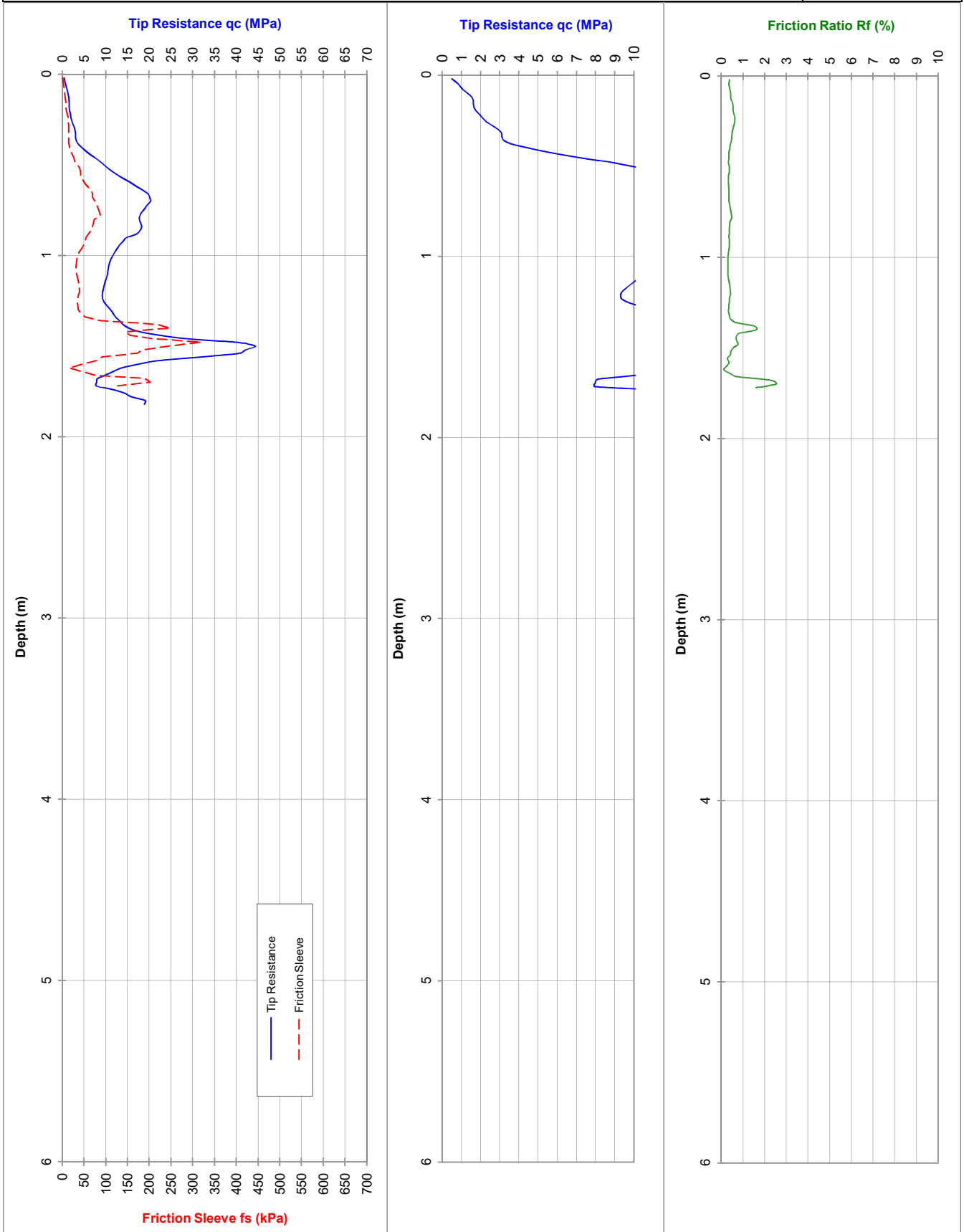
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 10

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.3

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC40

File: GL1079TT

Rig Type: 22 tonne Track-Truck

ELECTRIC FRICTION-CONE PENETROMETER

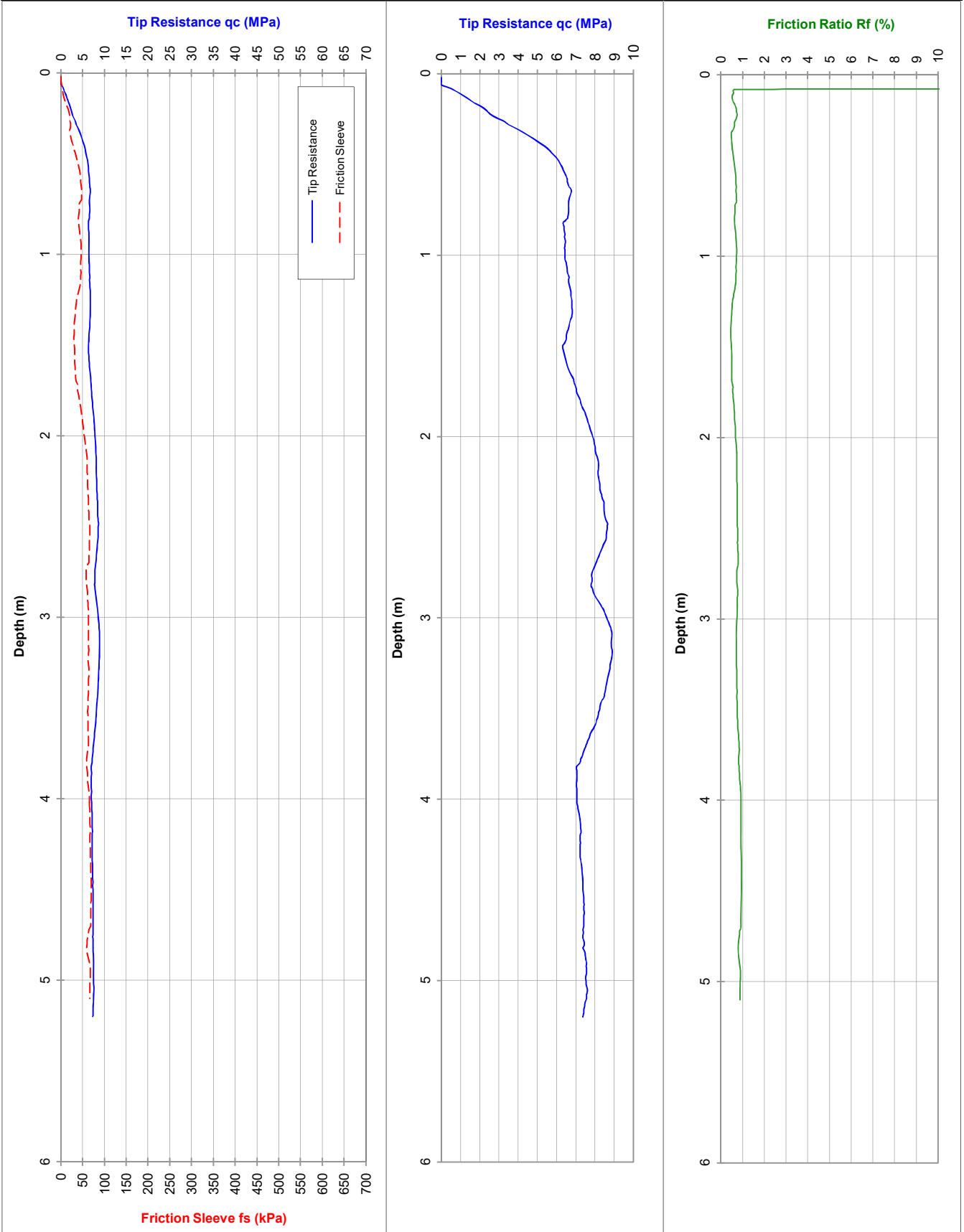
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 11

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0613M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

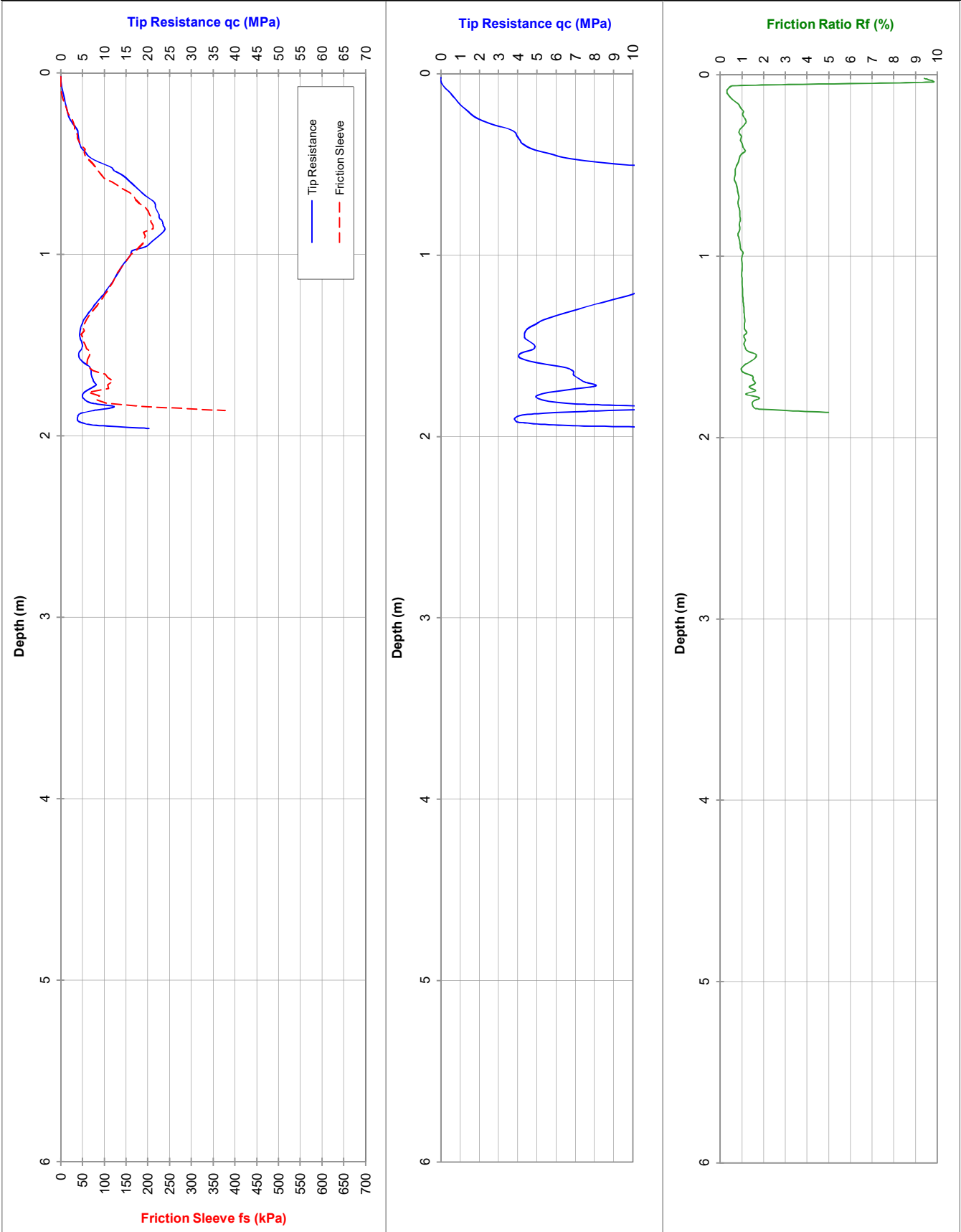
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 12

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0614M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

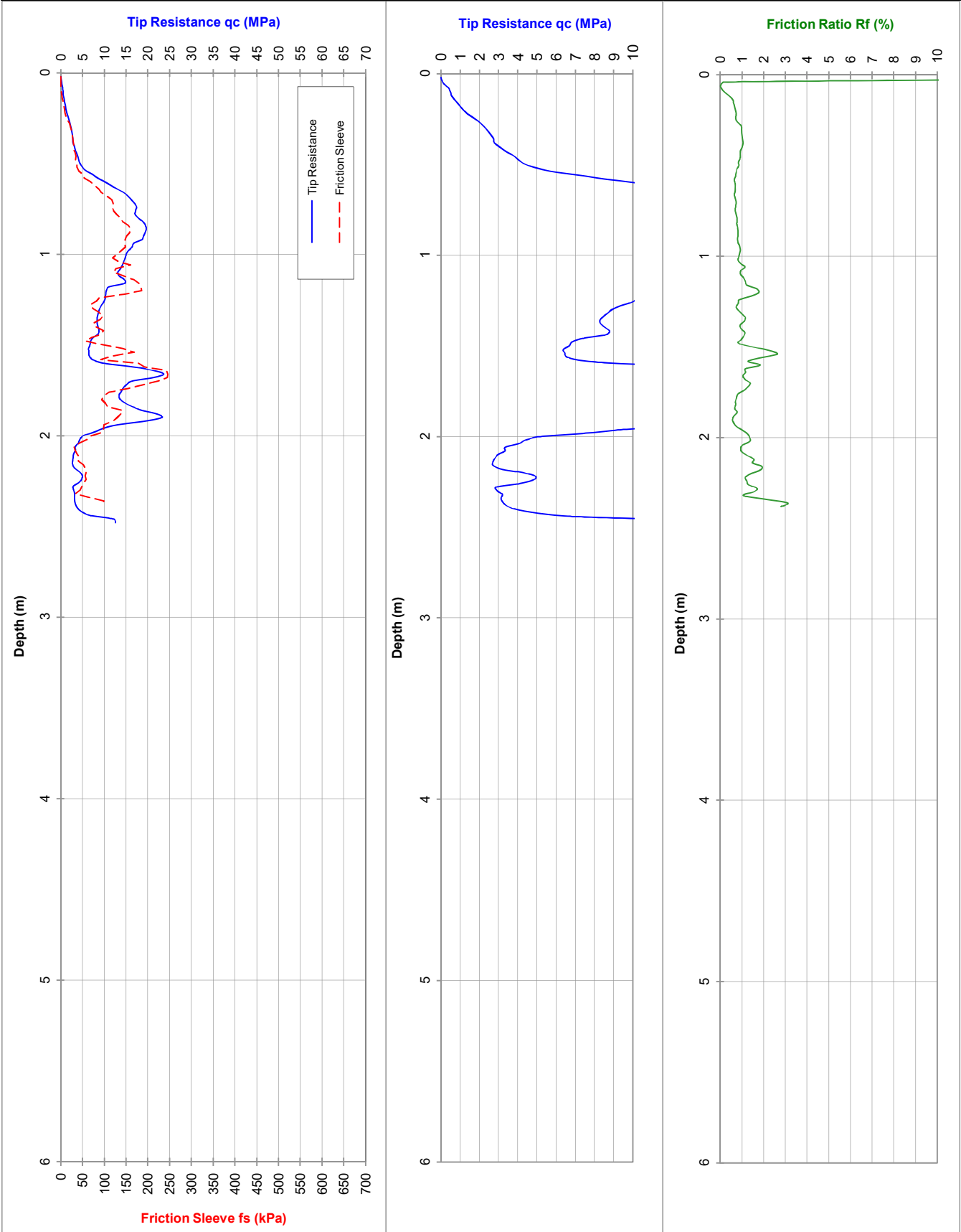
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 13

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.4

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0615M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

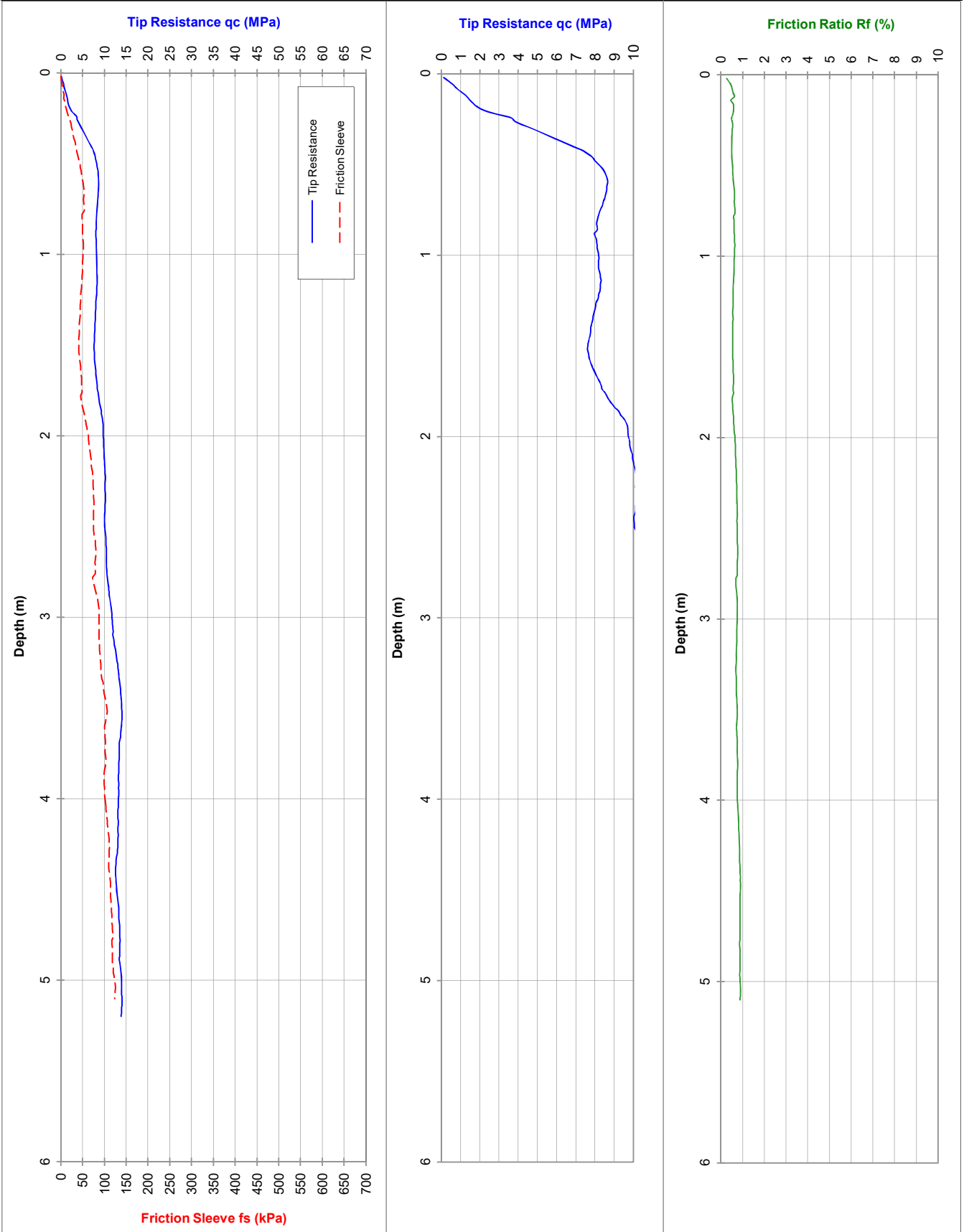
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 14

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0612M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

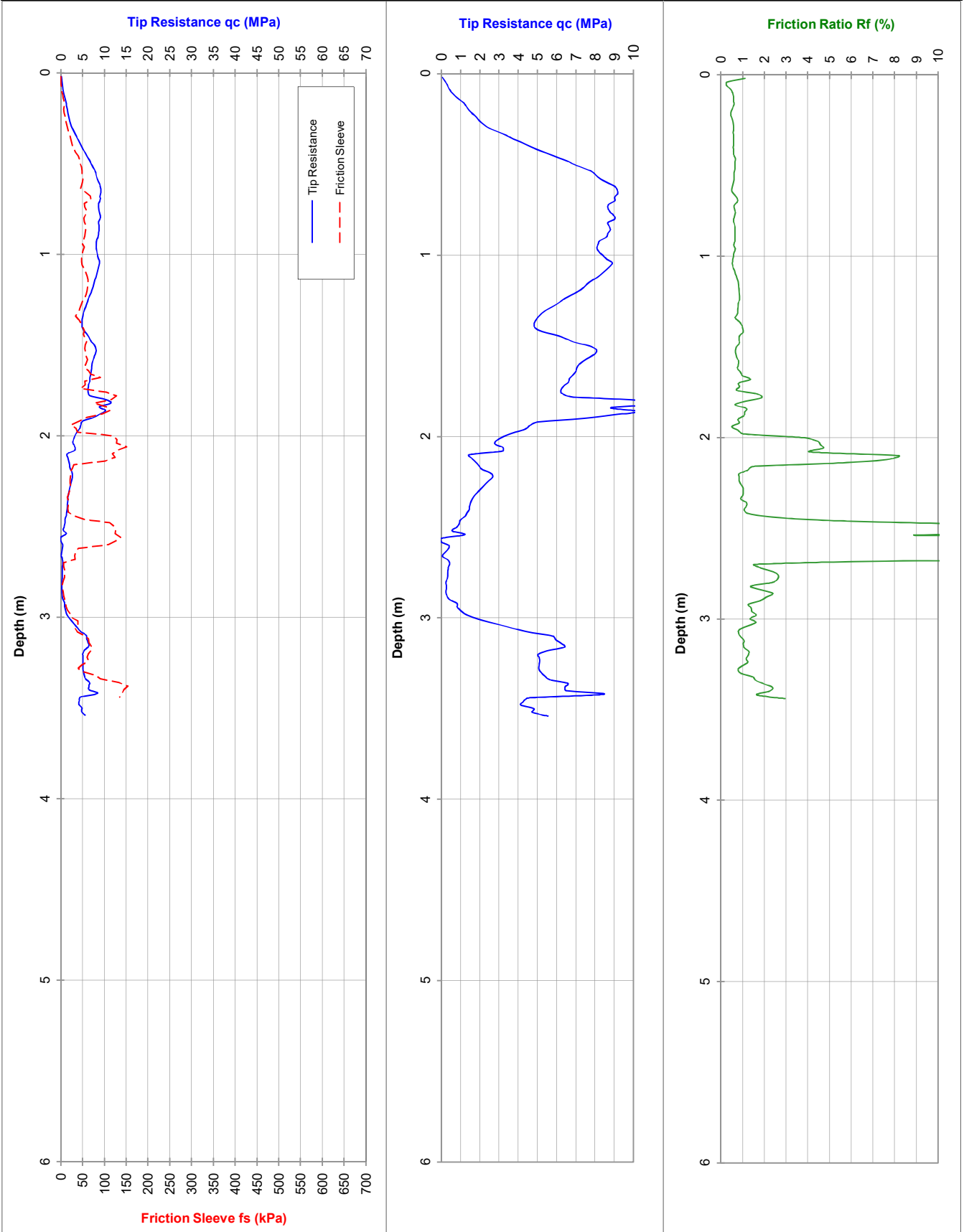
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 15

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.0

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0611M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

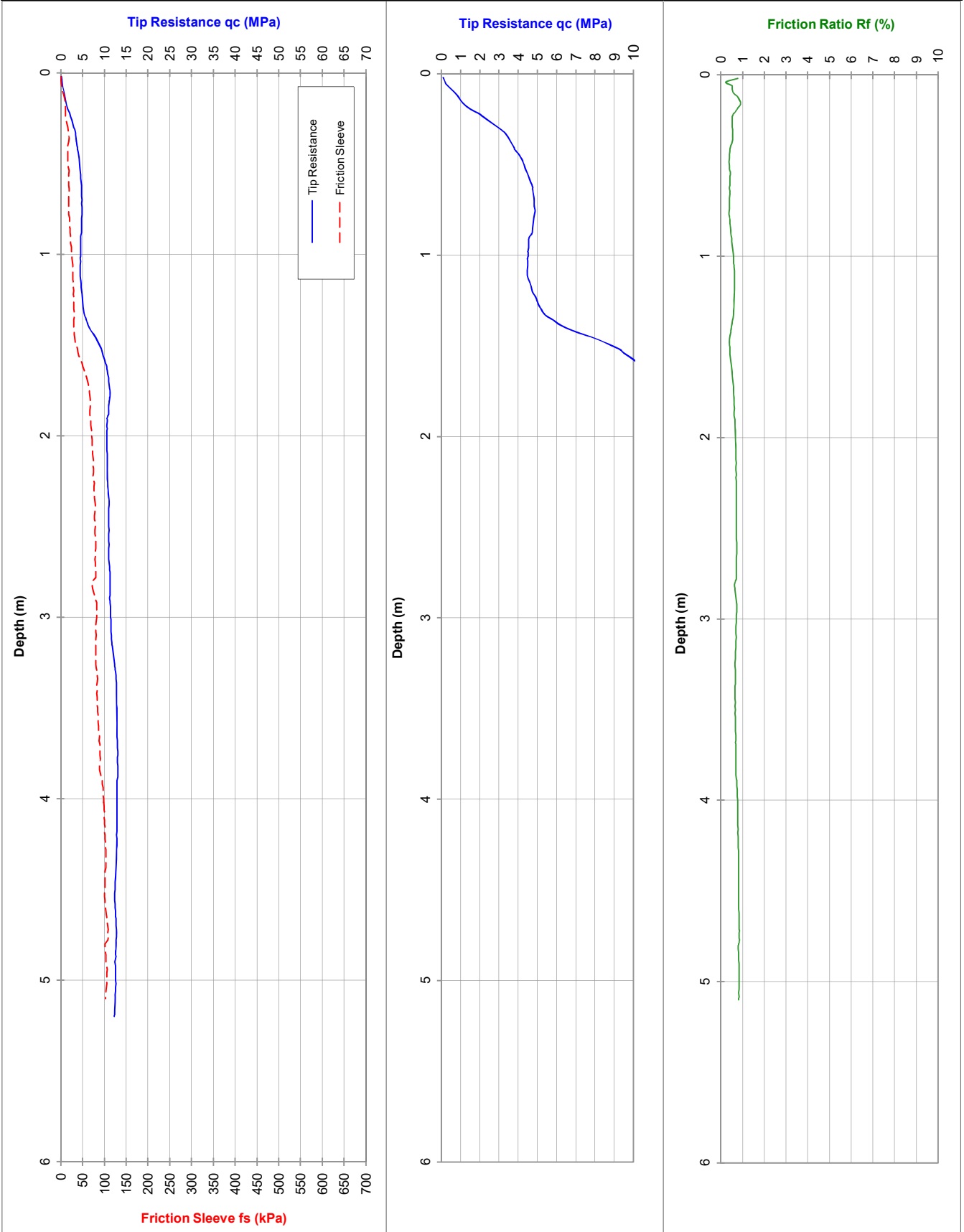
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 16

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.1

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0606M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

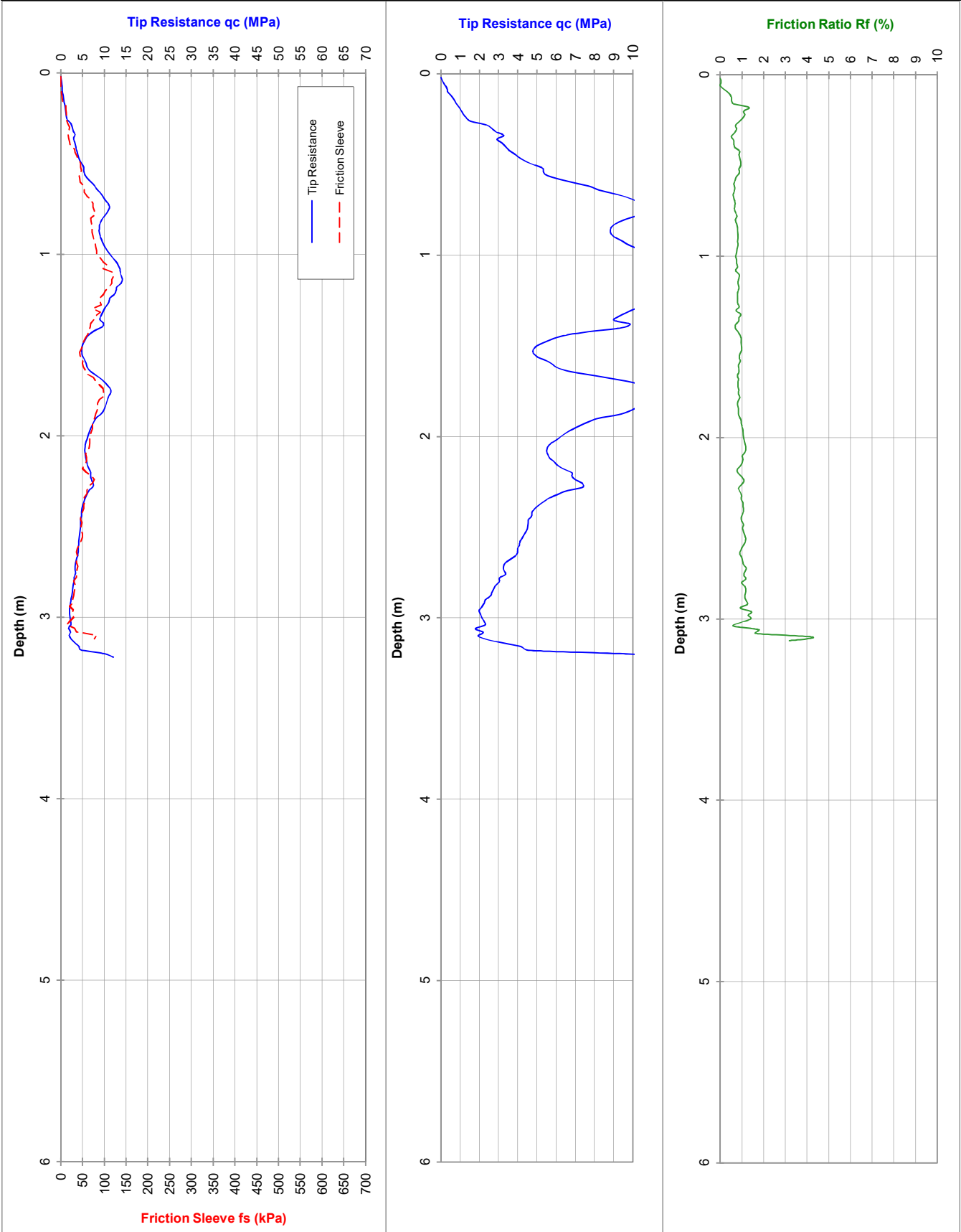
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 17

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0609M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

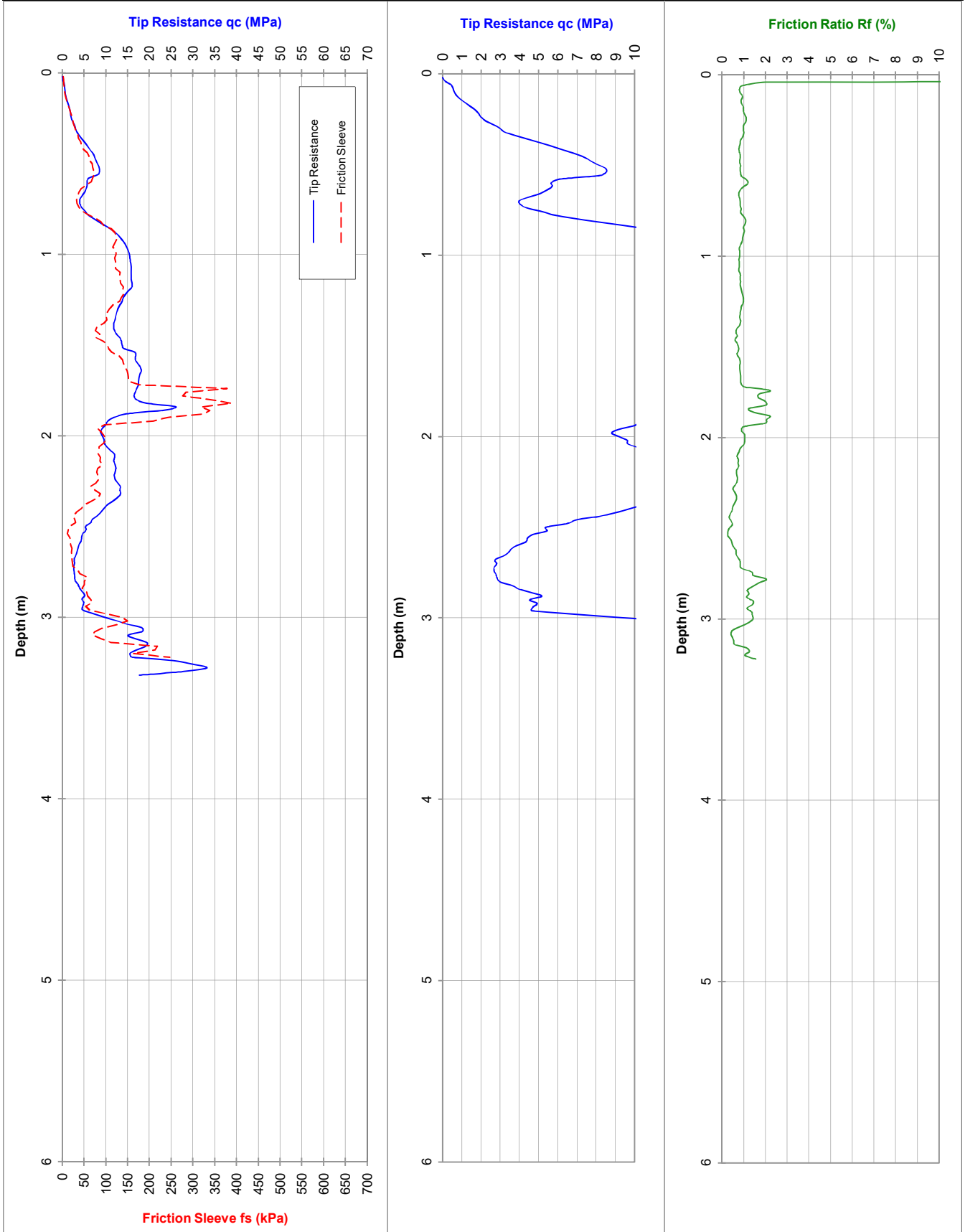
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 18

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.2

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0610M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

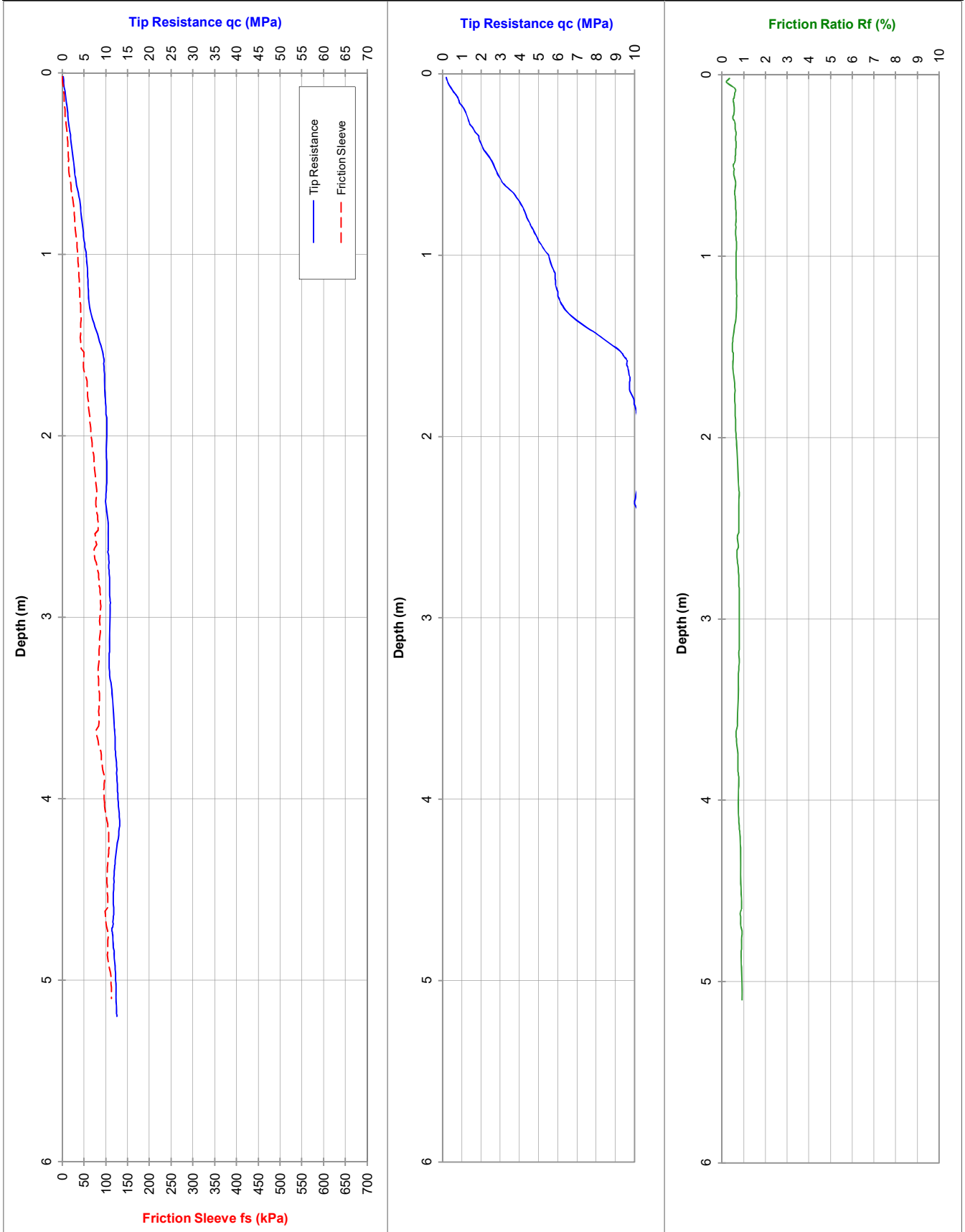
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 19

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 3.9

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0605M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

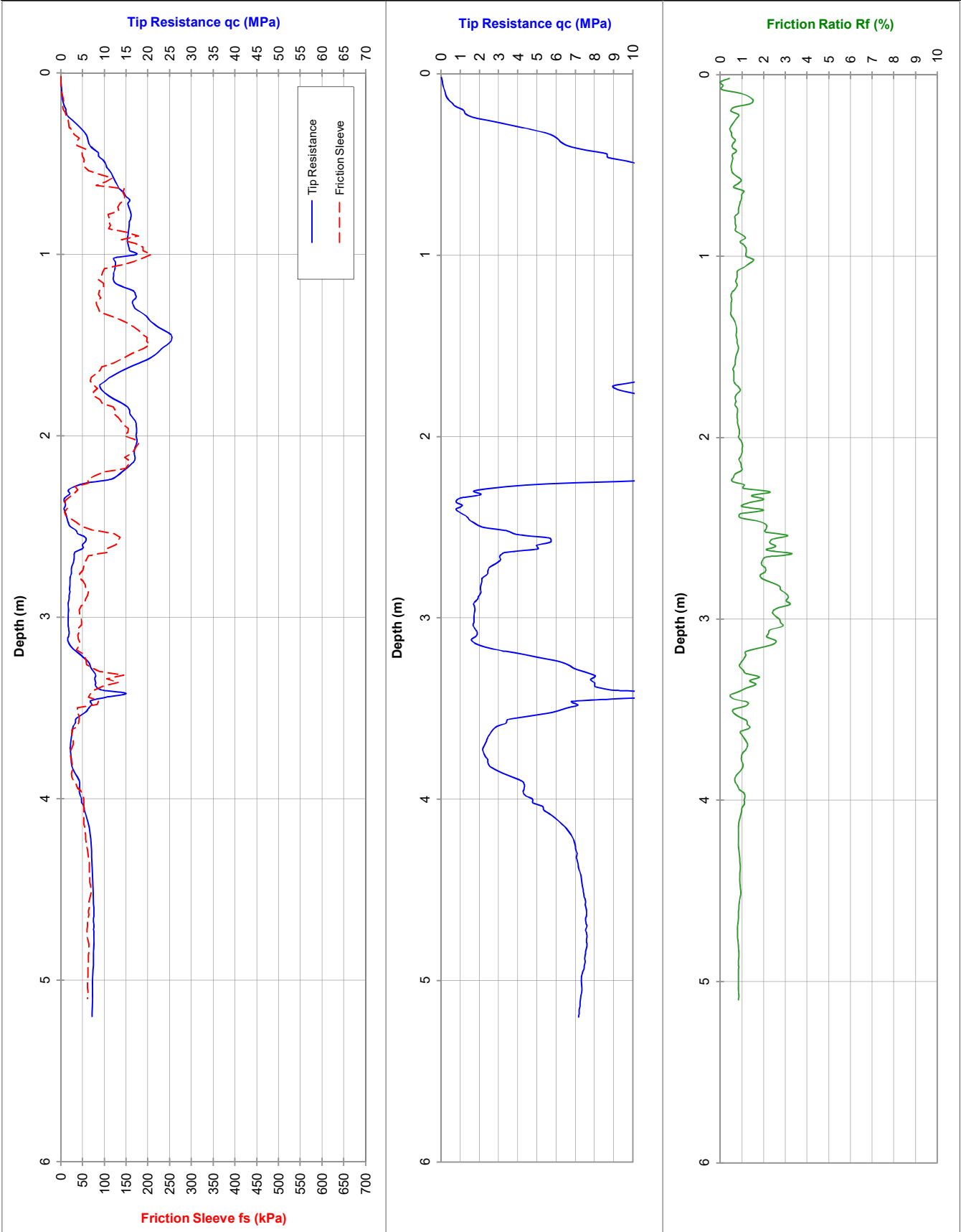
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 20

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.0

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0608M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

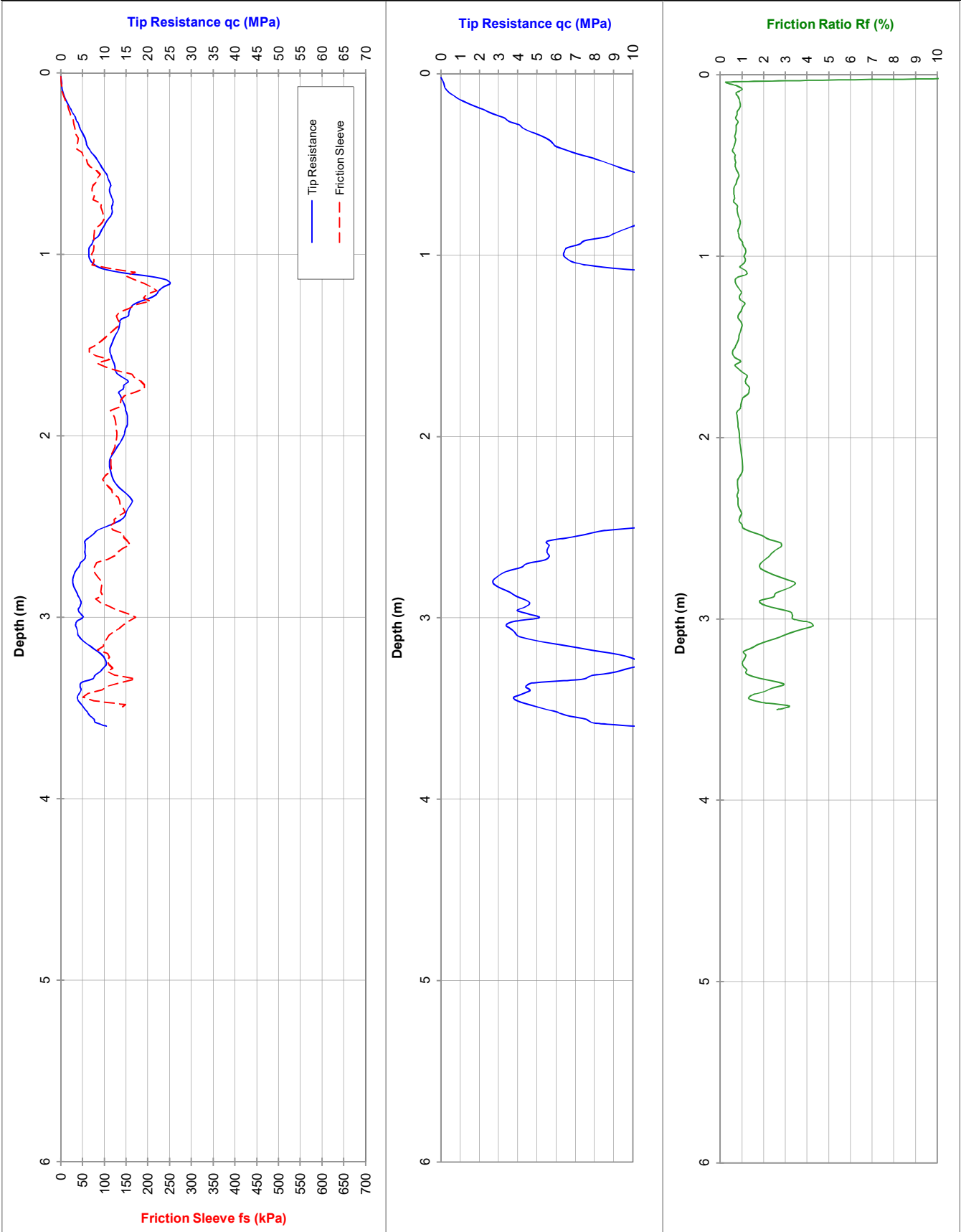
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 21

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC20

File: GL0607M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

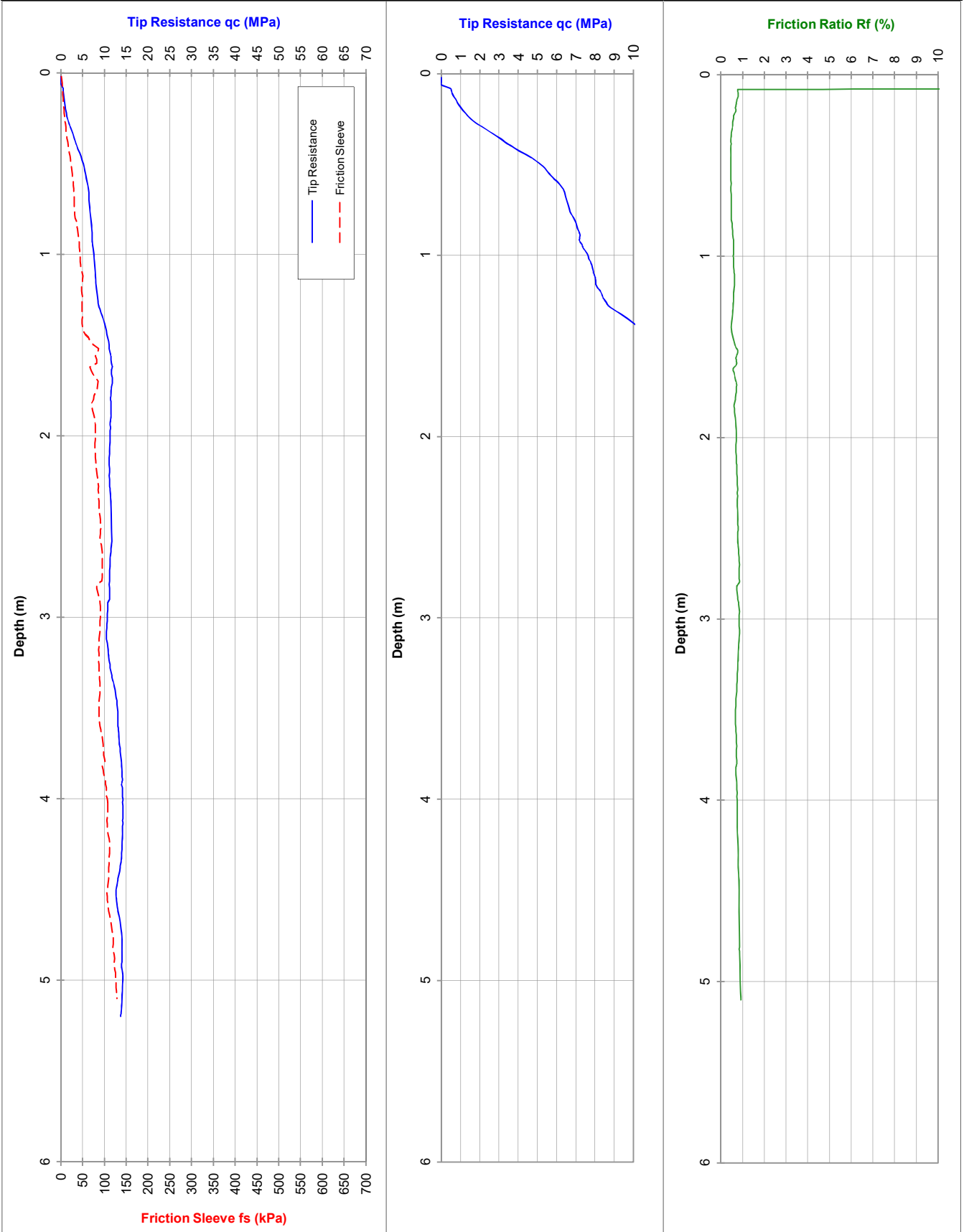
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 22

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 4.2

Dummy probe to (m):

Refusal:

Cone I.D.: EC20

File: GL0604M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

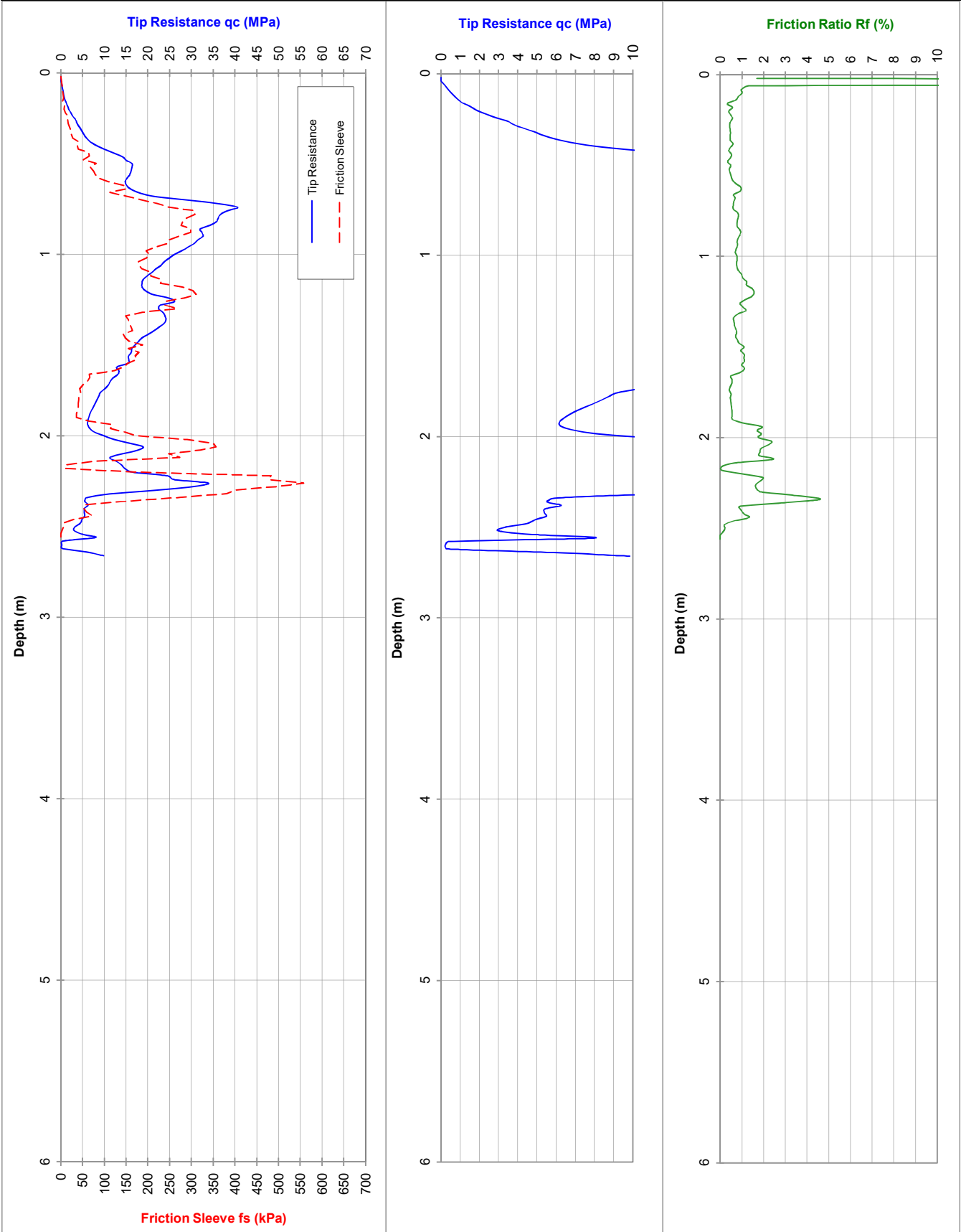
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 23

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.6

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0602M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

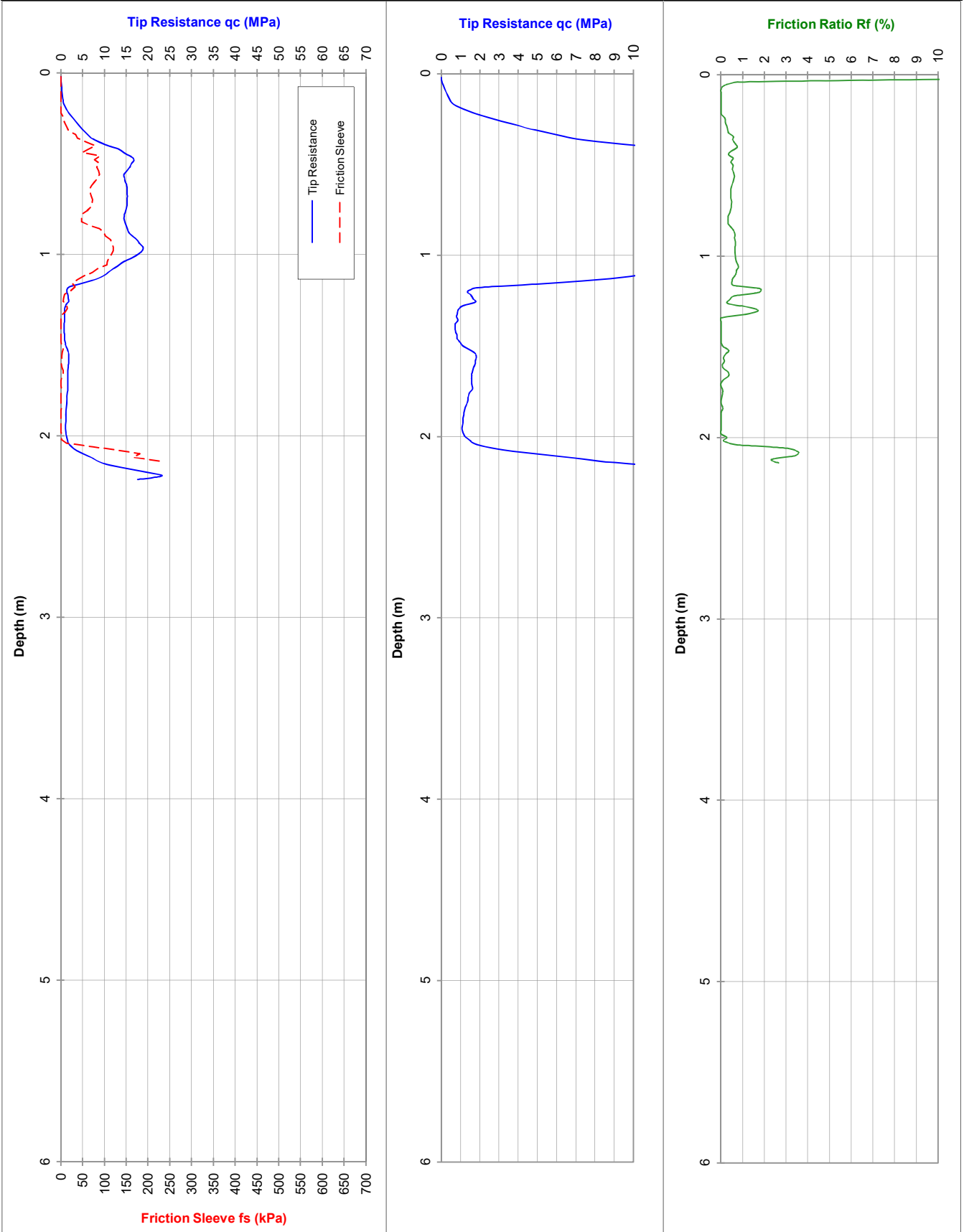
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 24

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): -
 Dummy probe to (m):
 Refusal: Inclination

Cone I.D.: EC38

File: GL0603M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

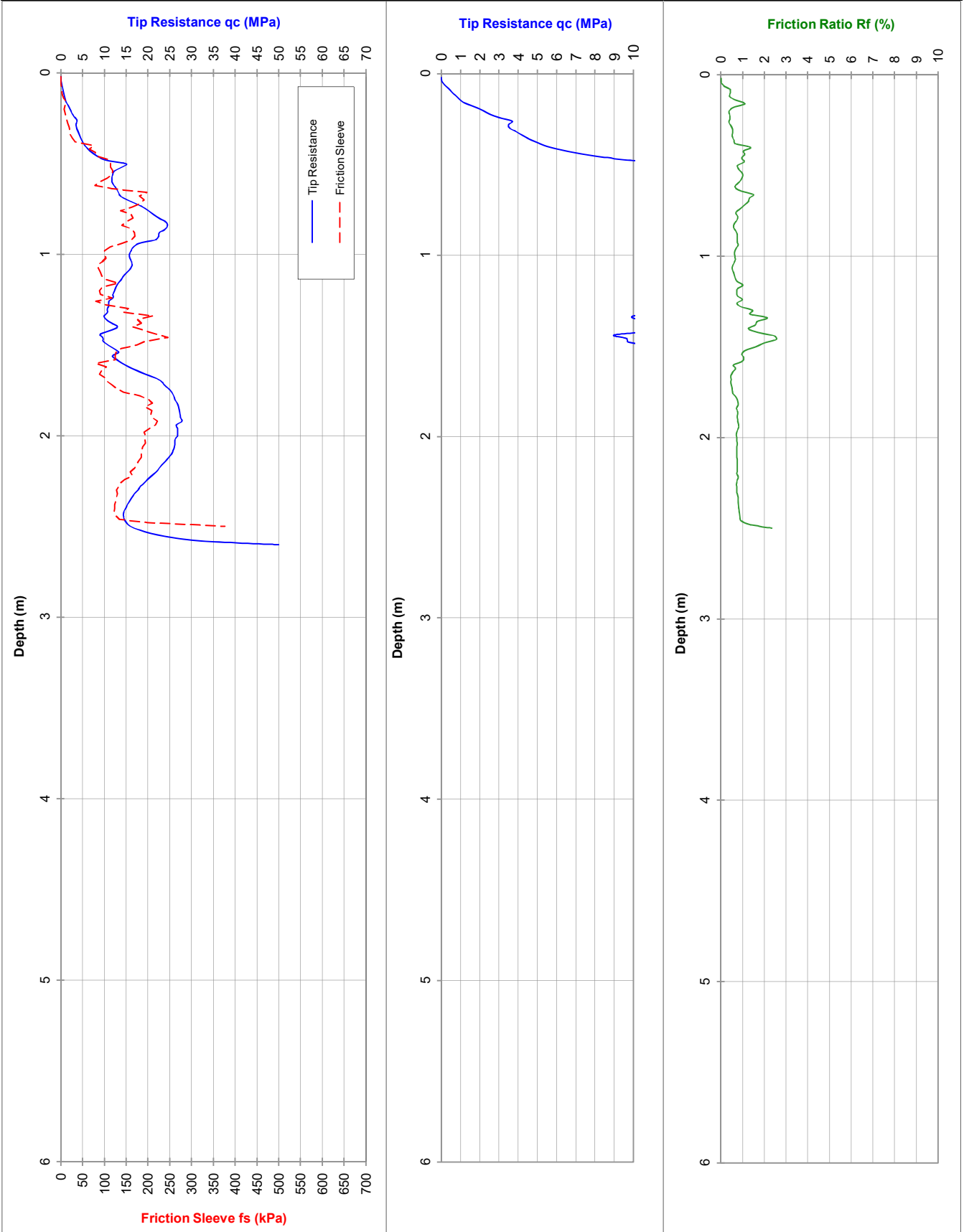
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 25

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.5

Dummy probe to (m):

Refusal: 50MPa + Inclination

Cone I.D.: EC38

File: GL0601M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

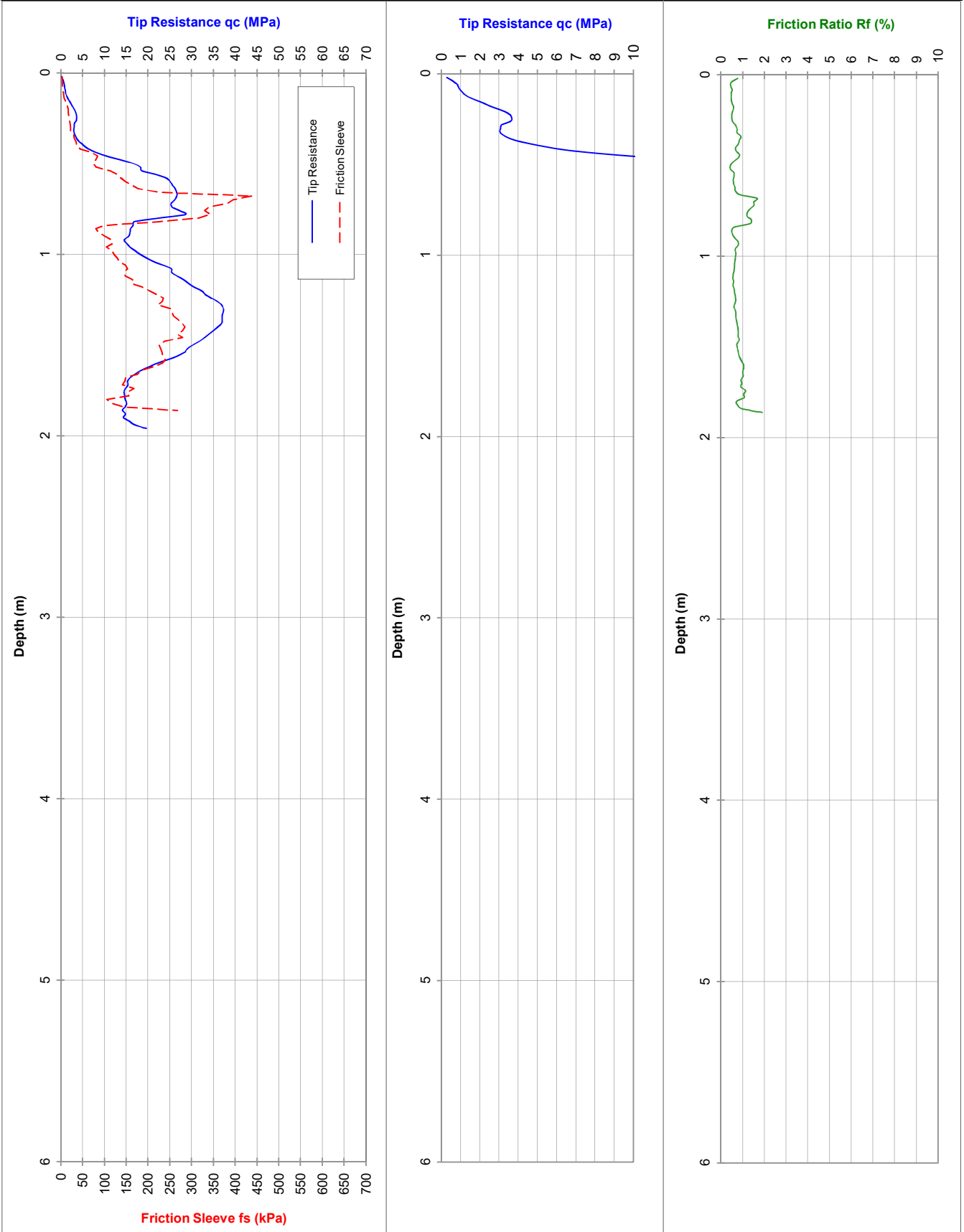
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 26

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 1.9

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0600M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

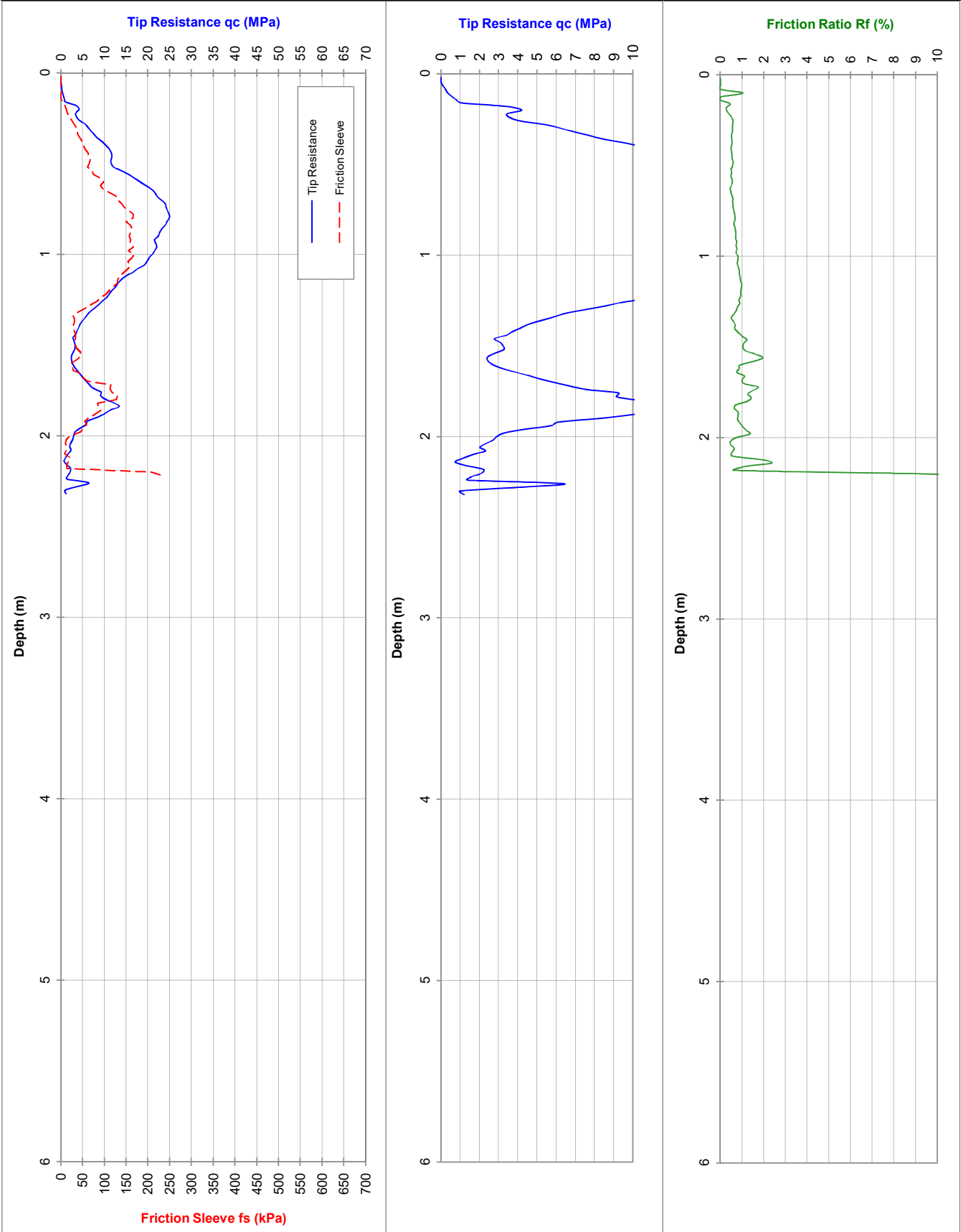
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 27

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.3

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0599M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

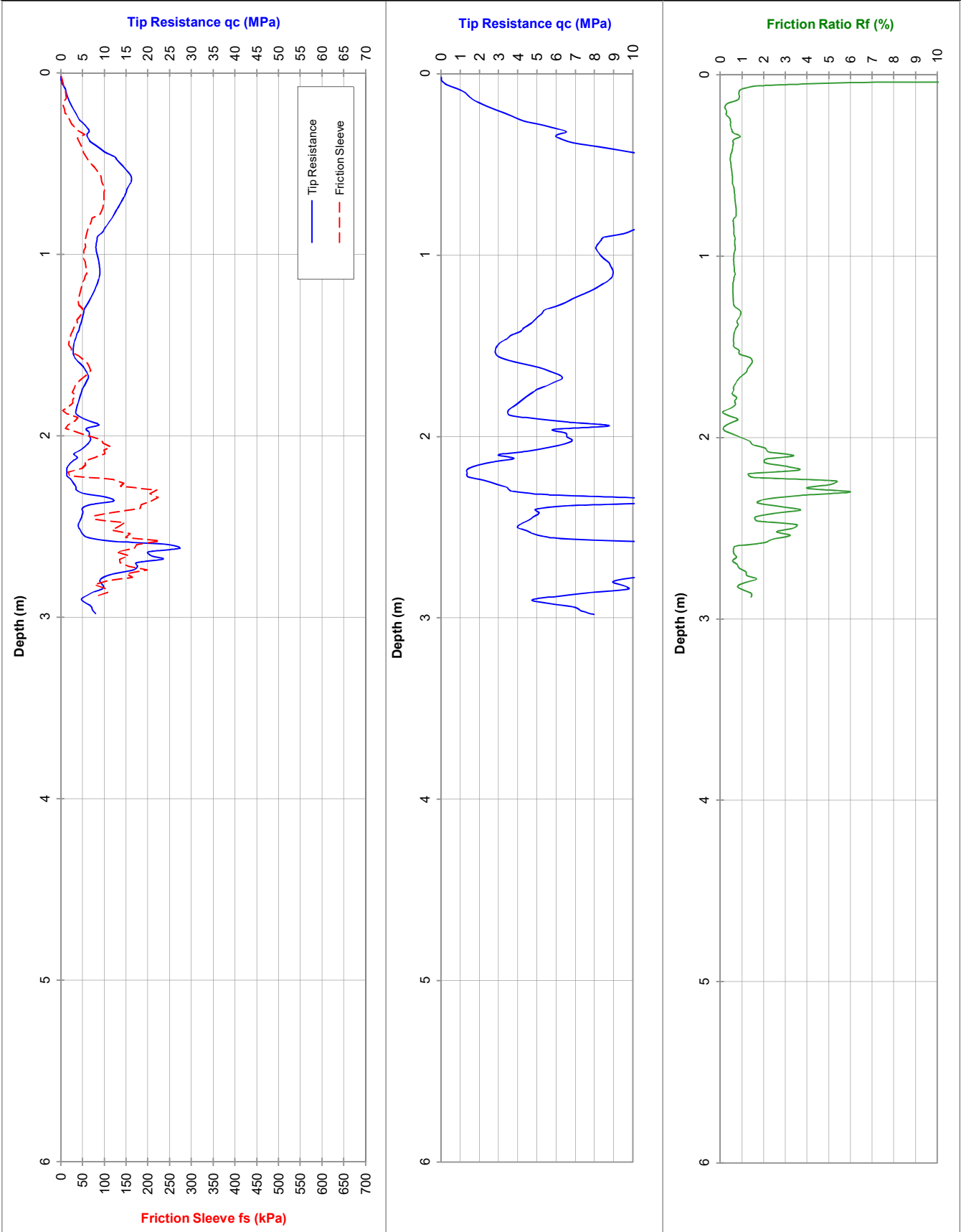
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 28

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.9

Dummy probe to (m):

Refusal: Inclination

Cone I.D.: EC38

File: GL0598M

Rig Type: 12 tonne track (M1)

ELECTRIC FRICTION-CONE PENETROMETER

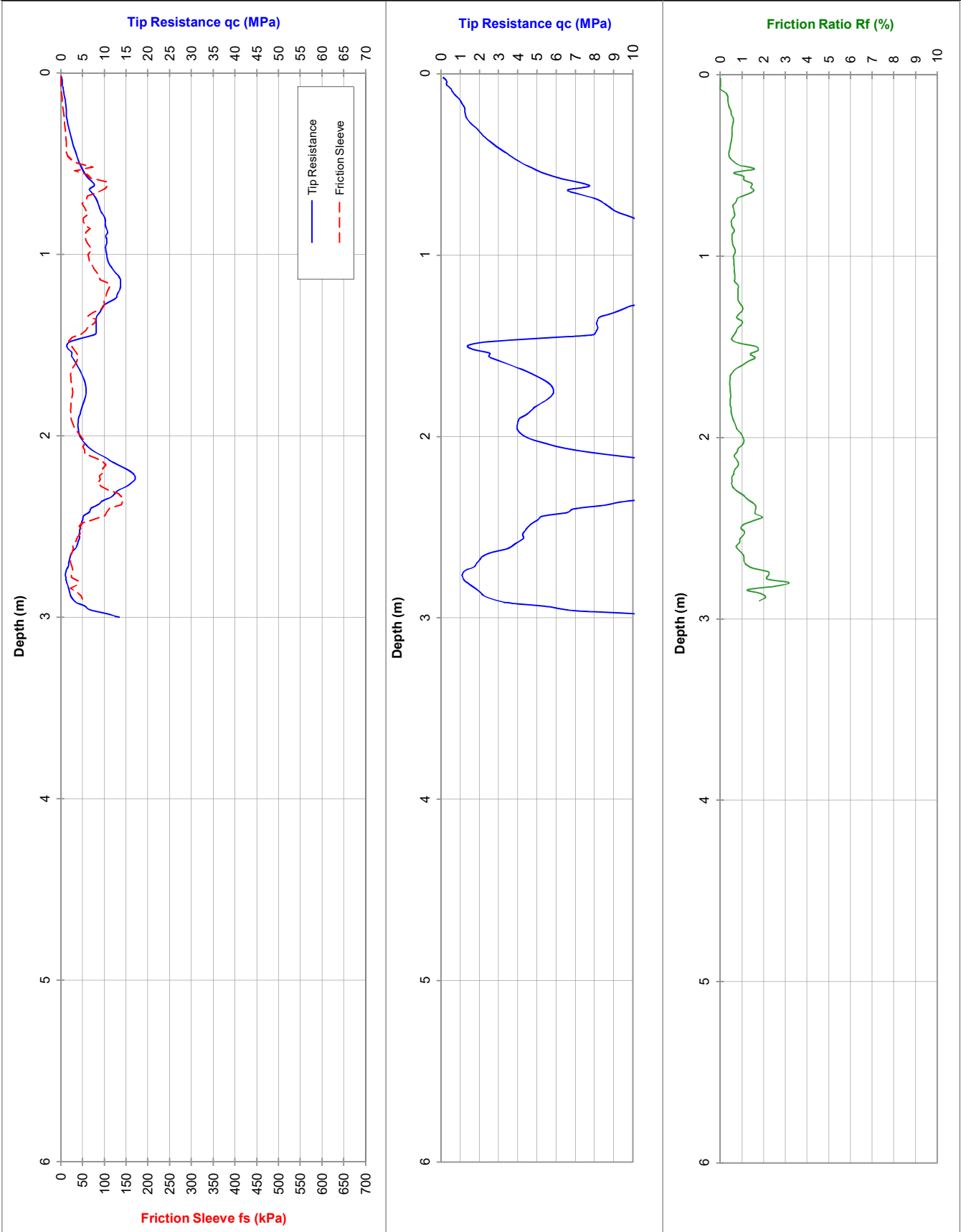
Probe I.D

CLIENT: Parcel Property
 PROJECT: Proposed Mixed-Use Development
 LOCATION: 26 Driver Road, Darch

Job No.: J1801113
 RL (m):
 Co-ords:

PGCPT 29

21-May-19



Tested in accordance with AS 1289.6.5.1-1999 and IRTF 2001 for friction reducer

Approx. Water (m): Dry to 2.3

Dummy probe to (m):

Refusal: Inclination (Limestone on tip)

Cone I.D.: EC38

File: GL0597M

Rig Type: 12 tonne track (M1)



Appendix E: Test Pit Reports

METHOD OF SOIL DESCRIPTION BOREHOLE AND TEST PIT REPORTS



GRAPHIC LOG & SOIL CLASSIFICATION SYMBOLS

Graphic	USCS	Soil Name
		FILL (various types)
		COBBLES / BOULDERS
	GP	GRAVEL (poorly graded)
	GW	GRAVEL (well graded)
	GC	Clayey GRAVEL
	GM	Silty GRAVEL
	SP	SAND (poorly graded)
	SW	SAND (well graded)
	SC	Clayey SAND

Graphic	USCS	Soil Name
	SM	Silty SAND
	ML	SILT (low liquid limit)
	MH	SILT (high liquid limit)
	CL	CLAY (low plasticity)
	CI	CLAY (medium plasticity)
	CH	CLAY (high plasticity)
	OL	Organic SILT (low liquid limit)
	OH	Organic SILT (high liquid limit)
	Pt	PEAT

NOTE: Dual classification given for soils with a fines content between 5% and 12%.

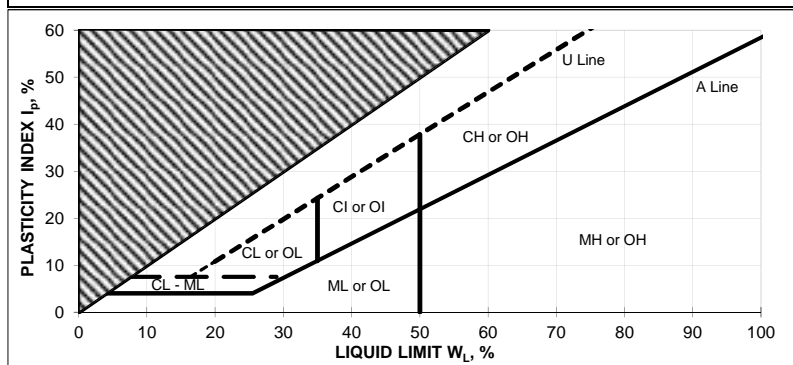
SOIL CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil descriptions are based on AS1726-2017. Material properties are assessed in the field by visual/tactile methods in combination with field and laboratory testing techniques (where used).

NOTE: AS 1726-2017 defines a fine grained soil where the total dry mass of fine fractions (<0.075 mm particle size) exceeds 35%.

PARTICLE SIZE		
Soil Name	Particle Size (mm)	
BOULDERS	>200	
COBBLES	63 to 200	
GRAVEL	Coarse	19 to 63
	Medium	6.7 to 19
	Fine	2.3 to 6.7
SAND	Coarse	0.6 to 2.36
	Medium	0.21 to 0.6
	Fine	0.075 to 0.21
FINES	SILT	0.002 to 0.075
	CLAY	<0.002

PLASTICITY - MODIFIED CASAGRANDE CHART - AS1726-2017



RESISTANCE TO EXCAVATION		
Symbol	Term	Description
VE	Very easy	All resistances are relative to the selected method of excavation
E	Easy	
F	Firm	
H	Hard	
VH	Very hard	

MOISTURE CONDITION	
Symbol	Term
D	Dry
M	Moist
W	Wet

CEMENTATION	
Cementation	Description
Weakly cemented	Soil may be easily disaggregated by hand in air or water
Moderately cemented	Effort is required to disaggregate the soil by hand in air or water

CONSISTENCY		
Symbol	Term	Undrained Shear Strength (kPa)
VS	Very Soft	0 to 12
S	Soft	12 to 25
F	Firm	25 to 50
St	Stiff	50 to 100
VSt	Very Stiff	100 to 200
H	Hard	>200

ORGANIC SOILS	
Material	Organic Content % of dry mass
Inorganic soil	<2%
Organic soil	2% to 25%
Peat	>25%

DENSITY		
Symbol	Term	Density Index (%)
VL	Very Loose	<15
L	Loose	15 to 35
MD	Medium Dense	35 to 65
D	Dense	65 to 85
VD	Very Dense	>85

EXPLANATORY NOTES TO BE READ WITH BOREHOLE AND TEST PIT REPORTS



METHOD OF DRILLING OR EXCAVATION

AC	Air Core	E	Excavator	PQ3	PQ3 Core Barrel
AD/T	Auger Drilling with TC-Bit	EH	Excavator with Hammer	PT	Push Tube
AD/V	Auger Drilling with V-Bit	HA	Hand Auger	R	Ripper
AT	Air Track	HMLC	HMLC Core Barrel	RR	Rock Roller
B	Bulldozer Blade	HQ3	HQ3 Core Barrel	SON	Sonic Rig
BH	Backhoe Bucket	N	Natural Exposure	SPT	Driven SPT
CT	Cable Tool	NMLC	NMLC Core Barrel	WB	Washbore
DT	Diatube	PP	Push Probe	X	Existing Excavation

SUPPORT

T Timbering

PENETRATION EFFORT (RELATIVE TO THE EQUIPMENT USED)

VE	Very Easy	E	Easy	F	Firm
H	Hard	VH	Very Hard		

WATER

▶	Water Inflow	▼	Water Level
◀	Water Loss (complete)		
◁	Water Loss (partial)		

SAMPLING AND TESTING

B	Bulk Disturbed Sample	P	Piston Sample
BLK	Block Sample	PBT	Plate Bearing Test
C	Core Sample	U	Undisturbed Push-in Sample
CBR	CBR Mould Sample		U50: 50 mm diameter
D	Small Disturbed Sample	SPT	Standard Penetration Test
ES	Environmental Soil Sample		Example: 3, 4, 5 N=9
EW	Environmental Water Sample		3,4,5: Blows per 150 mm
G	Gas Sample		N=9: Blows per 300 mm after
HP	Hand Penetrometer		150 mm seating interval
LB	Large Bulk Disturbed Sample	VS	Vane Shear; P = Peak
M	Mazier Type Sample		R = Remoulded (kPa)
MC	Moisture Content Sample	W	Water Sample

ROCK CORE RECOVERY

$$TCR = \text{Total Core Recovery (\%)} = \frac{CRL}{TCL} \times 100$$

$$RQD = \text{Rock Quality Designation (\%)} = \frac{ALC > 100}{TCL} \times 100$$

TCL Length of Core Run

CRL Length of Core Recovered

ALC>100 Total Length of Axial Lengths of Core Greater than 100 mm Long

Job Number: J1801113	Easting: 391212 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480067 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 41.76 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	41.76			SP	FILL: SAND (TOPSOIL), fine to coarse grained, sub-angular to sub-rounded, grey-brown, trace fines, trace organics				Density not assessed. Trace brick fragments in top 100 mm
			1	41.36			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, distinct layers from filling process noted				Limestone cobble (0.7-1.5 m depth) One star picket noted Two tree roots (approximately 150 mm diameter) at top of natural sand Total proportion of rubble, etc, <5% <1% deleterious/putrescible (steel, roots)
			2					Becoming dark grey to grey				
			3	39.16			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white-grey				
			4	37.76				Hole terminated at 4.00 m Target depth Groundwater not encountered				
			5									
			6									
			7									
			8									




Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391286 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480070 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43.14 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	43.14			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, distinct layers from filling process noted		M		Density not assessed Limestone rubble (0.6 m to 1.0 m)
			1									
			2									
			3									
			4	39.54					FILL: Mixture of SAND (60-70%) and RUBBISH (30-40%), sand is fine to coarse grained, rounded to angular, pale brown and grey mottled, trace fines, rubbish is a mixture of largely intact bricks, plastic strapping, plastic grid tiles, plastic sheets, concrete slabs and pieces, trace glass, electrical wire, wooden stakes, plastic bags, steel bar, carpet, plastic bottles, total putrescible portion <1%			
		5	38.04									
		6	37.64				SP	SAND: medium to coarse grained, rounded, pale grey to white	W			
		7										
		8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391382 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480068 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 48.63 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	48.63		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace fines, trace organics in top 200 mm			Density not assessed Trace tile pieces and brick pieces on surface, limestone rubble at 0.2 m to 1.0 m depth (in patches)	
			1									
			2									
			3	45.43			[Red hatched box]	FILL: Mixed RUBBISH and SAND: sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles, trace MDF (300 mm x 50 mm), trace plastic strapping	M		Intermixing between clean layer and rubbish fill due to collapse	
		4										
		5	43.83				FILL Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles, pieces of timber wood, ply wood (2-5%), metal piping (approximately 100 mm long, 50 mm diameter) (1%), plastics (sheeting, strapping (2-3%), plastic piping (<1%), carpet/mats (1000 mm x 1500 m) (<1%), estimate of putrescible materials 3-5%					
		6										
		7		41.43				Hole terminated at 7.20 m Target depth Groundwater not encountered				
		8										


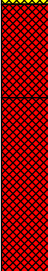
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391463 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480062 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.82 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	55.82			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, mottled grey/white, trace rootlets to 400 mm	M			Density not assessed Trace plastic strapping, thin plastic piping (10 mm diameter) in top 500 mm, trace gravelly/cobbly limestone, trace brick fragments	
			1										
			2										
			3										
			4	52.32				Mixture of SAND (70%) and RUBBISH (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown, rubbish is mostly brick fragments, concrete slabs (70-80%), trace plastic strapping, tiles and wood chunks				500 mm x 100 mm thick concrete slab, chunk of asphalt 400 mm x 180 mm thick	
		5	51.32					Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown, rubbish is mostly brick fragments, concrete slab, limestone gravel/cobbles (70%), plastic strapping, sheeting, bucket, bottles (2-3%), trace wood/timber, trace foam chunks			Thick concrete slab present at approximately 4.5 m (not excavated), log 200 mm long by 40 mm diameter		
			6										
			7	49.42				Hole terminated at 6.40 m Target depth Groundwater not encountered					
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391545 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northings: 6480067 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58.98 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	58.98			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets top 300 mm				Density not assessed	
			1										
			2										
			3	56.48				M	FILL: Mixture of SAND (60%) and RUBBISH (40%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly brick fragments, concrete slabs, gravel (70-80%), plastic sheeting, trace plastic strapping, trace metal wiring, trace carpet sheets (200 mm long), trace wood chunks				Concrete slabs relatively large in size (400-600 mm long, 100 mm thick), large boulders (200-300 mm diameter)
			4										
		5	54.38				M	FILL Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly bricks, concrete slabs, cobbles (60-70%), long metal pipes (40 mm diameter, 2000 mm long) (2-3%), wood pieces (approximately 5%) varying in length to 1500 mm, large tree roots (20-40 mm diameter) (2-4%), trace electrical/metal wiring, trace soft drink cans				Large concrete slab present (700 mm x 100 mm)	
		6											
		7											
		8	51.48					Hole terminated at 7.50 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391594 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480064 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58.01 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	58.01			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown mottled white				Density not assessed Trace gravel from 0.4 m to 1.0 m	
			1										
			2	56.11					FILL: Mixture of SAND (60%) and RUBBISH (40%): sand is fine to coarse grained, sub-angular to sub-rounded, pale brown, rubbish consists of mostly bricks, concrete slabs, gravel (70-80%), trace rusted metal sheet chunks (1-2%), wood blocks (150 mm x 100 mm thick) (2-3%), trace wiring, car battery, trace plastic sheeting, strapping				
			3										
			4	53.91					FILL Mixture of SAND (50%) and RUBBISH (50%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly bricks, concrete slabs, cobbles (70-80%), plastic strapping, sheeting (2-3%), bottles, trace wood, trace crushed metal, metal rack, plastic toy		M		Large tree piece (100 mm diameter x 300 mm long), large concrete slabs (300 mm x 150 mm thick), cemented bricks (two stuck to each other)
		5											
		6											
		7											
		8		50.11				Hole terminated at 7.90 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391164 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480132 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43.49 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	43.49		[Cross-hatched pattern]		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace rootlets in top 200 mm				Density not assessed	
			1										
			2					SP					Gravelly cobbles in patches from 1.7 m to 2.6 m
			3						Becoming dark grey to grey				
			4	39.29		[Dotted pattern]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white				Small 200-300 mm layer at 3.9 m depth with dark grey sand and cobbles (potential road base)	
			5	38.89				Hole terminated at 4.60 m Target depth Groundwater not encountered					
			6										
			7										
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391276 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480121 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45.34 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	45.34			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace rootlets in top 200 mm		Density not assessed Trace cobbles, gravelly limestone (0.4 m to approximately 3.0 m depth) No significant deleterious material found
			6	39.24			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white	M	
			7	38.94				Hole terminated at 6.40 m Target depth Groundwater not encountered		
			8							

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391355 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480117 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 48.78 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	48.78				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled brown mottled white, trace rootlets top 400 mm, distinct layering from filling process noted				Density not assessed
			1				SP					Trace gravel, cobbles, small brick fragments from approximately 1 m depth
			2									
			3									
			4	45.38				M	FILL: Mixture of SAND (80%) and RUBBISH (20%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles (80-90%), gravel (70-80%), trace plastic strapping and plastic sheeting			
		5	43.88					FILL: Mixture of SAND (50%) and RUBBISH (50%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, cobbles (70-80%), scrap metal (2-3%) including large piece 500 mm long large tarp (approximately 2 m long) (1-2%), trace foam pieces (small), trace carpet fibres dangling from test pit, plastic strapping and plastic bags/sheeting (1-2%), timber/wood stake fragments (1-2%), small chunks of tree roots (1-2%)				
		6										
		7										
		8	41.38					Hole terminated at 7.40 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391443 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480137 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54.45 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	54.45				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled pale grey, trace rootlets top 300 mm				Density not assessed Large concrete slab excavated from around 4.4 m depth (1500 mm x 200 mm thick), other moderately large pieces (concrete) varying in length from 200 mm to 600 mm, plastic strapping and bags visible on test pit walls	
			1				SP	Trace gravelly cobbles, minor brick fragments from 0.7 m depth					
			2	52.45				FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, brick fragments, limestone rubble (70-80%), trace plastic strapping, bottles, sheeting/bags, trace PVC pipe (60 mm diameter), trace wood pieces, trace organics, trace crushed aluminium can, trace scrap metal					M
			4										
			5	50.05					FILL Mixture of RUBBISH (60%) and SAND (40%) sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, cobbles (60-70%), plastic strapping, plastic bottles, sheeting/bags (1-2%), plastic lids x 2 (800 mm x 200 mm), wood/timber and wood planks (approximately 800 mm x 200 mm) (2-3%), trace organics, trace tablecloth (500 mm x 500 mm), trace scrap metal, trace broken PVC pipes				
		8	46.75					Hole terminated at 7.70 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391526 m	Contractor: ANH Contracting	Date: 29/04/2019
Client: Parcel Property	Northing: 6480130 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59.5 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	59.50			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown mottled orange mottled grey				Density not assessed Pockets of limestone cobbles/gravel and brick fragments Buried piping at 0.8 m depth	
			1										
			2										
			3	56.60					FILL: Mixture of SAND (75%) and RUBBISH (25%): sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles/gravel (70%), large piece of metal with foam attached (crushed, 1500 mm x 300 mm), trace rootlets, trace plastic sheeting, trace glass		M		Layer of concrete slab around 2.9-3.0 m (large pieces excavated out around 0.6-1.4 m, 200 mm diameter (multiple pieces)
			4		55.10				FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly bricks, concrete slabs, cobbles/gravel (60-70%), trace plastic strapping and sheeting, organics (tree branches)/roots (1-2%), trace scrap metal				Plastic sheeting in test pit walls around 4.0-5.5 m depth Concrete brick pieces found (400 mm x 300 mm), large piece on concrete 1 m long
			5										
			6										
			7										
			8	52.00				Hole terminated at 7.50 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391626 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480129 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58.11 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.11			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown mottled orange mottled grey		Density not assessed
			3	55.21				FILL: Mixture of SAND (70%) and RUBBISH (30%): sand is fine to coarse grained, sub-angular to sub-rounded, rubbish consists of mostly bricks, concrete slabs, gravel/cobbles (80%), trace cardboard, trace rugs, trace scrap metal, trace plastic strapping, trace wood planks	M	Layer of carpet/rugs in test pit wall at approximately 3.0 m Layer of plastic strapping in test pit wall at 3.0 m to 3.2 m depth (trace elsewhere)
			4	53.71				FILL Mixture of SAND (50%) and RUBBISH (50%), sand is fine to coarse grained, sub-angular to sub-rounded, brown to dark grey, rubbish consists of mostly bricks, concrete slabs (80%), plastic strapping and sheeting (1-2%), trace plaster, trace scrap metal, trace wood/tree logs		Cemented brick (3-5) in test pit wall at approximately 4.2 m depth. Slabs varying in length (200-300 mm) Couple of large concrete slabs (400-500 mm long)
			7.5					Hole terminated at 7.50 m Target depth Groundwater not encountered		
			8	50.61						


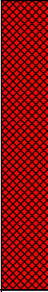
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391127 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480194 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45.55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	45.55			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled white mottled pale yellow, trace rootlets in top 700 mm, distinct layers from filling process noted	M			Density not assessed
			4	41.95								
			7	38.85				Hole terminated at 6.70 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391215 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480193 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	46.00		[Green Hatched Box]		FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white blue-grey, fine to coarse grained gravel, trace rootlets in top 300 mm, with gravelly brick pieces				Density not assessed	
			1										Hard excavation - cemented gravel
			2										
			3										
			4										
			5										
			6	40.40		[Red Hatched Box]	SP	FILL: SAND (90-95%) with trace RUBBISH (5-10%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly boulders (in small quantities), with trace plastic strapping				Trace plastic strapping in test pit wall	
		7											
			8	38.30		[Orange Box]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, white					
			8	38.10				Hole terminated at 7.90 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391319 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480186 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 48.68 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	48.68				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 200 mm				Density not assessed Hard excavation into this layer. Large cemented gravel boulder and crushed brick and gravel excavated. M Concrete slabs excavated in small chunks/boulders. Plastic strapping in test pit wall.	
			1				SP						
			2	46.98				FILL: Gravelly SAND, fine to coarse grained, white mottled brown, fine to coarse grained gravel					
			4	44.98				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey to pale grey/white, with fine to medium grained gravel, trace brick fragments, trace foam, trace organics				
			6	43.28					FILL: Mixture of SAND (65%) and RUBBISH (35%): sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments and small boulders (60-70%), plastic strapping, plastic bucket, large plastic tarp, plastic bags (approximately 2 m long) (3-5%), wood chunks/planks (3-5%)				
		8	41.28					Hole terminated at 7.40 m Target depth Groundwater not encountered					



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391397 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northings: 6480195 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51.86 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	51.86			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 300 mm, trace limestone rubble, gravel, small brick fragments	M			Density not assessed
			1									
			2									
			3									
			4									
			5	47.16				FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, brick fragments, cobbles (slabs vary in size from cobbles to boulders, 800 mm x 100 mm), wood planks/stakes (2-4%), glass bottles/shards (2-4%), plastic strapping, bags and bottles (2-4%), trace electrical wiring, scrap metal/metal wiring (1-2%), trace foam, trace organics/root chunks (1-2%), chunk of roots (200 mm x 100 mm)			Plastic strapping and bags present in test pit wall. Concrete slab chunks present in test pit wall.	
		6										
		7										
			8	44.36				Hole terminated at 7.50 m Target depth Groundwater not encountered				

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391493 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480201 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57.56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.56		[Yellow cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white mottled orange, trace rootlets in top 300 mm, trace gravelly limestone, cobbles and small brick fragments				Density not assessed
			4	54.26				[Red cross-hatched pattern]	M	FILL: Mixture of RUBBISH (65%) and SAND (35%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks and limestone cobbles/gravel, multiple large wood slabs/planks (3-4 pieces varying in length, 400 mm to 1 m, 50 mm thick) (2-3%), multiple (3-4) large concrete slabs (400-900 mm long x 100-200 mm thick), plastic strapping and bags, bottles and bucket (2-4%)		
			8	49.96				Hole terminated at 7.60 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391563 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480168 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59.55 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	59.55			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow mottled grey, trace limestone cobbles, gravel and small brick fragments				Density not assessed
			1									
			2									
			3	56.35				FILL: Mixture of RUBBISH (60%) and SAND (40%): sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, several large PVC pipes (2-3, 100 mm x 800-1500 mm long) (3-5%), plastic strapping, bags (1-2%), large concrete slabs (400-800 mm x100 mm), 1 x large reinforced slab (approximately 1.5 m wide), trace scrap metals, trace foam, wood chunks (1-2%), trace organics (1-2%), large stump (500 mm), trace wiring, thin PVC piping	M			Small voids in test pit wall (one or two visible)
			4									
			5									
			6									
			7	52.95				Hole terminated at 6.60 m Target depth Groundwater not encountered				
			8									


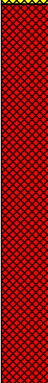
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391640 m	Contractor: ANH Contracting	Date: 30/04/2019
Client: Parcel Property	Northing: 6480219 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58.39 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.39			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, white mottled brown mottled yellow, trace rootlets in top 300 mm, trace limestone gravel and cobbles				Density not assessed
			4	54.89				M	FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks and limestone cobbles/gravel, plastic sheeting/strapping, lids, bottles (2-4%), trace foam, trace tile fragments, scrap metal (rods/cans) (1-2%), clothes/rags (1-2%), trace organics, wood planks/stakes (2-3%)			One narrow void in test pit wall (approximately 800 x 100 mm). Two large reinforced concrete slabs (1-1.5 m x 100 mm).
			8	50.79					Hole terminated at 7.60 m Target depth Groundwater not encountered			

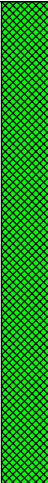

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391441 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480263 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.56 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description											
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS						
E			0	55.56			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey mottled white, trace rootlets in top 300 mm, with fine to coarse grained gravel, cobbles, minor brick fragments	M			Density not assessed						
			1															
			2															
			3															
			4															
			5															
			5.36	50.36				FILL: Mixture of RUBBISH (60%) and SAND (40%); sand is fine to coarse grained, sub-angular to sub-rounded, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, plastics (strapping/bags) (2-4%), trace tile pieces, wood stakes, chunks (2-4%), trace scrap metals, trace organics/roots										
			6															
			7	48.76				Hole terminated at 6.80 m Target depth Groundwater not encountered										
			8															

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391577 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480268 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58.29 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	58.29				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, orange-brown mottled grey, trace rootlets in top 600 mm				Density not assessed
			1										
			2	56.39					FILL: Mixture of SAND (60%) and RUBBISH (40%): sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, large piece of metal and metal wiring/meshing (1-2 m x 100 mm), large piece of metal reinforcement (1 m x 200 mm) (metals 10-15%), asbestos fencing in fragments (10-15%), trace plastic				
			3	55.69					Hole terminated at 2.60 m Terminated due to presence of ACM Groundwater not encountered				
			4										
			5										
			6										
			7										
			8										

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391698 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480248 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57.26 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.26				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey mottled white mottled brown, trace rootlets in top 600 mm, distinct layering from filling process noted				Density not assessed Trace limestone gravel and cobbles
			1				SP					
			2	55.06				FILL: Mixture of RUBBISH (60-70%) and SAND (30-40%): sand is fine to coarse grained, sub-angular to sub-rounded, grey and black, rubbish consists of mostly concrete slabs, brick fragments, limestone cobbles/gravel, scrap metal (1-2%) with one large piece of metal framing (700 x 400 x 100 mm), plastic strapping, bags and bottles (2-3%), small chunks of grass roots (1-2%), trace carpets/rugs, trace rubber mats, one large plastic garden pot, wood blocks/planks (1-2%)		M		Cleaner FILL layer present 2.2-3.0 m in parts. Large concrete lump with metal pipe attached (400 mm diameter boulder, 300 mm long pipe, 50 mm diameter). Minimal large concrete slab pieces.
			3									
			4									
			5									
			6									
			7	50.16				Hole terminated at 7.10 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391505 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480302 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57.15 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	57.15			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 400 mm				Density not assessed Trace gravel/cobbles, minor brick fragments throughout	
			1										
			2										
			3		53.85			M	FILL: Mixture of RUBBISH (60%) and SAND (40%): sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, brick fragments, gravel/cobbles, plastics (strapping, bags, bucket pieces) (1-2%), trace cloth, scrap metals (1-2%), trace wood stakes/planks, trace organics/tree materials (minor thin tree roots present), trace glass shards				Large concrete slabs (approximately 1000 x 100 mm)
		4											
		5											
		6											
		7		50.65				Hole terminated at 6.50 m Target depth Groundwater not encountered					
		8											

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391629 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480327 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57.39 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	57.39		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange, trace rootlets in top 400 mm, trace gravel/cobbles	M			Density not assessed
			1									
			2									
			3	54.89		[Red hatched pattern]	FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown, rubbish consists of mostly concrete slabs, brick fragments, cobbles, plastic strapping/bags (1-2%), trace tiles, scrap metals (1-2%), wood chunks (1-2%), trace organics/tree materials					
		4	53.39			[Red hatched pattern]	FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, strapping and bottles (2-4%), wood (2-4%), trace PVC pipe				Long plastic pipe (300 x 120 mm)	
		5										
		6										
		7										
		8		50.19				Hole terminated at 7.20 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391729 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480313 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57.19 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	57.19			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow, trace rootlets in top 500 mm, trace limestone gravel and cobbles, trace brick fragments				Density not assessed	
			1										
			2										
			3										
		4		53.09			M	FILL: Mixture of SAND (50% and RUBBISH (50%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic strapping, bags and mesh (1%), wood stakes/planks (1%), scrap metals (1-2%), trace tile pieces				One large brick wall chunk (500 x 500 x 200 mm). Multiple other small brick wall chunks (200 x 50 mm). 5-7 large concrete slabs varying in size (800-1500 mm x 100-150 mm)	
		5											
		6											
		7		50.09				Hole terminated at 7.10 m Target depth Groundwater not encountered					
		8											








Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391432 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480361 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56.36 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	56.36			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 200 mm				Density not assessed	
			1	55.36			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, fine to coarse grained gravel, small brick fragments and tile fragments				Cemented Gravelly SAND layer on top	
			2					SP					
			3	53.26				SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, distinct layers from filling present		M		
			4					SP					
			5	51.16				SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey				
			6					SP					
		7						Trace rubbish: bricks, concrete slabs, trace plastic, trace wiring					
		8		49.26				Hole terminated at 7.10 m Target depth Groundwater not encountered					

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391544 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480372 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56.46 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	56.46			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange mottled white, trace rootlets in top 600 mm, trace limestone gravel/cobbles				Density not assessed
			2	54.76				FILL: Mixture of RUBBISH (65%) and SAND (35%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly large piece from soakwell, concrete and metal reinforcement, plastics (bags/strapping/bottles) (2%), trace glass pieces, trace multiple pieces of large concrete slabs (600-2200 mm long), trace PVC pipe, wood planks (several large planks up to 1 m long)/chunks (2-4%), organic/tree materials (1-2%), scrap metal (1-2%)		M		Several large broken cement/ceramic cylinders (600 mm diameter). Concrete soakwell in test pit wall. One long piece of metal (2 m x 500 mm).
			7	49.56				Hole terminated at 6.90 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391699 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480365 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56.79 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	56.79			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange, trace rootlets in top 600 mm, distinct layers from filling process noted				Density not assessed
			1					Trace gravel/cobbles				
			3	53.79				FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly concrete slabs, bricks, limestone cobbles, wood planks/pieces (2-4%), scattering of small grass roots and tree materials (1-2%), plastic bags, strapping and bottles (1-2%), trace metal wiring, trace foam	M			Plastic strapping in test pit wall. One or two large concrete slabs (approximately 500 x 500 x 100 mm). PVC pipe (120 mm diameter, 500 mm long).
			7	50.09				Hole terminated at 6.70 m Target depth Groundwater not encountered				
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391753 m	Contractor: ANH Contracting	Date: 01/05/2019
Client: Parcel Property	Northing: 6480373 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56.7 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	56.70		SP		FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange mottled white, trace rootlets in top 300 mm				Density not assessed
			1					With fine to coarse grained limestone gravel/cobbles, trace asphalt chunks and brick fragments				
			2				M					Potentially in-situ orange-brown sand from 2.7 m depth?. Rubbish layer placed on angled cut towards middle of site. One car tyre.
			3		53.30				FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, grey-brown mottled orange-brown, rubbish consists of plastic bags and strapping (1-2%), scrap metal (1-2%), wood (1-2%), trace organics			
		4										
		5										
		6										
		7		50.10				Hole terminated at 6.60 m Target depth Groundwater not encountered				
		8										


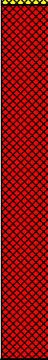
Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391510 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480430 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54.51 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.51			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 600 mm, distinct layers from fill process noted, with fine to coarse grained limestone gravel, cobbles from 1.2 m depth, trace brick fragments				Density not assessed
			4	51.11				M	FILL Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, strapping and bottles, oversize items (3-5%), scrap metal, metal reinforcement (2-3%), organics, tree matter (1%), wooden planks/pieces (1-2%)			Large pieces (1-2) of scrap metal from car engine (500 x 400 mm). Large blocks of reinforced concrete slabs (up to 1.2 m long). Plastic wheelbarrow. One large chunk of grass roots (400 x 400 mm). Thick asphalt chunks (100 mm thick).
			7	47.31					Hole terminated at 7.20 m Target depth Groundwater not encountered			
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391619 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480430 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.59 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
E			0	55.59		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace rootlets in top 500 mm	M			Density not assessed	
			1										
			2										
			3										
			4	51.49		[Red hatched pattern]		FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, gravel, trace scrap metal, trace plastic bottles and bags, trace wood, trace tiles					
		5						Rubbish content increasing to approximately 50%, sand becoming dark grey, plastic bags and tarps increase to 1-2%, scrap metal and metal debris (1%), wooden planks and pieces (2-3%), roots/tree matter (approximately 1%)				Long piece of wood (approximately 1 m x 100 mm). Small hollow concrete pipe (300 mm long x 100 mm diameter)	
		6											
			7										
			8	48.09				Hole terminated at 7.50 m Target depth Groundwater not encountered					

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391746 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480431 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.49 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.49				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled pale yellow/white, trace rootlets in top 200 mm, trace limestone gravel/cobbles and brick fragments.				Density not assessed.
			1				SP	With fine to coarse grained limestone gravel/cobbles				
			2									
			3	52.99				FILL: Mixture of SAND (70%) and RUBBISH (30%); sand is fine to coarse grained, sub-angular to sub-rounded, brown, rubbish consists of mostly bricks, concrete slabs and cobbles, plastic strapping and bags (1-2%), wood (1-2%), trace PVC pipe pieces		M		
		4	51.49					FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish is mostly concrete slabs, bricks, cobbles, wood planks/pieces (2-3%), plastic bags, sheeting, strapping and bottles (2-4%), thin PVC pipe pieces (1%), roots/tree materials (1-2%)				
		5										
		6										
		7	48.89					Hole terminated at 6.60 m Target depth Groundwater not encountered				
		8										


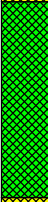


Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391442 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480460 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54.67 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.67			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 300 mm				Density not assessed
			1	53.47				FILL: Gravelly SAND, fine to coarse grained, white mottled brown, fine to coarse grained limestone gravel/cobbles, crushed concrete, bricks				
			3	51.37			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange	M			
			6	48.87				FILL: Mixture of SAND (70-80%) and RUBBISH (20-30%): sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles, gravel, wood pieces (2-3%), plastic sheeting and strapping (1%), trace PVC pipes, trace wiring, trace organics, tree matter, trace scrap metal				
			8	47.27				Hole terminated at 7.40 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391590 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480478 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54.32 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.32			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled orange mottled white, trace rootlets in top 700 mm, trace gravel/cobbles				Density not assessed
			2	52.72			M	FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags, plaster sheet bandage (shredded) (2-3%), plastic strapping, bags and tarps (1-2%), scrap metals (3-5%), wooden planks/pieces (2-3%), organics/tree matter (1%), trace asphalt chunks				Several large pieces of scrap metal (up to 1 m long). Several large concrete slabs (600-800 mm x 300-400 mm). Large metal barrel crushed.
			7	47.12				Hole terminated at 7.20 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391691 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480474 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.4 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.40		[Cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white, trace rootlets in top 300 mm, trace limestone gravel/cobbles				Density not assessed
			4	51.70		[Cross-hatched pattern]		FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, cobbles/gravel, wood chunk/pieces (2-3%) including several long pieces up to 1 m long, scrap metal <1%, plastic bags, strapping and bottles (1-2%), trace foam, trace plumbing pipe	M			3-4 large pieces of concrete slabs (500 x 500 mm). Scattering of medium sized concrete slabs.
			8	48.10				Hole terminated at 7.30 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391481 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480526 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52.28 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	52.28			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled yellow mottled white, trace rootlets in top 200 mm, trace limestone cobbles/gravel				Density not assessed
			3.5	49.08				FILL Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic bags and strapping (1-2%), PVC pipes (3-5%), trace scrap metal, wooden planks/pieces (2-3%), organics, tree matter (approximately 1%)	M			One long PVC pipe (approximate 1-2 m long, 100 mm diameter). Broken piece of PVC, several large pieces (250 mm diameter, 400-600 mm long).
			7.2	45.08				Hole terminated at 7.20 m Target depth Groundwater not encountered				

Sketch & Other Observations


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391624 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480533 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54.07 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	54.07		[Yellow hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace rootlets in top 300 mm, trace limestone cobbles/gravel	M	Density not assessed
			4	50.37				[Red hatched pattern]		
			8	46.77				Hole terminated at 7.30 m Target depth Groundwater not encountered		

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391748 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480523 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.3 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.30		[Yellow hatched box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey mottled orange, trace rootlets in top 300 mm				Density not assessed
			1									
			2									
			3									
			4	51.20		[Red hatched box]		FILL Mixture of RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, scrap metal/metal reinforcement (3-5%), several chunks of bark and tree roots, trace wiring, fabrics/carpet strands (1%), wood (2-3%)				One large tyre and wheel (possibly truck tyre). 2-3 large pieces of metal (0.8-1.2 m long). One meshed tarp (approximately 1 m x 1 m). Several large wooden planks (0.6-1.0 m long).
		5										
		6										
			7									
			8	48.00				Hole terminated at 7.30 m Target depth Groundwater not encountered				




Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391436 m	Contractor: ANH Contracting	Date: 02/05/2019
Client: Parcel Property	Northing: 6480573 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50.89 m AHD	Bucket: 1.2 m	Checked By: ORW

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	50.89				FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, white. fine to coarse grained limestone gravel and cobbles				Density not assessed
			1	49.89			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white				Old water pipe and power cables encased in PVC pipe connecting through test pit at 1.0 m depth. Trace gravel/cobbles.
			2									
			3									
			4	47.39				FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey, rubbish consists of mostly concrete slabs, bricks, limestone cobbles/gravel, plastic strapping, bags and crushed crates (2-3%), wood pieces (approximately 1%), trace scrap metal, organics/tree roots (1-2%), trace PVC pipes (broken)	M			
			5									
			6									
			7									
			8	43.59				Hole terminated at 7.30 m Target depth Groundwater not encountered				

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391554 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480574 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51.62 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 4 m

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	51.62		[Yellow cross-hatched pattern]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled white/grey, trace rootlets in top 200 mm, trace gravel/cobbles	D - M	Density not assessed
			1							
			2							
			3							
			4	48.22		[Red cross-hatched pattern]	SP	FILL: Mixture of RUBBISH (60%) and SAND (40%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs and bricks, scrap metal cans and metal wiring (1-2%), plastic bags, strapping and bottles (2-3%), trace foam pieces, wooden planks/pieces (2-3%), trace roots/tree matter	M	
		5								
			6							
			7	45.32				Hole terminated at 6.30 m Target depth Groundwater not encountered		
			8							

Sketch & Other Observations



Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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GALT LIB 1.01.GLB Log_SG_EXCAVATION_J1801113.GPJ <-DrawingFile> 12/06/2019 08:52 10.0.0.000 D:\galt\GSD, CPT, Photo, Monitoring Tools\ Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21

Job Number: J1801113	Easting: 391607 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480579 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52.68 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 1.4 m

Excavation			Sampling			Field Material Description				
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	52.68			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, trace rootlets in top 300 mm, trace cobbles/gravel	D - M	Density not assessed
			1							
			2							
			3	49.98			SP	FILL: Mixture of RUBBISH (70%) and SAND (30%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks and limestone cobbles/gravel, scrap metal panels, drum, pieces and wiring) (4-6%), plastic cups, bags and strapping (1-3%), wooden planks/chunks (1-2%), organics/tree matter (1%), 1 piece of insulation sheeting (500 x 200 mm)	M	Large metal drum (crushed, approximately 1 m long x 800 mm wide)
			4							
			5							
			6							
			7	46.48				Hole terminated at 6.20 m Target depth Groundwater not encountered		
			8							

Sketch & Other Observations






[Dotted grid area for sketches and observations]

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391701 m	Contractor: ANH Contracting	Date: 07/05/2019
Client: Parcel Property	Northing: 6480565 m	Machine: 28 tonne excavator	Logged: PA
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55.16 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 1.4 m

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	55.16			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown mottled grey, trace rootlets in top 400 mm, trace gravel/cobbles	D - M			Density not assessed
			1									
			2	53.26			SP	FILL: Mixture of RUBBISH (80%) and SAND (20%), sand is fine to coarse grained, sub-angular to sub-rounded, dark grey mottled brown mottled grey, rubbish consists of mostly limestone cobbles/gravel, bricks and concrete slabs, one metal pipe (300 mm long, 40 mm diameter), trace plastic bottles and bags, one glass bottle	M			1.9-2.6 m: Layer of dark grey/black sand
			3									
			4	51.76			SP	FILL: Mixture of SAND (50%) and RUBBISH (50%), sand is fine to coarse grained, sub-angular to sub-rounded, brown mottled dark grey, rubbish consists of mostly concrete slabs, bricks, gravel, cobbles, scrap metal (approximately 1%), wooden planks/pieces (1-2%), plastics bags, strapping and cylinders (1%), bunch of small twigs/roots, one clump of grass roots (1%)				
		5										
		6	49.56					Hole terminated at 5.60 m Target depth Groundwater not encountered				
		7										
		8										



Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391435 m	Contractor: ANH Contracting	Date: 03/05/2019
Client: Parcel Property	Northing: 6480181 m	Machine: 28 tonne excavator	Logged: ORW
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	Operator: Neil	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53.59 m AHD	Bucket: 1.2 m	Checked By: ORW
		Width: 1.5 m	Length: 4 m

Excavation				Sampling			Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
E			0	53.59			SP	FILL: Gravelly SAND, fine to coarse grained, brown, gravel is fine to coarse grained, rounded to angular, includes limestone and crushed brick and concrete rubble, trace timber and plastic (<1%), trace organics	D - M			Density not assessed
			1									
				2	52.09				FILL: Mixed RUBBISH (60-70%) and SAND (30-40%), sand is fine to coarse grained, black, with some organic fines (estimated approximately 5%), rubbish is mainly concrete and brick pieces to approximately 300 mm, about 4% timber to 300 mm, trace plastic sheets and strapping, trace metal pieces i.e rods, wire, etc (<1%)	M		
			3									
			4									
			5	49.09				Hole terminated at 4.50 m Target depth Groundwater not encountered				
			6									
			7									
			8									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



Appendix F: Borehole Reports

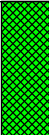
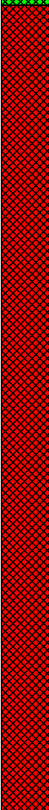

Job Number: J1801113	Eastings: 391088 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.12			SP	FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
				45.52			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow, trace fines	D	
			2							
			4	42.12				Hole terminated at 4.00 m Target depth Groundwater not encountered		
			6							
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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GALT LIB 1.01.GLB Log_GG_NON_CORED J1801113.GPJ <<Drawingfile>> 2/10/2019 11:21 10.0000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013:02:21 Proj: GALT 1.01 2013:02:21

Job Number: J1801113	Easting: 391138 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	45.79			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel (of brick, limestone and aggregate)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
								As above, mottled black		
			2	43.79				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of brick, limestone, aggregate, trace cobbles, trace plastic(sheets))		
								As above, trace wood	M	
			4					With fine to coarse grained gravel		
							SP	Inferred concrete slab (approximately 170 mm thick) With fine to medium grained brick fragments, and fine to coarse grained gravel		
								Trace glass, trace to with fine to coarse grained gravel, trace cobbles		
								Inferred concrete slab (approximately 80 mm thick) With fine to coarse grained gravel, trace plastic and glass		
			8	37.59				SAND: fine to medium grained, sub-angular to sub-rounded, grey-pale grey, trace fines	W	
							SP			
								Hole terminated at 10.50 m Target depth Groundwater encountered at 7.4 m		

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

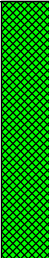
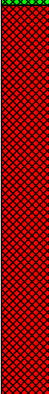

Job Number: J1801113	Eastings: 391188 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.71			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2.21	42.21			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace fines Pale grey Brown		
			4.50	40.21				Hole terminated at 4.50 m Target depth Groundwater not encountered		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391288 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.36			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone etc), trace fines trace plastic	D			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	44.36			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel, trace fines	M			
			6	40.86			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey-brown, trace fines				
			8					Pale grey Pale grey-pale brown	W			
				35.86				Hole terminated at 10.50 m Target depth Groundwater encountered at 7.8 m				
Comments:												
See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions												

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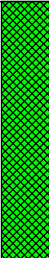


Job Number: J1801113	Easting: 391338 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 48 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	47.92		[Green Hatched Box]	SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel, trace fines Trace to with fine to medium grained gravel, trace plastic Trace to with fine to coarse grained gravel				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			2			[Green Hatched Box]	SP						
			4	43.92			[Red Hatched Box]	SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel, trace to with fine to coarse grained brick fragments, trace plastic (sheets), trace cobbles Dark grey-black, trace to with fine to coarse grained gravel, trace cobbles, plastic and metal As above, with organics and metal (wire)				
			6				[Red Hatched Box]	SP	With fine to coarse grained gravel, trace cobbles and cobble sized brick fragments As above, trace organics, plastic and metal				
			8				[Red Hatched Box]	SP	With organics/wood chips/fragments, plastic, wire and material (textiles) Trace to with fine grained gravel, trace fines				
		10	37.92			[Orange Box]	SP	Inferred dolerite boulder, recovered as cobbles SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines					
		12	37.42					Hole terminated at 10.50 m Target depth Groundwater encountered at 9.3 m					

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

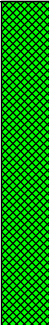


Job Number: J1801113	Eastings: 391142 m	Contractor: Proline Drilling	Date: 16/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 44 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.43			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	42.43			M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel an occasional cobbles, trace organics (wood fragments)		
			4				SP	Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel		
			6					Trace plastic (sheets) Trace plastic (sheets) Inferred concrete slab (approximately 80 mm thick) Inferred concrete slab (approximately 90 mm thick) With fine to medium grained gravel and occasional cobbles, trace plastic, metal (wire), trace fine to medium grained brick fragments		
			7	37.43			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines	W	
			8	36.43				Hole terminated at 8.00 m Target depth Groundwater encountered at 7 m		
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391192 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	44.55			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines As above, trace cobbles		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	42.05			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace fine to medium grained brick and tile fragments, trace plastic, trace fines Dark grey-black	M	
			4	40.05			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		
			6	38.55				Hole terminated at 6.00 m Target depth Groundwater not encountered		
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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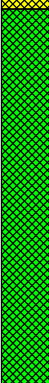
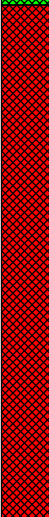

Job Number: J1801113	Easting: 391242 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 46 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	45.59				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2					Brown-pale brown, trace to with fine to medium grained gravel, trace cobbles and concrete fragments		
			4				SP	Trace fine to medium grained gravel, trace organics		
			6	39.59				SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines		
								Grey-brown		
			8	38.09				Hole terminated at 7.50 m Target depth Groundwater not encountered		
			10							
			12							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



Job Number: J1801113	Easting: 391292 m	Contractor: Proline Drilling	Date: 29/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.93			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	45.33			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, fine to medium grained, sub-rounded gravel of limestone, brick, concrete, tile, trace fines			
			6	42.43			M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel, trace organics, trace fines As above, with fine to coarse grained gravel As above, trace to with organics (wood/wood fragments), trace fine to medium grained brick fragments and glass Inferred concrete slab (approximately 200-400 mm thick), recovered as fine to coarse grained gravel, trace cobbles Dark grey-black, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone, brick and glass) As above with plastic and organics With fine to coarse grained gravel (as above) and trace organics			
			10	38.43			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		W	
				36.43				Hole terminated at 10.50 m Target depth Groundwater encountered at 9 m			

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391342 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	49.29				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown-pale brown, trace to with fine to coarse grained gravel, trace fines, trace cobbles		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1								
			2				SP	Brown, trace tile fragments			
			3								
			4								
			5	44.29				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey, with fine to coarse grained gravel and cobbles, trace plastic, glass, metal and concrete cobbles, trace organics (wood fragments), trace brick fragments	M		
			6								
			7						Inferred granite boulder		
			8					SP	Trace plastic (sheets) and organics/wood fragments, trace cobbles and cobble sized concrete fragments, trace brick		
			9						As above, pale grey		
			10								
		11					As above, pale grey				
							Dark grey	W			

Comments:



See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391342 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480161 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 49 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12	37.39			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, pale grey-brown, trace fines	W	
			13							
			14	35.79				Hole terminated at 13.50 m Target depth Groundwater encountered at 11 m		
			15							
			16							
			17							
			18							
			19							
			20							
			21							
			22							
			23							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391181 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 43 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	42.95			SP	FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	Yellow-pale brown, trace plastic		
			39.95				SP	Brown, trace to with fine to coarse grained gravel, trace fine to coarse grained concrete fragments		
			4	38.95			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, trace fines Grey-brown		
			4	38.95				Hole terminated at 4.00 m Target depth Groundwater not encountered		
			6							
			8							
			10							
			12							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391331 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.91			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel (of brick, concrete, limestone, aggregate and laterite), trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2							
			4	43.41			SP	Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel of brick, concrete, limestone and aggregate), trace cobbles, organics (wood/wood fragments) and fines With fine to coarse grained gravel, trace metal, plastic, glass and organics		
			6					Inferred concrete slab (approximately 40 mm thick)		
			8					Inferred concrete slab (approximately 40 mm thick) With fine to coarse grained gravel and organics, trace metal, plastic and cobbles As above, with glass, brick fragments and cobbles, trace concrete cobbles		
			10	37.91			SP	SAND: fine to coarse grained sub-angular to sub-rounded, grey, trace fines Pale grey		
			12	36.41				Hole terminated at 10.50 m Target depth Groundwater encountered at 8.3 m		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391281 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	44.89				FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			2				SP	Yellow-pale brown, trace plastic			M		
			4	41.89				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, trace fines Grey-brown				
			4	40.89				Hole terminated at 4.00 m Target depth Groundwater not encountered					
			6										
			8										
			10										
			12										

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391431 m	Contractor: Proline Drilling	Date: 15/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Hole Dia: 90 mm	Checked By: ORW

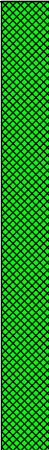

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	53.12			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	51.12			SP	UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, grey-brown, with fine to coarse grained gravel, trace to with fines, trace organics, trace fine to medium grained concrete fragments Inferred concrete slab (approximately 75 mm thick) Dark grey, with organics, trace cobbles and brick fragments As above, dark grey to black, trace plastic (sheets) and metal (wire/strapping), trace organics As above, with inferred concrete slab (approximately 150 mm) thick Trace plastic (sheets) Inferred concrete slab, recovered as gravelly SAND, fine to coarse grained concrete gravel fragments and cobbles Trace brick, with fine to coarse grained gravel, plastic, metal (wire/strapping), glass Trace to with fine to coarse grained gravel and cobbles	M	
				42.12				Hole terminated at 11.00 m Refusal on inferred granite/metal Groundwater not encountered		11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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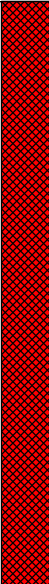

Job Number: J1801113	Eastings: 391406 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northings: 6480247 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	54.20			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			2								
			4	50.70				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, grey-brown, trace to with fine to coarse grained gravel, trace cobbles, trace fines	M		
								As above, with fine to coarse grained gravel (of brick, aggregate, concrete and limestone), trace cobbles and organics			
								As above, trace plastic and material (textiles)			
			6					Inferred concrete slab (approximately 60 mm thick)			
								Inferred concrete slab (approximately 60 mm thick) With fine to coarse grained gravel, trace cobbles, metal, plastic and organics			
			8					SP			With organics (wood chips/wood fragments)
								With fine to coarse grained gravel and cobbles			
								As above, trace plastic			
								With organics (wood chips/wood fragments) With fine to coarse grained gravel and cobbles			
			10								
		12							11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391406 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480247 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Inferred concrete slab (approximately 60 mm thick) With fine to coarse grained gravel and cobbles, trace brick cobbles		
								Trace to with fine to coarse grained gravel, trace cobbles and metal		
			14				SP	With fine to coarse grained gravel (predominantly concrete fragments) Trace rubber fragments and plastic	M	
								With fine to coarse grained gravel, trace cobbles, trace plastic (sheets)		
				37.70				SAND: fine to coarse grained, sub-angular to sub-rounded, pale yellow-pale brown, with fine to coarse grained limestone gravel and cobbles		
							SP	Trace fine to medium grained limestone gravel	W	
			18	36.20				Hole terminated at 18.00 m Target depth Groundwater not encountered		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391470 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480201 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			12			SP		With fine to coarse grained gravel and glass			
			14					With fine to coarse grained gravel, trace metal, plastic, organics, cobbles and glass	M		
			16			SP		Predominantly fine to medium grained, angular to sub-angular gravel			
			18					With fine to coarse grained gravel, trace plastic, organics and cobbles	W		
			38.13			SP		SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines			
			36.93					Hole terminated at 19.50 m Target depth Groundwater encountered at 16.5 m			
			20								
			22								
			24								
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			

Job Number: J1801113	Easting: 391515 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480104 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 17/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.51			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.51				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown to dark grey, with fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace organics, trace cobbles and plastic				
			4					Predominantly fine to coarse grained gravel (of brick, concrete, limestone, aggregate and bitumen), with fine to coarse grained sand, trace metal and plastic				M
			6					Dark grey to black, with fine to coarse grained gravel (of brick, concrete, aggregate, glass, tile and limestone), trace metal and plastic, trace occasional cobbles				
			8					Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace cobbles and plastic				
								With fine to coarse grained gravel, trace organics (wood chips/fragments), trace cobbles and plastic				
								As above, with organics				
			10					Trace organics				
			12					Inferred concrete slab/boulder (approximately 100 m thick) With fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace organics, plastic, metal and cobbles				

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391515 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480104 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 17/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			12								
			14						As above, with plastic (sheets) Trace plastic		
			16					SP	Grey-brown, with fine to coarse grained gravel (of concrete, brick, aggregate, limestone and asphalt), trace to with cobbles, trace organics and plastic	M	
			18						Predominantly fine to coarse grained gravel, trace cobbles (of concrete, approximately 80-90 mm thick)		
			20	38.51			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines			
			22	37.51				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.8 m			
			24								

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391612 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480096 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.23				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
							SP	Pale brown-grey		
			2	56.23				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of bricks, concrete, aggregate, glass and tile), trace cobbles, plastic and metal		
								As above, trace material (textiles)		
								With fine to medium grained gravel (of brick, concrete, aggregate, glass and tile), trace to with cobbles, trace plastic		
			6					Predominantly fine to coarse grained gravel (as above), with fine to coarse grained sand, trace organics	M	
							SP	With fine to coarse grained gravel (as above), trace cobbles, plastic, organics and metal		
			8					As above, grey-brown		
								As above, dark brown to dark grey/black, trace to with cobbles and organics, trace metal and plastic		
			12							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391612 m	Contractor: Proline Drilling	Date: 14/06/2019
Client: Parcel Property	Northing: 6480096 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 58 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace organics and plastic				
								With fine to coarse grained gravel, trace to with plastic, trace organics, cobbles and plastic				
			14					As above, trace asbestos (in small fragments)				
			16				SP	With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace material (textiles), trace plastic, metal and cobbles		M		
			18					Predominantly fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), with fine to coarse grained sand, trace cobbles and organics				
								As above, fine to coarse grained gravel (predominantly brick and tile fragments)				
								With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace plastic, metal and cobbles				
				38.63				SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown-grey, with fines				
							SP					
				37.23				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m				
			22									
			24									
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions				

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Job Number: J1801113	Eastings: 391655 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northing: 6480149 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	56.95				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
							Pale brown				
			2				SP	Brown, trace to with gravel			
					53.95				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone and tile), trace organics, plastic and cobbles		M
								Inferred concrete slab (approximately 120 mm thick), recovered as fine to coarse grained Gravelly SAND and COBBLES			
								Predominantly fine to coarse grained brick fragments (gravel), trace concrete, plastic and organics			
								Dark brown to dark grey, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace metal, plastic, organics and cobbles			
								As above, trace to with plastic and organics			
								Predominantly fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace plastic			
								Dark grey to black, with fine to coarse grained gravel (as above), trace plastic, organics and metal			
								As above, trace to with plastic and organics			
								Predominantly fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace plastic			
							Dark grey to black, with fine to coarse grained gravel (as above), trace plastic, organics and metal				
							As above, trace to with organics (wood chips/fragments)				
							Grey, trace to with fine to medium grained gravel, with organics				

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391583 m	Contractor: Parcel Property	Date: 12/06/2019
Client: Parcel Property	Northing: 6480181 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.84			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics and fines	D			Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.84			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown to dark brown, with fine to coarse grained gravel (of brick, concrete, aggregate, tile, etc), trace cobbles, organics and fines				
								As above, trace asbestos fragments				
								With fine to coarse grained gravel (as above), trace to with cobbles				
								As above, pale brown, trace cobbles				
								Brown to dark brown, with fine to coarse grained gravel, trace cobbles, trace plastic (hard plastic fragments and sheets), trace organics and metal	M			
								Predominantly fine to coarse grained gravel (of bricks, concrete, tiles, glass and aggregate), trace cobbles, organics and plastic				
								With fine to medium grained gravel (of bricks, concrete, tiles, glass and aggregate), trace cobbles and plastic				
								Inferred concrete slab (approximately 90 mm thick)				
								Inferred concrete slab (approximately 110 mm thick), recovered as Gravelly SAND and COBBLES				
								Predominantly fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), with fine to coarse grained sand, trace plastic and metal				

Comments:


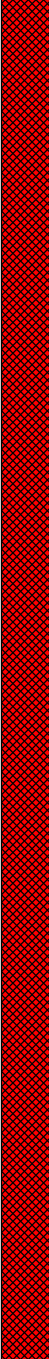
See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391583 m	Contractor: Parcel Property	Date: 12/06/2019
Client: Parcel Property	Northing: 6480181 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					As above, gravel predominantly fine to coarse grained brick fragments				
								With fine to coarse grained, gravel (of brick, concrete, aggregate and tile)				
								Trace to with material (textiles)				
			14					Inferred concrete slab (approximately 120 mm thick)				
								With fine to coarse grained gravel (predominantly fine to coarse grained brick fragments), trace concrete, glass and tile gravel				
			16				SP	As above, trace plastic (sheets), with fine to coarse grained gravel (of brick, concrete, glass, tile and aggregate)	M			
								Predominantly fine to coarse grained brick gravel, trace organics				
								With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace organics, plastic, cobbles and metal				
				39.24 39.14				LIMESTONE: well cemented, pale brown-yellow, possible FILL				
			20				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, pale brown-yellow, trace fines	W			
				37.84				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m				
			22									
			24									
Comments:									See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			


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Job Number: J1801113	Easting: 391559 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	58.70			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
								Brown-yellow			
				57.20					Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of brick, aggregate etc) trace cobbles, plastic and organics (wood chips/fragments)		
				2					As above, with organics (wood chips/fragments), dark brown		
				4					Trace to with fine to coarse grained gravel, trace organics and cobbles		
									Inferred concrete slab (approximately 60 mm thick) Red, with fine to coarse grained gravel, trace cobbles, plastic, glass and organics		
				6				SP			M
									As above, brown, trace metal and tile fragments		
				8					As above, trace to with organics		
									Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel, trace metal, cobbles, plastic and organics		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391559 m	Contractor: Proline Drilling	Date: 05/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	As above, trace brick and concrete cobbles		
			14					As above with organics (wood chips/fragments)		
								Inferred concrete slab (approximately 120 mm thick)		
								With fine to coarse grained gravel and organics, trace plastic and cobbles (predominantly brick and concrete)		
			16				SP	As above, trace organics	M	
			18							
			19.8	39.10				LIMESTONE: moderately to well cemented, pale brown-yellow		
			20	38.30			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow-brown, trace fine grained limestone gravel, trace fines	W	
			21.00	37.70				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.8 m		
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391610 m	Contractor: Proline Drilling	Date: 12/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	58.57			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	56.57			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel (of brick, concrete, aggregate and tile), trace plastic and metal, trace organics	M	
							As above, with fine to medium grained gravel			
							Dark brown to dark grey, with fine to coarse grained gravel, trace plastic, rubber, metal and organics			
			4				As above, trace brick cobbles			
							As above, with organics (wood chips/fragments)			
							With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic			
			6				As above, with glass			
							With fine to medium grained gravel (of brick, concrete, aggregate and tile), trace plastic and glass			
							As above, with plastic			
			8				Trace plastic			
							As above, with inferred concrete slab (approximately 90 mm thick), recovered as Gravelly SAND and COBBLES			

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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Job Number: J1801113	Easting: 391610 m	Contractor: Proline Drilling	Date: 12/06/2019
Client: Parcel Property	Northing: 6480211 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 59 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			12					With fine to coarse grained gravel (of brick, concrete, aggregate, tile and glass), trace brick cobbles (up to 120 mm thick), trace plastic and organics					
			14					As above, trace metal					
			16				SP		Inferred concrete slab (approximately 100 mm thick) With fine to coarse grained gravel (of bricks, concrete, aggregate, tile and glass), trace cobbles, plastic and organics	M			
			18						Predominantly fine to coarse grained gravel, with fine to coarse grained sand, trace cobbles, plastic, glass and metal				
			20	38.57				SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace fines	W				
								Brown to pale brown					
				37.57				Hole terminated at 21.00 m Target depth Groundwater encountered at 19.5 m					
			22										
			24										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391710 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northing: 6480261 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	57.08				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel (of brick, aggregate, concrete and tile), trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	As above, trace to with fine to coarse grained gravel		
			4	54.08				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace organics (wood chips/fragments)		
			6					As above, with low to medium plasticity fines		
			8					Dark brown to dark grey, with organics, trace non-plastic fines		
			10					Brown-grey, with fine to coarse grained gravel, trace plastic and cobbles	M	
			12					Inferred concrete slab (approximately 100 mm thick), recovered as fine to coarse grained GRAVEL and COBBLES		
								Dark grey to black, with fine to coarse grained gravel (of concrete, bricks, tile and aggregate), trace organics (wood chips/fragments), trace plastic and metal		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Eastings: 391710 m	Contractor: Proline Drilling	Date: 13/06/2019
Client: Parcel Property	Northings: 6480261 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 14/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC		▼	12			[Red hatched pattern]		As above, with organics (wood chips/fragments)			
								Trace organics			
								Grey, inferred concrete slab/boulder, recovered as fine to coarse grained Gravelly SAND and COBBLES			
			14					Dark brown, with fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic, organics, metal and material (textiles)			
							SP	Predominantly fine to coarse grained gravel, with fine to coarse grained sand	M		
								With fine to coarse grained gravel (of brick, concrete, aggregate and tile), trace plastic			
			16					As above, trace cobbles, metal and organics			
									W		
				18							
				38.58				Hole terminated at 18.50 m Refusal on unknown material Groundwater inferred at 18.0 m			
			20								
			22								
			24								
Comments:								See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions			


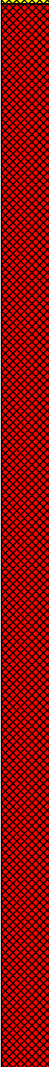
Job Number: J1801113	Easting: 391491 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480277 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	As above, trace plastic (sheets) and metal, trace organics	M	
			14					With fine to coarse grained brick fragments		
			16					As above, trace wood, trace plastic		
			18	38.76			SP	With fine to coarse grained gravel and cobbles (of brick, concrete, aggregate, limestone and tile)	W	
					SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines					
			20	37.26				Pale grey		
			22					Hole terminated at 19.50 m Target depth Groundwater encountered at 17.2 m		
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391459 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480311 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	56.80			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to coarse grained gravel, trace fines, trace organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			4	53.00			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey-brown, trace to with fine to coarse grained gravel and cobbles, trace plastic (sheets), trace organics, trace to with fines With fine to coarse grained brick fragments and cobbles Trace to with concrete cobbles, organics and plastic (sheets) As above, with fine to coarse grained gravel and cobbles		
			10							10.50: Drilling water added, sand washed from sample
			12							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

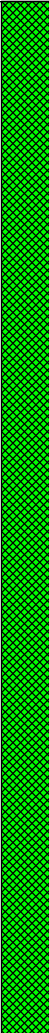
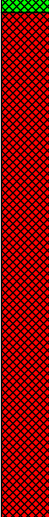
Job Number: J1801113	Easting: 391459 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480311 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					With concrete cobbles and hard plastics		13.50: Drilling water added to borehole, sand wash from sample
			14				SP	With fine to coarse grained gravel and cobbles, fine to coarse grained brick fragments, trace metal, plastic and organics (wood)	M	
			16					With fine to coarse grained brick fragments and cobbles, trace to with organics (wood)		
			18	38.80				With fine to coarse grained gravel and cobbles		
			18					With fine to coarse grained brick fragments		
			18				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines	W	
			20	37.30				Hole terminated at 19.50 m Target depth Groundwater encountered at 16.7 m		
			22							
			24							

Comments:

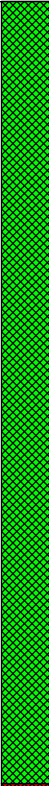

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northing: 6480321 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 57 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	57.17			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel (of concrete, aggregate, limestone, brick and tile), trace fines, trace organics in top 0.5 m	D		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2					As above, dark brown			
			4					Brown-grey, with fine to medium grained gravel			
			6					With fine grained gravel, trace plastic	M		
			8	49.17			SP	UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, brown-brown/grey, trace to fine grained gravel, fine with to medium grained brick fragments, trace organics, trace plastic, trace cobbles			11.00: Inferred base of landfill, drill bit destroyed, extremely slow progress
								Dark grey-black, trace plastic (sheets)			
								Trace metal			
								Trace organics/wood chips, wood fragments			
								Trace organics and plastic			
								Trace to with plastic, with cobbles			
								As above, with organics, trace tile fragments, trace asbestos			
								Trace to with metal strapping			
			12								

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



Job Number: J1801113	Eastings: 391427 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480367 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	56.12			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete, aggregate, limestone, tile), trace to with fines, trace plastic (sheets)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2							
			4					Trace to with fine to medium grained gravel		
			6	50.12			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey/black, with fine to coarse grained gravel (of brick, concrete, aggregate, tile fragments), trace cobbles, trace plastic (sheets), trace to with organics (wood chips / wood fragments)	M	
		8						Inferred concrete slab (approximately 150 mm thick), recovered as fine to coarse grained gravel and cobbles With fine to coarse grained gravel, trace organics/wood chips/fragments		
		10						With fine to coarse grained gravel, trace cobbles, with organics, trace plastic, engine components, metal, glass, tile and brick fragments		
		12						With fine to coarse grained gravel, trace cobbles, organics and glass		

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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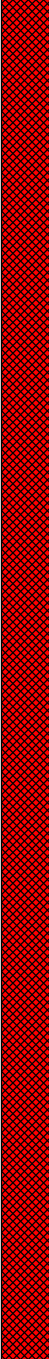
Job Number: J1801113	Easting: 391427 m	Contractor: Proline Drilling	Date: 28/05/2019
Client: Parcel Property	Northing: 6480367 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					As above, trace metal		
			14				SP	With fine to coarse grained gravel, trace cobbles, trace fines	M	
			16					As above, inferred concrete slab (approximately 120 mm thick) With fine to coarse grained gravel and cobbles		
								As above, trace plastic, glass and fine to medium grained brick fragments		
				38.62					W	
			18	38.12			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		
								Hole terminated at 18.00 m Target depth Groundwater encountered at 17 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391520 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480393 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	55.74			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to medium grained gravel, trace fines				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			54.24				SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark grey, trace to with fine to coarse grained gravel, trace plastic metal and organics, with fines				
			2					With concrete slabs recovered as Gravelly SAND/Sandy GRAVEL, fine to coarse grained sand, fine to medium grained concrete gravel and cobbles				
			4					With fine to coarse grained gravel and organics				
								With hard plastic and plastic sheets, trace to with organics (wood fragments and wood chips)				
								Trace to with fine to medium grained brick and concrete fragments				
								Trace to with organics				
			6				SP					M
								With fine to medium grained angular gravel				
			8					As above, with organics/roots, metal, plastic, rubber, trace cobbles				
			10									
			12									

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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Job Number: J1801113	Eastings: 391680 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480388 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	56.45			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown, trace fine to medium grained gravel, trace fines				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions. 3.50-4.50: Typical interbedded sand fill with gravel 7.50-9.00: Typical interbedded sand fill with gravel
				55.05				Brown, trace to with fine to medium grained gravel				
			2					UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel and occasional cobbles, trace brick fragments, fine to coarse grained concrete fragments and cobbles, trace organics, trace to with fines				
								With fine to coarse grained gravel only				
			4					As above, trace to with cobbles, fine to coarse grained brick fragments, organics, metal, plastic, granite cobbles/boulders				
								With fine to coarse grained gravel, trace fine to medium grained brick fragments, plastic (sheets) and hard plastic fragments	M			
			6				SP	With fine to coarse grained gravel only				
								As above, with fine grained brick fragments and organics (wood fragments and wood chips), trace occasional cobbles				
			8					As above, trace metal and plastic				
								As above, trace to with organics (wood fragments, wood chips and roots)				
			10					As above, trace cobbles, trace to with fine to coarse grained brick fragments and brick cobbles				
			12									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

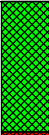


Job Number: J1801113	Easting: 391680 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480388 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12							
							SP	As above, with metal (strapping) and plastic (hard and soft sheets)	M	
				40.95			SP	UNCONTROLLED FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown, fine to coarse grained gravel, with occasional cobbles, trace metal and plastic	M - W	
				39.95			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines Becoming pale brown	W	
			18	38.45				Hole terminated at 18.00 m Target depth Groundwater encountered at 16.7 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

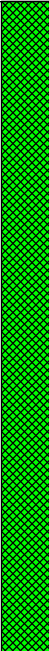
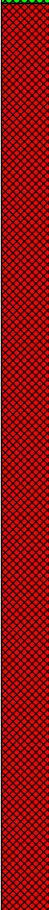
Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 47 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	46.65			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, with fine to coarse grained gravel, trace plastic, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			45.65					UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-dark grey, with fine to coarse grained gravel, trace cobbles, trace organics, trace glass, metal, ceramic (tile), fine to medium grained brick fragments and plastic		
			2					Inferred concrete slab (approximately 60 mm thick) With interbedded layer of predominately fine to coarse grained gravel (of brick, tile, glass and aggregate)		
			4					Inferred concrete slab (approximately 60 mm thick)	M	
			6					Trace metal and plastic (sheets)		
			39.15				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark grey, trace fines		
			8					Yellow	W	
			37.65					Hole terminated at 9.00 m Target depth Groundwater encountered at 7.6 m		
			10							
			12							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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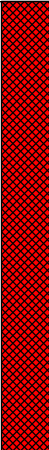
Job Number: J1801113	Easting: 391441 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480457 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	54.81				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines and organics		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	Brown-dark brown		
			4					Yellow-brown		
								Brown		
				49.81				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel and occasional cobbles, trace to with organics (wood fragments/wood chips) Dark grey, trace to with fine to coarse grained brick fragments		7.50: Drilling water added to borehole, sand washed from sample 9.00-9.80: Drilling water added to borehole, sand washed from sample
			6				M	Trace plastic, rope/twine		
			8				SP	Dark grey to black, with fine to coarse grained gravel and cobbles, trace concrete cobbles, trace organics		
			10					As above, trace metal, plastic, glass and PVC		
			12							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



Job Number: J1801113	Easting: 391441 m	Contractor: Proline Drilling	Date: 07/05/2019
Client: Parcel Property	Northing: 6480457 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					With fine to coarse grained gravel, trace metal and cobbles, trace organics		<p>13.50: Drilling water added to borehole, sand washed from sample</p> <p>15.00: Drilling water added to borehole, sand washed from sample</p>
							SP	As above, with fine to coarse grained brick fragments	M	
								As above, with organics		
			39.31			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines	W		
			18	36.81				Hole terminated at 18.00 m Target depth Groundwater encountered at 15.2 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391517 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	53.97				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
							As above, pale brown-yellow	D - M		
							Brown-dark brown/grey			
			2							
				51.37				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fine to coarse grained gravel, trace to with organics (wood fragments/wood chips), trace plastic (sheets) and materials (rags/clothing)		
							Trace occasional cobbles and cobble sized concrete fragments			
							Trace plastic (sheets)			
			4						M	
							Trace metal			
			6							
							Trace to with fine to coarse grained brick fragments, trace glass and metal, trace organics			
			8							
			10							
			12							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions


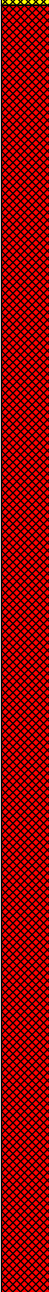
Job Number: J1801113	Eastings: 391517 m	Contractor: Proline Drilling	Date: 06/05/2019
Client: Parcel Property	Northing: 6480467 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 54 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	With fine to coarse grained gravel and cobbles, fine to coarse grained and cobble sized brick and concrete fragments	M	
								Trace plastic		
			14				SP	With inferred concrete slabs, recovered as Gravelly SAND / Sandy GRAVEL, fine to coarse grained SAND, fine to coarse grained concrete fragments and cobbles, trace metal	W	
			38.97					SAND: fine to coarse grained, sub-angular to sub-rounded, brown/yellow, trace fines		
			16	37.97				Hole terminated at 16.00 m Target depth Groundwater encountered at 15.2 m		
			18							
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391609 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480461 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	54.75			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, pale brown to brown, trace to with fine to medium grained gravel, trace organics in top 400 mm, trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	52.75			M	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown to dark brown, with fine to coarse grained gravel and cobbles, trace to with organics (wood fragments and wood chips)		
								With fine to coarse grained limestone fragments and concrete cobbles		
								With cobble sized brick and concrete fragments, trace metal (can)		
								Grey to pale grey		
								Dark grey, with fine to medium grained gravel, trace to with organics (wood chips and roots)		
								As above, trace cobble sized brick fragments and plastic		
								With organics (wood chips/wood fragments)		
								Grey to pale grey, with inferred concrete slabs, recovered as Gravelly SAND and cobble sized concrete fragments		
								Brown to dark brown, with fine to coarse grained gravel and cobble sized brick and concrete fragments		
								As above, with organics (wood fragments and wood chips), metal, plastic and glass		
									M	
									SP	
								As above, dark grey to black		
								Brown		

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391609 m	Contractor: Proline Drilling	Date: 03/05/2019
Client: Parcel Property	Northing: 6480461 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					With fine to coarse grained gravel only	M	13.00-15.50: Typical interbedded sand fill with gravel
			14		SP		With fine to coarse grained brick fragments, cobbles, metal fragments, plastic and material (clothing/rags)			
			16	39.25					SAND: fine to coarse grained, sub-angular to sub-rounded, grey-brown, trace fines	
18	36.75		SP	Pale grey						
			20					Hole terminated at 18.00 m Target depth Groundwater encountered at 14.7 m		
			22							
			24							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions


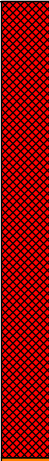

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Job Number: J1801113	Eastings: 391683 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480447 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	55.54				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines, trace occasional coarse grained gravel/cobbles		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2				SP	As above, trace to with fine to medium grained gravel		
								Trace plastic (sheets)		
				52.54				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown to grey, with fine to coarse grained gravel and concrete, occasional cobble sized concrete fragments With organics (wood chips/fragments)		3.50: Drilling water added to borehole, sand washed from sample
			4					Organics not present, with fine to coarse grained brick fragments		
								Dark grey to black		
								With medium to coarse grained brick fragments		
								With concrete (inferred slabs), recovered as Gravelly SAND		
			6					Trace fine to coarse grained brick fragments	M	
								With organics, plastic, metal		
								Brown to dark brown, trace to with fine to medium grained gravel		
			8				SP	With fine to coarse grained gravel and occasional cobbles, trace metal, plastic and organics (wood chips and fragments), trace ceramic fragments		

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391683 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480447 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 56 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Possible Sandy GRAVEL (to 13.5 m)		13.00-16.00: Drilling water added
			14				SP	Trace to with fine to coarse grained gravel, with fines, trace metal (strapping) and plastic, trace fine to coarse grained brick fragments and occasional cobbles/cobble sized concrete fragments	M	
			40.04					Possible Sandy GRAVEL (to 16.0 m)		
			16				SP	SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines	W	
				37.54				Yellow		
			18					Hole terminated at 18.00 m Target depth Groundwater encountered at 15.7 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480517 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	49.67			SP	FILL: Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, brown, fine to coarse grained gravel, trace metal, trace organics				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
				48.67				UNCONTROLLED FILL: SAND, fine to coarse grained sub-angular to sub-rounded, dark grey-dark brown, with fine to coarse grained gravel, trace cobbles, trace plastic, metal and organics With organics and plastic (sheets)				
			2					With fine to coarse grained gravel, trace cobbles and organics (wood chips/fragments), trace plastic				
								Inferred concrete slab (approximately 60 mm thick)				
								Inferred limestone boulder (approximately 140 mm thick)				
								With fine to coarse grained gravel, trace plastic, trace fine to medium grained brick fragments				
							SP	As above, predominantly coarse grained gravel and cobbles, trace to with plastic and metal				
			6					With fine to coarse grained gravel, trace metal fragments		D		
								Inferred concrete slab (approximately 90 mm thick)				
								With fine to coarse grained gravel, trace cobbles, trace metal fragments				
								As above, trace organics and plastic (sheets)				
								Trace to with fine to coarse grained gravel, trace cobbles				
								With fine to coarse grained gravel (of brick, concrete, aggregate, limestone and tile) trace organics, trace metal and plastic				
				39.07			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace fines				
								Yellow				
				12								

Comments: Hole terminated at 12.00 m
Target depth
Groundwater not encountered

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 21/05/2019
Client: Parcel Property	Northing: 6480517 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			12	37.67									
			14										
			16										
			18										
			20										
			22										
			24										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391515 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480576 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	51.88				FILL: SAND, fine to medium grained, sub-angular to sub-rounded, brown-grey, trace to with fine to medium grained gravel, trace wood, trace organics/rootlets in top 300 mm, trace fine to medium grained concrete fragments, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2			SP				
			4	48.58				UNCONTROLLED FILL: fine to coarse grained, sub-angular to sub-rounded, dark grey to black, trace to with fine to medium grained gravel, trace plastic (sheeting/bags), trace fine to medium grained concrete fragments, trace fines With wood fragments, fabric (i.e. clothing, rags, etc) and cobbles Wood, material, cobbles not present Below 5.0 m, trace to with fine to coarse grained gravel and occasional cobbles and pockets of plastic (sheeting/bags and bottles), trace wood fragments, trace brick and limestone fragments	M	
			6			SP			M - W	
			8					With fine to coarse grained gravel Trace metal (sheeting) Trace wire, recovered as bundles and metal strapping	M	11.00: Drilling water added to borehole, sand washed from sample
			10							
			12	40.38			SP	SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines	W	

Comments:	Hole terminated at 12.00 m Target depth Groundwater encountered at 11.5 m	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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AC





Job Number: J1801113	Easting: 391515 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480576 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 52 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			12	39.88									
			14										
			16										
			18										
			20										
			22										
			24										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions


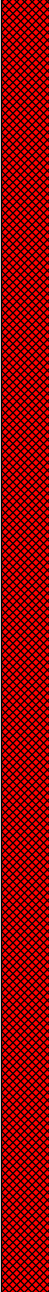
Job Number: J1801113	Easting: 391609 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northing: 6480561 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 53 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	12				SP					
			14	39.32				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey to pale grey, trace fines, with fine to medium grained, angular gravel			
			38.32					Hole terminated at 15.00 m Target depth Groundwater encountered at 13.5 m				
			16									
			18									
			20									
			22									
			24									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions




Job Number: J1801113	Easting: 391684 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northing: 6480516 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	55.14			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace organics, trace fines				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	53.14			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fine to medium grained gravel and occasional coarse grained gravel, trace brick fragments and wood, trace fines				8.00: Drilling water added
			4					Dark grey, trace metal fragments				
			4					Brown to dark brown, trace cobbles				
			4					With fine to medium grained gravel, trace organics				
			6					Trace cobbles and cobble sized brick fragments and plastic				
			6					With fine to medium grained gravel, trace metal and wire				
			8					With fine to medium grained gravel, brick fragments, metal, cobble sized concrete fragments, plastic sheets, organics (wood and clumps of fibrous organic material)				
			10									
			12									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391684 m	Contractor: Proline Drilling	Date: 01/05/2019
Client: Parcel Property	Northing: 6480516 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP		M	12.50: Drilling water added, sand washed from sample
			14							
			16	39.14			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow, trace fines As above, becoming pale grey	W	
			18	37.14				Hole terminated at 18.00 m Target depth Groundwater encountered at 15.5 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391725 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480494 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	55.28		[Pattern]	SP	<p>FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace fines, trace rootlets/organics in top 500 mm</p> <p>Trace fine to medium grained gravel</p> <p>Brown to grey</p> <p>Trace brick fragments</p>		<p>Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.</p> <p>3.50: Drilling water added to borehole, sand washed from sample</p> <p>7.50: Drilling water added to borehole, sand washed from sample</p> <p>9.00: Drilling water added to borehole, sand washed from sample (to 10.0 m)</p>	
			2			[Pattern]					
			4	52.28			[Pattern]	M	<p>UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, grey-brown, with fine to medium grained gravel and concrete fragments, trace fines</p> <p>As above, trace to with cobbles and cobble sized concrete fragments</p>		
			6				[Pattern]		<p>As above, trace organics (wood)</p> <p>Trace to with plastic (sheets), rubber and metal fragments</p>		
			8				[Pattern]	SP	<p>As above, with fine to coarse grained gravel fragments and cobbles, trace cobble sized brick fragments</p>		
			10				[Pattern]		<p>Trace organics (wood)</p> <p>With metal strapping and wire</p> <p>Trace organics (wood)</p>		
			12				[Pattern]		<p>Trace to with cobble sized concrete fragments</p>		

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391725 m	Contractor: Proline Drilling	Date: 02/05/2019
Client: Parcel Property	Northing: 6480494 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 55 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12					Trace cobble sized brick fragments		16.00: Drilling water added to borehole, sand washed from sample
			14				SP	Trace metal strapping	M	
							Trace to with cobble sized concrete fragments			
							Trace to with organics (wood shavings/fragments)			
			38.78					SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines	W	
					SP		Yellow			
			37.28					Hole terminated at 18.00 m Target depth Groundwater encountered at 15.5 m		
			20							
			22							
			24							

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391415 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480596 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			0	51.20			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown-yellow, trace organics/rootlets in top 300 mm, trace fine to medium grained gravel, trace fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			2	49.70			SP	UNCONTROLLED FILL: fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to medium grained gravel, trace concrete, plastic, metal and jars	D - M	
			4					Trace occasional cobbles and cobble sized concrete fragments		
			6	45.50				SP	SAND: fine to medium grained, sub-angular to sub-rounded, brown, trace fines Yellow	
			8					Pale yellow to pale brown		
			10					Yellow to pale orange		
			12					Fine to coarse grained, pale grey	W	

Comments:

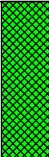


See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391415 m	Contractor: Proline Drilling	Date: 30/04/2019
Client: Parcel Property	Northing: 6480596 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			12				SP	Predominantly fine to medium grained, trace coarse grained sand	W	
				36.20				Hole terminated at 15.00 m Target depth Groundwater encountered at 10.9 m		
			14							
			16							
			18							
			20							
			22							
			24							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northing: 6480417 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	49.69			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of concrete, brick, limestone, aggregate), trace fines		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			1	48.69				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of concrete, brick, aggregate), trace cobbles, trace fines, trace plastic (sheets) Trace to with brick and concrete cobbles	M	
			4				SP	Trace organics (wood), trace to with fine to medium grained brick fragments		
			5					Inferred concrete slab (approximately 60 mm thick) With plasterboard, low plasticity fines		
			6					Trace to with fine grained gravel		
			7	43.19				SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace to with fines Pale brown-pale yellow		W
			8				SP	Yellow		
			9							
			10							

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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GALT LIB 1.01.GLB Log_GG_NON_CORED J1801113.GPJ <<Drawingfile>> 2/10/2019 11:22 10.0000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013:02:21 Pjt: GALT 1.01 2013:02:21

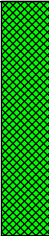
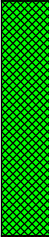

Job Number: J1801113	Easting: 391405 m	Contractor: Proline Drilling	Date: 20/05/2019
Client: Parcel Property	Northing: 6480417 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10				•	SP	Pale grey				
				39.19					Hole terminated at 10.50 m Target depth Groundwater encountered at 6.5 m				
			11										
			12										
			13										
			14										
			15										
			16										
			17										
			18										
			19										
			20										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391388 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling	Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
			0	51.49			SP	FILL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to coarse grained gravel (of brick, concrete aggregate and limestone), trace fines, trace metal and plastic				Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1	49.99			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fine to coarse grained gravel, trace fines, trace brick fragments and organics (wood)					
			2	48.49				UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown-grey, trace fines, trace to with fine to coarse grained gravel and occasional cobbles, trace brick and concrete					
			3					With fine to coarse grained gravel					
			4					As above, grey, trace plastic (sheets)					
			5					As above, trace organics (wood), metal and occasional cobbles	M				
			6					With organics (wood chips/fragments), brick and tile fragments, metal, plastic and fines					6.00: Drilling water added to borehole, sand washed from sample
			7					Brown, with fine to coarse grained gravel and cobbles, trace metal (wire) and synthetic fibre bundles	SP				
			8					Inferred concrete slab (approximately 120 mm thick), grey					
								Brown, with organics (wood chips), fragments					
								With cobbles					
			9					Inferred concrete slab (approximately 190 mm thick), grey					
								Brown, with fine to coarse grained gravel, trace cobbles, metal and organics (wood chips/fragments), trace brick fragments					
			10										

Comments:	See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions
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Job Number: J1801113	Easting: 391388 m	Contractor: Proline Drilling	Date: 17/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 51 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC		▼	10			[Red cross-hatched pattern]	SP	Trace metal (possibly mechanical components, wire and plastic (sheets), trace brick and tile fragments, trace organics (wood/wood fragments)	M			
			11									
			12									
			13	38.69		[Orange dotted pattern]	SP	SAND: fine to coarse grained, sub-angular to sub-rounded, yellow-brown, trace fines				
			14						Yellow			
			15									
			16	35.49				Hole terminated at 16.00 m Target depth Groundwater encountered at 12.9 m				
			17									
			18									
			19									
			20									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391238 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	45.31			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, with fine to medium grained gravel (of brick, concrete, limestone, aggregate and tile), trace to with fines	M	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1								
			2								
			3								
			4					As above, trace cobbles			
			5	40.61			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, brown, trace to with fines	W		
			6					Grey			
			7					Dark brown (inferred very weakly to weakly cemented (Coffee Rock))			
			8					Moderately to well cemented, recovered as fine to coarse grained gravel and cobbles			
			9					Dark brown, very weakly to weakly cemented			
		10									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391238 m	Contractor: Proline Drilling	Date: 22/05/2019
Client: Parcel Property	Northing: 6480221 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50 305	Inclination: -90°	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 45 m AHD	Hole Dia: 90 mm	Checked By: ORW

Drilling			Sampling			Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10				•	SP					
				34.81					Hole terminated at 10.50 m Target depth Groundwater encountered at 7 m				
			11										
			12										
			13										
			14										
			15										
			16										
			17										
			18										
			19										
			20										

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Eastings: 391381 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	49.98				FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines, trace organics (in top 100 mm)		Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.
			1				SP	As above, trace to with fine to coarse grained gravel, trace concrete and brick cobbles		
			2							
			3	47.48				Uncontrolled FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown to with fine to coarse grained gravel, trace fines	M	
			4					Inferred concrete slab (approximately 80 mm thick) Dark grey-dark brown, with fine to coarse grained gravel (of brock, concrete, limestone, aggregate), trace concrete cobbles		
			5					As above, trace concrete and brick cobbles, trace glass, plastic, material (textiles), and metal fragments, trace organics		
			6							
			7							
			8						W	
			9							
			10							

Comments: See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions





Job Number: J1801113	Easting: 391381 m	Contractor: Proline Drilling	Date: 04/06/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 50 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling			Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AC			10					Inferred concrete slab (approximately 60 mm thick)				
			11				SP	With fine to coarse grained gravel (of brick, concrete, limestone, aggregate), trace concrete and brick cobbles, trace glass, plastic and metal fragments, with organics (wood chips/fragments)				
			12	37.98				Inferred concrete slab (100 mm thick)				
			13				SP	SAND: fine to coarse grained, sub-angular to sub-rounded, grey, trace fines		W		
			14					Yellow				
			15	34.98				Hole terminated at 15.00 m Target depth Groundwater encountered at 12.3 m				
			16									
			17									
			18									
			19									
			20									

Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

Job Number: J1801113	Easting: 391231 m	Contractor: Proline Drilling	Date: 29/05/2019
Client: Parcel Property	Northing: 6480107 m	Drill Rig: Commachio Geo	Logged: MC
Project: Proposed Mixed Use Subdivision	Datum: MGA94 Zone 50	305	Checked Date: 06/06/2019
Location: 26 Driver Road, Darch	Surface RL: 44 m AHD	Inclination: -90°	Checked By: ORW
		Hole Dia: 90 mm	

Drilling			Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
AC			0	43.98			SP	FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to medium grained gravel, trace fines	D	Density not assessed. It is not possible to indicate full composition of uncontrolled fill from spoil recovered from boreholes. Refer to test pit reports for more complete descriptions.	
			1								
			2	42.58			SP	UNCONTROLLED FILL: SAND, fine to coarse grained, sub-angular to sub-rounded, brown, trace fine to coarse grained gravel (of brick, concrete, aggregate), trace fines			
			3					Trace to with fine coarse grained gravel			
			4								
			5	39.48			SP	SAND: fine to coarse grained, sub-angular to sub-rounded, dark grey, trace fines	M		
			6					Pale grey			
			7								
			8					Brown-dark brown, very weak to weakly cemented, with well cemented gravel			
			9	34.98				Hole terminated at 9.00 m Target depth Groundwater encountered at 5.9 m			
			10								


Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions



PointID : LG01 Depth Range: 0.00 - 4.00 m

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	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG01</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	1/1	



PointID : LG02 Depth Range: 0.00 - 4.00 m



PointID : LG02 Depth Range: 4.00 - 8.00 m

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TITLE


Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG02

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : LG02 Depth Range: 8.00 - 10.50 m

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	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG02</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG03 Depth Range: 0.00 - 4.00 m



PointID : LG03 Depth Range: 4.00 - 4.50 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG03	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/1




PointID : LG04 Depth Range: 0.00 - 4.00 m



PointID : LG04 Depth Range: 4.00 - 8.00 m


GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT.1.01.2013.02.21 Proj: GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG04	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	



PointID : LG04 Depth Range: 8.00 - 10.50 m

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	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG04</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG05 Depth Range: 0.00 - 4.00 m



PointID : LG05 Depth Range: 4.00 - 8.00 m


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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG05	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : LG05 Depth Range: 8.00 - 10.50 m

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	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG05</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG06 Depth Range: 0.00 - 4.00 m



PointID : LG06 Depth Range: 4.00 - 8.00 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG06	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/1




PointID : LG07 Depth Range: 0.00 - 4.00 m



PointID : LG07 Depth Range: 4.00 - 6.00 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG07	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	




PointID : LG08 Depth Range: 0.00 - 4.00 m



PointID : LG08 Depth Range: 4.00 - 7.50 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG08	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/1	




PointID : LG09 Depth Range: 0.00 - 4.00 m



PointID : LG09 Depth Range: 4.00 - 8.00 m


GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG09	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : LG09 Depth Range: 8.00 - 10.50 m

GALT \LIB 1.01.GLB G\c\B\ DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG09</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG10 Depth Range: 0.00 - 4.00 m



PointID : LG10 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT.1.01.2013.02.21 Proj-GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG10	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/2	




PointID : LG10 Depth Range: 8.00 - 12.00 m



PointID : LG10 Depth Range: 12.00 - 13.50 m


GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG10	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/2



PointID : LG12 Depth Range: 0.00 - 4.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG12</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	1/1



PointID : LG13 Depth Range: 0.00 - 4.00 m



PointID : LG13 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG13

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : LG14 Depth Range: 0.00 - 4.00 m



PointID : LG14 Depth Range: 4.00 - 4.50 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT.1.01.2013.02.21 Proj-GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG14

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/1




PointID : LG15 Depth Range: 0.00 - 4.00 m



PointID : LG15 Depth Range: 4.00 - 8.00 m


GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG15	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : LG15 Depth Range: 8.00 - 11.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG15</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG16 Depth Range: 0.00 - 4.00 m



PointID : LG16 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG16	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG16 Depth Range: 8.00 - 12.00 m



PointID : LG16 Depth Range: 12.00 - 16.00 m


GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG16	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3



PointID : LG16 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG16</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG17 Depth Range: 0.00 - 4.00 m



PointID : LG17 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG17

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3




PointID : LG17 Depth Range: 8.00 - 12.00 m



PointID : LG17 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG17	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3




PointID : LG18 Depth Range: 0.00 - 4.00 m



PointID : LG18 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT.1.01.2013.02.21 Proj-GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG18	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG18 Depth Range: 8.00 - 12.00 m



PointID : LG18 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG18	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3




PointID : LG18 Depth Range: 16.00 - 20.00 m



PointID : LG18 Depth Range: 20.00 - 21.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG18	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3



PointID : LG19 Depth Range: 0.00 - 4.00 m



PointID : LG19 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG19

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 1/3	




PointID : LG19 Depth Range: 8.00 - 12.00 m



PointID : LG19 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21] Pjt:GALT.1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG19	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3




PointID : LG19 Depth Range: 16.00 - 20.00 m



PointID : LG19 Depth Range: 20.00 - 21.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG19	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3




PointID : LG20 Depth Range: 0.00 - 4.00 m



PointID : LG20 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG20	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	




PointID : LG20 Depth Range: 8.00 - 12.00 m



PointID : LG20 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG20	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3



PointID : LG20 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G:\c\l\l\ DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG20</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	3/3	




PointID : LG21 Depth Range: 0.00 - 4.00 m



PointID : LG21 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG21	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3



PointID : LG21 Depth Range: 8.00 - 12.00 m



PointID : LG21 Depth Range: 12.00 - 16.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:106/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG21

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

2/3



PointID : LG21 Depth Range: 16.00 - 20.00 m



PointID : LG21 Depth Range: 20.00 - 21.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG21	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3



PointID : LG22 Depth Range: 0.00 - 4.00 m



PointID : LG22 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG22

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3



PointID : LG22 Depth Range: 8.00 - 12.00 m



PointID : LG22 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG22

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 2/3	




PointID : LG22 Depth Range: 16.00 - 20.00 m



PointID : LG22 Depth Range: 20.00 - 21.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG22	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 3/3




PointID : LG23 Depth Range: 0.00 - 4.00 m



PointID : LG23 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG23	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG23 Depth Range: 8.00 - 12.00 m



PointID : LG23 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 D:\galt\GCD, CPT, Photo, Monitoring Tools \Lib\GALT\1.01\2013\02\21 Pjt\GALT\1.01\2013\02\21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG23	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	




PointID : LG23 Depth Range: 16.00 - 20.00 m



PointID : LG23 Depth Range: 20.00 - 21.00 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG23	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 3/3	




PointID : LG24 Depth Range: 0.00 - 4.00 m



PointID : LG24 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib_GALT\1.01 2013-02-21 Proj_GALT\1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG24	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG24 Depth Range: 8.00 - 12.00 m



PointID : LG24 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG24

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113


FIGURE No

2/3



PointID : LG24 Depth Range: 16.00 - 18.50 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Pjt:GALT.1.01.2013.02.21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG24</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	3/3	



PointID : LG25 Depth Range: 0.00 - 4.00 m



PointID : LG25 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG25

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3



PointID : LG25 Depth Range: 8.00 - 12.00 m



PointID : LG25 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG25

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113


FIGURE No

2/3



PointID : LG25 Depth Range: 16.00 - 19.50 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG25</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : LG26 Depth Range: 0.00 - 4.00 m



PointID : LG26 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG26	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 1/3	



PointID : LG26 Depth Range: 8.00 - 12.00 m



PointID : LG26 Depth Range: 12.00 - 16.00 m


GALT LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG26	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3



PointID : LG26 Depth Range: 16.00 - 19.50 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG26</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : LG27 Depth Range: 0.00 - 4.00 m



PointID : LG27 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG27	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3



PointID : LG27 Depth Range: 8.00 - 12.00 m



PointID : LG27 Depth Range: 12.00 - 16.00 m

GALT LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE


Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG27

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 2/3	



PointID : LG27 Depth Range: 16.00 - 19.50 m

GALT LUB 1.01.GLB G:\c\td\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG27</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG28 Depth Range: 0.00 - 4.00 m



PointID : LG28 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG28

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3



PointID : LG28 Depth Range: 8.00 - 12.00 m



PointID : LG28 Depth Range: 12.00 - 16.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Pjt:GALT.1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG28

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113


FIGURE No

2/3



PointID : LG28 Depth Range: 16.00 - 18.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG28</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : LG29 Depth Range: 0.00 - 4.00 m



PointID : LG29 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG29	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG29 Depth Range: 8.00 - 12.00 m



PointID : LG29 Depth Range: 12.00 - 16.00 m


GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG29</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/3



PointID : LG29 Depth Range: 16.00 - 18.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG29</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3



PointID : LG30 Depth Range: 0.00 - 4.00 m



PointID : LG30 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT\1.01 2013-02-21 Proj-GALT\1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG30

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3




PointID : LG30 Depth Range: 8.00 - 12.00 m



PointID : LG30 Depth Range: 12.00 - 16.00 m


GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 D:\galt\G.D.G.D. CPT. Photo Monitoring Tools \Lib-GALT\1.01 2013-02-21 Pjt-GALT\1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG30	DRAWN	DATE 21/06/2019	
		CHECKED	DATE 21/06/2019	
		SCALE Not To Scale		A4
		PROJECT No J1801113	FIGURE No 2/3	



PointID : LG30 Depth Range: 16.00 - 18.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT.1.01.2013.02.21 Pjt-GALT.1.01.2013.02.21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG30</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	3/3




PointID : LG31 Depth Range: 0.00 - 4.00 m



PointID : LG31 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG31	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : LG31 Depth Range: 8.00 - 9.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG31</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : LG32 Depth Range: 0.00 - 4.00 m



PointID : LG32 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG32	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3



PointID : LG32 Depth Range: 8.00 - 12.00 m



PointID : LG32 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:25 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013.02.21 Proj: GALT 1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG32

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	2/3



PointID : LG32 Depth Range: 16.00 - 18.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:25 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG32

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	3/3



PointID : LG33 Depth Range: 0.00 - 4.00 m



PointID : LG33 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG33

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2




PointID : LG33 Depth Range: 8.00 - 12.00 m



PointID : LG33 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG33	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/2



PointID : LG34 Depth Range: 0.00 - 4.00 m



PointID : LG34 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG34	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3




PointID : LG34 Depth Range: 8.00 - 12.00 m



PointID : LG34 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG34</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/3



PointID : LG35 Depth Range: 0.00 - 4.00 m



PointID : LG35 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG35	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/3



PointID : LG35 Depth Range: 8.00 - 12.00 m



PointID : LG35 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE


Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG35

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 2/3	



PointID : LG35 Depth Range: 16.00 - 18.00 m

GALT LUB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Proj: GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG35</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	3/3	




PointID : LG36 Depth Range: 0.00 - 4.00 m



PointID : LG36 Depth Range: 4.00 - 8.00 m


GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT 1.01 2013-02-21 Pjt:GALT 1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG36	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : LG36 Depth Range: 8.00 - 12.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG36</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2



PointID : LG37 Depth Range: 0.00 - 4.00 m



PointID : LG37 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG37

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 1/1	




PointID : LG38 Depth Range: 0.00 - 4.00 m



PointID : LG38 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG38</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	1/2	




PointID : LG38 Depth Range: 8.00 - 12.00 m



PointID : LG38 Depth Range: 8.00 - 15.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG38	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/2



PointID : LG39 Depth Range: 0.00 - 4.00 m



PointID : LG39 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG39

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/3




PointID : LG39 Depth Range: 8.00 - 12.00 m



PointID : LG39 Depth Range: 12.00 - 16.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib_GALT\1.01 2013-02-21 Proj_GALT\1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG39	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 2/3



PointID : LG40 Depth Range: 0.00 - 4.00 m



PointID : LG40 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/06/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG40

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113

FIGURE No

1/3



PointID : LG40 Depth Range: 8.00 - 12.00 m



PointID : LG40 Depth Range: 12.00 - 16.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib-GALT.1.01.2013.02.21 Proj-GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - LG40

DRAWN

DATE

21/06/2019

CHECKED

DATE

21/06/2019

SCALE

Not To Scale

A4

PROJECT No

J1801113


FIGURE No

2/3



PointID : LG40 Depth Range: 16.00 - 18.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools \Lib-GALT 1.01 2013-02-21 Pjt-GALT 1.01 2013-02-21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - LG40</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	3/3	



PointID : MW01 Depth Range: 0.00 - 4.00 m



PointID : MW01 Depth Range: 4.00 - 8.00 m

GALT.LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - MW01

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : MW01 Depth Range: 8.00 - 12.00 m



PointID : MW01 Depth Range: 12.00 - 15.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - MW01

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 2/2	



PointID : MW02 Depth Range: 0.00 - 4.00 m



PointID : MW02 Depth Range: 4.00 - 8.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01 2013.02.21 Proj:GALT.1.01 2013.02.21



TITLE


Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - MW02

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No	1/2



PointID : MW02 Depth Range: 8.00 - 10.50 m

GALT LUB 1.01.GLB G:\cfr\ DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pdf: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW02</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : MW03 Depth Range: 0.00 - 4.00 m



PointID : MW03 Depth Range: 4.00 - 8.00 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools \Lib:GALT\1.01 2013-02-21 Proj:GALT\1.01 2013-02-21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW03	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



PointID : MW03 Depth Range: 8.00 - 12.00 m



PointID : MW03 Depth Range: 12.00 - 16.00 m

GALT LUB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Proj:GALT.1.01.2013.02.21



TITLE

Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - MW03

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 2/2	



PointID : MW04 Depth Range: 0.00 - 4.00 m



PointID : MW04 Depth Range: 0.40 - 8.00 m

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TITLE


Parcel Property
26 Driver Road, Darch
Proposed Mixed Use Subdivision
Core Photo - MW04

DRAWN	DATE	21/06/2019
CHECKED	DATE	21/06/2019
SCALE	Not To Scale	A4
PROJECT No J1801113	FIGURE No 1/2	



PointID : MW04 Depth Range: 8.00 - 10.50 m

GALT \LIB 1.01.GLB G1c1b1 DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 21/06/2019 11:26 10.0.0.000 Datigel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Pjt: GALT 1.01 2013-02-21

	<p>TITLE</p> <p>Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW04</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No J1801113	FIGURE No	2/2	




PointID : MW05 Depth Range: 0.00 - 4.00 m



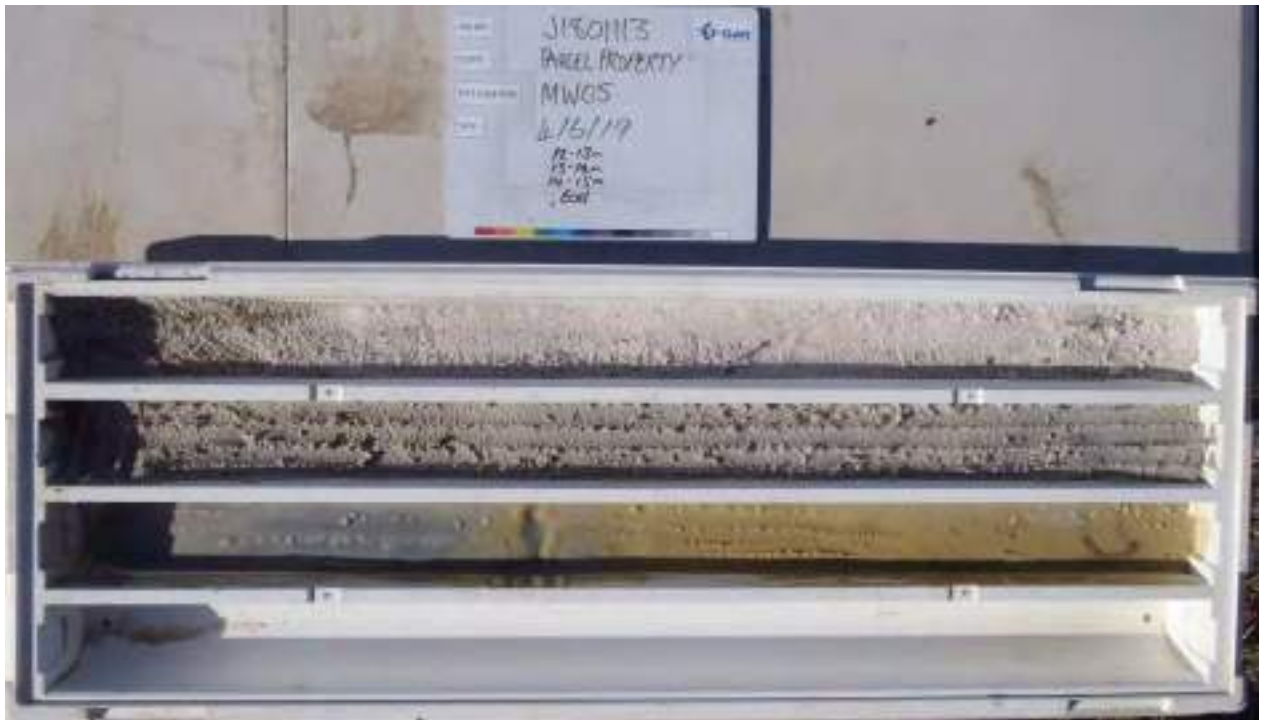
PointID : MW05 Depth Range: 4.00 - 8.00 m

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	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW05	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2




PointID : MW05 Depth Range: 8.00 - 12.00 m



PointID : MW05 Depth Range: 12.00 - 15.00 m

GALT LIB 1.01.GLB G:\citra DG PHOTO CORE PHOTO 2 PER PAGE J1801113.GPJ <<DrawingFile>> 2/10/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21 Proj:GALT.1.01.2013.02.21

	<p>TITLE</p> <p style="text-align: center;">Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW05</p>	DRAWN	DATE	21/06/2019	
		CHECKED	DATE	21/06/2019	
		SCALE	Not To Scale		A4
		PROJECT No	J1801113	FIGURE No	2/2




PointID : MW06 Depth Range: 0.00 - 4.00 m



PointID : MW06 Depth Range: 4.00 - 8.00 m

GALT LIB 1.01.GLB G:\c\tr\ DG PHOTO CORE PHOTO 2 PER PAGE J180113.GPJ <<DrawingFile>> 2:10/6/2019 11:26 10.0.0.000 Datagel DGD, CPT, Photo, Monitoring Tools [Lib:GALT.1.01.2013.02.21] Pjt:GALT.1.01.2013.02.21

	TITLE Parcel Property 26 Driver Road, Darch Proposed Mixed Use Subdivision Core Photo - MW06	DRAWN	DATE 21/06/2019
		CHECKED	DATE 21/06/2019
		SCALE Not To Scale	A4
		PROJECT No J1801113	FIGURE No 1/2



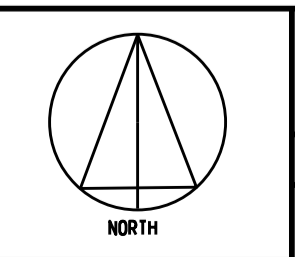
Appendix G: 2008-2018 Survey Comparison



REVISIONS

ION SERVICES PTY LTD
 LICENSED SURVEYORS
 14/23 GIBBERD ROAD, BALCATTA WA 6021
 TELEPHONE 081 9240 2300
 FACSIMILE 081 9240 2303

DATE : 12 - 6 - 2018
 SCALE : 1 : 1500 @ A1
 DATUM : PCG94
 VERT : AHD



Monitoring Points - 2008 to 2018
 Lot 2 urniss Road, Landsdale
 Non Organic Disposals
 REF No: 7025/518/a1_rev1



Appendix H: Understanding Your Report

UNDERSTANDING YOUR REPORT

GALT FORM PMP11 Rev3

1. EXPECTATIONS OF THE REPORT

This document has been prepared to clarify what is and is not provided in your report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with the conditions on site.

Geotechnical engineering and environmental science are less exact than other engineering and scientific disciplines. We include this information to help you understand where our responsibilities begin and end. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of projects and we can help you to manage your risk.

2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following:

- ✦ the project objectives as we understood them and as described in this report;
- ✦ the specific site mentioned in this report; and
- ✦ the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this report if any of the following conditions apply:

- ✦ the report was not written for you;
- ✦ the report was not written for the site specific to your development;
- ✦ the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- ✦ the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the project team. Furthermore, we recommend that we be able to review work produced by other members of the project team that relies on information provided in our report.

3. SOIL LOGS

Our reports often include logs of intrusive and non-intrusive investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party because of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

5. CHANGE IN SUBSURFACE CONDITIONS

The recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including anthropogenic events (such as construction or contaminating activities on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use professional judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from professional judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

7. ENVIRONMENTAL AND GEOTECHNICAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not addressed in geotechnical reports. Similarly, geotechnical issues are not addressed in environmental reports. The investigation techniques used for geotechnical investigations can differ from those used for environmental investigations. It is the client's responsibility to satisfy themselves that geotechnical and environmental considerations have been taken into account for the site.

Geotechnical advice presented in a Galt Environmental report has been provided by Galt Geotechnics under a sub-contract agreement. Similarly, environmental advice presented in a Galt Geotechnics report has been provided by Galt Environmental under a sub-contract agreement.

Unless specifically noted otherwise, no parties shall draw any inferences about the applicability of the Western Australian state government landfill levy from the contents of this document.

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APPENDIX 4 – INFILTRATION TESTING (GALT, 2019B)

TECHNICAL MEMORANDUM



J1801113 006 TM Rev0

16 August 2019

To: Steve Claudio

e-mail: steve@parcelproperty.com.au

Cc: Ross Perrigo

Cc email: ross@urbaqua.org.au

From: Owen Woodland

Sender's email: owen.woodland@galtgeo.com.au

PRELIMINARY INFILTRATION TESTING VARIOUS MATERIALS – LOT 2 DRIVER ROAD, DARCH

Dear Steve,

1. INTRODUCTION

This technical memorandum presents the outcomes of preliminary infiltration testing carried out in various materials at the proposed residential subdivision of Lot 2 Driver Road, Darch.

The testing was aimed at gaining an appreciation of the various unsaturated hydraulic conductivity responses of the materials on the site to inform the hydrological assessment of the site being undertaken by Urbaqua.

2. INFILTRATION TESTING

The material types present on the site are discussed in our geotechnical report, J1801113 005 R Rev0, dated 24 June 2019. Testing was focused on a preliminary assessment of unsaturated hydraulic conductivity in the following materials:

- ✦ Unit 1a: SAND FILL – typically derived from off-site sources including quarry sources, site clean-ups and 'slab scrapes'. Mostly relatively low-fines sand with minor inclusions like trace rootlets, bricks, etc. Generally well compacted to a dense to very dense state (locally medium dense) as assessed with the Perth sand penetrometer and cone penetration testing. Present over most of Lot 2 to between ~1 m and 5 m depth as a capping layer over natural sandy soil or Unit 1b.
- ✦ Unit 1b: Uncontrolled FILL – mixture of sand and generally inert construction/demolition rubble, often with some plastic pipes and some metal, with relatively minor inclusions of wood and organic material. Generally well compacted, however this is not testable by conventional methods. Some loose sand pockets present. The sand often includes trace to some organics and fines, which is usually a marker of reduced permeability (compared to "clean" low-fines and low-organic sand). Present over most of Lot 2, but absent in parts of the west of the site.
- ✦ Unit 1c: Screened FILL – typically <10 mm (nominally <7 mm) "all in" product left from the bottom end of screening processes done on Lot 1. Resulting in a gravelly sand, which is relatively well graded and very dense. Mainly present along the southern and eastern edge of Lot 1, extending into Lot 2.

Infiltration testing was undertaken on 26 July and 7 August 2019 by geotechnical engineers from Galt Geotechnics. Testing was done generally using the inverse auger hole method described by Cocks¹. A modified version of this test, using a test pit (rather than a small augered borehole) was done for selected materials due to possible scale effects and the heterogeneity of the materials

¹ Cocks, G (2007), "Disposal of Stormwater Runoff by Soakage in Perth Western Australia", Journal and News of the Australian Geomechanics Society, Volume 42 No. 3, pp 101-114.

on site. Site photographs taken during testing are included in Attachment A. The approximate locations of the tests are shown in Figure 1.

The results of the infiltration testing are presented in Attachment B, Infiltration Test Results and summarised in Table 1: Summary of Infiltration Test Results.

Table 1: Summary of Infiltration Test Results

Test Location	Test Method	Material Tested	Minimum Unsaturated Hydraulic Conductivity ¹ , k (m/day)		
			Test 1	Test 2	Test 3
IT01	IAH	Unit 1a - SAND	8.3	7.6	7.9
IT02	IAH	Unit 1a - SAND	9.5	9.1	9.1
IT03	IAH	Unit 1a - SAND	>15	12.8	12.4
IT04	IAH	Unit 1a - SAND	12.0	10.3	9.4
IT05	IAH	Unit 1a - SAND	6.9	6.6	6.6
IT06	IAH	Unit 1a - SAND	9.8	9.3	9.2
IT07	IAH	Unit 1a - SAND	8.7	7.1	8.0
IT08	IAH	Unit 1a - SAND	8.5	7.4	7.6
IT09	IAH	Unit 1a - SAND	7.6	7.6	7.4
IT10	IAH	Unit 1a - SAND	5.0	4.0	4.0
IT11	IAH	Unit 1c – Screened FILL	7.3	7.4	7.4
IT12	IAH	Unit 1c – Screened FILL	9.4	8.4	7.1
IT13	IAH	Unit 1c – Screened FILL	5.9	7.0	8.8
IT14	TP	Unit 1b – Uncontrolled FILL	13.7	-	-
IT15	TP	Unit 1b – Uncontrolled FILL	4.9	-	-
IT16	TP	Unit 1b – Uncontrolled FILL	4.2	-	-
IT17	TP	Unit 1b – Uncontrolled FILL	>15	-	-
IT18	TP	Unit 1b – Uncontrolled FILL	14.5	-	-
IT19	TP	Unit 1b – Uncontrolled FILL	9.9	-	-
IT20	TP	Unit 1c – Screened FILL	5.4	-	-
IT21	TP	Unit 1c – Screened FILL	>15	-	-

- Notes:**
1. The minimum hydraulic conductivities are typically recorded towards the end of the test, with pressure head varying between about 0.15 m and 0.4 m.
 2. IAH – inverse auger hole, TP – test pit
 3. Reporting of hydraulic conductivity in excess of 15 m/day is not done due to the inaccuracy of the test at high rates.
 4. Reporting of hydraulic conductivity to one decimal place does not imply accuracy of the test, which is approximate.
 5. Due to limitations of water supply, only one test was done for test pit soakage tests. It is likely that the unsaturated hydraulic conductivity would reduce somewhat with repeated testing (as can be observed in the inverse auger hole test results).

Perth sand penetrometer (PSP) testing was done adjacent to shallow (inverse auger hole) tests to provide a basis for evaluating material density. Test results are included in Attachment C.

3. COMMENTARY

3.1 Unit 1a - SAND

Our testing indicates that the sand fill is generally well compacted (dense to very dense), albeit loose in about the upper 0.5 m of the profile in many places (this is probably a function of the topsoil placed loosely on the sand and 'fluffing up' of the upper layer of the sand used as the capping below).

The testing indicated an unsaturated hydraulic conductivity value in the range of about 4-10 m/day as tested. Given that the sand is generally well compacted at present, the hydraulic conductivity is unlikely to reduce significantly as a function of compaction in the future. Permeability may be reduced by siltation or similar as is typical in soakage basins and soakwells.

3.2 Unit 1b – Uncontrolled FILL

The uncontrolled fill is heterogeneous and therefore will exhibit variable drainage performance with spatial variation. However, our testing has indicated that this material is somewhat permeable, with measured unsaturated hydraulic conductivity in the range of 4-15 m/day on first wetting. We recommend that these values be discounted by at least 20% to allow for a reduction in hydraulic conductivity on subsequent wetting.

This material is not likely to be significantly further handled or compacted and it is likely that any infiltrated water passing through this layer will be filtered by the overlying sands, therefore the hydraulic conductivity performance of this layer is not likely to change significantly during service.

3.3 Unit 1c – Screened FILL

This material is somewhat variable in its density (generally very dense, and yet locally loose including 2 of the tested locations – noting that we had trouble in testing at the denser locations with the inverse auger hole method due to auger refusal).

The measured unsaturated hydraulic conductivity varied from around 5-8 m/day (excepting IT21, which we consider was very loose and hence the infiltration test was not representative of the drainage performance of compacted material). IT21 should be ignored at this stage.

The screened fill therefore appears to be relatively permeable. Given that the gravelly sand is generally well compacted at present, the hydraulic conductivity is unlikely to reduce significantly as a function of compaction in the future. Permeability may be reduced by siltation or similar as is typical in soakage basins and soakwells

3.4 General

Where hydraulic conductivity performance is critical to the performance of the site drainage, we recommend confirmatory testing be done on site at the Specified density (in the absence of other information, assume this to be a dry density ratio of 95% MMDD for sand soils).

4. CONCLUSION

We trust that this information meets your present needs. Please refer to “Understanding Your Report”, included in Attachment D.

Yours Faithfully,

GALT GEOTECHNICS PTY LTD

A handwritten signature in black ink, appearing to read "O. Woodland".

Owen Woodland CPEng

Geotechnical Engineer

Attachments: Figure 1 – Infiltration Test Locations
 A – Site Photographs
 B – Infiltration Test Results
 C – Perth Sand Penetrometer Test Results
 D – Understanding Your Report

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ATTACHMENT A

Site Photographs



Photograph 1: IT02 (Unit 1a SAND FILL) – Inverse auger hole test setup



Photograph 2: IT04 (Unit 1a SAND FILL) – Inverse auger hole test setup



Photograph 3: Inverse auger hole setup for testing in Unit 1C (Screened FILL) present below surficial layer of Unit 1A (SAND FILL)



Photograph 4: Unit 1C (Screened Fill) present in test pit



Photograph 5: Example test pit for infiltration testing in Unit 1B (Uncontrolled FILL) material – prior to water addition



Photograph 6: Testing in progress in Unit 1B (uncontrolled FILL) material



ATTACHMENT B

Infiltration Test Results

Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

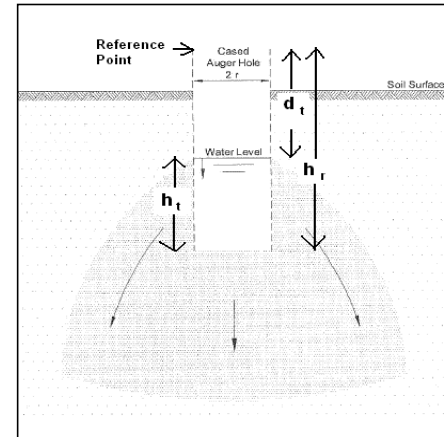
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT01	Parameter	Description	Value	Units
Test Depth:	0.74 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h _r	reference point height above base	0.93	m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.35	0.58	2.6E-04	22.4
40	0.43	0.5	2.1E-04	18.0
60	0.47	0.46	1.7E-04	14.5
80	0.5	0.43	1.4E-04	12.4
100	0.53	0.4	1.3E-04	11.2
120	0.55	0.38	1.2E-04	10.1
140	0.57	0.36	1.1E-04	9.4
160	0.59	0.34	1.0E-04	8.8
180	0.605	0.325	9.6E-05	8.3
AVERAGE			1.5E-04	12.8

Test 2

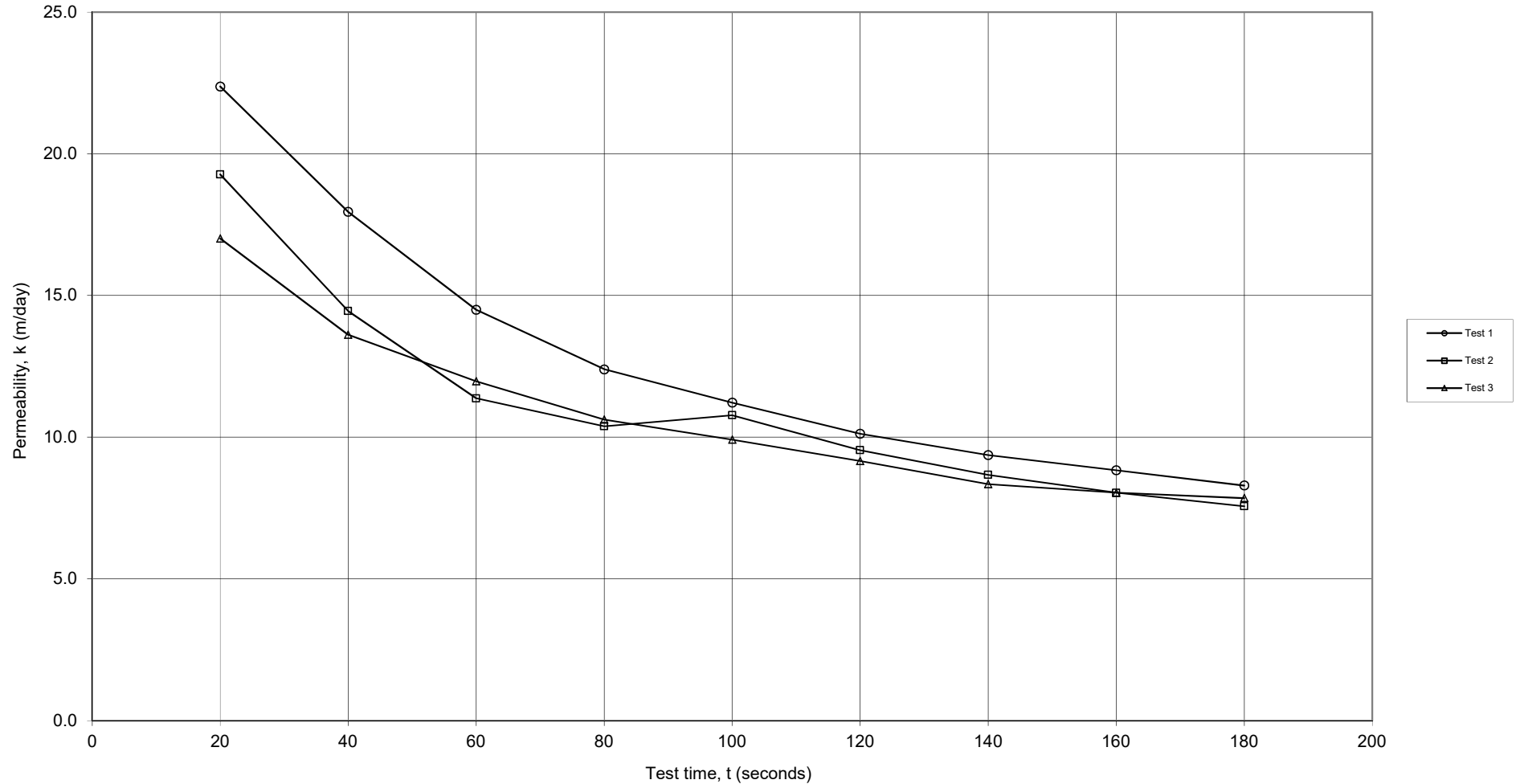
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.33	0.6	2.2E-04	19.3
40	0.39	0.54	1.7E-04	14.5
60	0.42	0.51	1.3E-04	11.4
80	0.46	0.47	1.2E-04	10.4
100	0.52	0.41	1.2E-04	10.8
120	0.535	0.395	1.1E-04	9.5
140	0.55	0.38	1.0E-04	8.7
160	0.565	0.365	9.3E-05	8.0
180	0.58	0.35	8.8E-05	7.6
AVERAGE			1.3E-04	11.1

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.19	0.74		
20	0.315	0.615	2.0E-04	17.0
40	0.38	0.55	1.6E-04	13.6
60	0.43	0.5	1.4E-04	12.0
80	0.465	0.465	1.2E-04	10.6
100	0.5	0.43	1.1E-04	9.9
120	0.525	0.405	1.1E-04	9.2
140	0.54	0.39	9.7E-05	8.3
160	0.565	0.365	9.3E-05	8.0
180	0.59	0.34	9.1E-05	7.9
AVERAGE			1.2E-04	10.7

Permeability by Inverse Auger Hole Method

IT01



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

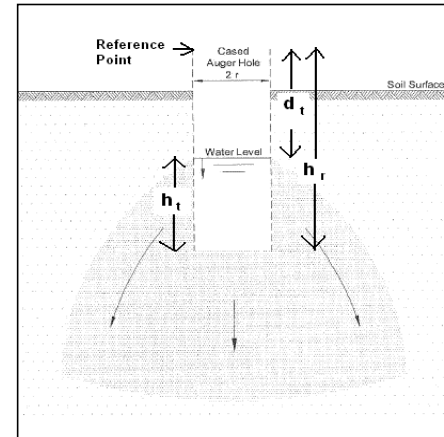
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT02	Parameter	Description	Value	Units
Test Depth:	0.62 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.455	0.475	2.8E-04	24.3
40	0.52	0.41	2.2E-04	18.8
60	0.565	0.365	1.9E-04	16.0
80	0.6	0.33	1.7E-04	14.3
100	0.625	0.305	1.5E-04	12.8
120	0.645	0.285	1.4E-04	11.7
140	0.66	0.27	1.2E-04	10.7
160	0.68	0.25	1.2E-04	10.2
180	0.69	0.24	1.1E-04	9.5
AVERAGE			1.6E-04	14.2

Test 2

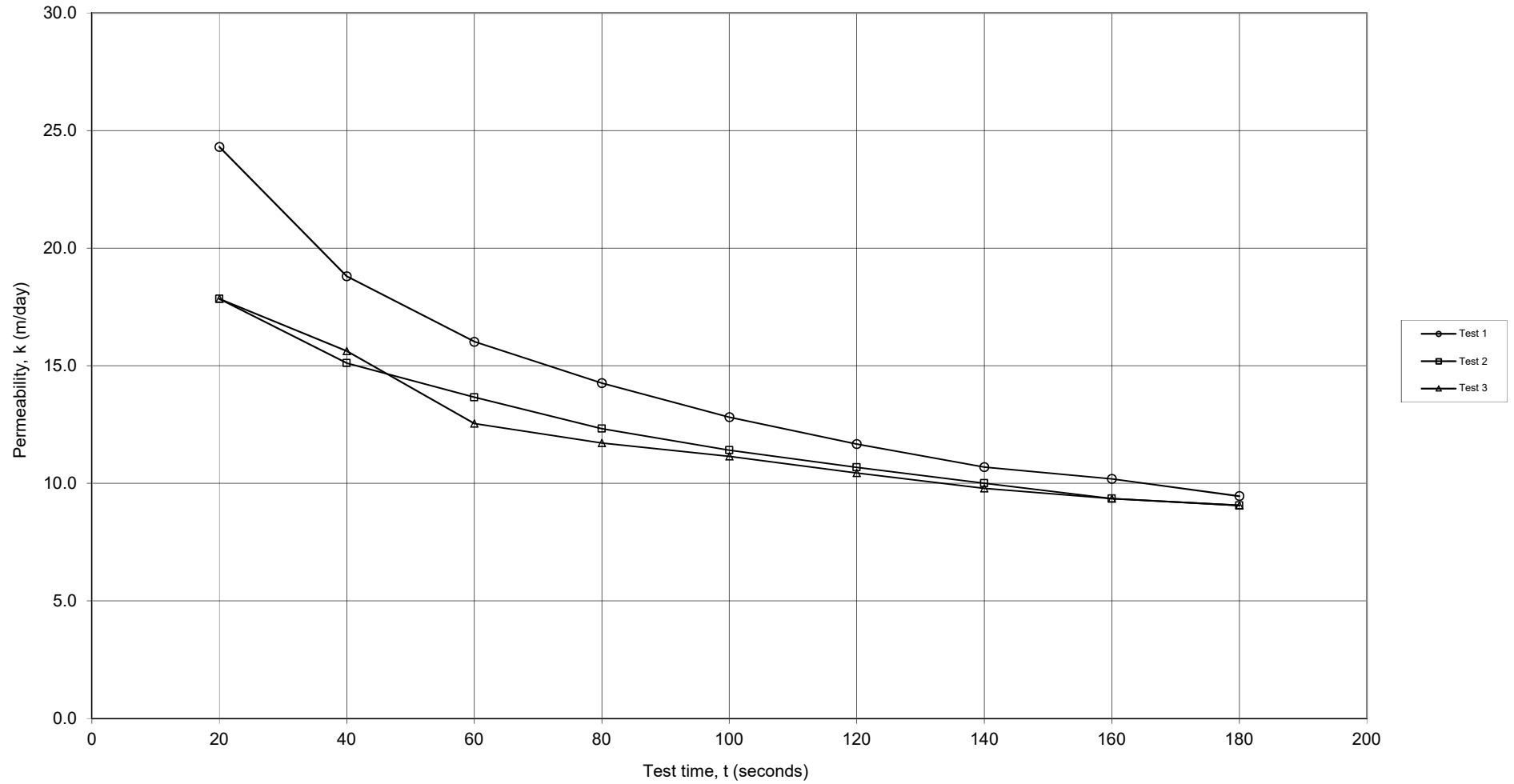
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.42	0.51	2.1E-04	17.8
40	0.485	0.445	1.7E-04	15.1
60	0.535	0.395	1.6E-04	13.7
80	0.57	0.36	1.4E-04	12.3
100	0.6	0.33	1.3E-04	11.4
120	0.625	0.305	1.2E-04	10.7
140	0.645	0.285	1.2E-04	10.0
160	0.66	0.27	1.1E-04	9.3
180	0.68	0.25	1.0E-04	9.1
AVERAGE			1.4E-04	12.2

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.31	0.62		
20	0.42	0.51	2.1E-04	17.8
40	0.49	0.44	1.8E-04	15.6
60	0.52	0.41	1.5E-04	12.5
80	0.56	0.37	1.4E-04	11.7
100	0.595	0.335	1.3E-04	11.1
120	0.62	0.31	1.2E-04	10.4
140	0.64	0.29	1.1E-04	9.8
160	0.66	0.27	1.1E-04	9.3
180	0.68	0.25	1.0E-04	9.1
AVERAGE			1.4E-04	11.9

Permeability by Inverse Auger Hole Method

IT02



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

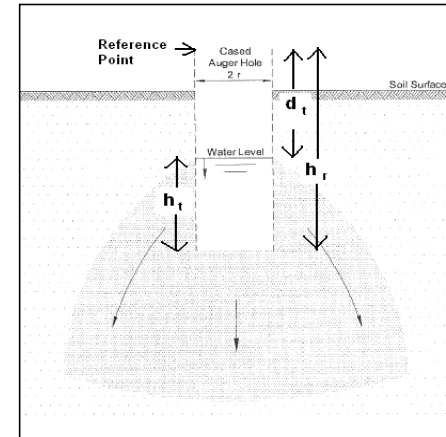
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT03	Parameter	Description	Value	Units
Test Depth:	0.76 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.42	0.51	4.2E-04	36.6
40	0.525	0.405	3.3E-04	28.7
60	0.595	0.335	2.9E-04	24.8
80	0.635	0.295	2.5E-04	21.4
100	0.67	0.26	2.2E-04	19.4
120	0.7	0.23	2.1E-04	17.9
140	0.73	0.2	2.0E-04	17.1
160	0.75	0.18	1.9E-04	16.1
180	0.765	0.165	1.7E-04	15.1
AVERAGE			2.5E-04	21.9

Test 2

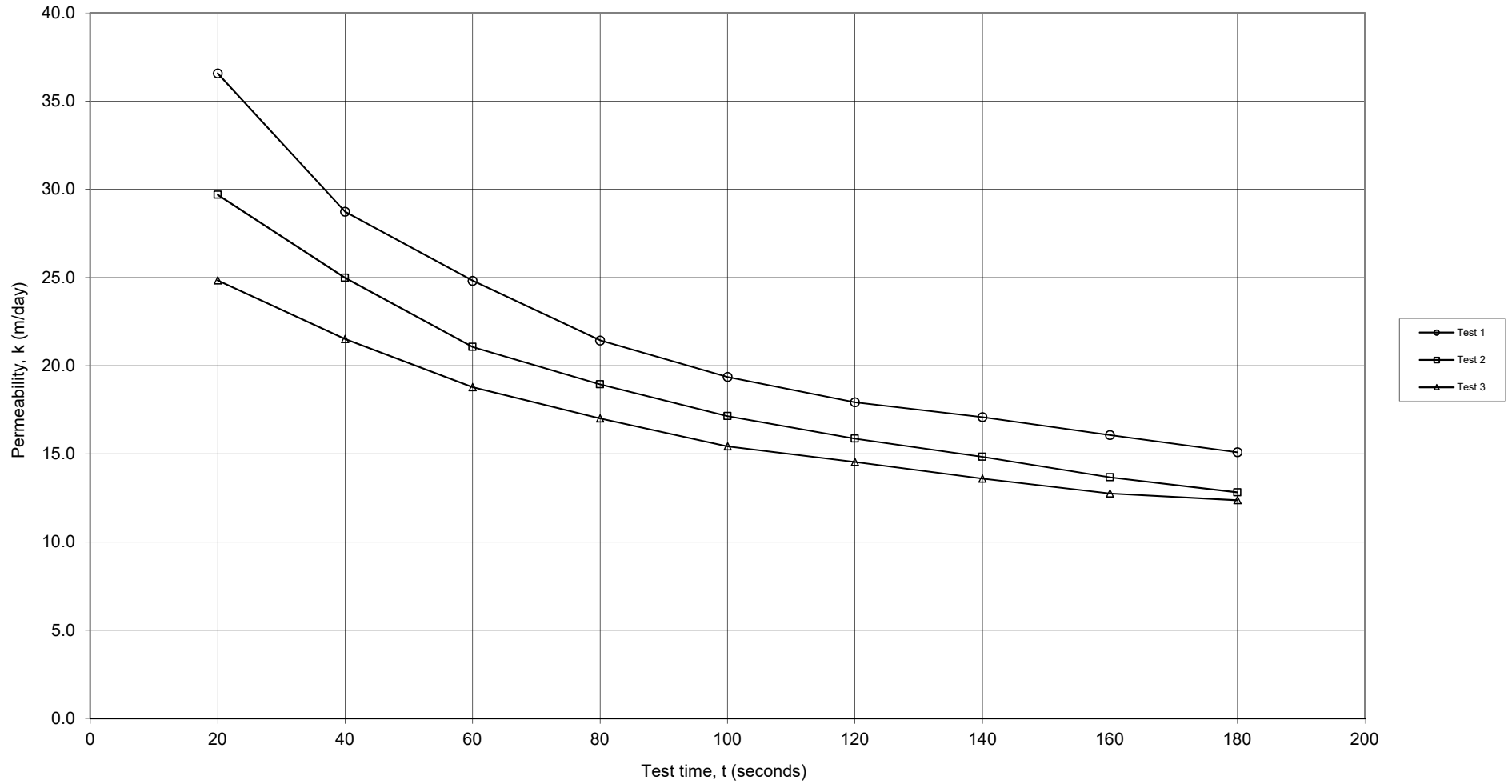
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.38	0.55	3.4E-04	29.7
40	0.49	0.44	2.9E-04	25.0
60	0.55	0.38	2.4E-04	21.1
80	0.6	0.33	2.2E-04	18.9
100	0.635	0.295	2.0E-04	17.1
120	0.665	0.265	1.8E-04	15.9
140	0.69	0.24	1.7E-04	14.8
160	0.705	0.225	1.6E-04	13.7
180	0.72	0.21	1.5E-04	12.8
AVERAGE			2.2E-04	18.8

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.17	0.76		
20	0.35	0.58	2.9E-04	24.8
40	0.455	0.475	2.5E-04	21.5
60	0.52	0.41	2.2E-04	18.8
80	0.57	0.36	2.0E-04	17.0
100	0.605	0.325	1.8E-04	15.4
120	0.64	0.29	1.7E-04	14.5
140	0.665	0.265	1.6E-04	13.6
160	0.685	0.245	1.5E-04	12.8
180	0.71	0.22	1.4E-04	12.4
AVERAGE			1.9E-04	16.8

Permeability by Inverse Auger Hole Method

IT03



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

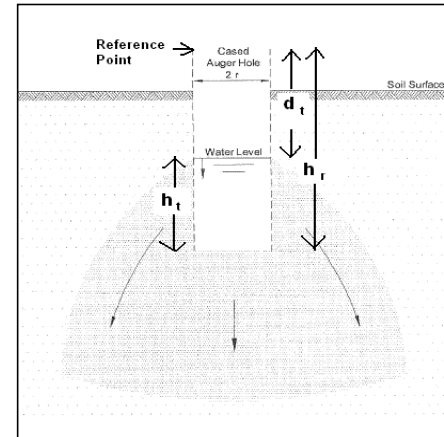
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT04	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.39	0.54	3.5E-04	30.1
40	0.475	0.455	2.6E-04	22.9
60	0.535	0.395	2.3E-04	19.5
80	0.58	0.35	2.0E-04	17.3
100	0.61	0.32	1.8E-04	15.5
120	0.64	0.29	1.7E-04	14.3
140	0.665	0.265	1.6E-04	13.4
160	0.68	0.25	1.4E-04	12.4
180	0.705	0.225	1.4E-04	12.0
AVERAGE			2.0E-04	17.5

Test 2

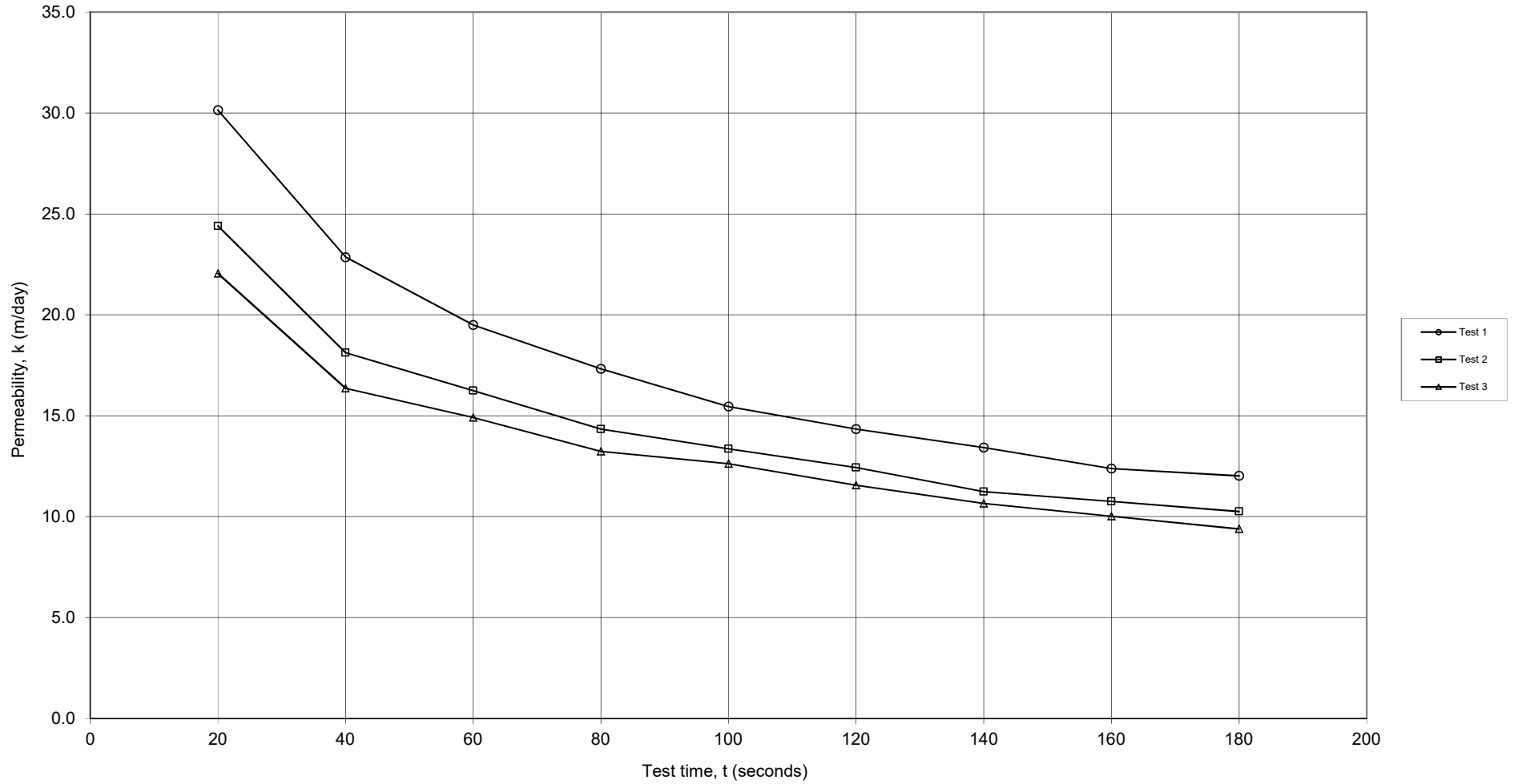
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.355	0.575	2.8E-04	24.4
40	0.425	0.505	2.1E-04	18.1
60	0.49	0.44	1.9E-04	16.2
80	0.53	0.4	1.7E-04	14.3
100	0.57	0.36	1.5E-04	13.4
120	0.6	0.33	1.4E-04	12.4
140	0.615	0.315	1.3E-04	11.2
160	0.64	0.29	1.2E-04	10.8
180	0.66	0.27	1.2E-04	10.3
AVERAGE			1.7E-04	14.6

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.34	0.59	2.6E-04	22.0
40	0.405	0.525	1.9E-04	16.4
60	0.47	0.46	1.7E-04	14.9
80	0.51	0.42	1.5E-04	13.2
100	0.555	0.375	1.5E-04	12.6
120	0.58	0.35	1.3E-04	11.6
140	0.6	0.33	1.2E-04	10.7
160	0.62	0.31	1.2E-04	10.0
180	0.635	0.295	1.1E-04	9.4
AVERAGE			1.6E-04	13.4

Permeability by Inverse Auger Hole Method

IT04



Permeability Calculation - Inverse Auger Hole Method

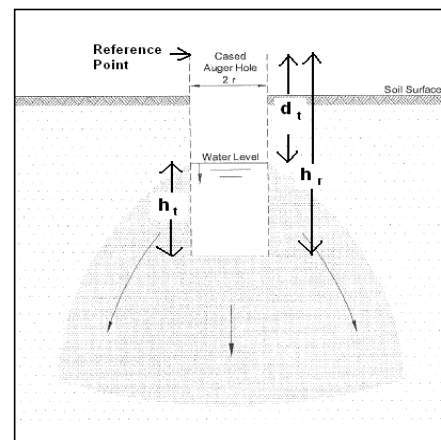
Galt Geotechnics

Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$



BH Name:	IT05	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	0.93	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				

Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.31	0.62	2.0E-04	17.5
40	0.38	0.55	1.6E-04	14.2
60	0.415	0.515	1.3E-04	11.5
80	0.44	0.49	1.1E-04	9.7
100	0.47	0.46	1.0E-04	8.9
120	0.495	0.435	9.6E-05	8.3
140	0.515	0.415	8.9E-05	7.7
160	0.535	0.395	8.5E-05	7.3
180	0.55	0.38	8.0E-05	6.9
AVERAGE			1.2E-04	10.2

Test 2

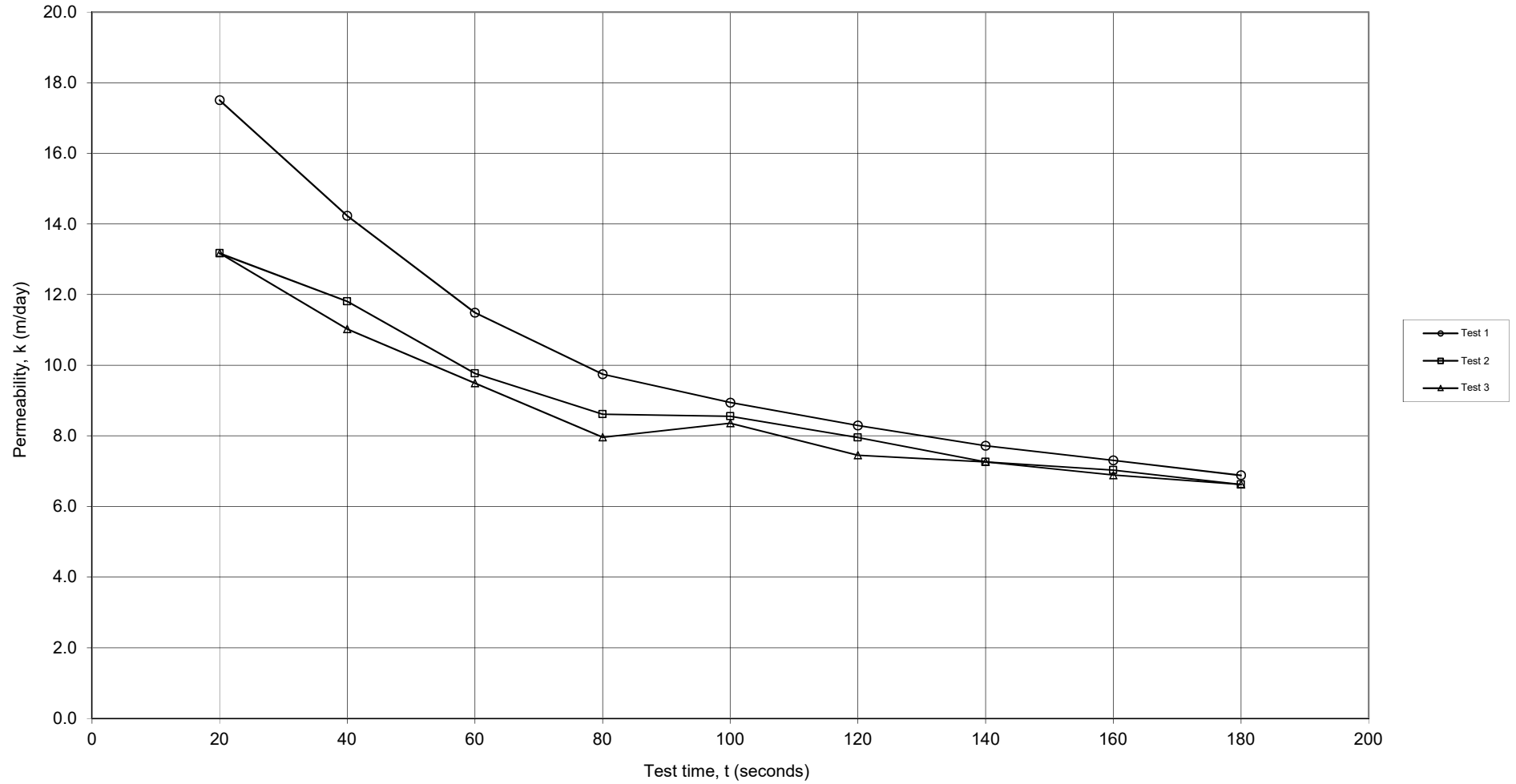
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.28	0.65	1.5E-04	13.2
40	0.35	0.58	1.4E-04	11.8
60	0.385	0.545	1.1E-04	9.8
80	0.415	0.515	1.0E-04	8.6
100	0.46	0.47	9.9E-05	8.6
120	0.485	0.445	9.2E-05	8.0
140	0.5	0.43	8.4E-05	7.3
160	0.525	0.405	8.1E-05	7.0
180	0.54	0.39	7.7E-05	6.6
AVERAGE			1.0E-04	9.0

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.18	0.75		
20	0.28	0.65	1.5E-04	13.2
40	0.34	0.59	1.3E-04	11.0
60	0.38	0.55	1.1E-04	9.5
80	0.4	0.53	9.2E-05	8.0
100	0.455	0.475	9.7E-05	8.4
120	0.47	0.46	8.6E-05	7.5
140	0.5	0.43	8.4E-05	7.3
160	0.52	0.41	8.0E-05	6.9
180	0.54	0.39	7.7E-05	6.6
AVERAGE			1.0E-04	8.7

Permeability by Inverse Auger Hole Method

IT05



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

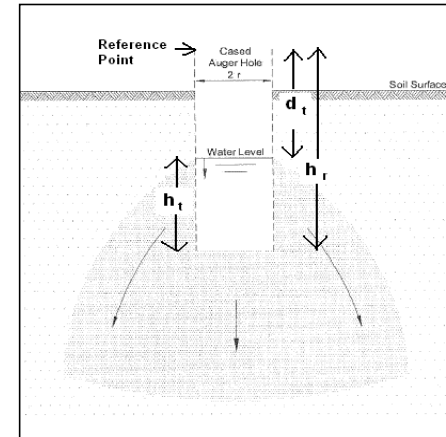
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT06	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.375	0.555	3.1E-04	27.0
40	0.44	0.49	2.2E-04	19.2
60	0.51	0.42	2.0E-04	17.4
80	0.55	0.38	1.8E-04	15.3
100	0.575	0.355	1.6E-04	13.5
120	0.6	0.33	1.4E-04	12.3
140	0.62	0.31	1.3E-04	11.4
160	0.635	0.295	1.2E-04	10.5
180	0.65	0.28	1.1E-04	9.8
AVERAGE			1.8E-04	15.2

Test 2

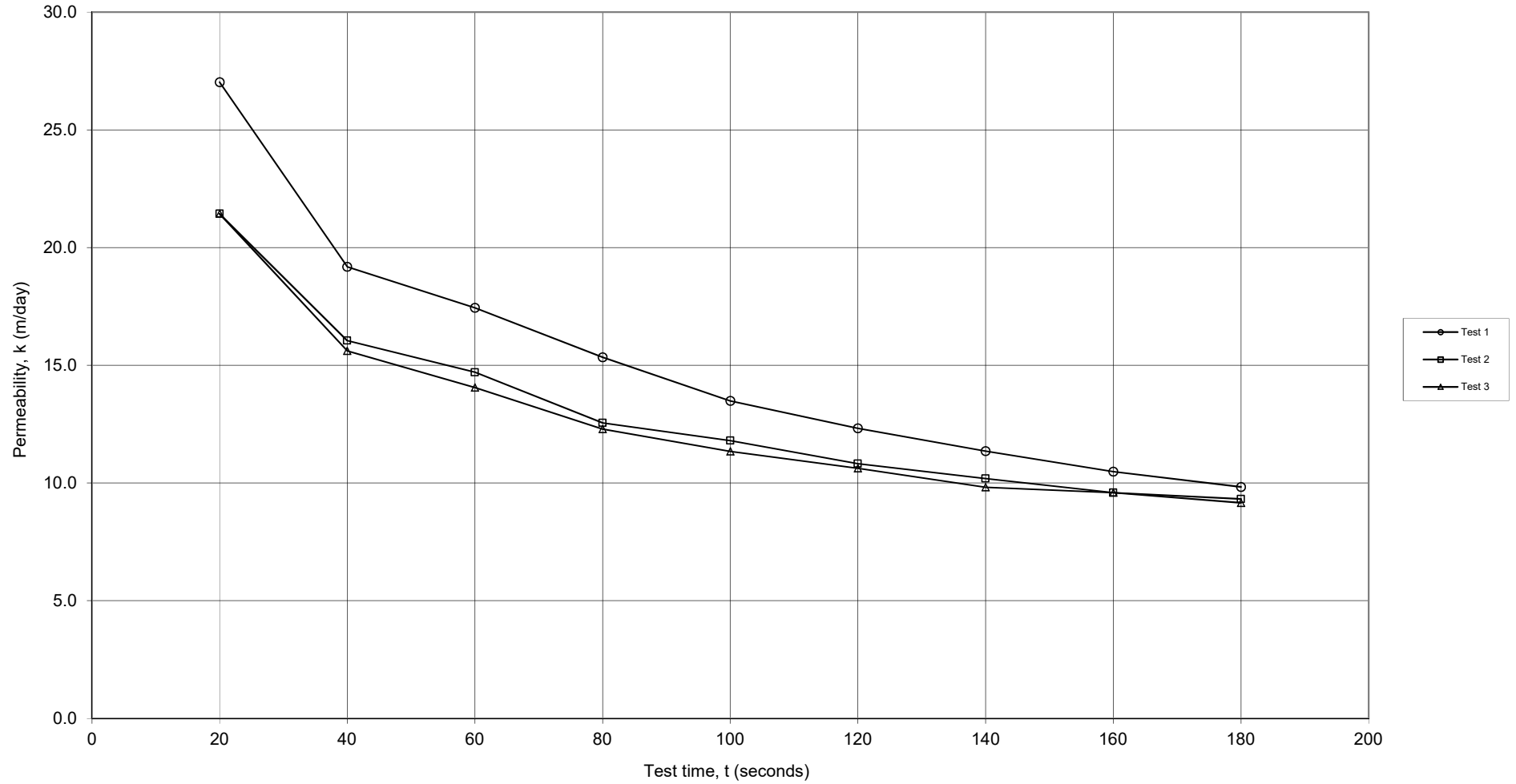
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.34	0.59	2.5E-04	21.4
40	0.405	0.525	1.9E-04	16.0
60	0.47	0.46	1.7E-04	14.7
80	0.5	0.43	1.5E-04	12.6
100	0.54	0.39	1.4E-04	11.8
120	0.565	0.365	1.3E-04	10.8
140	0.59	0.34	1.2E-04	10.2
160	0.61	0.32	1.1E-04	9.6
180	0.635	0.295	1.1E-04	9.3
AVERAGE			1.5E-04	12.9

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.34	0.59	2.5E-04	21.4
40	0.4	0.53	1.8E-04	15.6
60	0.46	0.47	1.6E-04	14.1
80	0.495	0.435	1.4E-04	12.3
100	0.53	0.4	1.3E-04	11.3
120	0.56	0.37	1.2E-04	10.6
140	0.58	0.35	1.1E-04	9.8
160	0.61	0.32	1.1E-04	9.6
180	0.63	0.3	1.1E-04	9.2
AVERAGE			1.5E-04	12.7

Permeability by Inverse Auger Hole Method

IT06



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

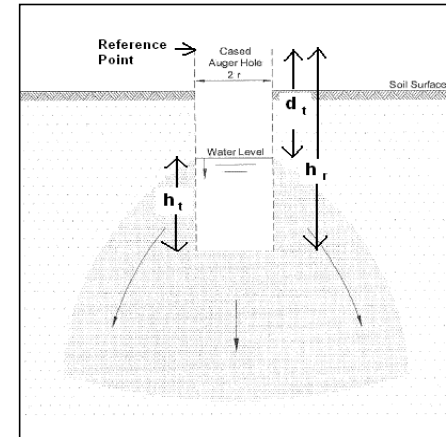
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT07	Parameter	Description	Value	Units
Test Depth:	0.60 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.47	0.46	2.8E-04	24.2
40	0.53	0.4	2.1E-04	18.4
60	0.57	0.36	1.8E-04	15.4
80	0.605	0.325	1.6E-04	13.9
100	0.62	0.31	1.4E-04	11.9
120	0.635	0.295	1.2E-04	10.7
140	0.645	0.285	1.1E-04	9.6
160	0.66	0.27	1.0E-04	9.0
180	0.68	0.25	1.0E-04	8.7
AVERAGE			1.6E-04	13.5

Test 2

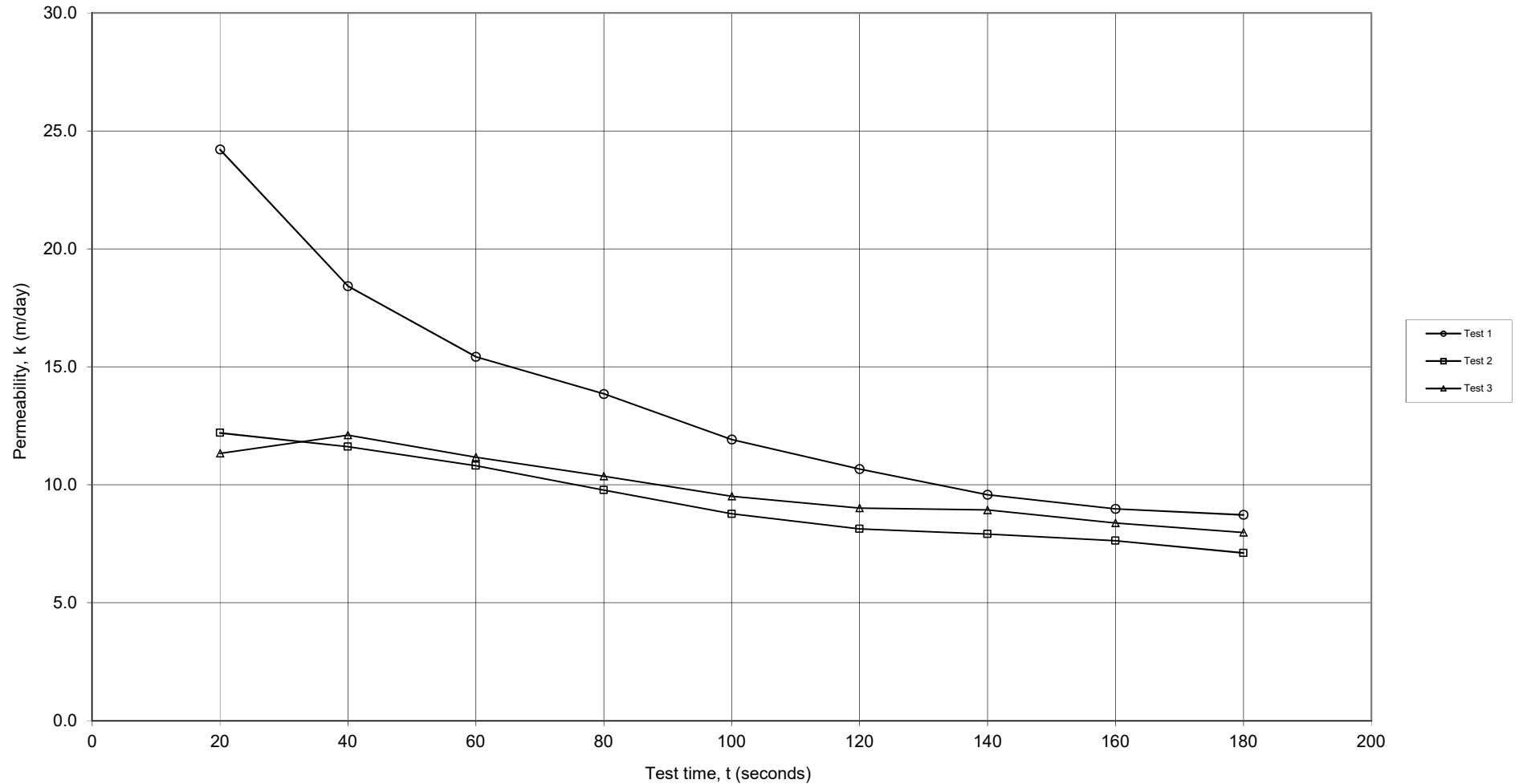
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.405	0.525	1.4E-04	12.2
40	0.465	0.465	1.3E-04	11.6
60	0.51	0.42	1.3E-04	10.8
80	0.54	0.39	1.1E-04	9.8
100	0.56	0.37	1.0E-04	8.8
120	0.58	0.35	9.4E-05	8.1
140	0.605	0.325	9.2E-05	7.9
160	0.625	0.305	8.8E-05	7.6
180	0.635	0.295	8.2E-05	7.1
AVERAGE			1.1E-04	9.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.33	0.6		
20	0.4	0.53	1.3E-04	11.3
40	0.47	0.46	1.4E-04	12.1
60	0.515	0.415	1.3E-04	11.2
80	0.55	0.38	1.2E-04	10.4
100	0.575	0.355	1.1E-04	9.5
120	0.6	0.33	1.0E-04	9.0
140	0.63	0.3	1.0E-04	8.9
160	0.645	0.285	9.7E-05	8.4
180	0.66	0.27	9.2E-05	8.0
AVERAGE			1.1E-04	9.9

Permeability by Inverse Auger Hole Method

IT07



Permeability Calculation - Inverse Auger Hole Method

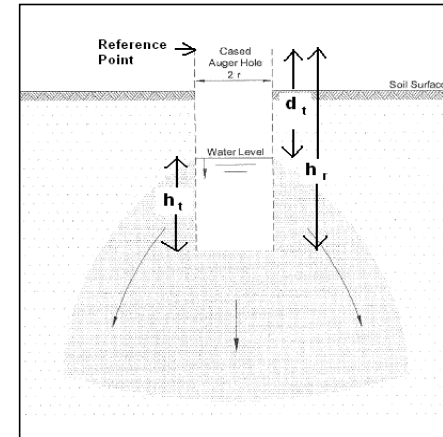
Galt Geotechnics

Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$



BH Name:	IT08	Parameter	Description	Value	Units
Test Depth:	0.75 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	0.93	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				

Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.35	0.58	2.7E-04	23.0
40	0.41	0.52	1.9E-04	16.5
60	0.47	0.46	1.7E-04	14.7
80	0.505	0.425	1.5E-04	12.8
100	0.54	0.39	1.4E-04	11.8
120	0.565	0.365	1.3E-04	10.8
140	0.58	0.35	1.1E-04	9.8
160	0.6	0.33	1.1E-04	9.2
180	0.61	0.32	9.9E-05	8.5
AVERAGE			1.5E-04	13.0

Test 2

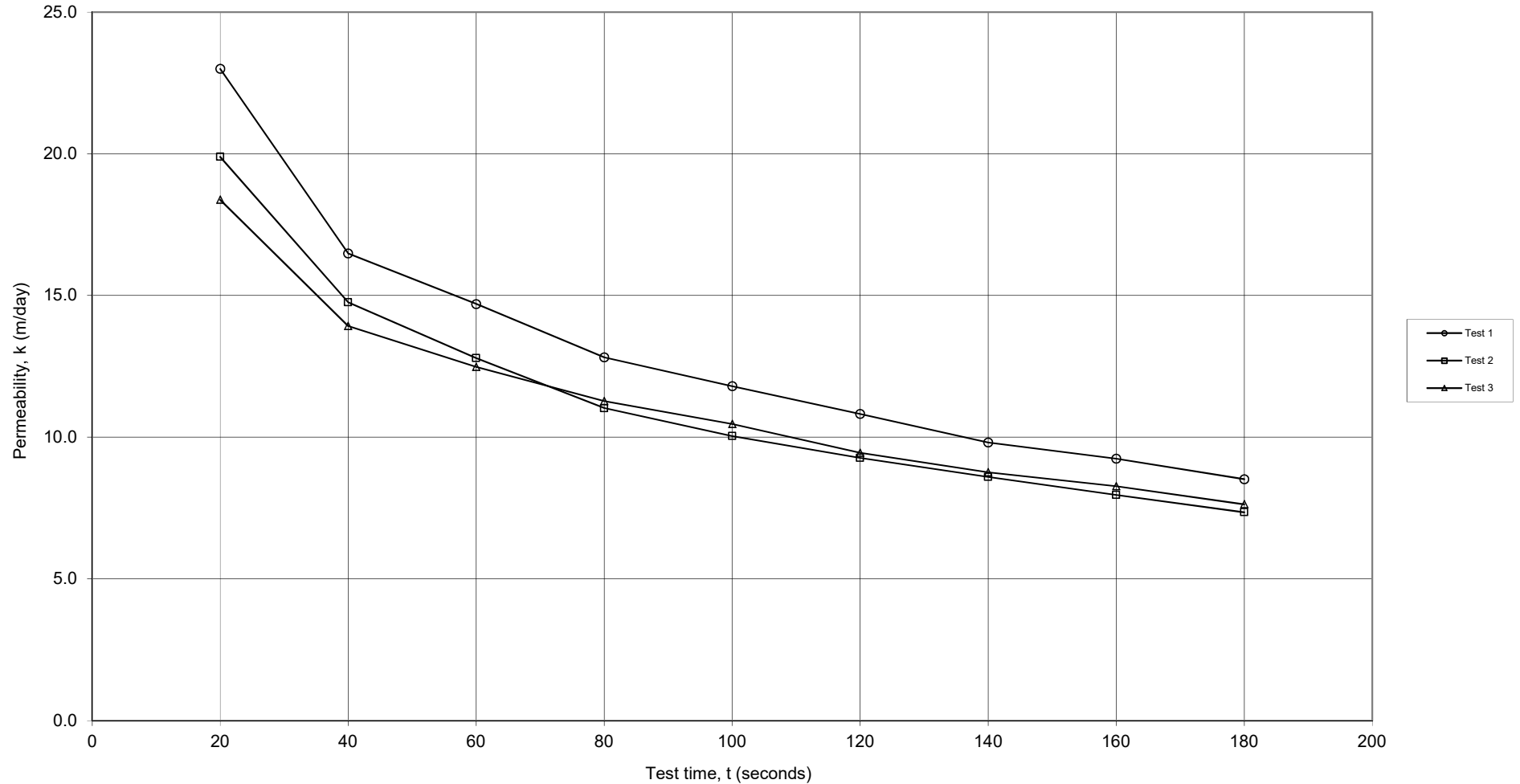
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.33	0.6	2.3E-04	19.9
40	0.39	0.54	1.7E-04	14.8
60	0.44	0.49	1.5E-04	12.8
80	0.47	0.46	1.3E-04	11.0
100	0.5	0.43	1.2E-04	10.0
120	0.525	0.405	1.1E-04	9.3
140	0.545	0.385	9.9E-05	8.6
160	0.56	0.37	9.2E-05	8.0
180	0.57	0.36	8.5E-05	7.4
AVERAGE			1.3E-04	11.3

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.185	0.745		
20	0.32	0.61	2.1E-04	18.4
40	0.38	0.55	1.6E-04	13.9
60	0.435	0.495	1.4E-04	12.5
80	0.475	0.455	1.3E-04	11.3
100	0.51	0.42	1.2E-04	10.5
120	0.53	0.4	1.1E-04	9.5
140	0.55	0.38	1.0E-04	8.8
160	0.57	0.36	9.6E-05	8.3
180	0.58	0.35	8.8E-05	7.6
AVERAGE			1.3E-04	11.2

Permeability by Inverse Auger Hole Method

IT08



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

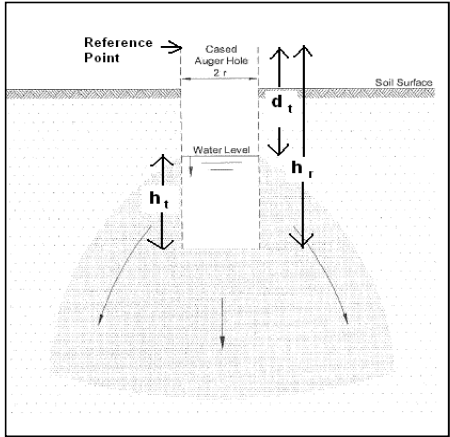
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT09	Parameter	Description	Value	Units
Test Depth:	0.72 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h _r	reference point height above base	0.93	m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.39	0.54	3.1E-04	26.4
40	0.45	0.48	2.1E-04	18.5
60	0.475	0.455	1.6E-04	14.0
80	0.495	0.435	1.3E-04	11.5
100	0.525	0.405	1.2E-04	10.5
120	0.55	0.38	1.1E-04	9.7
140	0.57	0.36	1.0E-04	9.0
160	0.58	0.35	9.5E-05	8.2
180	0.59	0.34	8.8E-05	7.6
AVERAGE			1.5E-04	12.8

Test 2

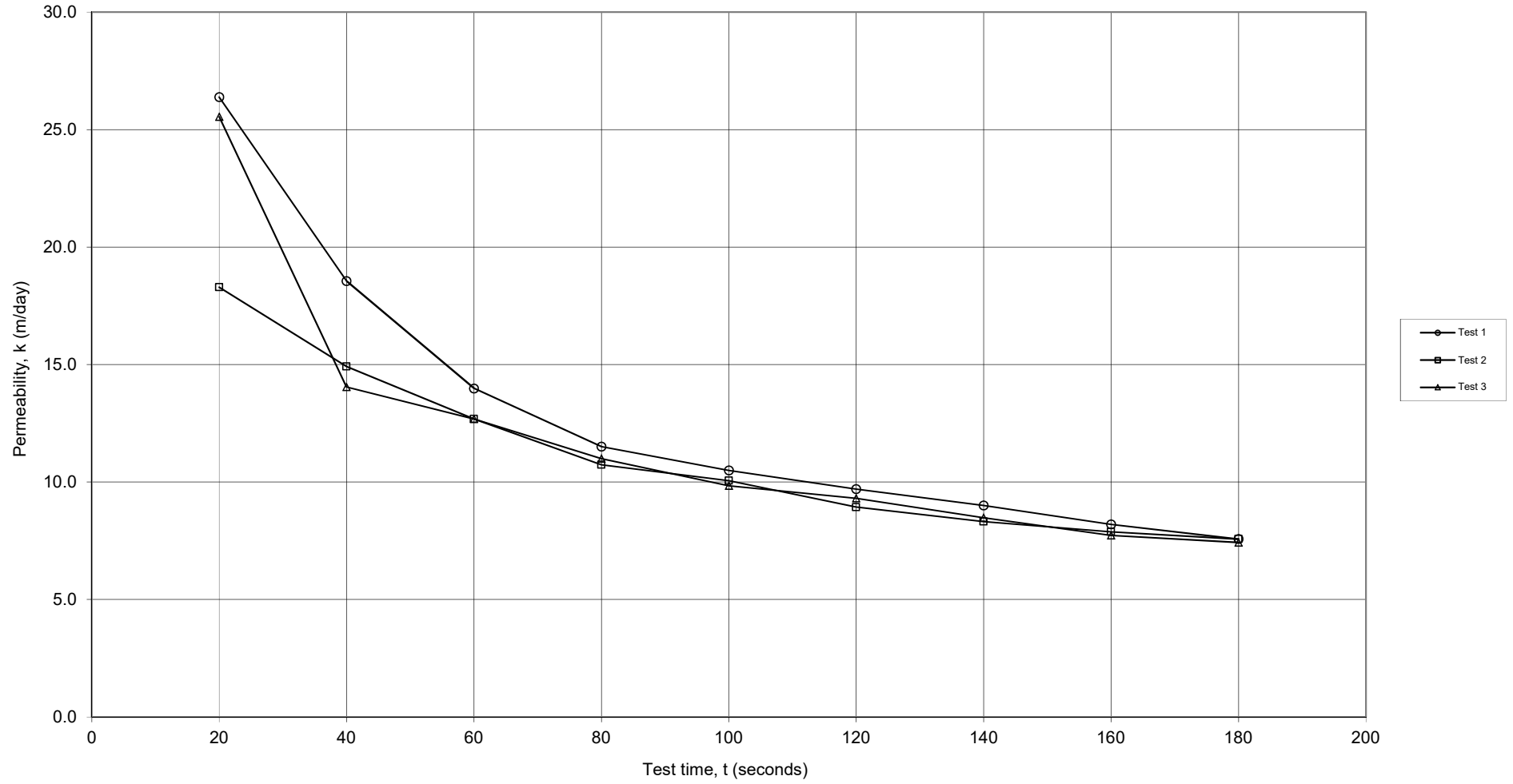
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.34	0.59	2.1E-04	18.3
40	0.41	0.52	1.7E-04	14.9
60	0.455	0.475	1.5E-04	12.7
80	0.48	0.45	1.2E-04	10.7
100	0.515	0.415	1.2E-04	10.1
120	0.53	0.4	1.0E-04	8.9
140	0.55	0.38	9.6E-05	8.3
160	0.57	0.36	9.1E-05	7.9
180	0.59	0.34	8.8E-05	7.6
AVERAGE			1.3E-04	11.0

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0	0.21	0.72		
20	0.385	0.545	3.0E-04	25.5
40	0.4	0.53	1.6E-04	14.0
60	0.455	0.475	1.5E-04	12.7
80	0.485	0.445	1.3E-04	11.0
100	0.51	0.42	1.1E-04	9.8
120	0.54	0.39	1.1E-04	9.3
140	0.555	0.375	9.8E-05	8.5
160	0.565	0.365	8.9E-05	7.7
180	0.585	0.345	8.6E-05	7.4
AVERAGE			1.4E-04	11.8

Permeability by Inverse Auger Hole Method

IT09



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

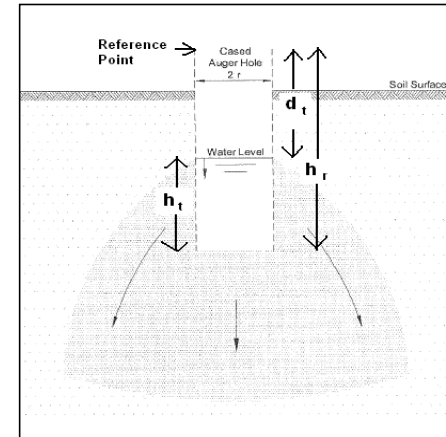
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT10	Parameter	Description	Value	Units
Test Depth:	0.71 m	K	Permeability		m/s
Material:	Unit 1A - SAND	r	radius of test hole	0.044	m
		t	time since start of measurement		s
		h_r	reference point height above base	0.93	m
		d_t	depth from reference point to water at time t		m
		h_t	Water column height at time t		m
		h_0	h_t at t=0		m



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.28	0.65	9.4E-05	8.1
40	0.335	0.595	9.4E-05	8.1
60	0.375	0.555	8.7E-05	7.5
80	0.405	0.525	8.0E-05	6.9
100	0.425	0.505	7.2E-05	6.2
120	0.445	0.485	6.7E-05	5.8
140	0.46	0.47	6.2E-05	5.4
160	0.48	0.45	6.0E-05	5.2
180	0.495	0.435	5.8E-05	5.0
AVERAGE			7.5E-05	6.5

Test 2

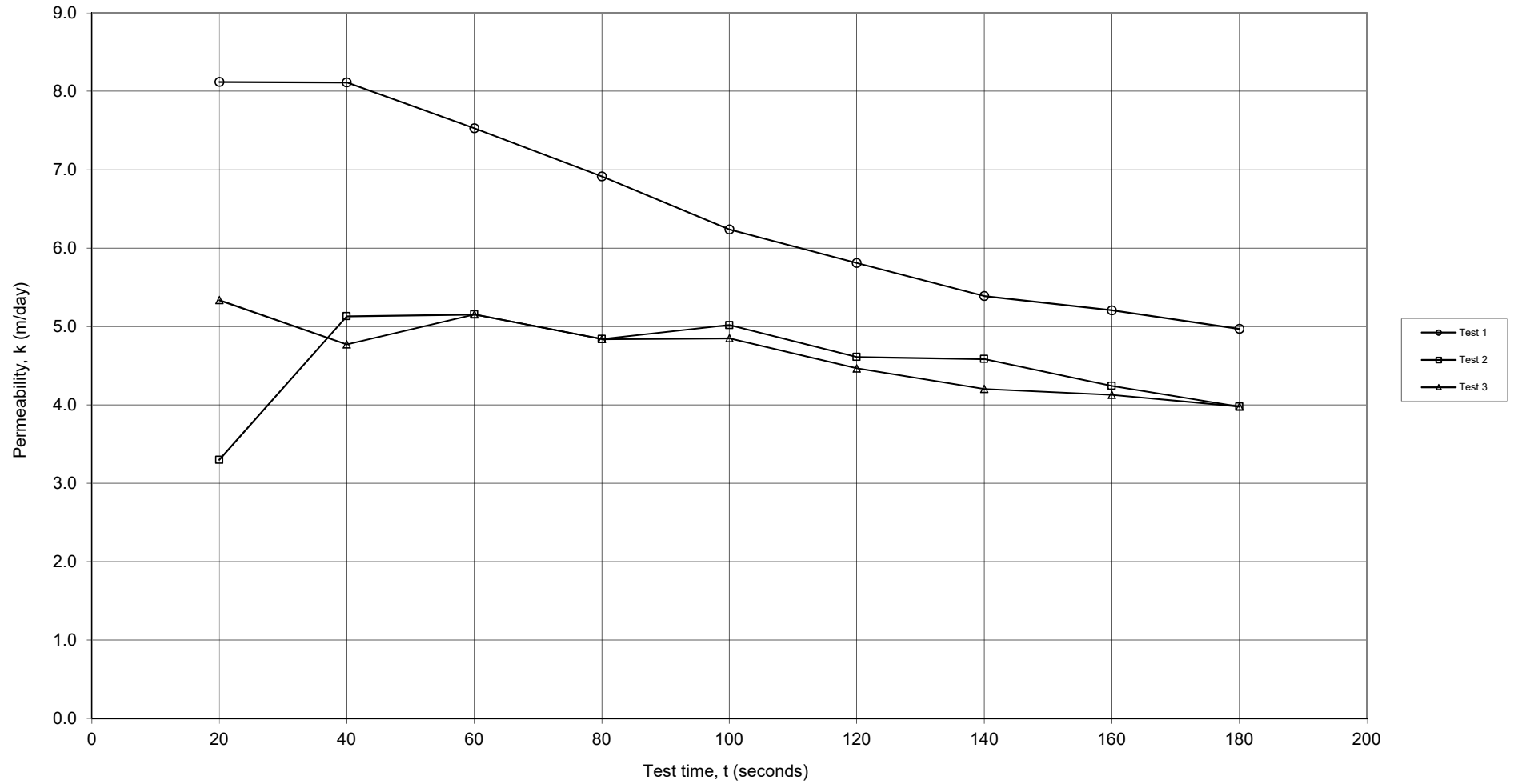
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.245	0.685	3.8E-05	3.3
40	0.295	0.635	5.9E-05	5.1
60	0.33	0.6	6.0E-05	5.2
80	0.355	0.575	5.6E-05	4.8
100	0.39	0.54	5.8E-05	5.0
120	0.405	0.525	5.3E-05	4.6
140	0.43	0.5	5.3E-05	4.6
160	0.44	0.49	4.9E-05	4.2
180	0.45	0.48	4.6E-05	4.0
AVERAGE			5.3E-05	4.5

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.22	0.71		
20	0.26	0.67	6.2E-05	5.3
40	0.29	0.64	5.5E-05	4.8
60	0.33	0.6	6.0E-05	5.2
80	0.355	0.575	5.6E-05	4.8
100	0.385	0.545	5.6E-05	4.8
120	0.4	0.53	5.2E-05	4.5
140	0.415	0.515	4.9E-05	4.2
160	0.435	0.495	4.8E-05	4.1
180	0.45	0.48	4.6E-05	4.0
AVERAGE			5.4E-05	4.6

Permeability by Inverse Auger Hole Method

IT10



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

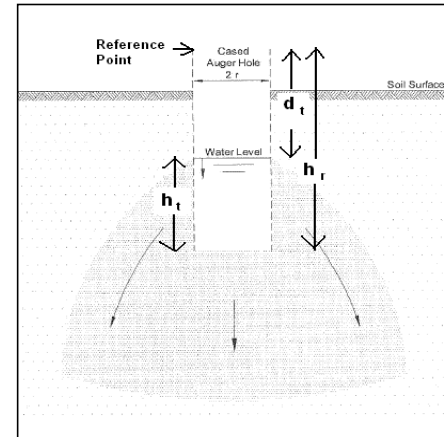
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT11	Parameter	Description	Value	Units
Test Depth:	0.84 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	1.12	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.43	0.69		
20	0.57	0.55	2.4E-04	20.8
40	0.63	0.49	1.8E-04	15.7
60	0.68	0.44	1.6E-04	13.7
80	0.7	0.42	1.3E-04	11.3
100	0.72	0.4	1.1E-04	9.9
120	0.74	0.38	1.0E-04	9.0
140	0.755	0.365	9.6E-05	8.3
160	0.77	0.35	8.9E-05	7.7
180	0.785	0.335	8.4E-05	7.3
AVERAGE			1.3E-04	11.5

Test 2

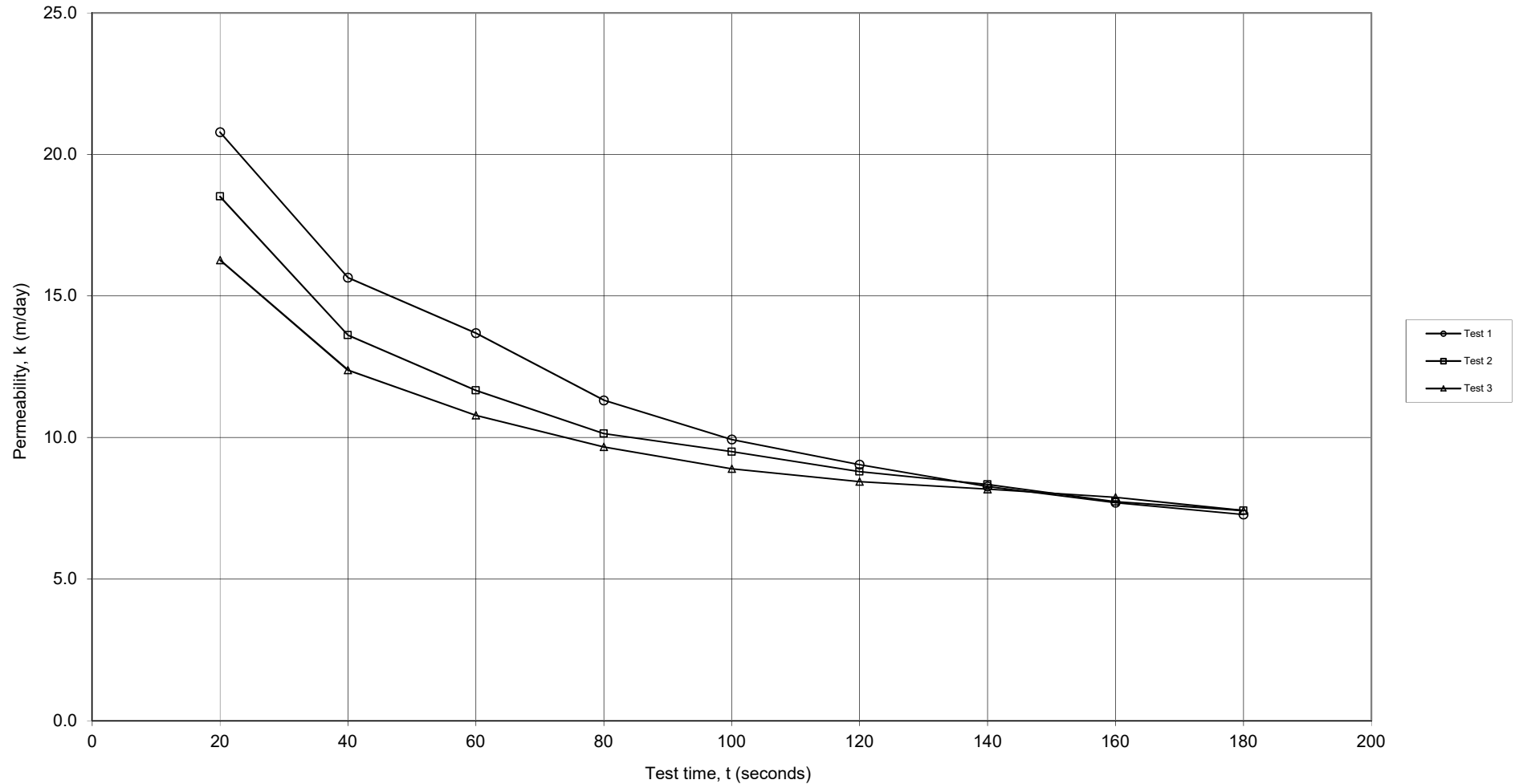
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.515	0.605	2.1E-04	18.5
40	0.57	0.55	1.6E-04	13.6
60	0.615	0.505	1.4E-04	11.7
80	0.645	0.475	1.2E-04	10.1
100	0.68	0.44	1.1E-04	9.5
120	0.705	0.415	1.0E-04	8.8
140	0.73	0.39	9.7E-05	8.3
160	0.745	0.375	9.0E-05	7.7
180	0.765	0.355	8.6E-05	7.4
AVERAGE			1.2E-04	10.6

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.5	0.62	1.9E-04	16.3
40	0.555	0.565	1.4E-04	12.4
60	0.6	0.52	1.2E-04	10.8
80	0.635	0.485	1.1E-04	9.7
100	0.665	0.455	1.0E-04	8.9
120	0.695	0.425	9.8E-05	8.4
140	0.725	0.395	9.5E-05	8.2
160	0.75	0.37	9.1E-05	7.9
180	0.765	0.355	8.6E-05	7.4
AVERAGE			1.2E-04	10.0

Permeability by Inverse Auger Hole Method

IT11



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

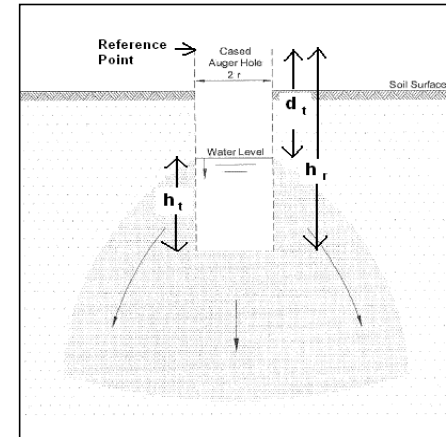
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT12	Parameter	Description	Value	Units
Test Depth:	0.79 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	1.12	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.36	0.76		
20	0.53	0.59	2.7E-04	23.3
40	0.59	0.53	1.9E-04	16.5
60	0.64	0.48	1.6E-04	14.0
80	0.69	0.43	1.5E-04	13.0
100	0.73	0.39	1.4E-04	12.2
120	0.76	0.36	1.3E-04	11.3
140	0.79	0.33	1.3E-04	10.8
160	0.81	0.31	1.2E-04	10.2
180	0.82	0.3	1.1E-04	9.4
AVERAGE			1.6E-04	13.4

Test 2

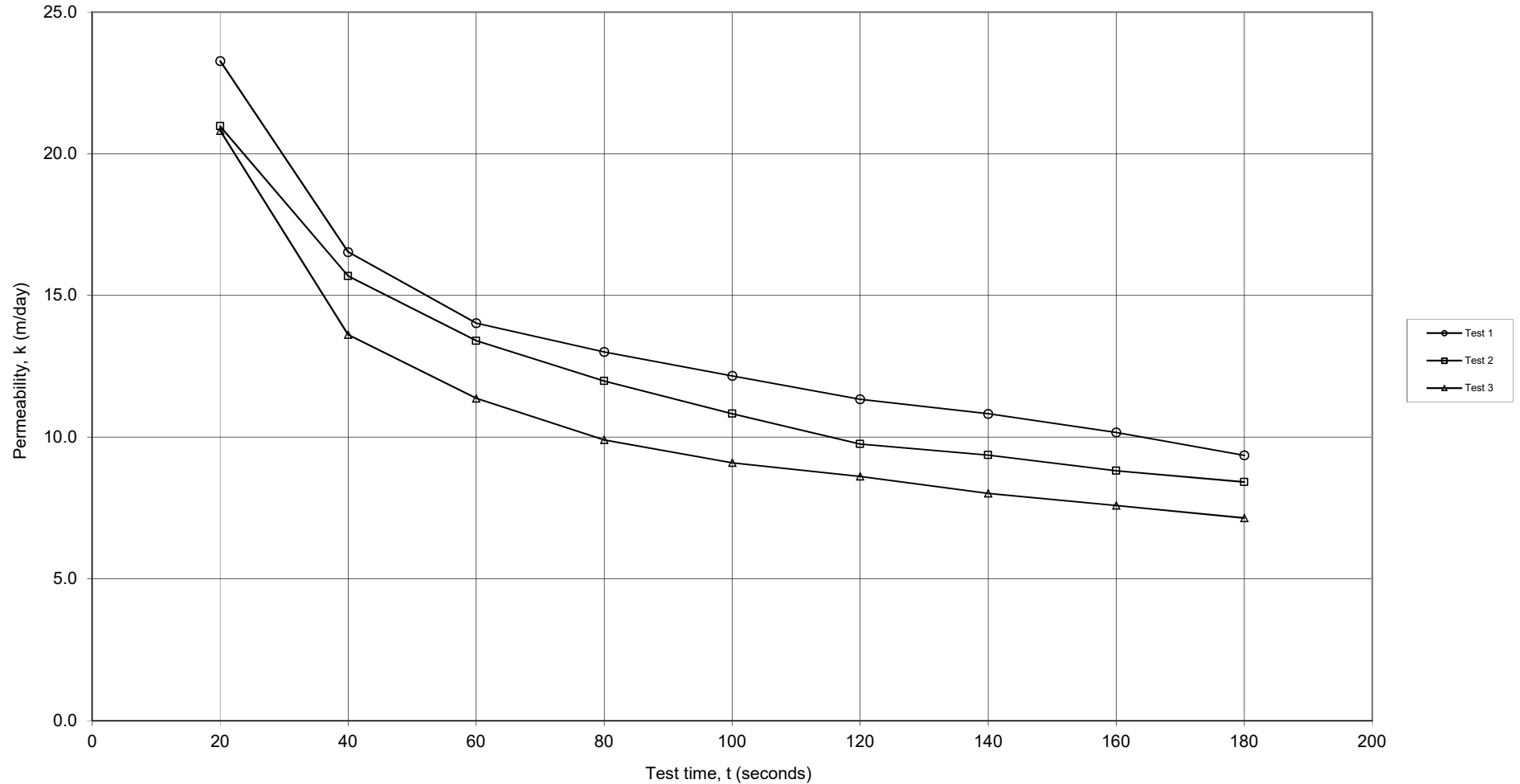
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.36	0.76		
20	0.515	0.605	2.4E-04	21.0
40	0.58	0.54	1.8E-04	15.7
60	0.63	0.49	1.6E-04	13.4
80	0.67	0.45	1.4E-04	12.0
100	0.7	0.42	1.3E-04	10.8
120	0.72	0.4	1.1E-04	9.8
140	0.75	0.37	1.1E-04	9.4
160	0.77	0.35	1.0E-04	8.8
180	0.79	0.33	9.7E-05	8.4
AVERAGE			1.4E-04	12.1

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.53	0.59	2.4E-04	20.8
40	0.57	0.55	1.6E-04	13.6
60	0.61	0.51	1.3E-04	11.4
80	0.64	0.48	1.1E-04	9.9
100	0.67	0.45	1.1E-04	9.1
120	0.7	0.42	1.0E-04	8.6
140	0.72	0.4	9.3E-05	8.0
160	0.74	0.38	8.8E-05	7.6
180	0.755	0.365	8.3E-05	7.1
AVERAGE			1.2E-04	10.7

Permeability by Inverse Auger Hole Method

IT12



Permeability Calculation - Inverse Auger Hole Method

Galt Geotechnics

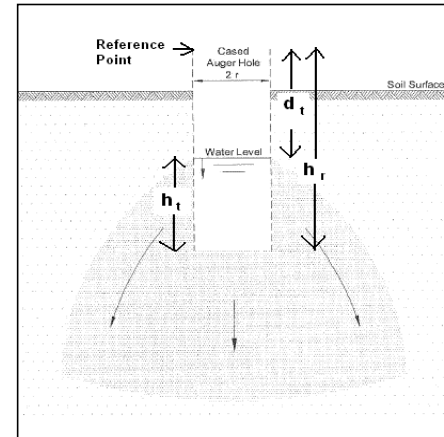
Spreadsheet author: ORW 17-Oct-09

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel
 Project: Proposed Residential S
 Location: Driver Road, Darch
 Calc by: PA

$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

BH Name:	IT13	Parameter	Description	Value	Units
Test Depth:	0.74 m	K	Permeability		m/s
Material:	Unit 1C-Gravelly SAND	r	radius of test hole	0.044	m
Spreadsheet Legend		t	time since start of measurement		s
	Required input	h_r	reference point height above base	1.12	m
	Calculated field	d_t	depth from reference point to water at time t		m
	Comment field	h_t	Water column height at time t		m
	Field not used	h_0	h_t at t=0		m
	Fixed field				



Test 1

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.48	0.64	1.5E-04	13.4
40	0.55	0.57	1.4E-04	12.0
60	0.585	0.535	1.1E-04	9.9
80	0.605	0.515	9.6E-05	8.3
100	0.63	0.49	8.7E-05	7.5
120	0.65	0.47	8.0E-05	6.9
140	0.67	0.45	7.5E-05	6.5
160	0.69	0.43	7.2E-05	6.2
180	0.705	0.415	6.8E-05	5.9
AVERAGE			9.8E-05	8.5

Test 2

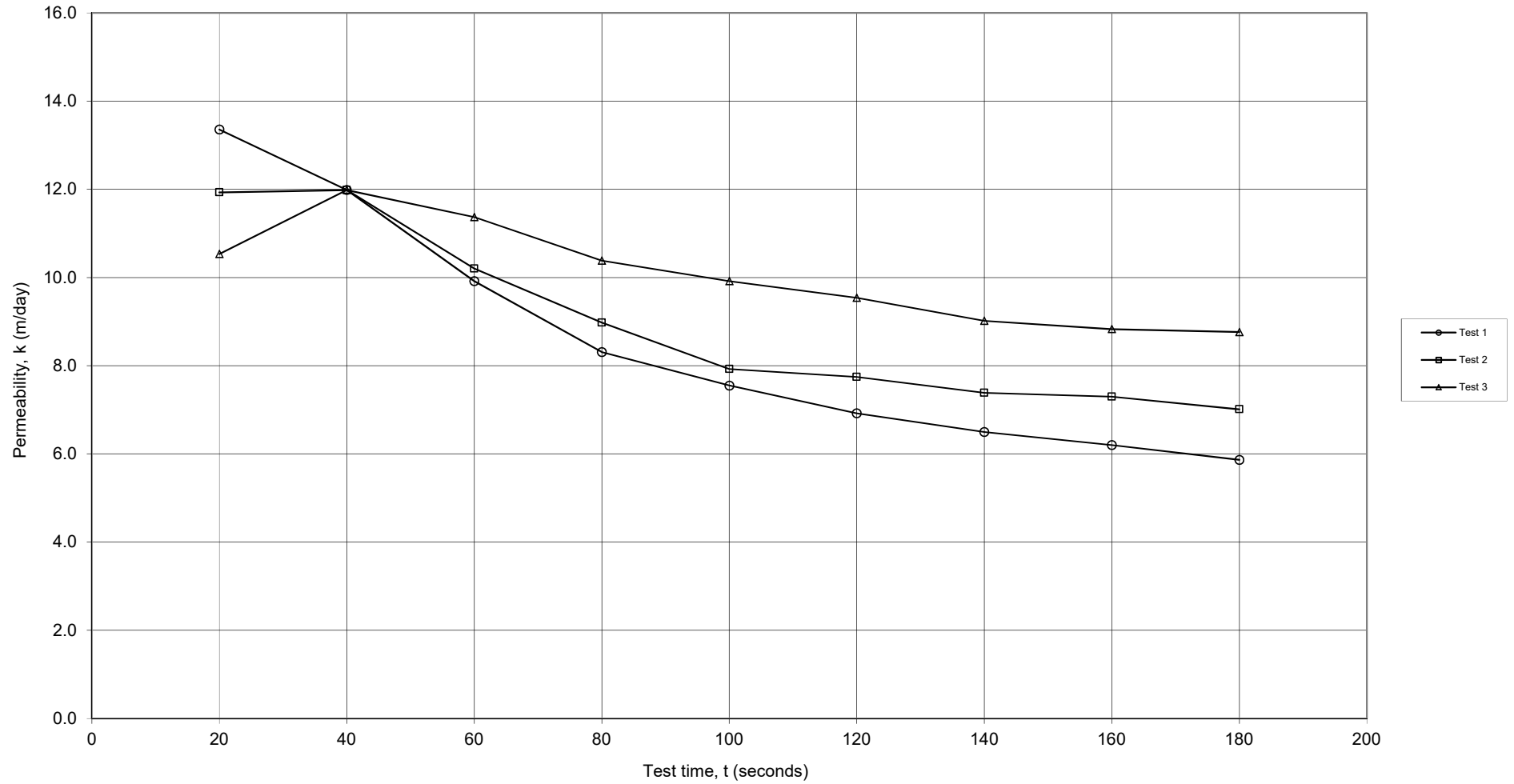
t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.47	0.65	1.4E-04	11.9
40	0.55	0.57	1.4E-04	12.0
60	0.59	0.53	1.2E-04	10.2
80	0.62	0.5	1.0E-04	9.0
100	0.64	0.48	9.2E-05	7.9
120	0.675	0.445	9.0E-05	7.7
140	0.7	0.42	8.5E-05	7.4
160	0.73	0.39	8.4E-05	7.3
180	0.75	0.37	8.1E-05	7.0
AVERAGE			1.0E-04	8.9

Test 3

t (s)	d_w (m)	h_t (m)	K (m/s)	K (m/day)
0	0.38	0.74		
20	0.46	0.66	1.2E-04	10.5
40	0.55	0.57	1.4E-04	12.0
60	0.61	0.51	1.3E-04	11.4
80	0.65	0.47	1.2E-04	10.4
100	0.69	0.43	1.1E-04	9.9
120	0.725	0.395	1.1E-04	9.5
140	0.75	0.37	1.0E-04	9.0
160	0.78	0.34	1.0E-04	8.8
180	0.81	0.31	1.0E-04	8.8
AVERAGE			1.2E-04	10.0

Permeability by Inverse Auger Hole Method

IT13



Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel Property
 Project: SI Driver Road
 Location: Darch
 Calc by: ORW

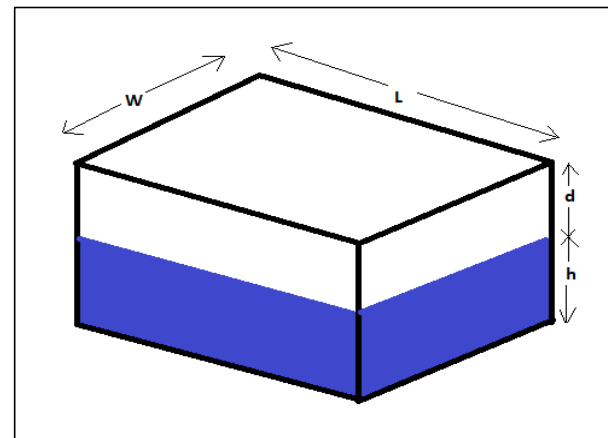
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name:	IT14	Parameter	Description	Value	Units
Test Depth:	1.80 m	K	Hydraulic Conductivity		m/s
Material:	Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.2	m
		w	Width of test pit (in test zone)	1.5	m
		r	equivalent radius of test hole	1.02	m
		t	time since start of measurement		s
		h _r	reference point height above base		m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.56		
1140		0.24	1.6E-04	13.7
AVERAGE			1.6E-04	13.7

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

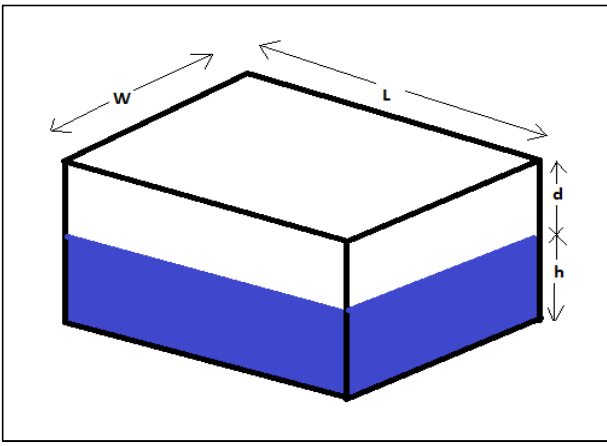
Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Parameter	Description	Value	Units
K	Hydraulic Conductivity		m/s
l	Length of test pit (in test zone)	2.6	m
w	Width of test pit (in test zone)	1.2	m
r	equivalent radius of test hole	1.00	m
t	time since start of measurement		s
h _r	reference point height above base		m
d _t	depth from reference point to water at time t		m
h _t	Water column height at time t		m
h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field



Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.46	5.7E-05	4.9
AVERAGE			5.7E-05	4.9

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
Client: Parcel Property
Project: SI Driver Road
Location: Darch
Calc by: ORW

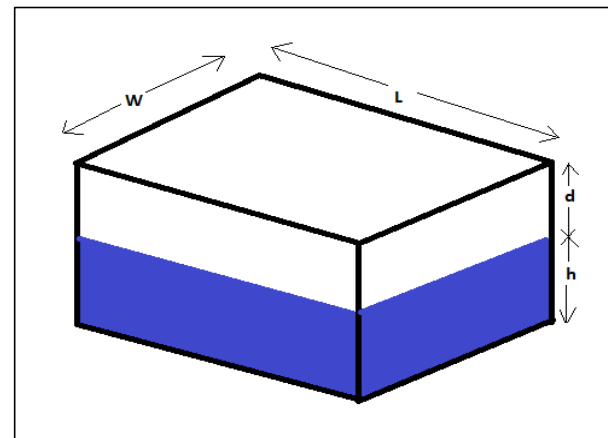
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name: IT16	Parameter	Description	Value	Units
Test Depth: 1.90 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.4	m
	w	Width of test pit (in test zone)	1.4	m
	r	equivalent radius of test hole	1.03	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.48	4.9E-05	4.2
AVERAGE			4.9E-05	4.2

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics

Spreadsheet author: ORW 14-Aug-19

REFERENCE: Cocks, G. *Disposal of Stormwater Runoff by Soakage in Perth Western Australia*, Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114

Job No: J1801113
 Client: Parcel Property
 Project: SI Driver Road
 Location: Darch
 Calc by: ORW

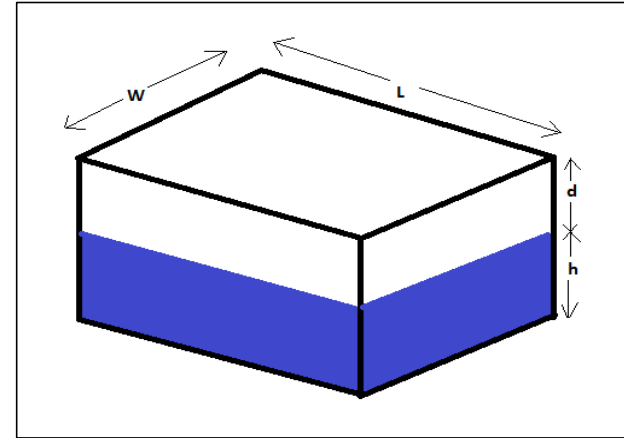
$$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$$

Test Name:	IT17	Parameter	Description	Value	Units
Test Depth:	1.40 m	K	Hydraulic Conductivity		m/s
Material:	Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.1	m
		w	Width of test pit (in test zone)	1.5	m
		r	equivalent radius of test hole	1.00	m
		t	time since start of measurement		s
		h _r	reference point height above base		m
		d _t	depth from reference point to water at time t		m
		h _t	Water column height at time t		m
		h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.22		
420		0	4.3E-04	37.5
AVERAGE			4.3E-04	37.5

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

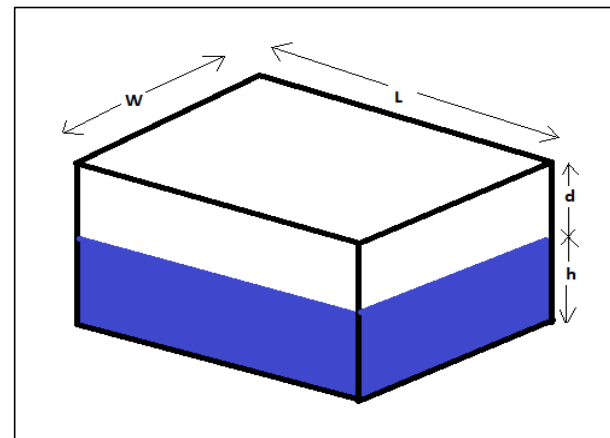
Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT18	Parameter	Description	Value	Units
Test Depth: 1.70 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.3	m
	w	Width of test pit (in test zone)	1.6	m
	r	equivalent radius of test hole	1.08	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field



Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.32		
900		0.11	1.7E-04	14.5
AVERAGE			1.7E-04	14.5

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

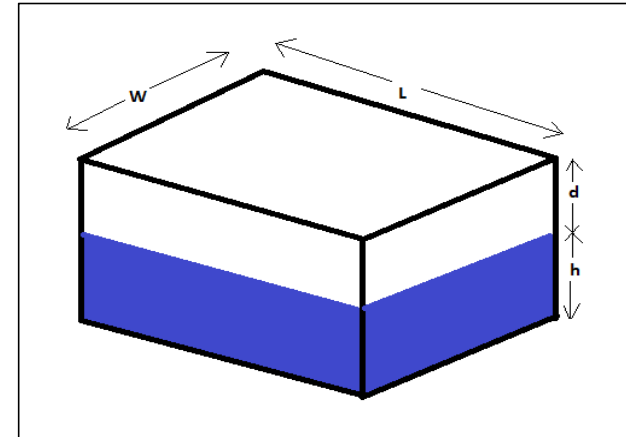
Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT19	Parameter	Description	Value	Units
Test Depth: 1.70 m	K	Hydraulic Conductivity		m/s
Material: Unit 1B - Rubbly fill	l	Length of test pit (in test zone)	2.7	m
	w	Width of test pit (in test zone)	0.9	m
	r	equivalent radius of test hole	0.88	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.6		
1200		0.32	1.1E-04	9.9
AVERAGE			1.1E-04	9.9

Test 2

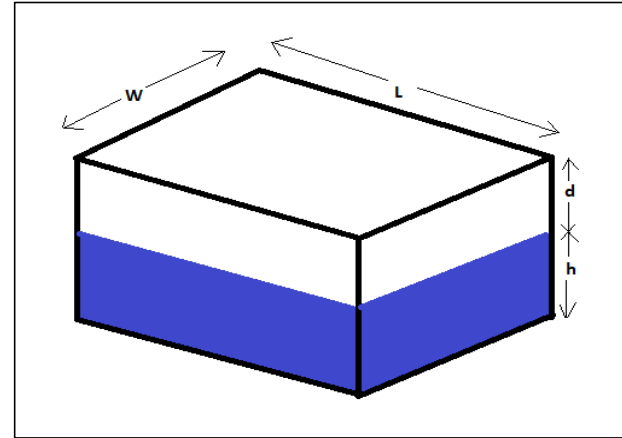
t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				



Parameter	Description	Value	Units
K	Hydraulic Conductivity		m/s
l	Length of test pit (in test zone)	2.6	m
w	Width of test pit (in test zone)	0.9	m
r	equivalent radius of test hole	0.86	m
t	time since start of measurement		s
h _r	reference point height above base		m
d _t	depth from reference point to water at time t		m
h _t	Water column height at time t		m
h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone

Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.39		
1080		0.27	6.3E-05	5.4
AVERAGE			6.3E-05	5.4

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Hydraulic Conductivity Calculation - Inverse Auger Hole Method (Applied to Test Pits)

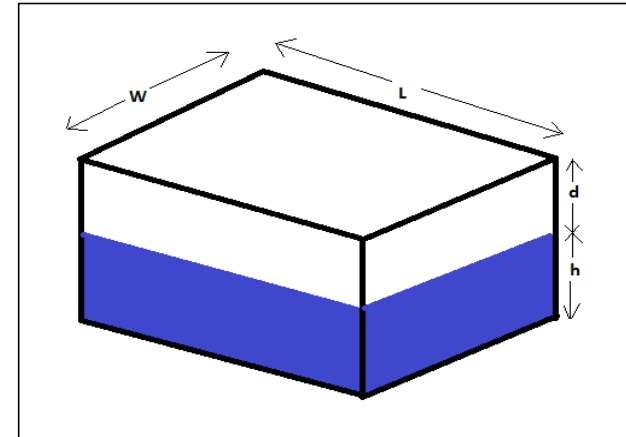
Galt Geotechnics	Spreadsheet author:	ORW	14-Aug-19	REFERENCE: Cocks, G. <i>Disposal of Stormwater Runoff by Soakage in Perth Western Australia</i> , Journal and News of the Australian Geomechanics Society, Volume 42 No 3 September 2007, pp101-114
Job No: J1801113	$K = 1.15r \frac{\log_{10}(h_0 + \frac{1}{2}r) - \log_{10}(h_t + \frac{1}{2}r)}{t - t_0}$			
Client: Parcel Property				
Project: SI Driver Road				
Location: Darch				
Calc by: ORW				

Test Name: IT21	Parameter	Description	Value	Units
Test Depth: 0.80 m	K	Hydraulic Conductivity		m/s
Material: Unit 1C - Gravelly sand	l	Length of test pit (in test zone)	1.7	m
	w	Width of test pit (in test zone)	1	m
	r	equivalent radius of test hole	0.74	m
	t	time since start of measurement		s
	h _r	reference point height above base		m
	d _t	depth from reference point to water at time t		m
	h _t	Water column height at time t		m
	h ₀	h _t at t=0		m

Spreadsheet Legend

Required input
Calculated field
Comment field
Field not used
Fixed field

Note: sides of test pit must be approximately vertical in test zone



Test 1

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
0		0.5		
1140		0.07	2.2E-04	19.1
AVERAGE			2.2E-04	19.1

Test 2

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!

Test 3

t (s)	d _w (m)	h _t (m)	K (m/s)	K (m/day)
AVERAGE			#DIV/0!	#DIV/0!



ATTACHMENT C

Perth Sand Penetrometer Test Results

**PERTH SAND PENETROMETER FIELD TEST DATA
(AS 1289.6.3.3)**

Client: Parcel Property
Project: Lot 2 Driver Road - Permeability Tests
Location: Darch

Job No: J1801113
Date: 26-Jul-19
Engineer: PA



Test No:	IT01	IT02	IT03	IT04	IT05	IT06	IT07	IT08	IT09
Material:	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)	Unit 1a (SAND)
Depth (mm)	No of Penetrometer Blows per 150 mm Depth Interval								
0-150	SET	SET	SET	SET	SET	SET	SET	SET	SET
150-300	7	2	2	2	1	2	2	2	2
300-450	15 R	3	5	5	2	2	7	4	5
450-600		7	8	9	11	5	11	12	11
600-750		13	14	10	15 R	11	12	6	15 R
750-900		10	14	11		15 R	14	4	
900-1050		12	15 R	12			14	5	
1050-1200									
1200-1350									
1350-1500									
1500-1650									
1650-1800									
1800-1950									
1950-2100									
2100-2250									
2250-2400									
2400-2550									
2550-2700									
2700-2850									
2850-3000									
3000-3150									
3150-3300									
3300-3450									
3450-3600									
3600-3750									
3750-3900									
3900-4050									
4050-4200									
4200-4350									
4350-4500									
4500-4650									
4650-4800									
4800-4950									
4950-5100									
5100-5250									
5250-5400									
5400-5550									

Note: R- Refusal

**PERTH SAND PENETROMETER FIELD TEST DATA
(AS 1289.6.3.3)**

Client: Parcel Property
Project: Lot 2 Driver Road - Permeability Tests
Location: Darch

Job No: J1801113
Date: 26-Jul-19
Engineer: PA



Test No:	IT10	IT11	IT12	IT13					
Location:	Unit 1a (SAND)	Unit 1b (Screened FILL)							
Depth (mm)	No of Penetrometer Blows per 150 mm Depth Interval								
0-150	SET	SET	SET	SET					
150-300	2	12	3	0					
300-450	4	15	2	1					
450-600	9	15 R	2	1					
600-750	14		2	1					
750-900	15 R		5	2					
900-1050			15	4					
1050-1200									
1200-1350									
1350-1500									
1500-1650									
1650-1800									
1800-1950									
1950-2100									
2100-2250									
2250-2400									
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2550-2700									
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3150-3300									
3300-3450									
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3600-3750									
3750-3900									
3900-4050									
4050-4200									
4200-4350									
4350-4500									
4500-4650									
4650-4800									
4800-4950									
4950-5100									
5100-5250									
5250-5400									
5400-5550									

Note: R- Refusal



ATTACHMENT D

Understanding Your Report

UNDERSTANDING YOUR REPORT

GALT FORM PMP11 Rev3

1. EXPECTATIONS OF THE REPORT

This document has been prepared to clarify what is and is not provided in your report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with the conditions on site.

Geotechnical engineering and environmental science are less exact than other engineering and scientific disciplines. We include this information to help you understand where our responsibilities begin and end. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of projects and we can help you to manage your risk.

2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following:

- ✦ the project objectives as we understood them and as described in this report;
- ✦ the specific site mentioned in this report; and
- ✦ the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this report if any of the following conditions apply:

- ✦ the report was not written for you;
- ✦ the report was not written for the site specific to your development;
- ✦ the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- ✦ the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the project team. Furthermore, we recommend that we be able to review work produced by other members of the project team that relies on information provided in our report.

3. SOIL LOGS

Our reports often include logs of intrusive and non-intrusive investigation techniques. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

4. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party because of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

5. CHANGE IN SUBSURFACE CONDITIONS

The recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including anthropogenic events (such as construction or contaminating activities on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

6. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use professional judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from professional judgement and opinion.

The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

7. ENVIRONMENTAL AND GEOTECHNICAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not addressed in geotechnical reports. Similarly, geotechnical issues are not addressed in environmental reports. The investigation techniques used for geotechnical investigations can differ from those used for environmental investigations. It is the client's responsibility to satisfy themselves that geotechnical and environmental considerations have been taken into account for the site.

Geotechnical advice presented in a Galt Environmental report has been provided by Galt Geotechnics under a sub-contract agreement. Similarly, environmental advice presented in a Galt Geotechnics report has been provided by Galt Environmental under a sub-contract agreement.

Unless specifically noted otherwise, no parties shall draw any inferences about the applicability of the Western Australian state government landfill levy from the contents of this document.

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APPENDIX 5 – SUMP SURVEY

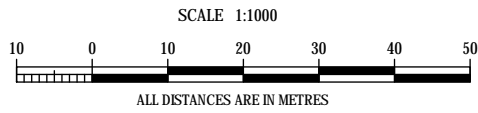


- Inlet IL = 38.578 (Dia 600)
 - Water level at 2:45pm 12/8/19 = 38.74
 - Top of logger - Cap on = 39.52
 - Top of SIP - Safety cap on = 40.36

- Inlet IL = 37.739 (Dia 600)
 - Water level at 3:30pm 12/8/19 = 38.65
 - Top of logger - Cap on = 39.47
 - Top of SIP - Safety cap on = 40.29

LEGEND

- CADASTRAL BOUNDARY
- EASEMENT BOUNDARY
- MAJOR CONTOUR
- MINOR CONTOUR (Contour Interval 0.2m)
- x NATURAL SURFACE
- ▲ PIPE INLET
- ◎ LOGGER



Rev.	Date	Description	Surveyor	Drawn	Approved
00	23/08/19	APPROVED & ISSUED	IS	NDH	LJG

WESTERN AUSTRALIA
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DEVELOP WITH CONFIDENCE™

Client: PARCEL DARCH PTY LTD

Surveyed By: IS Survey Date: 12/08/2019

Drawn By: NDH Drawn Date: 23/08/2019

Approved By: LJG

Scale (A3): 1:1000

Hor Datum: PCG94

Vert Datum: AHD

SUMP WATER LOGGER LEVELS
 LOT 14772 CARLOW WAY
 & LOT 14624 CRISTATA TERRACE
 DARCH

Job No 635744-005 Item No 002 Plan No 002 Rev 00


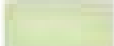
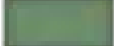
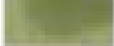

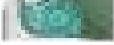
Sheet 1 of 1

APPENDIX 6 – LANDSCAPING CONCEPT

Landscape Master Plan

Lot 2 (No. 26) Driver Road
Darch

Legend

-  Trees | Feature, Basin, POS & Street trees
-  Irrigated Turf
-  Garden beds
-  Drainage basin
-  Playground node
-  Fitness equipment stations

Neighbourhood POS for Sport/Recreation

Description / 4 - 7ha (Neighbourhood Sports)

- Provisions for Sporting amenities building, parking, multipurpose senior sports ovals and multi-use half court
- Designated play area with shade over play
- Nodes for Picnic settings & shelters along with bench seats
- Fitness equipment stations
- Pedestrian/Cycle paths
- Landscaping through water wise planting & tree planting. Native revegetation
- 60% MAX. area permanently irrigated.

Proposed raingardens in road reserve. Size and location is indicative

Existing sump to be modified. Size is indicative



Proposed raingardens in road reserve. Size and location is indicative

Indicative drainage size and location

Perimeter path network with seating & shelter nodes, fitness nodes

Football oval, cricket pitch and rugby fields

Basketball half-court

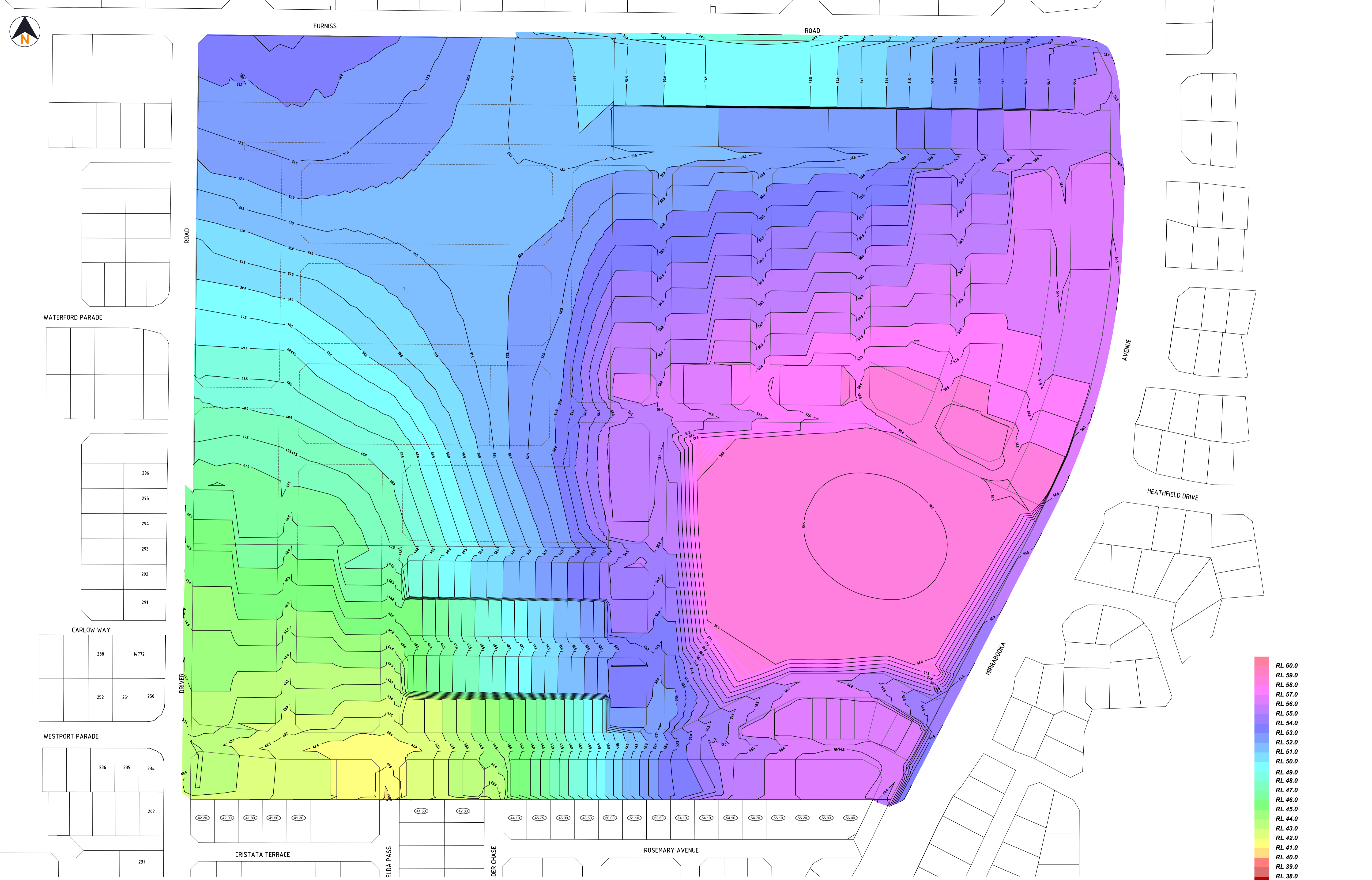
Parking & Community facility by others

Proposed playground location, design to accommodate different age groups. Shade sails or feature shade trees over play. Key shelter & BBQ node.

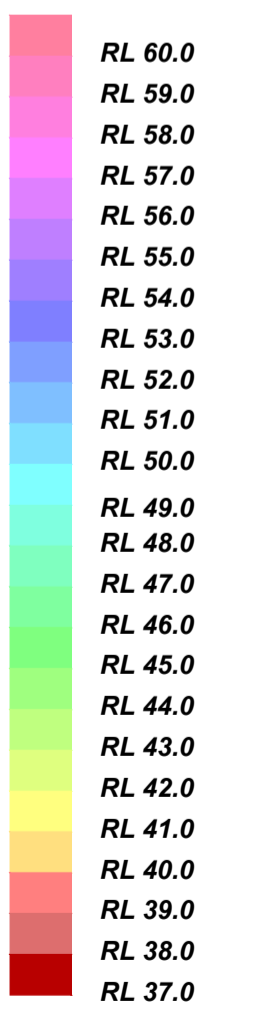
Indicative drainage size and location

APPENDIX 7 – ENGINEERING DRAWINGS

Plotted By: revans - Plot Date: 07/08/19 - 15:25 Cad File: T:\Projects\2407\Design\CAD Drawings\Sherches\2407-SK-004-Design Levels and Depth Bands.dwg



PLAN
N.T.S.



Design Finished Surface Levels

DRAWING NUMBER
2407-SK-004

ISSUE
B



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SCALE
A1

APPENDIX 8 – UNDO RESULTS PRE-DEVELOPMENT



Project: Sandy Soils

Date: 15-Oct-19

Version: Version 1.1.0.16333

Subregion name: **Subregion 1**

Landuse	Percent (%)	Area (ha)	Input load		Total area (ha)	Total percent (%)
			Nitrogen (kg)	Phosphorus (kg)		
Residential	0	0.00	0.00	0.00	22.20	100
Industrial, commercial & schools	0	0.00	0.00	0.00		
Rural living	0	0.00	0.00	0.00	5.23	0.15
Public open space	100	22.20	0.00	0.00		
Road reserve	0	0.00	0.00	0.00	0.52	0.00
					Nitrogen input (kg/ha/yr)	Phosphorus input (kg/ha/yr)
					Nitrogen export (kg/ha/yr)	Phosphorus (kg/ha/yr)

Public Open Space (POS)

Landuse	Percent (%)	Area (ha)		
Native gardens	0	0.00	Total area (ha)	Total percent (%)
Non-native gardens	0	0.00		
Not fertilised	100	22.20	22.20	100
Nature	0	0.00	Nitrogen input (kg)	Phosphorus input (kg)
Sport	0	0.00		
Recreation	0	0.00	0.00	0.00
Golf course	0	0.00		
Bowling green	0	0.00		
Impervious	0	0.00		
Water body	0	0.00		

APPENDIX 9 – UNDO RESULTS POST-DEVELOPMENT



Project: Darch PostDev

Date: 15-Oct-19

Version: Version 1.1.0.16333

Subregion name: **Development**

Landuse	Percent (%)	Area (ha)	Input load		Total area (ha)	Total percent (%)
			Nitrogen (kg)	Phosphorus (kg)		
Residential	53	11.77	276.42	80.98	22.20	100
Industrial, commercial & schools	0	0.00	0.00	0.00		
Rural living	0	0.00	0.00	0.00	37.36	5.49
Public open space	22	4.88	320.39	24.32		
Road reserve	25	5.55	116.55	13.24	3.71	0.04
					Nitrogen input (kg/ha/yr)	Phosphorus input (kg/ha/yr)
					Nitrogen export (kg/ha/yr)	Phosphorus (kg/ha/yr)

Residential

Size (m ²)	Percent (%)	Area (ha)	Input load		Total area (ha)	Total percent (%)
			Nitrogen (kg)	Phosphorus (kg)		
<400	100	11.77	276.42	80.98	11.766	53
400-500 m ²	0	0.00	0.00	0.00		
501-600 m ²	0	0.00	0.00	0.00	276.42	80.98
601-730 m ²	0	0.00	0.00	0.00		
>730 m ²	0	0.00	0.00	0.00		
Multiple dwellings	0	0.00	0.00	0.00		
					Nitrogen input (kg)	Phosphorus input (kg)

Public Open Space (POS)				
Landuse	Percent (%)	Area (ha)		
Native gardens	20	0.98	Total area (ha)	Total percent (%)
Non-native gardens	0	0.00		
Not fertilised	0	0.00	4.88	22
Nature	0	0.00		
Sport	80	3.91	Nitrogen input (kg)	Phosphorus input (kg)
Recreation	0	0.00		
Golf course	0	0.00	320.39	24.32
Bowling green	0	0.00		
Impervious	0	0.00		
Water body	0	0.00		
Road reserve				
Landuse	Percent (%)	Area (ha)	Total area (ha)	Total percent (%)
Roads	70	3.89	5.55	25
Road reserve - impervious	0	0.00		
Road reserve - native garden	15	0.83	Nitrogen input (kg)	Phosphorus input (kg)
Road reserve - non-native garden	0	0.00		
Road reserve - turf	15	0.83	116.55	116.55
Road reserve - not fertilised	0	0.00		

Soil and drainage information

Type of drainage	Infiltration	Does it contain imported fill?	Yes
Soil type	Spearwood Dune	Type of fill imported	Yellow sand (Spearwood)
Depth to groundwater (m)	5	Fill depth (m)	3
Groundwater slope (%)	0.5	Approximate PRI of imported fill	11
Soil PRI	11.0	Does subregion contain onsite sewage disposal system?	No

Note: Please attach the results of soil tests to this report when submitting.

Summary: Nutrient stripping devices

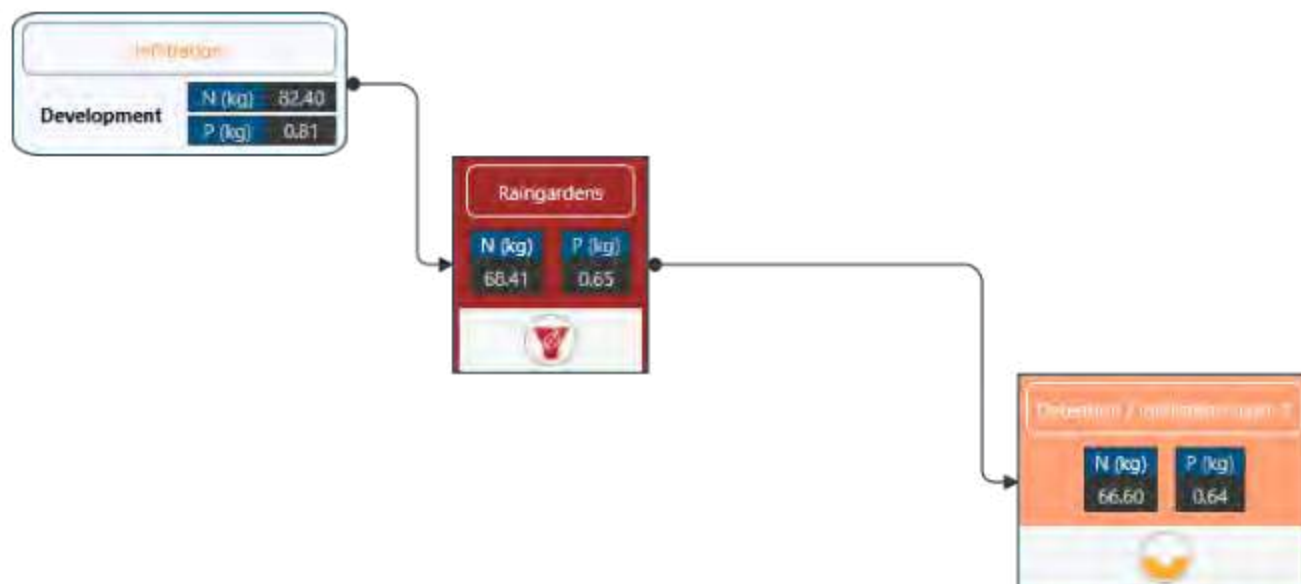
Treatment	Name	Size (m ²)	Treated area (ha)	Treating	N removed (kg/ha/yr)	P removed (kg/ha/yr)
Biofilter	Raingardens	1250.00	22.20	Sandy soils – Runoff only (infiltration on lots)	0.63	0.01
Detention / infiltration basin	Detention / infiltration basin 1	3660.00	22.20	Sandy soils – Runoff only (infiltration on lots)	0.08	0.00
Load removed					0.71	0.01
Net export					3.00	0.03

Summary: Nutrient load exports

Region	Area (ha)	P export (kg/ha/yr)	N export (kg/ha/yr)
Development	22.20	0.04	3.71

PRE-TREATMENT LOAD (kg/ha/yr)		LOAD REMOVED (kg/ha/yr)		NET LOAD EXPORT (kg/ha/yr)	
NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS	NITROGEN	PHOSPHORUS
3.71	0.04	0.71	0.01	3.00	0.03

Treatment diagram





Client: Parcel Property

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Draft	V1	AT / RP	HB	Electronic	15 October 2019
Draft for Project Team	V2	RP	HB	Electronic	17 October 2019

Urbaqua

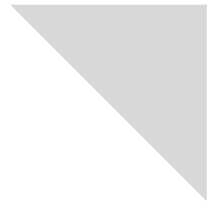
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APPENDIX 5

ENGINEERING INFRASTRUCTURE REPORT



ROWE
GROUP
DESIGN



LOT 2 DRIVER ROAD, DARCH
Engineering Infrastructure Report

TABEC Pty Ltd

September 2019

CLIENT: PARCEL PROPERTY

PROJECT: LOT 2 DRIVER ROAD, DARCH

TITLE: LOT 2 DRIVER ROAD, DARCH: ENGINEERING INFRASTRUCTURE REPORT

DOCUMENT REVIEW				
Revision	Date Issued	Written By	Reviewed By	Approved By
1	03/09/2019	JBSMALL	MARENA	CCBITMEAD
2	19/09/2019	JBSMALL	MARENA	CCBITMEAD
3	11/10/2019	JBSMALL	MARENA	CCBITMEAD

Note:

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1 INTRODUCTION

This report has been prepared by TABEC Pty Ltd to provide broad servicing and infrastructure advice for the proposed subdivision of Lot 2 on Driver Road, Darch.

This report is based on the civil engineering aspects of residential related land uses and summarises the availability of existing infrastructure assets in proximity to the landholding and the potential engineering infrastructure requirements to support urban development within the study area.

The investigation and preparation of the report includes the advice from various service authorities along with the planning and concept designs completed to date. The information is subject to change as further detail is resolved during the design phases. The report is supported by additional consultants and their inputs which are listed in the references. The information is current as of September 2019.

Figure 1 illustrates the location of the site, bounded in red on the aerial image.



Figure 1 – Site location and aerial image (Nearmap)

2 THE STUDY AREA

The proposed development site is approximately 24.7 hectares, with frontages to existing Furniss Road to the north, Mirrabooka Avenue to the east and Driver road to the west. Road access will also be available from existing Lavender Chase, Esmerelda Pass and Rosemary Avenue to the south, which are temporarily fenced from Lot 2.

Existing residential lots border the southern boundary of the site, along with an existing City of Wanneroo drainage sump, on Esmerelda Pass. The site also shares two boundaries with Lot 1, which is a building and construction waste receival site. A cross-over exists into Lot 2 from Furniss Road.

An extract of the current Concept Plan as prepared by Rowe Group is included in Figure 2. The site is L-shaped with the longest north south dimension approximately 570m. The greatest east-west dimension is about 620m.



Figure 2 – Preliminary Subdivision Plan (Rowe Group)

Since Lot 2 is a former landfill site, used for the disposal of non-organic waste, there is no significant vegetation which has been retained. A sand capping layer was placed over the fill material, which is generally 1.5m to 3.0m in depth, however this does vary across the site. It is therefore understood that the existing scattered vegetation which is currently onsite, is recent regrowth over the fill material.

The current estimated yield for the development of Lot 2 is 278 residential lots according to the above preliminary subdivision plan, plus a 4.8ha Public Open Space (POS) and a 1.85ha business precinct on the northern boundary fronting Furniss Road.

2.1 Landform / Topography

Preliminary survey information is available from Veris, with the existing surface elevations shown as contour banding included in Figure 3 below.

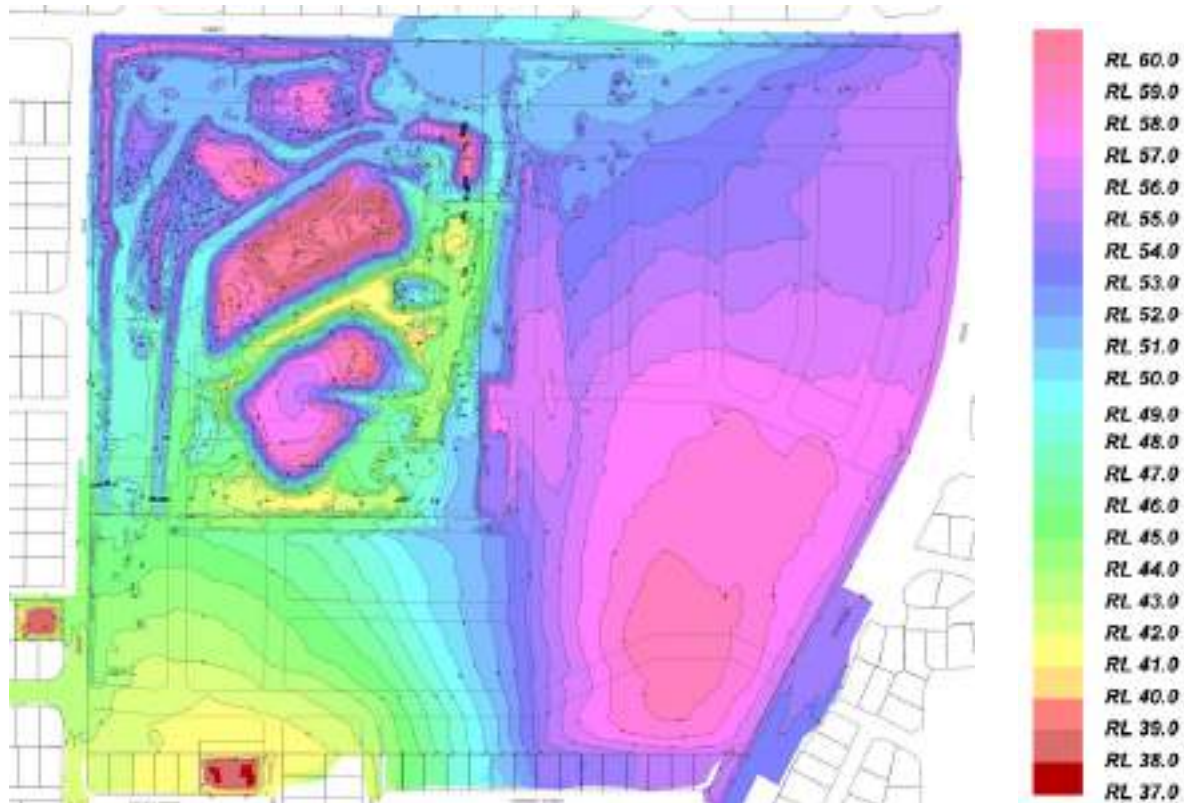


Figure 3 – Existing surface levels and contour banding (TABEC, 2019)

The image shows there are higher elevations in the south-east area with levels approximately 59.0m AHD. From that high point, Lot 2 grades toward both the north-western area and the south-western portion of the site, splitting Lot 2 into two broad catchments.

The average existing grade toward the north is approximately 2%, and while it varies toward the west, from the highpoint the average grade toward Esmerelda Pass on the southern boundary at an approximate elevation of 41m AHD is 6% is the lowest elevation.

The existing levels on Mirrabooka Avenue where the proposed road intersection is located are about 54m AHD and Lot 2 grades upward to the highpoint on site. There is currently a 5m level difference, which requires regrading in order to facilitate the proposed road construction.

There is also a low point in Furniss Road reserve, in the vicinity of the Darlot Road intersection to the north, which is at about 49m AHD contour.

2.2 Groundwater

The historical maximum groundwater levels, published by Department of Water and Environmental Regulation vary across the site. The maximum level in the south-west of Lot 2 is approximately 38.5m AHD, and about 41m in the north-east.

This is similar to the groundwater levels intersected by Galt Geotechnics during their field investigation.

The groundwater therefore grades generally toward the south-west across Lot 2 and are included below in Figure 4.



Figure 4 – Groundwater contours, historical maximum (Perth Groundwater Map, 2019)

2.3 Acid Sulphate Soils

Based on the former land uses over Lot 2, and in view of the existing groundwater levels that suggests that substantial dewatering will not be required during subdivision works, an acid sulphate soil investigation has not specifically been undertaken.

Also, the online mapping provided by Department of Water and Environmental Regulation as per Figure 5 identify the site and surrounding road reserves as having no known risk of encountering acid sulphate soils.



Figure 5 – Acid sulphate soil risk map, Perth Groundwater Atlas (Department of Water and Environmental Regulation, 2019)

3 SITEWORKS

In order to prepare the site for the proposed urban development, areas will be cleared of existing vegetation with grubbing out of the roots. Topsoil will be stripped to remove any shallow organic and root matter, which is generally present onsite in varying depths between approximately 100mm to 200mm.

A detailed ground improvement methodology shall be undertaken, which varies across the site based on the existing extent of buried fill, and the ultimate intended land use. For confirmation of these requirements, Galt Geotechnics have undertaken substantial investigations including the excavation of 43 test pits, drilling of 45 boreholes and 29 cone penetration tests over Lot 2. The understanding of the existing ground model and recommendations for site improvements are detailed by Galt Geotechnics, that is provided separately to this report.

The intended ground improvement works will achieve lot classifications varying between Class A to Class M, based on the 'Residential Slabs and Footings' standard AS2870. The ground improvement requirements are outlined below.

4 EARTHWORKS

4.1 Ground Conditions

Based on the field investigations, the existing ground material broadly comprises of three main units. In addition to the natural sands, which exist in areas where over-excavation and replacement with other fill materials has not occurred, the site contains sand fill, screened fill and uncontrolled fill.

The sand and screened fill are generally found together in the surface layers on site, typically between approximately 1.5m and 3m in thickness overlaying the uncontrolled fill. However, the depth of sand fill does vary up to about 6.8m in one location. The sand fill is graded and generally free draining.

The uncontrolled fill was typically encountered beneath the sand fill layers, is made up of inert builder debris (20-70%), sand (40-80%) and rubbish (less than 10%). This layer varies in thickness up to approximately 20m under the proposed POS location. The inert builder debris contains for example bricks, concrete and limestone gravels. The rubbish is described as plastic with some organics and scrap metal. It is noted that the uncontrolled fill was placed and compacted under supervised processes with minimal voids exposed during Galt Geotechnic's test pit investigation. The placement of fill rubbish was less significant toward the south-west areas of Lot 2. Also, the depths of uncontrolled fill taper toward the site boundaries where there is generally an offset from the former pit crest, to the site boundaries along Furniss Road, Mirrabooka Avenue and existing development boundary to the south.

The thickness of uncontrolled fill included in Figure 6 which is included in the Galt Geotechnics report.

4.2 Ground Improvement

Across the majority of the site, where sand fill overlies the uncontrolled fill, a ground improvement procedure, to support the intended land use is detailed by Galt Geotechnics. This includes the installation of a layered geogrid with gravel fill with the purpose of minimising potential future differential settlements.

The site preparation methodology would achieve a Class S site and includes; the removal of topsoil, over excavation and removal of the sand fill layers to expose the surface of the uncontrolled fill. The surface of the uncontrolled fill shall be proof compacted through saturation to expose and filling of any near surface voids. The uncontrolled fill layer shall then be compacted using vibratory rollers prior to the placement of a geofabric layer and geogrid within future development boundaries. A 250mm gravel, or limestone compacted layer shall then be placed over the geogrid, followed by a 250mm sand fill, before a second layer of geogrid and further 250mm of gravel. This therefore will act as a reinforced earth raft and the top level of this modified ground preparation shall remain at least 1.5m beneath the finished design surface.

Over the gravel/geogrid layers, the sand fill shall be replaced in compacted layers to the design surface level. The nominated minimum cover of 1.5m allows for installation of soakwells within lots. There is no requirement to extend the improved ground profile beyond the proposed building zone of influence. By excluding the geogrid and gravel layers from road reserves, where it is not considered necessary by Galt Geotechnics, services installation can be completed without impacting the ground improvement proposals. Also, the infiltration of stormwater drainage can occur within road verges and other basin locations without depth restrictions.

The typical ground improvement profile over areas of uncontrolled fill is included in Figure 7 below.



Figure 6 – Uncontrolled Fill Thickness (Galt Geotechnics, 2019)

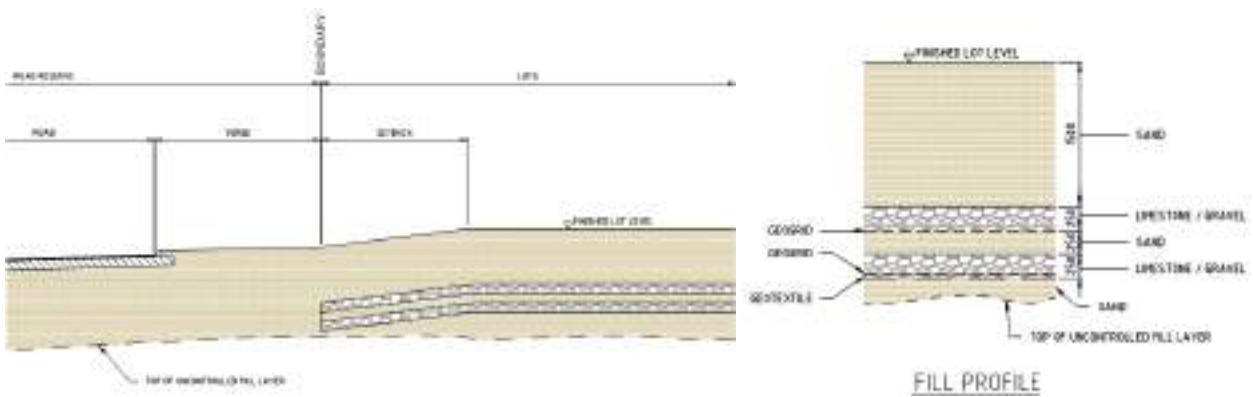


Figure 7 – Typical Ground Preparation Profile over Uncontrolled Fill (TABEC, 2019)

It can be seen from Figure 6 that the uncontrolled fill toward the south-western area of Lot 2 tapers out, and the area is predominantly sand fill and natural sands.

The remedial actions in the south-west location are aimed at confirming there is no deleterious material present below the future development areas, and re-compacting the site. This area of Lot 2 is expected to achieve Class A site classification, and it is intended that any uncontrolled fill would likely be over excavated and removed. It may be possible to screen any over-excavated uncontrolled fill, to remove the sand content for re-use. Any deleterious materials may need to be disposed offsite.

With reference to the northern, eastern and southern boundaries, there is a risk of differential settlements in lots, which form the boundaries to Lot 2, given the varying depth of uncontrolled fill and interface of the former land fill extents. A portion of these lots will be over natural sands, with no uncontrolled fill beneath the surface. Where the uncontrolled fill is limited, further site investigation to determine the extent may result in over over-excavation and removal to achieve Class A sites. Otherwise, a similar ground improvement profile, adopted for the majority of the site, which is detailed above should apply where uncontrolled fill will remain at the crest of the former pit. The varying nature of the lots will however result in Class M lot classifications at the boundaries of Lot 2.

The anticipated lot classifications resulting from the ground improvement works are included in Figure 8.

With regards the POS, the area does not require any specific site preparation requirements and a site classification of Class P would remain applicable. Regrading will however be undertaken in order to shape the area for the intended use. If structures are proposed on the POS, then localised ground improvement works would be appropriate that would extend up to approximately 5m outside the building structures.



Figure 8 – Typical Ground Preparation Profile over Uncontrolled Fill (TABEC, 2019)

The earthworks design for Lot 2 will otherwise follow the standard form for residential subdivision, with lots elevated above road reserves. In order to manage the level differences onsite, the design will include retaining walls to create terraced lots.

The preliminary design finished surface levels are included in Figure 9.

With each stage of development, the geotechnical engineer will undertake inspections to ensure the site preparation methodology and necessary compaction is achieved.

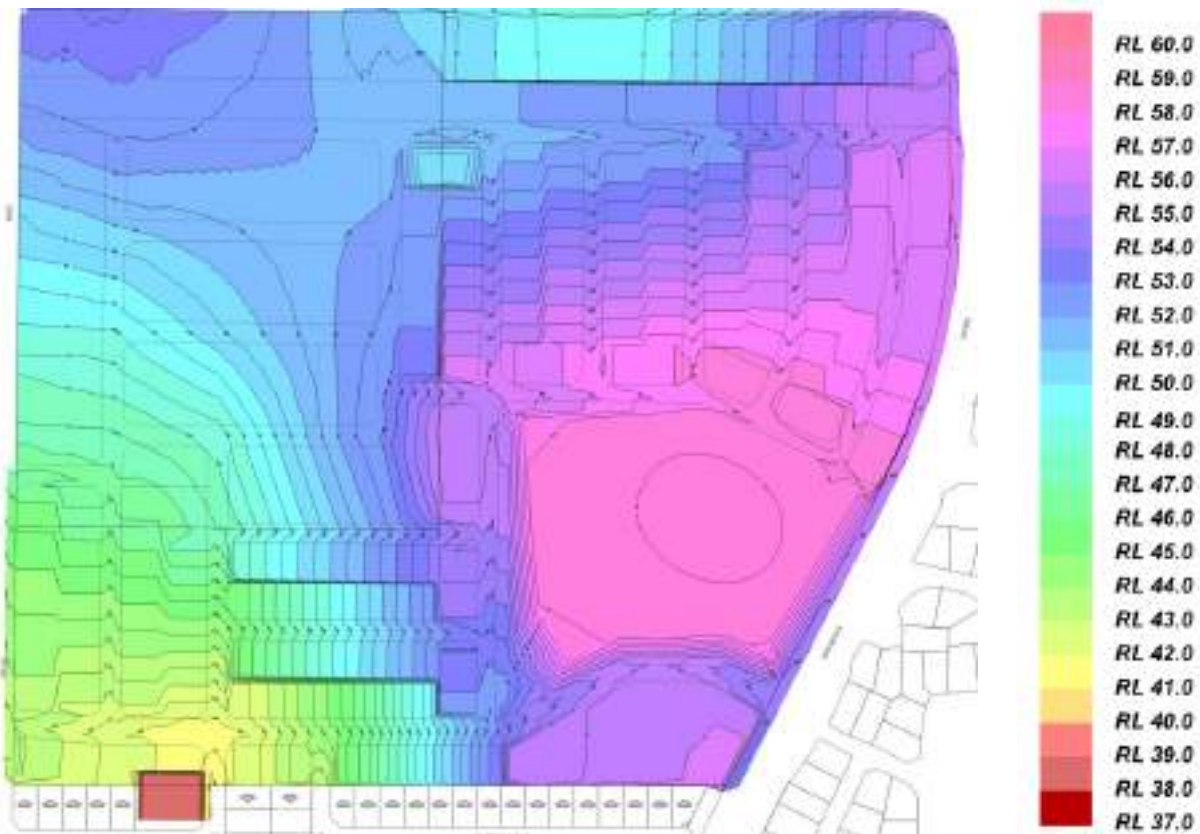


Figure 9 – Preliminary Design Finished Surface Levels, August 2019 (TABEC)

5 ACOUSTIC ASSESSMENT

Herring Storer Acoustics have provided advice that due to the recent update of State Planning Policy 5.4 (September 2019 release), the section of Mirrabooka Road for which the development land abuts, is not considered as triggering an assessment under the policy, therefore an acoustic assessment is not required.

Herring Storer also advises that there is no significant noise impacts from the industrial areas north of Furniss Road. Since the lots that front Furniss Road are intended to be a business precinct, it is considered the buildings will form a practical barrier to residential development within Lot 2 and therefore any additional acoustic constraints are unlikely.

6 ROADS AND TRAFFIC

6.1 Surrounding Road Network

Lot 2 has multiple existing road frontages, with access currently available from Furniss Road to the north and Driver Road to the west. Both Furniss and Driver Roads are currently unkerbed on the boundaries fronting Lot 2. It is intended that future business precinct lots will be accessible directly from Furniss Road.

Driver Road includes traffic calming facilities either side of Westport Parade, which forms a T-intersection with Driver Road. The current Rowe Group concept plan includes a proposed future 4-way intersection with Westport Parade and Driver Road to provide access to Lot 2. Future residential lots will be accessible from Driver Road.

Esmerelda Pass, Lavender Chase and Rosemary Avenue terminate at the southern boundaries of Lot 2. There are no temporary turn-around facilities for these road terminations, however each road is proposed to be extended into Lot 2 as part of the structure plan.

Mirrabooka Avenue is on the eastern boundary, with duplication works recently completed to an integrator arterial road standard with four lanes and cycle paths. A single access in the south-east of Lot 2 is proposed which will require modifications to the existing pavement and median, including the construction of appropriate turning lanes.

6.2 Internal Roads

A variety of road reserve widths have been nominated in the current concept plan in accordance with relevant road hierarchy. This includes a 20m east-west road reserve to provide a connection between Mirrabooka Avenue, the internal POS, through to Driver Road.

All other internal roads are proposed as 15m reserves, with narrower sections only on the POS boundaries. Four-way intersections as shown in two locations on the current Rowe Group concept plan, which may be constructed with roundabouts.

Roads will be paved with asphalt and kerbed in accordance with the City of Wanneroo's engineering specifications. Intersection treatments such as brick paving may be included.

Due to the varying levels across the site, and requirement to tie-in with existing pavements on the boundaries of Lot 2, longitudinal grades will vary, up to the typically allowable 6%. With relevance to the designed finished levels through the POS, lots will be kept elevated for aesthetic purposes. Maximum road grades are expected to result in some locations for overall efficiency of the earthworks design.

Footpaths according to the approved pedestrian movement network will also be included and constructed by the developer within the road reserves.

Road construction will be staged according to the development proposal for Lot 2.

7 STORMWATER DRAINAGE

Together with the preliminary earthworks plan, drainage catchments have been determined which are included in the Local Water Management Strategy (LWMS), prepared separately by Urbaqua. The report details the key stormwater management elements in the urban environment relevant to Lot 2.

Generally, from the elevated areas in the proposed POS, a catchment grades toward the north-west and another toward the south-west areas of Lot 2. The low point toward the south-west is located

immediately adjacent an existing City of Wanneroo drainage sump on Esmerelda Pass. A third catchment area is also nominated in the roads immediately surrounding the POS, with the intention that stormwater collected on roads abutting the POS will be discharged locally within the road verges and POS boundaries.

For reference, the drainage catchments are shown in Figure 10.

In assessing Lot 2 in isolation from neighbouring Lot 1, a low point is nominated in the north-west where there is currently no provision for a drainage basin or POS on the current Rowe Group subdivision plan. Options to consider a temporary facility may be appropriate to ensure adequate capture and treatment of stormwater in this location is achieved. Ultimately, a coordinated design outcome with Lot 1 would be recommended to avoid potential future duplication of drainage basins.

With regards the existing drainage basin on Esmerelda Pass to the south of Lot 2, an assessment of the current performance, infiltration rates and capacities is proposed and a view toward modifying the existing basin and increasing the size to adequately manage stormwater from Lot 2 is proposed. The recommendation is subject to detailed modelling and field-testing by Urbaqua as this presents a more efficient outcome for City of Wanneroo by amalgamating facilities.

In keeping with Water Sensitive Urban Design principals for at-source infiltration, and to reduce downstream requirements for drainage facilities, infiltration higher in each catchment will be a critical aspect in the stormwater drainage design. There are a number of initiatives to be proposed for the treatment of the minor rainfall events through shallow vegetated roadside swales and rain gardens where bio-retention areas will be constructed. Flush kerbing will be utilised in the road design where possible for immediate collection of runoff from impervious areas.

Stormwater runoff collected from the site will be conveyed via the road network to a conventional pit and pipe drainage network, prior to discharging into the bio-retention facilities. Underground stormwater facilities in verges will also form part of the overall drainage strategy for Lot 2. Gross pollutant traps are anticipated to be included in the design prior to discharging piped stormwater drainage into major stormwater storage facilities.

In terms of the proposed geotechnical ground improvement works, the remediation profile is restricted within development lot boundaries and is not required to extend into road reserves. The geotechnical advice is that a minimum cover of 1.5m beneath the finished surface is required to the top of the ground-improvement profile is necessary. Following the existing contours of Lot 2 and broad-scale catchments, the ground-improved profile will generally also follow a grade. The nominated depth of cover provides sufficient clearance for soakwells to be installed within the proposed lots.

Given that the road reserves and also POS areas will therefore contain free-drainage sand are not restricted with cover to a modified ground profile, a high level of stormwater infiltration is expected to be achieved. Storm water drainage pits with larger diameter liners, trapped bases and weep holes rather than benched bases are therefore proposed to promote recharge throughout the catchment network. The design may also incorporate infiltration galleries located behind the kerb.

Galt Geotechnics have undertaken permeability testing throughout the site, across a large number of samples including the various types of material. On the currently well compacted sand layer, hydraulic conductivity in the range of 4-10m per day was recorded. The permeability is unlikely to reduce significantly through the proposed ground compaction works.

The uncontrolled fill will have variable drainage performance, however the testing by Galt Geotechnics reported that the material is permeably with measured hydraulic conductivity in the range of 4-15m per day.

More detailed drainage management measures are identified through the Local Water Management Strategy, prepared by Urbaqua. And ultimately, the detailed drainage design will be documented in an Urban Water Management Plan (UWMP) for submission to the City of Wanneroo. A UWMP will be a Western Australian Planning Commission (WAPC) condition of subdivision as stages are developed.

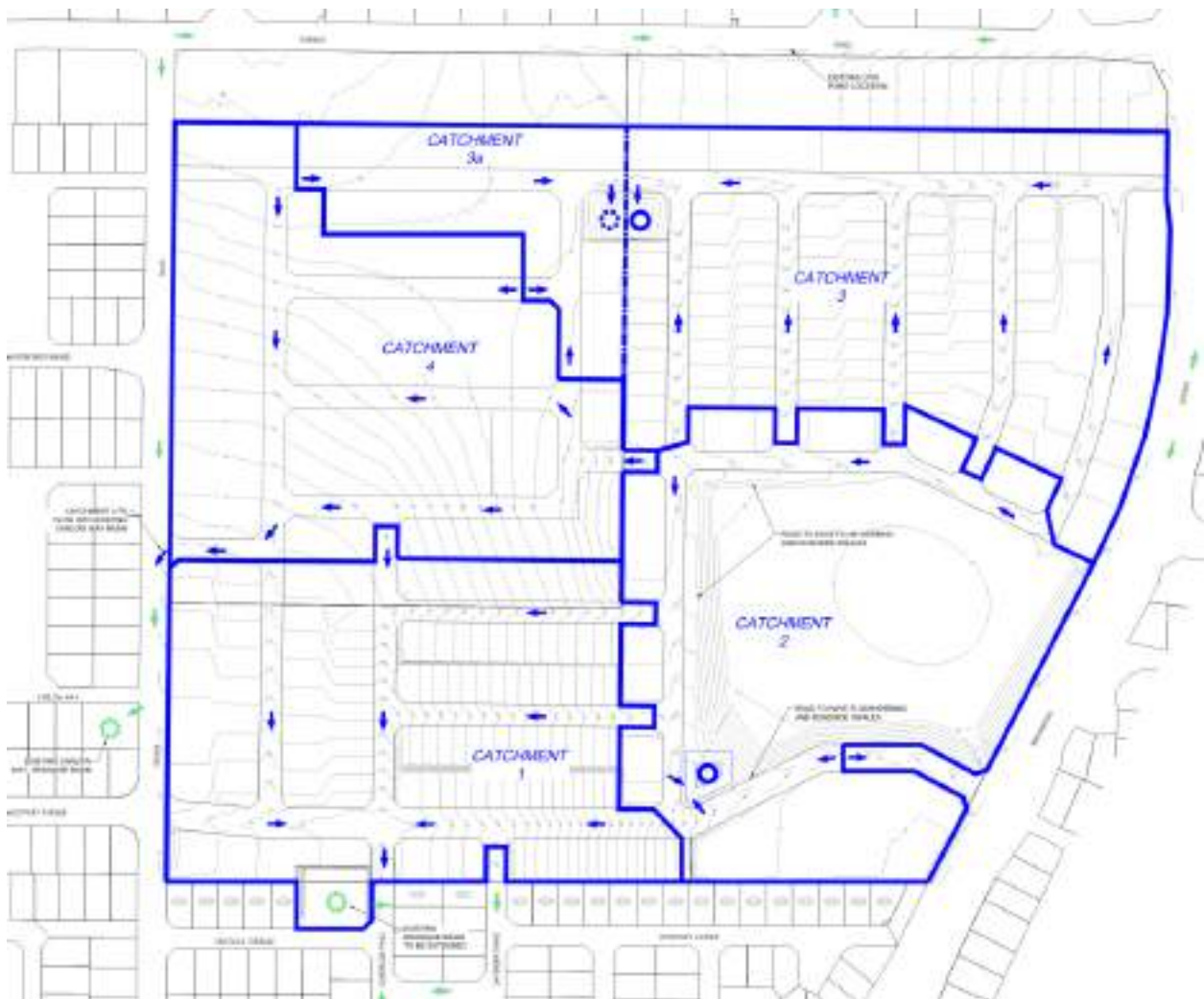


Figure 10 – Stormwater Drainage Catchment Plan, August 2019 (TABEC)

8 WASTEWATER

Water Corporation has existing scheme planning that covers Lot 2 and advises that the site can be serviced through the extension of a gravity sewer network. The site falls within the catchment of the existing Waste Water Pump Station (WWPS) Gngangara PS 4 on Driver Road, which is to the immediate south-west of Lot 2. Furniss Road and Mirrabooka Avenue form the catchment boundaries for this pump station, and existing development north of Furniss Road grades toward a WWPS Gngangara PS 1 on Rogers Way which is approximately 650m to the north-west of Lot 2.

Currently, there are existing waste water reticulated services in Esmerelda Pass, Lavender Chase and Rosemary Avenue at the southern boundaries of Lot 2. Each of which appears at sufficient depth for extensions in order to provide connections into the proposed development. The pipe size in Esmerelda Pass is 225mm which is shown on Water Corporation's planning as a future extension into Lot 2, while there is a 150mm diameter sewer in Esmerelda Pass and Rosemary Avenue.

For the business precinct fronting Furniss Road, the logical proposal is to utilise existing 225mm sewer main in the southern verge of fronting Lot 2. The sewer flows from these lots would therefore be directed toward Gngangara PS 1, and a slight modification to Water Corporation's scheme planning would be necessary. The sewer main in Furniss Road would also require an extension of approximately 140m toward Mirrabooka Avenue in order to service all lots fronting Furniss Road. Works in this verge will need to accommodate other existing live services such as Water Corporation's 400mm diameter steel water main which may impact lot connection levels.

For the balance of the site, Water Corporation has confirmed that there are no capacity issues or upgrades required to Gngangara PS 4 on Driver Road.

Since the earthworks design for Lot 2 creates a low point in the north-west of Lot 2, sewer extensions from the southern boundary will be laid deep, at minimum grade through the central area of the site. Deep excavations through the uncontrolled fill layers will likely result and appropriate trench bedding, backfilling and compaction shall be considered.

A broad, more efficient servicing strategy may extend a gravity sewer network through Lot 1 in order to service the northern parts of Lot 2, however access may be prevented in the interim and a reticulated design outcome that contains services inside Lot 2 is currently proposed.

The developer will be responsible for funding reticulation extensions and the installation of sewer network within the subdivision, designed and constructed in accordance with to Water Corporation specifications. Standard Water Corporation infrastructure contributions will apply on a per lot basis.

A copy of Water Corporation's catchment planning showing the locations of both Gngangara PS 1 and PS 4 waste water pump stations is included in Figure 11.

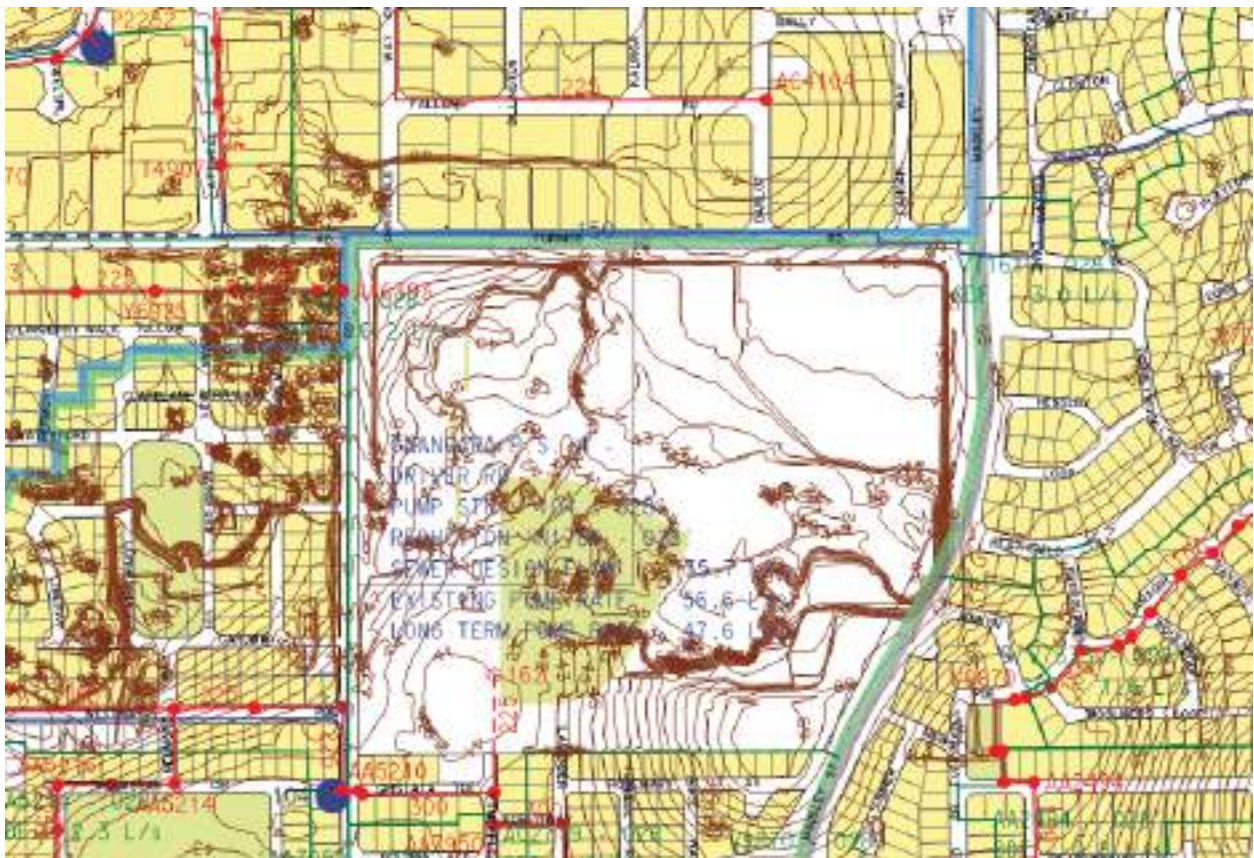


Figure 11 – Waste Water Planning, June 2019 (Water Corporation)

9 WATER SUPPLY

Currently, there are various existing Water Corporation reticulation and distribution water mains surrounding Lot 2. This includes, a 150mm reticulation main (western verge) and 375mm distribution main (eastern verge) in Driver Road, a 200mm reticulation main (northern verge) and a 400mm steel distribution main (southern verge) in Furniss Road, along with a 500mm steel distribution main and a 1400 steel trunk main in Mirrabooka Avenue which varies in alignment. Also, there are 100mm and 150mm reticulation mains in the road reserves at the southern boundary of Lot 2.

Water Corporation’s reticulation planning for the site is included in Figure 12, which illustrates the various existing and future proposed main sizes. The yellow boundary highlights Lots 1 and 2.

The 150mm water main in Lavender Chase, is intended to be extended through Lot 2 with connections to the 150mm main in Driver Road and the 200mm main in Furniss Road. Since there is no road connection through to Furniss Road on the current Rowe Group concept plan, the Water Corporation planning for this site requires updating. The remainder of Lot 2 will be serviced through 100mm reticulation mains.

It is noted that no water connections are intended to the existing large distribution water mains in Mirrabooka Avenue. Similarly, connections to Driver Road and Furniss Road will be made to the small 150mm and 200mm reticulation mains respectively, with no connections to the larger mains in those road

reserves. Various road crossings will therefore be necessary to complete the connections, along with deferred services for lots fronting those existing road reserves.

Water mains are to be designed and constructed according to the Water Corporation specifications. Installation will occur based on the staged development and funded by the developer. Standard infrastructure contributions will also be included.

Based on the water reticulation planning for Lot 2, it is intended that a Multi-Staged Works Agreement be prepared once subdivision approval is received to enable clearances for each subsequent stage as development proceeds.

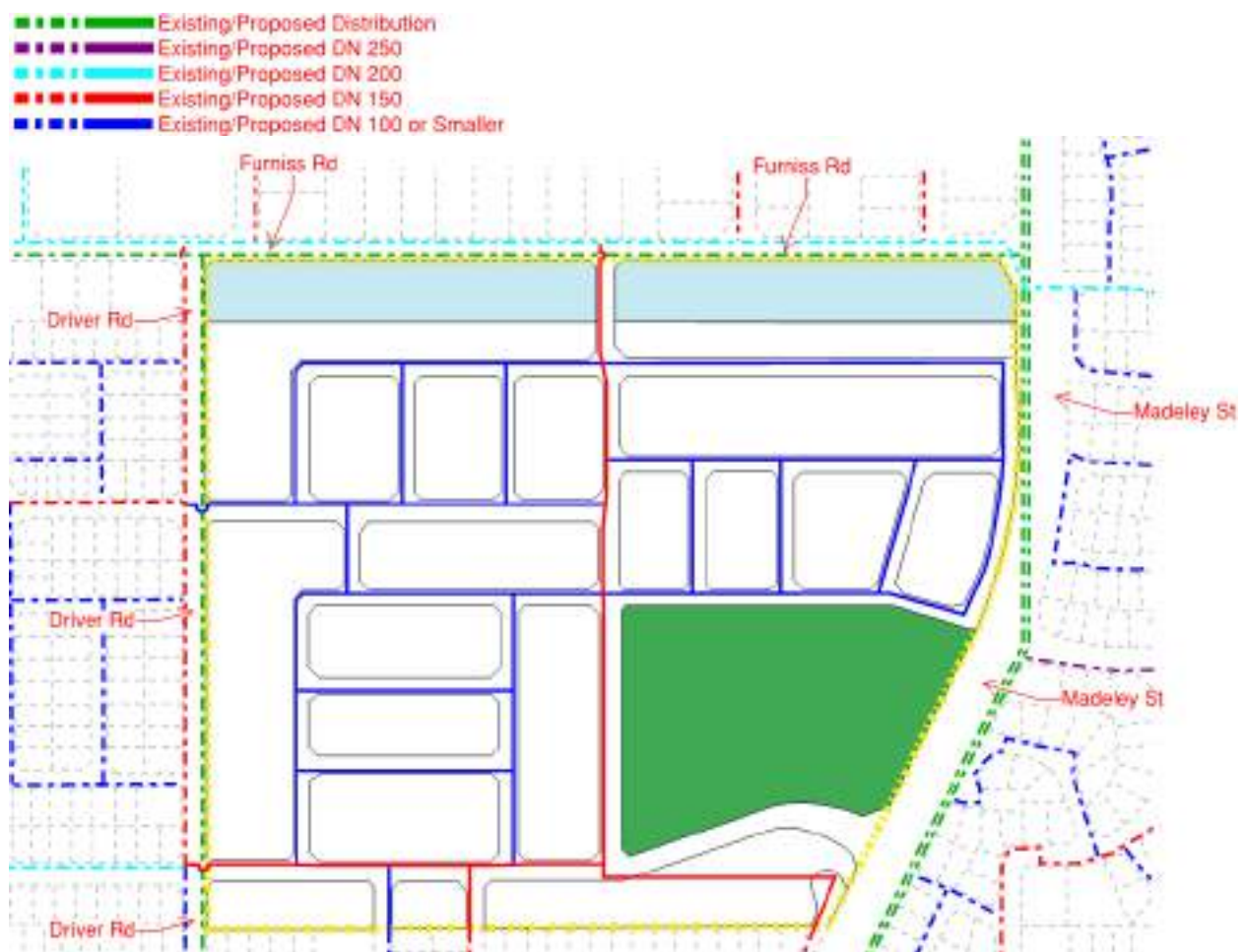


Figure 12 – Water Reticulation Planning, June 2019 (Water Corporation)

10 POWER SUPPLY

10.1 Existing Power Infrastructure

There are existing underground Western Power high voltage cables surrounding the site, including both verges of Driver Road, Furniss Road and the western boundary of Mirrabooka Avenue. There is also below ground low voltage cables that are located on the northern side of Furniss Road, in each of the roads to the southern boundary of Lot 2 and serving the street lighting in Mirrabooka Avenue.

Since all power assets in the area are below ground, there are no overhead poles to be removed during the proposed subdivision.

The only potential clash identified is the existing high voltage feeder cable in Mirrabooka Avenue. While the mapping appears to follow the existing road reserve boundary, Underground Power Development has identified that a survey, with pot-holding and servicing locating should be undertaken the cable is located correctly and not inside the boundary of Lot 2.

Underground Power Development also advises that Western Power's network has sufficient capacity in the area to service the proposed development. Western Power's network mapping tool is included in Figure 13, which demonstrates the capacity of the high-voltage feeder to the locality.

10.2 Proposed Power Infrastructure

The estimated power load to service the full build-out of Lot 2 is 1675kVA, which is based on 4.7kVA per lot for the residential lots and a total of 368kVA to service the 1.85ha business precinct.

A new 1MVA power transformer is required in order to service the higher loads associated with the business precinct area. A site in the north-eastern area that is 5.9m by 5.3m is necessary to contain the 1MVA transformer, switchgear and LV frame.

In addition, a 630kVA transformer is required that would ideally be located toward the south-west of Lot 2, on a site that is 3.7m by 4.0m. It is most likely that an additional 315kVA transformer and switchgear is also located in the south-east of the site, as it is expected that the POS and pavilion may include significant power loads based on anticipated facilities. There is potential opportunity to locate both the 630KVA and 315KVA transformers on the POS, as extensions to the road reserve.

The sizing and locations of transformers remains to be confirmed during detailed phase.

In terms of LV power supply to the subdivision, connections to existing roads will need to be provided with adequate street lighting. Modification to the existing street light arrangement in both Mirrabooka Avenue and Driver Road may be anticipated. All lots will otherwise be provided with power connections during the subdivision works, with street lighting provided throughout, as required by City of Wanneroo policy.

The effects of earth potential rise (EPR) issues will require investigation. Due to the significant large steel water mains on the site boundaries, site testing and earth resistivity shall be assessed. EPR reporting will be necessary prior to subdivision works commencing to determine any mitigation requirements that may be necessary.

Confirmation of Western Power servicing of the development is subject to a formal request being lodged. A Design Information Package (DIP) will be requested in order to commence that process.

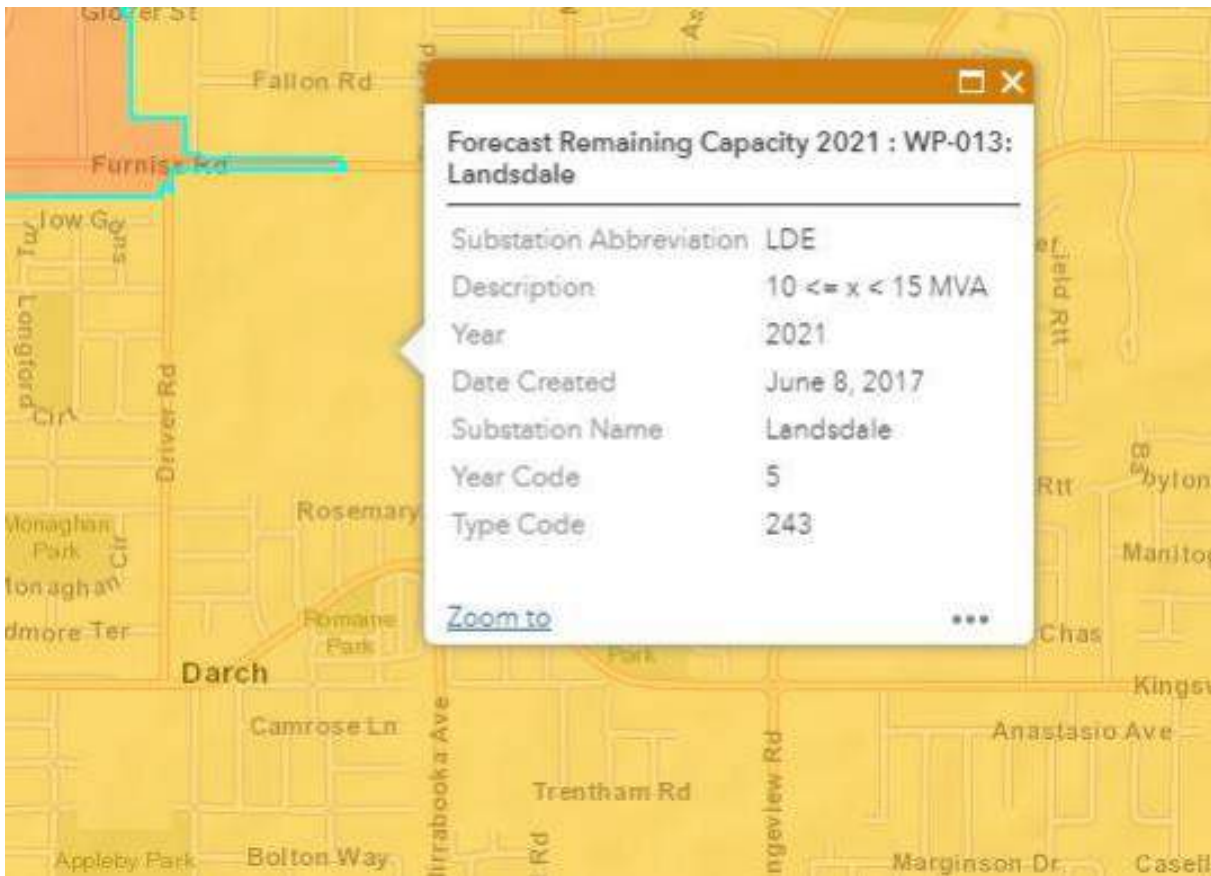


Figure 13 – Western Power network mapping tool. June 2018 (UPD)

11 TELECOMMUNICATIONS

NBN Co is responsible for the installation of fibre in all broad acre developments within the long-term optic fibre footprint, to which this project qualifies.

As shown in Figure 14 below, the NBN rollout has substantially commenced in the Darch area with a large portion of existing residential areas already served. There are existing NBN assets in Furniss Road and Driver Road along with the residential streets to the immediate south of Lot 2. While the existing residential areas east of Mirrabooka Avenue are serviced with NBN assets, there does not appear to be NBN Co services in Mirrabooka Avenue.

The developer is responsible for providing pit and pipe infrastructure throughout the subdivision for the fibre to be installed. NBN Co will cover the costs of installing fibre infrastructure in the development and backhaul requirements, if any shall be confirmed. While NBN assets exist to the site boundaries, connections to NBN services the eastern boundary of Lot 2 may therefore need to be assessed further.

As part of the developer agreement conditions, NBN will take over ownership of the assets upon completion and ensure that fibre is ready 3 months prior to the first occupancy for a new development.

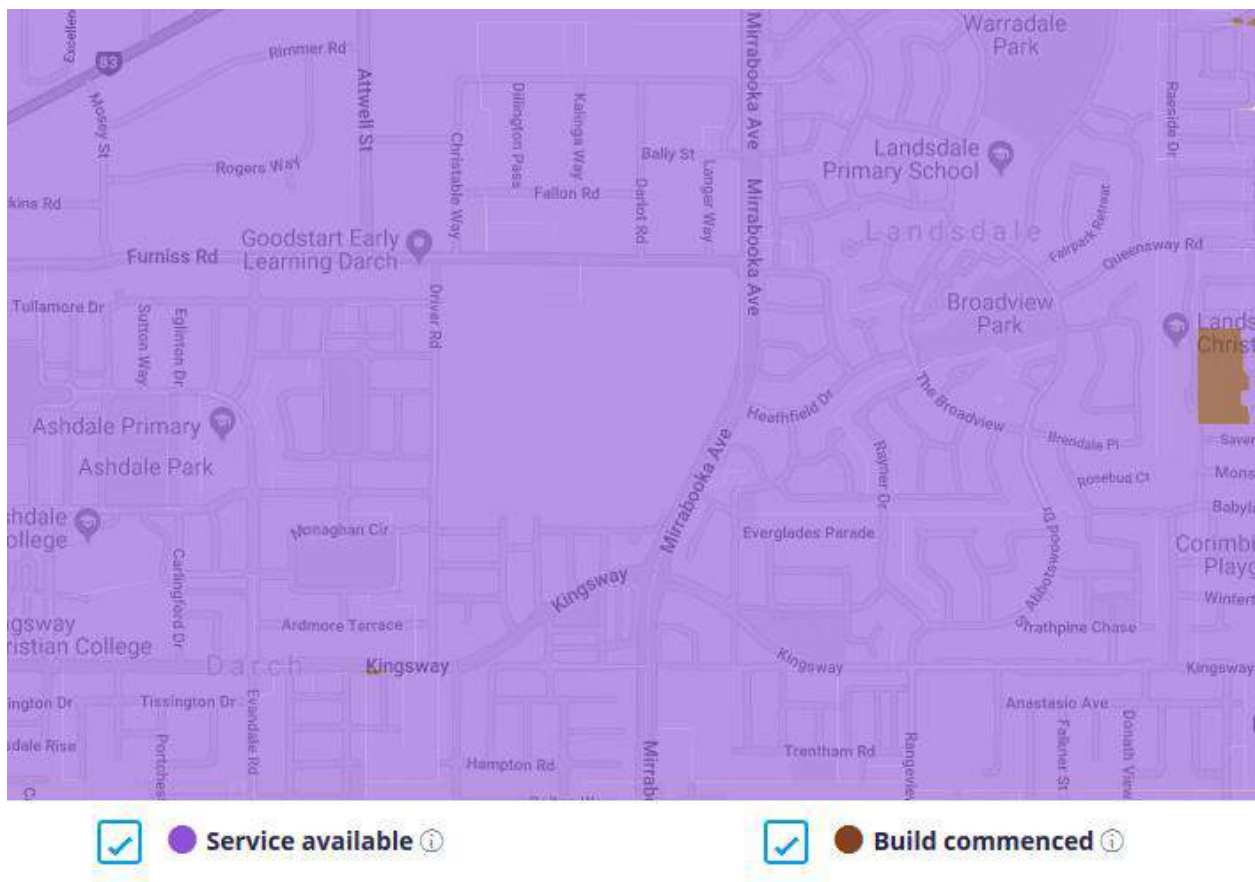


Figure 14 – NBN Rollout Map for Darch, August 2019 (NBN website)

12 GAS SUPPLY

All ATCO gas mains in the Darch area are medium pressure as outlined on the below broad scale ATCO gas mapping of existing assets including in Figure 15.

In Furniss Road, there is an existing 110PE gas main on the northern side of the road between Darlot Road and Langar Way. The main therefore does not extend to the full northern frontage of Lot 2 and terminates prior to Mirrabooka Avenue. Localised gas main extensions may therefore be necessary in order to ensure all of the business precinct which front Furniss Road are able to connect to an ATCO gas main. This would therefore require an approximate extension of 110m in exiting verges toward the western boundary of Lot 2 and an additional 50m from Langar Way to the east with bored road crossings.

To the west, there is an existing 110PE main in the western verge of Driver Road and at the southern boundary there is 63PE in Esmerelda Pass and 110PE in Lavender Chase.

It is expected that connections to these existing mains and extensions of the existing assets can be undertaken readily, notwithstanding there will be some disturbance and remediation in existing road verges.

There are no significant gas mains in the Mirrabooka Avenue road reserve. All development areas to the east of Mirrabooka Avenue terminate at the road reserve boundary. A connection through to the existing

ATCO gas network at Heathfield Drive or Jenkyn Circle may need to be investigated to determine the most appropriate location.

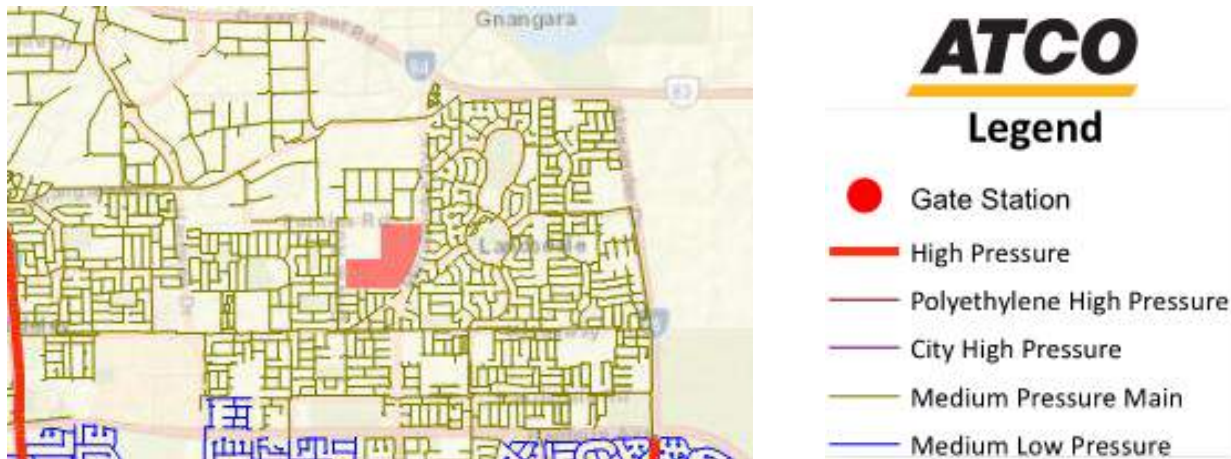


Figure 15 – ATCO Gas WA Network Coverage, Metro South 2017 (ATCO Gas website)

13 CONCLUSION

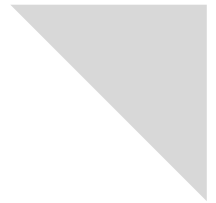
Based on the servicing infrastructure review, there does not appear to be engineering related constraints preventing development Lot 2, Driver Road Darch. Notwithstanding the previous land uses, based on the substantial ground investigations to date, completion of adequate ground preparation will ensure the site is capable of supporting the intended subdivision.

Following the submission of the Local Structure Plan, subdivision approval will be sought from the Western Australian Planning Commission. Detailed designs will be completed in order to satisfy the subdivision conditions that are anticipated to be issued.

As this report is based on the preliminary servicing advice and investigations completed to date, it is recommended that each Authority be kept informed as the planning progresses and concept engineering designs are refined. Communicating the proposed time-frames for the staged development is also important to inform and coordinate designs and approvals from all relevant Authorities.

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APPENDIX 6

TRANSPORT IMPACT ASSESSMENT



ROWE
GROUP
DESIGN

October 2019

Final

Proposed Rezoning and Local Structure Plan Amendment for Lot
2 Driver Road, Darch

Prepared For:
Parcel Property



Transport Impact Assessment
Report

DOCUMENT ISSUE AUTHORISATION

Issue	Rev	Date	Description	Prepared By	Checked By	Approved By
0	0	31/07/2019	Draft Report	CHS	DNV	DNV
0	1	05/08/2019	Second Draft Report	CHS	DNV	DNV
1	0	18/10/2019	Final	CHS	SY	SY
1	1	22/10/2019	Final - Minor Edits	CHS	SY	SY

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Donald Veal Consultants Pty Ltd

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1. INTRODUCTION

1.1 BACKGROUND

Parcel Property has commissioned Donald Veal Consultants, to prepare this Transport Impact Assessment report to support a Local Structure Plan amendment application for the site known as Lot 2 Driver Road, Darch. The site is currently included in the 'Landfill Precinct' of the Wanneroo Cell 6 Structure Plan and the application proposes to include it instead in the 'Residential Precinct'.

1.2 SCOPE OF THIS REPORT

The structure and scope of this Transport Assessment are in accordance with Volume 2 (Planning schemes, structure plans and activity centre plans) of the Western Australian Planning Commission's Transport Impact Assessment Guidelines (2016).

2. EXISTING SITE CONDITIONS

2.1 LOCATION

The development site at Lot 2 Driver Road, Darch is located immediately west of Mirrabooka Avenue and immediately south of Furniss Road in the Wanneroo suburb of Darch. Ocean Reef Road is about 1.5km north of the site and Hepburn Avenue is about 1km south of the site. The site location in relation to the northern corridor of Perth is shown in **Figure 2.1**, with the site location shown in more detail in **Figure 2.2**.



Figure 2.1: General Locality Plan *Source: Google Maps*



Figure 2.2: Site Location *Source: Google maps*

2.2 CURRENT LAND USES

The subject site is presently zoned Urban Development and is vacant apart from a single residence in the south western corner of the site. On the north-western corner of the site (Lot 1441 Furniss Road) is a recycling facility for waste building and construction materials called Non-organic Disposals. This is generally referred to as Lot 1 Driver Road. Directly north of the site and Furniss Road is the Landsdale Industrial Area. All other sides of the site are developed residential land included in the suburbs of Landsdale (east), and Darch (south and west).

Photo 1 shows an aerial view of the site in relation to the surrounding activities.



Photo 1: General view of the site (Source: Nearmap)

Photo 2 shows a view of the site from Furniss Road looking towards the southwest.



Photo 2: View from Furniss Road looking southwest over Lot 2 Driver Road. (Source: Google Maps StreetView)

2.3 ACCESS ARRANGEMENTS

The main entrance to the site is currently off Driver Road in the southwest corner near the residence on the site opposite Westport Parade. There is an informal access point off Furniss Road to the north of the site opposite Darlot Road. The recycling facility has an entrance off Furniss Road as shown in **Photo 3**.



Photo 3: Lot 1441 Furniss Road Entrance (Source: Googlemaps Streetview)

2.4 ADJACENT ROAD NETWORK

The road network adjacent to the site consists primarily of Mirrabooka Avenue to the east which was recently upgraded to a dual carriageway (2 lanes in each direction) and has a speed limit of 70km/h. Mirrabooka Avenue is classified as a Distributor A road in the Main Roads WA (MRWA) functional road hierarchy mapping system as shown in **Figure 2.3**.

Furniss Road runs along the northern boundary of the site, has a 10m wide paved carriageway and is classified as a Local Distributor Road by MRWA with a 60km/h speed limit. The wider carriageway is to accommodate the higher volume of heavy vehicles associated with the industrial area.

Driver Road is also classified as a Local Distributor Road with a 60km/h speed limit. The City of Wanneroo has advised that Driver Road carried a large number of commercial vehicles accessing the Landsdale Industrial Area. The City has subsequently installed a speed cushion traffic management system (recommended speed limit of 20km/h) which has reduced the number of commercial vehicles to the levels shown in the following section on traffic volumes.

Kingsway is an east-west Local Distributor Road with a 60km/h speed limit. It is not immediately adjacent to the site. It has a single carriage of varying width (typically 7m to 8.75m) with a painted median, also of varying width (1.0m to 2.2m).



Figure 2.3: MRWA Functional Road Hierarchy

2.5 EXISTING TRAFFIC VOLUMES

The latest available traffic counts were sourced from the City of Wanneroo and from loop counts undertaken for the study on Mirrabooka Avenue. These are summarised in **Table 2.1**.

Table 2.1: Traffic count data

Location	Date	AWT*	% Commercial Vehicles	85% Speed	Weekday AM Peak (vph**)	Weekday PM Peak (vph)
Mirrabooka Ave (north of Kingsway)	May 2019	18,754	n/a	n/a	1,600	1,746
Furniss Rd	October 2017	4,635	15%	64 km/h	n/a	n/a
Driver Rd	November 2016	1,373	7%	57 km/h	n/a	n/a
Kingsway (west of Kilchum Prom)	May 2018	6,351	3%	59 km/h	n/a	n/a

*AWT = Average Weekday Traffic **vph = vehicles per hour

Information from the MRWA Traffic Map shows that Mirrabooka Avenue carries about 8% heavy vehicles just north of Marangaroo Drive (south of the site).

2.6 CRASH HISTORY

The MRWA Crash Analysis Reporting System (CARS) was interrogated for crash data along Mirrabooka Avenue, Furniss Road and Driver Road, for the latest five-year period from January 2014 to December 2018.

The crash data reveals that there were 35 recorded crashes along Mirrabooka Avenue between, and including, the intersections of Kingsway and Furniss Road, 26 of which occurred at the intersection with Kingsway and two at the intersection with Furniss Road. None of the crashes resulted in a fatality and only seven medical treatment crashes in total.

During the same period, CARS shows three recorded crashes along Furniss Road (excluding the intersection with Mirrabooka Avenue), two of which resulted in Major Property Damage Only (PDO Major) and one PDO Minor.

There were only two recorded crashes on Driver Road during the assessment period, one of which resulted in hospitalisation of a motorcyclist who collided midblock with the traffic management device (speed cushion).

Crash history details are attached in **Appendix A**.

2.7 PLANNED CHANGES TO THE ROAD NETWORK

There are no planned changes to the surrounding road network although it is noted that the widening of Mirrabooka Avenue adjacent to the subject site was only completed in mid-2018. This included left and right turning pockets from Mirrabooka Avenue into Heathfield Drive.

The existing Structure Plan for the area (east Wanneroo Cell 6) shows a new east-west link between Mirrabooka Avenue and Westport Parade. All turning movements at the intersection of this road and the Mirrabooka Avenue are permitted as shown in **Figure 2.4** (excerpt from Structure Plan Cell 6).

The existing Structure Plan (and **Figure 2.4**) also shows a new north-south connection through the subject site intersecting with Furniss Road in the north.



Figure 2.4: Excerpt from East Wanneroo Structure Plan - Cell 6

3. PROPOSAL

3.1 PROPOSED DEVELOPMENT

The current application is for a Local Structure Plan Amendment to allow the future development of the site. A concept layout is shown in **Figure 3.1**.

The subject site will yield about 325 residential lots plus a further 12 business/commercial lots along Furniss Road on the northern boundary. The residential lots are of mixed density with some 224 at R20, 37 at R30 and up to 64 lots at R60.

While no recent subdivision design has been undertaken for the adjacent Lot 1 in the northwest corner, it is expected to yield a further 155 residential lots (based on earlier planning work undertaken by the Rowe Group) and an additional 10 business/commercial lots fronting Furniss Road. The traffic for this site has been included in this traffic assessment to provide a comprehensive assessment of future traffic impact.

The overall area of the subject site (Lot 2) is approximately 24.71 Hectares.

The road network in the concept plan is similar to that shown in the East Wanneroo Structure Plan and includes the east-west link along Westport Parade. It differs to the Structure Plan in that the north south link is not connected to Furniss Road in the north and the intersection of Westport Parade and Mirrabooka Ave is included as a T-junction.

The location of the Westport Parade/Mirrabooka Avenue intersection is shown as being located approximately opposite Sumner Mews to the east of Mirrabooka Ave in Landsdale (albeit with no road connection). This is approximately midway between the intersections with Heathfield Drive and the Kingsway roundabout along Mirrabooka Avenue which are currently 400m apart. The location of the proposed Westport Parade intersection meets the junction spacing requirement of 190m to Heathfield Drive for staggered junctions (Table 5 – Junction Spacing, Liveable Neighbourhoods 2009). This section of Mirrabooka Avenue is flat and straight and affords good sight distance in both directions.

Client: Parcel Property
Project: Lot 2 Driver Road, Darch TIA



Figure 3.1: Concept Plan

3.2 TRAFFIC GENERATION

Trip generation rates for this development have been derived from the usual published sources, in particular the *Guide to Trip Generating Developments*, NSW Road Traffic Authority (RTA) 2002. The proportional split of inbound and outbound trips for the peak hours has been taken from those suggested in the WAPC *Transport Impact Assessment Guidelines Volume 5 Technical Guidance* (2016).

Table 3.1 shows the expected am, pm and daily trip generation.

Table 3.1: Trip Generation

Land Use	UNITS	Rate per UNIT		Peak Hour Distribution (Source: WAPC)				Trips per Peak Hour & Daily				
	Dwellings	Source	Daily	AM in	AM out	PM in	PM out	AM in	AM out	PM in	PM out	Daily
Residential	379	RTA	9	0.2	0.6	0.5	0.3	76	227	190	114	3411
Residential Medium Density	101	RTA	6.5	0.2	0.6	0.5	0.3	20	61	51	30	657
Land Use	GLA	Source	Peak Hour	AM in	AM out	PM in	PM out	AM in	AM out	PM in	PM out	Daily
Business	16500	RTA	1.1/100m ² GLA	0.8	0.2	0.2	0.8	145	36	36	145	1285
								241	324	276	289	5353

The residential lots are expected to generate about 4,070 vehicle trips per day (vpd) based on 9 trips per dwelling per day for the R20 lots and 6.5 trips per dwelling per day for the remaining residential lots. In the peak hour the residential lots will generate about 385 vehicle trips per hour (vph) in both inbound and outbound directions.

The trip generation rates for business parks in the RTA guidelines suggests that 1.1trips/100m² GLA will be made in the peak hour. For the 22 business lots this translates into approximately 180vph. Table 3.4 of the RTA indicates that about 14% of daily trips occur in the morning peak hour which means that there will be about 1,285vpd generated by the business/commercial lots on a daily basis.

3.3 TRIP DISTRIBUTION

Trips to and from the subject site and Lot 1 will be attracted to a wide range of destinations. The assumed distribution of these trips for the subject site is shown in **Table 3.2** and has been discussed with and agreed by the City of Wanneroo.

Table 3.2: Trip Distribution Assumptions

Direction	% Trips
North (Joondalup, Wanneroo and Wangara)	20%
East (Midland, Malaga, Airport and further south)	20%
West (schools)	5%
West (to retail at Kingsway, Whitfords, Woodvale, Darch Plaza etc)	15%
South (Perth CBD and beyond)	30%
South (Balcatta Industrial)	5%
South (Osborne Park)	5%
Total	100%

The generated trips identified in **Table 3.1** have been assigned to the road network based on this distribution.

3.4 INTERNAL ROAD NETWORK

The concept plan in **Figure 3.1**, shows the internal road links that will provide access to the residential lots. All of the business lots are assumed to have individual access directly off Furniss Road (similar to those west of Driver Road) although there may be merit to providing a service lane for access. This would reduce the number of crossovers and potentially increase the opportunity for parking.

Taking into account the trip generation, the trip distribution and road layout of the site, that traffic from the residential areas will not load more than approximately 1,100vpd on any of the internal roads. The local access streets will experience diminishing traffic volumes the further they are from the larger access routes e.g. the Westport Parade extension or the Lot 1 access at Driver Road. The estimated, two-way, daily traffic volumes at the site entry and exit roads are shown in **Figure 3.2**.



Figure 3.2 Daily Forecast Traffic Volumes

Most of the internal roads are proposed as 15m road reserves. According to Liveable Neighbourhoods (2009) this is classed as an Access Street C and could carry up to 3,000vpd, which will adequately accommodate the forecast traffic. This type of street layout has on-street parking and has a typical road cross-section as shown in **Figure 3.3**.

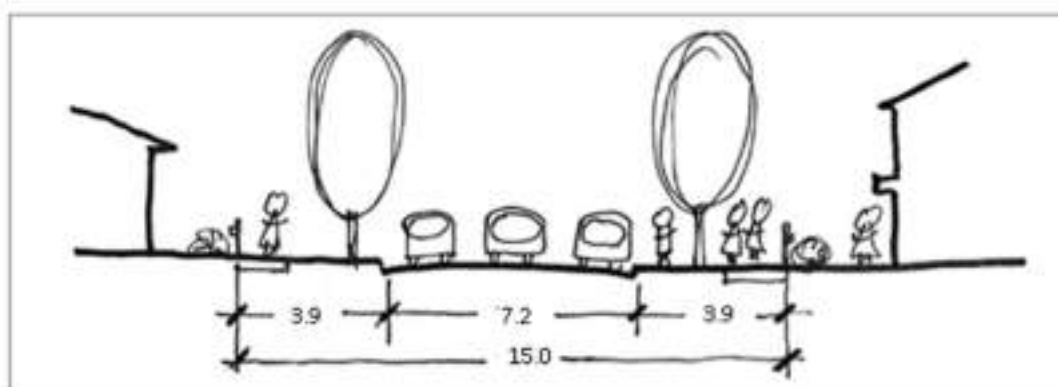


Figure 3.3: Access Street C - Typical Cross-section

The residential roads to the north and west of the public open space (POS) are shown as having a 13.2m road reserve. Because of the POS, the verge on that side can be reduced and the road would be expected to operate as an Access Street C with a 7.2m carriageway as shown in **Figure 3.3**.

Westport Parade extension is shown as the link between Mirrabooka Avenue and Driver Road. Between Driver Road and the POS it is shown as having a 20m road reserve. This is consistent with Westport Parade west of Driver Road which has an 8m road carriageway width, a 5m verge on the north side and a 7m verge on the south side that includes a 2m wide footpath. This would also be classified as an Access Street C carrying up to 3,000vpd, but with wider verges compared to the other subdivision roads.

Adjacent to the POS the road reserve is shown as 18.2m, consistent with a reduced verge width on the side of the POS.

DVC considers that there may be a small component of through-traffic on Westport Parade extension, mainly related to the three schools at the western end of Westport Parade. This traffic would come from the residential areas directly to the east of the subject site i.e. Landsdale. The proposed Access Street C would have spare capacity to handle this local through-traffic component. For trips originating further afield (i.e. not school related) there are more attractive, parallel, east-west routes e.g. Kingsway, which would take preference over Westport Parade extension. Therefore, for the purpose of this assessment through-traffic on the internal roads is considered negligible.

Austrroads *Guide to Traffic Management* provides advice on the capacity of unsignalised intersections. For minor roads where there are relatively low volumes of turning traffic, capacity considerations are usually not significant and capacity analysis is unnecessary. Intersection volumes, below which capacity analysis is unnecessary, are indicated in **Table 3.3**. It can be seen that for a two-lane major road, when the flow on the major road is 650 vph or less, the crossroads would easily accommodate up to 100 vph.

Table 3.3: Intersection Volumes below which Capacity Analysis is unnecessary (Austrroads 2009)

Type of road	Light cross and turning volumes maximum design hour volumes (vehicles per hour (two-way))		
	Four lane major road	1000	1500
Crossroads	100	50	25
Two lane major road	400	500	650
Crossroads	250	200	100

Figure 3.2 shows the daily forecast traffic volumes on the internal roads in the subject site. Peak hour traffic volumes are typically 10% of the daily volumes so it is clear from **Figure 3.2** that there will be no capacity issues expected on the internal roads and that further capacity calculations are not required.

The roundabouts shown on the north-south road and Westport Parade extension will assist with speed-calming, especially as these are the longest stretches of straight, wide carriageway within the subdivision, which might otherwise encourage speeding. The speed cushion treatment installed on Driver Road would

indicate that a roundabout at the intersection with Westport Parade would be beneficial from a safety viewpoint, while not strictly required to manage traffic volumes.

Liveable Neighbourhoods provides guidance on the street leg length and target operating speeds on local roads (see Element 2, Table 6: Street leg length and target operating speed). Based on this, additional speed management devices are recommended for Lot 2 as shown indicatively in **Figure 3.4**. It is recommended that roundabouts, mini-roundabouts, raised plateaux or other similar traffic calming measures are installed to ensure a safe traffic operating environment. The location of devices for Lot 1 will depend on the final road layout adopted.



Figure 3.4: Location of proposed speed management devices

3.5 EXTERNAL ROAD NETWORK – OPENING YEAR

3.5.1 Furniss Road

Some traffic from the residential areas of the subject site and Lot 1 is expected to use Furniss Road to access routes to the northern section of the metropolitan area, e.g. Joondalup, Wanneroo etc. This is forecast to be approximately 900vpd which will travel mostly to and from the west along Furniss Road. There will also be some additional traffic generated by the proposed commercial/business lots along Furniss Road which it is estimated could generate a further 1,285vpd. While the residential traffic from the subject site is expected to travel mainly to and from the west, the business commercial traffic would be more evenly distributed i.e. to and from both the east and west ends of Furniss Road.

Furniss Road is a Local Distributor Road with wide carriageways to handle larger vehicles associated with industrial use. It currently carries about 4,635vpd. According to the MRWA road hierarchy, local distributors have a theoretical capacity of about 6,000vpd. If the additional development traffic is added then Furniss Road could experience traffic volumes of around 6,800vpd at full development. DVC considers that Furniss

Road is capable of carrying this volume of traffic. While there are no medians, the wide carriageway will allow turning movements into the business sites without significant disruption to traffic. The nearby Gngangara Road and Prindiville Drive in the Wangara industrial area are similar roads and both carry around 10,000vpd.

Furniss Road also has excellent connection to the wider road network at Hartman Drive, Mirrabooka Avenue and Ocean Reef Road (via Atwell Street). As such, background traffic using Furniss Road is expected to be well distributed i.e. it is extremely unlikely that all of the future traffic would approach from a single direction. Therefore, the connecting intersections are unlikely to be severely congested.

3.5.2 Mirrabooka Avenue

Mirrabooka Avenue is classified as a District Distributor A in the MRWA functional road hierarchy and currently carries around 18,750vpd adjacent to the subject site. It is estimated that the proposed development will assign less than 1,000vpd onto Mirrabooka Avenue and a proportion of the total traffic (1285vpd) from the business/commercial site. North of Reid Highway, Mirrabooka Avenue carries over 30,000vpd with a similar cross section, indicating that it has adequate capacity to carry the proposed development traffic and future growth.

A preliminary operational analysis was undertaken of the proposed intersection of Westport Parade extension and Mirrabooka Avenue. Counts were undertaken along Mirrabooka Avenue for this study which, together with the assigned flows from the subject site were assessed using Sidra. This assessment indicated that the modest flows forecast to turn right into Mirrabooka Avenue would experience some delays because of the high volume of traffic on Mirrabooka Avenue in both directions during the peak periods.

This is typical of give-way controlled intersections on major arterial roads i.e. during the off-peak periods delays are minimal, but are longer during the peak periods. In reality drivers allow for this by altering their driving habits to avoid priority intersections during the peak periods where possible, and instead take advantage of nearby signal or roundabout controlled intersections to access the network. In this case some of the traffic travelling south would most likely travel via Kingsway to avoid the new intersection of Westport Parade and Mirrabooka Avenue.

This phenomenon also reinforces the role of Westport Parade extension as a local access road and not a through-route.

3.5.3 Kingsway

Kingsway currently carries about 6,350vpd and is classified as a Local Distributor Road in the MRWA functional road hierarchy with a desirable capacity of about 6,000vpd. No direct frontage access is permitted along Kingsway but fronting properties do have access through service lanes with one-way access into and out of the lane. There is a painted median along the length of Kingsway and there are no cycle lanes or on-street parking bays. It is a bus route with a combination of embayed and on-street bus stops.

It is estimated that the subject site would assign an additional 1,850vpd to and from the west end of Kingsway which would increase demand to about 8,200vpd. There are several examples of similar roads in Perth that carry in excess of this volume, especially where direct property access is prevented and there is a central median. Examples include Davallia Road in Joondalup (9,850vpd with direct property access) and North Beach Road south of Erindale Road in Stirling (+11,000vpd). DVC considers that Kingsway has adequate capacity to carry the additional traffic. However, in the event that congestion increases along Kingsway to an unacceptable level (typically at intersections), motorists will use alternative routes to avoid the congestion. In this case some motorists may use Westport Parade and Ashdale Boulevard or Hartman Drive as alternative routes, thus relieving congestion on Kingsway.

3.5.4 Local Streets – Lavender Chase/Esmeralda Pass/Driver Road

These local streets are likely to experience higher levels of traffic than they currently experience. For example, Lavender Chase is likely to carry some 850vpd as it has a roundabout controlled intersection with Kingsway which provides safe and predictable access. Similarly, some 775vpd from Lots 1 and 2 can be expected to use Esmeralda Pass to access Kingsway. Lavender Chase and Esmeralda Pass have road reserves of 14m and 15m respectively and would be classed as local access streets. They would currently serve only local residences and therefore have very low existing traffic volumes. With the additional traffic from the subject site traffic volumes will still be well below the upper operating levels of 3,000vpd.

Driver Road is classified as a local distributor, with a road reserve of 20m and currently carrying 1,375vpd. The additional subject site traffic is not expected to increase the demand to beyond the operational capacity on Driver Road. DVC estimates that the subject site will contribute about 850vpd to the northern and 500vpd to the southern ends of Driver Road.

3.6 EXTERNAL ROAD NETWORK - 10 YEAR POST OPENING HORIZON

3.6.1 Furniss Road

Furniss Road currently carries just over 4,300vpd. While background traffic may be expected to grow on major arterials, it is less likely on Furniss Road as it services an area which is already fully developed (with the exception of the subject site). If a compound traffic growth of 1% per annum (used in traffic work for other local authorities) is adopted to determine the +10 year traffic levels, Furniss Road could be expected to carry about 4,750vpd.

The subject site is expected to generate a further 2,185vpd i.e. 900vpd residential and 1,285vpd commercial related trips. In the unlikely scenario that all additional traffic travelled all the way along Furniss Road, then traffic levels could peak at around about 6,950vpd. Section 3.5.1 showed that similar roads e.g. Gnangara Road, carry about 10,000vpd and as Furniss Road has good connectivity from the north, east and west, no capacity issues are expected.

DVC notes that a detailed assessment of the intersection of Furniss Road and Mirrabooka Avenue has not been undertaken. With background traffic growth on Mirrabooka Avenue some delays might be experienced here and mitigation (e.g. signals) may be required in the long term.

3.6.2 *Mirrabooka Avenue*

Traffic count data from the MRWA traffic map show that on Mirrabooka Avenue at a site north of Marangaroo Drive, the compound traffic growth rate between 2014 and 2018 was 1.26% per annum. Adjacent to the subject site the current average weekday traffic on Mirrabooka Avenue is 18,754vpd. If the observed traffic growth of 1.26% is maintained over the next +10 years, traffic levels on Mirrabooka Avenue adjacent to the site would reach 21,250vpd. The capacity of Mirrabooka Avenue is significantly higher than that as evidenced by traffic counts further south (over 30,000vpd). DVC therefore concludes that the modest contribution of traffic from the subject site will not adversely affect the operation of Mirrabooka Avenue.

3.6.3 *Kingsway*

Data from the MRWA traffic map show that traffic grew approximately 1.7% per annum (compound growth) between 2014 and 2018. This occurred east of Mirrabooka Avenue in Landsdale where there has been significant housing development in the last 5 years (as shown by Nearnmaps historic aerial photographs). There are no counts to show whether this growth also occurs on Kingsway south of the subject site, but it is considered unlikely as Darch (west of Mirrabooka Avenue) was fully developed much earlier than Landsdale. A compound growth rate of 1.7% is also unlikely to be maintained over a full 10 year period.

However, if this growth rate is applied to the current traffic volumes on Kingsway (6350vpd west of Kilchum Promenade) the +10 year traffic forecast is 7,520vpd. If the subject site traffic is added (a further 1,850vpd) then the traffic forecast is just under 9,500vpd. The major intersections along Kingsway are either roundabout controlled (Hartman Drive, Mirrabooka Avenue) or signalised (Wanneroo Road) and Section 3.5.3 of this report identifies other similar roads which operate at these traffic levels.

4. SUSTAINABLE TRANSPORT

4.1 PEDESTRIANS AND CYCLISTS

The Perth Bicycle Network Maps (DoT) show that the existing bicycle network in the vicinity of the subject site is defined by bicycle paths on four major roads being Mirrabooka Avenue and Hartman Drive for north-south journeys and Gnangara Road and Hepburn Avenue for east-west journeys. In between these are a series of good on-street cycling environments or paths shared by pedestrians and cyclists.

It is expected that the development of the subject site will support this approach by providing additional supporting links to the external network i.e. to Mirrabooka Avenue and Westport Parade, etc. A 2m wide footpath on one side of every road appears to be a feature of the established areas in Darch. There are three schools in Darch (Kingsway Christian College, Ashdale Primary and Ashdale Secondary College) and two in Landsdale (Landsdale Christian School and Landsdale Primary School), all within easy cycling distance of the subject site. Good, safe cycle friendly links to these would enhance the amenity of the area.

It is recommended that as a minimum, Westport Parade extension includes a 2m wide footpath to match those along Westport Parade towards the schools at the western end and the PSP along Mirrabooka Avenue. Other streets in the subject site area may default to a 1.5m footpath on one side of the road although planning consistency may dictate a 2m instead as per the rest of Darch.

Pedestrian and cycle access to the north of the subject site to the Landsdale industrial area should be maintained even though no direct road link is envisaged. Access to Driver Road and to Mirrabooka Avenue at either end of the northernmost east-west road would be adequate.

4.2 PUBLIC TRANSPORT

Darch is currently served by two Transperth bus routes namely Routes 450 and 352. Route 450 links Warwick Train Station to Landsdale via Kingsway and Wanneroo Road. Route 352 links Landsdale to Whitfords Train Station also via Kingsway and Wanneroo Road, although Route 352 deviates for a short section via Driver Road and Ashdale Boulevard to the north of Kingsway.

The average walking distance from the subject site to these routes is approximately 400m i.e. approximately the walkable catchment distance for bus routes. DVC considers that these routes will provide a good service for commuters, particularly as they link to the Northern Railway Line and the Perth CBD.

In future there are plans to introduce a new route along Mirrabooka Avenue from the Mirrabooka Bus Station in the north to an as yet undefined terminus north of the subject site. This service is not yet funded so dates for its implementation are uncertain, although developments such as the subject site will assist in creating passenger demand and advancing the funding.

5. SUMMARY AND CONCLUSION

5.1 SUMMARY

Lots 1 and 2 Driver Road in Darch are situated immediately south of the Landsdale Industrial area and are bounded by Furniss Road to the north, Mirrabooka Road to the east and Driver Road to the west. Kingsway lies to the south of the site but is not immediately adjacent to it.

Lot 1 is situated in the north-west corner of the larger site and is currently a recycling facility for building materials. It is not strictly part of the structure plan application but is included in the traffic assessment to provide a more complete picture. Lot 2 is the subject of the structure plan application and is currently vacant land. Both Lots 1 and 2 are included in the East Wanneroo Structure Plan -Cell 6.

The subject site (Lots 1 and 2 together) will contain about 416 residential lots and approximately 15,750m² of business/commercial development as a buffer along the northern boundary fronting Furniss Road. The residential lots are expected to generate just over 4,000vpd while the business component will generate about 1,300vpd.

The road network within the subject site is such that no road will be expected to carry more than 1,100vpd. The layout also dissuades drivers from cutting through it from neighbouring suburbs as quicker alternative routes exist outside of the subject site for traffic from wider afield and the local trip attractions within it are small. There will be some local east-west through-traffic generated by the school precinct and neighbourhood centre to the west of the site.

The streets proposed in the subdivision are all Access Roads C with road reserve widths of either 15m or 20m (but reduced adjacent to the POS). DVC considers this provision adequate to accommodate the development traffic and some through-traffic although this is expected to be minimal. Speed reduction measures (roundabouts) are proposed to ensure a suitable speed is maintained on the subject site roads.

Access to the site is proposed via an eastern extension of Westport Parade from Driver Road to Mirrabooka Avenue. The northern areas of Lot 2 are also connected to Driver Road through Lot 1. There are two connections via existing roads through the residential area to Kingsway to the south. The only access to the business lots is via Furniss Road.

A preliminary SIDRA assessment of the proposed intersection of Westport Parade with Mirrabooka Avenue was undertaken based on traffic counts collected for this study. Vehicles turning right out of Westport Parade could experience some delays during the peak hours when traffic on Mirrabooka Avenue is heaviest. This is typical of give-way controlled T-junctions along major arterials. Evidence of this is found along Marmion Avenue through Joondalup and City of Stirling where there are numerous T-junctions. In reality most regular trip makers in the area will understand this and will take an alternative road to avoid delays in the peak hours. Outside of the peak hours this intersection is expected to operate with little or no delay. DVC considers that will create little or no adverse traffic impact to local residents or on the surrounding roads.

There are two existing commuter bus routes which have destinations at Whitfords train station and Warwick train station on the northern rail line. These routes use Kingsway to the south of the site, have an average walking distance of about 400m from the subject site, and will therefore enable many households in the area to use public transport if they wish. A long-term plan includes another bus route along Mirrabooka Avenue to Mirrabooka bus station.

There are good pedestrian and cycle paths around the area. Most streets in Darch have a 2m wide footpath on one side of each road. These should be continued on the Westport Parade through the subdivision to link to Marmion Avenue PSP and to the school precinct to the west of the site. No on-street cycle paths are proposed.

5.2 CONCLUSION

DVC concludes that the traffic from the proposed residential and business use areas will have only a low impact and can be readily accommodated by the proposed internal road network and the existing external road network. We therefore support the subdivision application from a traffic and road safety perspective.

APPENDIX A: CRASH HISTORY DETAILS

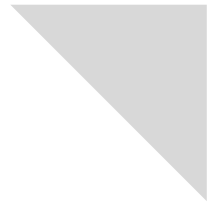
Detailed Crash History																														
Year	Month	Day	Time	Location	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Vehicle 5	Vehicle 6	Vehicle 7	Vehicle 8	Vehicle 9	Vehicle 10	Vehicle 11	Vehicle 12	Vehicle 13	Vehicle 14	Vehicle 15	Vehicle 16	Vehicle 17	Vehicle 18	Vehicle 19	Vehicle 20	Vehicle 21	Vehicle 22	Vehicle 23	Vehicle 24		
2019	December	11	10:00	2000	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	
2019	December	11	10:00	2000	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019	2019

Client: Parcel Property

Project: Lot 2 Driver Road, Darch TIA

Detailed Crash History																											
Year	Month	Day	Time	Location	Case	Age	Sex	Height	Weight	Eye Color	Hair Color	Build	Complexion	Scars	Alcohol	Drugs	Speed	Direction	Vehicle	Year	Make	Model	Color	Damage	Severity	Police	Notes
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Male	35	175	70	Brown	Black	Medium	Fair	None	0.02	None	45	North	Toyota	2015	Camry	White	Front	Minor	Police	None	None
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Female	28	160	55	Blue	Blonde	Slender	Fair	None	0.02	None	45	South	Toyota	2015	Camry	White	Rear	Minor	Police	None	None

Detailed Crash History																											
Year	Month	Day	Time	Location	Case	Age	Sex	Height	Weight	Eye Color	Hair Color	Build	Complexion	Scars	Alcohol	Drugs	Speed	Direction	Vehicle	Year	Make	Model	Color	Damage	Severity	Police	Notes
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2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Female	28	160	55	Blue	Blonde	Slender	Fair	None	0.02	None	45	South	Toyota	2015	Camry	White	Rear	Minor	Police	None	None
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Male	35	175	70	Brown	Black	Medium	Fair	None	0.02	None	45	North	Toyota	2015	Camry	White	Front	Minor	Police	None	None
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Female	28	160	55	Blue	Blonde	Slender	Fair	None	0.02	None	45	South	Toyota	2015	Camry	White	Rear	Minor	Police	None	None
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Male	35	175	70	Brown	Black	Medium	Fair	None	0.02	None	45	North	Toyota	2015	Camry	White	Front	Minor	Police	None	None
2017	December	20	1:15	Lot 2 Driver Rd	2017-0001	Female	28	160	55	Blue	Blonde	Slender	Fair	None	0.02	None	45	South	Toyota	2015	Camry	White	Rear	Minor	Police	None	None



APPENDIX 7

CONCEPT PLAN



ROWE
GROUP
DESIGN

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LEGEND

- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- EXISTING LOT NUMBERS
- RESIDENTIAL R20
- RESIDENTIAL R30
- RESIDENTIAL R60
- BUSINESS PRECINCT
- PUBLIC OPEN SPACE

LOT SUMMARY

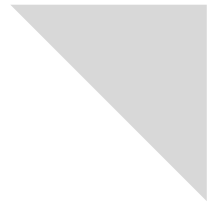
SITE AREA	~ 24.71ha
RESIDENTIAL R20	~10.41ha
RESIDENTIAL R30	~1.12ha
RESIDENTIAL R60 - SINGLE RESIDENTIAL	~0.28ha
RESIDENTIAL R60 - GROUPED HOUSING	~1.13ha
BUSINESS PRECINCT	~1.85ha
PUBLIC OPEN SPACE	~4.8142ha
TOTAL DWELLINGS	~ 278 LOTS

CONCEPT PLAN
 LOT 2 (No. 26) DRIVER ROAD
 DARCH

0 62.5 m
 SCALE @ A3: 1:2500
 8997-CON-02-1

ROWE GROUP DESIGN

8997_CON02_20191122 Darch (Concept Plan) - DRAWN: W. CLEMENTS - DATE CREATED: 2019.11.22 - PROJECTION: MGA50 GDA94 - AERIAL: NEARMAP 20190223



APPENDIX 8

LANDSCAPE CONCEPT PLAN









ROWE
GROUP
DESIGN

Landscape Master Plan

Lot 2 (No. 26) Driver Road
Darch

Legend

-  Trees | Feature, Basin, POS & Street trees
-  Irrigated Turf
-  Garden beds
-  Drainage basin
-  Playground node
-  Fitness equipment stations

Neighbourhood POS for Sport/Recreation

Description / 4 - 7ha (Neighbourhood Sports)

- Provisions for Sporting amenities building, parking, multipurpose senior sports ovals and multi-use half court
- Designated play area with shade over play
- Nodes for Picnic settings & shelters along with bench seats
- Fitness equipment stations
- Pedestrian/Cycle paths
- Landscaping through water wise planting & tree planting. Native revegetation
- 60% MAX. area permanently irrigated.

Proposed raingardens in road reserve. Size and location is indicative

Existing sump to be modified. Size is indicative

Proposed raingardens in road reserve. Size and location is indicative

Indicative drainage size and location

Perimeter path network with seating & shelter nodes, fitness nodes

Football oval, cricket pitch and rugby fields

Basketball half-court

Parking & Community facility by others

Proposed playground location, design to accommodate different age groups. Shade sails or feature shade trees over play. Key shelter & BBQ node.

Indicative drainage size and location

