221-227 and 289-311 Luddenham Road, Orchard Hills NSW

PROPOSED INDUSTRIAL DEVELOPMENT
SALINITY MANAGEMENT PLAN

Prepared for HB+B Property Pty Ltd

29January 2021

Construction Sciences

Document Information	
Prepared for	HB+B Property Pty Ltd
Project Name	Proposed Industrial Development Salinity Management Plan
File Reference	10791E/P/399-A
Job Reference	10791E/P/399
Quote Reference	10848/Q/414
Date	29January 2021
Version Number	A

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Date approved: 29/01/2021

DOCUMENT HISTORY

Version A	Preliminary for review

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Appendices

1. Introduction

1.1 Overview

HB+B Property Pty Ltd commissioned Construction Sciences Pty Ltd (CS) to carry out a Salinity Management Plan (SMP) for the proposed industrial development at 221-227 and 289-311 Luddenham Road Orchard Hills NSW (hereafter referred to as 'the site') as shown on attached drawing in Appendix B.

Saline soils affect much of the Western Sydney region. Buildings and infrastructure located on Wianamatta Shale are particularly at risk. Salinity can affect urban structures in a number of ways including corrosion of concrete, breakdown of bricks and mortar, break up of roads, corrosion of steel, attack on buried infrastructure, reduced ability to grow vegetation and increased erosion potential.

This report provides the results of the assessment carried out on the site and presents salinity management measures designed to:

- Reduce impacts of salinity, aggressivity and sodicity on the proposed development and associated structures; and
- Minimize the impact of the proposed development on the existing salinity characteristics of the site and the environment.

1.2 Relevant Documents

The following reports were reviewed for preparation of this document:

- Western Sydney Salinity Code of Practice, Western Sydney Regional Organisations of Councils (WSROC);
- Site Investigation for Urban salinity DLWC 2002;
- Guidelines to Accompany Map of Salinity Potential in Western Sydney, DIPNR (2002);
- Introduction to Urban Salinity, DIPNR (2003);
- Roads & Salinity, DIPNR (2003);
- Building in Saline Environment, DIPNR (2003);
- Urban Salinity Processes, DIPNR (2004); and;
- Waterwise Parks & Gardens, DIPNR (2004).

1.3 Proposed Development

Based on the supplied information and drawings, it was understood that the proposed development involves:

- Development of approximately 81ha for industrial and commercial warehouses, roads, and infrastructure.
- Earthworks to bring site levels above the flood level in some areas and to facilitate drainage.

- Flood storage basins and on-site detention basins.

1.4 Scope of works

The scope of work undertaken to achieve the objectives included:

- Review of Preliminary Geotechnical Investigation Report reference 5017200153-AR1 dated 10 June 2020 (CS2020a);
- Review of salinity test results of 165 soil samples from 79 test pits across the site;
- Review of 10 Chloride and sulphate tests and 12 cation Exchange Capacity test results;
- Review of preliminary construction layout and earthworks plans;
- Prepare a salinity Management Plan;

2. Site Description and Geology

Reference to the Penrith, 1:100,000 Geological Series Sheet indicates the site is underlain by Wianamatta Group Bringelly Shale (Twib), comprised of shale, carbonaceous claystone, laminite, lithic sandstone, rare coal.

The site is bounded by Patons Lane to the north, Luddenham Road to the east, residential property to the south and an open paddock to the west. At the time of the fieldwork, the site was observed to have undulating terrain throughout, with a trending slope of 1° toward the south. Vegetation consisted of predominantly grass ground cover with scattered pockets of tall grass throughout the site. Tall trees were also found throughout the site. Three dams were present on the southern half of the site. Occupied residential properties were also found on site.

3. Subsurface.

Subsurface profiles encountered in 79 tests pits carried out in CS2020a included topsoil and fill to depths ranging from 0.1m to 1.0m depth and residual high plasticity clay from 0.2m to more than 2m.

Weathered siltstone and shale were encountered at depths ranging from 0.2m to more than 2m.

Groundwater table was encountered in only one test pit (TP47), which was assessed to be perched water table due to recent rain before the investigation.

Test pit logs from CS2020a are included in Appendix B.

4. Laboratory Test Results

Laboratory testing on samples from CS2020a test pits comprised sixty-five (65) Moisture Content tests and nine (9) Atterberg Limit tests carried out to aid assessment and soil reactivity. One hundred and sixty-five (165) Ec/pH tests, ten (10) Chloride, Sulphate tests and twelve (12) CEC tests were carried out to aid assessment for soil exposure classification for durability of concrete and steel in ground. Laboratory test results from CS2020a are summarised in Table 1 and Table 2 below.

Table 1: Summary of Atterberg Limit Test Results

Test Pit No.	Depth (m)	Material	LL (%)	PL (%)	PI (%)
TP15	1.40-1.50	Silty Clay , grey	68	20	48
TP16	0.40-0.50	Clay, mottled red	66	20	46
TP20	0.20-0.30	Sandy Clay, brown	36	14	22
TP24	0.40-0.50	Clay, red	80	23	57
TP38	1.40-1.50	Silty Clay, grey	71	21	50
TP54	0.40-0.50	Silty Clay brown	59	21	38
TP66	0.40-0.50	Clay, brown	71	24	47
TP74	1.40-1.50	Clay, grey	70	21	49
TP80	0.20-0.30	Clay, red	75	23	52

Table 2: Summary of Geochemical Laboratory Test Results

Test Pit No.	Depth (m)	pH	Ec (µS/cm)	FMC (%)	Chloride (Cl) (mg/kg)	Sulphate (SO_4) (mg/kg)	CEC (meq/100g)
TP05	1.30-1.50	5.8	72		51	12	**13**
TP11	0.40-0.50	5.8	53	21	71	19	**13**
TP13	0.40-0.50	4.9	200	21			**16**
TP32	0.00-0.20	5.9	31	15	12	<10	**5.5**
TP34	0.20-0.3	5.2	220	21	320	280	**12**

TP54	1.40-1.50	5.2	250		270	35	**21**
TP60	0.40-0.50	6.0	81		16	36	**14**
TP67	1.40-1.50	4.2	760	17	1900	<10	**6.7**
TP70	0.40-0.50	5.4	40	30			**8.5**
TP72	0.40-0.50	5.7	48	19	28	50	
TP73	1.40-1.50	5.7	29	14			**9.1**
TP79	1.10-1.20	5.6	39	11	32	26	
TP80	1.40-1.50	5.4	89	14	93	40	
TP80	**1.90-2.00**	**5.4**	**79**	**13**			**16**

Electrical Conductivity (EC) and pH results are included in Appendix C .. A table of Ec and pH values along with exposure classification of all samples tested is included in Attachment 1 in Appendix C.

5. Salinity Management

5.1 Soil Salinity

Soil salinity was assessed based on electrical conductivity (Ec) of 1:5 (by mass) soil: water suspension and multiplying by a factor depending upon textural classification of soil to assess the electrical conductivity of pore water within the soil mass when saturated (Ec). A salinity scale has been adopted for the site salinity rating. The salinity scale adopted is given below:

Salinity Classification	Ec dS/m
Non Saline (NS)	0 – 1.99
Slightly Saline (SS)	2.0 – 3.99
Moderately Saline (MS)	4.0 – 7.99
Very Saline (HS)	8.0- 15.0
Highly Saline	>15.0

One hundred and sixty-five (165) salinity samples from test pits (TP01 to TP79) were collected from 4th May 2020 to 8th May 2020 during the geotechnical investigation. Test pit locations are shown on the attached Drawings 5017200153-A-1 and 2. Samples were collected from depths of 0.5m, 1.0m, 1.5m and 2.0m intervals. The test results are shown in Attachment B and summarised in Table 3 below

Table 3: Salinity Distribution Table

Salinity Rating	No. of Sampled	Percentage %
Non Saline	96	58.2
Slightly Saline	42	25.5
Moderately Saline	26	15.8
Very Saline	1	0.6

It is seen that a substantial area contains moderately saline soils. A Salinity Management Plan is required prior to undertaking earthworks, construction of infrastructure and proposed buildings.

Moderately saline soils at shallow depth was found in five test pits, TP1, TP49, TP53, TP57 and TP64. In 18 test pits (including the above five) moderately saline soils were found at 1.4m depth and below.

5.2 Exposure Classification

Sulphate content in the samples ranged from <10mg/kg to 280mg/kg.

Chloride content of the samples tested ranged from 12mg/kg to 1900mg/kg.

Cation Exchange capacity (CEC) ranged from 5.5meq/100g to 21meq/100g

Residential lots are rated in accordance with Electrical Conductivity of saturated pores (Ec_e) based on the following basis (Refer table 5.1 AS2870-2011).

Table 4: Exposure Classification for concrete in Saline Soils

Electrical Conductivity Ec_e (dS/m)	Exposure Rating
0 - <4	**A1**
4 - <8	**A2**
8 - <16	**B1**
>16	**B2**

In addition, the exposure classification is also based on soil pH for sulphate soils and sulphate content. The relevant parameters are reproduced in Table 7:

Table 5: Exposure Classification for concrete in Sulfate Soils

Sulfate Content in soil (ppm)	pH	Exposure class in Soil A	Exposure class in Soil B
<5000	>5.5	A2	A1
5000-<10000	4.5-<5.5	B1	A2
10000-<20000	4.0-<4.5	B2	B1
>20000	<4	C2	B2

Note:

Soil A: Sands and gravels under groundwater table.

Soil B: All soils above groundwater table and silt and clay below groundwater table.

Table 5 of AS2870-2011 specifies concrete strength for various exposure classifications for residential footings. It may be noted that the concrete strengths specified for residential footings, which are essentially shallow footings, are different to those specified in AS2159-2009 for piles.

Table 6: Exposure Classification rating

Electrical Conductivity EC_e (dS/m)	Minimum Concrete Strength (MPa)
A1	20
A2	25
B1	32
B2	40
C1 and C2	50

Soil pH was measured in one hundred and sixty-five (165) soil samples and the results ranged from 3.7 to 7.1. Values ranging from pH>4.5 to pH≤5.5 are considered "mild" and values >5.5 are considered "non-aggressive" in terms of exposure classification for concrete in accordance with AS 2159-2009, Piling Code.

The highest concentration of sulphate and chloride was assessed to be 280 mg/kg(ppm) and 1900mg/kg (ppm) respectively. AS2159 indicates that sulphate content up to 5000ppm is considered to be non-aggressive to concrete members in ground and chloride content up to 5000ppm is considered to non-aggressive to steel structures in ground.

Based on the above, all samples tested would be rated as Exposure classification A1 or A2.

The above exposure ratings are for standard footings designed in accordance with AS 2870-2011. If deeper pier footings are proposed, site specific geotechnical investigations may be required to assess exposure classifications.

5.3 Salinity Management Principles

On the basis of site observations and analytical data, it is considered reasonable to assign the following characteristics to the subject site:

- At least 16% of the samples tested indicate residual soils are moderately saline or worse;
- Soils are non-aggressive to steel and concrete;

In general, the management strategies are directed at:

- Minimising the impact of future development on the site salinity;
- Minimising the impact of salinity on the proposed development;
- Maintaining the natural water balance;
- Maintaining good drainage;
- Avoiding disturbance or exposure of sensitive soils;
- Retaining or increasing appropriate native vegetation in strategic areas; and
- Implementing building controls and engineering responses where appropriate.

5.4 Salinity Management in Earthworks

The following earthwork management strategies should be adopted:

- An erosion and Sediment Control Plan must be developed by the appointed earthworks contractor and implemented in accordance with the NSW Department of Housing document "*Managing Urban Stormwater: Soils and Construction*" (1998).
- All sediment and erosion controls by the plan are to be installed prior to excavation/site stripping.
- Locate moderately and highly saline soils areas on site and clearly flag out. Excavation in these areas should follow recommendations in this report. Further investigations should be carried out to assess the lateral and vertical extent of saline soils in these areas.
- Avoid water collecting in low lying areas, depressions, behind fill embankments or near trenches on the uphill sides of the roads. This can lead to water logging of the soils, evaporate concentrations of the salts, eventual breakdown in soil structure, resulting in accelerated erosion
- The programming of development road works and major excavations should minimise the time of soil exposure and should also be planned for times where rainfall is not forecasted.
- All imported soils should be sourced from non/slightly saline soils. Preference may be made for soils derived from sandstone, ripped sandstone and ripped moderately weathered shale assessed to be non/slightly saline.
- Identify the extent of moderately or higher saline soils in areas where deep excavations are proposed. Moderately or higher saline soils should be placed at depths during earthworks.
- Site sourced materials from moderately or highly saline cut areas should be filled below 1.0m from Finished Surface Level (FSL). The top 1m of filling should be carried out with site won or imported VENM material that has a salinity rating of non to slightly saline.
- All proposed imported fill should be verified by sampling and testing to ensure the material is non to slightly saline. Moderately saline soil is not considered acceptable. Supporting information and documentation should be supplied verifying that the subject material complies.
- Salinity testing should be carried out in conjunction with earthworks density testing in areas where site won materials from re used in the upper 1m depth from the finished level.
- These Salinity Management aspects should be included in earthworks specifications and implemented by the earthworks contractor in consultation with the geotechnical consultant.

5.5 Salinity Management in Civil Works

The following salinity management aspects may be undertaken during the development of the subdivision.

- Preferably design the surface water drainage system for the subdivision to coincide with pre-existing drainage pathways, thus minimising the disruption of existing surface water flows. Avoid filling or blocking preferential drainage pathways. Piping can be used to maintain drainage lines.

- Where possible, materials used for roads and fill embankments should be selected to contain minimal or no salts. Where the use of potentially moderately saline soils is unavoidable, such soil should be capped with coarser grained topsoil (loam), sandy materials or crushed rock. These measures are designed to reduce the potential for scour and limit capillary rise of moisture.
- All excavation batters exposing moderately saline soils should be appropriately surfaced as soon as possible after formation. Surfacing can include topsoil, turf, planting, crushed rock or similar measures that will reduce the potential for scour.
- Surface drains should generally be provided along the top of all batters to reduce the potential for concentrated flows of water down slopes, possibly causing scour. Well graded subsoil drainage should be provided at the base of all slopes where there are road pavements below the slope, to reduce the risk of waterlogging.
- At locations of deep excavations, it may be possible for groundwater to seep through fractures and joints in the shale bedrock, which will potentially be exposed in such excavations. To counter the potential impacts of salts and ions carried on the seepage water, the following additional measures are recommended:
- Grade the ground surface away from the base of the cutting to be collected by the surrounding subsurface drains.
- Provide additional sub surface drainage at the toe of the cutting to collect seepage water.
- Maintain the drainage system on a regular basis to ensure water flows freely, reducing the risk of future build-up of salts or mineral staining e.g. iron.
- Cut areas with moderately to highly saline soils within the depth of cut should be identified and marked on site.
- All concrete structures in contact with saline soils (MS or above) should be constructed with 40MPa concrete and 30mm cover.

5.6 Salinity Management for Buildings

For moderately saline soil, the following construction measures should be adopted during construction of buildings as part of salinity management:

- For slab on ground construction, a layer of bedding sand of at least 50mm thickness below the slab should be provided. This will permit free drainage of water beneath the slab, minimising the possibilities of pooling or trapping water that might potentially be carrying salts.
- A high impact damp proof membrane, not just a vapour proof membrane, should be laid under any ground bearing slab. The damp proof membrane should be extended to the outside face of the external edge beam up to the finished ground level.
- A minimum 32 MPa and 40 MPa concrete or a sulphate resisting cement with a water cement ratio no greater than 0.5, should be used for ground bearing slabs, footings, piers or beams for sites with exposure classification B1 and B2 respectively.

- The minimum cover to reinforcement must be 50mm from unprotected ground and 30mm from a membrane in contact with the ground.
- Slabs must be vibrated and then cured for at least seven days. Over vibration of concrete can cause segregation of concrete aggregates, this should be avoided.
- Water should not be permitted to pond against the walls of any new structures. Surrounding pathways and parking areas should be sloped as to drain the surface water away from external walls.
- Brickwork should be of exposure grade as required in the Building Code of Australia

6. Management Responsibilities.

The implementation of the Salinity Management Plan requires participation of the following entities:

Developer/Owner: Provide this plan to all stake holders. Ensure that the design and construction follow the recommendations of this plan.

Civil/Structural/Hydraulic Designers: All designers should implement the recommendations of this plan and where deviations are required, consult CS on alternative methods. Identify Hold Points in the contract documentations to ensure the plan is implemented.

Geotechnical/ Environmental Consultant: Supervise the implementation of SMP and revise if required.

Contractors: Adhere to the plan and obtain required release of Hold Points from appropriate consultants.

7. Closure

This report should be read in conjunction with the 'Important Information about this Geotechnical Report' sheet below.

CS trusts this report meets your current requirements. Please do not hesitate to contact Vipul de Silva on +61 411720045 or vipul.desilva@constructionsciences.net if you have any queries.

Important Information about this Geotechnical Report

Scope of Work

The purpose of this report and any associated documentation is expressly stated in the document. This document does not form a complete assessment of the site, and no implicit determinations about Construction Sciences scope can be taken if not specifically referenced. Whilst this report is intended to reduce geotechnical risk, no level of detail or scope of work can entirely eliminate risk.

The nature of geotechnical data typically precludes auxiliary environmental assessment without undertaking specific methods in the investigation. Therefore, unless it is explicitly stated in the scope of work, this report does not provide any contamination or environmental assessment of the site or adjacent sites, nor can it be inferred or implied from any component of the document.

The scope of work, geotechnical information, and assessments made by Construction Sciences may be summarised in the report; however, all aspects of the document, including associated data and limitations should be reviewed in its entirety.

Standard of care

Construction Sciences have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, data that was available or was collected, and previous experience.

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Data sources

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Subsurface conditions are complex and can be highly variable; they cannot be accurately defined by discrete investigations. Geotechnical data is based on investigation locations which are explicitly representative of the specific sample or test points. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and there are unknowns or variations in ground conditions between test locations that cannot be inferred or predicted.

The precision and reliability of interpretive assessment between discrete points is dependent on the uniformity of the subsurface strata, as well as the frequency, detail, and method of sampling or testing.

Subsurface conditions are formed by various natural and anthropogenic processes and therefore are subject to change over time. This is particularly relevant with changes to the site ownership or usage, site boundary or layout, and design or planning modifications. Aspects of the site may also not be able to be determined due to physical or project related constraints and any information provided by Construction Sciences cannot apply following modification to the site, regulations, standards, or the development itself.

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Appendix A

Important Information and General Notes

Explanatory Notes

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. Material descriptions are deduced from field observation or engineering examination, and may be appended or confirmed by in situ or laboratory testing. The information is dependent on the scope of investigation, the extent of sampling and testing, and the inherent variability of the conditions encountered.

Subsurface investigation may be conducted by one or a combination of the following methods.

Method	
Test Pitting: excavation/trench	
BH	Backhoe bucket
EX	Excavator bucket
R	Ripper
H	Hydraulic Hammer
X	Existing excavation
N	Natural exposure
Manual drilling: hand operated tools	
HA	Hand Auger
Continuous sample drilling	
PT	Push tube
PS	Percussion sampling
SON	Sonic drilling
Hammer drilling	
AH	Air hammer
AT	Air track
Spiral flight auger drilling	
AS	Auger screwing
AD/V	Continuous flight auger: V-bit
AD/T	Continuous spiral flight auger: TC-Bit
HFA	Continuous hollow flight auger
Rotary non-core drilling	
WB	Washbore drilling
RR	Rock roller
Rotary core drilling	
PQ	85mm core (wire line core barrel)
HQ	63.5mm core (wire line core barrel)
NMLC	51.94mm core (conventional core barrel)
NQ	47.6mm core (wire line core barrel)
DT	Diatube (concrete coring)

Sampling is conducted to facilitate further assessment of selected materials encountered.

Sampling method	
Soil sampling	
B	Bulk disturbed sample
D	Disturbed sample
C	Core sample
ES	Environmental soil sample
SPT	Standard Penetration Test sample
U	Thin wall tube ‘undisturbed’ sample
Water sampling	
WS	Environmental water sample

Field testing may be conducted as a means of assessment of the in situ conditions of materials.

Field testing	
SPT	Standard Penetration Test
HP/PP	Hand/Pocket Penetrometer
Dynamic Penetrometers (blows per noted increment)	
DCP	Dynamic Cone Penetrometer
PSP	Perth Sand Penetrometer
MC	Moisture Content
VS	Vane Shear
PBT	Plate Bearing Test
IMP	Borehole Impression Test
PID	Photo Ionization Detector

If encountered, refusal (R), virtual refusal (VR) or hammer bouncing (HB) of penetrometers may be noted.

The quality of the rock can be assessed by the degree of natural defects/fractures and the following.

Rock quality description	
TCR	Total Core Recovery (%) (length of core recovered divided by the length of core run)
RQD	Rock Quality Designation (%) (sum of axial lengths of core greater than 100mm long divided by the length of core run)

Notes on groundwater conditions encountered may include.

Groundwater	
Not Encountered	Excavation is dry in the short term
Not Observed	Water level observation not possible
Seepage	Water seeping into hole
Inflow	Water flowing/flooding into hole

Perched groundwater may result in a misleading indication of the depth to the true water table. Groundwater levels are also likely to fluctuate with variations in climatic and site conditions.

Notes on the stability of excavations may include.

Excavation conditions	
Stable	No obvious/gross short term instability noted
Spalling	Material falling into excavation (minor/major)
Unstable	Collapse of the majority, or one or more face of the excavation

Explanatory Notes: General Soil Description

The methods of description and classification of soils used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, a material is described as a soil if it can be remoulded by hand in its field condition or in water. The dominant component is shown in upper case, with secondary components in lower case. In general descriptions cover: soil type, plasticity or particle size/shape, colour, strength or density, moisture and inclusions.

In general, soil types are classified according to the dominant particle on the basis of the following particle sizes.

Soil Classification		Particle Size (mm)
CLAY		< 0.002
SILT		0.002 0.075
SAND	fine	0.075 to 0.21
	medium	0.21 to 0.6
	coarse	0.6 to 2.36
GRAVEL	fine	2.36 to 6.7
	medium	6.7 to 19
	coarse	19 to 63
COBBLES		63 to 200
BOULDERS		> 200

Soil types may be qualified by the presence of minor components on the basis of field examination methods and/or the soil grading.

Terminology	In coarse grained soils		In fine soils
	% fines	% coarse	% coarse
Trace	≤5	≤15	≤15
With	>5, ≤12	>15, ≤30	>15, ≤30

The strength of cohesive soils is classified by engineering assessment or field/lab testing as follows.

Strength	Symbol	Undrained shear strength
Very Soft	VS	≤12kPa
Soft	S	12kPa to ≤25kPa
Firm	F	25kPa to ≤50kPa
Stiff	St	50kPa to ≤100kPa
Very Stiff	VSt	100kPa to ≤200kPa
Hard	H	>200kPa

Cohesionless soils are classified on the basis of relative density as follows.

Relative Density	Symbol	Density Index
Very Loose	VL	<15%
Loose	L	15% to ≤35%
Medium Dense	MD	35% to ≤65%
Dense	D	65% to ≤85%
Very Dense	VD	>85%

The plasticity of cohesive soils is defined by the Liquid Limit (LL) as follows.

Plasticity	Silt LL	Clay LL
Low plasticity	≤ 35%	≤ 35%
Medium plasticity	N/A	> 35% ≤ 50%
High plasticity	> 50%	> 50%

The moisture condition of soil (*w*) is described by appearance and feel and may be described in relation to the Plastic Limit (PL), Liquid Limit (LL) or Optimum Moisture Content (OMC).

Moisture condition and description	
Dry	Cohesive soils: hard, friable, dry of plastic limit. Granular soils: cohesionless and free-running
Moist	Cool feel and darkened colour: Cohesive soils can be moulded. Granular soils tend to cohere
Wet	Cool feel and darkened colour: Cohesive soils usually weakened and free water forms when handling. Granular soils tend to cohere

The structure of the soil may be described as follows.

Zoning	Description
Layer	Continuous across exposure or sample
Lens	Discontinuous layer (lenticular shape)
Pocket	Irregular inclusion of different material

The structure of soil layers may include: defects such as softened zones, fissures, cracks, joints and root-holes; and coarse grained soils may be described as strongly or weakly cemented.

The soil origin may also be noted if possible to deduce.

Soil origin and description	
Fill	Anthropogenic deposits or disturbed material
Topsoil	Zone of soil affected by roots and root fibres
Peat	Significantly organic soils
Colluvial	Transported down slopes by gravity/water
Aeolian	Transported and deposited by wind
Alluvial	Deposited by rivers
Estuarine	Deposited in coastal estuaries
Lacustrine	Deposited in freshwater lakes
Marine	Deposits in marine environments
Residual soil	Soil formed by in situ weathering of rock, with no structure/fabric of parent rock evident
Extremely weathered material	Formed by in situ weathering of geological formations, with the structure/fabric of parent rock intact but with soil strength properties

The origin of the soil generally cannot be deduced solely on the appearance of the material and the inference may be supplemented by further geological evidence or other field observation. Where there is doubt, the terms ‘possibly’ or ‘probably’ may be used

Explanatory Notes: General Rock Description

The methods of description and classification of rocks used in this report are based on Australian Standard AS1726-2017 Geotechnical Site Investigations. In practice, if a material cannot be remoulded by hand in its field condition or in water, it is described as a rock. In general, descriptions cover: rock type, grain size, structure, colour, degree of weathering, strength, minor components or inclusions, and where applicable, the defect types, shape, roughness and coating/infill.

Rock types are generally described according to the predominant grain or crystal size, and in groups for each rock type as follows.

Rock type	Groups
Sedimentary	Deposited, carbonate (porous or non), volcanic ejection
Igneous	Felsic (much quartz, pale), Intermediate, or mafic (little quartz, dark)
Metamorphic	Foliated or non-foliated
Duricrust	Cementing minerology (iron oxides or hydroxides, silica, calcium carbonate, gypsum)

Reference should be made to AS1726 for details of the rock types and methods of classification.

The classification of rock weathering is described based on definitions in AS1726 and summarised as follows.

Term and symbol		Definition
Residual Soil	RS	Soil developed on rock with the mass structure and substance of the parent rock no longer evident
Extremely weathered	XW	Weathered to such an extent that the rock has 'soil-like' properties. Mass structure and substance still evident
Distinctly weathered	DW	The strength is usually changed and may be highly discoloured. Porosity may be increased by leaching, or decreased due to deposition in pores. May be distinguished into MW (Moderately Weathered) and HW (Highly Weathered).
Slightly weathered	SW	Slightly discoloured; little or no change of strength from fresh rock
Fresh Rock	FR	The rock shows no sign of decomposition or staining

The rock material strength can be defined based on the point load index as follows.

Term and symbol		Point Load Index I_s50 (MPa)
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	M	0.3 to 1.0
High	H	1.0 to 3
Very High	VH	3 to 10
Extremely High	EH	> 10

It is important to note that the rock material strength as above is distinct from the rock mass strength which can be significantly weaker due to the effect of defects.

A preliminary assessment of rock strength may be made using the field guide detailed in AS1726, and this is conducted in the absence of point load testing.

The defect spacing measured normal to defects of the same set or bedding, is described as follows.

Definition	Defect Spacing (mm)
Thinly laminated	< 6
Laminated	6 to 20
Very thinly bedded	20 to 60
Thinly bedded	60 to 200
Medium bedded	200 to 600
Thickly bedded	600 to 2000
Very thickly bedded	> 2000

Terms for describing rock and defects are as follows.

Defect Terms			
Joint	JT	Sheared zone	SZ
Bedding Parting	BP	Seam	SM
Foliation	FL	Vein	VN
Cleavage	CL	Drill Lift	DL
Crushed Seam	CS	Handling Break	HB
Fracture Zone	FZ	Drilling Break	DB

The shape and roughness of defects in the rock mass are described using the following terms.

Planarity		Roughness	
Planar	PR	Very Rough	VR
Curved	CU	Rough	RF
Undulose	UN	Smooth	S
Irregular	IR	Slickensided	SL
Stepped	ST	Polished	POL
Discontinuous	DIS		

The coating or infill associated with defects in the rock mass are described as follows.

Infill and Coating		
Clean	CN	
Stained	SN	
Carbonaceous	X	
Minerals	MU	Unidentified mineral
	MS	Secondary mineral
	KT	Chlorite
	CA	Calcite
	Fe	Iron Oxide
	Qz	Quartz
Veneer	VNR	Thin or patchy coating
Coating	CT	Infill up to 1mm

Construction Sciences

Graphic Symbols Index


CLAY


Silty CLAY


Sandy CLAY


Gravelly CLAY


Silty Gravelly CLAY


Silty Sandy CLAY


Sandy Gravelly


CLAY SILT


Clayey SILT


Sandy SILT Gravelly


SILT


Clayey Sandy SILT


Clayey Gravelly SILT


Sandy Gravelly SILT


SAND


Clayey SAND


Silty SAND


Gravelly SAND


Clayey Silty SAND


Clayey Gravelly SAND


Silty Gravelly SAND


GRAVEL


Clayey GRAVEL


Silty GRAVEL


Sandy GRAVEL


Clayey Silty GRAVEL


Clayey Sandy GRAVEL


Silty Sandy GRAVEL


COBBLES & BOULDERS


PEAT, highly organic soil


TOPSOIL


FILL


FILL: Asphalt or Bituminous Seal


FILL: Ballast


FILL: Concrete


FILL: Roadbase


Sedimentary rock: fine, mostly clay (CLAYSTONE)


Sedimentary rock: fine, mostly silt (SILTSTONE)


Sedimentary rock: fine, silt and clay (MUDSTONE, SHALE, LAMINITE)


Sedimentary rock: medium (SANDSTONE, GREYWACKE)

Sedimentary rock: fine to coarse, angular (BRECCIA)

Sedimentary rock: coarse, rounded (CONGLOMERATE)

Sedimentary rock: Organic (COAL)

Sedimentary rock: Carbonate (LIMESTONE, DOLOMITE)

Sedimentary rock: Volcanic (TUFF, VOLCANIC BRECCIA, AGGLOMERATE)

Igneous rock: Felsic, fine (RHYOLITE)

Igneous rock: Felsic, coarse (GRANITE)

Igneous rock: Mafic, fine to medium (BASALT, DOLERITE)

Igneous rock: Mafic, coarse (GABBRO)

Metamorphic rock: Foliated, fine to medium (SLATE, PHYLLITE, SHIST)

Metamorphic rock: Foliated, coarse (GNEISS)

Metamorphic rock: Non-foliated (QUARTZITE, HORNFELS, MARBLE)

Appendix B

Site Plan and Borehole Logs

N

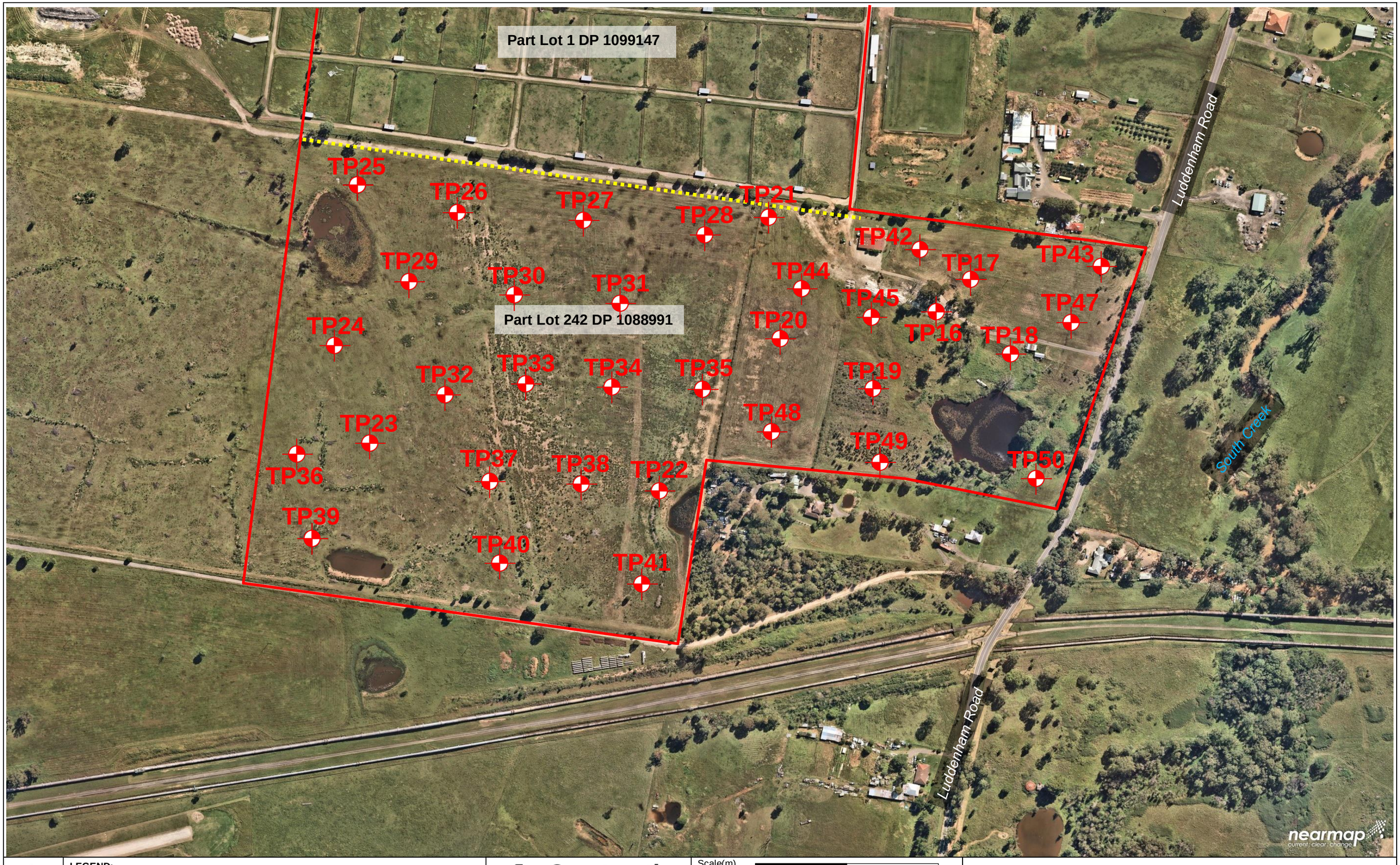
LEGEND:

- Site Boundary
- Lot Boundary
- Test Pit Locations

Construction Sciences

31 Anvil Road
SEVEN HILLS NSW 2147
Tel: (02) 8646 2000
Fax: (02) 8646 2025
Web: www.constructionsciences.net

Scale(m) 0 200 400	Project: 5017200153	
Date: 4th May 2020 to 8th May 2020	Client: HB+B Property Pty Ltd	
Drawn By: Nicholas Leong	Location: Part Lot 1 in DP 1099147 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills NSW 2745	
Drawing No: **5017200153-A-1**	Sheet: 1 of 2	**APPROXIMATE TEST PIT LOCATIONS**



N

LEGEND:

- Site Boundary
- Lot Boundary
- Sample Locations

Construction Sciences

31 Anvil Road
SEVEN HILLS NSW 2147
Tel: (02) 8646 2000
Fax: (02) 8646 2025
Web: www.constructionsciences.net

Scale(m) 0 200 400	Project: 5017200153	
Date: 4th May 2020 to 8th May 2020	Client: HB+B Property Pty Ltd	
Drawn By: Nicholas Leong	Location: Part Lot 242 DP 1088991 Address: 221-227 and 289-311 Luddenham Road, Orchard Hills, NSW, 2745	
Drawing No: **5017200153-A-2**	Sheet: 2 of 2	**APPROXIMATE TEST PIT LOCATIONS**

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP01

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81810, 150.75232 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	VH	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP01 0.00m - 0.20m)	0			SILT: low plasticity, brown	M (<PL)		TOPSOIL
								0.30m			
				D 0.50 - 0.60 m	0.5		CL	CLAY: low plasticity, brown mottled grey and red	M (<PL)	H	RESIDUAL SOIL
								0.90m			
					1.0		CL	Silty CLAY: low plasticity, grey mottled brown	M (<PL)	H	
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP02

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81840, 150.75362 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP02 0.00m - 0.20m)				SILT: low plasticity, brown, trace clay with crushed sandstone on surface	M (<PL)		TOPSOIL
								0.20m			
				D 0.50 - 0.60 m	0.5		CH	Silty CLAY: high plasticity, orange brown mottled red and grey	M (≈PL)	F	RESIDUAL SOIL
				D 1.40 - 1.50 m	1.0						
					1.5			1.50m TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
water inflow
water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP03

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81913, 150.75632 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.40 m (ID: TP03 0.00m - 0.20m)	0			Gravelly SILT: low plasticity, dark brown to brown, ironstone gravel	M (<PL)		TOPSOIL
					0.40m						
				D 0.50 - 0.60 m	0.5		MH	Clayey SILT: high plasticity, brown orange mottled grey and red	M (≈PL)	F to St	RESIDUAL SOIL
					1.00m						
					1.0		CH	CLAY: high plasticity, grey mottled brown orange and red grades: trace ironstone gravel	M (≈PL)	St	
				D 1.40 - 1.50 m	1.50m						
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP04

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81845, 150.75716 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP04 0.00m - 0.20m)	0			SILT: medium plasticity, dark brown, with gravel	M (≈PL)		TOPSOIL
								0.20m			
								Clayey SILT: high plasticity, brown orange mottled red and grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		MH		M (≈PL)	F	
								0.90m			
					1.0			Clayey SILT: medium plasticity, grey mottled red, with ironstone gravel			
							ML		M (<PL)		
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP05

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81847, 150.75958 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP05 0.00m - 0.20m)				SILT: low plasticity, dark brown to brown, with gravel	M (<PL)		TOPSOIL
								0.20m			
								Clayey SILT: high plasticity, orange brown mottled grey red			RESIDUAL SOIL
				D 0.50 - 0.60 m	0.5		MH		M (≈PL)	F	
								0.90m			
					1.0		CH	Silty CLAY: high plasticity, grey mottled orange brown and red	M (≈PL)	F	
								1.30m			
	H			D 1.30 - 1.40 m				SILTSTONE, pale grey, extremely weathered, low strength	D		WEATHERED ROCK
								1.40m			
					1.5			TERMINATED AT 1.40 m Refusal			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
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PL - Plastic limit
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SOIL CONSISTENCY
VS - Very Soft
S - Soft
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H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP06

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81968, 150.75408 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP06 0.00m - 0.20m) (ID: QC301) (ID: QC302)				SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.40m			
				D 0.50 - 0.60 m	0.5			Silty CLAY: medium plasticity, brown orange mottled grey			RESIDUAL SOIL
					1.0		CI	grades: trace ironstone	M (≈PL)	F to St	
								grades: with ironstone			
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
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MC - Moisture Content
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SAMPLES
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U - Thin wall tube 'undisturbed'

MOISTURE
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PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP07

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82007, 150.75182 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP07 0.00m - 0.20m)				SILT: low plasticity, brown	M (<PL)		TOPSOIL
								0.20m			
								Silty CLAY: high plasticity, yellow brown			RESIDUAL SOIL
								grades: grey mottled yellow brown and pale red			
				D 0.50 - 0.60 m	0.5						
					1.0		CH		M (≈PL)	F	
				D 1.40 - 1.50 m	1.5						
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
water inflow
water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP08

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82045, 150.75693 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP08 0.00m - 0.20m)				SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: PID = 4.20ppm
								0.20m			
				D 0.50 - 0.60 m	0.5		ML	SILT: medium plasticity, orange brown mottled red and grey, trace gravel	M (≈PL)	F	Possibly ALLUVIUM
								0.90m			
					1.0		CH	CLAY: high plasticity, grey mottled brown	M (≈PL)	St	RESIDUAL SOIL
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP09

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82109, 150.75498 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP09 0.00m - 0.20m)				Gravelly SAND: fine grained, poorly graded, rounded, brown, medium poorly graded rounded gravel	M		TOPSOIL 0.00 m: PID = 0.80ppm
								0.30m			
				D 0.50 - 0.60 m	0.5			Clayey SILT: medium plasticity, brown orange mottled red		F	RESIDUAL SOIL
					1.0		ML	grades: grey mottled red	M (≈PL)	St	
								grades: with ironstone gravel		H	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP10

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82118, 150.75627 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP10 0.00m - 0.20m)				SILT: low plasticity, brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.50ppm
								0.20m			
							CH	Silty CLAY: high plasticity, brown	M (≈PL)	F to St	RESIDUAL SOIL
								0.40m			
				D 0.50 - 0.60 m	0.5		CH	CLAY: high plasticity, grey mottled brown red	M (≈PL)	St	
								1.00m			
					1.0		CI	Sandy CLAY: medium plasticity, grey mottled brown	M (<PL)	St	
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP11

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82186, 150.75599 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP11 0.00m - 0.20m)	0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.60ppm
								0.20m			
							Cl	Silty CLAY: medium plasticity, brown	M (≈PL)	F	RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0			1.00m			
							CH	CLAY: high plasticity, grey mottled brown red, with ironstone gravel	M (≈PL)	F	1.20 m: increasing ironstone content with depth
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP12

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.18234, 150.75650 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP12 0.00m - 0.20m)				SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL 0.00 m: PID = 0.60ppm
								0.20m			
								Silty CLAY: medium plasticity, brown orange mottled red, trace gravel	M (≈PL)		RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0		CI	grades: grey mottled red		F to St	
									M (<PL)		
				D 1.40 - 1.50 m	1.5						
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP13

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82344, 150.75349 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP13 0.00m - 0.20m)				Silty CLAY: medium plasticity, dark brown	M (≈PL)		TOPSOIL 0.00 m: with grass roots PID = 0.80ppm
								0.20m			
								CLAY: high plasticity, grey mottled brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0		CH	grades: grey mottled red and brown orange	M (≈PL)	St	
				D 1.40 - 1.50 m	1.5						
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
water inflow
water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP14

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82437, 150.75592 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP14 0.00m - 0.20m)	0			SILT: low plasticity, dark brown	M (≈PL)		TOPSOIL 0.00 m: PID = 0.40ppm
								0.20m			
								CLAY: high plasticity, red to red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CH		M (<PL)	St to VSt	
					1.0						
								1.30m			
				D 1.40 - 1.50 m	1.5		CL	CLAY: low plasticity, grey mottled red	M (<PL)	H	
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP15

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82398, 150.75107 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP15 0.00m - 0.20m)				SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
								0.20m			
								CLAY: medium plasticity, grey mottled red and brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		Cl		M (<PL)	St	
					1.0			1.00m			
								Silty CLAY: high plasticity, grey, trace ironstone			
							CH		M (≈PL)	F	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP16

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82571, 150.75751 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.01 - 0.20 m (ID: TP16 0.00m - 0.20m) (ID: QC101) (ID: QC102)	0.01m			FILL: Gravelly SAND: dark brown to brown, trace silt	D		PAVEMENT FILL 0.01 m: PID = 0.50ppm
					0.30m						
				D 0.40 - 0.50 m	0.5		CL	CLAY: low plasticity, grey with brown streaks mottled red	M (<PL)	St	RESIDUAL SOIL
				D 0.90 - 1.00 m	1.0						
					1.10m		CI	Silty CLAY: medium plasticity, grey mottled red	M (<PL)	St	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP17

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82538, 150.75780 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP17 0.00m - 0.20m)				SILT: low plasticity, dark brown to brown, trace gravel PID = 0.4ppm	M (≈PL)		TOPSOIL 0.00 m: PID = 0.40ppm
								0.30m			
				D 0.40 - 0.50 m	0.5		CL	Silty CLAY: high plasticity, brown mottled red	M (≈PL)	F	RESIDUAL SOIL
				D 0.90 - 1.00 m	1.0			1.00m			
							ML	Clayey SILT: low plasticity, grey mottled brown	M (<PL) to M (≈ PL)	F	
					1.5			1.50m			
	H			D 1.50 - 1.60 m				SANDSTONE, grey, with ironstone gravel, low strength			WEATHERED ROCK
								1.60m			
								TERMINATED AT 1.60 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP18

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82630, 150.75868 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP17 0.00m - 0.20m)				FILL: Gravelly SAND: dark brown, with silt	M		FILL 0.00 m: PID = 0.40ppm
				D 0.40 - 0.50 m	0.5			grades: wet	W		
								0.80m			
				D 0.90 - 1.00 m	1.0		GC	Clayey GRAVEL: red mottled brown, ironstone gravel	M	L	RESIDUAL SOIL
				D 1.30 - 1.40 m				1.40m			
					1.5			TERMINATED AT 1.40 m Refusal			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP19

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82640, 150.75688 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP19 0.00m - 0.20m)				Sandy SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL 0.00 m: polypipe on surface PID = 0.10ppm
								0.20m			
					0.5		CH	CLAY: high plasticity, red mottled grey		St	RESIDUAL SOIL
								grades: with ironstone gravel, grey mttled brown orange	M (≈LL)	VSt to H	
								0.80m			
								TERMINATED AT 0.80 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP20

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82609, 150.75635 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP20 0.00m - 0.20m)				SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: with ceramic tiles, timber PID = 0.10ppm
				D 0.20 - 0.30 m			CL	0.20m Sandy CLAY: low plasticity, brown mottled brown orange 0.30m	M (<PL)	S to F	RESIDUAL SOIL
					0.5		CH	Silty CLAY: high plasticity, red mottled brown grades: grey mottled pale brown	M (≈PL)	St	
					1.0			1.00m TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP21

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82504, 150.75602 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Material Description: Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.30 m (ID: TP21 0.00m - 0.20m) (ID: TP21-ACM-0.30m) (ID: Asbestos sample)				Sandy SILT: low plasticity, dark brown, trace clay	M (<PL)		TOPSOIL 0.00 m: with conrete, bricks and iron bar Abestos Containing Material at 0.30m PID = 0.20ppm
								0.30m			
							CI	CLAY: medium plasticity, red mottled grey	M (≈PL)	F to St	RESIDUAL SOIL
					0.5			0.50m			
								TERMINATED AT 0.50 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP22

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82790, 150.75457 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP22 0.00m - 0.20m)				Sandy SILT: low plasticity, brown	M (<PL)		TOPSOIL 0.00 m: PID = 0.20ppm
								0.20m			
							CL	Sandy CLAY: low plasticity, brown, coarse poorly graded rounded sand	M (<PL)		RESIDUAL SOIL
					0.5			0.30m			
							CH	CLAY: high plasticity, brown mottled grey	M (<PL) to M (~PL)	St	
								0.70m			
								TERMINATED AT 0.70 m Target depth			
					1.0						
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP23

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82748, 150.75128 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.10 m (ID: TP23 0.00m - 0.10m)	0.5			SILT: low plasticity, brown 0.10m	M (<PL)		TOPSOIL 0.00 m: PID = 0.30ppm
							CH	CLAY: high plasticity, red mottled grey 0.60m	M (≈PL)	St	RESIDUAL SOIL
					1.0		CL	CLAY: low plasticity, grey mottled pale brown 1.00m	M (<PL)	St to VSt	
								TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP24

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82586, 150.75151 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.00m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.40 m (ID: TP24 0.00m - 0.40m)	0.0			SILT: low plasticity, dark brown, trace clay	M (<PL)		TOPSOIL 0.00 m: with grass roots PID = 0.40m
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, red mottled grey	M (≈PL)	St	RESIDUAL SOIL 0.30 m: PID = 0.30ppm
								grades: grey mottled brown		St to VSt	
					1.0			1.00m TERMINATED AT 1.00 m Target depth			
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP25

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.87473, 150.75144 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	ES 0.00 - 0.20 m (ID: TP25 0.00m - 0.20m)				Sandy SILT: low plasticity, dark brown	M (<PL)		TOPSOIL 0.00 m: ceramic, plastic, metal on surface PID = 0.50ppm
								0.20m			
					0.5		CH	CLAY: high plasticity, red brown mottled grey			RESIDUAL SOIL
								grades: grey mottles pale brown	M (≈PL)	F to St	
					1.0			1.00m			
							CL	Sandy CLAY: low plasticity, grey mottled pale brown	M (<PL)	St to VSt	
								1.20m			
								TERMINATED AT 1.20 m Target depth			
					1.5						
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP26

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82484, 150.75247 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
					0.10m						
								CLAY: high plasticity, grey mottled red			RESIDUAL SOIL
				D 0.40 - 0.50 m					M (≈PL)		
					0.5						
							CH			St	
					1.0			grades: less moist	M (<PL)		
				D 1.40 - 1.50 m							
					1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP27

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82481, 150.75399 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		1	0.0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
						0.20m						
				D 0.40 - 0.50 m	2	0.5		CH	CLAY: high plasticity, grey mottled red and brown orange, trace ironstone gravel	M (≈PL)	St	RESIDUAL SOIL
					3	1.0						
					4 7				grades: grey mottled red			
				D 1.40 - 1.50 m	8 7							
						1.5						
					6				TERMINATED AT 1.50 m Target depth			
						2.0						
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP28

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82509, 150.75517 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
							SC	Clayey SAND: brown, low plasticity clay	M	L	RESIDUAL SOIL
								0.30m			
				D 0.40 - 0.50 m				CLAY: high plasticity, red mottled grey			
					0.5				M (≈PL)	St	
							CH				
					1.0			grades: grey mottled brown orange, low plasticity			
									M (<PL)	St to VSt	
				D 1.40 - 1.50 m							
					1.5						
								1.60m			
								TERMINATED AT 1.60 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP29

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82565, 150.75196 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled brown	M (≈PL)	St	RESIDUAL SOIL
					1.0						
								1.30m			
	H			D 1.40 - 1.50 m				SHALE, grey, very low strength	D		WEATHERED ROCK
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP30

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82592, 150.75363 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					Clayey SILT: high plasticity, dark brown	M (≈PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled brown and red, trace gravel	M (≈PL)	St	RESIDUAL SOIL 0.30 m: with tree root 0.30m to 0.50m
				D 1.40 - 1.50 m	1.0						
					1.5			1.50m			
								SHALE, pale brown and grey, with clay, very low strength	D		WEATHERED ROCK
								1.80m			
					2.0			TERMINATED AT 1.80 m Target depth			
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP31

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82606, 150.75510 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
					0.30m						
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown mottled red	M (≈PL)	St	RESIDUAL SOIL
								grades: grey mottled red and brown			
				D 0.90 - 1.00 m	1.0						
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP32

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82680, 150.75231 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	D 0.00 - 0.20 m				Clayey SILT: medium plasticity, dark brown	M (≈PL)		TOPSOIL
								0.20m			
								CLAY: high plasticity, red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m							
					0.5			grades: grey mottled pale brown	M (≈PL)		
							CH			St	
					1.0				M (<PL)		
								1.30m			
							CL	CLAY: low plasticity, grey, with extremely weatherd shale, inferred very low strength	M (<PL) to D	St	
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP33

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82705, 150.75333 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)	S	TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5			CLAY: high plasticity, brown orange mottled red	M (<PL)		RESIDUAL SOIL
					1.0		CH	grades: trace ironstone, grey mottled red, low plasticity	D to M (<PL)	St to VSt	
				D 1.40 - 1.50 m							
					1.5			1.50m TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP34

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82706, 150.75412 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.50 m CBR D 0.20 - 0.30 m	1 2	0.5			SILT: medium plasticity, dark brown, with clay	M (≈PL)		TOPSOIL
				D 0.40 - 0.50 m	1 2 3				0.20m CLAY: high plasticity, brown red mottled grey			RESIDUAL SOIL
				D 0.90 - 1.00 m	9 10 7 9	1.0		CH		M (≈PL)	St	
				D 1.40 - 1.50 m	10 12	1.5			1.20m Silty CLAY: medium plasticity, grey mottled red and brown orange, with ironstone gravel			
				D 1.90 - 2.00 m		2.0		CI		M (<PL)	St	
						2.5			2.00m TERMINATED AT 2.00 m Target depth			

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP35

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82712, 150.75520 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 4/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, brown grey, trace gravel	M (<PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		CI	Silty CLAY: medium plasticity, brown mottled red	M (≈PL)	St	RESIDUAL SOIL
					1.0			1.00m			
							SC	Sandy CLAY: low plasticity, grey mottled red	M (<PL)	VSt	
				D 1.40 - 1.50 m	1.5			1.50m			
								SANDSTONE, fine grained, pale brown, very low strength	D		WEATHERED ROCK
								1.70m			
								TERMINATED AT 1.70 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP36

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82722, 150.75070 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					Clayey SILT: medium plasticity, dark brown	M (≈PL)		TOPSOIL
								0.20m			
								CLAY: high plasticity, red mottled grey and pale brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CH		M (≈PL)	St	
					1.0			grades: grey mottled pale red	M (<PL)		
								1.40m			
				D 1.40 - 1.50 m			CL	CLAY: low plasticity, grey, with extremely weatherd shale, inferred very low strength	D	St	
					1.5			1.50m TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP37

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82747, 150.75290 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: medium plasticity, dark brown, with gravel	M (≈PL)		TOPSOIL
								0.10m			
								CLAY: high plasticity, red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CH		M (<PL)	S	
								0.90m			
					1.0			Silty CLAY: low plasticity, grey			
							CL-ML		M (<PL) to D	H	
				D 1.40 - 1.50 m							
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP38

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82755, 150.75408 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			Sandy SILT: low plasticity, brown to orange brown	M (<PL)		TOPSOIL
								0.20m			
								CLAY: high plasticity, pale red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CH		M (≈PL)	St	
								0.90m			
					1.0		CH	Silty CLAY: high plasticity, grey mottled red, trace ironstone gravel	M (<PL) to D	H	
				D 1.40 - 1.50 m							
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP39

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82830, 150.75082 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation				Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.50 m	3				SILT: low plasticity, brown	M (<PL)		TOPSOIL
				D 0.40 - 0.50 m	2 1 2 3	0.5			0.10m CLAY: medium plasticity, pale red mottled grey	M (≈PL)	St	RESIDUAL SOIL
				D 0.90 - 1.00 m	4 7 11	1.0		CI	grades: trace EW shale fragments	M (<PL)		
	H			D 1.40 - 1.50 m	12 15	1.5			1.20m SHALE, pale grey, with clay, extremely weathered, very low strength	D		WEATHERED ROCK
				D 1.90 - 2.00 m		2.0			2.00m TERMINATED AT 2.00 m Target depth			
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP40

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82843, 150.75290 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled red and orange brown	M (≈PL)	St	RESIDUAL SOIL
								1.00m			
	H				1.0			SILTSTONE, grey mottled brown and dark red, extremely weathered, very low strength	D		WEATHERED ROCK
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP41

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82855, 150.75460 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown, with gravel	M (<PL)		TOPSOIL
								0.10m			
								CLAY: high plasticity, brown mottled grey and red			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
					1.0		CH		M (≈PL)	F	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
water inflow
water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP42

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82527, 150.75761 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled red	M (≈PL)	St	RESIDUAL SOIL 0.40 m: PP 140kPa, 120kPa, 100kPa
					1.0			1.20m			
							CI	Silty CLAY: medium plasticity, grey mottled red and brown orange	M (<PL)	St	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP43

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82555, 150.75989 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: medium plasticity, dark brown, trace gravel	M (<PL) to M (≈PL)		TOPSOIL
					0.20m						
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled pale red	M (≈PL)	F	RESIDUAL SOIL
				D 0.90 - 1.00 m	1.0						
					1.20m			CLAY: medium plasticity, grey mottled red and brown orange, with ironstone gravel			
				D 1.40 - 1.50 m	1.5		CI		M (<PL)	St	
				D 1.90 - 2.00 m	2.0						
					2.00m			TERMINATED AT 2.00 m Target depth			
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP44

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82575, 150.75637 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.60 m CBR	2 3 2 3	0.0			SILT: dark brown, with gravel	M (<PL)		TOPSOIL
				D 0.40 - 0.50 m	4 12 5	0.5			0.30m Silty CLAY: brown orange mottled red and grey			RESIDUAL SOIL
				D 1.40 - 1.50 m	8 15 14 12 20	1.0		CI	grades: grey mottled red	M (≈PL)	F	1.00 m: PP 300kPa, 350kPa, 300kPa
						1.5			1.50m with ironstone gravel TERMINATED AT 1.50 m Target depth			
						2.0						
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP45

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82606, 150.75724 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation: Method	Excavation: Resistance	Excavation: Stability	Water	Sampling & Testing: Sample or Field Test	Depth (m)	Material Description: Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX								Sandy SILT: low plasticity, dark brown, trace gravel	M (≈PL)		TOPSOIL
								0.10m			
	F	Stable	Not Encountered	D 0.40 - 0.50 m	0.5		CH	Silty CLAY: high plasticity, grey mottled red, trace gravel	M (≈PL)	F	RESIDUAL SOIL
					1.0			1.10m			
	H			D 1.20 - 1.30 m				SILTSTONE, pale grey, highly weathered, low strength	M		ROCK
								1.30m			
								TERMINATED AT 1.30 m Refusal			
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP46

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82630, 150.75799 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					Gravelly SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CL	Sandy CLAY: low plasticity, red brown	M (<PL)	F	RESIDUAL SOIL
								0.70m			
	H			D 0.70 - 0.80 m			CH	Silty CLAY: high plasticity, grey	M (≈PL)	F	
								0.80m			
								TERMINATED AT 0.80 m Refusal			
					1.0						
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP47

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82632, 150.75913 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Groundwater Observed	D 0.40 - 0.50 m	0.5		MH	Sandy SILT: low plasticity, dark brown black 0.20m Clayey SILT: high plasticity, brown, with gravel 0.80m	M to W M (≈PL)	F	TOPSOIL RESIDUAL SOIL 0.50 m: observed water
				D 1.40 - 1.50 m	1.0		CH	CLAY: high plasticity, grey mottled red 1.50m	M (≈PL)	F	0.95 m: water inflow
					1.5			TERMINATED AT 1.50 m Target depth			1.50 m: visible water
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP48

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82729, 150.75596 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					Sandy SILT: low plasticity, brown to pale brown, with gravel	M (<PL)		TOPSOIL
					0.30m						
				D 0.40 - 0.50 m	0.5		Cl	Silty CLAY: medium plasticity, brown orange mottled grey and red	M (≈PL)	St	RESIDUAL SOIL
					1.0						
					1.10m			Sandy CLAY: low plasticity, grey mottled brown orange, trace ironstone gravel			
				D 1.40 - 1.50 m			CL		M (<PL)	St	
					1.5						
					1.60m			TERMINATED AT 1.60 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP49

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82746, 150.75691 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown, with gravel	M (≈PL)		TOPSOIL
								0.20m			
							CH	FILL: Silty CLAY: high plasticity, orange brown	M (<PL) to M (≈PL)	S	FILL
								0.40m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled pale red	M (≈PL) to M (<LL)	S	RESIDUAL SOIL
					1.0			1.20m			
							CI	CLAY: medium plasticity, grey mottled pale brown and red, with ironstone gravel	M (<PL)	F	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP50

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82767, 150.75886 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 8/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			Gravelly SILT: low to medium plasticity, dark brown	M (≈PL)		TOPSOIL
					0.10m						
				D 0.40 - 0.50 m	0.5		ML	Gravelly SILT: low plasticity, orange brown mottled grey, ironstone gravel	M (<PL)	St	RESIDUAL SOIL
					1.0			grades: grey mottled red			
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP51

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81923, 150.75964 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		3 4 2				SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
				B 0.20 - 0.50 m CBR					0.20m CLAY: high plasticity, red mottled grey			RESIDUAL SOIL
				D 0.40 - 0.50 m	2 3 2 1 2	0.5		CH		M (≈PL)	St	
				D 0.90 - 1.00 m	3 5 8 11 20	1.0			grades: trace ironstone, grey mottled red			
				D 1.40 - 1.50 m		1.5			1.30m Silty CLAY: medium plasticity, grey mottled red, trace ironstone			
				D 1.90 - 2.00 m				CI		M (≈PL)	St	
						2.0			2.00m TERMINATED AT 2.00 m Target depth			
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP52

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81853, 150.75856 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
					0.25m						
				D 0.40 - 0.50 m	0.5		MH	SILT: high plasticity, orange brown mottled grey and red	M (≈PL)	F	RESIDUAL SOIL
					1.0						
					1.10m		CH	CLAY: high plasticity, grey mottled brown and red	M (≈PL) to M (<LL)	F	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

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TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP53

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81918, 150.75782 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, red brown, with gravel	M (<PL)		TOPSOIL
					0.30m						
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown mottled red and grey tree root	M (<PL)	VSt to H	RESIDUAL SOIL
					1.0						
					1.20m			Silty CLAY: high plasticity, grey mottled red and brown			
				D 1.40 - 1.50 m			CH		M (<PL)	VSt	
					1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP54

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81965, 150.75602 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, brown	M (≈PL)		TOPSOIL
					0.20m						
				D 0.40 - 0.50 m	0.5		CH	Silty CLAY: high plasticity, brown mottled red and grey	M (≈PL)	S	RESIDUAL SOIL
					1.0						
					1.10m		CH	CLAY: high plasticity, pale grey mottled red and brown orange	M (≈PL) to M (<LL)	F	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP55

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81899, 150.75498 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX								SILT: low plasticity, brown	M (<PL)		TOPSOIL
								0.20m			
	F	Stable	Not Encountered	D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown mottled grey	M (≈PL)	F	RESIDUAL SOIL
					1.0			grades: grey mottled yellow brown and red			
								1.10m			
							CH-MH	Silty CLAY: high plasticity, grey mottled yellow brown and red	M (≈PL)	F	
								1.40m			
	H			D 1.40 - 1.50 m	1.5		CH	Gravelly CLAY: high plasticity, grey mottled red, ironstone gravel gravel	M (≈PL)	St	
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP56

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81836, 150.75623 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown, with gravel	M (<PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		ML	FILL: Gravelly SILT: medium plasticity, brown orange, ironstone gravel	M (<PL) to M (≈PL)	F	FILL
					1.0			1.00m			
							CH	Silty CLAY: high plasticity, brown orange mottled red and grey, with ironstone gravel	M (≈PL)	F	RESIDUAL SOIL
								1.30m			
				D 1.40 - 1.50 m	1.5		CH	CLAY: high plasticity, grey mottled red and brown orange, with ironstone gravel tree root at 1.30m	M (≈PL)	St	
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP57

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81825, 150.75497 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: high plasticity, brown grey, trace gravel	M (≈PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	Silty CLAY: high plasticity, grey mottled brown	M (≈PL)	S to F	RESIDUAL SOIL
					1.0			1.10m			
				D 1.40 - 1.50 m			ML	Clayey SILT: low to medium plasticity, grey mottled brown	M (<PL)	F	
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP58

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81891, 150.75356 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.60 m CBR	4 2 1	0.5			SILT: low plasticity, brown, trace gravel	M (≈PL)		TOPSOIL
				D 0.40 - 0.50 m	3				0.20m CLAY: high plasticity, yellow brown			RESIDUAL SOIL
				D 0.90 - 1.00 m	4	1.0		CH	grades: yellow brown mottled grey	M (≈PL)	F	
				D 1.40 - 1.50 m	5 6	1.5			1.10m Silty CLAY: high plasticity, grey mottled yellow brown			
				D 1.90 - 2.00 m	5 8	2.0		CH-MH	grades: trace ironstone	M (<PL) to M (≈ PL)	St	
						2.5			2.00m TERMINATED AT 2.00 m Target depth			

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP59

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81968, 150.75321 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: high plasticity, dark brown, trace gravel	M (≈PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, yellow brown mottled grey	M (≈PL) to M (<LL)	S	RESIDUAL SOIL
					1.0			1.10m			
				D 1.40 - 1.50 m	1.5		CH-MH	Silty CLAY: high plasticity, grey mottled yellow brown	M (≈PL)	S	
								1.50m			
					2.0			TERMINATED AT 1.50 m Target depth			
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP60

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.81885, 150.75255 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (≈PL)		TOPSOIL
								0.25m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, yellow brown mottled grey	M (≈PL) to M (<LL)	S	RESIDUAL SOIL
					1.0			1.10m			
				D 1.40 - 1.50 m			CH-MH	Silty CLAY: high plasticity, grey mottled yellow brown	M (≈PL)	F	
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP61

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82025, 150.75616 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.60 m CBR	3	0.0			SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
				D 0.40 - 0.50 m	5	0.20m		CH-MH	Clayey SILT: medium plasticity, brown orange mittled red	M (≈PL)	F	RESIDUAL SOIL
					4	0.5			CLAY: high plasticity, grey with pale red streaks			
				D 0.90 - 1.00 m	2	1.0		CH		M (≈PL) to M (<LL)	St	
				D 1.40 - 1.50 m	3	1.5			grades: trace ironstone, pale grey mottled brown orange and dark red			
				D 1.90 - 2.00 m		2.00m						
						2.0			TERMINATED AT 2.00 m Target depth			
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP62

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82028, 150.75449 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			Silty Gravelly SAND: brown	M (<PL)		TOPSOIL
								0.30m			
								Gravelly SILT: low plasticity, brown red, ironstone gravel, with clay	M (≈PL)	St	RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		ML				
					1.0			grades: grey mottled red	M (<PL)	VSt	
								1.40m			
				D 1.40 - 1.50 m			CH	CLAY: high plasticity, grey mottled red and brown	M (≈PL)	VSt	
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP63

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82023, 150.75323 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, brown	M (<PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	Silty CLAY: high plasticity, yellow brown	M (≈PL)	F	RESIDUAL SOIL
								0.80m			
					1.0		CH	CLAY: high plasticity, grey mottled yellow brown	M (≈PL)	F	
				D 1.40 - 1.50 m							
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP64

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82103, 150.75155 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0 1 5				Sandy SILT: low plasticity, brown pale red	M (≈PL)		TOPSOIL
									0.40m			
				B 0.40 - 0.60 m CBR D 0.40 - 0.50 m	3	0.5			Silty CLAY: medium to high plasticity, yellow brown			RESIDUAL SOIL
				D 0.90 - 1.00 m		1.0			grades: high plasticity, yellow brown mottled grey			
					4			CH		M (≈PL)	St	
				D 1.40 - 1.50 m	5	1.5						
				D 1.90 - 2.00 m	6							
						2.0			2.00m TERMINATED AT 2.00 m Target depth			
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP65

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82112, 150.75263 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 7/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.25m			
				D 0.40 - 0.50 m	0.5		ML	Clayey SILT: low plasticity, brown mottled red and grey, with ironstone gravel	M (≈PL)	F	RESIDUAL SOIL
					1.0			1.10m			
				D 1.40 - 1.50 m			CH	CLAY: high plasticity, grey mottled red, with ironstone gravel	M (≈PL)	St	
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP66

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82108, 150.75408 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.30m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown orange mottled red	M (<PL)	F	RESIDUAL SOIL
								0.90m			
					1.0		CH	Silty CLAY: high plasticity, grey mottled red	M (≈PL)	St to VSt	
				D 1.40 - 1.50 m				1.50m			
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP67

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82196, 150.75186 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown, trace gravel	M (<PL)		TOPSOIL
					0.30m						
				D 0.40 - 0.50 m	0.5		CI	Silty CLAY: medium plasticity, brown orange mottled red and grey	M (≈PL)	F	RESIDUAL SOIL
					1.00m						
					1.0		CH	CLAY: high plasticity, grey mottled red and brown	M (≈PL)	St	
				D 1.40 - 1.50 m	1.50m						
					1.5			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP68

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82189, 150.75305 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CI	Silty CLAY: medium plasticity, red, trace ironstone gravel	M (≈PL)	F	RESIDUAL SOIL
					1.0			1.00m			
							ML	Clayey SILT: medium plasticity, grey mottled red and brown, with ironstone gravel	M (≈PL)	F	
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP69

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82185, 150.75400 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		ML	Clayey SILT: medium plasticity, red brown	M (≈PL)	F	RESIDUAL SOIL
					1.0		CH	1.00m CLAY: high plasticity, grey with brown and red orange streaks	M (≈PL)	F	
				D 1.40 - 1.50 m				1.30m SILTSTONE, grey with brown orange, with Silty CLAY, extremely weathered, very low strength	M (≈PL)		WEATHERED ROCK
					1.5			1.50m TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP70

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82245, 150.75201 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		2 3				SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
				B 0.20 - 0.50 m CBR					0.20m			
				D 0.40 - 0.50 m	5 7 8 6	0.5			Clayey SILT: high plasticity, brown red, with ironstone gravel			RESIDUAL SOIL
					7 9 14	1.0		MH		M (≈PL)	F	
									grades: grey mottled red			
				D 1.40 - 1.50 m	16	1.5			1.50m			
									TERMINATED AT 1.50 m Target depth			
						2.0						
						2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP71

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82260, 150.75315 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (≈PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled red and brown	M (≈PL)	St	RESIDUAL SOIL
					1.0			grades: with ironstone gravel			
				D 1.40 - 1.50 m	1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger: V-Bit
AD/T	Solid flight auger: TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
DT	Diatube

PENETRATION

VE	Very Easy (No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard (Refusal)

WATER

Water Level on Date shown
water inflow
water outflow

FIELD TESTS

SPT	-	Standard Penetration Test
HP	-	Hand/Pocket Penetrometer
DCP	-	Dynamic Cone Penetrometer
PSP	-	Perth Sand Penetrometer
MC	-	Moisture Content
PBT	-	Plate Bearing Test
IMP	-	Borehole Impression Test
PID	-	Photoionisation Detector
VS	-	Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES

B	-	Bulk disturbed sample
D	-	Disturbed sample
ES	-	Environmental sample
U	-	Thin wall tube 'undisturbed'

MOISTURE

D	-	Dry
M	-	Moist
W	-	Wet
PL	-	Plastic limit
LL	-	Liquid limit
w	-	Moisture content

SOIL CONSISTENCY

VS	-	Very Soft
S	-	Soft
F	-	Firm
St	-	Stiff
VSt	-	Very Stiff
H	-	Hard

RELATIVE DENSITY

VL	-	Very Loose
L	-	Loose
MD	-	Medium Dense
D	-	Dense
VD	-	Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP72

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82264, 150.75430 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		Cl	Silty CLAY: medium plasticity, brown orange mottled red	M (≈PL)	F	RESIDUAL SOIL
					1.0			grades: grey mottled brown and red			
								1.30m			
				D 1.40 - 1.50 m				SANDSTONE, pale grey brown, with clay, extremely weathered, very low strength	M		WEATHERED ROCK
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP73

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82272, 150.75551 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, brown	M (<PL)		TOPSOIL
								0.20m			
				D 0.40 - 0.50 m	0.5		ML	Clayey SILT: medium plasticity, orange brown with grey, with gravel	M (≈PL)	F	RESIDUAL SOIL
					1.0			grades: grey mottled red			
								1.10m			
							SC	Clayey SAND: fine grained, poorly graded, rounded, grey mottled brown, low plasticity clay	M	MD	
								1.40m			
				D 1.40 - 1.50 m	1.5			SANDSTONE, fine grained, grey mottled brown, extremely weathered, low strength	M		ROCK
								1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP74

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82275, 150.75673 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			SILT: low plasticity, dark brown grey, trace gravel	M (<PL)		TOPSOIL
					0.20m						
								CLAY: high plasticity, grey mottled brown	M (≈PL)	St	RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5						
								grades: grey mottled red, low plasticity			
					1.0		CH		M (<PL)	H	
				D 1.40 - 1.50 m							
					1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
- EX Excavator bucket
- R Ripper
- HA Hand auger
- PT Push tube
- SON Sonic drilling
- AH Air hammer
- PS Percussion sampler
- AS Short spiral auger
- AD/V Solid flight auger: V-Bit
- AD/T Solid flight auger: TC-Bit
- HFA Hollow flight auger
- WB Washbore drilling
- DT Diatube

PENETRATION
- VE Very Easy (No Resistance)
- E Easy
- F Firm
- H Hard
- VH Very Hard (Refusal)

WATER
- Water Level on Date shown
- water inflow
- water outflow

FIELD TESTS
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer
- DCP - Dynamic Cone Penetrometer
- PSP - Perth Sand Penetrometer
- MC - Moisture Content
- PBT - Plate Bearing Test
- IMP - Borehole Impression Test
- PID - Photoionisation Detector
- VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
- B - Bulk disturbed sample
- D - Disturbed sample
- ES - Environmental sample
- U - Thin wall tube 'undisturbed'

MOISTURE
- D - Dry
- M - Moist
- W - Wet
- PL - Plastic limit
- LL - Liquid limit
- *w* - Moisture content

SOIL CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP75

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82315, 150.75164 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
								Clayey SILT: medium plasticity, dark brown	M (≈PL)		TOPSOIL
								0.20m			
EX	F	Stable	Not Encountered	D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, grey mottled red	M (≈PL)	St	RESIDUAL SOIL
				D 1.40 - 1.50 m	1.0						
					1.5			1.50m			
								TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer
DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP77

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82347, 150.75502 **Angle from Horizontal:** 90° **Surface Elevation:**
Machine Type: 5 tonne Excavator **Excavation Method:** EX
Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation
Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered		0			Silty CLAY: medium plasticity, dark brown	M (≈PL)		TOPSOIL
					0.20m						
				D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown mottled grey	M (≈PL)	St	RESIDUAL SOIL
					1.0			grades: grey mottled red	M (<PL)	VSt	
				D 1.40 - 1.50 m	1.5						
					1.50m			TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP78

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82384, 150.75217 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 5/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered					SILT: low plasticity, dark brown, with clay	M (<PL)		TOPSOIL
								0.20m CLAY: high plasticity, grey mottled brown			RESIDUAL SOIL
				D 0.40 - 0.50 m	0.5		CH		M (≈PL)	St	
					1.0			grades: with ironstone gravel			
				D 1.40 - 1.50 m				1.40m SHALE, pale brown and grey, with clay and ironstone staining, extremely weathered, low strength	D		WEATHERED ROCK
					1.5			1.50m TERMINATED AT 1.50 m Target depth			
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
B - Bulk disturbed sample
D - Disturbed sample
ES - Environmental sample
U - Thin wall tube 'undisturbed'

MOISTURE
D - Dry
M - Moist
W - Wet
PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP79

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82420, 150.75418 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX								SILT: low plasticity, brown, trace gravel	M (<PL)		TOPSOIL
								0.20m			
	F	Stable	Not Encountered	D 0.40 - 0.50 m	0.5		CH	CLAY: high plasticity, brown mottled grey red	M (≈PL)	F	RESIDUAL SOIL
								1.00m			
	H			D 1.10 - 1.20 m	1.0			SILTSTONE, pale grey, highly weathered, low strength	D		WEATHERED ROCK
								1.20m			
								TERMINATED AT 1.20 m Refusal			
					1.5						
					2.0						
					2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
SPT - Standard Penetration Test
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DCP - Dynamic Cone Penetrometer
PSP - Perth Sand Penetrometer
MC - Moisture Content
PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
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D - Disturbed sample
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U - Thin wall tube 'undisturbed'

MOISTURE
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SOIL CONSISTENCY
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H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
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D - Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

CONSTRUCTION SCIENCES

Construction Sciences

TEST PIT LOG SHEET

Client: HB+B Property
Project: Geotechnical Assessment, Proposed Industrial Land Development
Location: 221-227 and 289-317 Luddenham Road

Hole No: TP80

Job No: 5017200153 **Sheet:** 1 of 1

Position: -33.82440, 150.75656 **Angle from Horizontal:** 90° **Surface Elevation:**

Machine Type: 5 tonne Excavator **Excavation Method:** EX

Excavation Dimensions: 1.50m LONG AND 0.30m WIDE **Contractor:** Platinum Excavation

Date Excavated: 6/5/20 **Logged By:** NL **Checked By:** VDS

Excavation			Water	Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test	DCP (blows per 100 mm) 1 2 4 8		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX	F	Stable	Not Encountered	B 0.20 - 0.60 m CBR D 0.20 - 0.30 m	3 4	0.5			SILT: low plasticity, dark brown	M (<PL)		TOPSOIL
				D 0.40 - 0.50 m	5 4 2				0.20m CLAY: high plasticity, red mottled grey			RESIDUAL SOIL
				D 0.90 - 1.00 m	3 4 5 10	1.0		CH		M (≈PL)	St	
				D 1.40 - 1.50 m	13 19	1.5			grades: trace ironstone			
				D 1.90 - 2.00 m		2.0			2.00m TERMINATED AT 2.00 m Target depth			
						2.5						

METHOD
EX Excavator bucket
R Ripper
HA Hand auger
PT Push tube
SON Sonic drilling
AH Air hammer
PS Percussion sampler
AS Short spiral auger
AD/V Solid flight auger: V-Bit
AD/T Solid flight auger: TC-Bit
HFA Hollow flight auger
WB Washbore drilling
DT Diatube

PENETRATION
VE Very Easy (No Resistance)
E Easy
F Firm
H Hard
VH Very Hard (Refusal)

WATER
Water Level on Date shown
water inflow
water outflow

FIELD TESTS
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PBT - Plate Bearing Test
IMP - Borehole Impression Test
PID - Photoionisation Detector
VS - Vane Shear; P=Peak, R=Resdual (uncorrected kPa)

SAMPLES
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U - Thin wall tube 'undisturbed'

MOISTURE
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M - Moist
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PL - Plastic limit
LL - Liquid limit
w - Moisture content

SOIL CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

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CONSTRUCTION SCIENCES

Appendix C
Laboratory Test Results

ATTACHMENT - 1 - SOIL EXPOSURE CLASSIFICATION REPORT

Project: 221-227, 289-317 Luddenham Road Orchard Hills NSW 2748

Job No: 5017200153
Report Date: 1/06/2020

Project Manager: VDS
Sampled by: NL
Tested By: CS/EUROFINS

Sample ID	Date Sampled	Field Texture	Multiplication Factor	EC (µS/cm)	Ece	Salinity Rating	pH	Exposure Classification
TP01 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	890	5.3	MS	**5.8**	A1
TP01 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	950	5.7	MS	**5.3**	A2
TP02 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	120	0.7	NS	**5.6**	A1
TP02 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	800	4.8	MS	**6.2**	A1
TP03 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	130	0.8	NS	**5.5**	A2
TP03 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	470	2.8	SS	**4.8**	A2
TP04 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	330	2.0	NS	**5.3**	A2
TP04 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	470	2.8	SS	**4.3**	A2
TP05 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	93	0.6	NS	**5.5**	A2
TP05 **1.30-1.50**	7/5/2020	HEAVY CLAY	6	72	0.4	NS	**5.8**	A1
TP06 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	580	3.5	SS	**6**	A1
TP06 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	990	5.9	MS	**6.3**	A1
TP07 **0.50-0.60**	7/5/2020	HEAVY CLAY	6	140	0.8	NS	**5.5**	A2
TP07 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	890	5.3	MS	**4.9**	A2
TP08 **0.50-0.60**	6/5/2020	HEAVY CLAY	6	150	0.9	NS	**5.4**	A2
TP08 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	230	1.4	NS	**5.3**	A2
TP09 **0.50-0.60**	6/5/2020	LIGHT CLAY	9	79	0.7	NS	**5.3**	A2
TP09 **1.40-1.50**	6/5/2020	LIGHT CLAY	9	33	0.3	NS	**5.5**	A2
TP10 **0.50-0.60**	6/5/2020	HEAVY CLAY	6	400	2.4	SS	**5.4**	A2
TP10 **1.40-1.50**	6/5/2020	SANDY LOAM	9	430	3.9	SS	**5.5**	A2
TP11 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	53	0.5	NS	**5.8**	A1
TP11 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	360	2.2	SS	**4.9**	A2
TP12 **0.40-0.50**	6/5/2020	MEDIUM CLAY	7	53	0.4	NS	**5.8**	A1
TP12 **1.40-1.50**	6/5/2020	MEDIUM CLAY	7	140	1.0	NS	**5.1**	A2
TP13 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	200	1.2	NS	**4.9**	A2
TP13 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	280	1.7	NS	**5.8**	A1
TP14 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	410	2.5	SS	**5.1**	A2
TP14 **1.40-1.50**	5/5/2020	HEAVY CLAY	6	230	1.4	NS	**5**	A2
TP15 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	150	0.9	NS	**4.9**	A2
TP15 **1.40-1.50**	5/5/2020	MEDIUM CLAY	7	730	5.1	MS	**4.7**	A2
TP16 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	210	1.3	NS	**4.9**	A2
TP16 **0.90-1.00**	5/5/2020	HEAVY CLAY	6	310	1.9	NS	**4.7**	A2
TP16 **1.40-1.50**	5/5/2020	MEDIUM CLAY	7	500	3.5	SS	**4.5**	A2
TP17 **0.40-0.50**	5/5/2020	MEDIUM CLAY	7	65	0.5	NS	**5.2**	A2
TP17 **0.90-1.00**	5/5/2020	MEDIUM CLAY	7	56	0.4	NS	**5.2**	A2
TP17 **1.50-1.60**	5/5/2020	SANDY LOAM	9	160	1.4	NS	**5.1**	A2
TP18 **0.40-0.50**	5/5/2020	SANDY LOAM	9	19	0.2	NS	**5.3**	A2
TP18 **0.90-1.00**	5/5/2020	SANDY LOAM	9	25	0.2	NS	**5.2**	A2
TP18 **1.30-1.40**	5/5/2020	SANDY LOAM	9	28	0.3	NS	**5.1**	A2
TP26 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	220	1.3	NS	**4.6**	A2
TP26 **1.40-1.50**	4/5/2020	HEAVY CLAY	6	780	4.7	MS	**4**	A2
TP27 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	360	2.2	SS	**4.8**	A2
TP27 **1.40-1.50**	4/5/2020	HEAVY CLAY	6	480	2.9	SS	**4.8**	A2
TP28 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	270	1.6	NS	**4.7**	A2
TP28 **1.40-1.50**	4/5/2020	HEAVY CLAY	6	300	1.8	NS	**4.9**	A2
TP29 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	450	2.7	SS	**4.9**	A2
TP29 **1.40-1.50**	4/5/2020	SANDY LOAM	9	690	6.2	MS	**5.6**	A1
TP30 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	210	1.3	NS	**4.8**	A2
TP30 **1.40-1.50**	4/5/2020	HEAVY CLAY	6	270	1.6	NS	**5.6**	A1
TP31 **0.40-0.50**	4/5/2020	HEAVY CLAY	6	42	0.3	NS	**5.7**	A1
TP31 **1.40-1.50**	4/5/2020	HEAVY CLAY	6	48	0.3	NS	**5.1**	A2
TP32 **0.00-0.20**	8/5/2020	LIGHT CLAY	9	31	0.3	NS	**5.9**	A1
TP32 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	340	2.0	SS	**5**	A2
TP32 **1.40-1.50**	8/5/2020	MEDIUM CLAY	7	460	3.2	SS	**5.7**	A1
TP33 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	400	2.4	SS	**4.8**	A2
TP33 **1.40-1.50**	5/5/2020	HEAVY CLAY	6	520	3.1	SS	**4.7**	A2
TP34 **0.20-0.30**	5/5/2020	HEAVY CLAY	6	220	1.3	NS	**5.2**	A2
TP34 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	270	1.6	NS	**5.1**	A2
TP34 **0.90-1.00**	5/5/2020	HEAVY CLAY	6	320	1.9	NS	**5**	A2
TP34 **1.40-1.50**	5/5/2020	MEDIUM CLAY	7	280	2.0	NS	**4.9**	A2
TP34 **1.90-2.00**	5/5/2020	MEDIUM CLAY	7	370	2.6	SS	**4.6**	A2
TP35 **0.40-0.50**	4/5/2020	MEDIUM CLAY	7	57	0.4	NS	**5.3**	A2

TP35 **1.40-1.50**	4/5/2020	SANDY LOAM	9	60	0.5	NS	**5.1**	A2
TP36 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	260	1.6	NS	**4.8**	A2
TP36 **1.40-1.50**	8/5/2020	MEDIUM CLAY	7	420	2.9	SS	**5.3**	A2
TP37 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	290	1.7	NS	**5.3**	A2
TP37 **1.40-1.50**	8/5/2020	MEDIUM CLAY	7	470	3.3	SS	**5.8**	A1
TP38 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	420	2.5	SS	**5.3**	A2
TP38 **1.40-1.50**	8/5/2020	MEDIUM CLAY	7	540	3.8	SS	**5.3**	A2
TP39 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	270	1.6	NS	**5.1**	A2
TP39 **0.90-1.00**	8/5/2020	HEAVY CLAY	6	270	1.6	NS	**5**	A2
TP39 **1.40-1.50**	8/5/2020	SANDY LOAM	9	300	2.7	SS	**5.3**	A2
TP39 **1.90-2.00**	8/5/2020	SANDY LOAM	9	600	5.4	MS	**5**	A2
TP40 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	56	0.3	NS	**5.4**	A2
TP40 **1.40-1.50**	8/5/2020	SANDY LOAM	9	140	1.3	NS	**5.1**	A2
TP41 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	360	2.2	SS	**5.5**	A2
TP41 **1.40-1.50**	8/5/2020	HEAVY CLAY	6	530	3.2	SS	**5.8**	A1
TP42 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	320	1.9	NS	**4.8**	A2
TP42 **1.40-1.50**	5/5/2020	MEDIUM CLAY	7	260	1.8	NS	**4.9**	A2
TP43 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	230	1.4	NS	**5**	A2
TP43 **0.90-1.00**	5/5/2020	HEAVY CLAY	6	370	2.2	SS	**5**	A2
TP43 **1.40-1.50**	5/5/2020	HEAVY CLAY	6	370	2.2	SS	**4.7**	A2
TP43 **1.90-2.00**	5/5/2020	HEAVY CLAY	6	400	2.4	SS	**4.9**	A2
TP44 **0.40-0.50**	5/5/2020	MEDIUM CLAY	7	67	0.5	NS	**5.6**	A1
TP44 **1.40-1.50**	5/5/2020	MEDIUM CLAY	7	46	0.3	NS	**5.5**	A2
TP45 **0.40-0.50**	5/5/2020	MEDIUM CLAY	7	40	0.3	NS	**5.3**	A2
TP45 **1.20-1.30**	5/5/2020	SANDY LOAM	9	52	0.5	NS	**5**	A2
TP46 **0.40-0.50**	5/5/2020	SANDY LOAM	9	100	0.9	NS	**4.3**	A2
TP46 **0.70-0.80**	5/5/2020	MEDIUM CLAY	7	63	0.4	NS	**5.2**	A2
TP47 **0.40-0.50**	5/5/2020	LIGHT CLAY	9	49	0.4	NS	**5.4**	A2
TP47 **1.40-1.50**	5/5/2020	HEAVY CLAY	6	51	0.3	NS	**5.4**	A2
TP48 **0.40-0.50**	5/5/2020	LIGHT CLAY	9	80	0.7	NS	**5.6**	A1
TP48 **1.40-1.50**	5/5/2020	SANDY LOAM	9	250	2.3	SS	**5.1**	A2
TP49 **0.40-0.50**	8/5/2020	HEAVY CLAY	6	200	1.2	NS	**5.1**	A2
TP49 **1.40-1.50**	8/5/2020	HEAVY CLAY	6	720	4.3	MS	**4.6**	A2
TP50 **0.40-0.50**	8/5/2020	SANDY LOAM	9	51	0.5	NS	**5.4**	A2
TP50 **1.40-1.50**	8/5/2020	SANDY LOAM	9	43	0.4	NS	**5.2**	A2
TP51 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	680	4.1	MS	**5.1**	A2
TP51 **0.90-1.00**	7/5/2020	HEAVY CLAY	6	910	5.5	MS	**4.8**	A2
TP51 **1.40-1.50**	7/5/2020	MEDIUM CLAY	7	820	5.7	MS	**4.7**	A2
TP51 **1.90-2.00**	7/5/2020	MEDIUM CLAY	7	930	6.5	MS	**3.7**	A2
TP52 **0.40-0.50**	7/5/2020	LIGHT CLAY	9	130	1.2	NS	**5.7**	A1
TP52 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	570	3.4	SS	**5.6**	A1
TP53 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	910	5.5	MS	**5.5**	A2
TP53 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	660	4.0	SS	**5.1**	A2
TP54 **0.40-0.50**	7/5/2020	MEDIUM CLAY	7	170	1.2	NS	**6.5**	A1
TP54 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	250	1.5	NS	**5.2**	A2
TP55 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	330	2.0	NS	**5.4**	A2
TP55 **1.40-1.50**	7/5/2020	LIGHT CLAY	9	560	5.0	MS	**4.9**	A2
TP56 **0.40-0.50**	7/5/2020	LIGHT CLAY	9	32	0.3	NS	**5.9**	A1
TP56 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	450	2.7	SS	**4.8**	A2
TP57 **0.40-0.50**	7/5/2020	MEDIUM CLAY	7	600	4.2	MS	**5.5**	A2
TP57 **1.40-1.50**	7/5/2020	LIGHT CLAY	9	680	6.1	MS	**5.9**	A1
TP58 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	360	2.2	SS	**5.6**	A1
TP58 **0.90-1.00**	7/5/2020	HEAVY CLAY	6	460	2.8	SS	**5.7**	A1
TP58 **1.40-1.50**	7/5/2020	MEDIUM CLAY	7	530	3.7	SS	**5.9**	A1
TP58 **1.90-2.00**	7/5/2020	MEDIUM CLAY	7	620	4.3	MS	**5.7**	A1
TP59 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	600	3.6	SS	**6.4**	A1
TP59 **1.40-1.50**	7/5/2020	MEDIUM CLAY	7	450	3.2	SS	**7.1**	A1
TP60 **0.40-0.50**	7/5/2020	HEAVY CLAY	6	81	0.5	NS	**6**	A1
TP60 **1.40-1.50**	7/5/2020	MEDIUM CLAY	7	860	6.0	MS	**5.9**	A1
TP61 **0.40-0.50**	7/5/2020	MEDIUM CLAY	7	150	1.1	NS	**5.7**	A1
TP61 **0.90-1.00**	7/5/2020	HEAVY CLAY	6	300	1.8	NS	**5.2**	A2
TP61 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	310	1.9	NS	**5.3**	A2
TP61 **1.90-2.00**	7/5/2020	HEAVY CLAY	6	280	1.7	NS	**5.4**	A2
TP62 **0.40-0.50**	7/5/2020	LIGHT CLAY	9	34	0.3	NS	**5.7**	A1
TP62 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	49	0.3	NS	**5.5**	A2
TP63 **0.40-0.50**	7/5/2020	LIGHT CLAY	9	250	2.3	SS	**5.7**	A1
TP63 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	1000	6.0	MS	**6**	A1
TP64 **0.40-0.50**	7/5/2020	MEDIUM CLAY	7	440	3.1	SS	**6.5**	A1
TP64 **0.90-1.00**	7/5/2020	MEDIUM CLAY	7	730	5.1	MS	**6.1**	A1
TP64 **1.40-1.50**	7/5/2020	MEDIUM CLAY	7	720	5.0	MS	**6.7**	A1
TP64 **1.90-2.00**	7/5/2020	MEDIUM CLAY	7	590	4.1	MS	**6.4**	A1
TP65 **0.40-0.50**	7/5/2020	LIGHT CLAY	9	47	0.4	NS	**5.8**	A1

TP65 **1.40-1.50**	7/5/2020	HEAVY CLAY	6	100	0.6	NS	**5.4**	A2
TP66 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	90	0.8	NS	**5.7**	A1
TP66 **1.40-1.50**	6/5/2020	MEDIUM CLAY	7	140	1.0	NS	**5.2**	A2
TP67 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	110	1.0	NS	**5.8**	A1
TP67 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	760	4.6	MS	**4.2**	A2
TP68 **0.40-0.50**	6/5/2020	MEDIUM CLAY	7	41	0.3	NS	**5.7**	A1
TP68 **1.40-1.50**	6/5/2020	LIGHT CLAY	9	51	0.5	NS	**4.8**	A2
TP69 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	56	0.5	NS	**5.6**	A1
TP69 **1.40-1.50**	6/5/2020	SANDY LOAM	9	44	0.4	NS	**5.5**	A2
TP70 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	40	0.4	NS	**5.4**	A2
TP70 **1.40-1.50**	6/5/2020	LIGHT CLAY	9	43	0.4	NS	**5.1**	A2
TP71 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	460	2.8	SS	**4.9**	A2
TP71 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	1400	8.4	VS	**4.5**	A2
TP72 **0.40-0.50**	6/5/2020	MEDIUM CLAY	7	48	0.3	NS	**5.7**	A1
TP72 **1.40-1.50**	6/5/2020	SANDY LOAM	9	28	0.3	NS	**5.5**	A2
TP73 **0.40-0.50**	6/5/2020	LIGHT CLAY	9	44	0.4	NS	**5.8**	A1
TP73 **1.40-1.50**	6/5/2020	SANDY LOAM	9	29	0.3	NS	**5.7**	A1
TP74 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	300	1.8	NS	**5.6**	A1
TP74 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	540	3.2	SS	**5.1**	A2
TP75 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	290	1.7	NS	**5.1**	A2
TP75 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	530	3.2	SS	**4.8**	A2
TP77 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	490	2.9	SS	**5.1**	A2
TP77 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	420	2.5	SS	**5.2**	A2
TP78 **0.40-0.50**	5/5/2020	HEAVY CLAY	6	100	0.6	NS	**5.1**	A2
TP78 **1.40-1.50**	5/5/2020	SANDY LOAM	9	690	6.2	MS	**4.3**	A2
TP79 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	57	0.3	NS	**5.3**	A2
TP79 **1.10-1.20**	6/5/2020	SANDY LOAM	9	39	0.4	NS	**5.6**	A1
TP80 **0.40-0.50**	6/5/2020	HEAVY CLAY	6	190	1.1	NS	**5.2**	A2
TP80 **0.90-1.00**	6/5/2020	HEAVY CLAY	6	150	0.9	NS	**5**	A2
TP80 **1.40-1.50**	6/5/2020	HEAVY CLAY	6	89	0.5	NS	**5.4**	A2
TP80 **1.90-2.00**	6/5/2020	HEAVY CLAY	6	79	0.5	NS	5.4	A2

Salinity:	Non Saline (NS)	96	58.2%	**pH:**	pH_{MAX}	7.1	
	Slightly Saline (SS)	42	25.5%		pH_{MIN}	3.7	
	Moderately Saline (MS)	26	15.8%		pH≤4.5	6	
	Highly Saline (HS)	0	0.0%		pH>4.5	110	pH≤5.5
	Very Saline (VS)	1	0.6%		pH>5.5	49	

Construction Sciences Pty Ltd
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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Vipul DeSilva**

Report **718188-S**
Project name LUDDENHAM ROAD ORCHARD HILLS HBB
Project ID 5017200153
Received Date May 07, 2020

Client Sample ID			**TP08 0.50M**	**TP08 1.50M**	**TP09 0.50M**	**TP09 1.50M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My10657**	**S20-My10658**	**S20-My10659**	**S20-My10660**
Date Sampled			**May 06, 2020**	**May 06, 2020**	**May 06, 2020**	**May 06, 2020**
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	150	230	79	33
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.4	5.3	5.3	5.5
% Moisture	1	%	23	-	22	-

Client Sample ID			**TP10 0.50M**	**TP10 1.50M**	**TP11 0.50M**	**TP11 1.50M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My10661**	**S20-My10662**	**S20-My10663**	**S20-My10664**
Date Sampled			**May 06, 2020**	**May 06, 2020**	**May 06, 2020**	**May 06, 2020**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	-	-	71	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	400	430	53	360
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.4	5.5	5.8	4.9
Sulphate (as SO4)	10	mg/kg	-	-	19	-
% Moisture	1	%	19	-	21	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	13	-

Client Sample ID			**TP12 0.50M**	**TP12 1.50M**	**TP13 0.50M**	**TP13 1.50M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-My10665**	**S20-My10666**	**S20-My10667**	**S20-My10668**
Date Sampled			**May 06, 2020**	**May 06, 2020**	**May 06, 2020**	**May 06, 2020**
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	53	140	200	280
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.8	5.1	4.9	5.8
% Moisture	1	%	22	-	21	21
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	16	-

Client Sample ID			TP66 0.50M	TP66 1.50M	TP67 0.50M	TP67 1.50M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10669	S20-My10670	S20-My10671	S20-My10672
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	-	-	-	1900
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	90	140	110	760
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.7	5.2	5.8	4.2
Sulphate (as SO4)	10	mg/kg	-	-	-	< 10
% Moisture	1	%	-	10	-	17
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	15	-	6.7

Client Sample ID			TP68 0.50M	TP68 1.50M	TP69 0.50M	TP69 1.50M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10673	S20-My10674	S20-My10675	S20-My10676
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	41	51	56	44
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.7	4.8	5.6	5.5
% Moisture	1	%	-	16	-	19

Client Sample ID			TP70 0.50M	TP70 1.50M	TP71 0.50M	TP71 1.50M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10677	S20-My10678	S20-My10679	S20-My10680
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	40	43	460	1400
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.4	5.1	4.9	4.5
% Moisture	1	%	30	-	15	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	8.5	-	-	-

Client Sample ID			TP72 0.50M	TP72 1.50M	TP73 0.50M	TP73 1.50M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10681	S20-My10682	S20-My10683	S20-My10684
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	28	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	48	28	44	29
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.7	5.5	5.8	5.7
Sulphate (as SO4)	10	mg/kg	50	-	-	-
% Moisture	1	%	19	-	21	14
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	9.1

Client Sample ID			TP74 0.50M	TP74 1.50M	TP75 0.50M	TP75 1.50M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10685	S20-My10686	S20-My10687	S20-My10688
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	300	540	290	530
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.6	5.1	5.1	4.8
% Moisture	1	%	23	-	-	16

Client Sample ID			TP77 0.50M	TP77 1.50M	TP79 0.50M	TP79 1.20M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10689	S20-My10690	S20-My10691	S20-My10692
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	-	-	-	32
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	490	420	57	39
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.1	5.2	5.3	5.6
Sulphate (as SO4)	10	mg/kg	-	-	-	26
% Moisture	1	%	-	16	-	11

Client Sample ID			TP80 0.50M	TP80 1.00M	TP80 1.50M	TP80 2.00M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-My10693	S20-My10694	S20-My10695	S20-My10696
Date Sampled			May 06, 2020	May 06, 2020	May 06, 2020	May 06, 2020
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	-	-	93	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	190	150	89	79
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.2	5.0	5.4	5.4
Sulphate (as SO4)	10	mg/kg	-	-	40	-
% Moisture	1	%	-	16	14	13
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	16

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	May 12, 2020	28 Days
- Method: E045 /E047 Chloride			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	May 13, 2020	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Sulphate (as SO4)	Sydney	May 12, 2020	28 Days
- Method: E045 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	May 13, 2020	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	May 14, 2020	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Sydney	May 08, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Project Name: LUDDENHAM ROAD ORCHARD HILLS HBB
Project ID: 5017200153

Order No.: 5017200153
Report #: 718188
Phone: 02 9854 1700
Fax:

Received: May 7, 2020 9:31 AM
Due: May 14, 2020
Priority: 5 Day
Contact Name: Vipul DeSilva

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Chloride	Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Moisture Set	Cation Exchange Capacity
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	TP08 0.50M	May 06, 2020		Soil	S20-My10657		X	X		X	
2	TP08 1.50M	May 06, 2020		Soil	S20-My10658		X	X			
3	TP09 0.50M	May 06, 2020		Soil	S20-My10659		X	X		X	
4	TP09 1.50M	May 06, 2020		Soil	S20-My10660		X	X			
5	TP10 0.50M	May 06, 2020		Soil	S20-My10661		X	X		X	
6	TP10 1.50M	May 06, 2020		Soil	S20-My10662		X	X			
7	TP11 0.50M	May 06, 2020		Soil	S20-My10663	X		X	X	X	X
8	TP11 1.50M	May 06, 2020		Soil	S20-My10664		X	X			
9	TP12 0.50M	May 06, 2020		Soil	S20-My10665		X	X		X	
10	TP12 1.50M	May 06, 2020		Soil	S20-My10666		X	X			

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Site # 1254 & 14271

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IANZ # 1290

Company Name: Construction Sciences Pty Ltd
Address: 2/4 Kellogg Rd
Glendenning
NSW 2761

Project Name: LUDDENHAM ROAD ORCHARD HILLS HBB
Project ID: 5017200153

Order No.: 5017200153
Report #: 718188
Phone: 02 9854 1700
Fax:

Received: May 7, 2020 9:31 AM
Due: May 14, 2020
Priority: 5 Day
Contact Name: Vipul DeSilva

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Chloride	Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	Sulphate (as SO4)	Moisture Set	Cation Exchange Capacity
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
11	TP13 0.50M	May 06, 2020		Soil	S20-My10667			X		X	X
12	TP13 1.50M	May 06, 2020		Soil	S20-My10668		X	X		X	
13	TP66 0.50M	May 06, 2020		Soil	S20-My10669		X	X			
14	TP66 1.50M	May 06, 2020		Soil	S20-My10670			X		X	X
15	TP67 0.50M	May 06, 2020		Soil	S20-My10671		X	X			
16	TP67 1.50M	May 06, 2020		Soil	S20-My10672	X		X	X	X	X
17	TP68 0.50M	May 06, 2020		Soil	S20-My10673		X	X			
18	TP68 1.50M	May 06, 2020		Soil	S20-My10674		X	X		X	
19	TP69 0.50M	May 06, 2020		Soil	S20-My10675		X	X			
20	TP69 1.50M	May 06, 2020		Soil	S20-My10676		X	X		X	
21	TP70 0.50M	May 06, 2020		Soil	S20-My10677			X		X	X
22	TP70 1.50M	May 06, 2020		Soil	S20-My10678		X	X			
23	TP71 0.50M	May 06, 2020		Soil	S20-My10679		X	X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271										X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
24	TP71 1.50M	May 06, 2020		Soil	S20-My10680		X	X			
25	TP72 0.50M	May 06, 2020		Soil	S20-My10681	X	X	X	X	X	
26	TP72 1.50M	May 06, 2020		Soil	S20-My10682		X	X			
27	TP73 0.50M	May 06, 2020		Soil	S20-My10683		X	X		X	
28	TP73 1.50M	May 06, 2020		Soil	S20-My10684			X		X	X
29	TP74 0.50M	May 06, 2020		Soil	S20-My10685		X	X		X	
30	TP74 1.50M	May 06, 2020		Soil	S20-My10686		X	X			
31	TP75 0.50M	May 06, 2020		Soil	S20-My10687		X	X			
32	TP75 1.50M	May 06, 2020		Soil	S20-My10688		X	X		X	
33	TP77 0.50M	May 06, 2020		Soil	S20-My10689		X	X			
34	TP77 1.50M	May 06, 2020		Soil	S20-My10690		X	X		X	
35	TP79 0.50M	May 06, 2020		Soil	S20-My10691		X	X			
36	TP79 1.20M	May 06, 2020		Soil	S20-My10692	X	X	X	X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271										X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
37	TP80 0.50M	May 06, 2020		Soil	S20-My10693		X	X			
38	TP80 1.00M	May 06, 2020		Soil	S20-My10694		X	X		X	
39	TP80 1.50M	May 06, 2020		Soil	S20-My10695	X	X	X	X	X	
40	TP80 2.00M	May 06, 2020		Soil	S20-My10696			X		X	X
Test Counts						5	33	40	5	23	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	101			70-130	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	%	108			70-130	Pass	
Sulphate (as SO4)	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10657	CP	uS/cm	150	150	1.1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S20-My10657	CP	pH Units	5.4	5.4	Pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10660	CP	uS/cm	33	36	7.2	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S20-My10660	CP	pH Units	5.5	5.4	Pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10670	CP	uS/cm	140	140	2.1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S20-My10670	CP	pH Units	5.2	5.1	Pass	30%	Pass	
% Moisture	S20-My10670	CP	%	10	12	17	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10680	CP	uS/cm	1400	1400	4.3	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S20-My10680	CP	pH Units	4.5	4.6	Pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S20-My10681	CP	mg/kg	28	24	14	30%	Pass	
Sulphate (as SO4)	S20-My10681	CP	mg/kg	50	58	15	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10688	CP	uS/cm	530	550	3.9	30%	Pass	
% Moisture	S20-My10688	CP	%	16	17	9.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S20-My10690	CP	uS/cm	420	410	2.1	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S20-My10690	CP	pH Units	5.2	5.2	Pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Ursula Long	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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