Environmental Assessment and Management Plan

Warmun Landfill Development

Government of **Western Australia**
Department of **Communities**

Prepared for Department of Communities

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Name	Position	File Reference
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1 Introduction

The Aboriginal community of Warmun currently uses a local putrescible landfill located on Lot 915 Aboriginal Lands Trust, Crown Reserve Land, accessed via an unsealed road off Boolardy-Woolen Road, approximately 1km from the town centre. The existing landfill is reaching operational capacity requiring the development of a new landfill site (the Site). Talis Consultants Pty Ltd (Talis) has been engaged by the Department of Communities (Communities) to develop and identify a suitable site for a new landfill that generally complies with the *WA Environment Protection Regulations 2002* (Rural Landfill Regulations) as Communities intends to register the new site as a Category 89 landfill.

The Site will provide long term waste management to the community, including a putrescible landfill and a community drop-off area for scrap metal, tyres, greenwaste, white goods and car batteries.

A Works Approval from the Department of Water and Environmental Regulation (DWER) is required to construct a proposed landfill. This Environmental Assessment and Management Plan (EAMP) has been prepared to support the Works Approval application for the Site by outlining the existing environmental attributes, detailed designs, proposed construction works, and environmental management measures to be implemented.

1.1 Report Objectives

The key objectives of this EAMP are to:

- Provide the design, construction and operational details of the Site;
- Outline the environmental and social aspects requiring management;
- Undertake a residual risk assessment in accordance with the DWER's *Guidance Statement: Risk Assessments* (2017); and
- Demonstrate that the proposed management measures adequately manage potential environmental risks.

1.2 Scope of the Report

To satisfy the objectives outlined in Section 1.1, this report contains the following sections:

- Section 2: Site Information
- Section 3: Environmental Attributes
- Section 4: Social Attributes
- Section 5: Infrastructure Layout & Design
- Section 6: Operational Aspects
- Section 7: Environmental Aspects and Management
- Section 8: Residual Risk Assessment
- Section 9: Conclusion.

2 Site Information

The following sections provide an overview of the key aspects of the Site, including its location, registration, surrounding land uses, and sensitive receptors.

2.1 Site Location and Access

The Site is situated within the Shire of Halls Creek, approximately 145km north of Halls Creek townsite. Access to the Site is via the eastern end of Warmun Road. The existing site occupies an area of 0.63 hectares (ha). The Site is planned on Lot 915, located approximately 200 meters (m) southeast of the existing site and encompasses approximately 5.8ha. It is part of Crown Reserve 34593 Aboriginal Lands Trust. Lot 915 is located within Lot 500 which also covers parts of the Warmun townsite.

Communities have indicated that there are 98 households and a full-time residential population of 228 people within the community.

A summary of the Site details is provided in Table 2-1.

Table 2-1: Site Details

Detail	Description
Land Description	Lot 915 on Plan 72451
Crown Reserve	Type “3 R” Reserve 34593
Street Address	Warmun Road, Warmun

A locality plan of the Site is provided in Figure 1, in Appendix A.

2.2 Historic, Current and Future Activities

The following sections provide an overview of the current and future activities at the Site.

2.2.1 Historic and Current Activities

The existing landfill is unregistered and undertakes landfill trenching. Operation of the existing landfill and waste collection is managed by the Warmun community. The Site is unmanned and there are no restrictions on community access.

There is currently one active landfill trench which can be accessed by members of the community. A review of aerial imagery shows that the existing site has been in operation since 2011/2012, with historical waste placement from north to south and covering about 80% of the site, indicating that the site is nearing its operational capacity. Following waste placement and capping aerial imagery indicates that this area is currently being utilised as a community drop-off area for a variety of materials, including but not limited to, green waste and scrap metal.

2.2.2 Future Activities

Communities is planning to develop a new landfill facility at the Site, which will be situated at a new location in proximity to the existing site, directly southeast of the existing wastewater ponds. The new

facility is intended to cater for all municipal waste streams from the Warmun community, and its proposed location is show in Figure 2 (Appendix A).

The Site is also to have a number of dedicated single-material storage areas which include the following:

- Scrap metal stockpile area;
- Green waste stockpile area;
- White goods/bulky item stockpile area; and
- Car battery stockpile area.

2.2.3 Waste Quantities

Historic waste acceptance data has not been collected at the existing site. This is because the acceptance volume is minimal, there has been no requirement to report to DWER, and it is not feasible for the landfill site to be manned or to install a weighbridge. Alternately, waste volumes can be estimated using population data as waste generation is often closely linked with population and waste generation can be estimated based on reported figures. This approach can be used to generate estimated landfill tonnages and average annual growth.

A per capita waste generation rate of 1.2 tonnes per annum (tpa) was assumed based on typical waste generation rates for regional and remote towns in WA. A cover soil volume and waste compaction factor were applied to the waste generation rate to calculate the landfill volume required to dispose of the waste volume, referred to as the landfill consumption rate. It is assumed that waste disposed at the Site will not be compacted due to the lack of availability of plant equipment, therefore the waste compaction factor is assumed to be 0.3t/m^3. Based on the volume of waste accepted and the monthly waste covering requirements, as outlined in the Rural Landfill Regulations, the cover soil volume has been estimated to be 50% of the waste volume. Using these values the per capita landfill consumption rate is estimated to be 6m^3.

Table 2-2 outlines the values used to calculate the landfill consumption rate.

Table 2-2: Generation Estimate

Aspect	Value
Estimate Waste Generation per Capita (tpa)	1.2
Waste Compaction Factor (t/m^3)	0.3
Cover Soil % Waste Volume	50%
Landfill Consumption Rate per Capita (m^3/year)	6
Community Population (No.)	228
Total Annual Consumption (m^3/year)	1,368

As discussed in Section 2.1, the population of Warmun is 228 and is not predicted to increase, therefore it is assumed that the population will remain the same for the purpose of landfill sizing. Using the per capita consumption rate outlined in Table 2-2, the total annual consumption rate is calculated to be 1,368m^3.

2.3 Site Registration

Communities intends to apply for registration for the Site as a Category 89 prescribed premises under Part 2 of Schedule 1 of the *Environmental Protection Regulations 1987*. Details of the prescribed premises category is listed in Table 2-3.

Table 2-3: Current Prescribed Premises Categories

Category No.	Name	Description	Production or Design Capacity	Expected Maximum Throughput
89	Putrescible Landfill Site	Premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer, as amended from time to time) is accepted for burial	More than 20 but less than 5,000 tonnes per annum	300 tonnes per annum

A Works Approval application for the construction must first be submitted under Part V of the *Environmental Protection Act 1986* and will include an allowance for time-limited operations to enable the Site to be used as soon as possible. It is not expected that the waste management activities will require the Site be licenced as acceptance volumes will not exceed the limits outlined in Schedule 1 of the *Environmental Protection Regulations 1987.* Therefore, once a Works Approvals has been obtained, a Registration application will be lodged.

2.4 Zoning and Surrounding Land Use

According to the Western Australian Planning Commission, the area earmarked for the Site has already been zoned as a waste disposal facility[1]. To the northwest of the Site is the community's septage wastewater pond system. The remaining area surrounding the Site is undisturbed native grass and shrub land.

2.5 Sensitive Receptors

The Environmental Protection Authority (EPA's) *Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses (2005)* (Guidance Statement 3) contains the recommended separation distances between industrial activities, including waste management facilities, and sensitive land uses. Sensitive land uses are defined by the EPA as those that are sensitive to industrial emissions and include residential developments, schools, hospitals, shopping centres and other public areas and buildings. Table 2-4 provides the recommended minimum separation distances between sensitive land uses and the prescribed premises categories for which the Site is currently registered.

[1] Warmun Layout Plan 2 – Context. Amendment 1. Western Australian Planning Commission. 7 December 2020

Table 2-4: Recommended Separation Distances between Industrial and Sensitive Land Uses

Category No.	Industry	Impacts					Recommended Separation Distance
		Gaseous	Noise	Dust	Odour	Risk	
89	**Class II or III putrescible landfill Site**	✓	✓	✓	✓		500m for subdivisions 150m for single residences 35m internal buffer from Site boundary

The Site, once registered, will meet all separation distance requirements as summarised in Guidance Statement 3. The nearest sensitive receptors to the Site are residential properties, located 569m to the west and 862m to the northwest. The closest sensitive receptor classed as community land use is the Art Centre and Walumba Elder Centre which are located 820m southwest and 990m west of the Site, respectively.

The location of these identified sensitive receptors are presented in Figure 3, in Appendix A.

2.6 Stakeholder Engagement

Officers from Communities have undertaken consultation with the following key stakeholders within the Warmun Community:

- Warmun Community (Turkey Creek) Incorporated (WCI), the registered community representative body; and
- Yurriyangem Taam Aboriginal Corporation (YTAC), the registered Native Title Holder body.

Representatives of the Remote Communities Fund (RCF) Project Working Group met with WCI and discussed the scope of the RCF work, including the landfill. WCI provided an 'in-principle' letter of support, which has been provided as an attachment to the Works Approval application form.

On 1 April 2025, an RCF PWG member met with the CEO of Warmun Community, Jack McHugh, to discuss the progression of planning for the landfill. The CEO advised that the community was supportive of an up to date landfill.

Officers from Communities discussed the Public Works Agreement (PWA) with the WCI Board on 16 April 2025 and received their approval to construct the landfill on the agreed site. The PWA, which contains a letter of endorsement from the Board, is provided as an attachment to the Works Approval application form.

Consultation with YTAC is ongoing and any updates will be provided to the DWER when available.

3 Environmental Attributes

The following section outlines the key environmental attributes that are relevant to the Site's design, including climate, topography, geology, hydrogeology (groundwater), hydrology (surface water) and other key attributes.

3.1 Climate

The closest Bureau of Meteorology (BOM) weather station with long-term data is Warmun (Station No. 2032), approximately 800m north of the Site. The prevailing wind and temperature and rainfall information was sourced from this weather station. However, pan evaporation data was not available from this station. Therefore, this parameter has been sourced using the Scientific Information for Land Owners (SILO), a database of Australian climate data from 1889 to the present day that is hosted by the Queensland Department of Environment, Tourism Science and Innovation. It provides daily meteorological datasets for a range of climate variables in ready-to-use formats suitable for biophysical modelling, research, and climate applications. The datasets are constructed from observational data obtained from BOM, using mathematical interpolation techniques to infill gaps in time series and construct spatial grids. The spatial grid selected (Latitude: 17.02, Longitude: 128.22) encompasses the Site in its entirety.

The climate of the Site is considered to be tropical wet-dry as per the Köppen classification system used by the BOM. The local climate is defined by distinct wet and dry seasons. Table 3-1 presents a summary of BOM and SILO weather data from 1962-2023.

Table 3-1: Monthly Climate Statistics Summary from 1962 – 2023

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Rainfall (mm)	182	175	118	25	10	6	6	1	5	23	64	119	732
Mean Evaporation (mm)	240	201	218	216	197	171	187	224	267	306	290	273	2,790
Mean Max Temp (˚C)	37	36	36	35	32	30	30	32	36	39	39	38	35
Mean Min Temp (˚C)	25	24	23	21	17	14	13	15	19	23	25	25	20

The annual average rainfall recorded at Warmun since records began is 732mm, with the minimum and maximum values ranging from 1mm and 182mm, respectively. The average annual potential evaporation rate is approximately 2,790mm, which is substantially higher than the average annual rainfall and occurs at higher rates of up to 306mm per month during the warmer, drier months of the year.

The Site is subject to heavy rainfall events which can result in flooding. During the 2011 flood event the highest annual rainfall of 1,566mm with a peak of 650mm in March was recorded. According to the *Turkey Creek Flood Study: Warmun (the Flood Study)* undertaken by DWER (then Department of Water) in 2011, this flood event is considered to be a '1-in-50' to '1-in-100' year event.

The wind direction generally stays relatively consistent throughout the day and does not show significant changes between in the morning (9am) and in the afternoon (3pm). Winds at the Site are

typically moderate in the morning and the afternoon. The wind rose for morning and afternoon winds can be seen in Diagram 4-1.

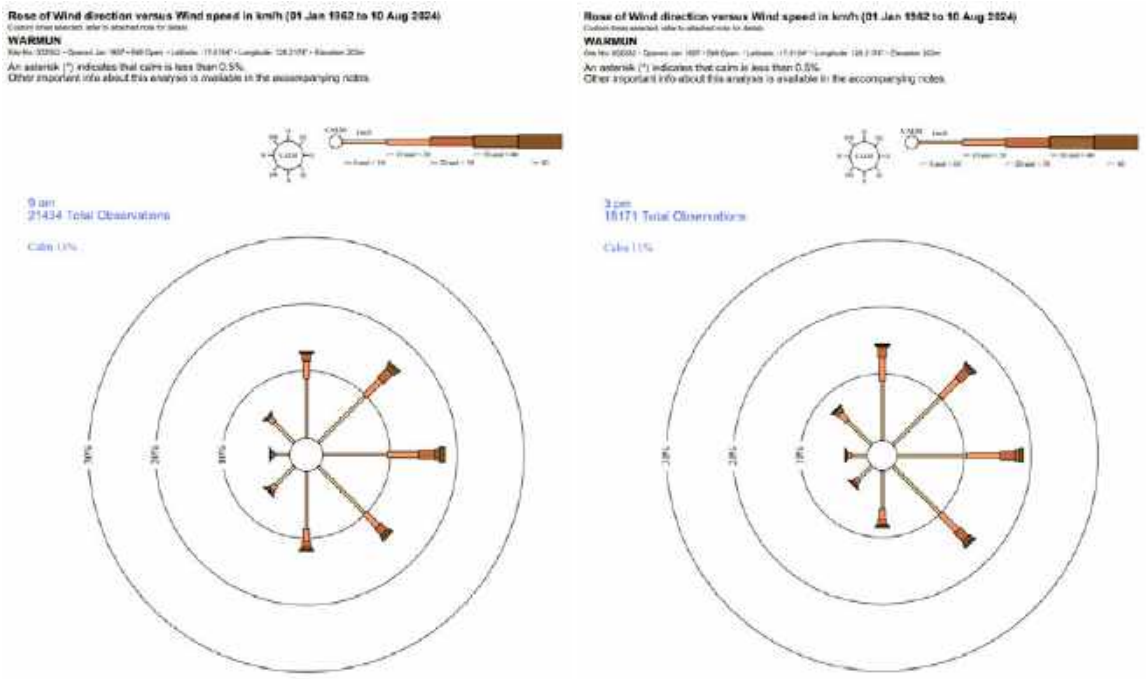

Diagram 4-1: 9am (left) and 3pm (right) Wind Rose for Warmun Station

3.2 Topography

Topography at the Site is relatively flat, with natural ground elevations at 210m Australian Height Datum (AHD). To the west of the existing site there is an elevated area of up to 230mAHD.

The general topography of the Site is shown in Figure 2, presented in Appendix A.

3.3 Flora and Fauna

3.3.1 Threatened and Priority Fauna

A search of the DCCEEW's Protected Matters Search Tool suggests the potential occurrence of Threatened Species within the Site with a search radius of 2km. The mapping tool indicates that 13 fauna species may be present in the region, including mammals, birds and reptiles, as listed in Table 3-2.

It is noted that the mapping of these species' presence likely encompasses the entire area and may not accurately reflect specific occurrences within the region, this is likely due to the limited availability of detailed flora and fauna studies conducted in the region and reliance on generalised data from similar areas. The mapping of these species is not expected to affect the development of the Site.

Table 3-2: Warmun Threatened and Priority Flora and Fauna

Species	Type/Classification	Class
Australian Painted Snipe	Endangered	Bird
Gouldian Finch	Endangered	Bird
Night Parrot	Endangered	Bird
Red Goshawk	Endangered	Bird
Grey Falcon	Vulnerable	Bird
Curlew Sandpiper	Critically Endangered	Bird
Sharp-tailed Sandpiper	Vulnerable	Bird
Northern Brushtail Possum	Vulnerable	Mammal
Greater Bilby	Vulnerable	Mammal
Ghost Bat	Vulnerable	Mammal
Merten's Water Monitor	Endangered	Reptile
Mitchell's Water Monitor	Critically Endangered	Reptile
Northern Blue-tongued Skink	Critically Endangered	Reptile

A search of the Department of Biodiversity, Conservation and Attraction's (DBCA's) database indicated that there were no records of threatened or priority fauna being present at the Site. However, approximately 930 meters north of the Site one Priority 4 and one specially protected species were identified.

Threatened and priority fauna mapping is presented in Figure 4, in Appendix A.

3.3.2 Declared Rare and Priority Flora

The DBCA's Threatened and Priority Flora Database indicate that there are no rare or priority flora present within or 2km surrounding the Site.

3.3.3 Threatened and Priority Ecological Communities

A search of the DBCA's Priority Ecological Communities database indicate that the Site is located within a priority ecological community area.

PEC mapping is presented in Figure 4, in Appendix A.

3.4 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared in Environmental Protection (Clearing of Native Vegetation) Regulations 2004 as areas that cover any and/or all of the following conservation significant areas:

- A declared World Heritage property as defined in section 13 of the Environment Protection and Biodiversity Conservation Act 1999;

- An area that is included on the Register of the National Estate, because of its natural heritage value under the Australian Heritage Council Act 2003;
- A defined wetland and the area within 50 metres of the wetland;
- The area covered by vegetation within 50 metres of rare (threatened) flora, to the extent to which the vegetation is continuous with the vegetation in which the rare (threatened) flora is located;
- The area covered by a TEC;
- A Bush Forever site listed in "Bush Forever" Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission;
- The areas covered by the Environmental Protection (Gnangara Mound Crown Land) Policy 1992;
- The areas covered by the Environmental Protection (Western Swamp Tortoise Habitat) Policy 2002;
- The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies; and
- Protected wetlands as defined in the Environmental Protection (Southwest Agricultural Zone Wetlands) Policy 1998.

There are no ESAs within or directly surrounding the Site. The closest ESA is the Purnululu Conservation Reserve, located 4km to the south of the Site.

3.5 Geology

According to National Map (https://nationalmap.gov.au/), the surface geology at the Site is Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; which may include minor alluvial or sand plain deposits, local calcrete and reworked laterite. Soils in the area are characterised by red sandy earth soils.

The *Geotechnical Site Classification Report* (Geotechnical Report) prepared by Local Geotechnics presents findings of site investigations conducted in December 2024. The Geotechnical Report classified the soil as follows:

- 0.0 – 1.0 m: Uncontrolled Fill, Sandy clay (CL) – low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, grass, moist, firm to stiff;
- 1.0 – 1.7 m: Sandy Gravel (GW) – fine to medium grained, sub-angular gravel up to 60 mm in size at depths, grey, with fine to medium grained sand, moist, dense to very dense, extended up to maximum investigated depth (Local Geotechnics, 2025).

The Geotechnical Report is provided in Appendix B.

3.6 Hydrology

According to National Map, the Site is part of the Upper Ord River catchment and is located 80m from Turkey Creek which is subject to seasonal flooding. BoM's Flood Watch Area Map indicates that this region is located on Flood Watch Area No.2 (East Kimberley Rivers). The Site is not included within the 'FPM Historical Extent of Flooding'. However, it is located in the '1 in 100 AEP Floodplain Development Area'.

A review of Floodplain mapping for March 2011 presented in the *Flood Study* (DWER, 2011) indicates that the Site area is above the observed flood level.

Floodplain mapping of the Site is shown in Figure 5, presented in Appendix A.

3.7 Hydrogeology

The hydrogeology on Site is identified as local aquifers of generally low productivity.

Global Groundwater conducted an appraisal of Bore 2/90 and Roadhouse Bore in 2009, the *Warmun (Turkey Creek) Community Bore 2/90 Appraisal* report. Based on groundwater level data from Bore 2/90 and the Roadhouse Bore, it can be inferred that the groundwater level at the Site is deeper than 7 meters below ground level (mbgl). Bore 2/90, located at an elevation greater than 200mAHD, has a groundwater level of 8mbgl, while the Roadhouse Bore, at approximately 210mAHD, has a groundwater level of 9.6mbgl.

Given that the Site is situated between 205-208mAHD and is located within 1km of the bores, a similar trend in groundwater depth suggests that the water table at this location would be deeper than 7mbgl.

The hydrogeology mapping of the Site is shown in Figure 6, presented in Appendix A.

3.8 Bushfire Prone Areas

Disaster mapping from Landgate indicates that the Site is within a Bushfire Prone Area, shown in Figure 7, presented in Appendix A. Refer to Section 7.11 for fire management measures on Site.

4 Social Attributes

4.1 Native Title

Under Australian Law, Native Title is a form of land title that recognises the unique connections Aboriginal groups have to the land. Native Title exists where Aboriginal people have maintained a traditional connection to their land and waters, since sovereignty, and where acts of government have not removed it. Under the Native Title Act 1993 a Native Title determination confirms the rights and interests of Indigenous people to land and waters according to their traditional laws and customs. This determination grants the Native Title holders certain rights over the land, which can influence how the land is used and developed.

A review of the National Native Titles Tribunal *National Native Title Register* indicates that exclusive Native Title rights and interests are shown to exist over both the existing site and the Site, as per the Yurriyangem Taam Determination (Determination reference WCD2019/006).

Native Title mapping of the Site is shown in Figure 8, presented in Appendix A.

4.2 Aboriginal Heritage

A search of the DPLH's Aboriginal Heritage Places dataset identified that the Site has no known Aboriginal Cultural Heritage sites within its boundaries. The two Aboriginal Cultural Heritage sites "Turkey Creek" (ID: DBCA 13761) and "Telecom 18A old" are located 1.7km and 2.2km west of the Site.

The identified sites are presented in Figure 9, presented in Appendix A.

4.3 Mining Tenements

A review of the Department of Mines, Industry Regulation and Safety (DMIRS) mining tenement data indicated that the Site is located within a mining tenement (Id E8005724) that is classed under exploration licence held by IGO Newsearch PTY LTD.

Mining tenements surrounding the Site are shown in Figure 10, presented in Appendix A.

5 Infrastructure Layout and Design

Talis has developed a Site layout in consultation with Communities to determine the size requirements and location of future waste management activities at the Site. The infrastructure included in the conceptual site design layout include:

- Landfill trenches for putrescible waste (constructed progressively);
- Community drop-off area;
- Stock-proof fencing; and
- Surface water management system.

Figure 2 presented in Appendix A outlines the proposed Site layout, and all proposed infrastructure is discussed further in the following sub-sections.

5.1 Landfill

The following sections outline the design considerations and details that will be incorporated over the landfill facility's anticipated lifespan.

5.1.1 Landfill Trench Design

The landfill trench design has been based on the waste quantities discussed in Section 2.2.3 and best practice design principles. The base of the landfill trenches will be 4m below the surrounding natural ground level, aligning with expected groundwater levels and geological conditions. The landfill slopes will be 4m deep at a 1:3 (V:H) gradient along the northwest, northeast, and southeastern walls.

The volume for each landfill trench was determined based on the estimated total landfill consumption rate over the 16-year period. The required landfill trench volume and depth were then used to determine an appropriate length and width. A width of 30m and a length of 100m were selected to meet design criteria while minimising the effects of wind and surface water flow. To minimise environmental impact, landfill trenches have been designed to be operational for approximately 4 years. It is estimated that four trenches will be required to meet the demand of a 16-year landfill operational capacity.

The base for each landfill will consist of in-situ soils. Bunds will be constructed around the perimeter of the active landfill trench to divert surface water run-off from coming in contact with waste and as a health and safety measure for when community members enter the facility. The bunds will be 0.5m high, a minimum of 2m wide at 1:4 (V:H) slopes, and will be constructed of site-won soils.

Drawing W-102 in Appendix C shows an indicative Site layout and typical trench and bund details. The detailed trench design modelling is presented in Appendix D.

5.1.2 Layout and Siting

The layout and siting of each landfill trench is also important to ensure compliance with the Rural Landfill Regulations and to maintain adequate environmental controls.

A stock-proof fence will surround the Site and will be located at a minimum 8m from the edge of the landfill surface water bunds. While this is not in compliance with the Rural Landfill Regulations 9(a), Communities is requesting an exemption due to the facility's small size, the low volume of waste

generated, and the site's remote location. This fence is intended to deter most fauna from accessing the landfill and to contain windblown litter to within the landfill facility boundary. The 8m separation distance still allows for eventually capping of the trench and manoeuvrability around the capped trench by plant/machinery, if required.

Each landfill trench will have a maximum width of 30m to ensure compliance with the tipping area restrictions outlined in the Rural Landfill Regulations.

The layout of the Site is shown in Figure 2, presented in Appendix A. Typical fence details are shown in Drawing W-301, presented in Appendix C.

5.1.3 Proposed Final Fill Profile

The final fill profile of waste will be limited to ground level, with restoration soils placed on top to create a final landform compliant with the Rural Landfill Regulations. This is anticipated to significantly reduce windblown litter at the Site and ensure that environmental impact of landfilling activities is minimised. It is anticipated that landfill trenches will be covered within a year of completion.

5.1.4 Cap Design

The recommended capping system for the landfill trenches at the Site is as follows, in order of construction, from bottom to top:

- 300mm Regulating Layer;
- 500mm Low-Permeability Soil Layer (if available on Site); and
- 500mm of Revegetation Layer.

The cap layers will consist of site-won materials excavated during the landfill trench excavation.

An additional capping layer of 200mm of green waste mulch can placed, if practical. This will promote the growth of the vegetation on the surface of the capping system, which will help minimise erosion.

5.1.5 Final Restoration Profile

The final restoration profile for the Site is based on the final fill profile and the proposed capping system design. The profile has a maximum height of 212mAHD, which is approximately 1.3m above existing ground level.

The landfill cap will feature slopes of 1:20 (V:H) above the waste mass and slopes of 1:5 (V:H) at the edge of the capping footprint. These slopes will encourage surface water shedding away from the waste mass.

The proposed final restoration profile provides the following key outcomes:

- The encapsulation of all waste disposed of in landfill trenches;
- Facilitate the conventional rehabilitation of the Site through compliance with the Rural Landfill Regulations;
- The development of a best practice landfill profile and side slopes which will:
    - Ensure the long-term stability and integrity of the capping system and environmental control systems (surface water management);

- Minimise the long-term maintenance requirements of the capping system; and
- Provide an aesthetically acceptable landform long-term and support further post-closure land uses.

5.2 Community Drop-off Area

The community drop-off area contains designated spaces for the stockpiling of a variety of material types that can be utilised by the community. These materials include the following:

- Scrap metal;
- Greenwaste;
- White goods/bulky items;
- Car Batteries; and
- Tyres.

Each material stockpile area will be sign posted. Drawing W-302 provides typical details for signage, as well as graphics for the materials listed above.

Figure 2, presented in Appendix A, outlines the siting of the community drop-off area.

5.3 Supporting Infrastructure

The following sections discuss the proposed supporting infrastructure at the Site.

5.3.1 Surface Water Management Infrastructure

Environmental risks associated with flooding and leachate will be managed through the implementation of surface water management infrastructure at the Site to prevent the infiltration of surface water into the waste mass and thereby preventing the production of leachate over time.

A Flood Protection Bund will be installed to protect the Site from external floodwaters. The Flood Protection Bund is proposed to be 1m high, and 9m wide with 1:4 (V:H) slopes, and will be constructed of non-dispersive site-won soils. The bund shall be constructed continuously along the perimeter of the Site and a 1:10 ramp will be constructed over the Flood Protection Bund in line with the gate to provide vehicle access.

A safety protection and surface water bund (Trench Bund) will be installed along the entire perimeter of each active landfill trench. The Trench Bund is proposed to be 0.5m high, 2m wide at the tip and 6m wide at the base, with 1:4 (V:H) slopes and will be constructed of non-dispersive site-won soils.

The design for the final capping system for landfill trenches features slopes of 1:20 (V:H) above the waste mass and slopes of 1:5 (V:H) at the edge of the capping footprint. These slopes will encourage surface water shedding away from the waste mass.

Typical details of the Flood Protection Bund and access ramp are shown in Drawing W-303, presented in Appendix C. Typical details of the Trench Bund are shown in Drawing W-102, presented in Appendix C.

5.3.2 Fire Management

5.3.2.1 *Offsite*

Due to the Site's location, there is a potential for offsite bushfires to occur. Extreme fire weather conditions, including low humidity, high temperatures, high winds, and cured vegetation will increase the likelihood of a bushfire occurring. Impacts from offsite bushfires will be limited to ember attack in most cases. Consequential fires from ember attack can occur in many locations, particularly in stockpiles of flammable waste streams such as green waste, tyres, and mattresses. Therefore, a 5-meter wide firebreak will be constructed and maintained around the boundary of the Site.

5.3.2.2 *Onsite*

A cover material stockpile will be maintained in proximity to the active landfilling area and to be used to smother a fire in the event that one occurs in a landfill trench. It is recommended that signage is installed on Site to inform visitors of the reporting and fire management procedures.

5.4 Project Timeline

The current estimated project timeline is shown in Table 5-1 based on the assumption that the DWER can complete the works approval assessment within 80 days. This timeline includes the environmental approvals, procurement, and construction phases for the Site.

Table 5-1: Project Timeline

Task	Start	End
Works Approval Assessment	April 2025	August 2025
Procurement	June 2025	July 2025
Construction	August 2025	October 2025
Operation	October 2025	---

5.5 Construction Quality Assurance and Technical Specification

To ensure the materials and construction of the new landfill facility meet the design criteria, a Technical Specification has been prepared. The Technical Specification details the earthworks, supply and installation of the Site's proposed infrastructure. A copy of the Technical Specification is provided in Appendix E.

5.6 Time Limited Operations

Communities requests that the DWER grant approval for time limited operations for the Site until such time a Registration is granted. It is understood that the maximum period for time limited operations is 180 days and therefore Communities wish to seek this timeframe to mitigate any potential risks associated with delays during the assessment stage for the Registration application. This request has been reflected within Part 4 of the DWER application form. As it is Communities' aim to establish the new Site infrastructure as soon as possible, the time limited operations period will ensure the Site is operational as soon as it is constructed, in accordance with the Works Approval conditions and detailed designs.

6 Operational Aspects

The implementation of appropriate management practices will ensure the successful management of landfill operations whilst minimising the risk of any long-term environmental impacts. The key factors for ensuring effective landfill management according to the Rural Landfill Regulations include:

- Maintaining a small tip face/working face as far as practicable;
- Correct waste placement/deposition; and
- Waste covering with suitable material and thickness.

To ensure the landfill is operated effectively and efficiently, the following section outlines the requirements for the active tip face size, waste placement including cover requirements, disposal activities during adverse weather conditions, and phasing of filling.

6.1.1 Phasing of Filling

Filling of each landfill trench should progress from the farthest point from its access point, back towards this point. Each landfill trench should be developed with adequate time to allow the smooth transition of landfill operations and relocation of environmental controls.

6.1.2 Tip Face Size

Waste deposited at the active tip face will be kept to a maximum of 30m long by 2m high in accordance with the Rural Landfill Regulations. With the trench width designed to range from 6 meters at the base to 30 meters at the capping edge, the maximum width will remain compliant. The tipping face should be kept as small as practicably possible to minimise leachate generation and reduce the required cover soil amounts.

6.1.3 Waste Placement

In general, the preferred method for the placement of waste is as follows:

- Unloading the waste from the trench edge to the tip face;
- Spreading and compacting waste in 500mm thick layers to form a 2m deep platform;
- Development of a level platform across the landfill width until the other side is reached; and
- Repetition of this procedure until the pre-settlement final fill landfill profile is reached.

Throughout the waste placement process, cover material is applied in line with Section 6.1.4.

6.1.4 Cover of Waste

An initial layer of suitable cover material is progressively applied to exposed waste on the top of the active landfill area. The covering of waste will assist with minimising odour, leachate generation, windblown litter, attraction of vermin, fire risk and general amenity. A stockpile of cover material sourced from the excavated surplus overburden soils from the trenches should be maintained close by to allow for easy installation of waste cover. The cover materials should be free of rocks and deleterious material with a diameter greater than the thickness of the cover soil layer. Based on the Rural Landfill Guidelines, waste at the Site should be covered on at least a monthly basis with a minimum of 300mm of cover soils due to the waste's high putrescible composition.

6.1.5 Adverse Weather Conditions

During periods of high winds and heavy rainfall events, the placement of waste should cease until it is deemed safe and acceptable to recommence works. Adverse weather conditions can result in the generation of leachate, litter and dust as well as general safety issues.

6.1.6 Full Site Inspections

To ensure compliance with the Rural Landfill Regulations it is recommended that full Site inspections should be undertaken at the Site on a monthly basis by a dedicated member of the community. The purpose of these full Site inspections is to inspect Site infrastructure to identify non-conformances and implement corrective actions where necessary. At a minimum, Site inspections should review the items described in Table 6-1.

Table 6-1: Proposed Full Site Inspection Contents

Item	Description
Landfill	• Road and hardstand areas intact / repairs or rectification required; • All signage and traffic control operating effectively (i.e., signs installed, in good condition, correct position and updated information); • Intermediate cover applied to filled areas; • Tip face being kept to minimum size and shaped for minimum cover placing; • No evidence of litter beyond the active tipping area; • No evidence of bird, vermin and / or feral animal activity; • No signs of dust generation; and • No noticeable odours present.
General Site	• Site vegetation control (i.e., no evidence of noxious weed infestations); • Sediment and erosion control structures in place and in functional condition (as required); • Site firebreaks maintained; and • No evidence of contamination outside of operational areas.
Security	• Gates securely locked at all times; • Entire perimeter fencing must be maintained in a sound and functional condition, with inspections to ensure it is free of wind-blown litter and has no holes.
Other	• General observations; and • Identification of items not otherwise listed in the sections above.

6.2 Rural Landfill Regulations Compliance Summary

The Rural Landfill Regulations set out the requirements for Category 89 Prescribed Premises registered under Part V of the *Environment Protection Act 1986*. These requirements include landfill siting, waste deposition, required infrastructure, landfilling operations, environmental controls and closure requirements. Table 6-2 outlines the relevant requirements of the Rural Landfill Regulations that will affect the design and operation of the Site, and how the proposed landfill complies with those requirements.

Table 6-2: Rural Landfill Regulations Compliance Summary

<table>
<tr><th>Regulation</th><th>Description</th><th>Compliance</th></tr>
<tr><td>5.</td><td>Tipping area
The occupier of the landfill site must ensure that the tipping area of the site is not greater than –
a) 30 metres in length; and
b) 2 metres above ground level in height.</td><td>The Site will operate to maintain the required tipping area size at or below the requirements of Regulation 5, as outlined in Section 6.1.2. Additionally, the design of each trench will feature a maximum width of 30m and a 0.5m high exterior trench bund to help ensure that the tipping face can be maintained within the required dimensions, as outlined in Section 5.3.1. Monthly Site inspections described in Section 6.1.6 will also help ensure that the landfill tipping face is maintained at the required length and height.
Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 5.</td></tr>
<tr><td>6.</td><td>Covering of waste
1. The occupier of a landfill site must ensure that waste in the tipping area of the site is covered –
a) At least as often as is specified in the Table to this regulation; and
b) In accordance with sub-regulation (2).
2. Waste is to be –
a) Covered with a dense, inert and incombustible material, or such other material as is approved in respect of a particular landfill site; and
b) Totally covered, so that no waste is left exposed.
3. The occupier of a landfill site must ensure that there is enough cover material at any time stored and readily available on the site for the tipping area of the site to be covered, in accordance with this regulation, at least twice.
<table>
<tr><th>Tonnes of waste received per year</th><th>Frequency waste is to be covered</th></tr>
<tr><td>Less than 500 tonnes</td><td>Monthly</td></tr>
<tr><td>Between 500 and 2 000 tonnes</td><td>Fortnightly</td></tr>
<tr><td>Between 2 000 and 5 000 tonnes</td><td>Weekly</td></tr>
</table></td><td>Section 6.1.4 outlines the proposed cover depth and frequency.
Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 6.</td></tr>
<tr><td>7.</td><td>Fencing of the landfill site
The occupier of a landfill site must ensure that there is a fence around the boundary of the site which is an effective barrier to cattle, horses and other stock</td><td>As discussed in Section 5.1.2, a perimeter fence will be installed at the Site to prevent access from fauna.
Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 7.</td></tr>
<tr><td>8.</td><td>Waste to be contained on landfill site
The occupier of a landfill site must ensure that –
1. Waste does not get washed, or blown, outside the site; and
2. Waste that has been washed, or blown, away from the tipping area of the site is returned to the tipping area at least once in each month.</td><td>Bunds and fencing at the Site will help ensure that litter is not washed or blown outside the Site, in compliance with Regulation 8.1.
Operationally, a monthly fence inspection will be conducted at the Site to ensure that fences are maintained free of litter which will improve the management of litter and vermin at the Site.
Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 8.</td></tr>
<tr><td>9.</td><td>Separation of waste from water and site boundary
Unless otherwise approved in writing, the occupier of a landfill site must ensure that there is no waste within –
1. 35 metres from the fence surrounding the site;
2. 100 metres of any surface water body at the site; or
3. 3 metres of the highest level of the water table aquifer at the site.</td><td>There is a proposed reduction in the fence boundary required under Regulation 9.1 due to the facility's small size, the low volume of waste generated, and the site's remote location.
The nearest sensitive receptor is located over 600m from the Site boundary.
As outlined in Section 3.7, the minimum depth to groundwater at the Site is over 3m at the Site.
Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 9, once an exception is granted for Regulation 9.1.</td></tr>
</table>

10.	**Stormwater management** The occupier of a landfill site must ensure that stormwater on the site is adequately managed so that – 1. It is diverted from areas of the site where there is waste; and 2. Water that has come into contact with waste is to be diverted into a sump on the site or otherwise retained on the site.	Landfill bunds will be installed as part of each trench development to both ensure that stormwater is diverted from the area of the Site where waste is deposited, and to ensure that water that has come into contact with the waste is retained on the Site. Additional drive-over bunds may be installed at the entrance to the landfill trench to prevent surface water from entering the landfill trench. Each landfill trench will have a minimum 2% grade sloping away from the entrance to further ensure that water that has come into contact with the waste will be retained on the Site. Long-term surface water management is discussed further in Section 7.4. Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 10.
11.	**Dust suppression** The occupier of a landfill site must ensure that no visible dust escapes from the landfill site.	Landfilling activities such as unloading of material will be undertaken in such a way as to minimise dust generation, and cover soils used at the Site are assumed to be non-dispersive. Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 11.
12.	**Firebreaks** The occupier of a landfill site must ensure that there is a firebreak of at least 3 metres around the boundary of the site.	A minimum firebreak of 5m will exist around the Site as outlined in Section 5.1.2. Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 12.
13.	**Burning of greenwaste only** 4. The occupier of a landfill site must ensure that waste is not burnt at the site, other than greenwaste burnt in accordance with this regulation 5. N/A 6. N/A	Greenwaste will not be burnt at the Site, so no further consideration has been given to Regulation 13.
14.	**Outbreak of fire** 1. The occupier of a landfill site must ensure that there are appropriate procedures in force at the site so that – b. Any unauthorised fire on the site is properly extinguished; and c. Appropriate alarm and evacuation procedures are in place. 2. The occupier of a landfill site must ensure that an unauthorised fire on the site is extinguished as soon as possible 3. Within 14 days of an unauthorised fire at a landfill site, the occupier of the site must give to the Chief Executive Officer a report on the fire containing – b. Details on the date, time and location of the fire; c. The time the location of the fire was declared safe by the Fire Control Officer for the site; and d. The cause, or suspected cause, of the fire.	Fire management measures are discussed in Sections 5.3.2 and 7.11. Therefore, with these measures in place it is assumed that the Site will be compliant with Regulation 14.

7 Environmental Aspects and Management

To ensure the potential environmental impacts that may occur during construction or operation of the Site are addressed the following environmental aspects were considered:

- Odour
- Noise
- Dust
- Stormwater
- Groundwater
- Leachate
- Landfill Gas
- Litter
- Traffic
- Vermin and Fauna
- Fire
- Security; and
- Stability.

The following sections outlines the engineering and management measures to be used at the Site to mitigate the outlined environmental impacts.

7.1 Odour

Odour emissions may arise from the acceptance of putrescible wastes. Odour emissions will be generated from the natural decomposition of putrescible waste that will be disposed onsite. However, as this has not been an issue at the existing site it is unlikely that the Site will result in significant odour impacts off site. Additionally, operations are only expected to occur weekly at the Site.

Given the increase in separation distance from sensitive receptors, the low putrescible waste volume and the appropriate cover of waste, it is considered to be sufficient to adequately mitigate and manage potential odour impacts.

7.2 Noise

Noise emissions associated with the project has the potential to result in noise impacts. Noise emissions will be generated from construction, the plant during waste deposition and covering, and from road and engine noise generated from vehicles entering and exiting the Site. However, as this has not been an issue at the existing site and operations will remaining largely the same, the expansion of the Site is not anticipated to significantly increase noise emissions on site. The nearest sensitive receptor is approximately 500m away, and it is not expected that any sensitive receptors will be constructed any closer to the Site.

These measures are deemed to adequately mitigate and manage potential noise impacts.

7.3 Dust

Dust will be generated during the construction of the landfill and during the operation of the facility, mainly from earthworks and vehicle movements once the landfill is operational. The generation of dust is anticipated to occur mainly during the construction phase of a landfill trench. To manage the generation of dust, the following management measures will be implemented:

- Operations will cease during periods of high winds; and
- Vehicles will be restricted to a maximum speed of 10km/hr.

These measures are deemed to adequately mitigate and manage potential dust impacts.

7.4 Surface Water

Surface water, or stormwater, will be generated as a result of precipitation falling into and around the Site. If surface water comes into contact with waste material at the Site, it can generate leachate. Therefore, water should be directed away from the active tipping area wherever possible.

As discussed in Section 3.6, the Site is within a '1 in 100 AEP Floodplain Development Area'. To ensure that surface water is appropriately managed at the Site, surface water management infrastructure has been included in the Site design. A Flood Protection Bund surrounding the perimeter of the Site will mitigate impacts from offsite floodwaters.

The use of Trench Bunds surrounding the active landfill trench will be adopted to prevent stormwater from coming in contact with the waste mass. Additionally, the final capping system for the landfill trenches is designed to encourage surface water to shed away from the waste mass.

It is anticipated that these management measures will appropriately manage potential stormwater within and around the Site.

7.5 Groundwater

Groundwater may be impacted by leachate percolating through the ground and may also cause landfill inundation if the separation distance is inadequate. The regional depth to groundwater is understood to be well in excess of the 3m requirement of the Rural Landfill Regulations and will allow for minimal impacts to groundwater from Site operations.

The siting and design of the landfill trench are deemed to adequately mitigate and manage potential groundwater impacts.

7.6 Leachate

Leachate may be generated by putrescible wastes, and by water coming into contact with waste material. This liquid has the potential to impact groundwater quality and surface water quality if not appropriately managed.

As outlined in Section 2.2.3, the Site accepts a small annual quantity of putrescible waste. Additionally, the climate in the Kimberley region is characterised by a tropical monsoonal climate with distinct wet and dry seasons, as discussed in Section 3.1. Although the wet season experiences high-intensity rainfall, the prolonged dry season contributes to rapid evaporation and overall limited infiltration. It is recommended that cover soils be distributed across the waste mass prior to extreme rainfall events to minimise the potential for leachate generation.

These management measures are adequate for the management of the leachate risk at the Site.

7.7 Landfill Gas

As outlined in Section 2.2.3, the Site accepts a very low quantity of putrescible waste annually, and the conditions at the Site result in a generally dry waste mass. These factors not only reduce leachate generation from the landfilled putrescible waste, but also landfill gas generation, which is dependent

on the moisture content within the waste. Therefore, a dry waste mass with a low putrescible volume is not anticipated to produce significant quantities of landfill gas.

Landfill gas can cause an asphyxiation and explosion risk, particularly when it accumulates in subsurface services such as utility pipes and basements. The remote location of the landfill ensures that there are no receptors or pathways for exposure of landfill gas, significantly reducing the risk.

Therefore, the siting and design of the Site are deemed to adequately mitigate and manage potential landfill gas impacts.

7.8 Litter

Litter may be generated as a result of transporting and handling waste, particularly during windy conditions. As well as reducing visual amenity, litter can attract vermin to the Site, which may affect surrounding land uses if these vermin migrate offsite.

To ensure that the generation of litter is minimised and appropriately managed at the Site, the following management measures will be implemented:

- All waste will be unloaded as close to the ground as possible, and will be covered as per the Rural Landfill Guidelines;
- A permanent fence will be installed to mitigate any litter from leaving the Site; and
- Wind-blown litter will be collected as soon as practicable.

These management measures are deemed to adequately mitigate and manage potential litter generation and impacts.

7.9 Traffic

Onsite traffic movements have the potential to generate noise, dust and create an occupational health and safety risk to staff. The small volumes of waste disposed of at the Site will result in minimal operational movements.

Therefore, the siting and design of the Site are deemed to adequately mitigate and manage potential traffic impacts.

7.10 Vermin and Feral Animals

Vermin and fauna such as rats, mice, birds, insects, cats and dingoes may be attracted to waste management facilities particularly those with poor housekeeping practices. If uncontrolled, vermin can present a health risk to staff and surrounding land users.

The acceptance of waste (particularly putrescible waste) can attract vermin which has the potential to impact local health of staff and nearby land users. To control potential vermin issues, the Site proposes to adopt the following management measures:

- The generation of odour and litter will be minimised through the implementation of appropriate management measures (see Sections 7.1 and Section 7.8); and
- A permanent perimeter fence with lockable gate will be installed.

These management measures are deemed to adequately mitigate and manage potential vermin and feral animal impacts.

7.11 Fire

Fires may occur through faulty equipment, machinery, waste acceptance, landfill fires or arson. Fire management measures will be implemented to ensure this risk is mitigated.

Fire management measures have been included in the design of the landfill, including:

- The incorporation of a 5m wide firebreak in line with Rural Landfill Guidelines;
- Cover soils stockpile near the active tip face that can be used to smother a fire; and
- Permanent perimeter fence with a lockable gate.

These management measures are considered adequate to manage offsite and onsite fires.

7.12 Security

A breach of security may result in injury to persons or damage to infrastructure. To minimise potential security risks the following management measures are implemented:

- Appropriate signage is installed at the site entrance; and
- A perimeter fence is installed around the Site and is monitored and maintained on a regular basis.

These management measures are deemed to be sufficient to adequately mitigate and manage potential security risks.

7.13 Stability

Consideration has also been given to the stability of the landfill trenches. Settlement often occurs from the uneven degradation of putrescible wastes and can be amplified when waste is uncompacted over large waste depths. To manage the risks associated with stability, the Site will feature the following risk management measures:

- Incorporation of 1:3 (V:H) side slopes into the landfill trench design;
- A low putrescible waste volume and relatively shallow depth of waste material within each landfill trench; and
- Significant soil surcharge of minimum 1.3m for each landfill trench.

It is anticipated that these measures will be more than adequate to manage the stability risk at the Site during operation and post-closure.

8 Residual Risk Assessment

The risk assessment outlined in this section is conducted to assess the environmental, public health and amenity risks associated with various aspects of ongoing landfill development and operation. The risk assessment framework is adapted from DWER's *Risk Assessments, Part V, Division 3, Environmental Protection Act 1986 (WA)*, and is detailed in the following sections.

8.1 Methodology

The objective of the risk assessment is to ensure the potential environmental and social risks associated with the operation and closure of the landfill are understood and managed appropriately to confirm suitable management measures are in place and there is no unacceptable residual risk. The following sections identify 'source-pathway-receptor' scenarios to determine the level of risk before, and after management measures have been implemented.

8.1.1 Source of Contamination or Harm

For the purpose of this assessment, a source is defined as a primary risk with the potential to cause significant contamination or harm to the environment. With regards to the environment and public health, sources and its potential hazards which may arise are outlined in Table 8-1.

Table 8-1: Sources of Contamination or Harm

Source	Description	Risk Description
Odour	Odour emissions from landfill gas or open tip face	Reduced amenity due to smell
Noise	Sounds emitted from vehicles and plant onsite	Noise emissions can reduce amenity on and immediately surrounding the Site
Dust	Fine particles that can be blown in the wind.	Dust causes reduced visual amenity and can be dangerous if it includes asbestos fibres
Surface Water	Stormwater generated by rainfall	Improper management can lead to generation of leachate, erosion, and damage to infrastructure
Leachate	Chemically contaminated solution generated by rainwater mixing with waste or through decomposition of organic or liquid waste inputs	Leachate commonly contains ammonia, ammoniacal nitrogen and total nitrogen which can impact water sources and those who rely on them
Landfill Gas	Compounds within the gas which are asphyxiant	Carbon dioxide and methane can replace oxygen and accumulates in enclosed areas, inadvertently causing an asphyxiation risk to humans and fauna
	Compounds within the gas which are explosive	Methane is explosive and flammable at 5-15% v/v in surplus oxygen which causes a risk to human health and infrastructure

Source	Description	Risk Description
	Compounds within the gas that are toxic	Hydrogen sulfide can be fatal in concentrations greater than 500ppm[2]
	Compounds within the gas that are ecotoxic	Methane at 45% v/v and carbon dioxide at 5-10% v/v cause stress in the root zone
Litter	Light waste materials that can blow in the wind.	Reduced visual amenity and may easily travel beyond the Site's boundary
Traffic	Vehicle movements around the Site	Possibility for vehicles to collide with Site personnel, structures or other vehicles. Poor design of traffic flow and operations can lead to unpredictable traffic routes and create safety hazards onsite
Vermin and Fauna	Animals attracted to the landfill by odour or exposed waste	Vermin and feral animals may cause nuisance and present health risks
Fire	Potential for fires from waste materials or faulty equipment	Fire is a large risk to human and environmental health, and can cause damage to Site infrastructure
Security	Restriction of access to the Site	Unauthorised personnel may access the Site, resulting in a security risk to the Site facilities, plant and equipment
Physical Aspects	Surface irregularities which pose a health and safety threat to end users	Trip, slip or fall hazards from uneven surfaces
	Unstable design or shape of the landfill.	Unstable profiles that may cause landslides or slope failures
Exposed Waste	Waste material that is physically exposed.	Increased risk of leachate generation in addition to harm or sickness if physical contact or consumption occurs

8.1.2 Pathways of Potential Contamination or Harm

For the purpose of this assessment, a pathway for a hazard is defined as the route by which potential contamination or harm can migrate. The key migration pathways generally include the following:

- Air through which lightweight materials such as dust and litter, odour and landfill gas travel;
- Surface along which the sources of contamination or harm can travel or be present at (e.g. surface water runoff, litter, persons walking or working over the surface); and
- Sub-surface whereby the underlying soils, bedrock, aquifers and infrastructure permit gas and leachate migration towards the receptors.

[2] International Programme on Chemical Safety and World Health Organisation, 2003, Concise international Chemical Assessment Document 53 – Hydrogen Sulphide: Human Health Aspects

8.1.3 Receptors of Potential Contamination or Harm

For the purpose of this assessment, a receptor is defined as the location where the impact of the contamination or harm is registered. The possible receptors of the contamination or harm caused by the hazards identified are summarised in Table 8-2.

Table 8-2: Generic Receptors that may be Impacted by Potential Contamination or Harm

Receptor	Description of the Receptor
Surrounding Land Users	People who work or live beyond the boundary of the Site. Some of these are referred to as sensitive receptors.
Site Users	Persons authorised to traverse across the Site, including: • Operational staff, if any; • Contractors carrying out maintenance or monitoring; and • Visitors to the site.
Buildings/Infrastructure	Buildings or infrastructure that are semi-permanently or permanently occupied and used for work or residential purposes.
Vegetation and Flora	Vegetation on and surrounding the Site.
Fauna	Fauna species whose habitats are within or surrounding the Site.
Groundwater	Groundwater that exists beneath the landfill either as a local perched system or as a regional aquifer from which a water supply may be extracted for industrial or potable purposes.
Surface Water	Permanent or semi-permanent surface water which provides a habitat for flora and fauna.

As discussed in Sections 2.5, there are no surrounding land users, buildings or infrastructure within the immediate vicinity of the Site. Therefore, these receptors have not been considered when undertaking the risk assessment.

8.2 Risk Rating Matrix

To assess the various risks, the potential hazards identified in Table 8-1 were classified according to the risk assessment matrix shown in Table 8-5. This risk assessment matrix considers the consequence and likelihood of the risk, the definitions of which can be seen in Table 8-3 and Table 8-4. Table 8-6 shows the appropriate risk treatments for each risk level.

Table 8-3: Consequence of Risk Occurring†

Consequence	Environment	Public Health* and Amenity (i.e. air and water quality, noise, & odour)
Severe	• On-site impacts: catastrophic • Off-site impacts local scale: high level or above • Off-site impacts wider scale: mid-level or above • Mid to long term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • Adverse health effects: high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • Local scale impacts: permanent loss of amenity
Major	• On-site impacts: high level • Off-site impacts local scale: mid-level • Off-site impacts wider scale: low level • Short term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• Adverse health effects: mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • Local scale impacts: high level impact to amenity
Moderate	• On-site impacts: mid-level • Off-site impacts local scale: low level • Off-site impacts wider scale: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• Adverse health effects: low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • Local scale impacts: mid-level impact to amenity
Minor	• On-site impacts: low level • Off-site impacts local scale: minimal • Off-site impacts wider scale: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • Local scale impacts: low level impact to amenity
Slight	• On-site impact: minimal • Specific Consequence Criteria (for environment) met	• Local scale: minimal impacts to amenity • Specific Consequence Criteria (for public health) criteria met

^ Determination of areas of high conservation value or special significance should be informed by Guidance Statement: Environmental Siting
** In applying public health criteria, DWER may have regard to the Department of Health's, Health Risk Assessment (Scoping) Guidelines*
† From DWER Guidance Statement: Risk Assessments rev. V2 February 2017 "on-site" means within the prescribed premises boundary

Table 8-4: Likelihood

Likelihood	The following criteria will be used to determine the likelihood of the risk event occurring
Almost Certain	The risk event is expected to occur in most circumstances
Likely	The risk event will probably occur in most circumstances
Possible	The risk event could occur at some time
Unlikely	The risk event will probably not occur in most circumstances
Rare	The risk event may only occur in exceptional circumstances

The risk matrix in Table 8-5 combines the level of likelihood and consequence to determine the level of associated risk.

Table 8-5: Risk Assessment Matrix

		Consequence				
		Slight	Minor	Moderate	Major	Severe
Probability	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Medium	Medium	Medium	High
	Rare	Low	Low	Medium	Medium	High

Table 8-6 from the Guidance Statement: Risk Assessments by DWER outlines the acceptability and treatment of the risk levels.

Table 8-6: Risk Treatment Table†

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable	Risk event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls	Risk event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls	Risk event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled	Risk event is acceptable and will generally not be subject to regulatory controls.

† From DWER Guidance Statement: Risk Assessments rev. V2 February 2017

8.3 Risk Profile

Risk management measures refer to the key management strategies that will be adapted onsite to ensure that all hazards and potential risks identified are controlled to an appropriate level, and that strategies are in place to react to any potential incidents or accidents. In most cases these risk management measures decrease the probability and/or consequence of the identified hazards, thus lowering the risk rating.

Table 8-7 presents a summary of the 'source-pathway-receptor' scenarios identified in the risk assessment process. The table includes risks both before and after the successful implementation of the proposed engineering and management measures prescribed within this EAMP.

Table 8-7: Residual Risk Profile

Source	Receptor	Pathway	Risk Description	Probability	Consequence	Risk Rating	Management Measures	Revised Probability	Revised Consequence	Revised Risk Rating
Odour	Site Users	Fugitive Emissions	Lowered amenity due to odour	Possible	Slight	Low	• Operations at the Site are expected to occur weekly • Waste will be covered monthly as per Rural Landfill Regulations • Increased separation distance compared to existing site	Rare	Slight	Low
		Subsurface Migration		Rare	Slight	Low		Rare	Slight	Low
Noise	Site Users	Noise travels through the air	Reduced Amenity and long-term exposure health risks	Rare	Slight	Low	• No sensitive receptors are expected to be constructed any closer than 500m to the Site • Vehicles will be restricted to a maximum speed of 10km/hr • All materials handling will be confined to the designated areas	Possible	Slight	Low
	Sensitive Receptors		Reduced Amenity	Rare	Minor	low		Rare	Slight	Low
Dust	Site Users	Dust blown in the wind	Reduced visual amenity	Unlikely	Slight	Low	• Operations will cease during periods of high winds • Vehicles will be restricted to a maximum speed of 10km/hr	Rare	Minor	Low
Surface Water	Vegetation and flora	Surface	Sedimentation from uncontrolled stormwater impacting flora and vegetation	Possible	Minor	Medium	• Implementation of a surface water management system, including construction of Trench Bunds and a Flood Protection Bund	Unlikely	Slight	Low
	Groundwater	Surface	Water that encounters waste generating leachate that can cause contamination to groundwater and surface water bodies	Possible	Major	High		Unlikely	Slight	Low
	Surface water	Surface		Possible	Major	High		Unlikely	Slight	Low
Leachate	Site Users	Migration via surface water runoff	Contact with or consumption of leachate	Rare	Moderate	Medium	• Operations are estimated to average one time per week • The landfill trench base will consist suitable Site-won soils to mitigate any leachate seepage into the environment • The landfill trench perimeter will be bunded to contain any leachate generated • The landfill trench floor will be sloped away from the entrance into the landfill • Waste will be covered as per Rural Landfill Regulations • Separation from groundwater is expected to be greater than 3m below the landfill trench base • Following the completion of waste disposal, the landfill trenches will be permanently capped	Rare	Minor	Low
	Flora			Unlikely	Minor	Medium		Rare	Minor	Low
	Fauna			Unlikely	Moderate	Medium		Rare	Slight	Low
	Groundwater	Migration via groundwater		Unlikely	Minor	Medium		Rare	Minor	Low
	Surface Water	Migration via surface water runoff		Possible	Moderate	Medium		Rare	Minor	Low
Landfill Gas	Site Users	Fugitive Emissions	Toxicity from trace gasses, predominantly hydrogen sulphide	Landfill gas will be unable to accumulate next to the landfill as it will oxidise and disperse. No subsurface pathways exist in the vicinity of the landfill trenches.			The risk is adequately managed via the design of the landfill trenches and minimal landfill gas generation from the small, dry waste mass.	Landfill gas will be unable to accumulate next to the landfill trenches as it will oxidise and disperse. No subsurface pathways exist in the vicinity of the landfill trenches.		
		Subsurface Migration								
	Site Users	Fugitive Emissions	Asphyxiation from high carbon dioxide levels, explosion, and fire risk from methane between 5 and 15% v/v							
		Subsurface Migration								
	Site Infrastructure	Subsurface Migration	Explosion and fire risk from methane between 5-15% v/v							
	Flora	Subsurface Migration	Root stress from carbon dioxide levels between 5-10% v/v							

Source	Receptor	Pathway	Risk Description	Probability	Consequence	Risk Rating	Management Measures	Revised Probability	Revised Consequence	Revised Risk Rating
Litter	Site Users	Litter blown in the wind	Reduced visual amenity	Almost Certain	Slight	Medium	• All waste will be unloaded as close to the ground as possible, and will be covered monthly • A permanent fence will be installed to prevent any litter from leaving the Site • The permanent fence will be inspected regularly, and any maintenance works scheduled accordingly • Wind-blown litter will be collected as soon as practicable	Unlikely	Slight	Low
	Fauna		Consumption of the litter	Likely	Moderate	High		Unlikely	Slight	Low
	Surface Water	Litter transported by surface water flow or wind	Coming into contact with waste	Likely	Moderate	High		Unlikely	Slight	Low
Traffic	Site Users	Collisions with vehicles	Human health risks	Rare	Severe	High	• The small volumes of waste generated at the Site will result in minimal operational waste movements, estimated to average one time per week • Vehicles will be restricted to a maximum speed of 10km/hr • Trench bunds will mitigate vehicle roll over	Rare	Minor	Low
	Site Infrastructure		Damage to infrastructure	Unlikely	Moderate	Medium		Rare	Minor	Low
Vermin and Fauna	Site Users	Animals attracted to the waste mass	Amenity and human health risk	Unlikely	Minor	Medium	• The generation of odour and litter will be minimised through the implementation of appropriate management measures (see Sections 7.1 and Section 7.8) • Regular litter collections will be undertaken onsite • A permanent fence will be installed, monitored and maintained	Unlikely	Slight	Low
	Sensitive Receptors		Amenity and human health risk	Rare	Minor	Low		Rare	Slight	Low
Fire	Site Users	Contact with fire	Human health risk or fatality from fire	Rare	Severe	High	• The incorporation of a 5m wide firebreak in line with Rural Landfill Guidelines • Cover soils stockpile near the active tip face that can be used to smother a fire • Permanent perimeter fence with a lockable gate • Small landfill trench size and dispersed trench location to minimise the risk of fire spreading	Rare	Minor	Low
	Site Infrastructure		Damage to infrastructure from fire	Likely	Moderate	High		Rare	Minor	Low
Security	Site Infrastructure	Trespassers and unauthorised entrants	Damage from vandalism or misuse of Site	Possible	Minor	Medium	• Appropriate signage is installed at the site entrance • A perimeter fence is installed around the Site and is monitored and maintained on a regular basis	Rare	Slight	Low
Physical Aspects	Site Users	Surface irregularities and unstable surfaces	Trip hazard	Possible	Moderate	Medium	• Incorporation of 1:3 (V:H) side slopes into the landfill trench design • A low putrescible waste volume and relatively shallow depth of waste material within each landfill trench • Significant soil surcharge of minimum 1.3m for each landfill trench	Rare	Minor	Low
			Erosion & landfill slope failures	Unlikely	Major	Medium		Rare	Minor	Low
Exposed Waste	Site Users	Direct contact with exposed waste	Coming into contact with waste	Possible	Moderate	Medium	• Waste will be covered as per the Rural Landfill Regulations • The landfill trenches will be capped as outlined in Section 5.1.4, preventing physical contact with the waste • Permanent perimeter fence with a lockable gate will prevent access from unauthorised personnel and fauna	Unlikely	Slight	Low
	Fauna		Consumption of the waste	Possible	Moderate	Medium		Unlikely	Slight	Low
	Surface Water		Coming into contact with waste	Possible	Moderate	Medium		Unlikely	Slight	Low

Source	Receptor	Pathway	Risk Description	Probability	Consequence	Risk Rating	Management Measures	Revised Probability	Revised Consequence	Revised Risk Rating
							• The Trench Bunds will be constructed around the active landfill trench to limit accessibility by Site users and ensure improved health and safety			

8.4 Assessment Conclusion

The Residual Risk Assessment identified the current sources of hazards as well as possible sources of hazards arising from the proposed works. The risk rating prior to the implementation of management measures ranged from 'Low' to 'High'. The revised risk ratings were all downgraded to 'Low' once management measures were applied. Given the proposed management measures and engineering controls, it is believed that any potential health, environment, and amenity impacts are avoided or minimised.

9 Conclusion

The development of a new landfill trench site in Warmun is essential to meet the long-term waste management needs of the community. Communities intend to register the facility as a Category 89 landfill and therefore the design and this supporting documentation has been developed to ensure compliance with the Rural Landfill Regulations, where possible.

The new landfill facility will consist of the following:

- Unlined landfill trenches for putrescible waste;
- Community drop-off area;
- Supporting Infrastructure:
  - Stock-proof fencing;
  - Fire break;
  - Access roads; and
  - Surface water management system.

The key potential environmental impacts associated with the construction and operation of the new facility that were considered include:

- Odour;
- Noise;
- Dust;
- Stormwater;
- Groundwater;
- Leachate;
- Landfill Gas;
- Litter;
- Traffic;
- Vermin and Fauna;
- Fire;
- Security; and
- Stability.

The design of the Site has been developed to ensure all these environmental and social impacts are managed appropriately, and that the design and operations comply with the Rural Landfill Regulations, where possible. Based on the design, proposed engineering and environmental management measures and low residual risk, the Community believes that the construction and operation of the waste management facility can be achieved in a manner that ensures that these potential impacts can be minimised and managed appropriately.

APPENDIX A
Figures

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LEGEND

- Development Boundary

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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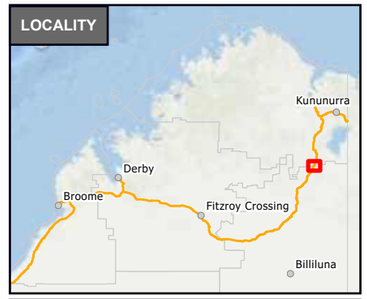

0 200 400 600 800 km

SITE LOCALITY

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:15,000

Prepared:	[redacted]	Date:	26/02/2025
Reviewed:		Revision:	A
Project:	TW24038		

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Figure 01

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Note: Ground truthing and community consultation must take place for all locations before a preferred location is selected.

Location Name	Latitude	Longitude
Warmun	-17.028573	128.223395
Warmun	-17.027431	128.2246
Warmun	-17.030601	128.225471
Warmun	-17.02946	128.226676

417,200 417,400 417,600

8,117,400 8,117,200 8,117,000

230 220 210

Existing Landfill / Dump Point

Wastewater Ponds

Access Road

Community Drop Off

Flood Protection Bund (1m)

Buffer Zone for Fire Break (5m)

New Landfill Development Area

Surface Water Bund

Initial Landfill Trench

Future Landfill Trench

Future Landfill Trench

Future Landfill Trench

Fence Line

Data source: Roads, Topography - Landgate, 2025. Imagery: Google Satellite, 2024.

LEGEND

- Development Boundary

Ground Surface Topography

- Major Contour
- Minor Contour

Fence Line

- Fence Line
- Flood Protection Bund (1m)
- Future Landfill Trench
- Initial Landfill Trench
- Existing Landfill / Dump Point
- Access Road
- Wastewater Ponds
- Community Drop Off (Stockpile Area)
- Buffer Zone for Fire Break (5m)
- Surface Water Bunds

Western Australian Roads

- Other

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LOCALITY

0 200 400 600 800 km

SITE LAYOUT

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N 0 20 40 60 80 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:2,000

Prepared:	[redacted]	Date:	7/03/2025
Reviewed:		Revision:	A
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Figure 02

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Sensitive Receptor	Distance to Buffer Zone
Community Land use	1,027 m
Warmun Clinic	988 m
Residential Property 1	895 m
Residential Property 2	862 m
Residential Property 3	901 m
Residential Property 4	877 m
Residential Property 5	851 m
Residential Property 6	846 m
Walumba Elder Centre	986 m
Ngalangangpum School	1,074 m
Residential Property 7	550 m
Residential Property 8	564 m
Residential Property 9	586 m
Residential Property 10	614 m
Wanyanyakem Team Early Learning Centre	1,202 m
Art Centre	814 m
Public Swimming Pool	1,283 m

LEGEND

- Development Boundary

Sensitive Receptors

- Residential Property (RP)
- Community Facility
- Separation Distance

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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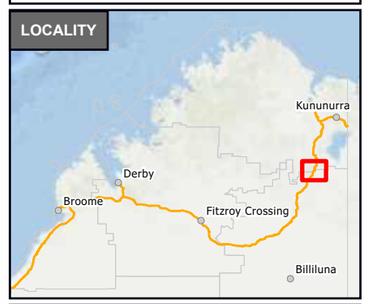

0 200 400 600 800 km

SENSITIVE RECEPTORS

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N 0 100 200 300 400 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:9,000

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Reviewed:		Revision:	A
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Figure 03

Data source: Roads - Landgate, 2025; Imagery: Google Satellite, 2024.

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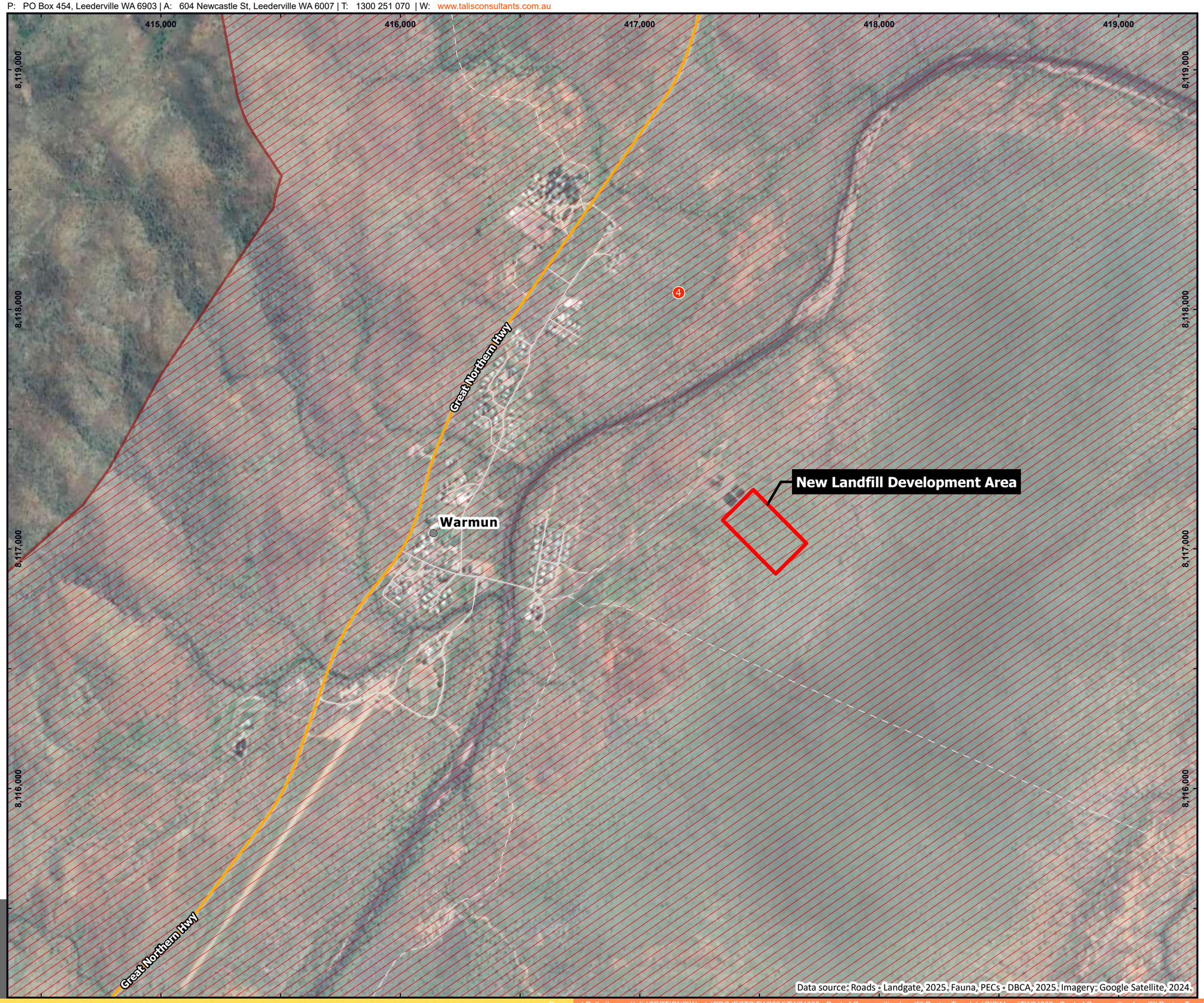

LEGEND

- Development Boundary

Threatened and Priority Fauna

- 4 Priority 4
- Specially protected species

Threatened Ecological Communities

- Priority

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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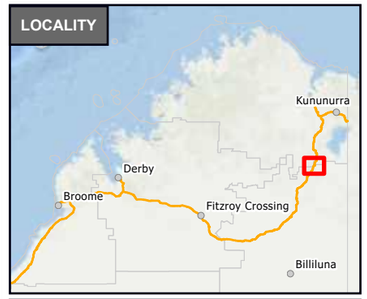

0 200 400 600 800 km

PRIORITY FAUNA AND ECOLOGICAL COMMUNITIES

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3:

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Figure 04

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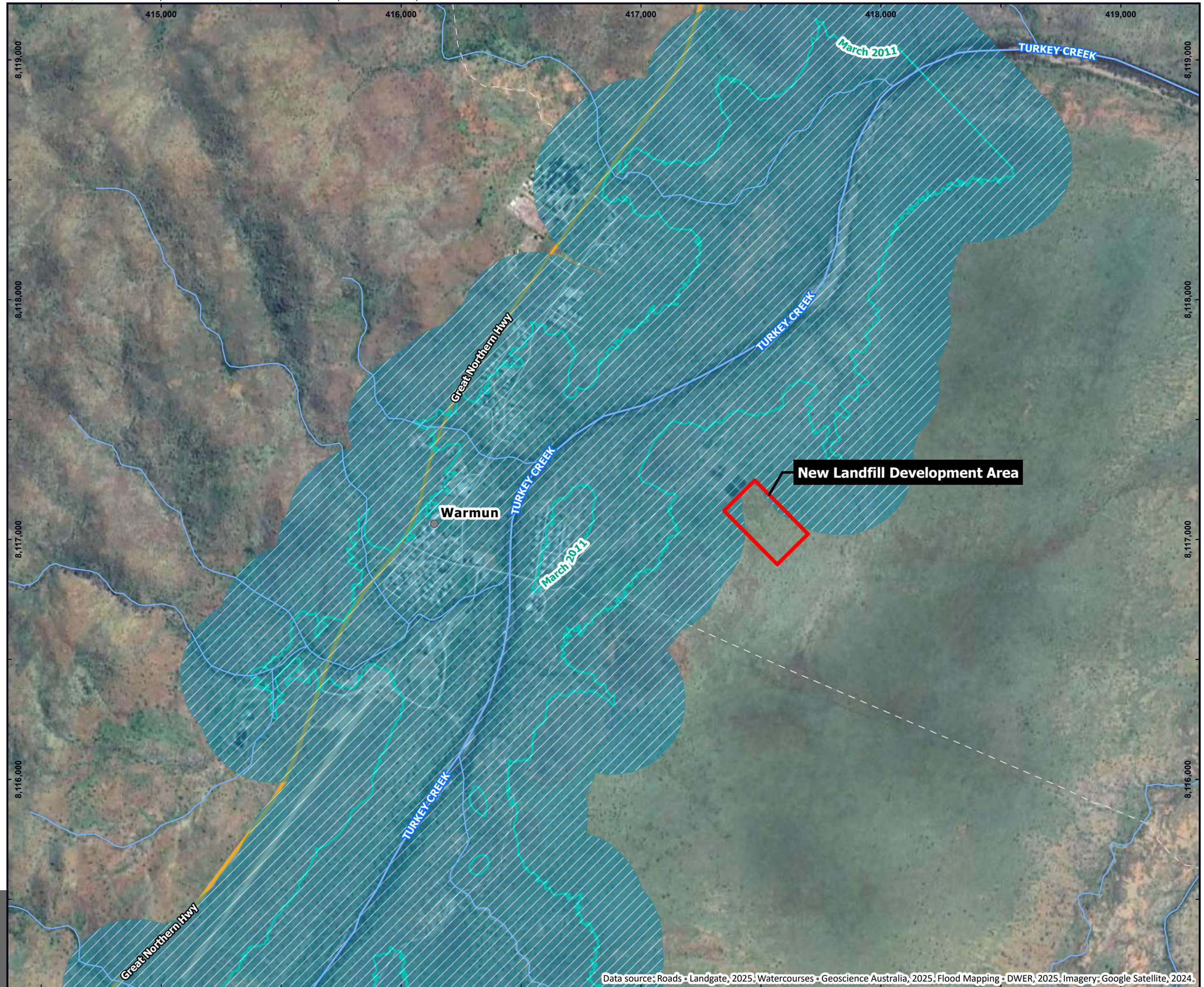

LEGEND

- Development Boundary

Watercourses

- Major Watercourse
- Minor Watercourse

Floodplain Mapping

- 1 in 100yr 1% AEP Floodplain Development Area
- Historical Extent of Flooding

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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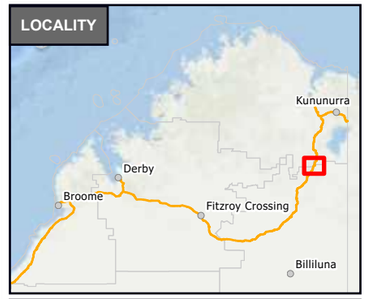

0 200 400 600 800 km

HYDROLOGY

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:15,000

Prepared:	[redacted]	ate:	26/02/2025
Reviewed:		evision:	A
Project:	TW24038		

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Figure 05

Data source: Roads - Landgate, 2025. Watercourses - Geoscience Australia, 2025. Flood Mapping - DWER, 2025. Imagery: Google Satellite, 2024.

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415,000 416,000 417,000 418,000 419,000

8,119,000 8,118,000 8,117,000 8,116,000

Great Northern Hwy

80919070 80919069 80919071 80919064 80919065 80970065

New Landfill Development Area

Warmun

80919066 80910126 80919072 80919062 80919063 80919067 80919061 80919068

Great Northern Hwy

Great Northern Hwy

Data source: Roads - Landgate, 2025. Hydrogeology - Geoscience Australia, 2025. Bores -DWER, 2024. Imagery: Google Satellite, 2024.

LEGEND

- Development Boundary

Hydrogeology

- Local aquifers, of generally low productivity

Groundwater Monitoring Bores

- Monitoring
- Unknown Use
- Water Supply

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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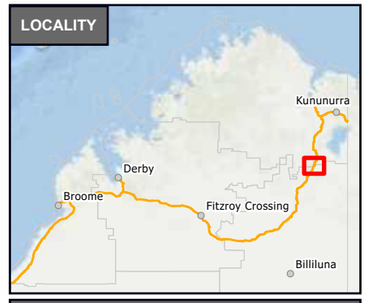

0 200 400 600 800 km

HYDROGEOLOGY

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
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Figure 06

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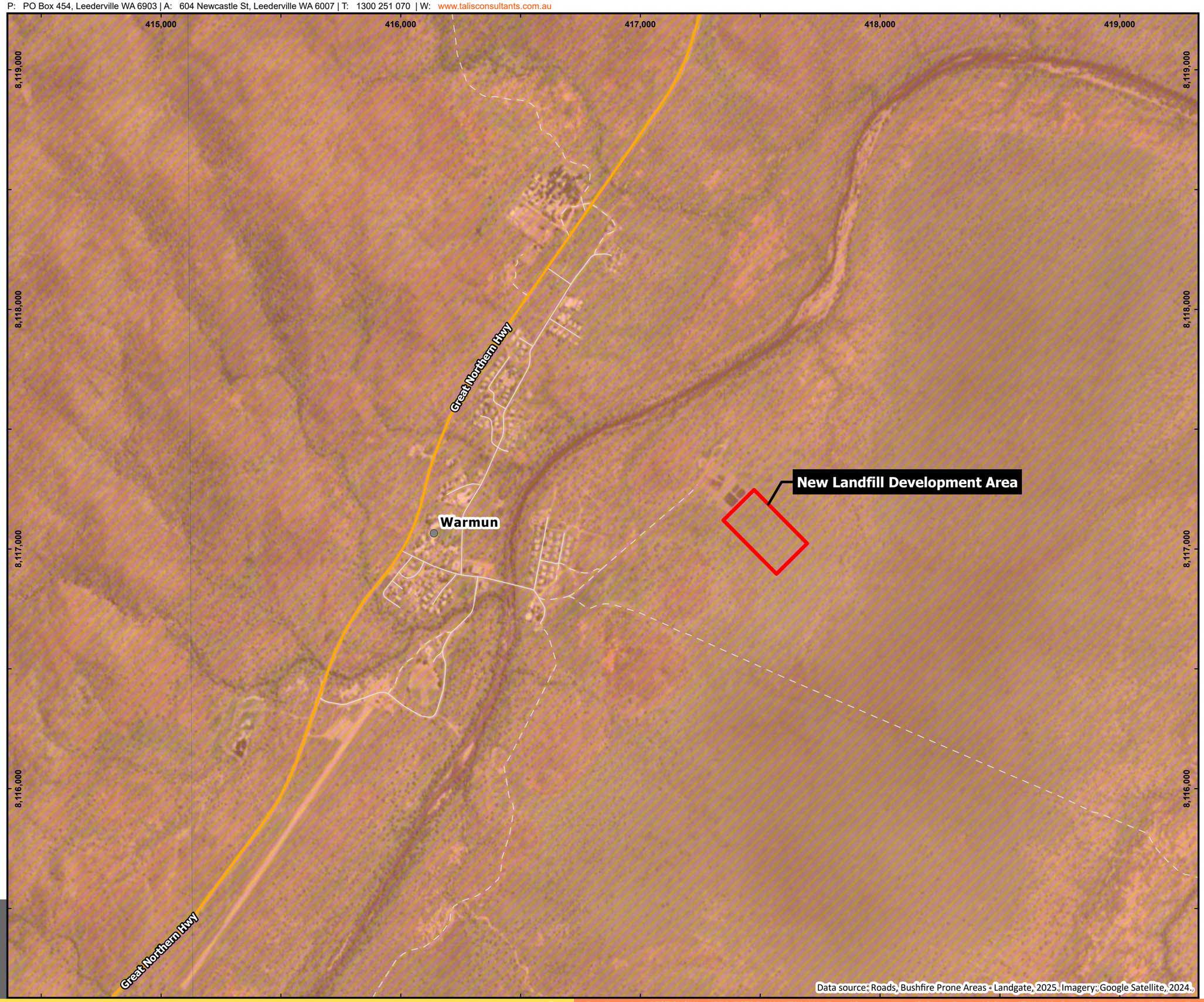

LEGEND

- Development Boundary
- Bushfire Prone Areas (Current)

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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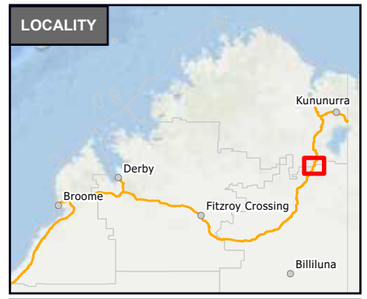

0 200 400 600 800 km

BUSHFIRE PRONE AREAS

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
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Figure 07

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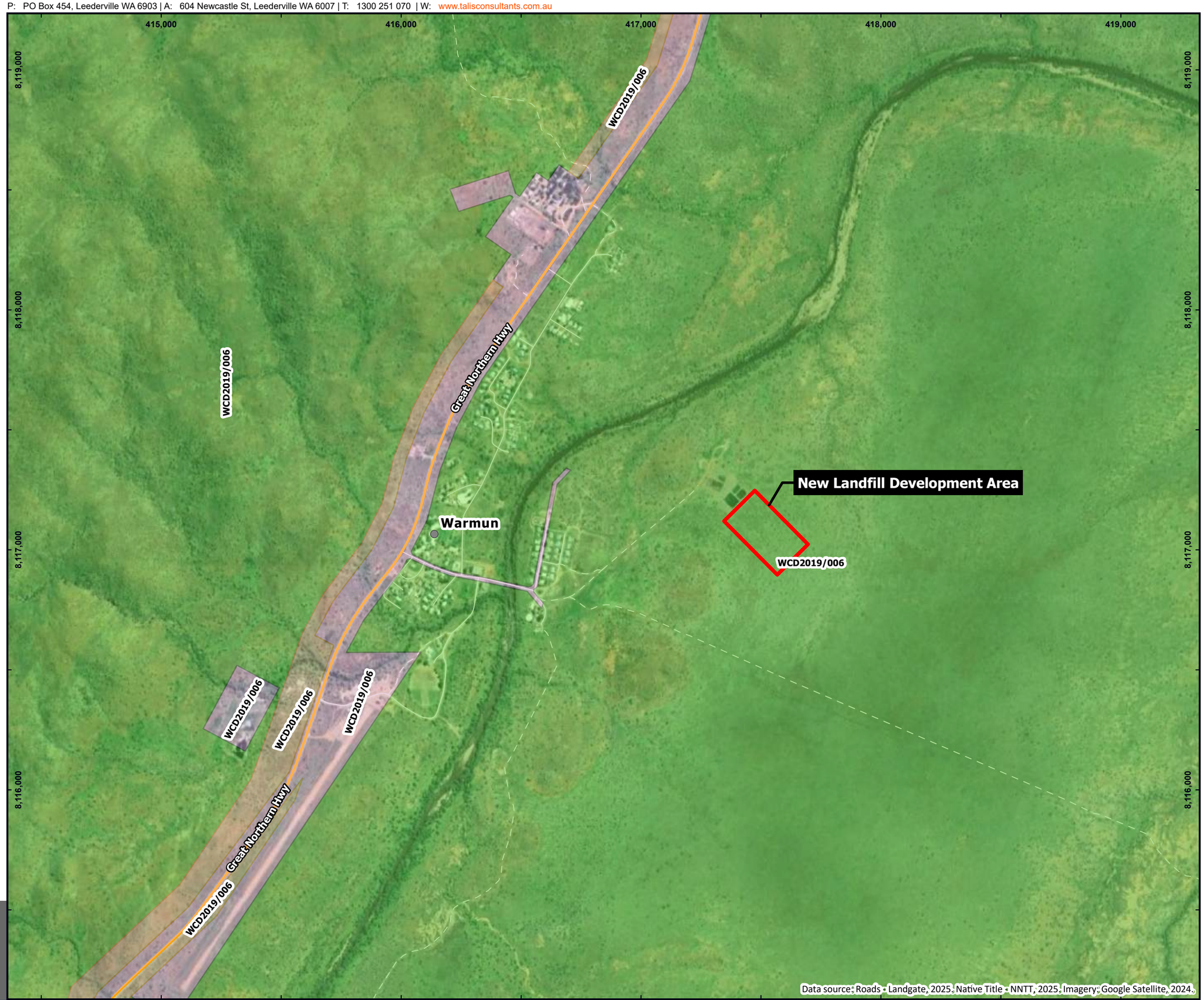

LEGEND

- Development Boundary

Native Title Determination Outcomes

- Native title does not exist
- Native title exists (exclusive)
- Native title exists (non-exclusive)

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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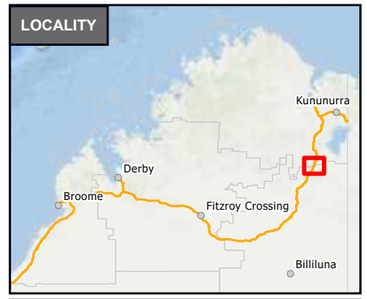

0 200 400 600 800 km

NATIVE TITLE

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:15,000

Prepared:	[redacted]	Date:	26/02/2025
Reviewed:		Revision:	A
Project:	TW24038		

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Figure 08

Data source: Roads - Landgate, 2025. Native Title - NNTT, 2025. Imagery: Google Satellite, 2024.

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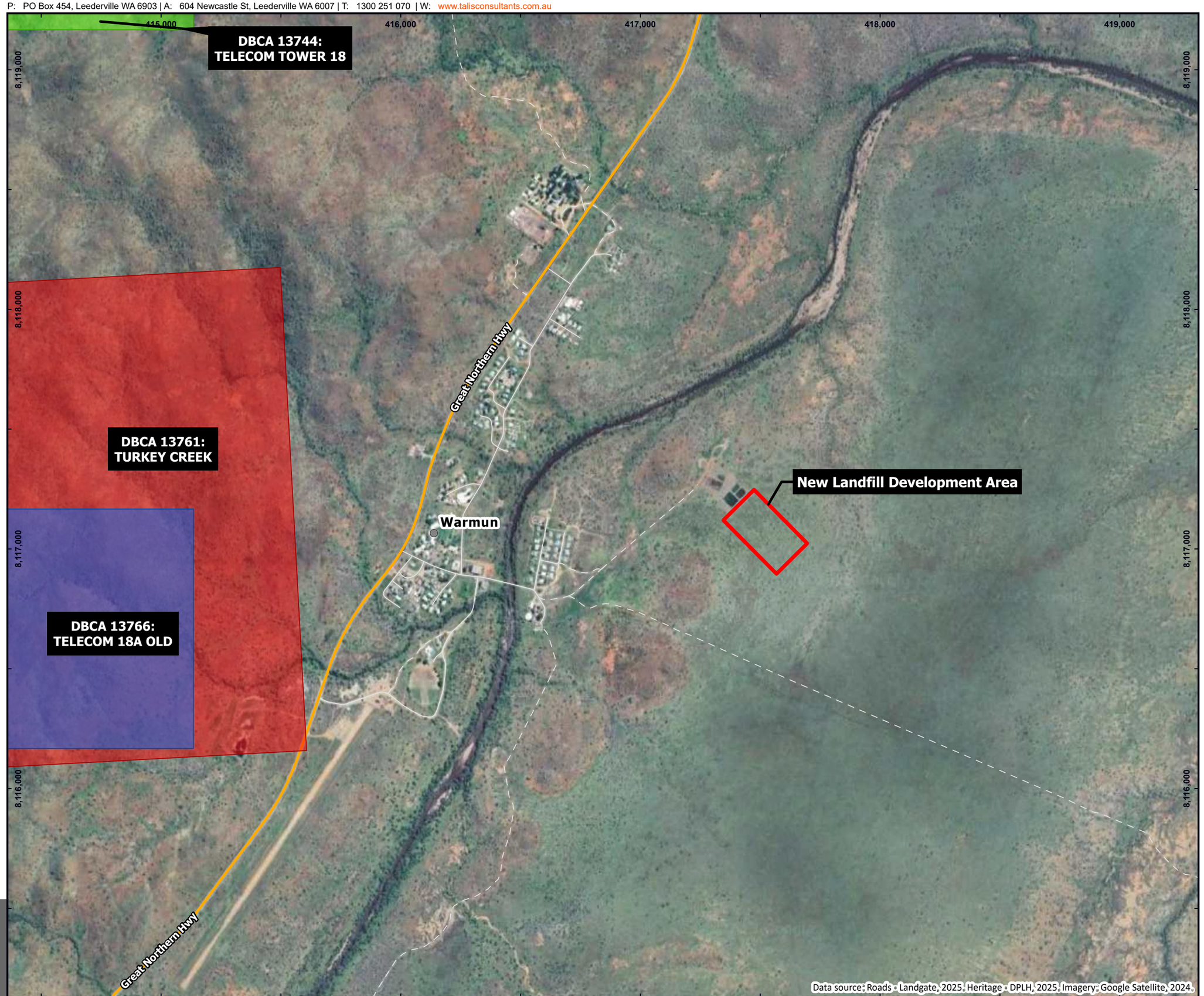

Data source: Roads - Landgate, 2025. Heritage - DPLH, 2025. Imagery: Google Satellite, 2024.

LEGEND

- Development Boundary

Aboriginal Heritage

- Registered Heritage Site
- Lodged Heritage Site
- Historic Heritage Site

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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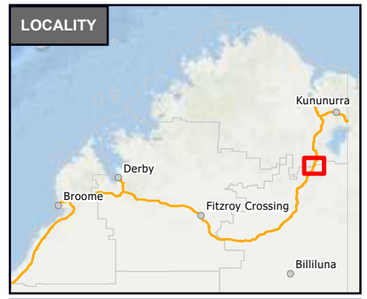

0 200 400 600 800 km

HERITAGE

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:15,000

Prepared:	[redacted]	ate:	26/02/2025
Reviewed:		evision:	A
Project:	TW24038		

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Figure 09

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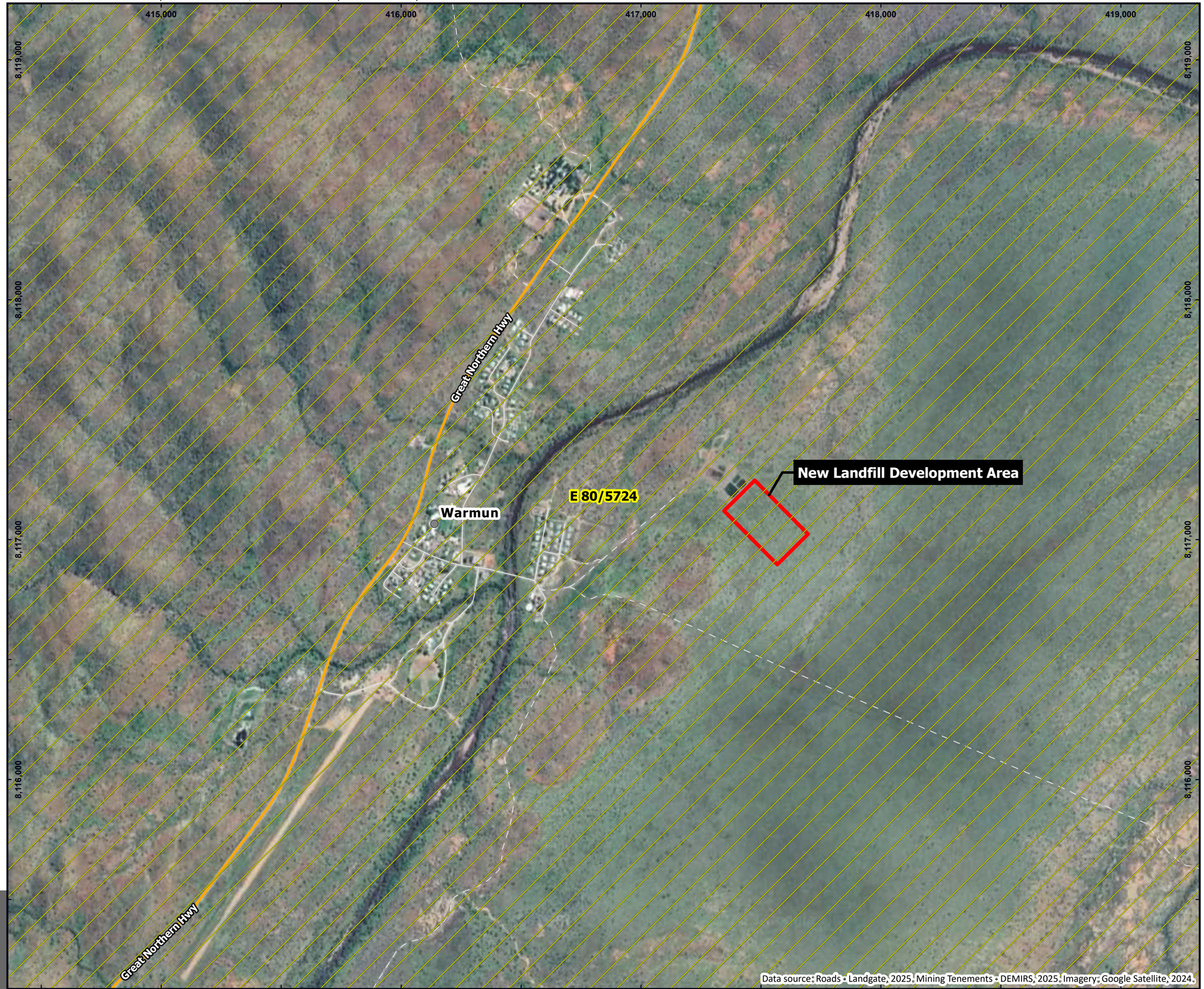
P: PO Box 454, Leederville WA 6903 | A: 604 Newcastle St, Leederville WA 6007 | T: 1300 251 070 | W: www.talisconsultants.com.au



LEGEND

- Development Boundary
- Mining Tenements

Western Australian Roads

- Freeway / Highway
- Minor Road
- Other

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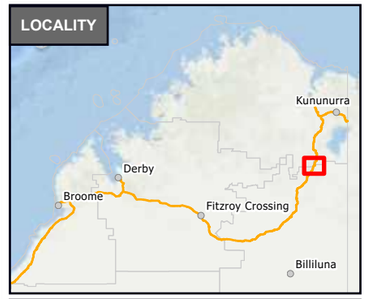
LOCALITY



0 200 400 600 800 km

MINING TENEMENTS

Warmun Waste Management Facility Development

Environmental Assessment & Management Plan

Department of Communities

N

0 200 400 600 m

Coordinate System: GDA2020 MGA Zone 52
Scale @ A3: 1:15,000

Prepared:	[redacted]	Date:	26/02/2025
Reviewed:		Revision:	A
Project:	TW24038		

talis consultants

Figure 10

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APPENDIX B
Geotechnical Report

Local Geotechnics *Geotechnical Site Classification Report*

LOCAL GEOTECHNICS

14 January 2025

Report on

Geotechnical Site Classification

17 Lots at Warmun Community, WA

Project:
LGK0632024SC
Rev_0

Client:
Department of Communities

Geotech | Civil | Pavement | Drainage

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LOCAL GEOTECHNICS

14 January 2025

To
Department of Communities

Dear Sir/Madam,

RE: Geotechnical Site Classification for 17 Lots at Warmun Community, WA.

This letter presents our report on a geotechnical site classification carried out at *17 Lots at Warmun Community, WA*. The report must be thoroughly read and implemented in full, no partial implementation of this report is allowed.

If you have any questions in regards to the geotechnical site investigation or we can be of further assistance, please do not hesitate to contact Local Geotechnics.

Local Geotechnics

Unit 12, 8 Production Road, Canning Vale WA 6155
PO Box 5050, Canning Vale South, WA 6155
08 9457 3517 (0), 0425 545 508 (M)
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PROJECT INFORMATION

Project	**LGK0632024SC Rev_0** **Geotechnical Site Classification**
Site Location	**17 Lots at Warmun Community, WA**

Rev	Description	Date	Prepared by	Approved by
0	Issued to client	14 January 2025	Y Chen	H Meer

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EXECUTIVE SUMMARY

Department of Communities commissioned Local Geotechnics to prepare a geotechnical site classification report for 17 Lots at Warmun Community, WA.

The proposed construction will be at maximum, double storey residential developments and a road reserve.

The objectives of the site class investigation were to obtain information on the subsurface conditions in order to classify the site in accordance to the definitions provided in Australian Standard AS2870 – 2011.

Field works were conducted on 3 December 2024 and 4 December 2024 in fine and sunny weather conditions. The investigation work consisted of field observation, documentation, sub-surface probing, soil profile logging, conducting of penetrometer testing alongside the test pits and field permeability tests.

The findings of the site classifications are presented in the following sections.

It is observed from the DCP test that the site soil is in dense to very dense and firm to hard condition. Based on the DCP results, we recommend that the foundation material is capable of sustaining an allowable bearing pressure of 100 kPa in its current condition.

Site Classification
Provided earthworks are completed as per the recommendation in Section 7.0 of this report, based on the site soil profile and surrounding condition, the site classification in accordance with the definitions provided in Australian Standard AS2870 are presented below.

Site Classification

Lot Number	Site Class	Surface movement (mm)	Remarks
95, 105, 117, 141, 200, 201, 202, 203, 204, 236, 701, 702, 703, 704, 612 and 914	**M**	30	-
915	**P**	-	**Class P** due to uncontrolled fill at the site

Lot 915 has uncontrolled fill up to a depth of 1.0 m. This uncontrolled fill needs to be replaced with clean sand and bring this to dense condition. Then this site (Lot 915) can be classified as Class M with surface movement of 30 mm.

Stormwater Drainage
Onsite disposal of roof runoff and stormwater via soakwell is not appropriate for this site. We recommend discharging of surface and roof runoff offsite to the council drainage system or locally available drainage system or as recommended by the local government authority. The drainage system must be designed by a qualified engineer as per requirements of the local government authority.

It is highly recommended that a competent geotechnical engineer should supervise earthworks and construction to ensure that all organic, roots, demolition debris, loose material have been adequately removed from the area and that the fill material is adequately compacted.

1.0 INTRODUCTION

Department of Communities commissioned Local Geotechnics (LG) to prepare a geotechnical site classification report for 17 Lots at Warmun Community, WA (the project). The site location is shown in Figure 1, with the tested areas highlighted in orange.

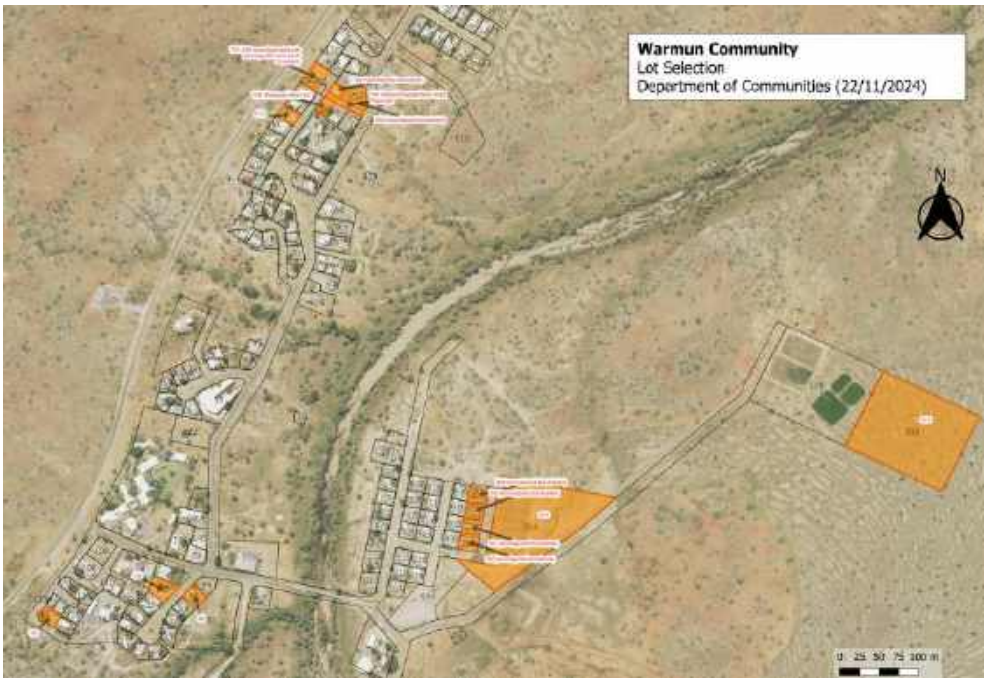


Figure 1. Aerial view of the site location (Source: Landgate Map)

Total 17 lots were investigated. The list and area of the sites are presented in Table 1.

Table 1. List and area of the sites

Item	Lot Number	Area (m^2)
1	95	1005
2	105	1533
3	117	923
4	141	1150
5	200	835
6	201	828
7	202	828
8	203	828
9	204	830
10	236	1008
11	701	1343
12	702	815
13	703	1286
14	704	1784
15	612	869
16	914	27300
17	915	30521

The objectives of the investigation are to obtain information on the sub-surface conditions to classify the site in accordance to the definitions provided in Australian Standard AS2870 – 2011 and to provide recommendations on stormwater drainage system for the site. Field works were conducted on 3 December 2024 and 4 December 2024. Weather condition on the day of field investigation was fine and sunny.

The scope of the investigation did not include compaction control, bearing capacity, wind force calculations or classifications, slope stability checking, and settlement calculation. Environmental issues were not considered in this report.

2.0 PROPOSED DEVELOPMENT

The proposed construction will be at maximum, double storey residential developments and a road reserve.

3.0 SCOPE AND OBJECTIVES

The scope and objectives of the investigation are as follows:

- Desktop review of geological survey maps, groundwater atlas and other publicly available information for the site;
- Identifying any underground services crossing the proposed field investigation locations by conducting “Before You Dig Australia (BYDA)” search;
- Preparation of a Job Safety and Environmental Analysis (JSEA) document for the geotechnical investigation and implementation of the JSEA register during the fieldworks;
- Conducting of up to one hundred and ten (110) Test Pits by using an Excavator up to 2.5 m or refusal;
- Conducting of Dynamic Cone Penetrometer (DCP) tests alongside the test pits up to a depth of 1.0 m or refusal;
- Conducting of up to eight (08) Field Permeability Tests by using a Guelph Permeameter;
- Logging of site soil profile as per Australian Standard AS1726;
- Groundwater recording as per test hole observation;
- Conducting of laboratory tests at NATA accredited laboratories which included:
  - Particle Size Distribution Test (AS 1289 3.6.1), and
  - Plasticity Index - Atterberg Limit Test (AS 1289 3.1.2, 3.2.1, 3.3.1, 3.4.1)
- Submit a factual report on findings to classify the site in accordance with the Australian Standard AS2870 - 2011;
- Provide recommendation on earthworks; and
- Provide recommendation on stormwater drainage.

4.0 SITE CONDITIONS

4.1 Surface Condition

The sites are located at 17 Lots at Warmun Community, WA. The surface condition is generally undulating. The terrain in Warmun varies, with steeper slopes and higher elevations on the western side, while the central area is flatter and the land rises into moderate hills to the east. There are existing houses spread throughout the community. The Turkey Creek flows generally from the east to the west, crossing through the Warmun area. Medium to large sizes trees, bushes, and tall grass can be observed throughout the area. A water pond can be observed next to Lot 915 during the time of investigation.

Site photos taken during the field investigation are shown in Appendix C.

4.2 Subsurface Condition

A review of Environmental Geological Western Australia survey Map of Halls Creek 1:100,000 (Sheet 4461) was conducted before site investigation. Environmental Geological map of Halls Creek revealed that the site is consisted of **Czcv** – Sand, silt, and clay, alluvial and colluvial, forming dissected low-lying terrain; and **Czb** – Grey clay and silt forming black soil plains (Lot 915).

4.3 Water Table and Drainage

A review of 'Perth Ground Water Atlas' of the Department of Water was carried out for this site. No existing ground water information was available during the time of investigation on 'Perth Ground Water Atlas'.

5.0 FIELD INVESTIGATION

The field investigation consists of sub-surface probing by using an excavator at one hundred and ten locations, and Dynamic Cone Penetrometer (DCP) testing alongside the test pits, taking photograph and Field Permeability Tests (FPT) across the site. Summary of the test locations are shown in Table 2.

Table 2. Summary of Test Locations

Test ID	Approx. Northing (m, GDA94)	Approx. Easting (m, GDA94)	Termination Depth (m)	Lot Number
FPT1	8 116 958	416 786	-	**Lot 914**
FPT2	8 116 989	416 857	-	
FPT3	8 116 860	416 158	-	**Lot 105**
FPT4	8 116 807	415 961	-	**Lot 117**
FPT5	8 117 754	416 387	-	**Lot 612**
FPT6	8 117 790	416 504	-	**Lot 702**
FPT7	8 117 162	417 467	-	**Lot 915**
FPT8	8 117 210	417 601	-	
TP1	8 116 944	416 705	2.5	**Lot 200 – Lot 204**
TP2	8 116 950	416 726	2.5	
TP3	8 116 961	416 706	2.5	
TP4	8 116 967	416 729	2.5	
TP5	8 116 980	416 710	2.5	
TP6	8 116 986	416 734	2.5	
TP7	8 117 001	416 715	2.5	
TP8	8 117 007	416 739	2.5	
TP9	8 117 021	416 718	2.5	
TP10	8 117 028	416 744	2.5	
TP11	8 117 040	416 721	2.5	
TP12	8 117 044	416 748	2.5	
TP13	8 117 059	416 725	2.5	
TP14	8 116 952	416 706	2.5	

Test ID	Approx. Northing (m, GDA94)	Approx. Easting (m, GDA94)	Termination Depth (m)	Lot Number
TP15	8 116 974	416 733	2.5	
TP16	8 116 849	416 210	1.0	**Lot 105**
TP17	8 116 839	416 230	1.0	
TP18	8 116 861	416 222	1.1	
TP19	8 116 860	373 633	1.1	
TP20	8 116 877	416 156	2.5	
TP21	8 116 861	416 163	2.2	**Lot 95**
TP22	8 116 848	416 165	2.0	
TP23	8 116 864	416 178	2.5	
TP24	8 116 808	415 949	1.5	**Lot 117**
TP25	8 116 821	415 955	1.5	
TP26	8 116 810	415 960	1.7	
TP27	8 116 797	415 966	2.5	
TP28	8 117 754	416 375	1.2	**Lot 612**
TP29	8 117 765	416 381	1.0	
TP30	8 117 746	416 393	1.5	
TP31	8 117 754	416 400	2.3	
TP32	8 117 818	416 420	1.8	**Lot 236 – Lot 701**
TP33	8 117 807	416 438	1.8	
TP34	8 117 820	416 431	1.5	
TP35	8 117 832	416 426	2.5	
TP36	8 117 822	416 445	2.5	
TP37	8 117 837	416 442	2.5	
TP38	8 117 848	416 437	2.5	
TP39	8 117 838	416 455	2.5	
TP40	8 117 763	416 444	2.5	**Lot 702 – Lot 704**
TP41	8 117 758.	416 450	2.5	
TP42	8 117 782	416 455	2.5	
TP43	8 117 776	416 468	2.5	
TP44	8 117 795	416 465	1.5	
TP45	8 117 788	416 478	1.5	
TP46	8 117 710	416 475	1.8	
TP47	8 117 803	416 486	1.8	
TP48	8 117 798	416 498	2.0	
TP49	8 117 802	416 520	1.2	
TP50	8 117 791	416 509	1.6	
TP51	8 117 783	416 489	1.5	

Test ID	Approx. Northing (m, GDA94)	Approx. Easting (m, GDA94)	Termination Depth (m)	Lot Number
TP52	8 117 776	416 504	2.0	
TP53	8 117 770	416 520	2.1	
TP54	8 116 910	416 707	2.2	
TP55	8 116 898	416 730	2.0	
TP56	8 116 878	416 766	2.5	
TP57	8 116 906	416 743	2.5	
TP58	8 116 904	416 761	2.5	
TP59	8 116 890	416 779	2.5	
TP60	8 116 897	416 799	1.9	
TP61	8 116 921	416 756	2.5	
TP62	8 116 919	416 781	2.5	
TP63	8 116 918	416 805	2.2	
TP64	8 116 945	416 758	2.0	
TP65	8 116 944	416 777	2.5	
TP66	8 116 941	416 810	1.2	
TP67	8 116 937	416 837	1.1	**Lot 914**
TP68	8 116 972	416 765	1.7	
TP69	8 116 972	416 765	1.5	
TP70	8 116 973	416 782	2.5	
TP71	8 116 970	416 815	2.5	
TP72	8 116 968	416 839	2.5	
TP73	8 116 976	416 879	2.5	
TP74	8 117 015	416 780	2.5	
TP75	8 117 037	416 799	2.5	
TP76	8 117 011	416 823	2.5	
TP77	8 117 034	416 849	2.5	
TP78	8 117 010	416 873	2.5	
TP79	8 117 027	416 893	2.5	
TP80	8 117 017	416 929	2.5	
TP81	8 117 130	417 435	1.2	
TP82	8 117 163	417 439	1.3	
TP83	8 117 189	417 449	1.3	
TP84	8 117 234	417 467	1.5	**Lot 915**
TP85	8 117 277	417 485	1.5	
TP86	8 117 122	417 462	1.6	
TP87	8 117 165	417 471	1.7	
TP88	8 117 202	417 479	1.2	

Test ID	Approx. Northing (m, GDA94)	Approx. Easting (m, GDA94)	Termination Depth (m)	Lot Number
TP89	8 117 247	417 488	1.2	
TP90	8 117 284	417 500	1.3	
TP91	8 117 124	417 484	1.3	
TP92	8 117 167	417 193	1.5	
TP93	8 117 210	417 505	1.5	
TP94	8 117 250	417 518	1.4	
TP95	8 117 286	491 800	1.2	
TP96	8 117 095	417 513	1.6	
TP97	8 117 141	417 518	1.6	
TP98	8 117 189	417 530	1.4	
TP99	8 117 229	417 541	1.3	
TP100	8 117 270	417 554	1.5	
TP101	8 117 095	417 552	1.5	
TP102	8 117 140	417 561	1.5	
TP103	8 117 191	417 570	1.4	
TP104	8 117 230	417 580	1.4	
TP105	8 117 274	417 592	1.2	
TP106	8 117 105	417 593	1.2	
TP107	8 117 142	417 613	1.5	
TP108	8 117 190	417 617	1.5	
TP109	8 117 235	417 624	1.5	
TP110	8 117 272	417 631	1.4	

5.1 Test Pit Logs

One hundred and ten Test Pits (TP1 – TP110) were conducted at the site by using an Excavator. TP1 – TP15 were conducted on Lot 200 to Lot 204; TP16 – TP20 were conducted on Lot 105; TP21 – TP23 were conducted on Lot 95; TP24 – TP27 were conducted on Lot 117; TP28 – TP31 were conducted on Lot 612; TP32 – TP39 were conducted on Lot 236 and Lot 701; TP40 – TP53 were conducted on Lot 702 to Lot 704; TP54 – TP80 were conducted on Lot 914 and TP81 – TP110 were conducted on Lot 915. TP1 – TP53 were conducted on 3 December 2024 while TP54 – TP110 were conducted on 4 December 2024. Test pit locations are shown in the site sketch in Appendix A.

During sub-surface probing, the spoil was stockpiled adjacent to the test location. The subsurface profiles exposed in the boreholes were logged in accordance with AS1726 and were photographed to provide a visual record of subsurface conditions encountered. Following these activities, each test location was progressively backfilled in the reverse order of excavation works.

TP1 – TP15 (Lot 200 to Lot 204), consist of similar soil profiles as described below:

- **0.0 – 0.1 m: Topsoil, Gravelly CLAY (CL)** – low plasticity, reddish brown / brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff to hard; followed by
- **0.1 – 0.3 m: Gravelly CLAY (CL)** – low plasticity, reddish brown / brown, with sub-angular gravel up to 10 mm in size, moist, stiff to hard; followed by

- **0.3 – 2.5 m: Clayey GRAVEL (GC)** – fine to medium grained, sub-angular gravel up to 60 mm in size at depths, pale brown to grey, with low plasticity clay, moist, very dense, extended up to maximum investigated depth.

TP16 – TP20 (Lot 105), consist of similar soil profiles as described below:
- **0.0 – 0.1 m: Topsoil, Gravelly CLAY (CL)** – low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff to hard; followed by
- **0.1 – 0.3 m: Gravelly CLAY (CL)** – low plasticity, brown, with sub-angular gravel up to 10 mm in size, moist, stiff to hard; followed by
- **0.3 – 2.5 m: Clayey GRAVEL (GC)** – fine to medium grained, sub-angular gravel up to 30 mm in size at depths, pale brown to grey, with low plasticity clay, moist, very dense, extended up to maximum investigated depth.

TP21 – TP23 (Lot 95), consist of similar soil profiles as described below:
- **0.0 – 0.1 m: Topsoil, Gravelly CLAY (CL)** – low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard; followed by
- **0.1 – 2.5 m: Gravelly CLAY (CL)** – low plasticity, reddish brown to pale brown, with sub-angular gravel up to 10 mm in size, moist, hard, extended up to maximum investigated depth.

TP24 – TP27 (Lot 117), consist of similar soil profiles as described below:
- **0.0 – 0.2 m: Topsoil, Gravelly CLAY (CL)** – low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff to hard; followed by
- **0.2 – 1.2 m: Gravelly CLAY (CL)** – low plasticity, reddish brown to greyish brown, with sub-angular gravel up to 10 mm in size, moist, stiff to hard; followed by
- **1.2 – 2.5 m: Clayey GRAVEL (GC)** – fine to medium grained, sub-angular gravel up to 30 mm in size at depths, pale brown, with low plasticity clay, moist, very dense, extended up to maximum investigated depth.

TP28 – TP31 (Lot 612), consist of similar soil profiles as described below:
- **0.0 – 0.1 m: Topsoil, Sandy CLAY (CL)** – low plasticity, pale brown, with fine to medium grained sand, moist, hard; followed by
- **0.1 – 2.5 m: Sandy CLAY (CL)** – low plasticity, pale brown to reddish brown, with sub-angular gravel up to 60 mm in size at depths, moist, hard, extended up to maximum investigated depth.

TP32 – TP39 (Lot 236 and Lot 701), consist of similar soil profiles as described below:
- **0.0 – 0.1 m: Topsoil, Sandy CLAY (CL)** – low plasticity, pale brown, with fine to medium grained sand, moist, hard; followed by
- **0.1 – 0.5 m: Sandy CLAY (CL)** – low plasticity, brown, with sub-angular gravel up to 60 mm in size at depths, moist, hard; followed by
- **0.5 – 2.5 m: Clayey SAND (SC)** – fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size, slightly moist, very dense, extended up to maximum investigated depth.

TP40 – TP53 (Lot 702 to Lot 704), consist of similar soil profiles as described below:
- **0.0 – 0.1 m: Topsoil, Sandy CLAY (CL)** – low plasticity, pale brown, with fine to medium grained sand, moist, hard; followed by
- **0.1 – 0.5 m: Sandy CLAY (CL)** – low plasticity, pale brown, with sub-angular gravel up to 10 mm in size at depths, moist, hard; followed by
- **0.5 – 2.5 m: Clayey SAND (SC)** – fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size at depths, slightly moist, very dense, extended up to maximum investigated depth.

TP54 – TP80 (Lot 914), consist of similar soil profiles as described below:

- **0.0 – 0.1 m: Topsoil, Gravelly CLAY (CL)** – low plasticity, reddish brown / brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff to hard; followed by
- **0.1 – 0.3 m: Gravelly CLAY (CL)** – low plasticity, reddish brown / brown, with sub-angular gravel up to 10 mm in size, moist, stiff to hard; followed by
- **0.3 – 2.5 m: Clayey GRAVEL (GC)** – fine to medium grained, sub-angular gravel up to 60 mm in size at depths, pale brown to grey, with low plasticity clay, moist, very dense, extended up to maximum investigated depth.

TP81 – TP110 (Lot 915), consist of similar soil profiles as described below:

- **0.0 – 1.0 m: Uncontrolled Fill, Sandy CLAY (CL)** – low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, grass, moist, firm to stiff; followed by
- **1.0 – 1.7 m: Sandy GRAVEL (GW)** – fine to medium grained, sub-angular gravel up to 60 mm in size at depths, grey, with fine to medium grained sand, moist, dense to very dense, extended up to maximum investigated depth.

A summary of the test pit coordinates and their termination depths is provided in Table 1. Ground water table was not encountered during the investigation. Test pit logs are attached in Appendix B.

5.2 Dynamic Cone Penetrometer (DCP) Tests

DCP tests (DCP1 – DCP110) were conducted alongside the test pits. DCP tests indicate the soil density of the site as per Standard Australia HB 160-2006, Table 6.4.6.1 (A) &(B). DCP data are presented in Table 3 and DCP test certificates are attached in Appendix B.

Table 3. Summary of DCP test data Ref. Table 6.4.6.1 (A) &(B) HB 160-2006

DCP Location	DCP1		DCP2		DCP3		DCP4		DCP5	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	6	VSt	5	VSt	8	VSt	5	VSt	12	H
100 - 200	7	VSt	5	VSt	8	VSt	8	VSt	14	H
200 - 300	6	VSt	5	VSt	7	VSt	>25	H	>25	H
300 - 400	8	D	6	D	8	D	-	-	-	-
400 - 500	14	VD	12	VD	16	VD	-	-	-	-
500 - 600	>25	VD	17	VD	>25	VD	-	-	-	-
600 - 700	-	-	>25	VD	-	-	-	-	-	-
DCP Location	**DCP6**		**DCP7**		**DCP8**		**DCP9**		**DCP10**	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	15	H	8	VSt	7	VSt	8	VSt	4	St
100 - 200	>25	H	8	VSt	7	VSt	8	VSt	4	St

DCP Location	DCP1		DCP2		DCP3		DCP4		DCP5	
200 - 300	-	-	8	D	6	D	8	D	12	VD
300 - 400	-	-	10	VD	9	VD	12	VD	>25	VD
400 - 500	-	-	8	D	12	VD	15	VD	-	-
500 - 600	-	-	16	VD	>25	VD	18	VD	-	-
600 - 700	-	-	>25	VD	-	-	>25	VD	-	-
DCP Location	**DCP11**		**DCP12**		**DCP13**		**DCP14**		**DCP15**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	6	VSt	5	VSt	>25	H	18	H	>25	H
100 - 200	7	VSt	5	VSt	-	-	>25	VD	-	-
200 - 300	8	D	9	VD	-	-	-	-	-	-
300 - 400	15	VD	12	VD	-	-	-	-	-	-
400 - 500	>25	VD	14	VD	-	-	-	-	-	-
500 - 600	-	-	>25	VD	-	-	-	-	-	-

DCP Location	DCP16		DCP17		DCP18		DCP19		DCP20	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	>25	H	17	H	>25	H	12	H
100 - 200	-	-	-	-	>25	H	-	-	15	H
200 - 300	-	-	-	-	-	-	-	-	>25	H
DCP Location	**DCP21**		**DCP22**		**DCP23**		**DCP24**		**DCP25**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	18	H	>25	H	>25	H	16	H
100 - 200	-	-	>25	H	-	-	-	-	>25	H
DCP Location	**DCP26**		**DCP27**		**DCP28**		**DCP29**		**DCP30**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	8	VSt	6	VSt	14	H	>25	H	>25	H
100 - 200	14	H	6	VSt	>25	H	-	-	-	-

DCP Location	DCP16		DCP17		DCP18		DCP19		DCP20	
200 - 300	>25	H	>25	H	-	-	-	-	-	-
DCP Location	**DCP31**		**DCP32**		**DCP33**		**DCP34**		**DCP35**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	8	VSt	14	H	12	H	>25	H
100 - 200	-	-	>25	H	15	H	>25	H	-	-
200 - 300	-	-	-	-	>25	H	-	-	-	-
DCP Location	**DCP36**		**DCP37**		**DCP38**		**DCP39**		**DCP40**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	16	H	8	VSt	>25	H	12	H	13	H
100 - 200	>25	H	15	H	-	-	15	H	17	H
200 - 300	-	-	>25	H	-	-	18	H	>25	H
300 - 400	-	-	-	-	-	-	>25	H	-	-

DCP Location	DCP41		DCP42		DCP43		DCP44		DCP45	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	17	H	>25	H	>25	H	>25	H
100 - 200	-	-	>25	H	-	-	-	-	-	-
DCP Location	**DCP46**		**DCP47**		**DCP48**		**DCP49**		**DCP50**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	18	H	>25	H	>25	H	4	St	>25	H
100 - 200	>25	H	-	-	-	-	8	VSt	-	-
200 - 300	-	-	-	-	-	-	6	VSt	-	-
300 - 400	-	-	-	-	-	-	8	VSt	-	-
400 - 500	-	-	-	-	-	-	15	VD	-	-
500 - 600	-	-	-	-	-	-	>25	VD	-	-
DCP Location	**DCP51**		**DCP52**		**DCP53**		**DCP54**		**DCP55**	

DCP Location	DCP41		DCP42		DCP43		DCP44		DCP45	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	24	H	23	H	22	H	6	VSt	5	VSt
100 - 200	>25	H	>25	H	>25	H	8	VSt	7	VSt
200 - 300	-	-	-	-	-	-	6	VSt	7	VSt
300 - 400	-	-	-	-	-	-	14	VD	9	VD
400 - 500	-	-	-	-	-	-	>25	VD	12	VD
500 - 600	-	-	-	-	-	-	-	-	>25	VD
DCP Location	DCP56		DCP57		DCP58		DCP59		DCP60	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	5	VSt	4	St	13	H	6	VSt	5	VSt
100 - 200	6	VSt	4	St	14	H	8	VSt	6	VSt
200 - 300	7	VSt	7	VSt	15	H	6	VSt	9	VSt
300 - 400	8	D	12	VD	>25	VD	13	VD	12	VD
400 - 500	12	VD	>25	VD	-	-	>25	VD	14	VD
500 - 600	12	VD	-	-	-	-	-	-	>25	VD
600 - 700	>25	VD	-	-	-	-	-	-	-	-

DCP Location	DCP61		DCP62		DCP63		DCP64		DCP65	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	4	St	6	VSt	5	VSt	7	VSt	6	VSt
100 - 200	7	VSt	8	VSt	8	VSt	8	VSt	8	VSt
200 - 300	8	VSt	9	VSt	6	VSt	8	VSt	14	H
300 - 400	14	H	14	H	13	H	10	VSt	>25	H
400 - 500	>25	H	15	H	>25	H	15	H	-	-
500 - 600	-	-	>25	H	-	-	>25	H	-	-
DCP Location	DCP66		DCP67		DCP68		DCP69		DCP70	
Depth (mm)	Penetration Resistance/Density Classification - Blows/100mm									
0 - 100	12	H	8	VSt	4	St	10	VSt	8	VSt

DCP Location	DCP61		DCP62		DCP63		DCP64		DCP65	
100 - 200	13	H	9	VSt	4	St	12	H	10	VSt
200 - 300	15	H	12	H	5	VSt	15	H	12	H
300 - 400	18	H	15	H	6	VSt	17	H	18	H
400 - 500	12	H	>25	H	12	H	18	H	>25	H
500 - 600	>25	H	-	-	15	H	>25	H	-	-
600 - 700	-	-	-	-	>25	H	-	-	-	-
DCP Location	**DCP71**		**DCP72**		**DCP73**		**DCP74**		**DCP75**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	4	St	7	VSt	6	VSt	10	VSt	6	VSt
100 - 200	4	St	8	VSt	8	VSt	9	VSt	7	VSt
200 - 300	12	H	9	VSt	9	VSt	11	H	8	VSt
300 - 400	12	H	10	VSt	14	H	13	H	8	VSt
400 - 500	13	H	17	H	>25	H	15	H	14	H
500 - 600	>25	H	>25	H	-	-	>25	H	14	H
600 - 700	-	-	-	-	-	-	-	-	15	H
700 - 800	-	-	-	-	-	-	-	-	>25	H

DCP Location	DCP76		DCP77		DCP78		DCP79		DCP80	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	13	H	12	H	15	H	18	H	12	H
100 - 200	14	H	>25	H	16	H	>25	H	15	H
200 - 300	>25	H	-	-	18	H	-	-	>25	H
300 - 400	-	-	-	-	>25	H	-	-	-	-
DCP Location	**DCP81**		**DCP82**		**DCP83**		**DCP84**		**DCP85**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	2	F	1	F	2	F	1	F
100 - 200	1	F	2	F	1	F	1	F	1	F
200 - 300	2	F	3	St	1	F	2	F	4	St
300 - 400	4	St	5	VSt	2	F	2	F	3	St

DCP Location	DCP76		DCP77		DCP78		DCP79		DCP80	
400 - 500	4	St	4	St	3	St	3	St	4	St
500 - 600	5	VSt	4	St	4	St	4	St	5	VSt
600 - 700	8	VSt	6	VSt	4	St	4	St	6	VSt
700 - 800	4	St	7	VSt	5	VSt	5	VSt	4	St
800 - 900	4	St	7	VSt	6	VSt	5	VSt	3	St
900 - 1000	6	VSt	5	VSt	7	D	8	D	5	D
DCP Location	**DCP86**		**DCP87**		**DCP88**		**DCP89**		**DCP90**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	3	St	2	F	1	F
100 - 200	2	F	1	F	4	St	2	F	3	St
200 - 300	2	F	1	F	4	St	3	St	2	F
300 - 400	3	St	3	St	5	VSt	4	St	3	St
400 - 500	4	St	5	VSt	4	St	4	St	4	St
500 - 600	4	St	5	VSt	5	VSt	6	VSt	4	St
600 - 700	6	VSt	7	VSt	8	VSt	6	VSt	6	VSt
700 - 800	5	VSt	8	VSt	3	St	7	VSt	5	VSt
800 - 900	6	VSt	8	VSt	4	St	5	D	5	D
900 - 1000	7	VSt	8	VSt	7	VSt	5	D	7	D

DCP Location	DCP91		DCP92		DCP93		DCP94		DCP95	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	2	F	1	F	1	F	1	F	1	F
100 - 200	2	F	1	F	1	F	1	F	1	F
200 - 300	3	St	2	F	2	F	3	St	2	F
300 - 400	4	St	3	St	3	St	4	St	3	St
400 - 500	4	St	3	St	4	St	5	VSt	4	St
500 - 600	4	St	4	St	5	VSt	6	VSt	6	VSt
600 - 700	5	VSt	5	VSt	5	VSt	7	VSt	8	VSt
700 - 800	4	St	6	VSt	6	VSt	5	VSt	5	VSt
800 - 900	6	VSt	6	VSt	4	St	4	St	4	St

DCP Location	DCP91		DCP92		DCP93		DCP94		DCP95	
900 - 1000	5	VSt	7	VSt	6	VSt	6	VSt	6	VSt
DCP Location	**DCP96**		**DCP97**		**DCP98**		**DCP99**		**DCP100**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	2	F	2	F	2	F
100 - 200	1	F	2	F	2	F	3	St	1	F
200 - 300	2	F	4	St	4	St	3	St	1	F
300 - 400	4	St	5	VSt	3	St	4	St	2	F
400 - 500	5	VSt	5	VSt	4	St	4	St	2	F
500 - 600	6	VSt	6	VSt	5	VSt	4	St	3	St
600 - 700	6	VSt	5	VSt	6	VSt	4	St	4	St
700 - 800	7	VSt	6	VSt	7	VSt	5	VSt	5	VSt
800 - 900	5	VSt	5	VSt	6	VSt	5	VSt	6	VSt
900 - 1000	6	VSt	5	VSt	5	D	5	D	7	D

DCP Location	DCP101		DCP102		DCP103		DCP104		DCP105	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	2	F	1	F	1	F
100 - 200	2	F	3	St	2	F	2	F	2	F
200 - 300	3	St	3	St	3	St	3	St	2	F
300 - 400	3	St	4	St	2	F	2	F	3	St
400 - 500	4	St	5	VSt	4	St	3	St	4	St
500 - 600	4	St	4	St	4	St	4	St	5	VSt
600 - 700	5	VSt	5	VSt	4	St	5	VSt	4	St
700 - 800	4	St	4	St	5	VSt	5	VSt	6	VSt
800 - 900	4	St	5	VSt	4	D	4	D	5	D
900 - 1000	5	VSt	4	St	6	D	6	D	7	D
DCP Location	**DCP106**		**DCP107**		**DCP108**		**DCP109**		**DCP110**	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	2	F	1	F	1	F	2	F	1	F

DCP Location	DCP101		DCP102		DCP103		DCP104		DCP105	
100 - 200	2	F	2	F	2	F	2	F	2	F
200 - 300	3	St	2	F	3	St	3	St	3	St
300 - 400	2	F	3	St	5	VSt	2	F	4	St
400 - 500	3	St	4	St	4	St	4	St	4	St
500 - 600	4	St	4	St	5	VSt	6	VSt	5	VSt
600 - 700	5	VSt	6	VSt	5	VSt	4	St	5	VSt
700 - 800	4	St	5	VSt	4	St	5	VSt	6	VSt
800 - 900	4	D	4	D	6	VSt	6	VSt	6	VSt
900 - 1000	4	D	6	D	6	VSt	5	VSt	5	VSt

Note: Density Classification is obtained based on Number of blows required for 100 mm penetration of DCP
(Table A) Very Soft (VS) < 1; Firm (F) 1 – 2; Stiff (St) 3 – 4; Very Stiff (VSt) 5 – 10; Hard (H) > 10
(Table B) Very Loose (VL) < 1; Loose (L) 1 – 2; Medium Dense (MD) 2 – 3; Dense (D) 4 – 8; Very Dense (VD) > 8

It is observed from the DCP test that the site soil is in dense to very dense and firm to hard condition.

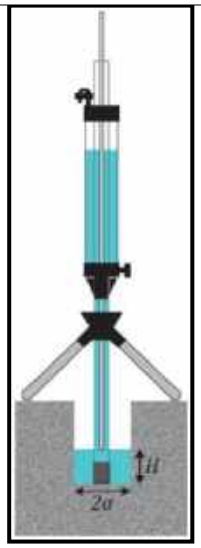
5.3 Field Permeability Test

Eight Field Permeability Tests (FPT) were conducted as per ASTM D5126 – 90 by using a Guelph Permeameter.

5.3.1 Testing Equipment: Guelph Permeameter

Guelph Permeameter is a constant head device that operates on the Mariotte siphon principle. The method involves measuring the steady-state rate of water recharge into unsaturated soil from a cylindrical well hole, in which a constant head of water is maintained. The Guelph Permeameter is capable of measuring hydraulic conductivity in sands and clays. It consists of a tripod to hold the apparatus vertical, the reservoir tube and the inner air tube. A typical test set-up is shown in Figure 2.

(a) Field Set-up



(b) Field Testing

Figure 2. Field Permeability Test by Guelph Permeameter

5.3.2 Testing Procedure

The field permeability test was conducted as per ASTM D5126 – 90. The following steps were followed during testing by using the Guelph Permeameter:

- The testing well (radius = a) was prepared using an auger. Rough auger followed by sizing auger were used to make the hole for permeability test as shown in Figure 3 (b).
- The depth of auger was selected based on head depth to be used in the test.
- Soil around the testing well was saturated by pouring extra water into the test hole. Water pouring was performed a few times to ensure the surrounding area of the hole becomes fully saturated.
- The Guelph Permeameter was then assembled as shown in Figure 3 (a) and both inner and outer reservoirs were filled with water.
- A head (H) was used in the testing by slowly lifting the air tube.
- The outflow from the reservoirs was recorded for a certain time interval. The timing of the reading was determined based on soil type.
- Reading was taken until at least three steady readings were observed during testing.

5.3.3 Test Results

The soil at the test locations comprised sand. It is assumed that site soil was fully saturated during the field permeability test. Permeability test results are summarised in Table 4 and the test certificates are presented in Appendix B.

Table 4. Summary of Field Permeability Test Data

Test ID	Permeability		Test Depth (m)	Observed Soil type
	m/sec	m/day		
FPT1	$3.1*10^{-6}$	0.27	0.45	Clayey loam
FPT2	$4.5*10^{-6}$	0.39	0.45	
FPT3	$3.1*10^{-6}$	0.26	1.0	
FPT4	$3.8*10^{-6}$	0.33	0.45	
FPT5	$3.0*10^{-6}$	0.26	0.45	
FPT6	$2.9*10^{-6}$	0.25	0.45	
FPT7	$2.5*10^{-6}$	0.22	0.45	
FPT8	$3.4*10^{-6}$	0.29	0.45	

It is found from the field test that the average permeability rate of in situ soil is approximately **0.28 m/day**.

6.0 LABORATORY TEST

Laboratory tests were conducted at Local Geotechnics Laboratory, a NATA accredited testing laboratory in WA. The following laboratory tests were undertaken:

- Atterberg Limit Test, AS 1289 2.1.1, and
- Particle Size Distribution Test, AS 1289 3.6.3, 3.5.1

The laboratory test results are summarised in Table 5. Laboratory test data show that the site soil is slightly reactive. The laboratory test certificates are attached in Appendix D.

Table 5. Summary of Laboratory Test Data

Sample	Particle Size Distribution (PSD)			Atterberg Limits Tests			
Location	G (%)	S (%)	Fines < 75µm (%)	LL (%)	PL (%)	PI (%)	LS (%)
TP1 (0.8 m – 1.8 m)	63	25	12	29	21	8	4.0
TP8 (0.1 - 0.2 m)	24	47	29	36	16	20	7.5
TP15 (0.3 - 1.0 m)	10	49	41	41	13	28	7.0
TP16 (1.2 - 1.5 m)	39	43	18	38	23	15	5.5
TP20 (0.7 - 1.2 m)	2	60	38	38	19	19	9.5
TP29 (0.0 - 0.3m)	2	53	45	35	17	18	8.5
TP38 (1.2 - 1.5 m)	9	60	31	38	15	23	7.5
TP41 (0.8 - 1.0 m)	84	8	8	46	12	34	12.5

Notes: G = Gravel; S = Sand; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; LS = Linear Shrinkage.

7.0 EARTHWORKS RECOMMENDATION

Any earthworks at the site should be carried out in general accordance with the Australian Standard AS 3798-2007 “Guidelines on Earthworks for Commercial and Residential Developments”. Asbestos and septic tank investigation was not in the scope of this investigation. Client must confirm that the site is free from asbestos and there is no septic tank at the site. Followings are general guidelines to be followed during earthworks:

- Clear any unsuitable material from the topsoil of the site. Unsuitable materials generally includes: organics, grass roots, uncontrolled fill of building rubbles, bricks, stone blocks, concrete, wood, asphalt, bore well, different types of waste etc.
- Remove all the trees with roots from the site and backfill with clean sand.
- **Lot 915 has uncontrolled fill up to a depth of 1.0 m. This uncontrolled fill needs to be replaced with clean sand and bring this to dense condition.**
- Before laying a foundation, compact the site up to 1050 mm depth to a dense condition as per AS 3798-2007. We recommend, PSP seating for 0-150 mm, 8 PSP blows for 150-450 mm, 9 PSP blows for 450-750 mm and 10 PSP blows for 750-1050 mm and 10 PSP blows for every 300 mm of penetration.
- In order to achieve the desired compaction, we recommend, box out approximately 200 mm top layer and stockpile at the site to reuse after screening. Compact bottom layer to bring it to dense condition. Later backfill the area to raise the site to the existing surface level by using clean sand (or screened site soil) and compact to a dense condition as per AS 3798.
- The backfilling layer should not exceed more than 300 mm in loose condition. Each 300 mm layer of backfilling should be compacted to dense condition as per AS 3798-2007.
- Site should be prepared in a way so that surrounding stormwater runoff or surface water runoff does not pass through the building envelop.
- Care needs to be given to any existing or adjacent structures to avoid any damage from excessive vibrations during compaction and earthworks.
- Retaining wall is required if there is an elevation difference of 250 mm or as per requirement of the local council.
- For site maintenance it is recommended to follow the CSIRO publication “Guide to Home Owners on Foundation Maintenance and Footing Performance” in Building Technology File Number 18. This document provides important information about implications of plumbing, property maintenance, site classification on foundation design, drainage and performance expectations.

- *It is highly recommended that a competent geotechnical engineer should supervise earthworks and construction.*

8.0 ENGINEERING CONSIDERATIONS AND RECOMMENDATIONS

8.1 Site Classification

Provided earthworks are completed as per the recommendation in Section 7.0 of this report, based on the site soil profile and surrounding condition, the site classification in accordance with the definitions provided in Australian Standard AS2870 are presented in Table 6.

Table 6. Site Classification

Lot Number	Site Class	Surface movement (mm)	Remarks
95, 105, 117, 141, 200, 201, 202, 203, 204, 236, 701, 702, 703, 704, 612 and 914	**M**	30	-
915	**P**	-	**Class P** due to uncontrolled fill at the site

Lot 915 has uncontrolled fill up to a depth of 1.0 m. This uncontrolled fill needs to be replaced with clean sand and bring this to dense condition. Then this site (Lot 915) can be classified as Class M with surface movement of 30 mm.

An assumption of soil suction change of 2.5 m is made in this case. General definition of 'Site Class' is shown in Table 7 (Source: AS 2870-2011).

Table 7. General Definition of Site Class (Source: AS 2870-2011)

Site Class	Soil Description	Characteristic Surface Movement (mm)
A	Most SAND and ROCK sites with little or no ground movement due to moisture content variation	little or no ground movement
S	Slightly reactive clayey or silty SAND, which will cause slight ground movement due to moisture content variation	0 < Ys ≤ 20
M	Moderately reactive clayey or silty soil which will cause moderate ground movement due to moisture content variation	20 < Ys ≤ 40
H1	Highly reactive clayey or silty soil which will cause high ground moved due to moisture content variation	40 < Ys ≤ 60
H2	Highly reactive clayey or silty soil which will cause high ground moved due to moisture content variation	60 < Ys ≤ 75
E	Extremely reactive clayey or silty soil which will cause extreme ground movement due to moisture content variation	Ys > 75
P	Problematic sites, sites consisted of soft soils, soft clay or silt or loose sand; landfills, mine subsidence, collapsing soils, very reactive soils, subjected to erosion and sites which cannot be classified as A to E.	-

8.2 Earthquake Design Factor

Australian Standard AS1170.4-2007 Structural design actions Part 4 "Earthquake actions in Australia" is recommended for earthquake consideration. AS1170.4-2007 outlines the design criteria required for a structure in consideration of the risk of being subjected to earthquake loads. Earthquake design factors are summarised in Table 8.

Table 8. Earthquake Design Factors

Factor/Class	Value/Name	Ref. AS1170.4- 2007
Hazard Factor (z)	0.10	Section 3 Table 3.2
Site subsoil class	Class C_e – Shallow Soil	Section 4

8.3 Stormwater Drainage

Onsite disposal of roof runoff and stormwater via soakwell is not appropriate for this site. We recommend discharging of surface and roof runoff offsite to the council drainage system or locally available drainage system or as recommended by the local government authority. The drainage system must be designed by a qualified engineer as per requirements of the local government authority.

9.0 LIMITATION OF USE

The ground is a product of continuing natural and man-made processes and therefore exhibits characteristics and properties which may vary from place to place and can change with time. Geotechnical site investigation involves gathering and assimilating limited facts about these characteristics and properties in order to better understand or predict the behaviour of the ground at a particular site under certain conditions.

This site investigation has been carried out by inspection, using a limited amount of pit excavations, sampling, testing or other means of investigation. Achieving a full coverage of the site to ensure all variations is not practical and is seldom done due to cost constraints as well as the impracticality.

It should be noted that the subsurface conditions encountered by the limited number of pit excavation as part of this geotechnical site investigation represents the ground conditions at the locations where the samples were taken and where tests have been undertaken and as such are an extremely small proportion of the site to be developed.

The facts reported in this document are directly relevant only to the ground at the place where, and time when, the investigation was carried out and are believed to be reported accurately. Given the limited number of test pits and limited field and laboratory testing carried out with respect to the overall site area, variations between investigation locations is likely and ground conditions different to those presented in this report may be present within the subject site area. The risk associated with this variability and the impact it will have on the proposed development should be carefully considered.

The level of geotechnical investigation that has been completed to date is considered appropriate for the project objectives. If the above mentioned client, its subcontractors, agents or employees use this factual information for any other purpose for which it was not intended, then the client, its subcontractors, agents or employees does so at its own risk and Local Geotechnics will not and cannot accept liability in respect of the advice, whether under law of contract, tort or otherwise.

Any interpretation or recommendation given in this report is based on judgement and experience and not on greater knowledge of the facts reported. Local Geotechnics does not represent that the information or interpretation contained in this report addresses completely the existing features, subsurface conditions or ground behaviour at the subject site.

10.0 REFERENCES

- Australian Standard AS1170.4-2007, *"Earthquake Actions in Australia"*.
- Australian Standard AS 1726-1993 *"Geotechnical Site Investigations".*
- Australian Standard AS 2870-2011, *"Residential Slabs and Footings".*
- Australian Standard AS 3798-2007, *"Guidelines on Earthworks for Commercial and Residential Developments".*
- CSIRO publication *"Guide to Homeowners on Foundation Maintenance and Footing Performance"* in Building Technology File Number 18.
- Environmental Geological Western Australia survey Map of Halls Creek 1:100,000 (Sheet 4461)
- 'Perth Ground Water Atlas' of the Department of Water.
- Standards Australia, Handbook HB 160-2006 *"Soil Testing".*

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APPENDIX A

SITE SKETCH

Site Sketch : Overview of Test Locations across Various Lots

Reference:	LGK0632024SC
Client:	Department of Communities
Project:	Geotechnical Site Classification Warmun Community, WA

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APPENDIX B

TP LOGS, DCP AND FPT TEST CERTIFICATES

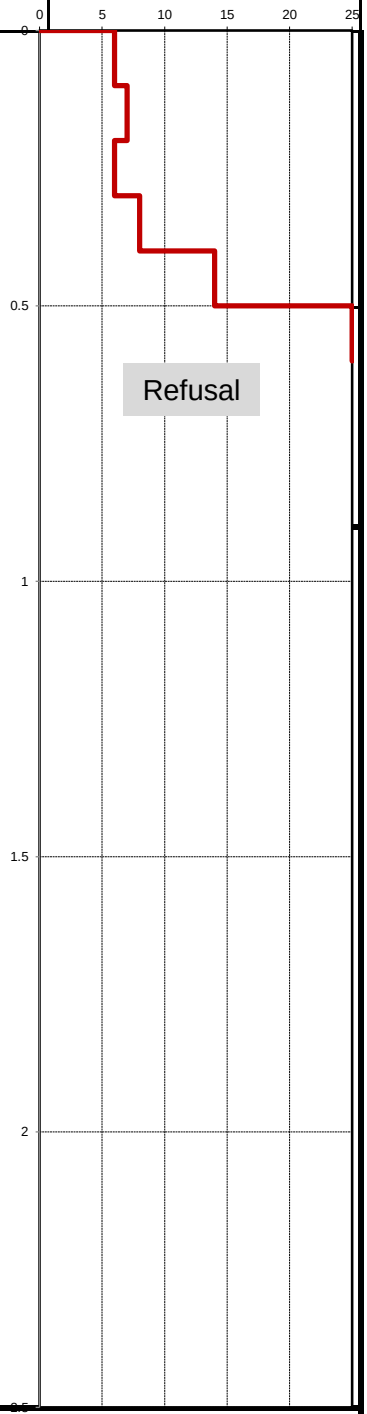
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP1
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 944 Easting: 416 705	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

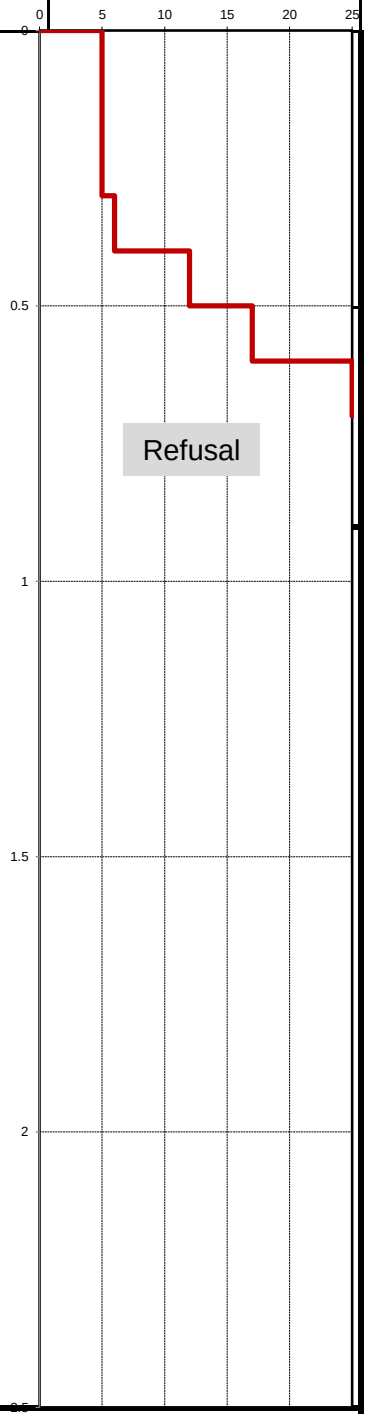
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP2
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 950 Easting: 416 726	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

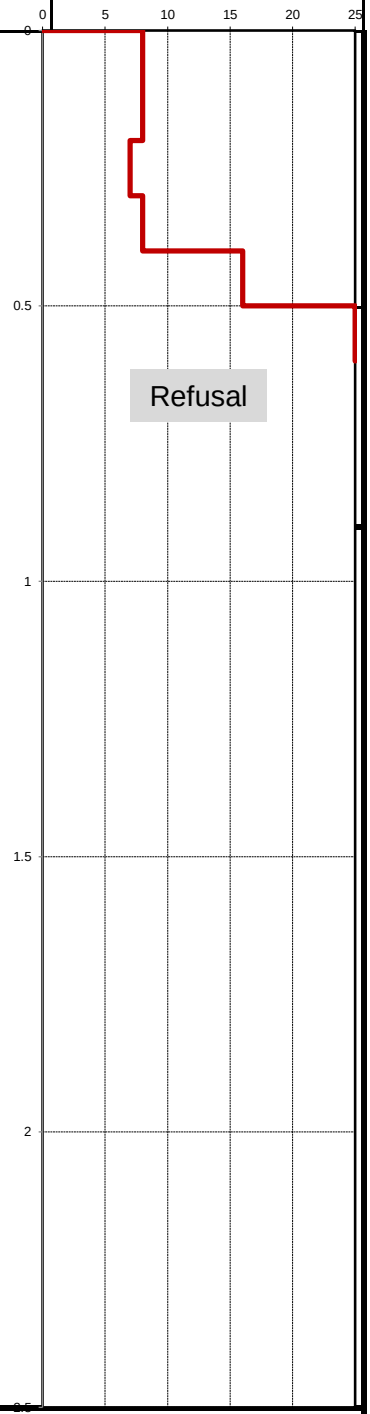
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP3
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 961 Easting: 416 706	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

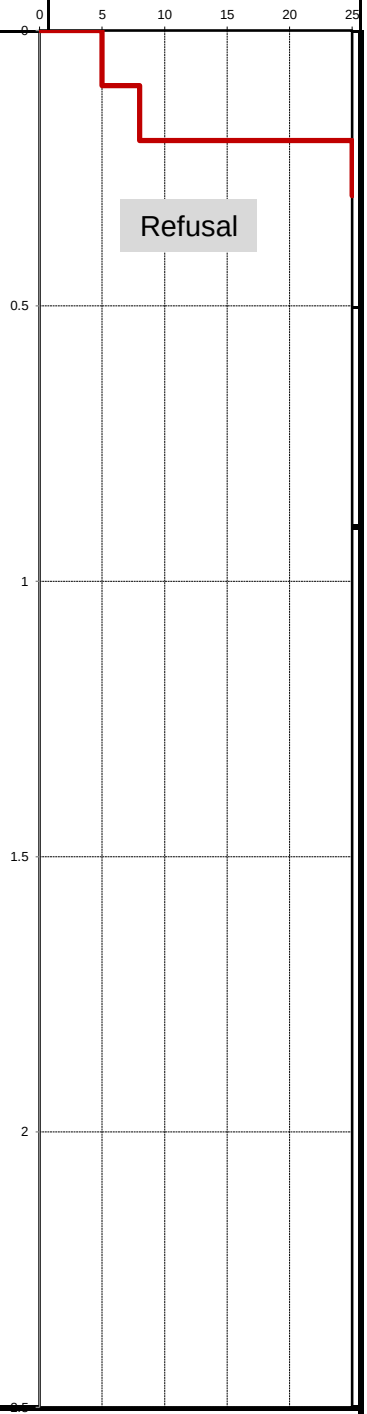
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP4
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 967 Easting: 416 729	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
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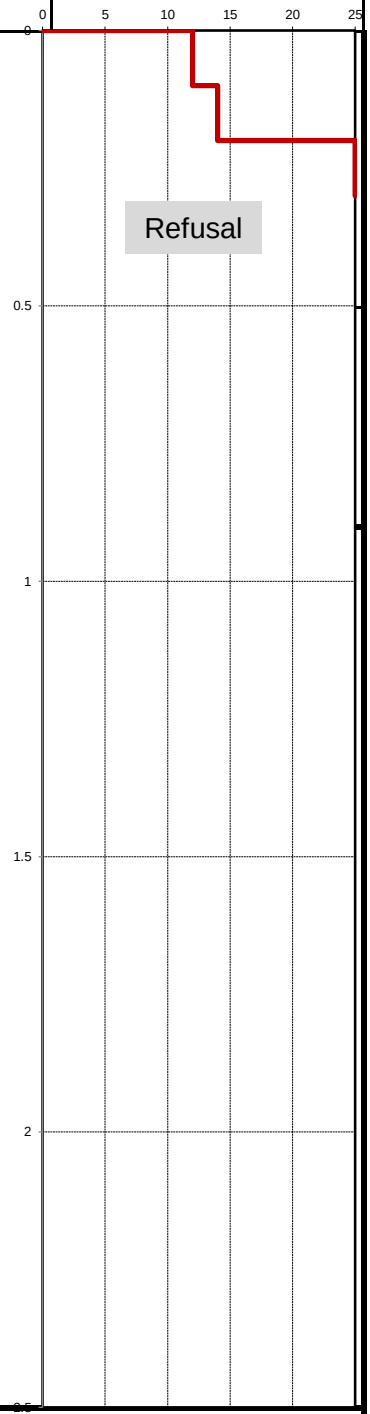
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP5
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 980 Easting: 416 710	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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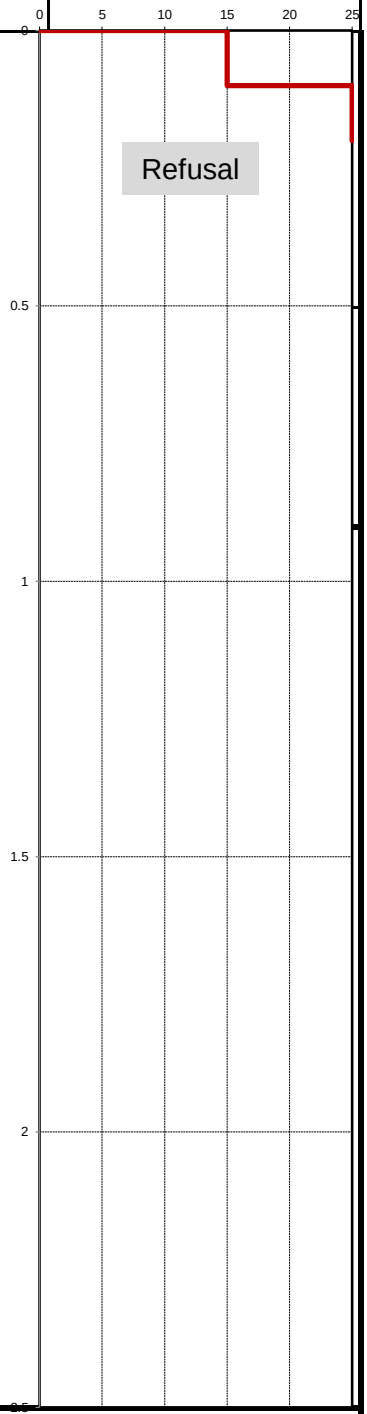
Reference	: LGK0632024SC	Test Pit/BH No.:	TP6
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 986 Easting: 416 734	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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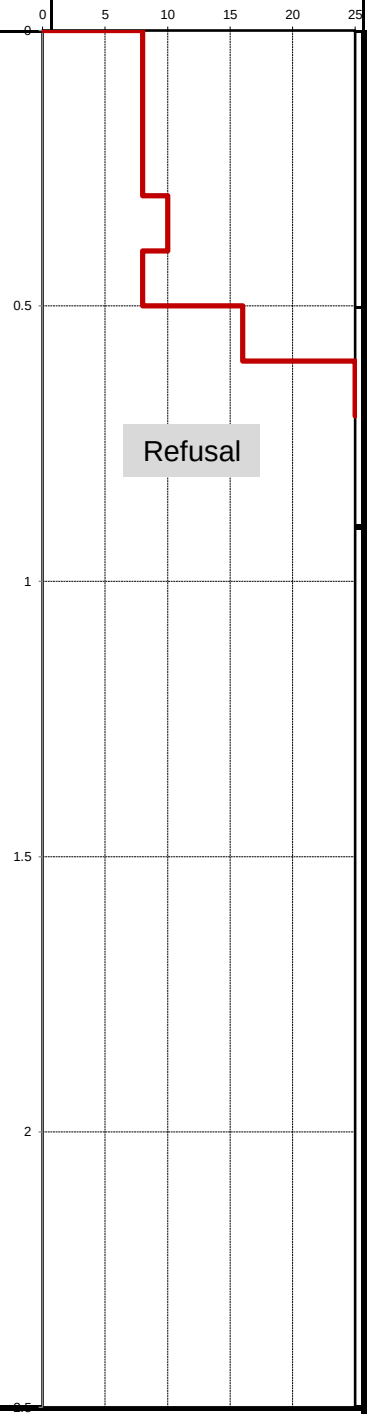
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP7
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 001 Easting: 416 715	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense becomes very dense	
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

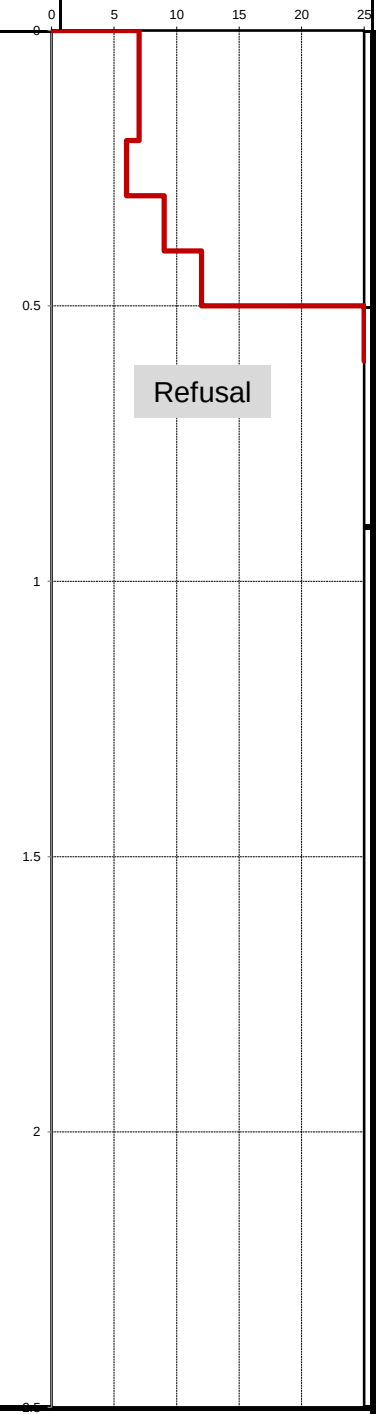
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP8
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 007 Easting: 416 739	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

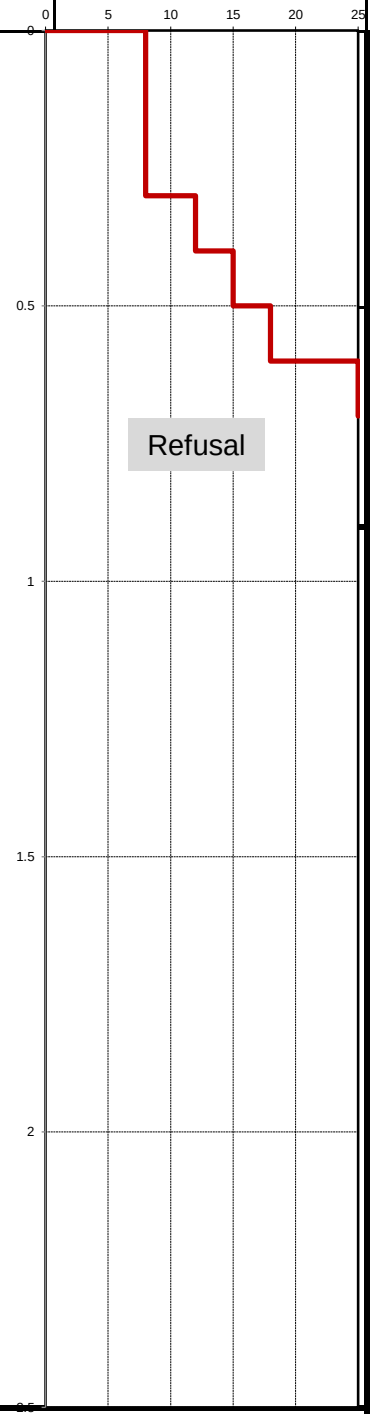
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP9
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 021 Easting: 416 718	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

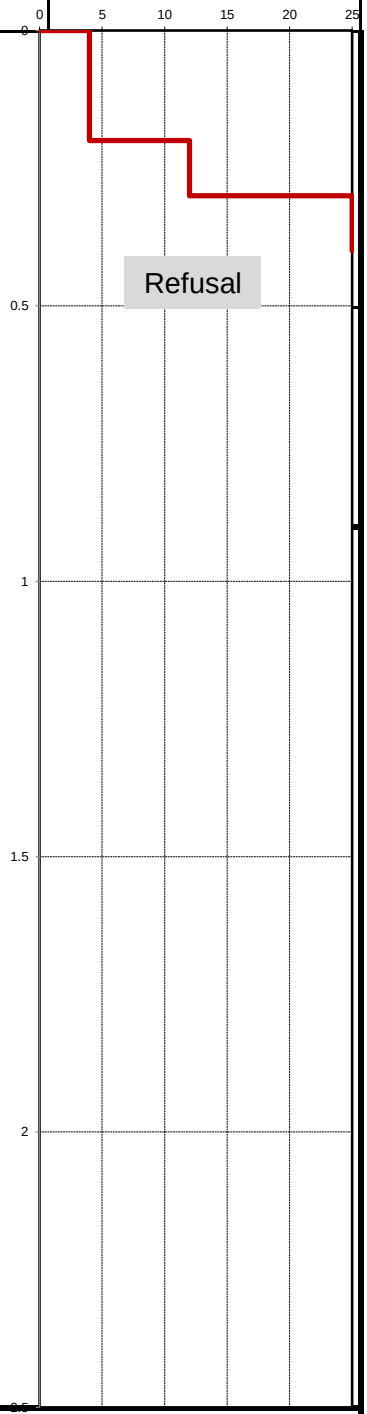
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP10
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 028 Easting: 416 744	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, stiff	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

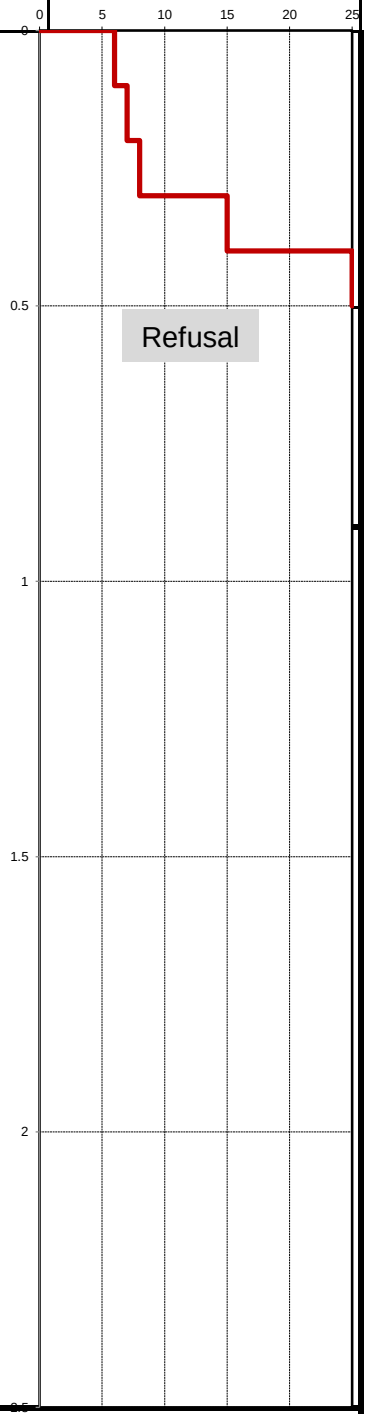
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP11
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 040 Easting: 416 721	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1								
0.2						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, very stiff	
						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

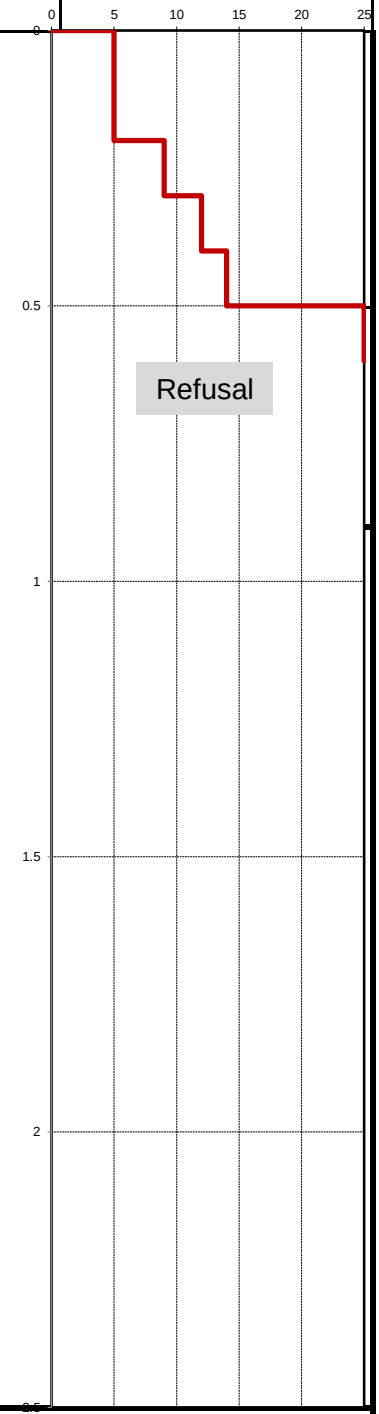
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP12
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 044 Easting: 416 748	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1								
0.2						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, very stiff	
						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

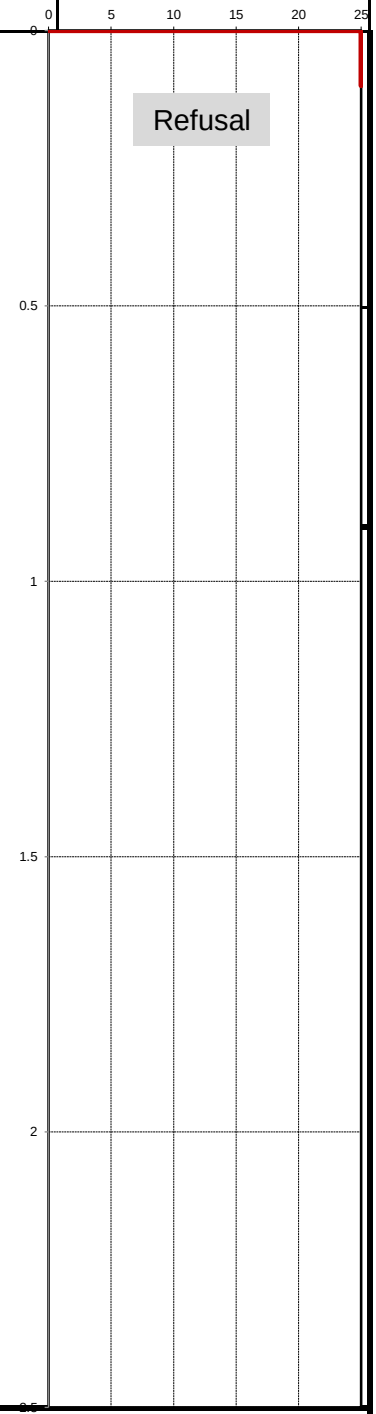
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP13
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 059 Easting: 416 725	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
0.6							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

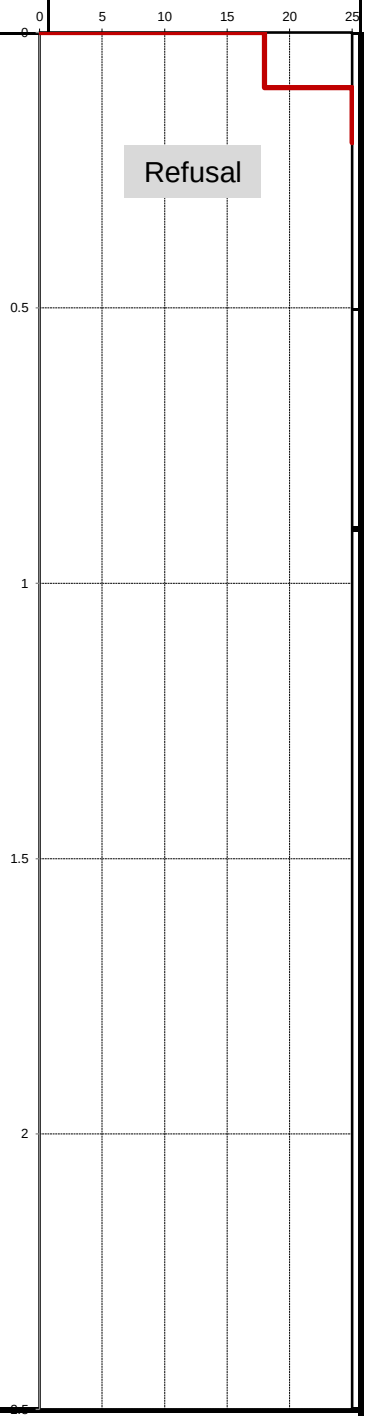
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP14
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 952 Easting: 416 706	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
0.6							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

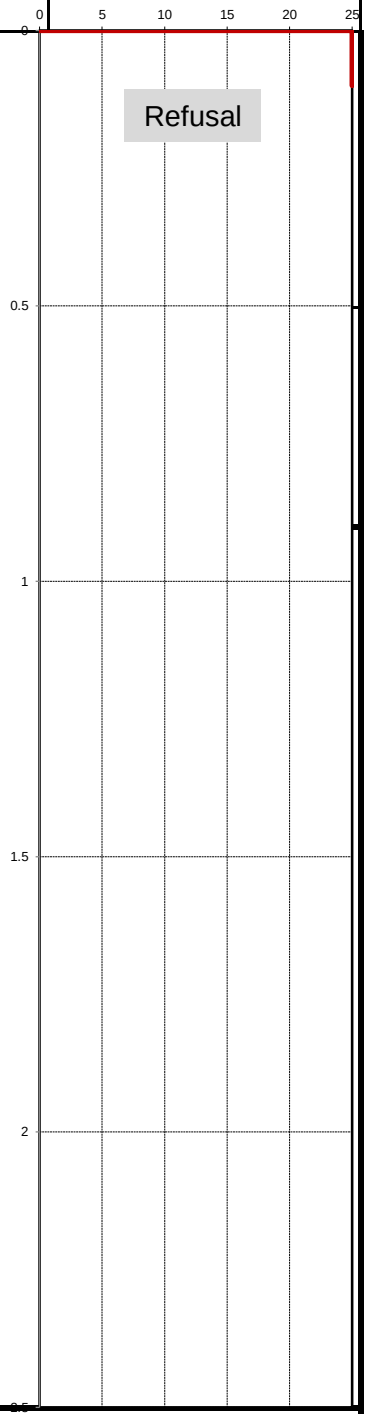
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP15
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 974 Easting: 416 733	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
0.6							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

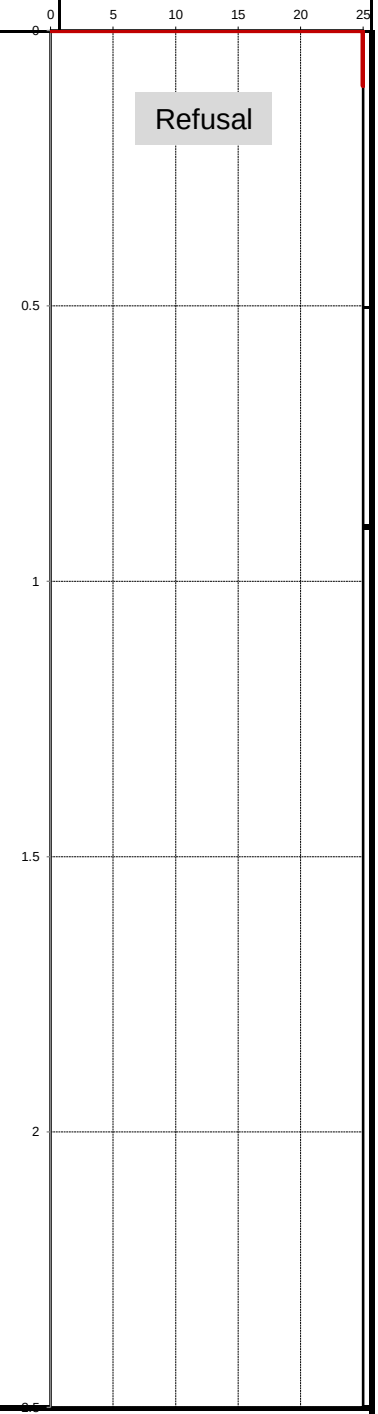
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP16
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 849 Easting: 416 210	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, brown, with low plasticity clay, moist, very dense	
0.5								
1.0							**Terminated at a depth of 1.0 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

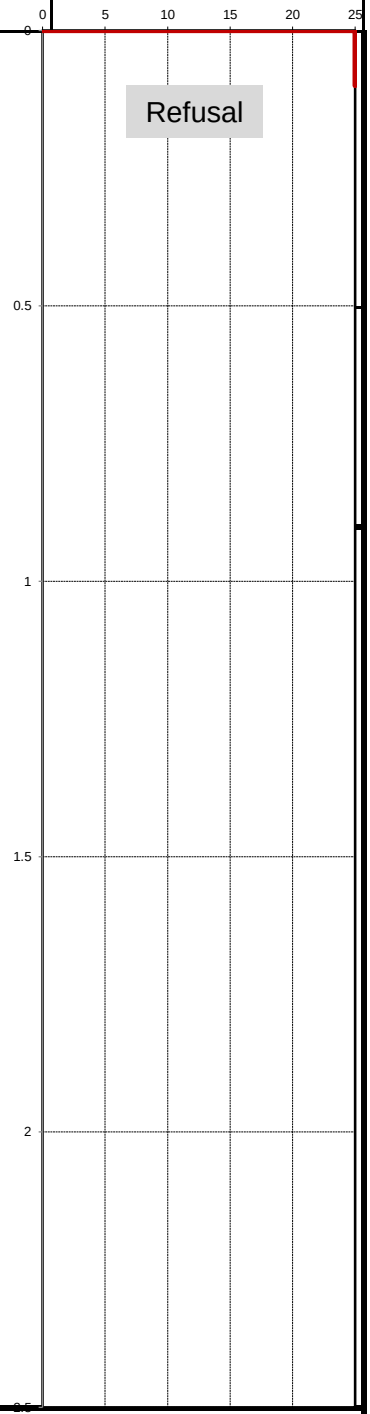
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP17
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 839 Easting: 416 230	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, brown, with low plasticity clay, moist, very dense	
0.5								
1.0							**Terminated at a depth of 1.0 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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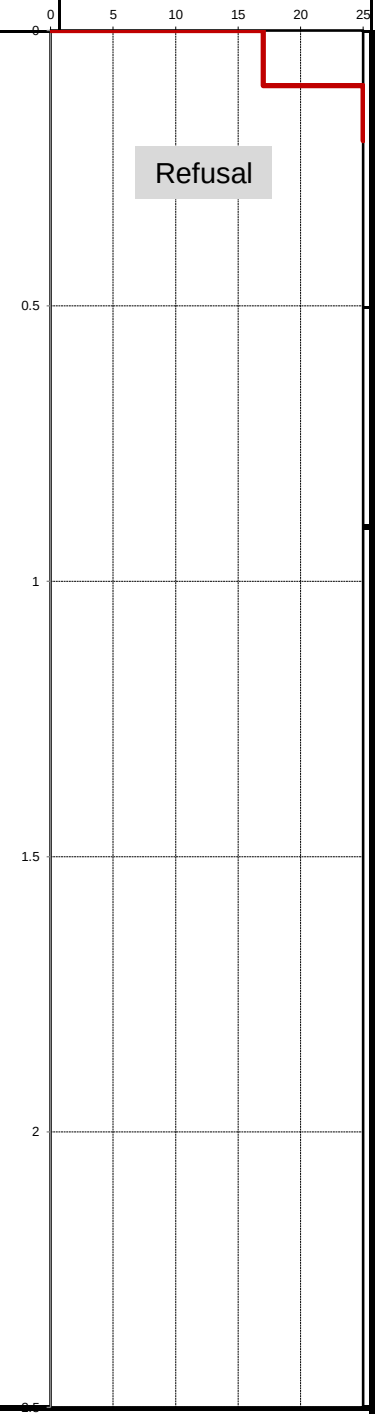
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP18
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 861 Easting: 416 222	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, brown, with sub angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, brown, with low plasticity clay, moist, very dense	
0.5								
1.0								
1.1							**Terminated at a depth of 1.1 m due to refusal on rock**	
1.5								
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
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12/8 Production Road, Canning Vale WA 6155
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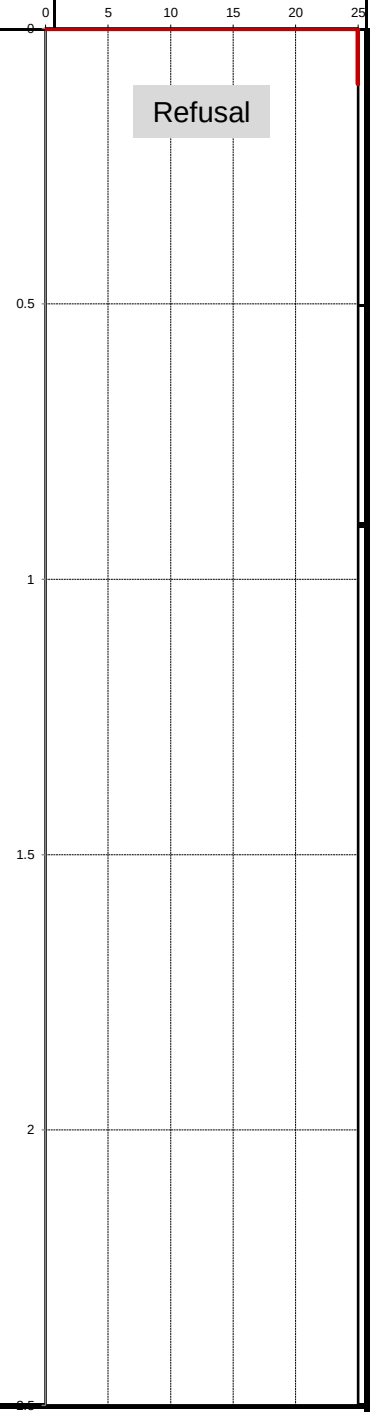
Reference	: LGK0632024SC	Test Pit/BH No.:	TP19
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 860 Easting: 373 633	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0								
1.1							**Terminated at a depth of 1.1 m due to refusal on rock**	
1.5								
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

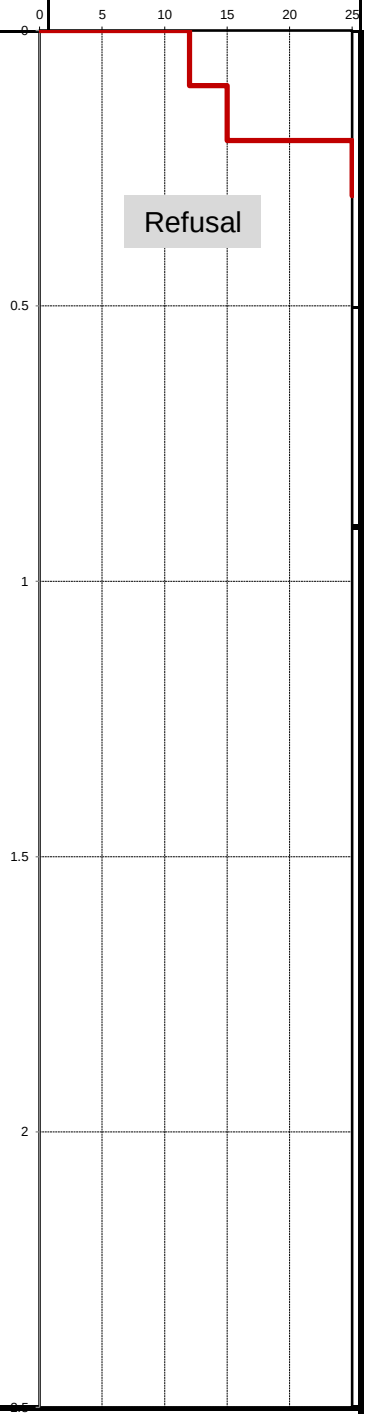
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP20
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 877 Easting: 416 156	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
0.5								
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

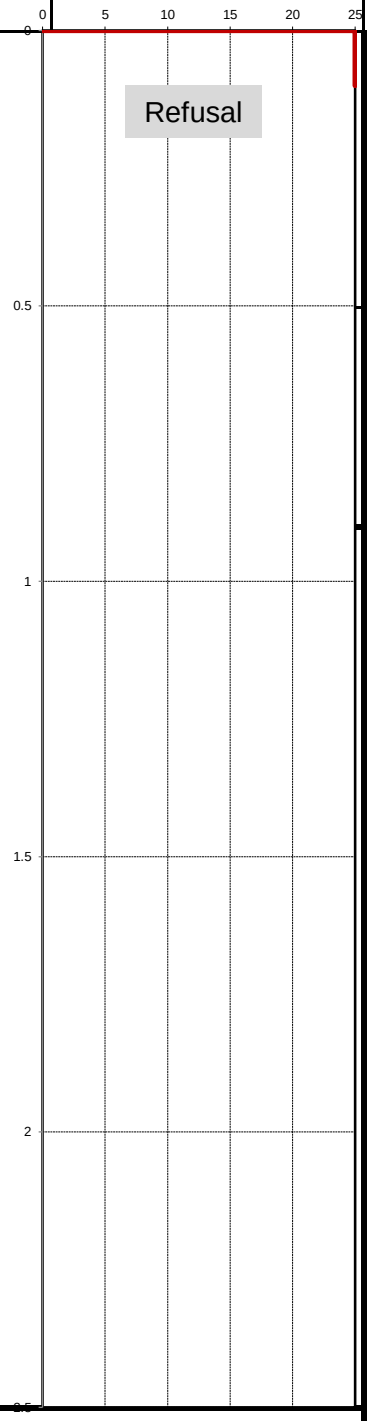
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP21
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 861 Easting: 416 163	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
0.8							colour changes to pale brown	
1.0								
1.5								
2.0								
2.2							**Terminated at a depth of 2.2 m due to refusal on rock**	
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

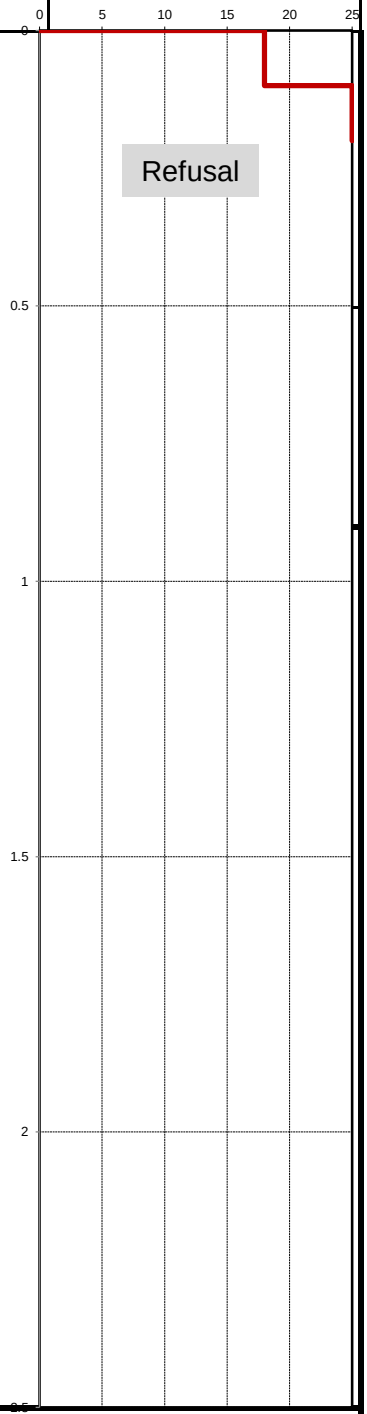
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP22
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 848 Easting: 416 165	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
1.0							colour changes to pale brown	
1.5								
2.0							**Terminated at a depth of 2.0 m due to refusal on rock**	
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

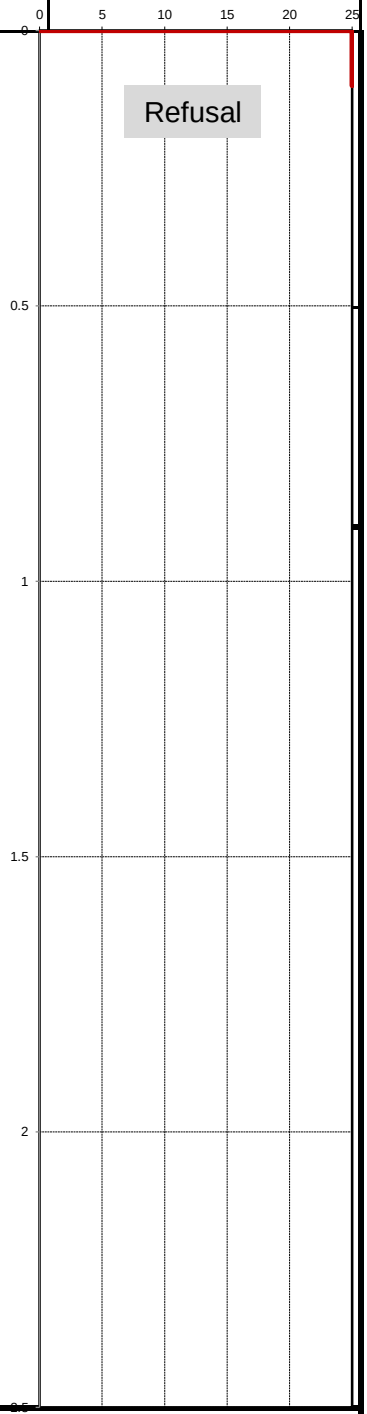
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP23
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 864 Easting: 416 178	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
1.0							colour changes to pale brown	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

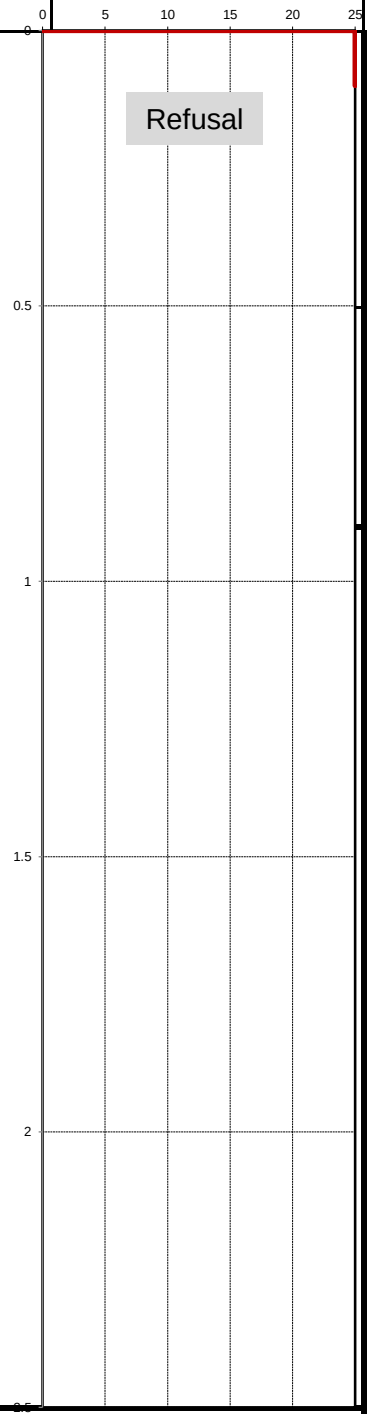
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP24
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 808 Easting: 415 949	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY -** low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
0.8							colour changes to greyish brown	
1.0								
1.2						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

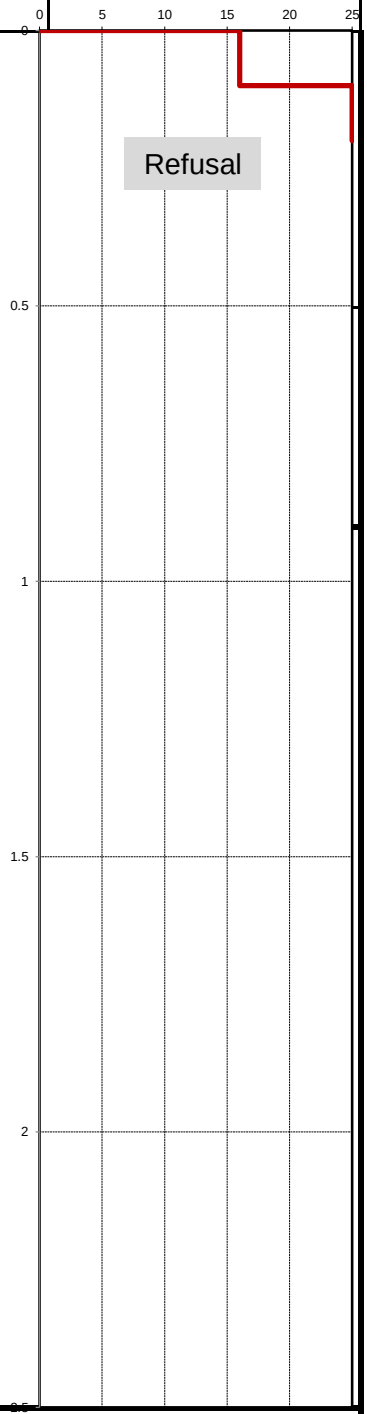
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP25
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 821 Easting: 415 955	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY -** low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
1.0							colour changes to greyish brown	
1.2						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

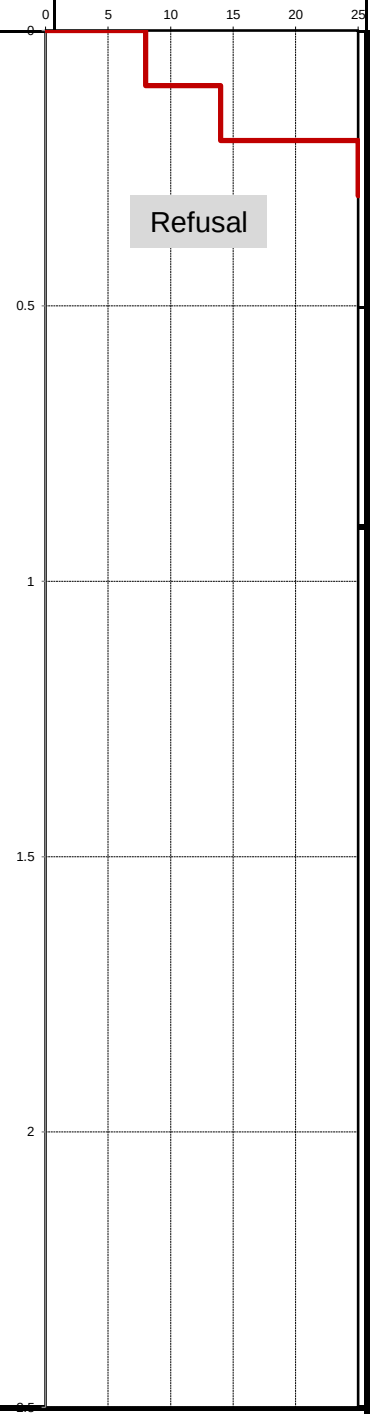
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP26
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 810 Easting: 415 960	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY -** low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
1.0							colour changes to greyish brown	
1.2						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.5								
1.7							**Terminated at a depth of 1.7 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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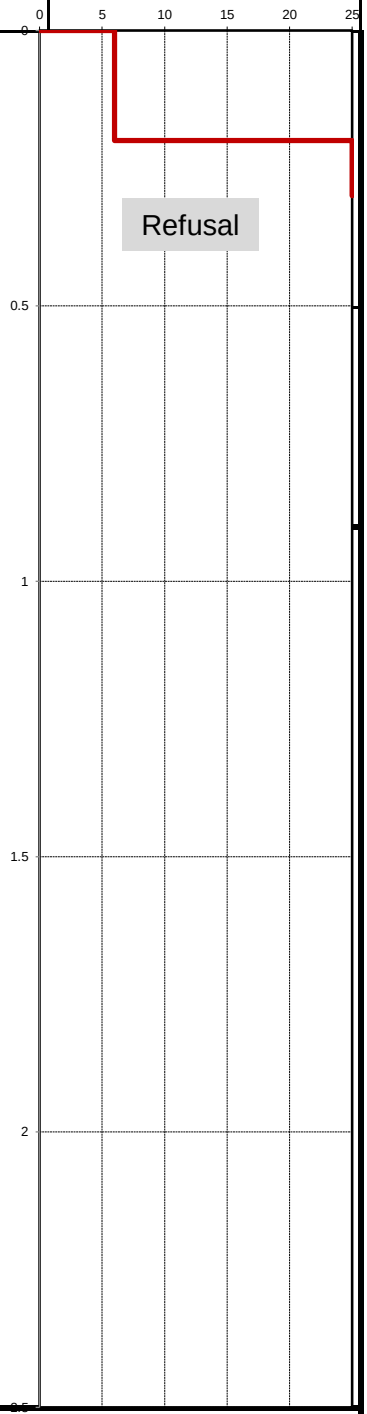
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP27
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 797 Easting: 415 966	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY -** low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
1.0								
1.2							colour changes to greyish brown	
1.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

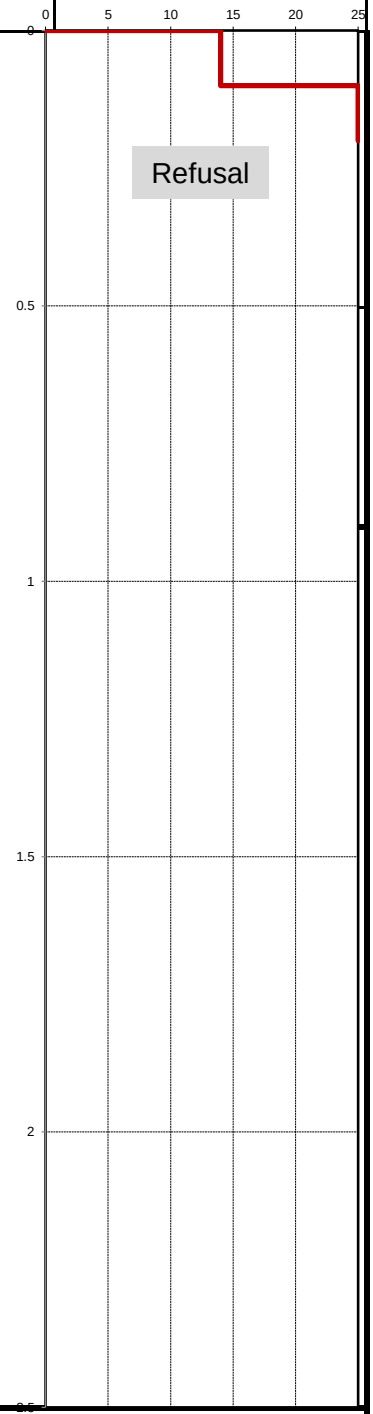
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP28
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 754 Easting: 416 375	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.3						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard colour changes to reddish brown	
0.7							with sub-angular gravel up to 60 mm in size	
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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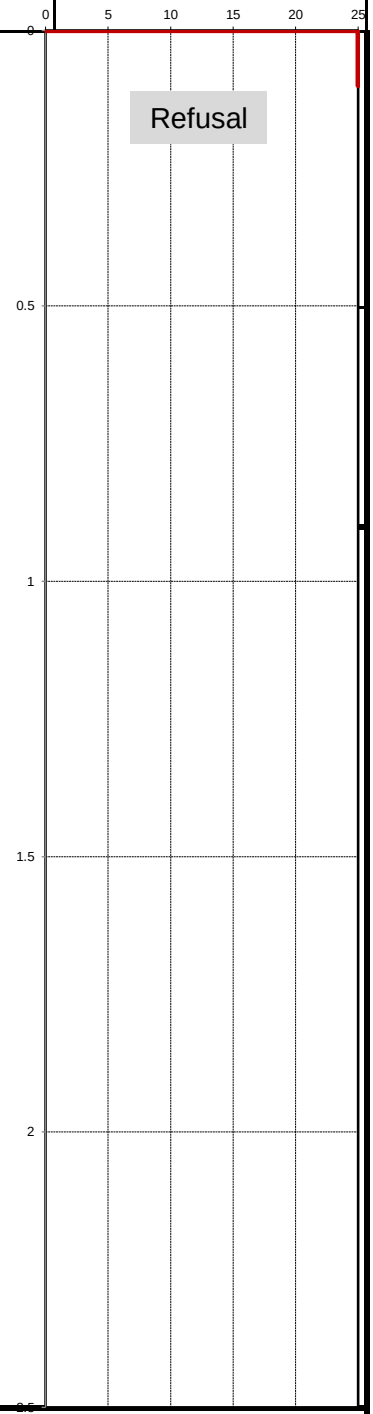
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP29
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 765 Easting: 416 381	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5							colour changes to reddish brown, with sub-angular gravel up to 60 mm in size	
1.0							**Terminated at a depth of 1.0 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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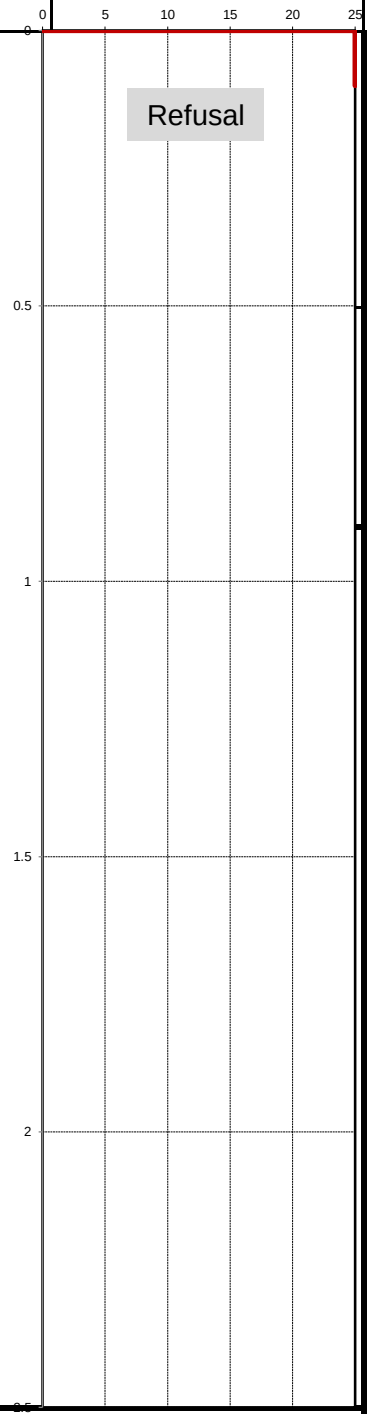
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP30
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 746 Easting: 416 393	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5							colour changes to reddish brown, with sub-angular gravel up to 60 mm in size	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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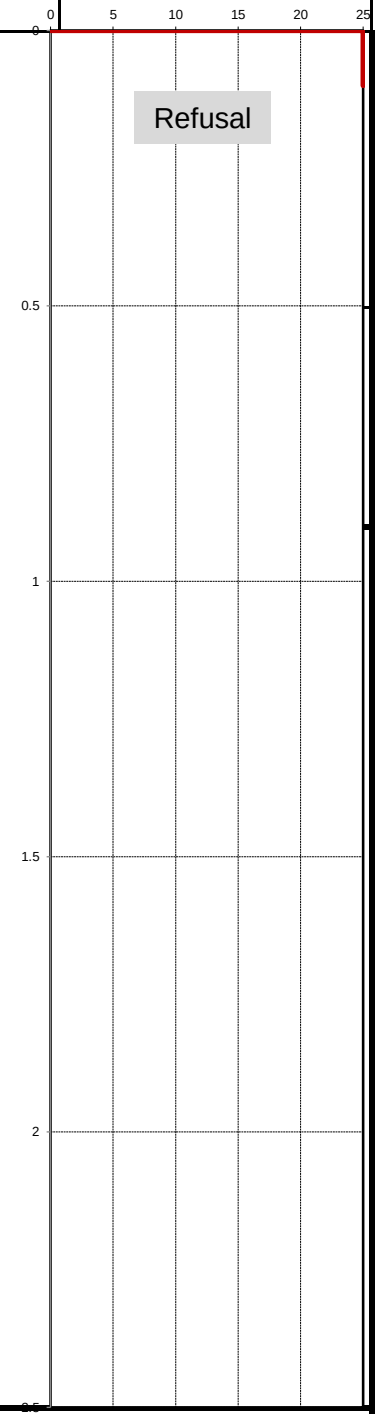
Reference	: LGK0632024SC	Test Pit/BH No.:	TP31
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 754 Easting: 416 400	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5								
1.0								
1.2							colour changes to reddish brown, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.3							**Terminated at a depth of 2.3 m due to refusal on rock**	
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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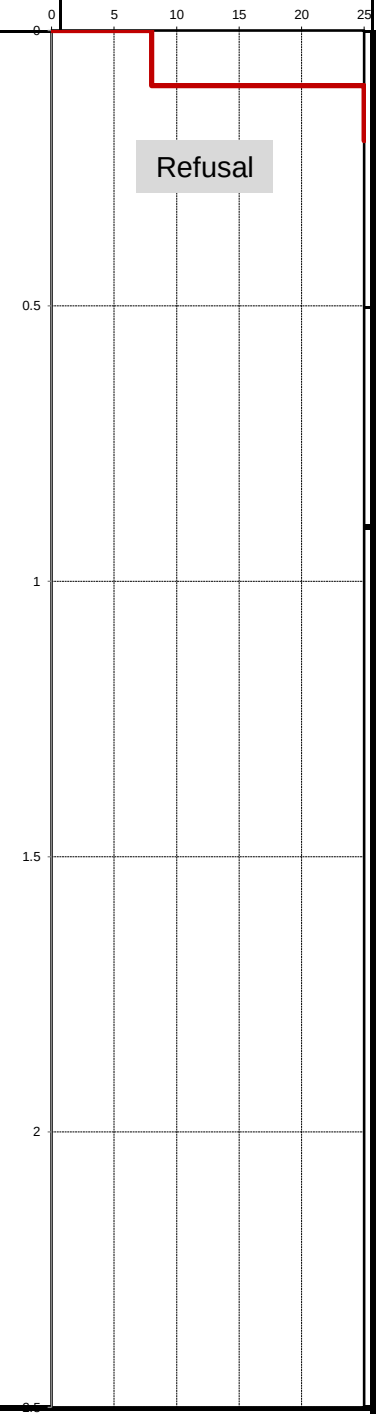
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP32
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 818 Easting: 416 420	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, very stiff	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5								
0.6						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0								
1.2							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
1.8							**Terminated at a depth of 1.8 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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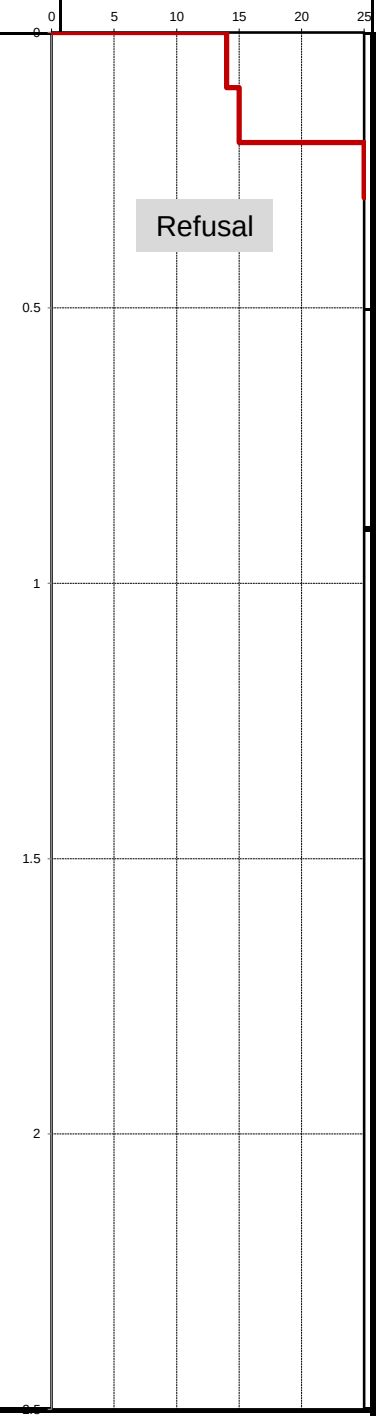
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP33
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 807 Easting: 416 438	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
1.8							**Terminated at a depth of 1.8 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

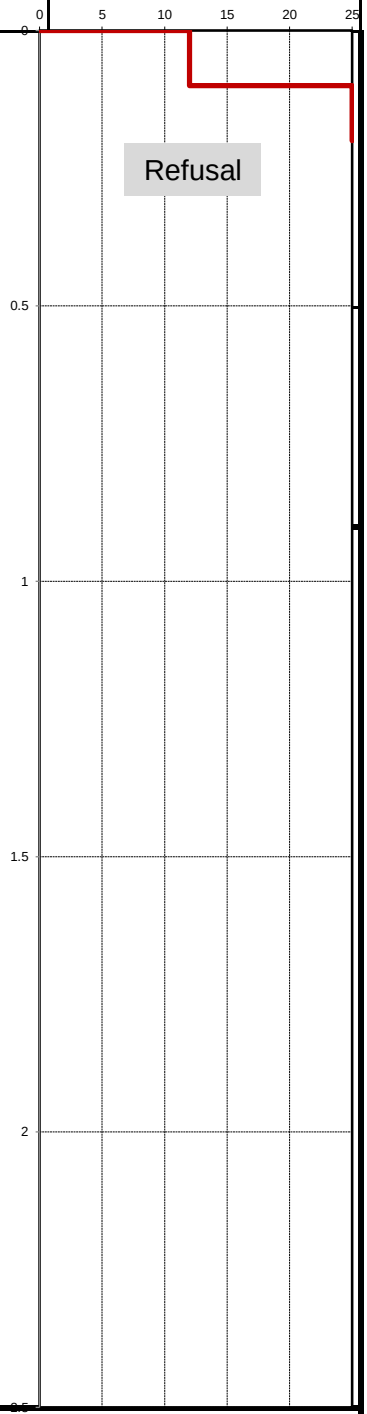
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP34
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 820 Easting: 416 431	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

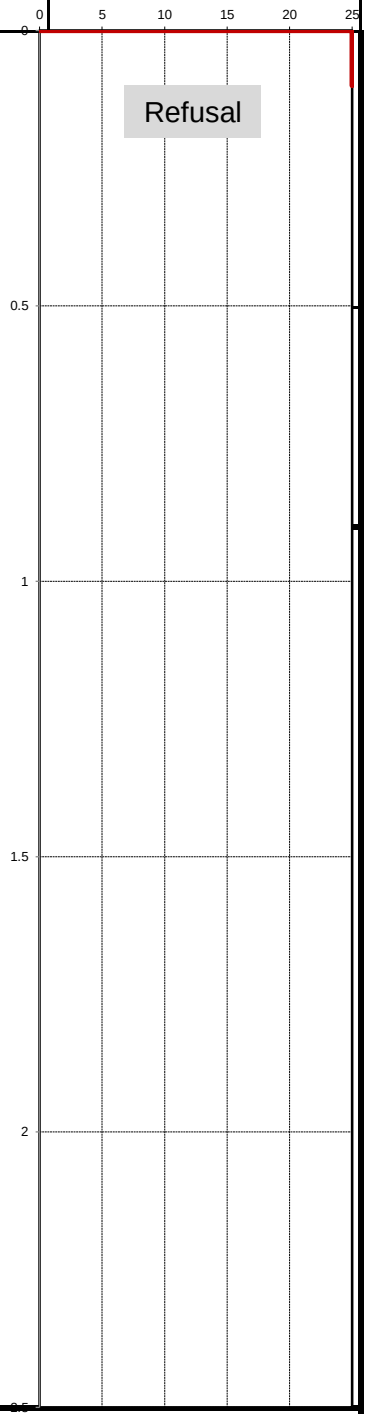
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP35
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 832 Easting: 416 426	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5								
0.9						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0								
1.5							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

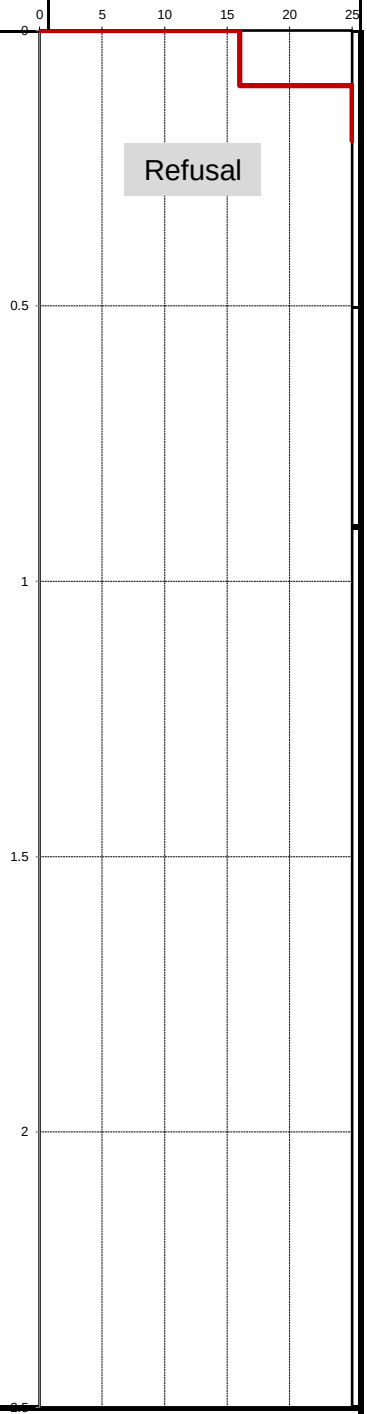
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP36
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 822 Easting: 416 445	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5								
1.0						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.3							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

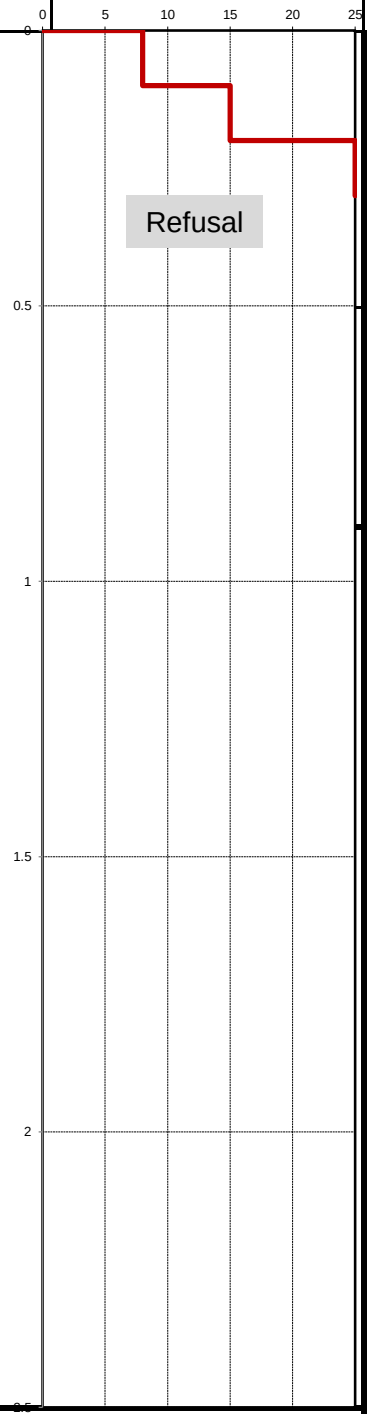
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP37
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 837 Easting: 416 442	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, very stiff	
0.1						CL	**Sandy CLAY** - low plasticity, brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5								
1.0						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.5							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

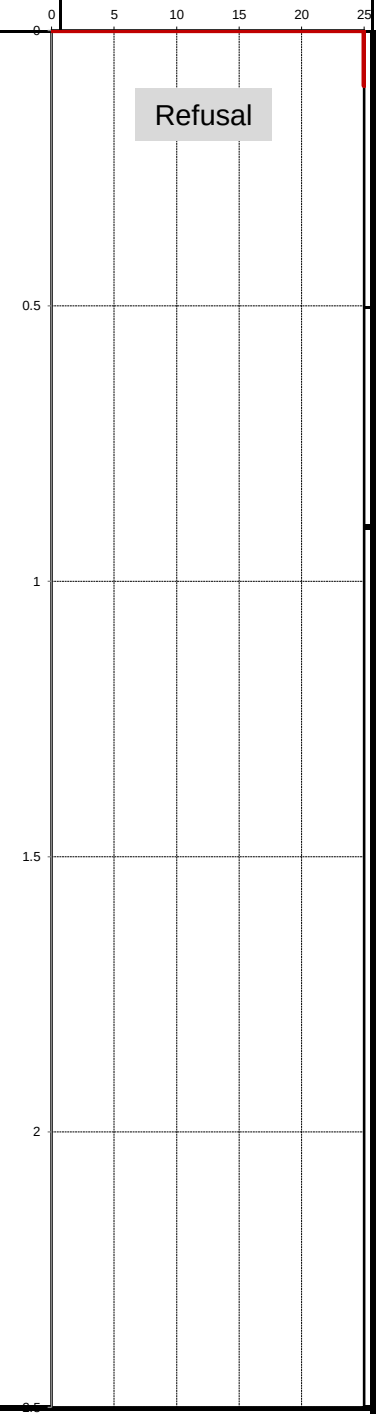
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP38
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 848 Easting: 416 437	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, dark brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, dark brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0								
1.5								
1.9							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

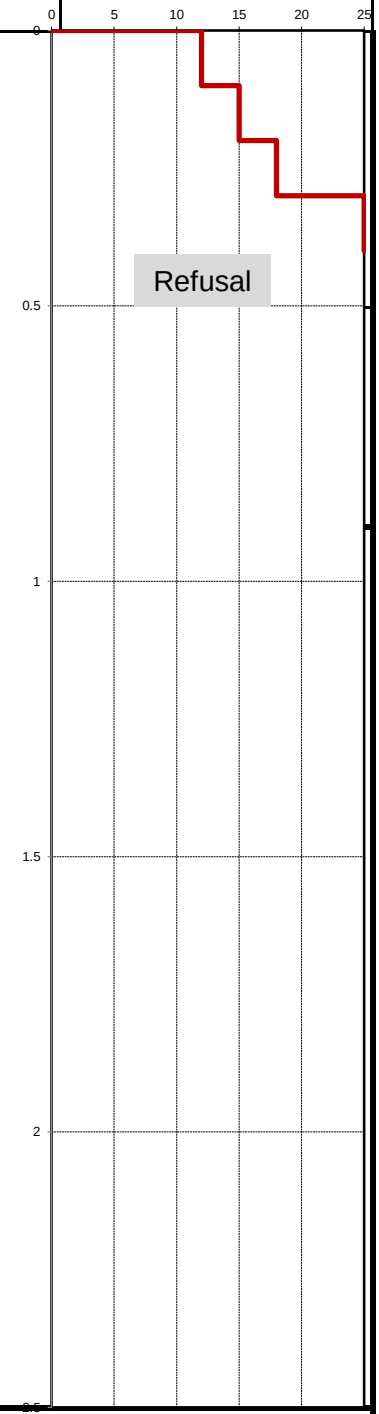
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP39
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 838 Easting: 416 455	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, dark brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, dark brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 30 mm in size, slightly moist, very dense	
1.0								
1.5								
2.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

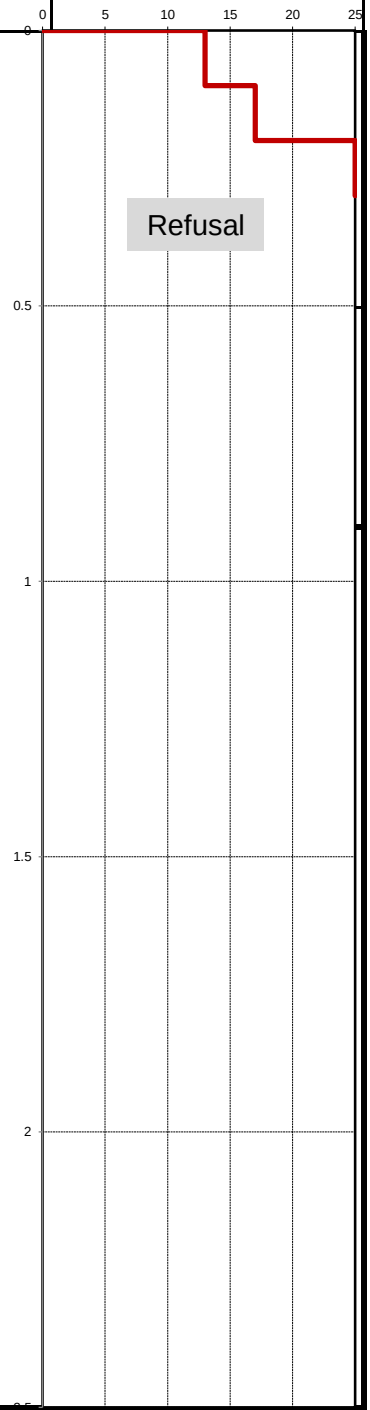
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP40
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 763 Easting: 416 444	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.4							colour changes to reddish brown	
0.5								
1.0								
1.1						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size, slightly moist, very dense	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

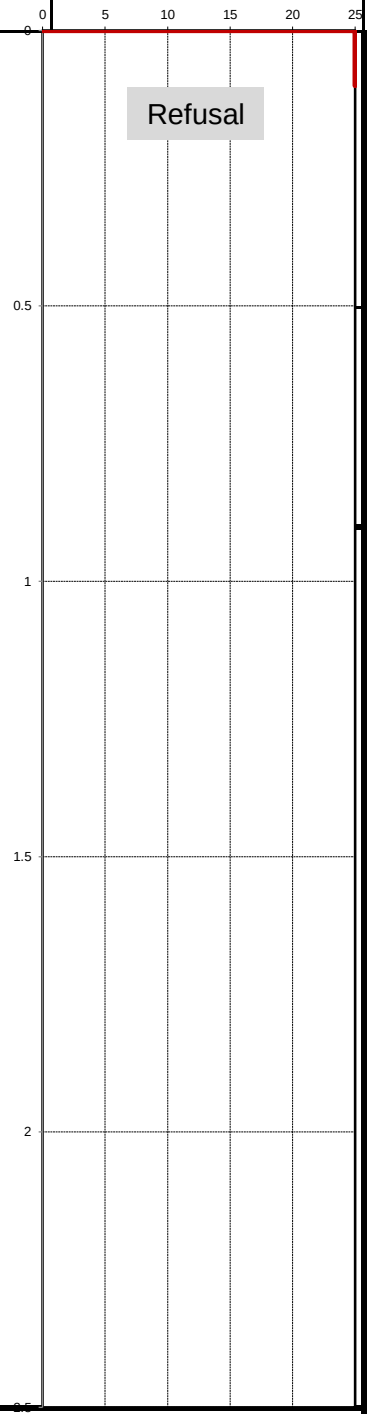
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP41
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 758. Easting: 416 450	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5							colour changes to reddish brown	
1.0								
1.1						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size, slightly moist, very dense	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

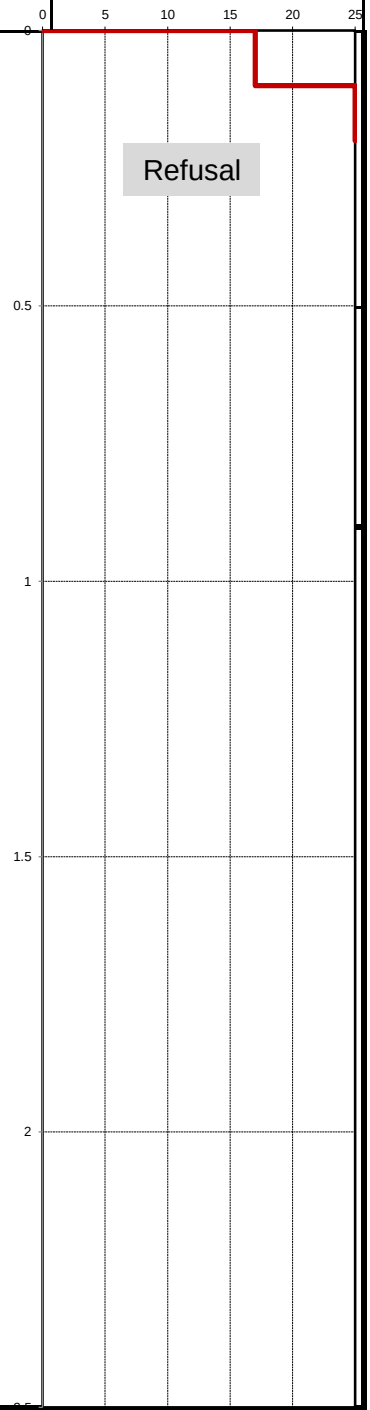
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP42
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 782 Easting: 416 455	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5							colour changes to reddish brown	
1.0						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size, slightly moist, very dense	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

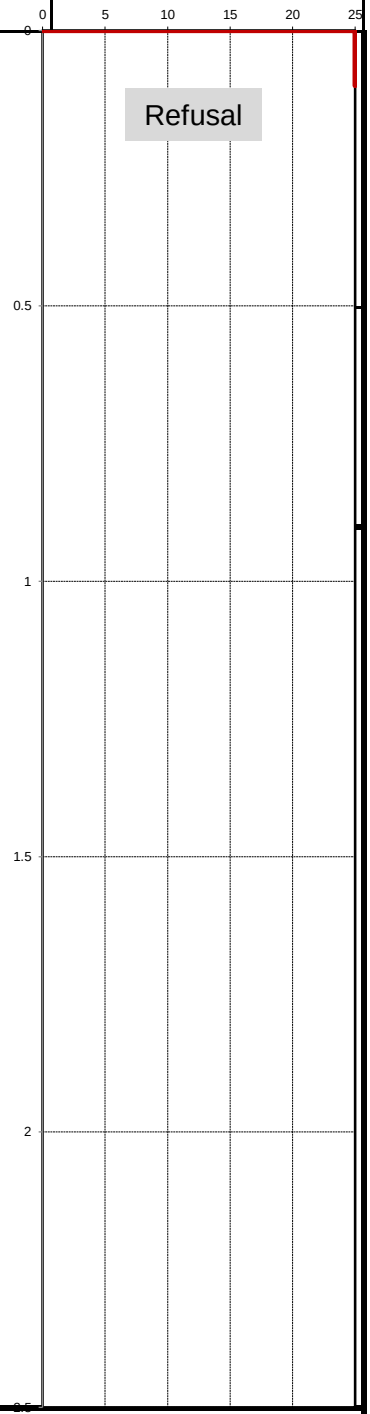
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP43
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 776 Easting: 416 468	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.5							colour changes to reddish brown	
1.0								
1.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 60 mm in size, slightly moist, very dense	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

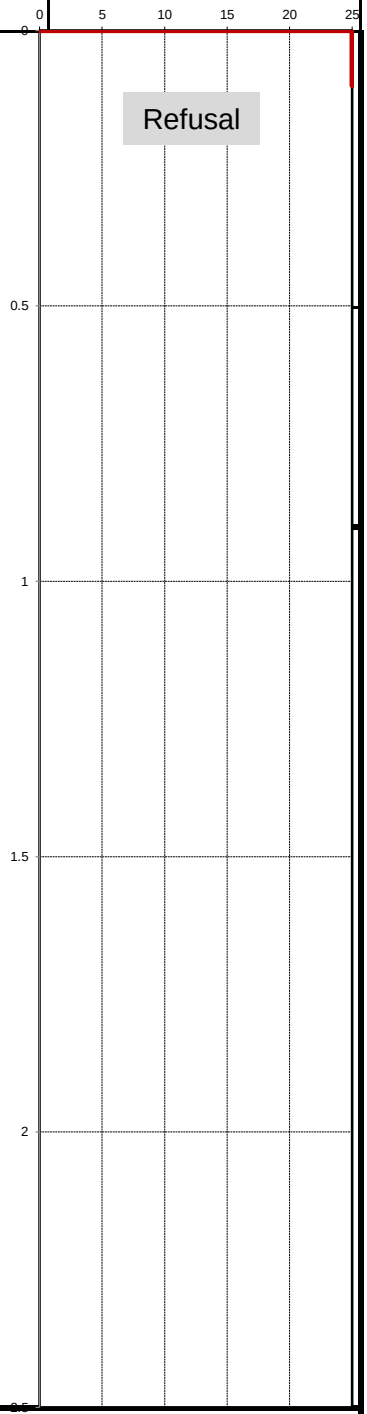
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP44
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 795 Easting: 416 465	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, reddish brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.2						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
0.6							with sub-angular gravel up to 60 mm in size	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

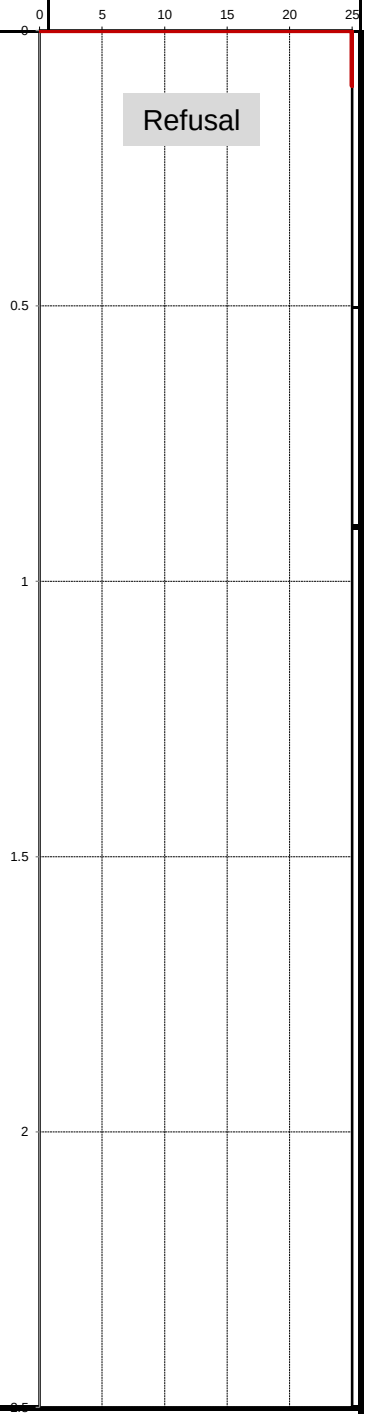
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP45
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 788 Easting: 416 478	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, reddish brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.2						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5							with sub-angular gravel up to 60 mm in size	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

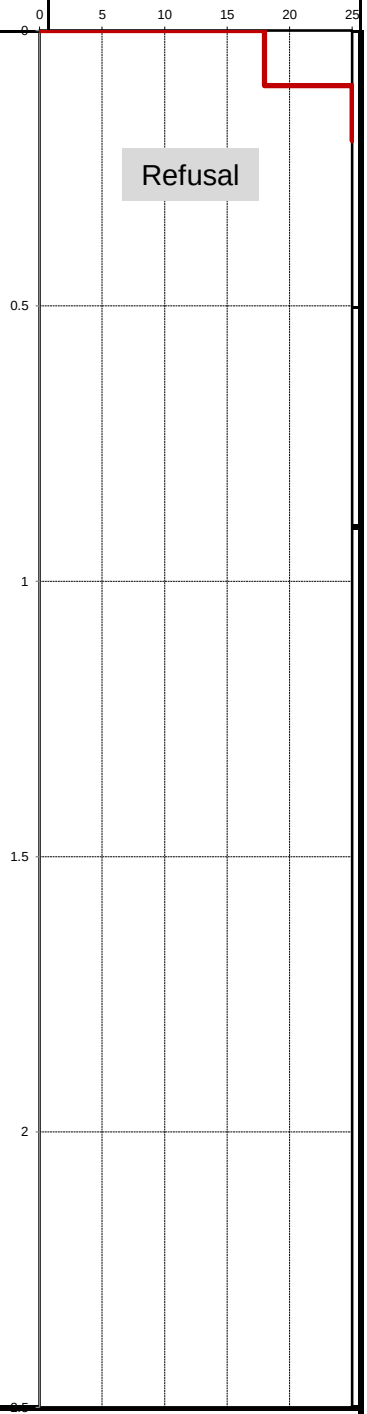
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP46
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 710 Easting: 416 475	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, reddish brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.2						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5							with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
1.8							**Terminated at a depth of 1.8 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

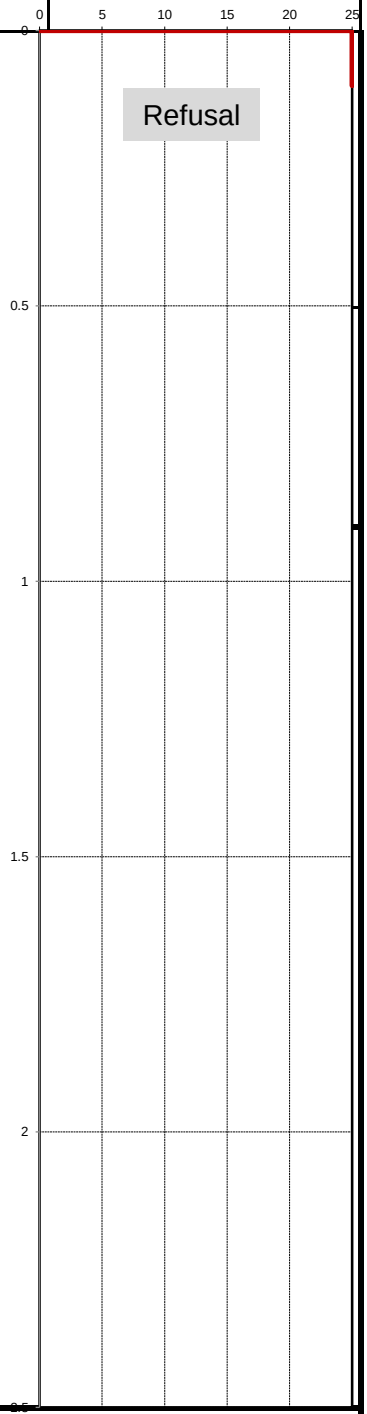
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP47
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 803 Easting: 416 486	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, reddish brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.2						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
0.9							with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
1.8							**Terminated at a depth of 1.8 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

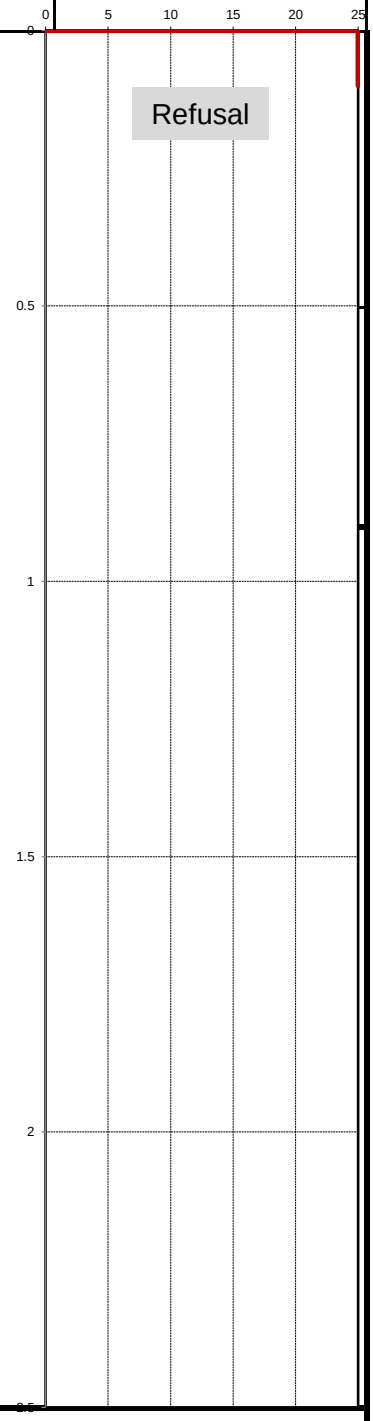
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP48
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 798 Easting: 416 498	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, reddish brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.2						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
0.6							with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0							**Terminated at a depth of 2.0 m due to refusal on rock**	
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

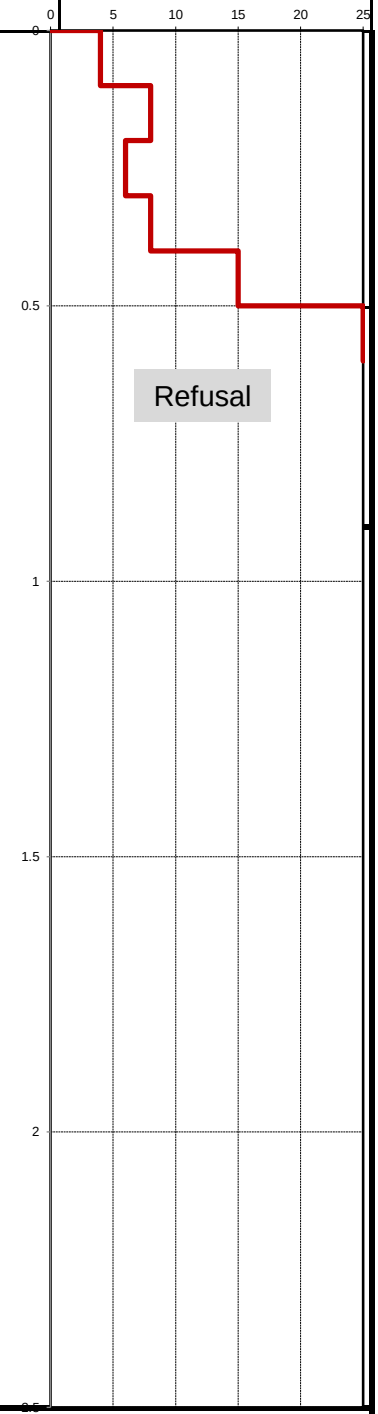
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP49
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 802 Easting: 416 520	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, stiff	
0.3						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, very stiff	
0.5						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, dense	
0.7							colour changes to greyish brown, with sub-angular gravel up to 60 mm in size	
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

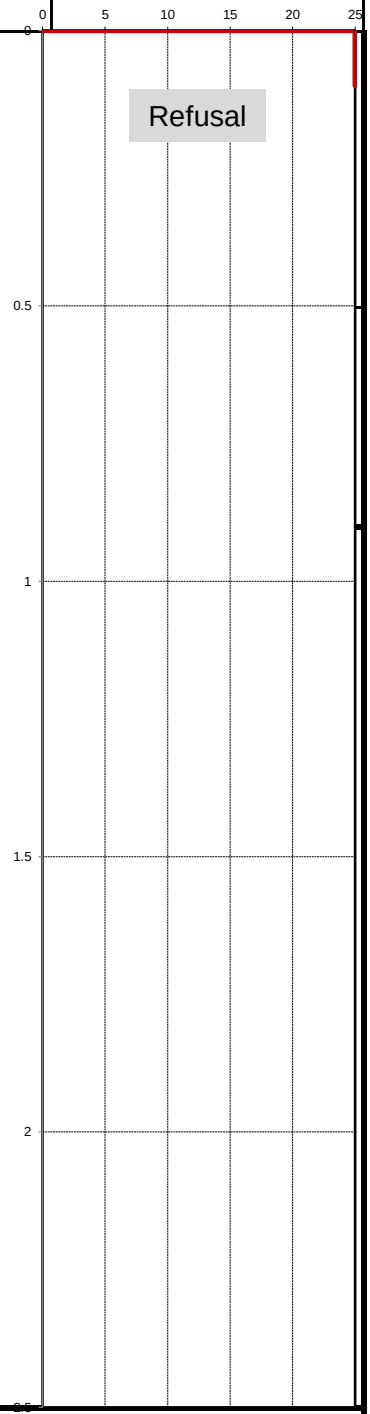
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP50
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 791 Easting: 416 509	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.3						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
1.0							colour changes to greyish brown, with sub-angular gravel up to 60 mm in size	
1.5								
1.6							**Terminated at a depth of 1.6 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

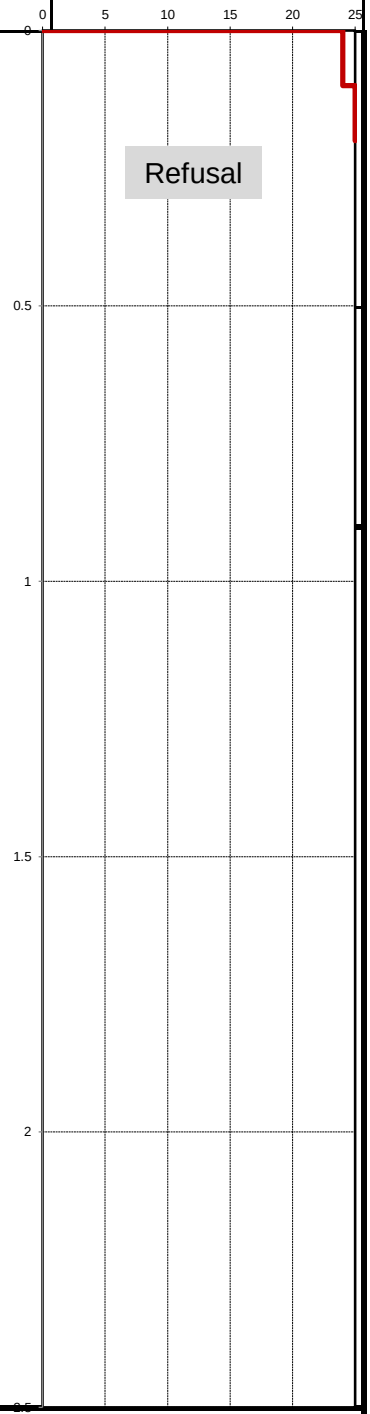
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP51
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 783 Easting: 416 489	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.3						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
1.0							colour changes to greyish brown, with sub-angular gravel up to 60 mm in size	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

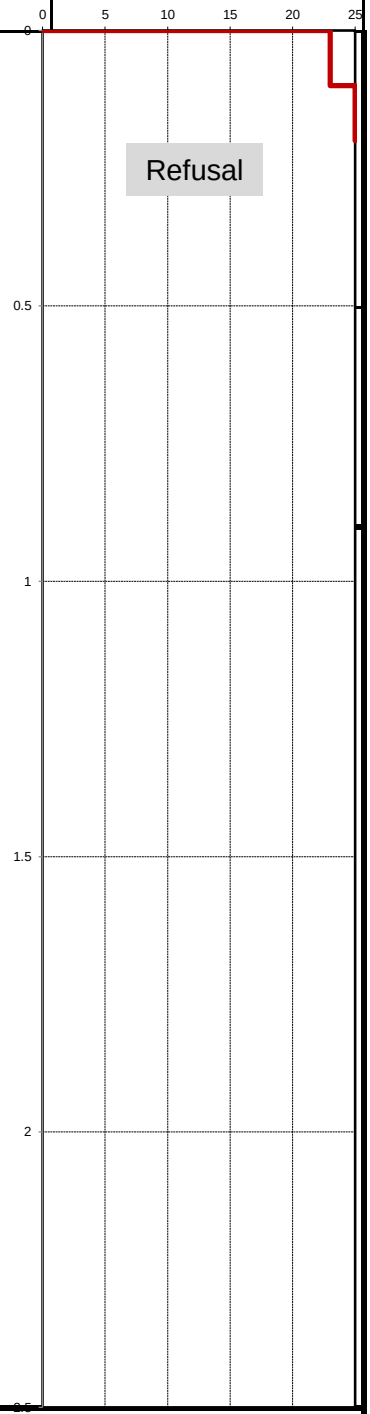
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP52
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 776 Easting: 416 504	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.3						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
0.9							colour changes to greyish brown, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0							**Terminated at a depth of 2.0 m due to refusal on rock**	
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

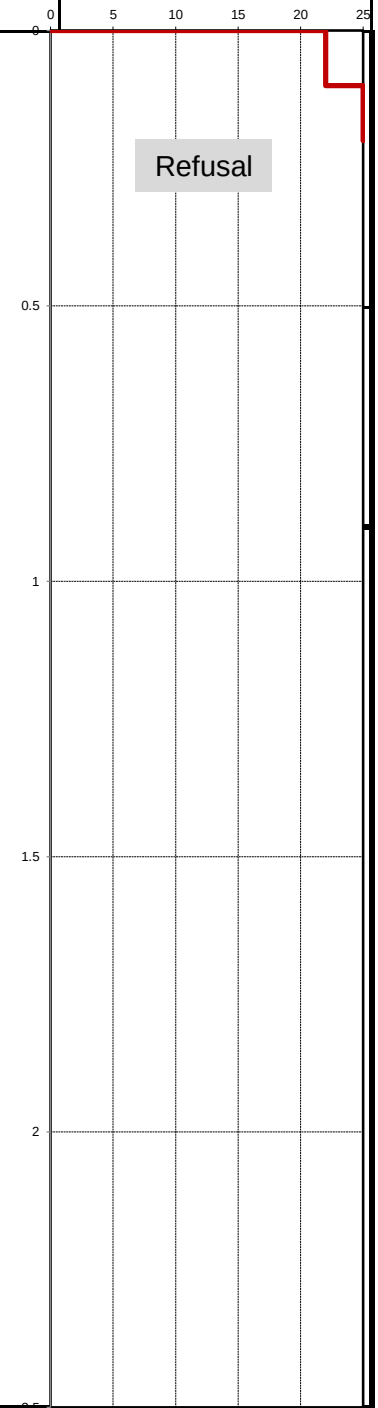
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP53
Client	: Department of Communities	Date Excavated:	3-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	3-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 770 Easting: 416 520	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, grass, slightly moist, hard	
0.1						CL	**Sandy CLAY** - low plasticity, pale brown, with fine to medium grained sand, sub-angular gravel up to 10 mm in size, slightly moist, hard	
0.3						SC	**Clayey SAND** - fine to medium grained, pale brown, with low plasticity clay, sub-angular gravel up to 10 mm in size, slightly moist, very dense	
0.5								
1.0							colour changes to greyish brown, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.1							**Terminated at a depth of 2.1 m due to refusal on rock**	
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

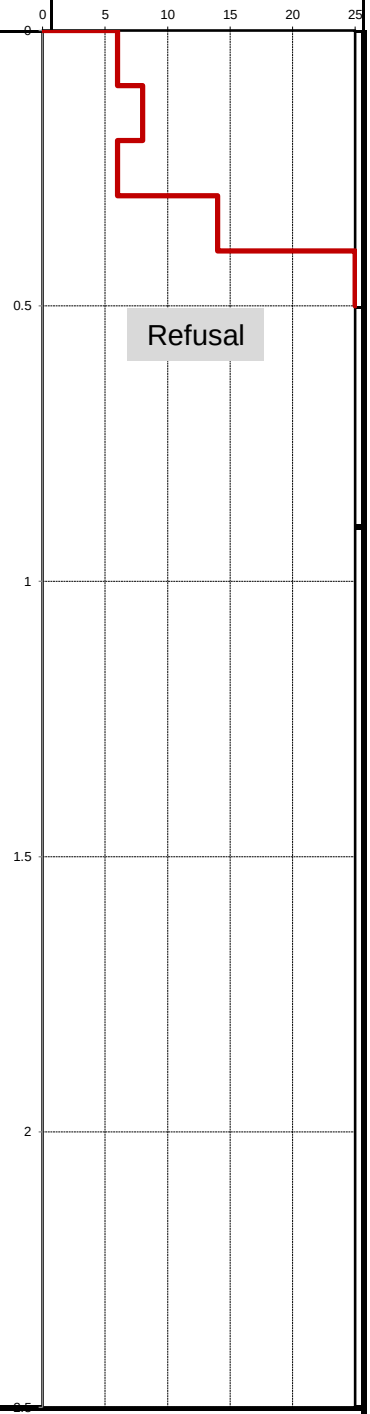
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP54
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 910 Easting: 416 707	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
0.8							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.2							**Terminated at a depth of 2.2 m due to refusal on rock**	
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

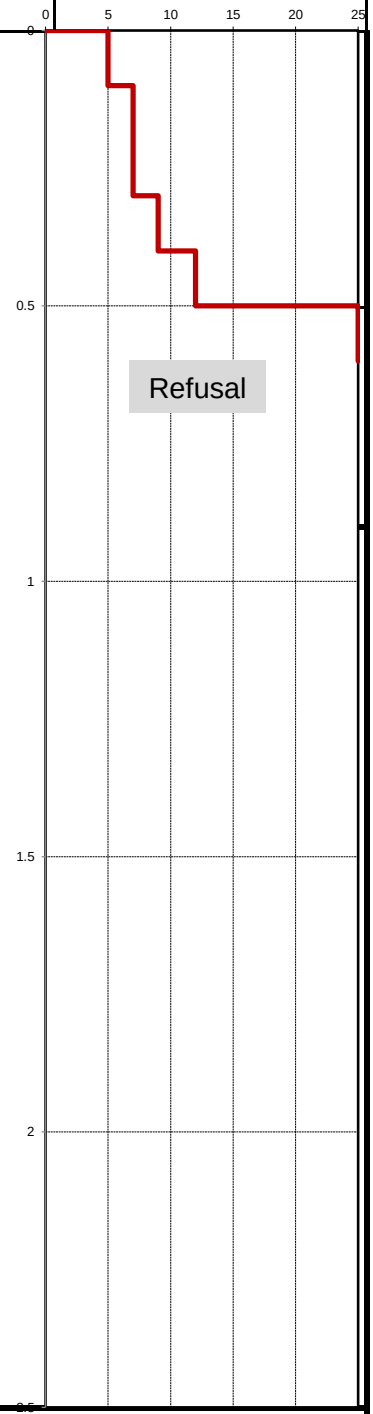
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP55
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 898 Easting: 416 730	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0							**Terminated at a depth of 2.0 m due to refusal on rock**	
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

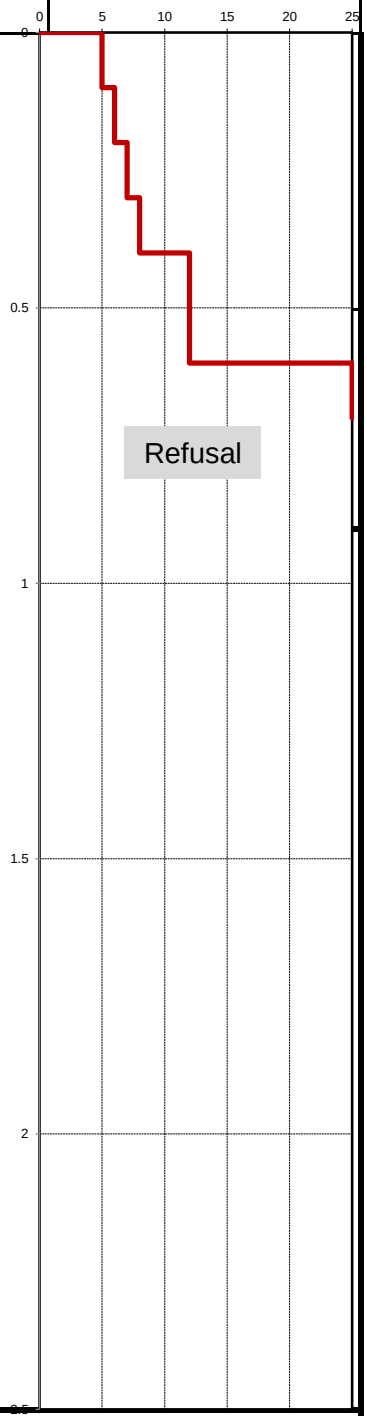
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP56
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 878 Easting: 416 766	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

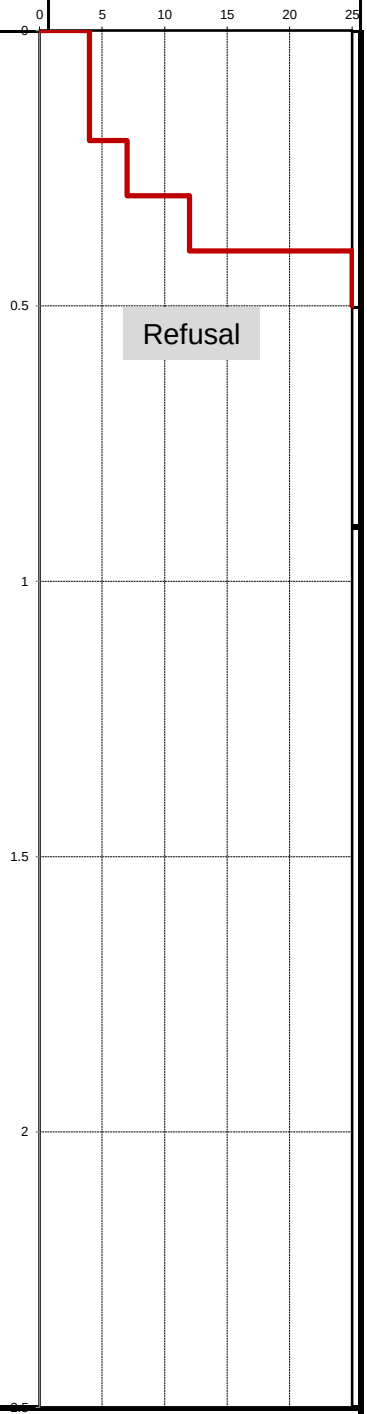
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP57
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 906 Easting: 416 743	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0								
1.2							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

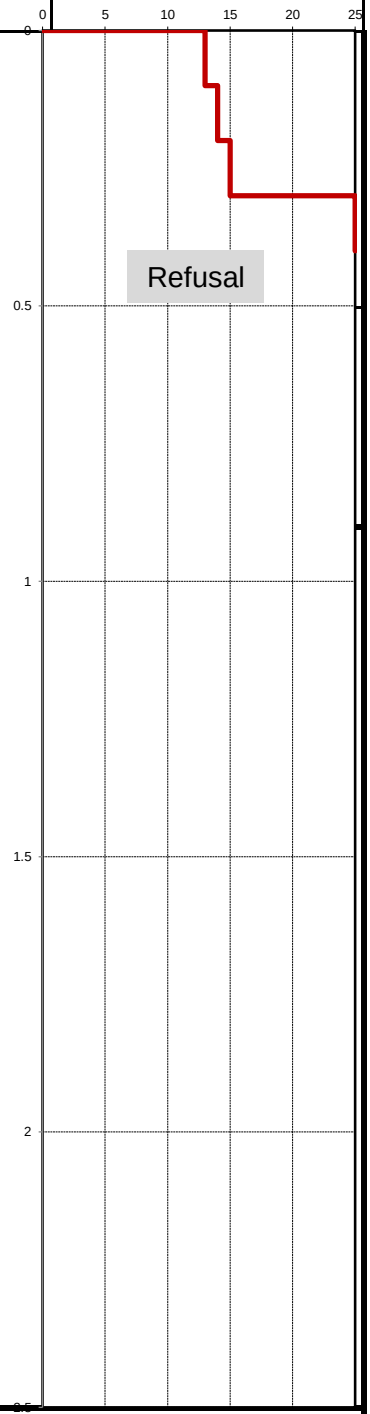
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP58
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 904 Easting: 416 761	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0								
1.2							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

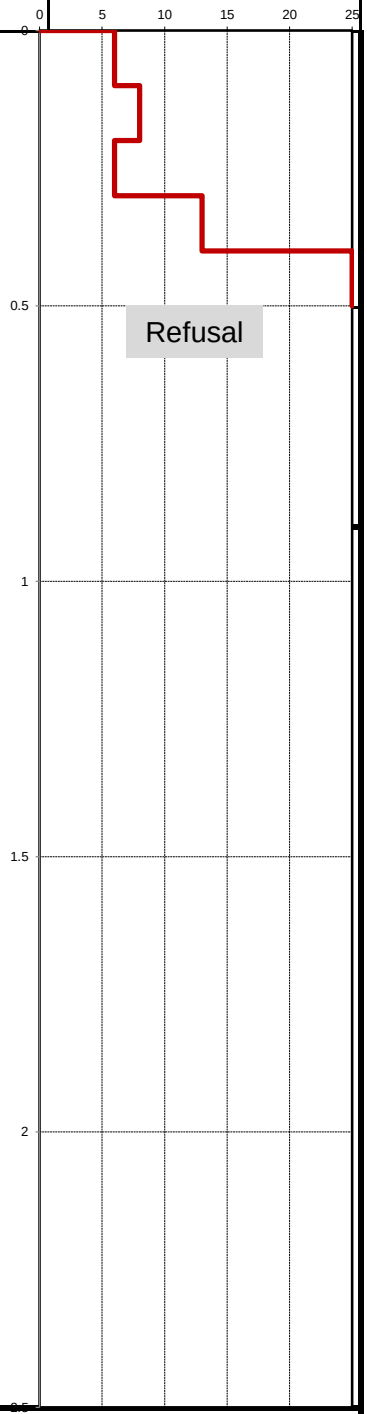
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP59
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 890 Easting: 416 779	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0								
1.2							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

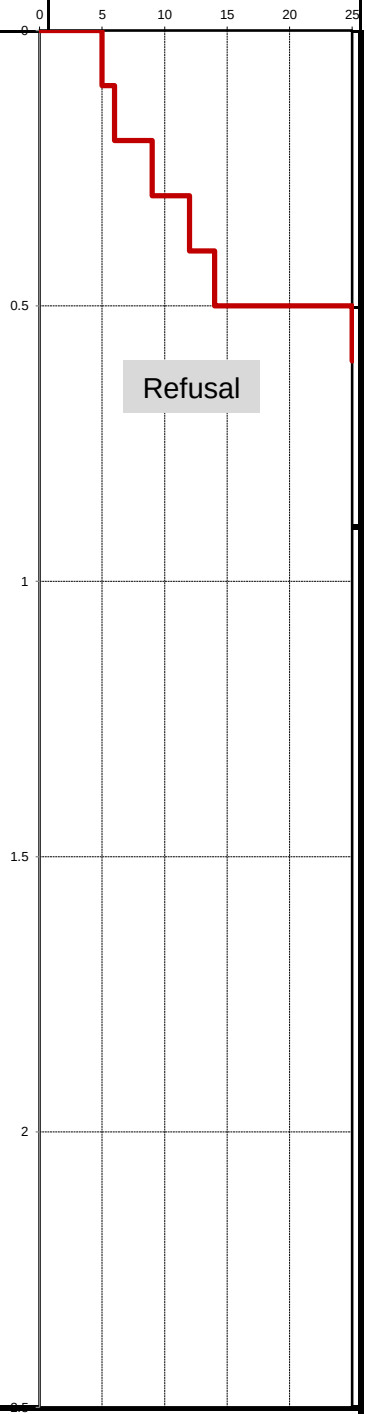
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP60
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 897 Easting: 416 799	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.5								
1.0								
1.5							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.9							**Terminated at a depth of 1.9 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

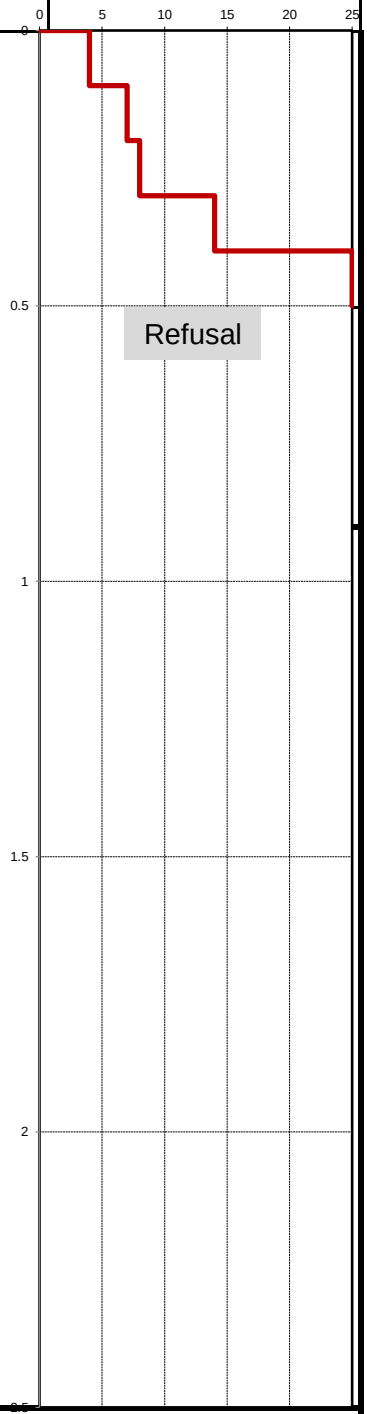
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP61
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 921 Easting: 416 756	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3							colour changes to reddish brown	
0.5								
0.6						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
1.0								
1.2							with sub-angular gravel up to 60 mm in size	
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

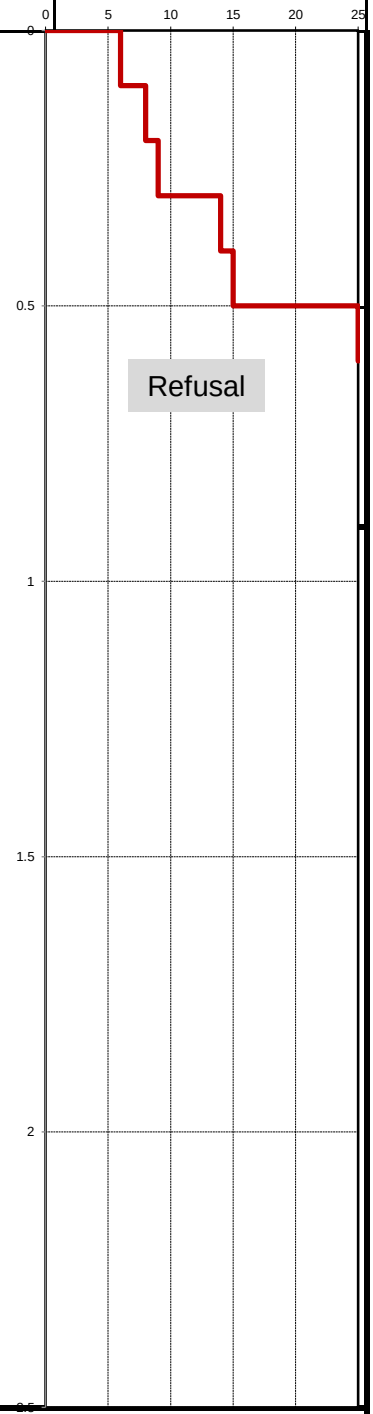
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP62
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 919 Easting: 416 781	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.3							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
1.0								
1.5							with sub-angular gravel up to 60 mm in size	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

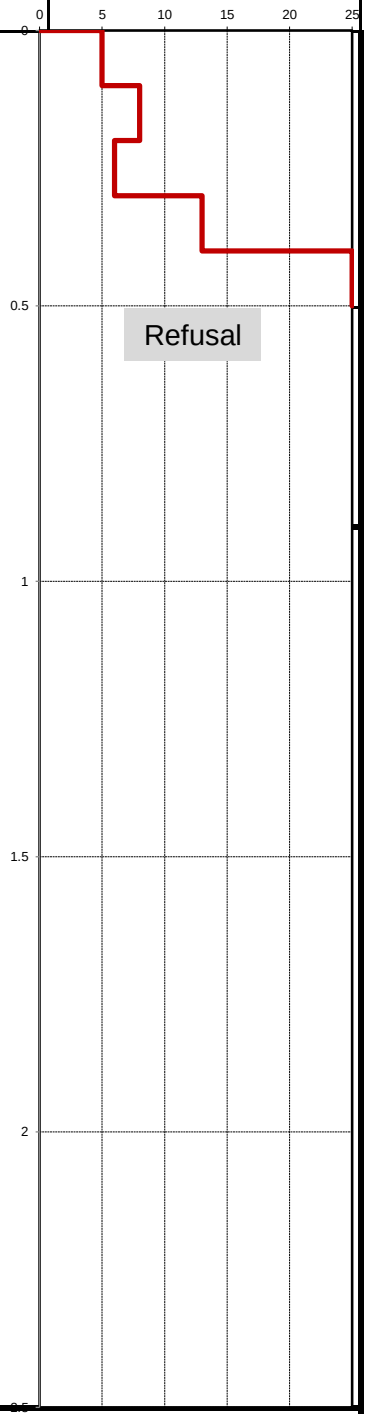
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP63
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 918 Easting: 416 805	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
1.0								
1.5							with sub-angular gravel up to 60 mm in size	
2.0								
2.2							**Terminated at a depth of 2.2 m due to refusal on rock**	
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

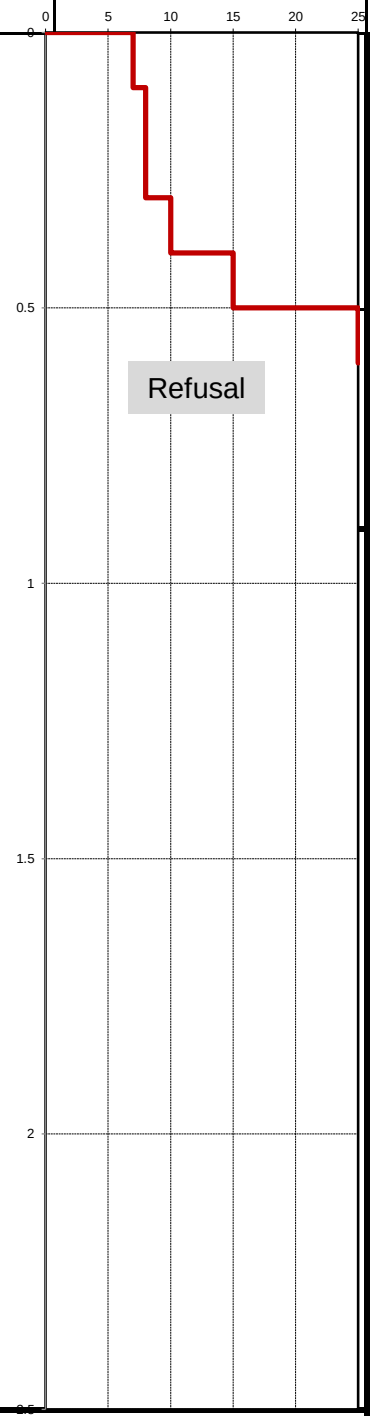
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP64
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 945 Easting: 416 758	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
1.0							with sub-angular gravel up to 60 mm in size	
1.5								
2.0							**Terminated at a depth of 2.0 m due to refusal on rock**	
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

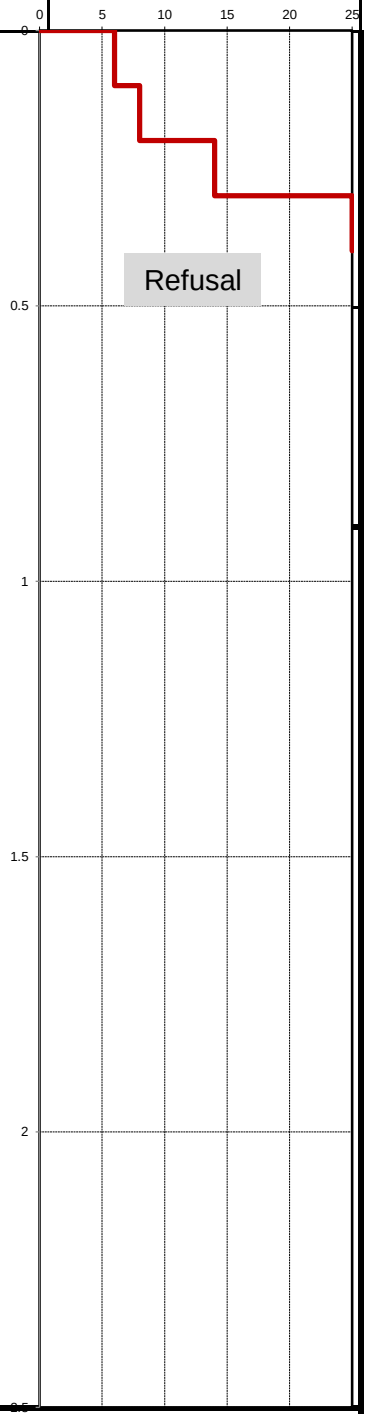
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP65
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 944 Easting: 416 777	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, dense	
0.9							with sub-angular gravel up to 60 mm in size	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

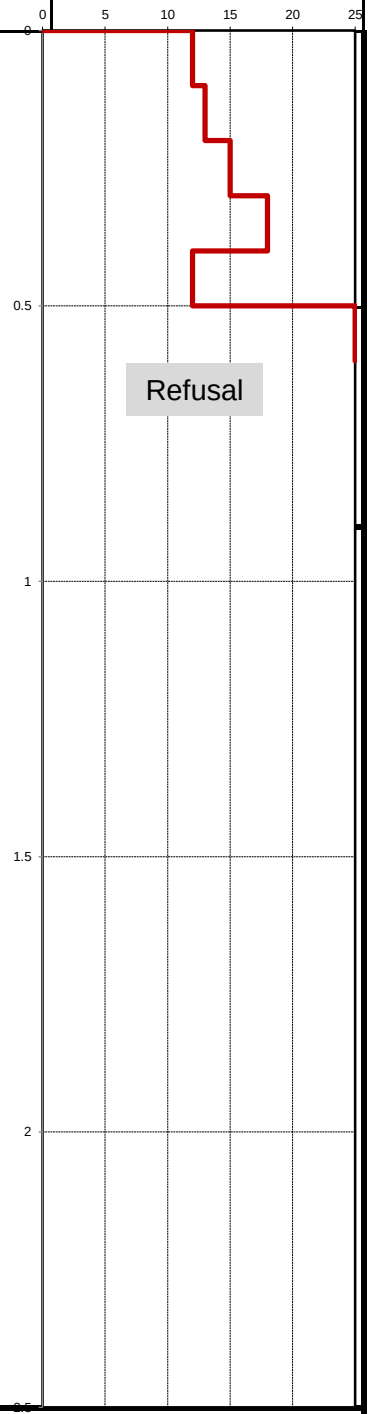
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP66
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 941 Easting: 416 810	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.0								
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

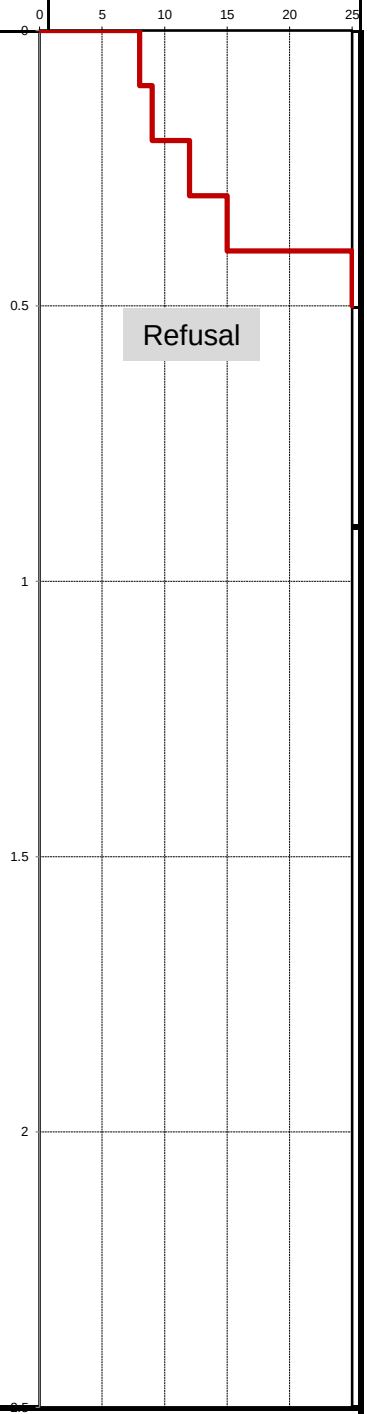
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP67
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 937 Easting: 416 837	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.0								
1.1							**Terminated at a depth of 1.1 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

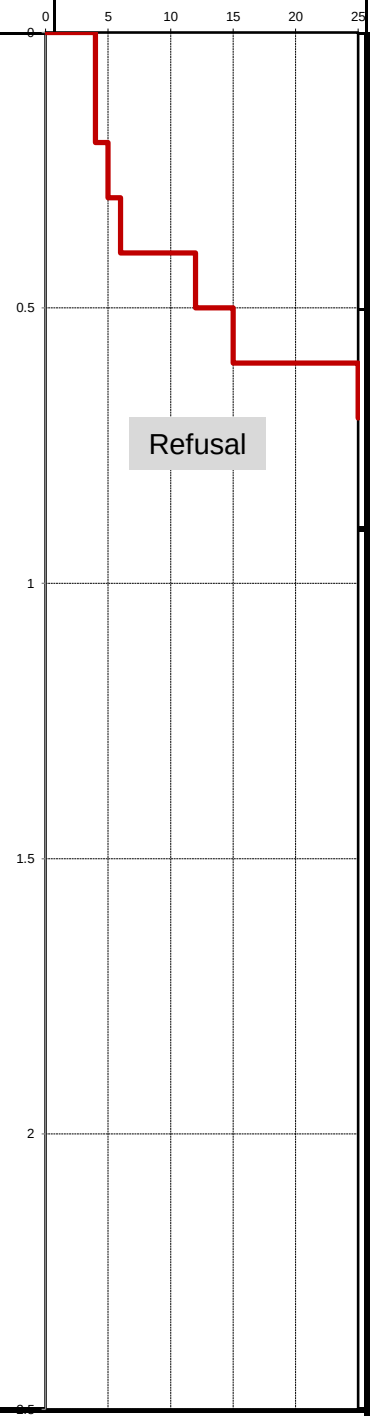
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP68
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 972 Easting: 416 765	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, stiff	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.0							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5								
1.7							**Terminated at a depth of 1.7 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

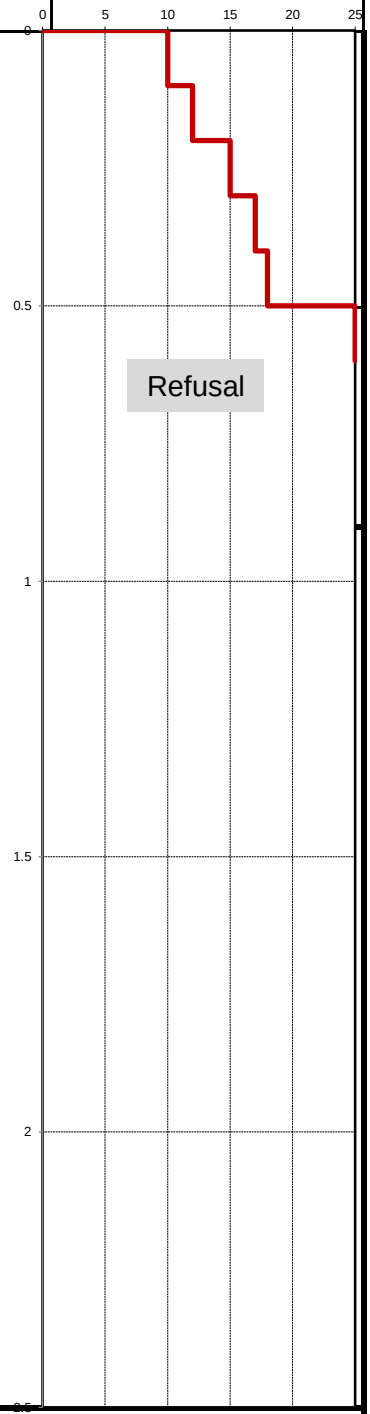
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP69
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 972 Easting: 416 765	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.4							colour changes to reddish brown	
0.5						GC	**Clayey GRAVEL** - fine to medium grained, sub angular gravel up to 30 mm in size, pale brown, with low plasticity clay, moist, very dense	
1.0								
1.2							colour changes to grey, with sub-angular gravel up to 60 mm in size	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

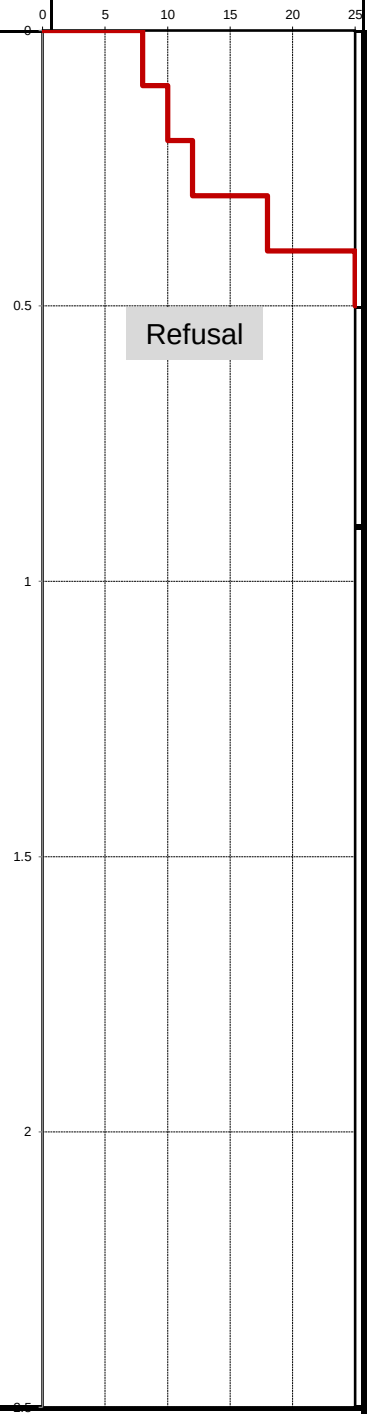
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP70
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 973 Easting: 416 782	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
1.0								
1.2							colour changes to greyish brown	
1.5								
1.8							colour changes to grey	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

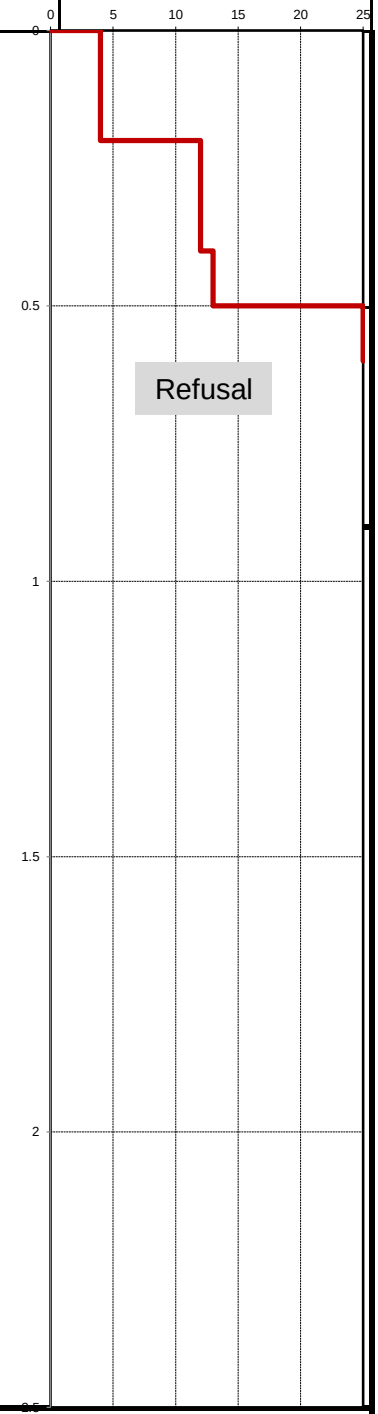
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP71
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 970 Easting: 416 815	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
1.0							colour changes to greyish brown	
1.5								
1.6							colour changes to grey	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

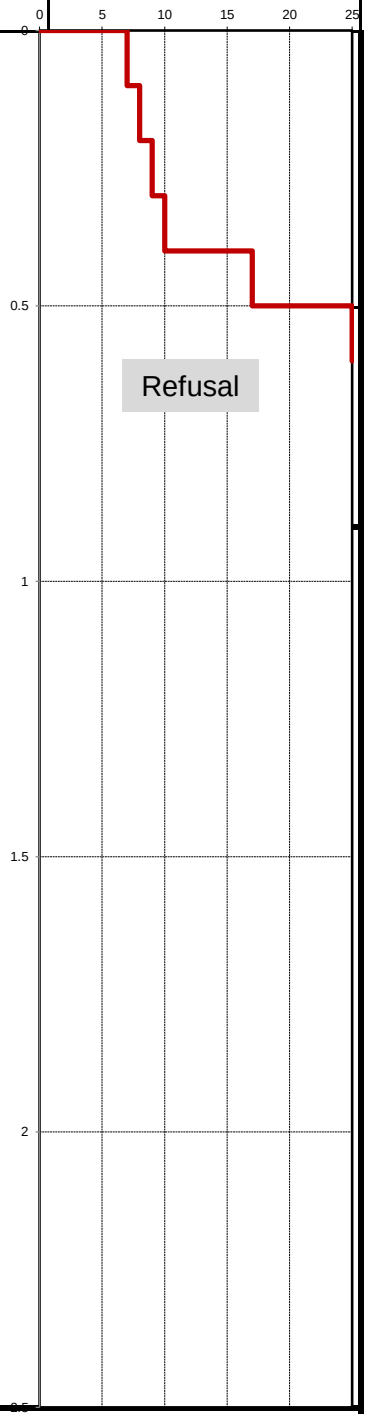
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP72
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 968 Easting: 416 839	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
0.9							colour changes to greyish brown	
1.0								
1.5								
1.9							colour changes to grey	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
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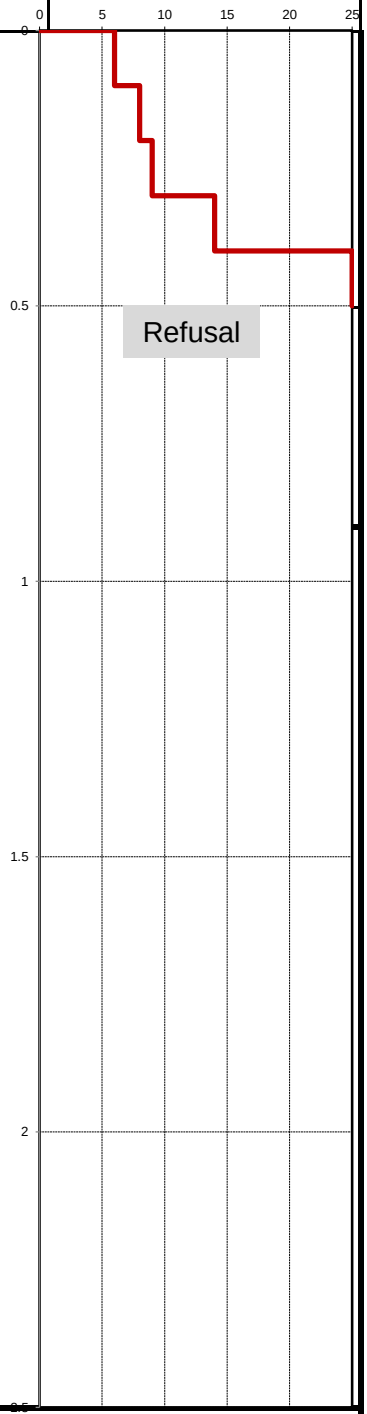
Reference	: LGK0632024SC	Test Pit/BH No.:	TP73
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 116 976 Easting: 416 879	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
0.9							colour changes to greyish brown	
1.0								
1.5								
2.0							colour changes to grey	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
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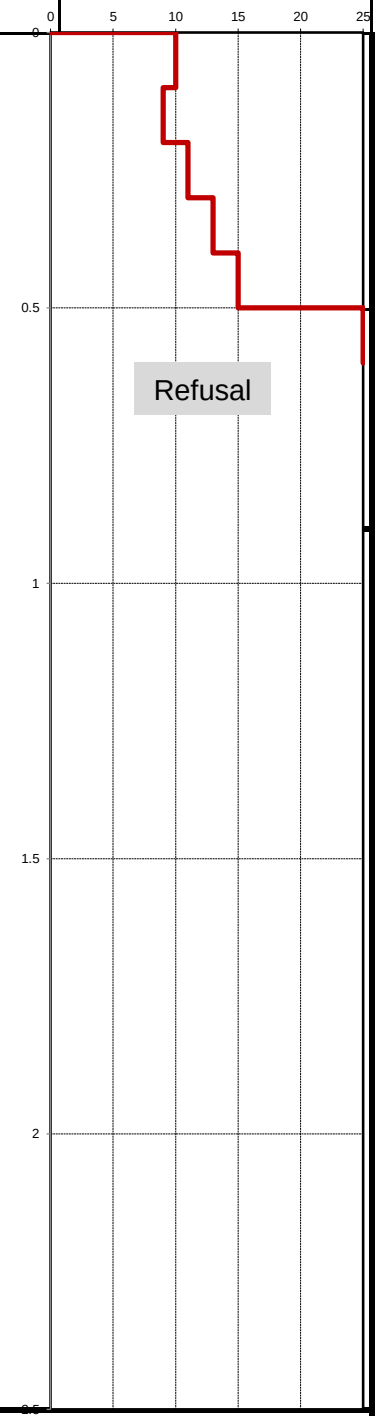
Reference	: LGK0632024SC	Test Pit/BH No.:	TP74
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 015 Easting: 416 780	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
0.8							colour changes to greyish brown	
1.0								
1.5								
2.0							colour changes to grey	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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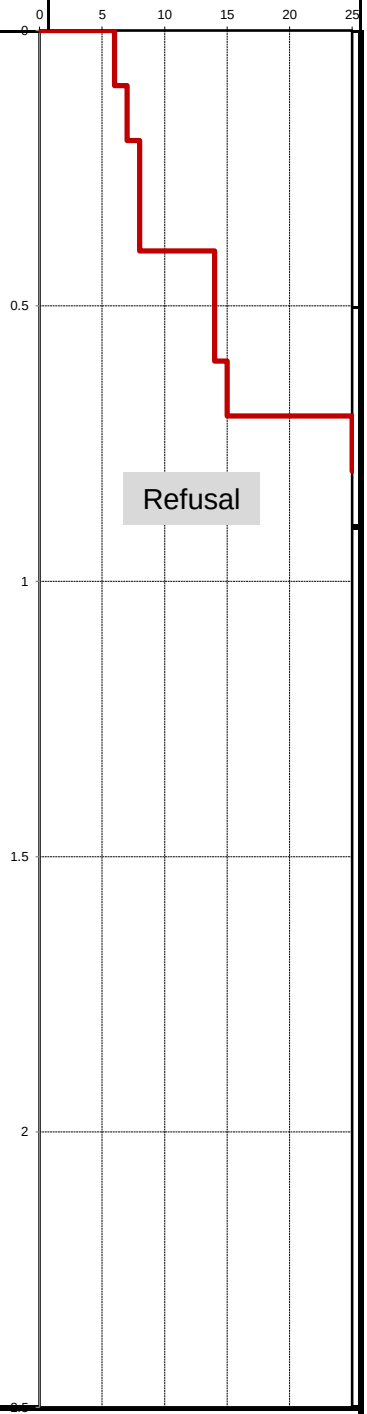
Reference	: LGK0632024SC	Test Pit/BH No.:	TP75
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 037 Easting: 416 799	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, grass, moist, very stiff	
0.2						CL	**Gravelly CLAY** - low plasticity, pale brown, with sub-angular gravel up to 10 mm in size, moist, very stiff	
0.5								
1.0							colour changes to greyish brown	
1.5							colour changes to grey	
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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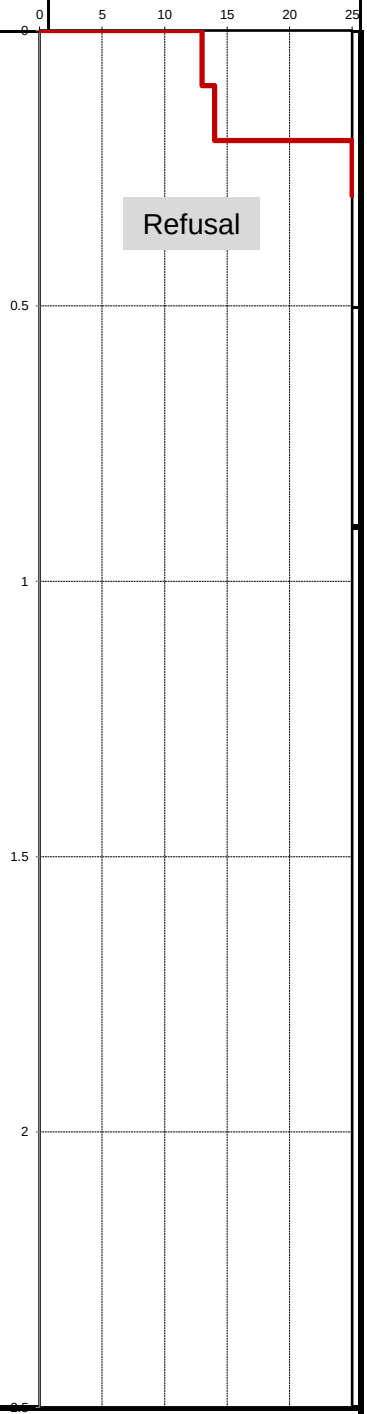
Reference	: LGK0632024SC	Test Pit/BH No.:	TP76
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 011 Easting: 416 823	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5							colour changes to greyish brown	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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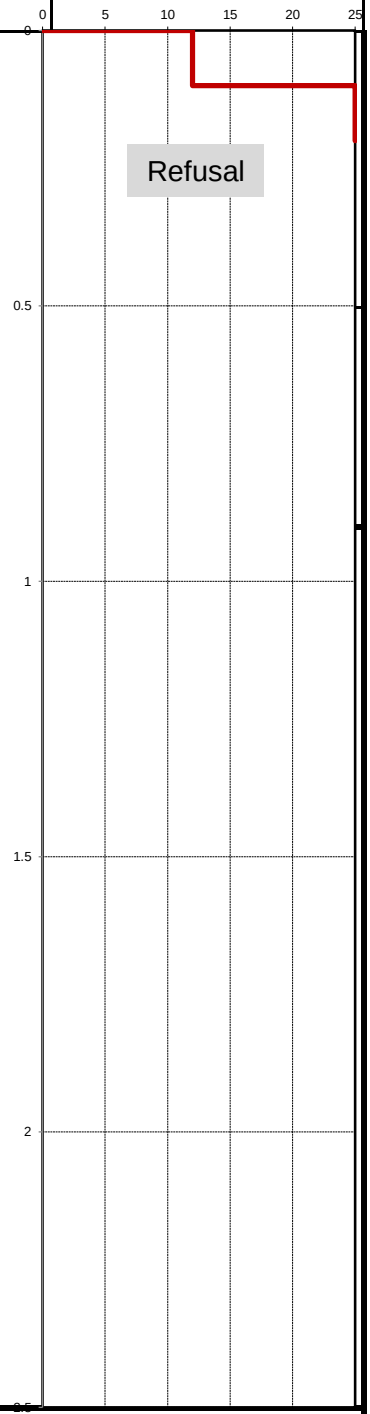
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP77
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 034 Easting: 416 849	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
0.6							colour changes to greyish brown	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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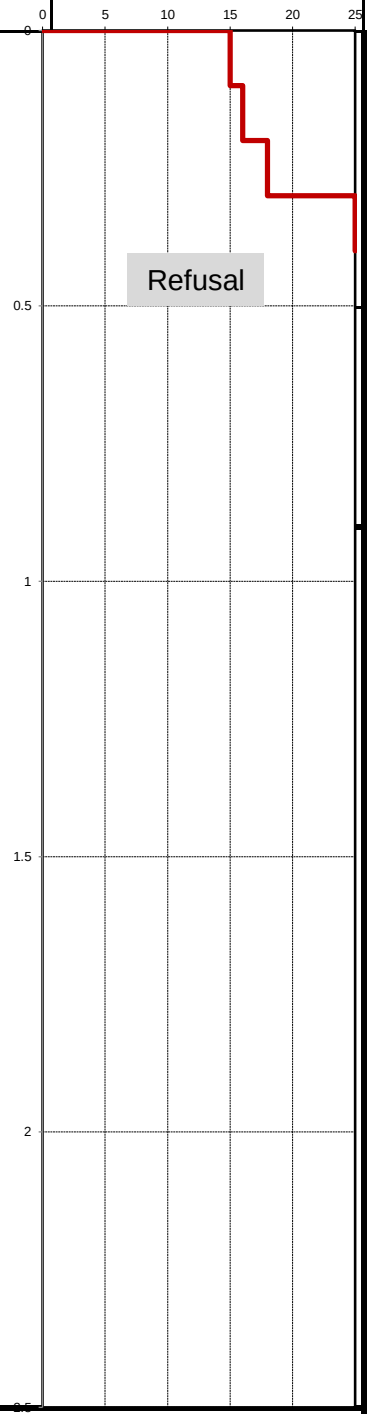
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP78
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 010 Easting: 416 873	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5								
0.6							colour changes to greyish brown	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
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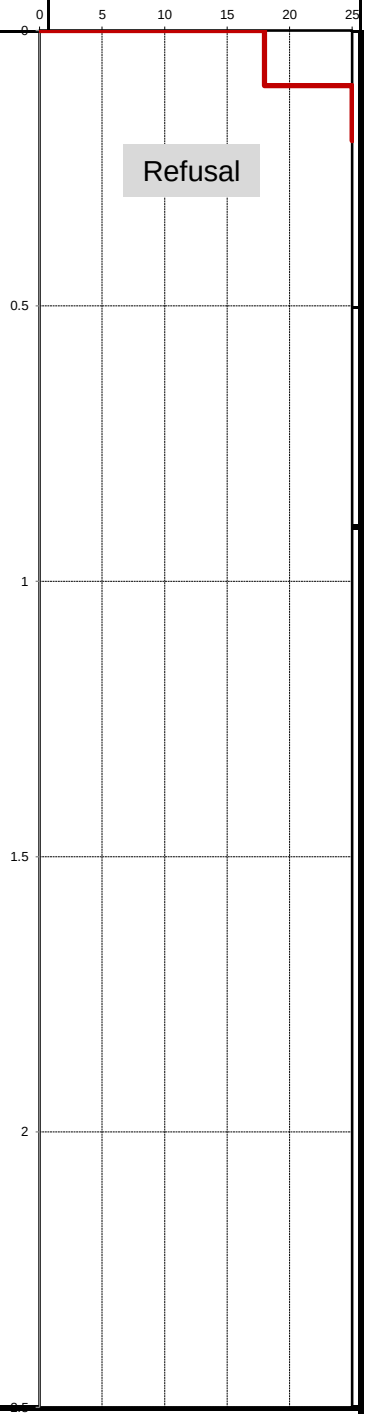
Reference	: LGK0632024SC	Test Pit/BH No.:	TP79
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 027 Easting: 416 893	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5							colour changes to greyish brown	
1.0								
1.5								
2.0								
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
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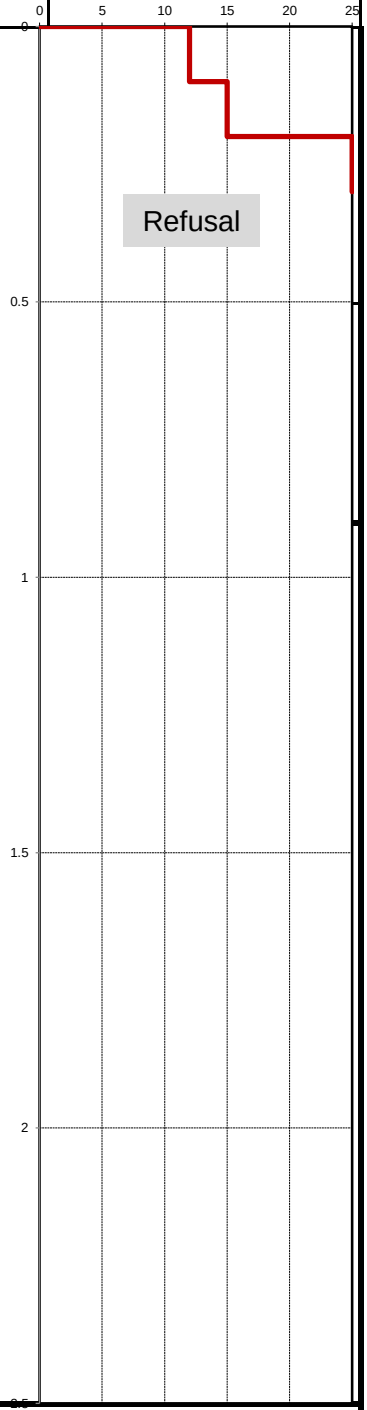
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP80
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 017 Easting: 416 929	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Topsoil, Gravelly CLAY** - low plasticity, brown, with sub-angular gravel up to 10 mm in size, grass, moist, hard	
0.1						CL	**Gravelly CLAY** - low plasticity, reddish brown, with sub-angular gravel up to 10 mm in size, moist, hard	
0.5							colour changes to greyish brown	
2.5							**Terminated at a target depth of 2.5 m**	



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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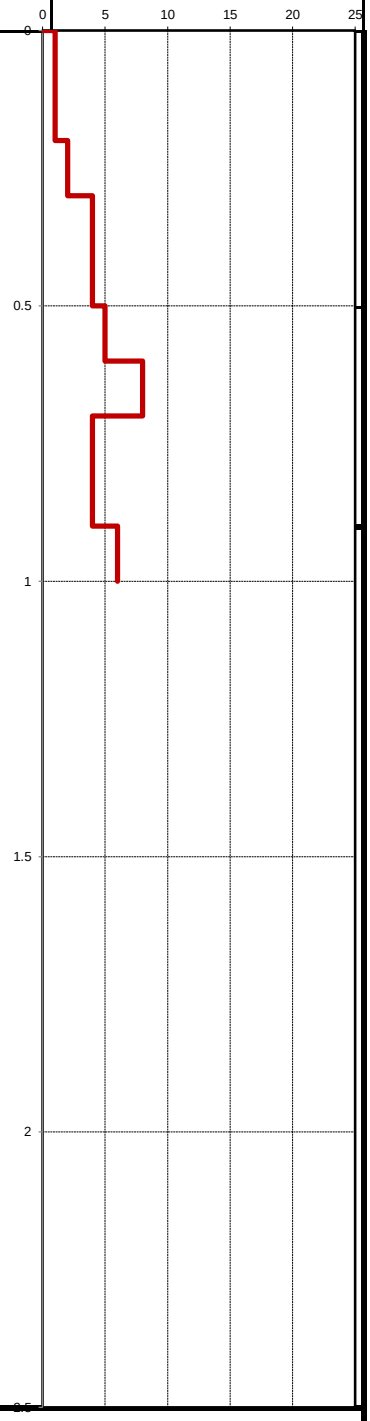
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP81
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 130 Easting: 417 435	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

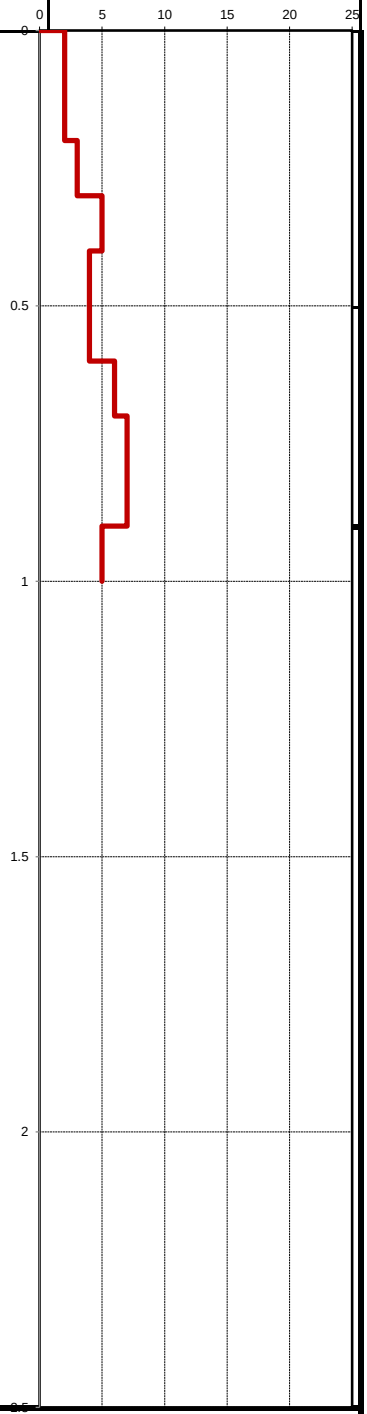
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP82
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 163 Easting: 417 439	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.3							**Terminated at a depth of 1.3 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

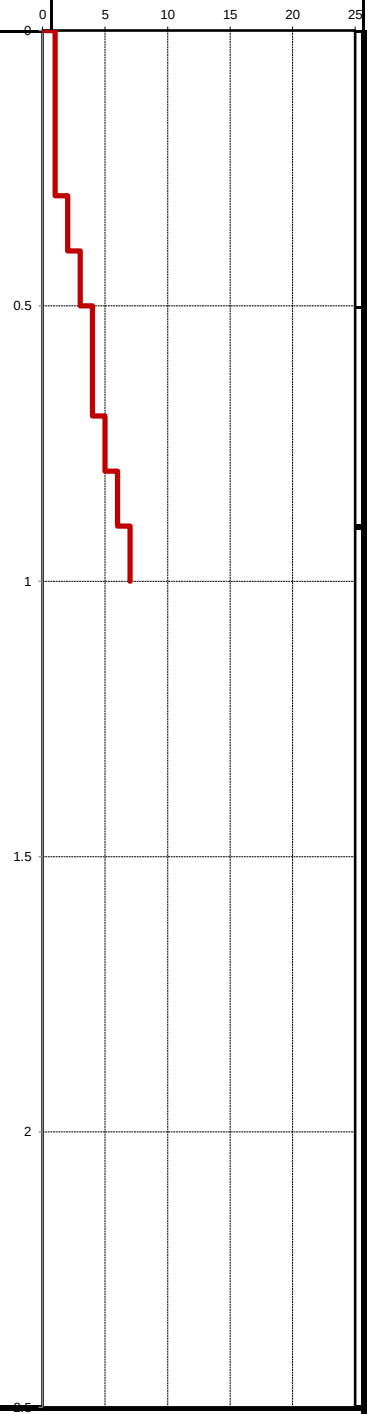
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP83
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 189 Easting: 417 449	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.9						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.3							**Terminated at a depth of 1.3 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

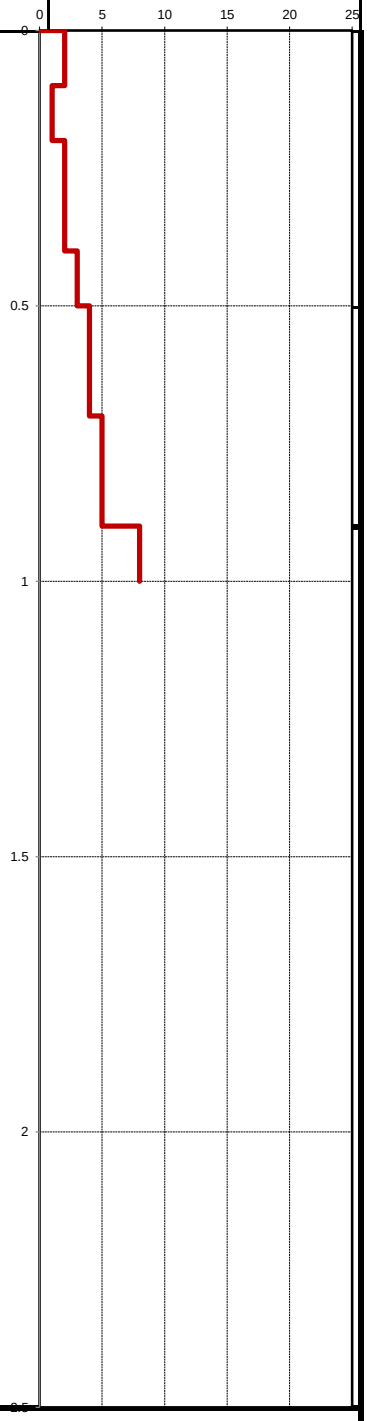
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP84
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 234 Easting: 417 467	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.9						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

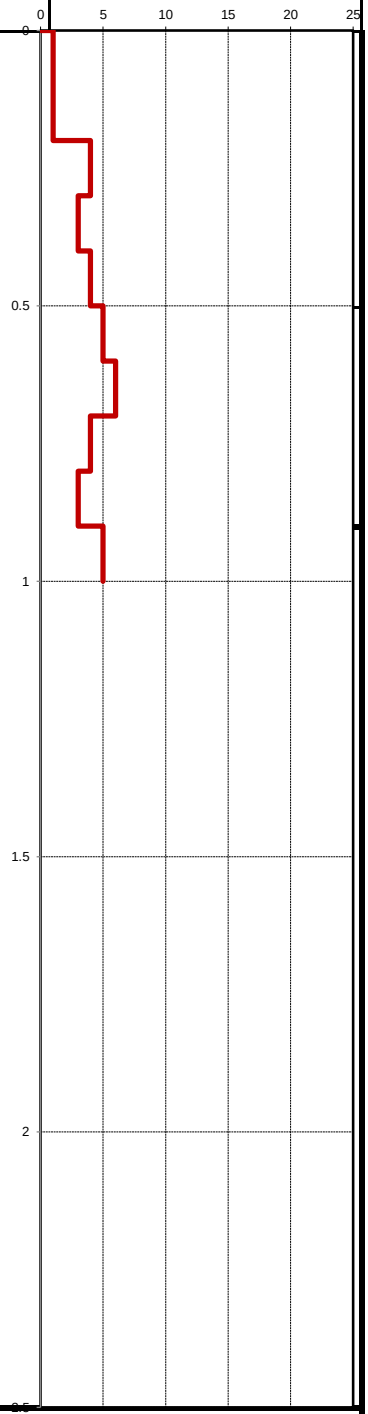
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP85
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 277 Easting: 417 485	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.9						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

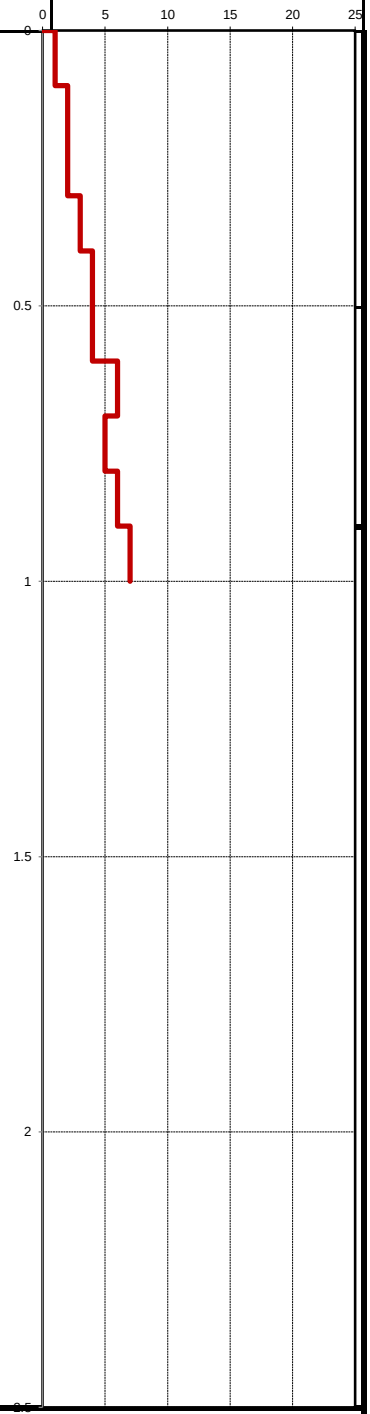
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP86
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 122 Easting: 417 462	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5								
1.6							**Terminated at a depth of 1.6 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

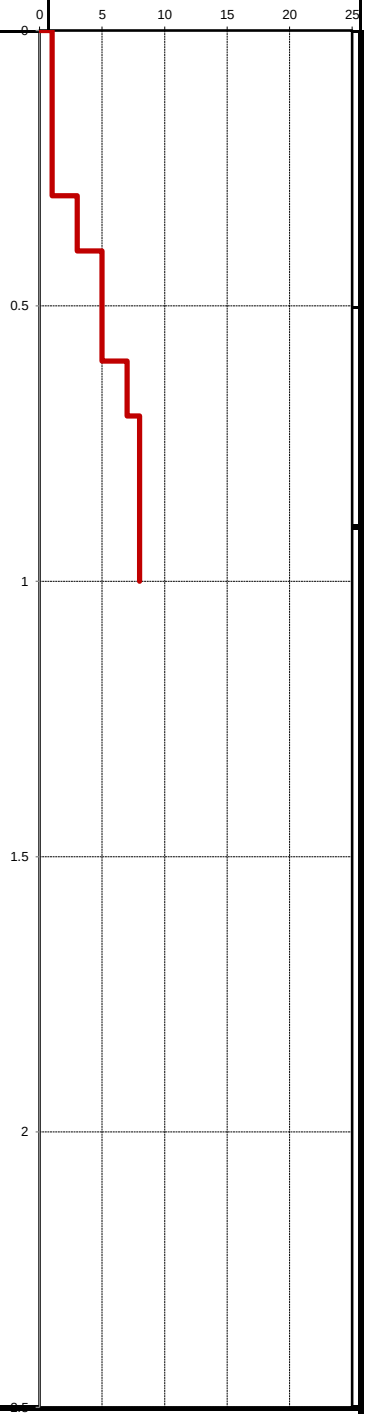
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP87
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 165 Easting: 417 471	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5								
1.7							**Terminated at a depth of 1.7 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

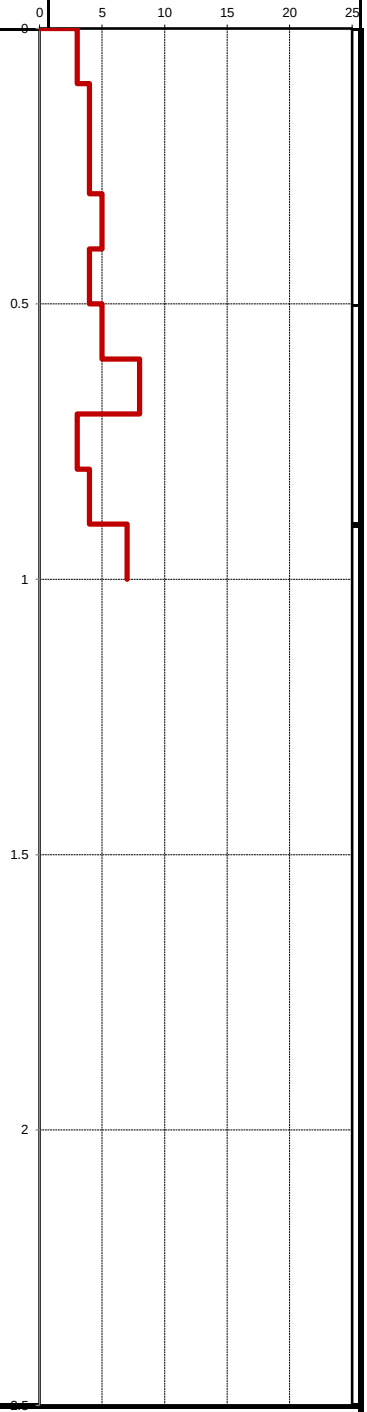
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP88
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 202 Easting: 417 479	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, stiff	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, stiff	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

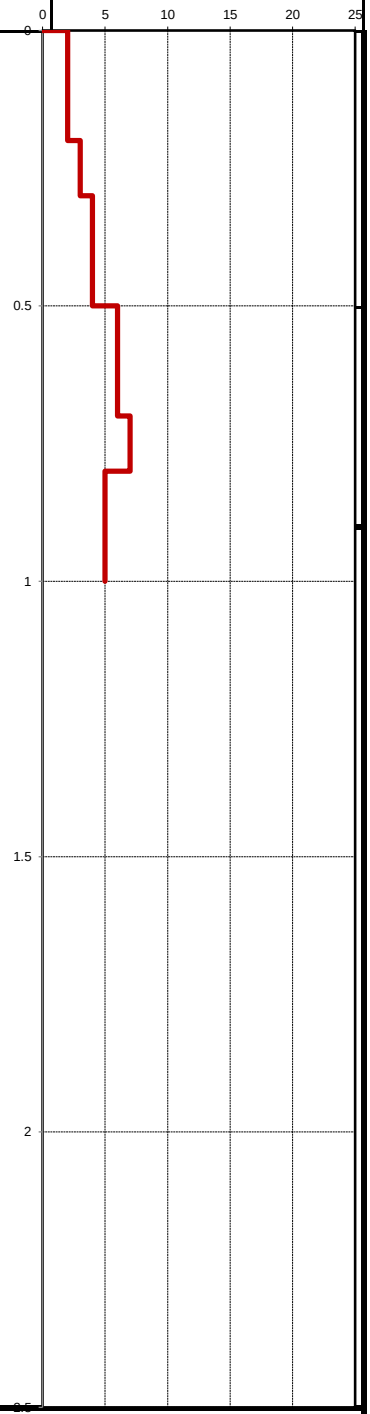
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP89
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 247 Easting: 417 488	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

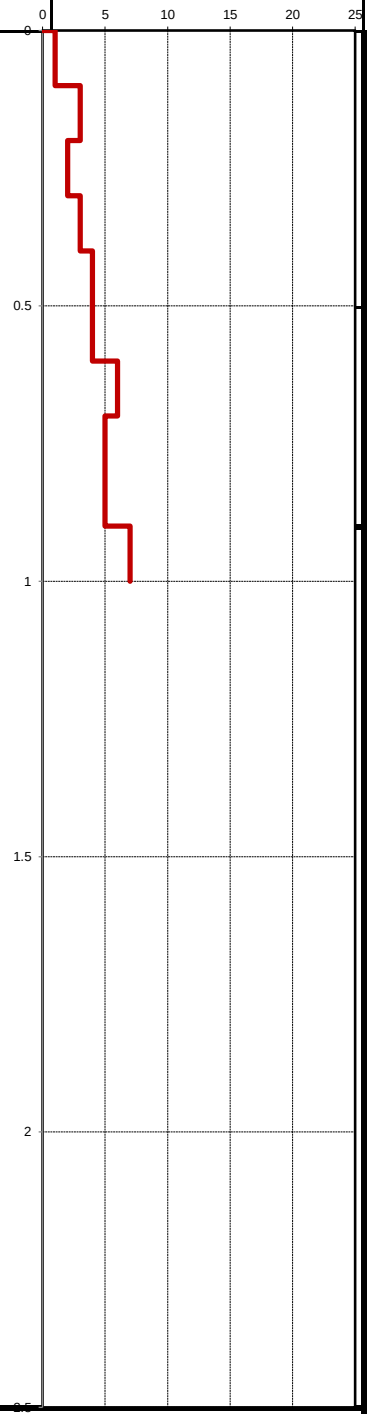
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP90
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 284 Easting: 417 500	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, stiff	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.3							**Terminated at a depth of 1.3 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

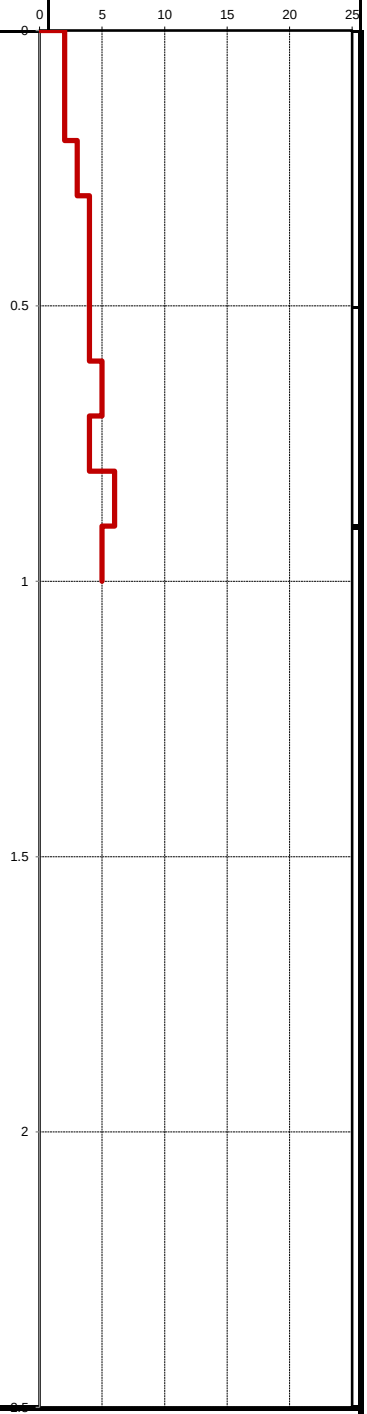
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP91
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 124 Easting: 417 484	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, stiff	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.3							**Terminated at a depth of 1.3 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

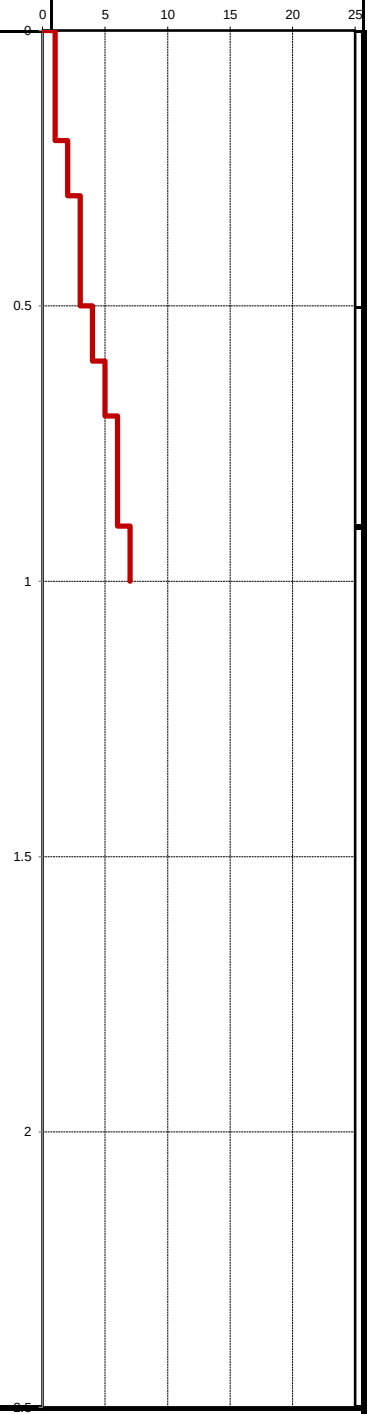
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP92
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 167 Easting: 417 193	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

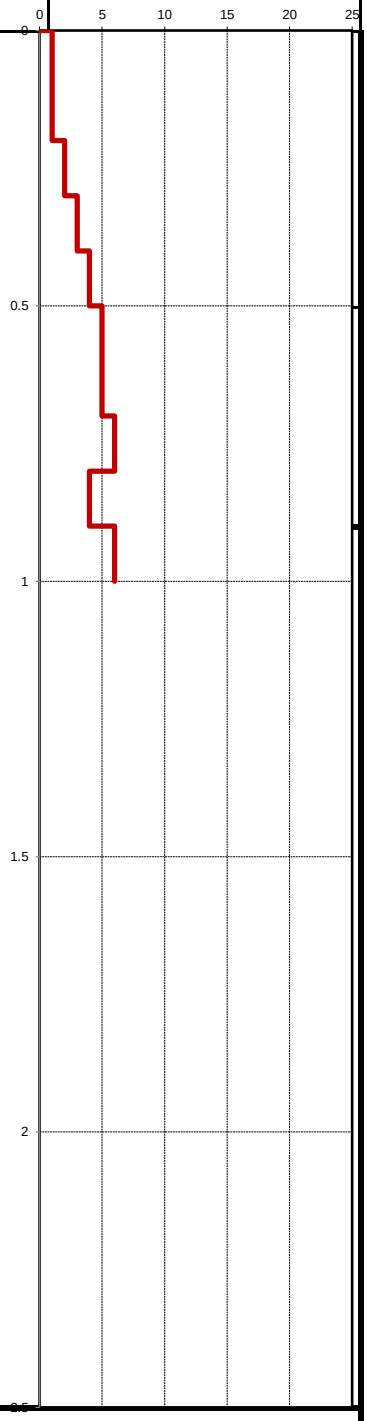
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP93
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 210 Easting: 417 505	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0								
1.1						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

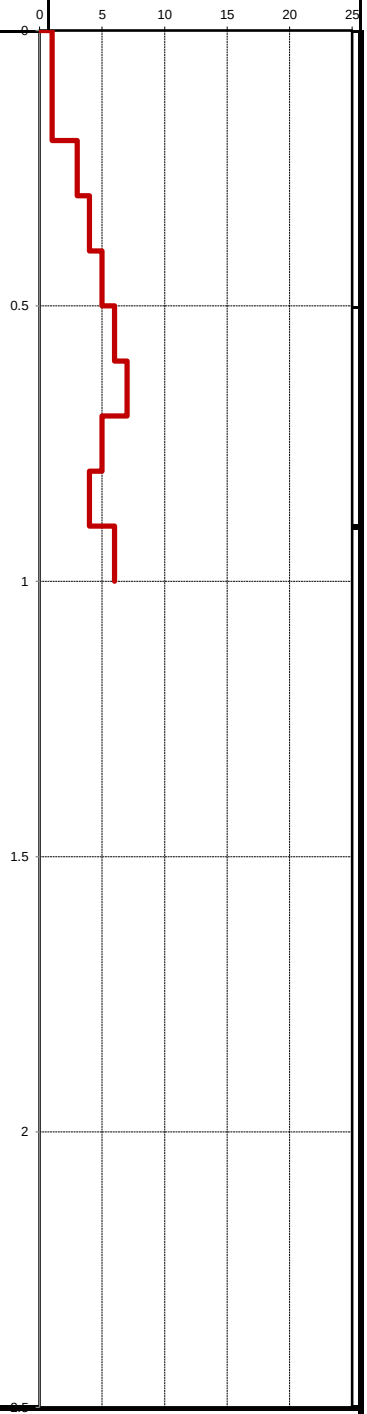
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP94
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 250 Easting: 417 518	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0								
1.1						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.4							**Terminated at a depth of 1.4 m due to refusal on rock**	
1.5								
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

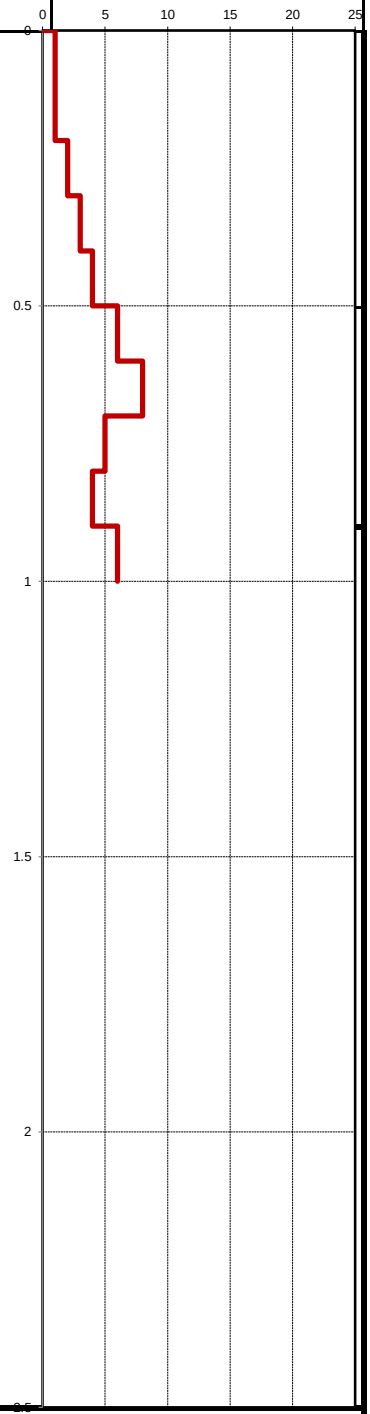
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP95
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 286 Easting: 491 800	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0								
1.1						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

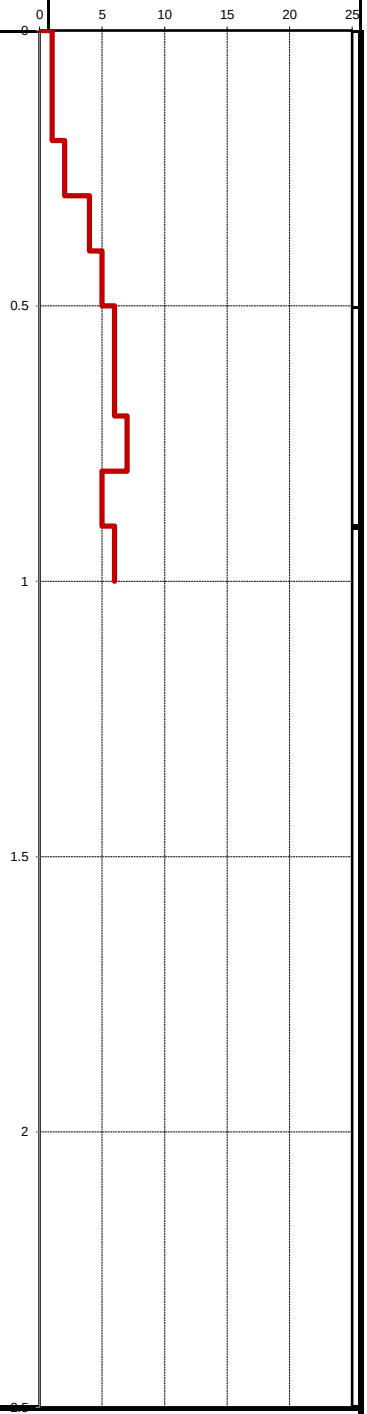
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP96
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 095 Easting: 417 513	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0								
1.1						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5								
1.6							**Terminated at a depth of 1.6 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

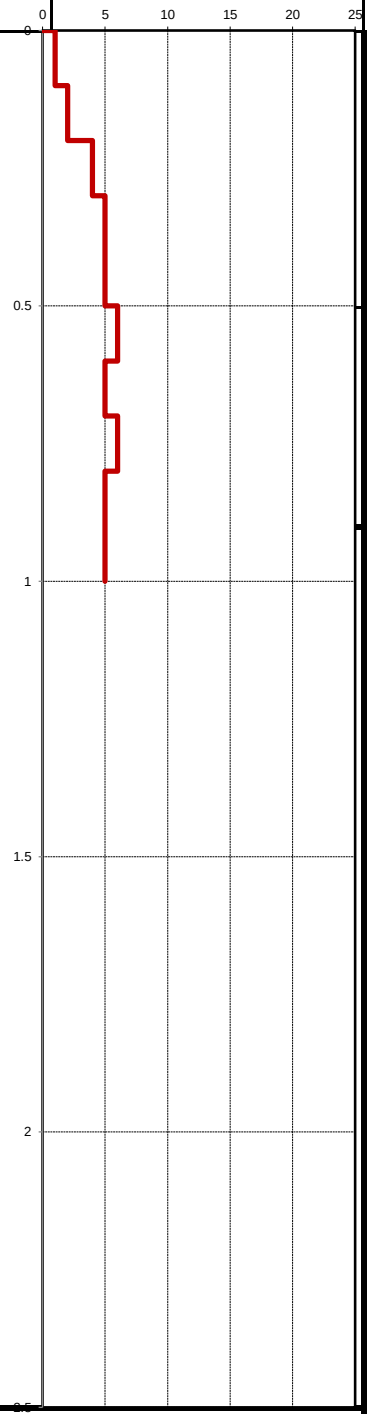
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP97
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 141 Easting: 417 518	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5								
1.6							**Terminated at a depth of 1.6 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

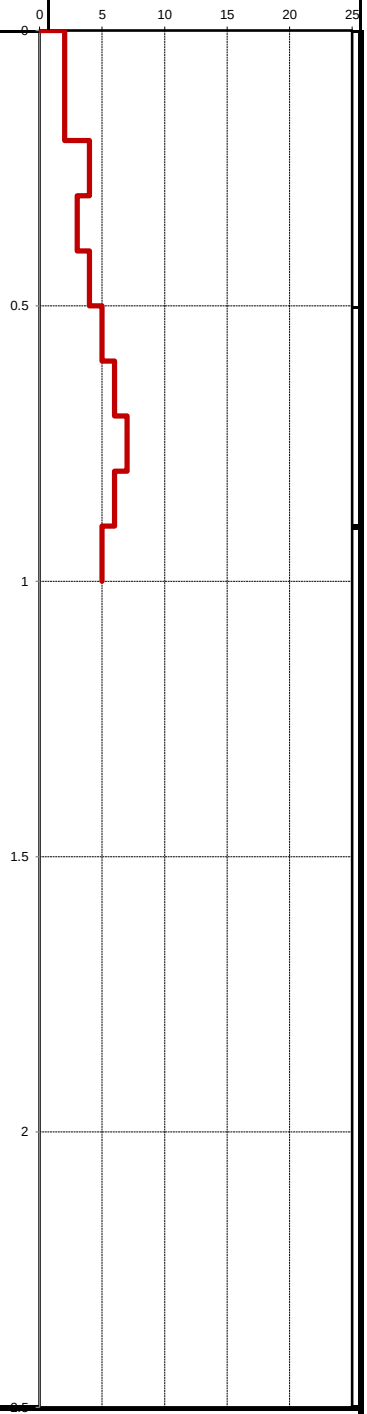
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP98
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 189 Easting: 417 530	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.4							**Terminated at a depth of 1.4 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

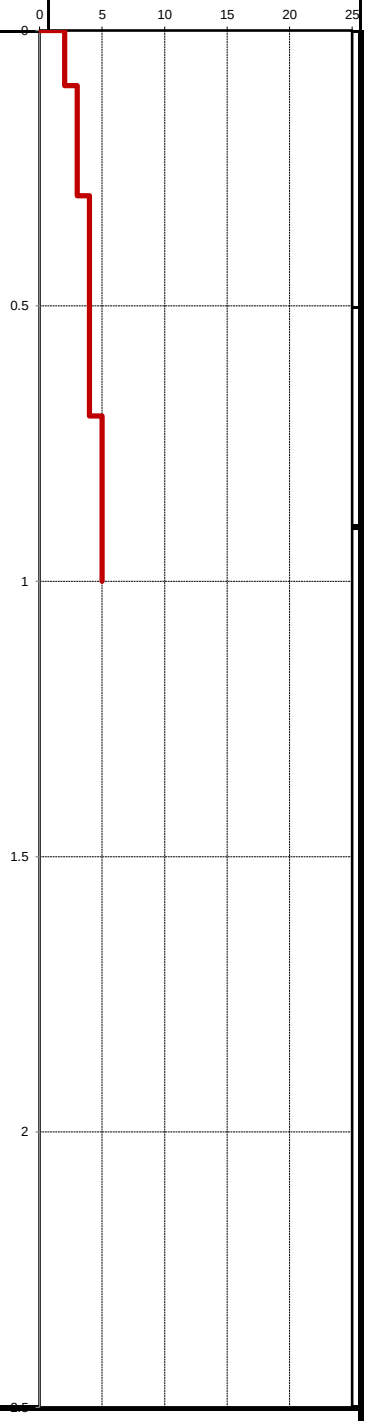
ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP99
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 229 Easting: 417 541	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, stiff	
0.5								
0.9						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.3							**Terminated at a depth of 1.3 m due to refusal on rock**	
1.5								
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

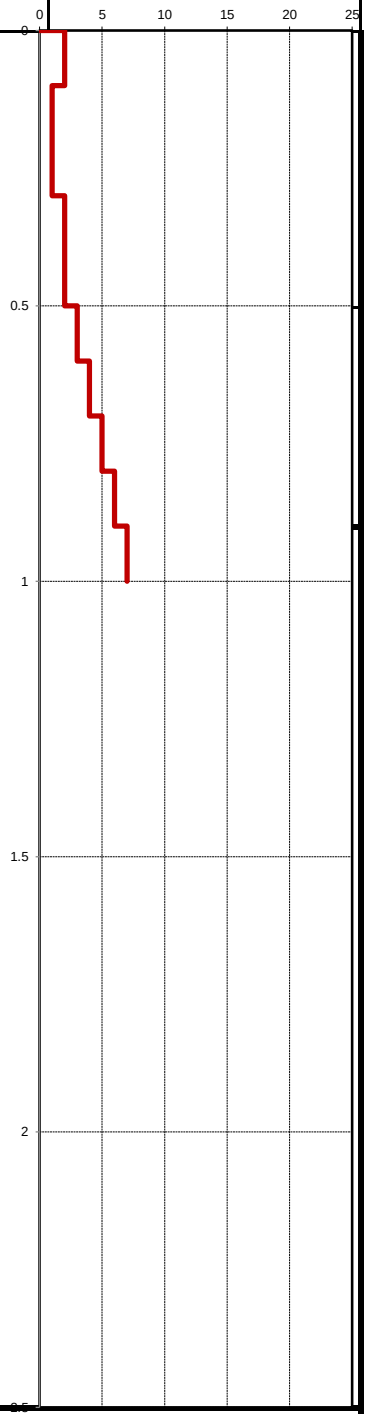
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP100
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 270 Easting: 417 554	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.9						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

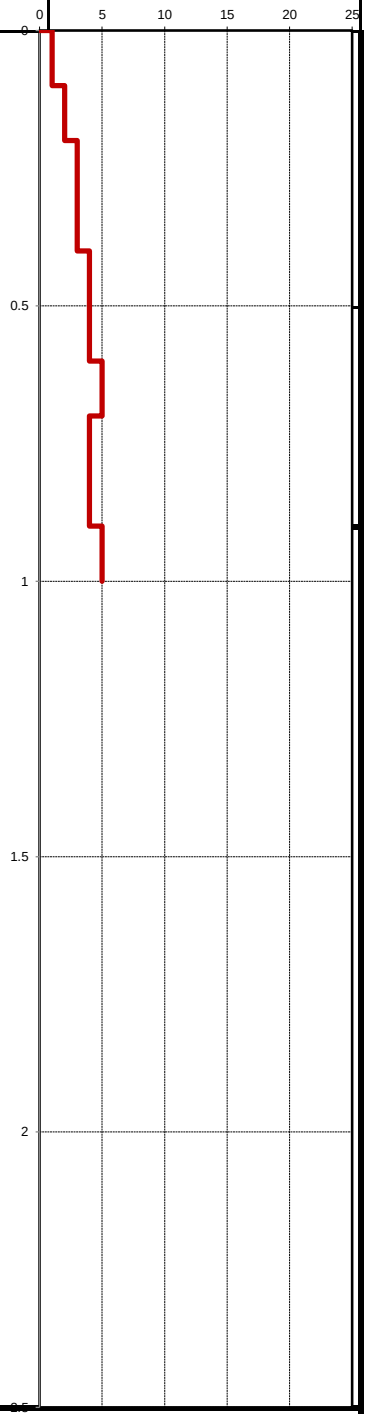
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP101
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 095 Easting: 417 552	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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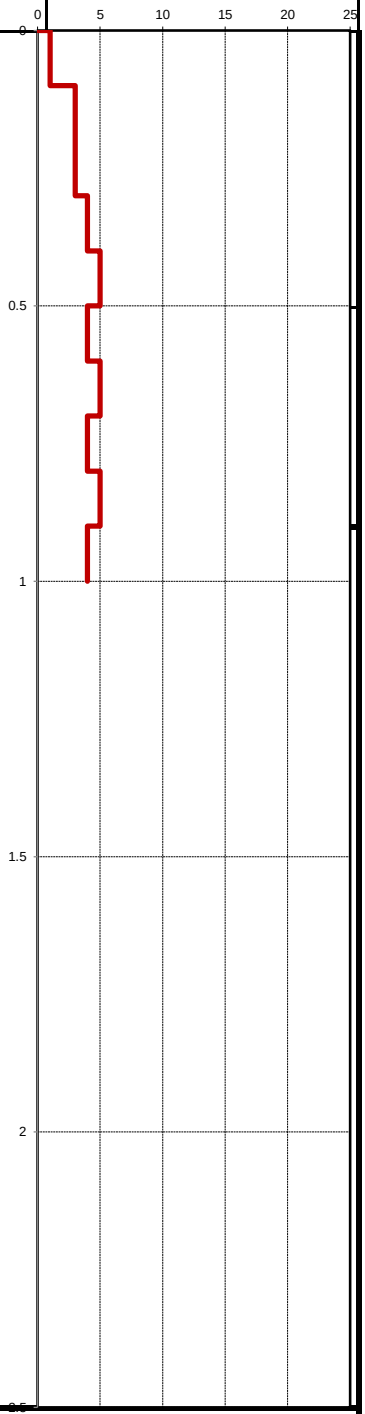
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP102
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 140 Easting: 417 561	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, stiff	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
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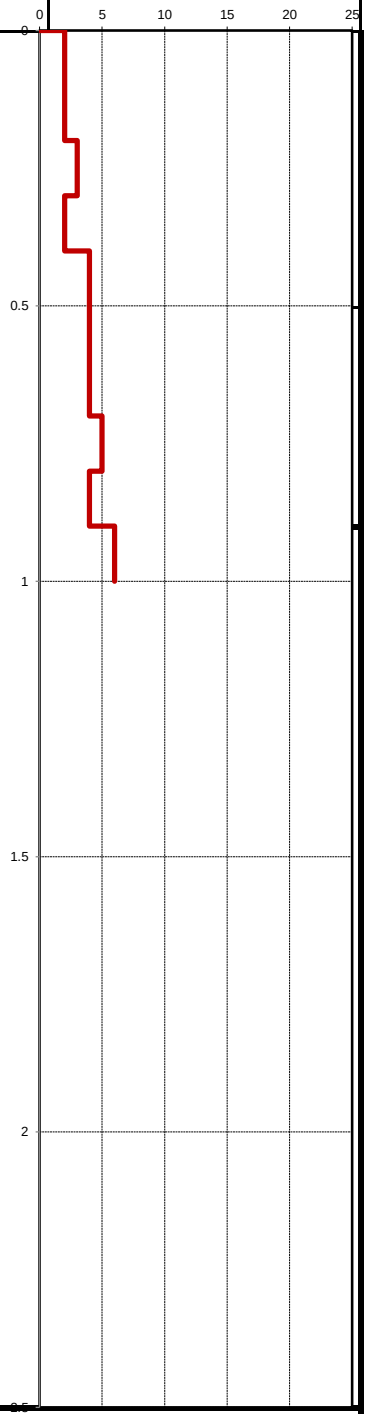
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP103
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 191 Easting: 417 570	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.4							**Terminated at a depth of 1.4 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

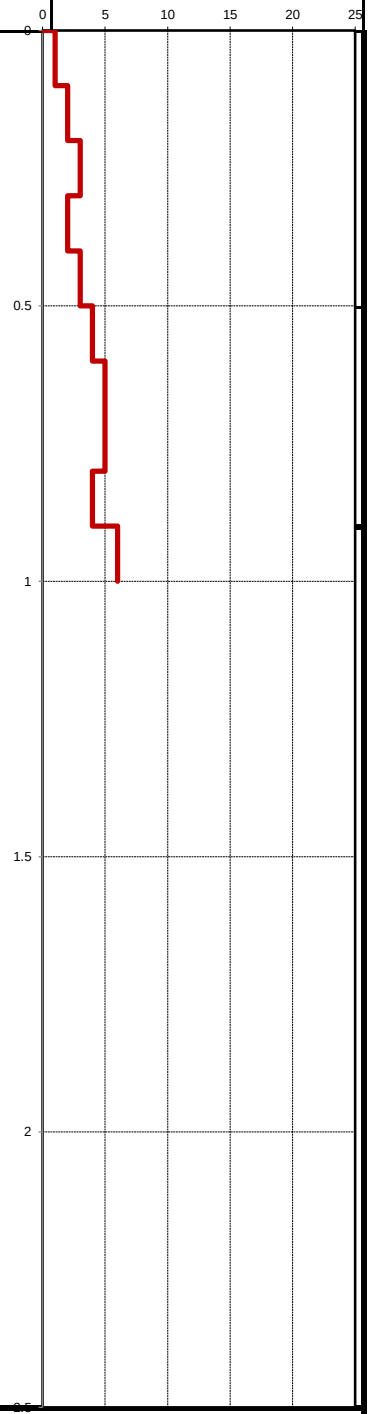
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP104
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 230 Easting: 417 580	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.4							**Terminated at a depth of 1.4 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

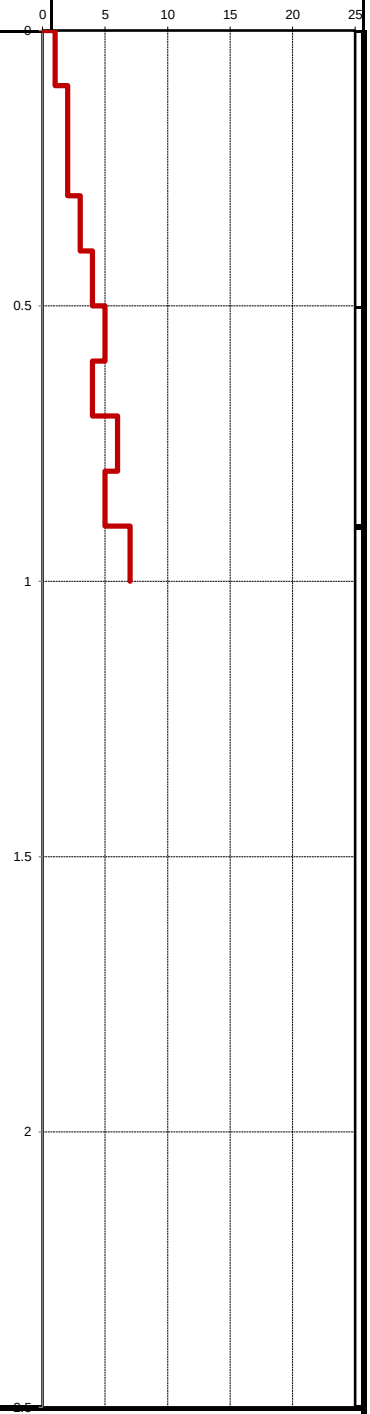
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP105
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 274 Easting: 417 592	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

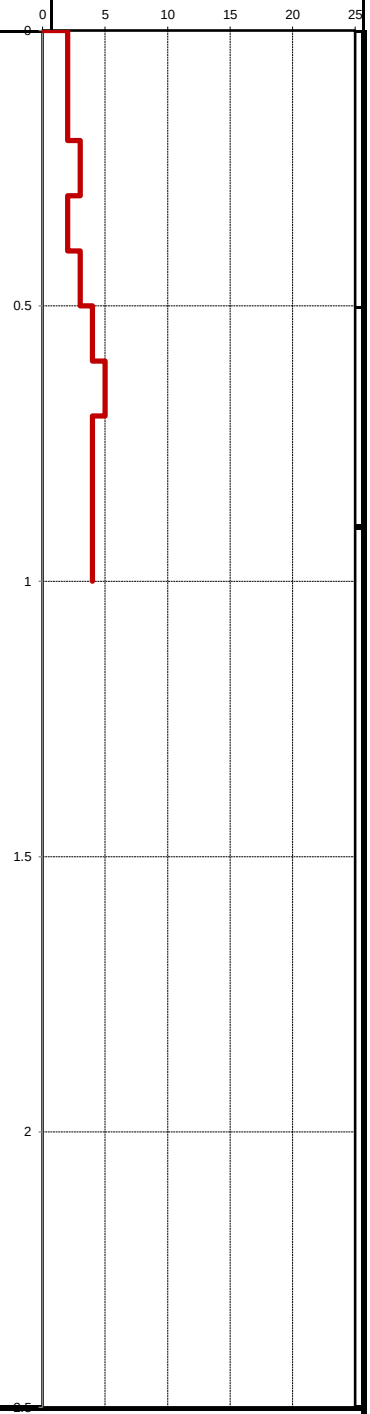
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP106
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 105 Easting: 417 593	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.2							**Terminated at a depth of 1.2 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

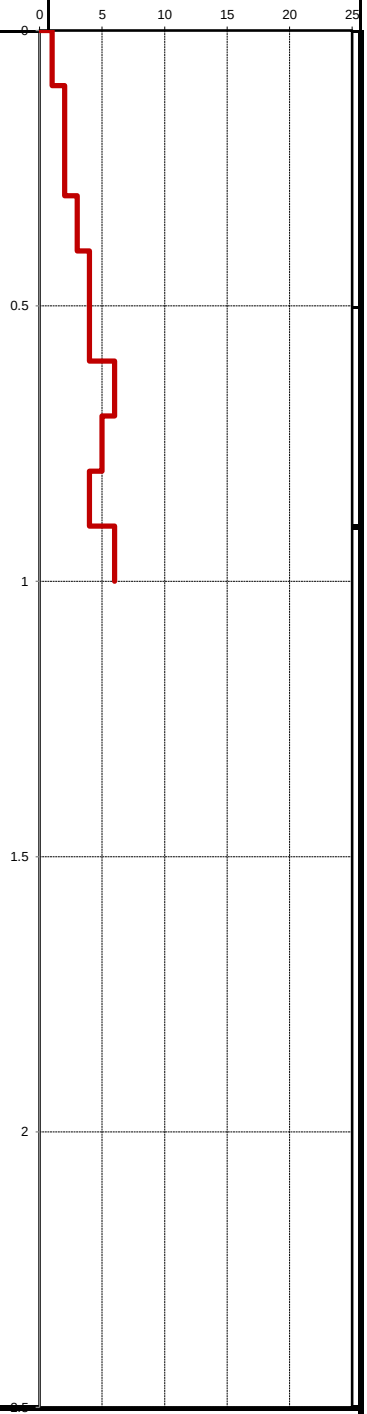
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP107
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 142 Easting: 417 613	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
0.8						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.0								
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

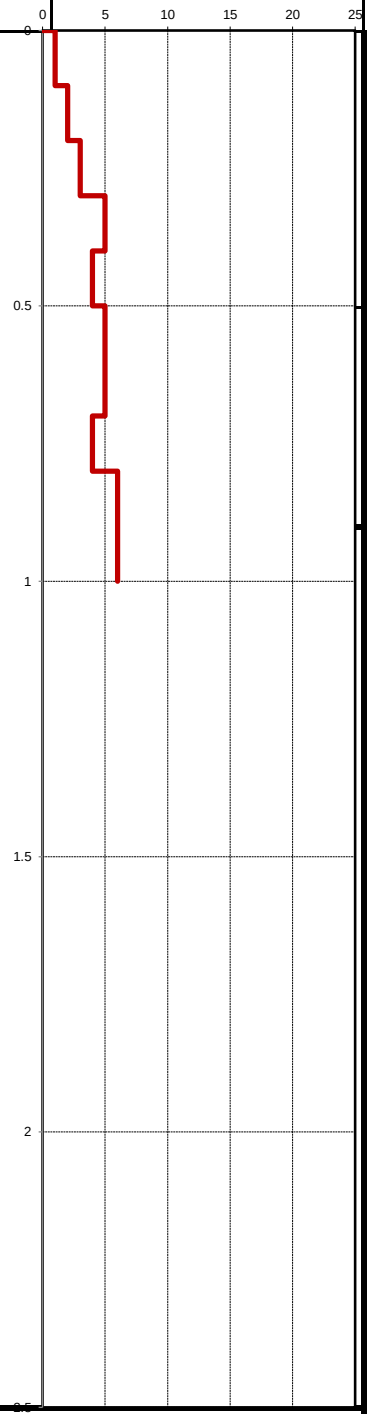
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP108
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 190 Easting: 417 617	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

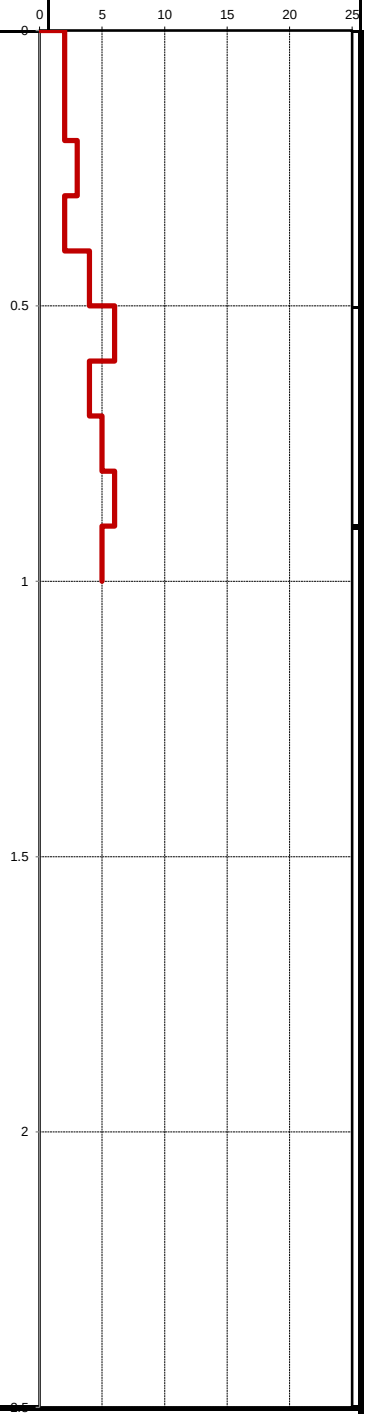
RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
ABN:61 737 984 867
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP109
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 235 Easting: 417 624	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.5							**Terminated at a depth of 1.5 m due to refusal on rock**	
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

ENGINEERING LOG

RESULT OF TEST HOLES/PITS

LOCAL GEOTECHNICS
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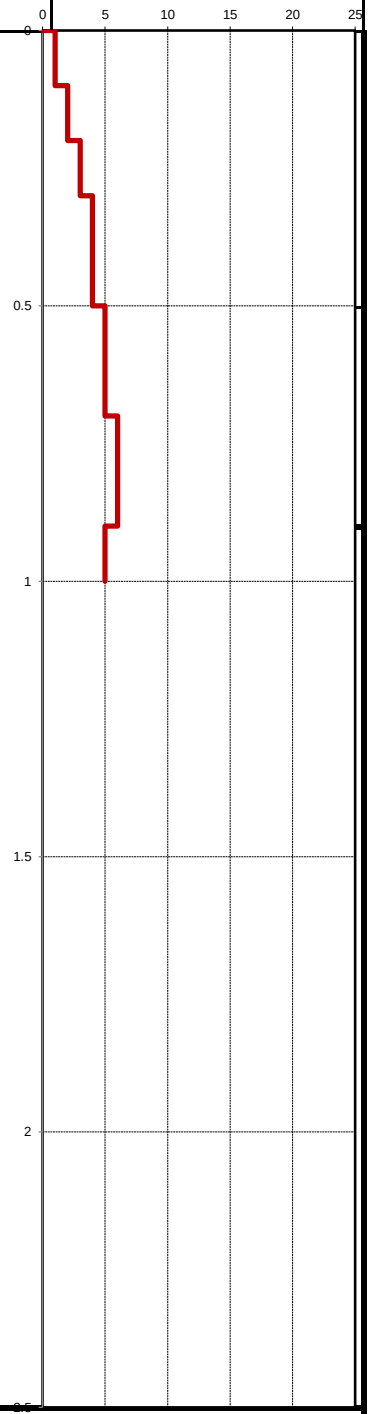
12/8 Production Road, Canning Vale WA 6155
PO Box 5050 Canning Vale South WA 6155
admin@localgeotechnics.com.au

Reference	: LGK0632024SC	Test Pit/BH No.:	TP110
Client	: Department of Communities	Date Excavated:	4-Dec-2024
Project	: Geotechnical Site Classification	Date completed:	4-Dec-2024
Location	: Warmun Community, WA	Equipment Type:	Excavator, DCP and FPT
GPS Zone 52	: Northing: 8 117 272 Easting: 417 631	Water Table:	Not encountered

Depth (m)	RL (m)	Method	Penetration resistance	Sampling Type	Graphic Log	Classification Symbol	Description of Soil Strata	Additional observations
0.0						CL	**Uncontrolled Fill, Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, grass, sub angular gravel up to 30 mm in size, moist, firm	
0.2						CL	**Sandy CLAY** - low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, moist, firm	
0.5								
1.0						GW	**Sandy GRAVEL** - fine to medium grained, sub angular gravel up to 60 mm in size, grey, with sand of fine to medium grained, moist, dense	
1.4							**Terminated at a depth of 1.4 m due to refusal on rock**	
1.5								
2.0								
2.5								

Dynamic Cone Penetrometer Test (Blows/100mm)



Notes:

Sampling Type :
B - Bulk/Disturbed Sample,
UD - Undisturbed Sample

Method:
HA - Hand Auger
E - Excavator
BH - Backhoe Bucket

Moisture:
D - Dry
M - Moist
W - Wet

Symbols:
W_L - Plastic Limit
W_P - Plastic Limit

Logged : Y Chen
Checked: H Meer

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP1-5
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP1		DCP2		DCP3		DCP4		DCP5	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	6	VSt	5	VSt	8	VSt	5	VSt	12	H
100 - 200	7	VSt	5	VSt	8	VSt	8	VSt	14	H
200 - 300	6	VSt	5	VSt	7	VSt	>25	H	>25	H
300 - 400	8	D	6	D	8	D	-	-	-	-
400 - 500	14	VD	12	VD	16	VD	-	-	-	-
500 - 600	>25	VD	17	VD	>25	VD	-	-	-	-
600 - 700	-	-	>25	VD	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

ABN: 61 737 984 867
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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP6-10
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP6		DCP7		DCP8		DCP9		DCP10	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	15	H	8	VSt	7	VSt	8	VSt	4	St
100 - 200	>25	H	8	VSt	7	VSt	8	VSt	4	St
200 - 300	-	-	8	D	6	D	8	D	12	VD
300 - 400	-	-	10	VD	9	VD	12	VD	>25	VD
400 - 500	-	-	8	D	12	VD	15	VD	-	-
500 - 600	-	-	16	VD	>25	VD	18	VD	-	-
600 - 700	-	-	>25	VD	-	-	>25	VD	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP11-15
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP11		DCP12		DCP13		DCP14		DCP15	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	6	VSt	5	VSt	>25	H	18	H	>25	H
100 - 200	7	VSt	5	VSt	-	-	>25	VD	-	-
200 - 300	8	D	9	VD	-	-	-	-	-	-
300 - 400	15	VD	12	VD	-	-	-	-	-	-
400 - 500	>25	VD	14	VD	-	-	-	-	-	-
500 - 600	-	-	>25	VD	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP16-20
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP16		DCP17		DCP18		DCP19		DCP20	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	>25	H	17	H	>25	H	12	H
100 - 200	-	-	-	-	>25	H	-	-	15	H
200 - 300	-	-	-	-	-	-	-	-	>25	H
300 - 400	-	-	-	-	-	-	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP21-25
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP21		DCP22		DCP23		DCP24		DCP25	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	18	H	>25	H	>25	H	16	H
100 - 200	-	-	>25	H	-	-	-	-	>25	H
200 - 300	-	-	-	-	-	-	-	-	-	-
300 - 400	-	-	-	-	-	-	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP26-30
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP26		DCP27		DCP28		DCP29		DCP30	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	8	VSt	6	VSt	14	H	>25	H	>25	H
100 - 200	14	H	6	VSt	>25	H	-	-	-	-
200 - 300	>25	H	>25	H	-	-	-	-	-	-
300 - 400	-	-	-	-	-	-	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP31-35
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP31		DCP32		DCP33		DCP34		DCP35	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	8	VSt	14	H	12	H	>25	H
100 - 200	-	-	>25	H	15	H	>25	H	-	-
200 - 300	-	-	-	-	>25	H	-	-	-	-
300 - 400	-	-	-	-	-	-	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP36-40
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP36		DCP37		DCP38		DCP39		DCP40	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	16	H	8	VSt	>25	H	12	H	13	H
100 - 200	>25	H	15	H	-	-	15	H	17	H
200 - 300	-	-	>25	H	-	-	18	H	>25	H
300 - 400	-	-	-	-	-	-	>25	H	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP41-45
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP41		DCP42		DCP43		DCP44		DCP45	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	>25	H	17	H	>25	H	>25	H	>25	H
100 - 200	-	-	>25	H	-	-	-	-	-	-
200 - 300	-	-	-	-	-	-	-	-	-	-
300 - 400	-	-	-	-	-	-	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP46-50
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP46		DCP47		DCP48		DCP49		DCP50	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	18	H	>25	H	>25	H	4	St	>25	H
100 - 200	>25	H	-	-	-	-	8	VSt	-	-
200 - 300	-	-	-	-	-	-	6	VSt	-	-
300 - 400	-	-	-	-	-	-	8	VSt	-	-
400 - 500	-	-	-	-	-	-	15	VD	-	-
500 - 600	-	-	-	-	-	-	>25	VD	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP51-55
Client	Department of Communities	Date Tested	3 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP51		DCP52		DCP53		DCP54		DCP55	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	24	H	23	H	22	H	6	VSt	5	VSt
100 - 200	>25	H	>25	H	>25	H	8	VSt	7	VSt
200 - 300	-	-	-	-	-	-	6	VSt	7	VSt
300 - 400	-	-	-	-	-	-	14	VD	9	VD
400 - 500	-	-	-	-	-	-	>25	VD	12	VD
500 - 600	-	-	-	-	-	-	-	-	>25	VD
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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ABN: 61 737 984 867
PO Box 5050
Canning Vale South, WA 6155

DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP56-60
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP56		DCP57		DCP58		DCP59		DCP60	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	5	VSt	4	St	13	H	6	VSt	5	VSt
100 - 200	6	VSt	4	St	14	H	8	VSt	6	VSt
200 - 300	7	VSt	7	VSt	15	H	6	VSt	9	VSt
300 - 400	8	D	12	VD	>25	VD	13	VD	12	VD
400 - 500	12	VD	>25	VD	-	-	>25	VD	14	VD
500 - 600	12	VD	-	-	-	-	-	-	>25	VD
600 - 700	>25	VD	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP61-65
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP61		DCP62		DCP63		DCP64		DCP65	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	4	St	6	VSt	5	VSt	7	VSt	6	VSt
100 - 200	7	VSt	8	VSt	8	VSt	8	VSt	8	VSt
200 - 300	8	VSt	9	VSt	6	VSt	8	VSt	14	H
300 - 400	14	H	14	H	13	H	10	VSt	>25	H
400 - 500	>25	H	15	H	>25	H	15	H	-	-
500 - 600	-	-	>25	H	-	-	>25	H	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP66-70
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP66		DCP67		DCP68		DCP69		DCP70	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	12	H	8	VSt	4	St	10	VSt	8	VSt
100 - 200	13	H	9	VSt	4	St	12	H	10	VSt
200 - 300	15	H	12	H	5	VSt	15	H	12	H
300 - 400	18	H	15	H	6	VSt	17	H	18	H
400 - 500	12	H	>25	H	12	H	18	H	>25	H
500 - 600	>25	H	-	-	15	H	>25	H	-	-
600 - 700	-	-	-	-	>25	H	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP71-75
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP71		DCP72		DCP73		DCP74		DCP75	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	4	St	7	VSt	6	VSt	10	VSt	6	VSt
100 - 200	4	St	8	VSt	8	VSt	9	VSt	7	VSt
200 - 300	12	H	9	VSt	9	VSt	11	H	8	VSt
300 - 400	12	H	10	VSt	14	H	13	H	8	VSt
400 - 500	13	H	17	H	>25	H	15	H	14	H
500 - 600	>25	H	>25	H	-	-	>25	H	14	H
600 - 700	-	-	-	-	-	-	-	-	15	H
700 - 800	-	-	-	-	-	-	-	-	>25	H
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP76-80
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP76		DCP77		DCP78		DCP79		DCP80	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	13	H	12	H	15	H	18	H	12	H
100 - 200	14	H	>25	H	16	H	>25	H	15	H
200 - 300	>25	H	-	-	18	H	-	-	>25	H
300 - 400	-	-	-	-	>25	H	-	-	-	-
400 - 500	-	-	-	-	-	-	-	-	-	-
500 - 600	-	-	-	-	-	-	-	-	-	-
600 - 700	-	-	-	-	-	-	-	-	-	-
700 - 800	-	-	-	-	-	-	-	-	-	-
800 - 900	-	-	-	-	-	-	-	-	-	-
900 - 1000	-	-	-	-	-	-	-	-	-	-

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP81-85
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP81		DCP82		DCP83		DCP84		DCP85	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	2	F	1	F	2	F	1	F
100 - 200	1	F	2	F	1	F	1	F	1	F
200 - 300	2	F	3	St	1	F	2	F	4	St
300 - 400	4	St	5	VSt	2	F	2	F	3	St
400 - 500	4	St	4	St	3	St	3	St	4	St
500 - 600	5	VSt	4	St	4	St	4	St	5	VSt
600 - 700	8	VSt	6	VSt	4	St	4	St	6	VSt
700 - 800	4	St	7	VSt	5	VSt	5	VSt	4	St
800 - 900	4	St	7	VSt	6	VSt	5	VSt	3	St
900 - 1000	6	VSt	5	VSt	7	D	8	D	5	D

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP86-90
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP86		DCP87		DCP88		DCP89		DCP90	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	3	St	2	F	1	F
100 - 200	2	F	1	F	4	St	2	F	3	St
200 - 300	2	F	1	F	4	St	3	St	2	F
300 - 400	3	St	3	St	5	VSt	4	St	3	St
400 - 500	4	St	5	VSt	4	St	4	St	4	St
500 - 600	4	St	5	VSt	5	VSt	6	VSt	4	St
600 - 700	6	VSt	7	VSt	8	VSt	6	VSt	6	VSt
700 - 800	5	VSt	8	VSt	3	St	7	VSt	5	VSt
800 - 900	6	VSt	8	VSt	4	St	5	D	5	D
900 - 1000	7	VSt	8	VSt	7	VSt	5	D	7	D

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP91-95
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP91		DCP92		DCP93		DCP94		DCP95	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	2	F	1	F	1	F	1	F	1	F
100 - 200	2	F	1	F	1	F	1	F	1	F
200 - 300	3	St	2	F	2	F	3	St	2	F
300 - 400	4	St	3	St	3	St	4	St	3	St
400 - 500	4	St	3	St	4	St	5	VSt	4	St
500 - 600	4	St	4	St	5	VSt	6	VSt	6	VSt
600 - 700	5	VSt	5	VSt	5	VSt	7	VSt	8	VSt
700 - 800	4	St	6	VSt	6	VSt	5	VSt	5	VSt
800 - 900	6	VSt	6	VSt	4	St	4	St	4	St
900 - 1000	5	VSt	7	VSt	6	VSt	6	VSt	6	VSt

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

LOCAL GEOTECHNICS

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP96-100
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP96		DCP97		DCP98		DCP99		DCP100	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	2	F	2	F	2	F
100 - 200	1	F	2	F	2	F	3	St	1	F
200 - 300	2	F	4	St	4	St	3	St	1	F
300 - 400	4	St	5	VSt	3	St	4	St	2	F
400 - 500	5	VSt	5	VSt	4	St	4	St	2	F
500 - 600	6	VSt	6	VSt	5	VSt	4	St	3	St
600 - 700	6	VSt	5	VSt	6	VSt	4	St	4	St
700 - 800	7	VSt	6	VSt	7	VSt	5	VSt	5	VSt
800 - 900	5	VSt	5	VSt	6	VSt	5	VSt	6	VSt
900 - 1000	6	VSt	5	VSt	5	D	5	D	7	D

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP101-105
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP101		DCP102		DCP103		DCP104		DCP105	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	1	F	1	F	2	F	1	F	1	F
100 - 200	2	F	3	St	2	F	2	F	2	F
200 - 300	3	St	3	St	3	St	3	St	2	F
300 - 400	3	St	4	St	2	F	2	F	3	St
400 - 500	4	St	5	VSt	4	St	3	St	4	St
500 - 600	4	St	4	St	4	St	4	St	5	VSt
600 - 700	5	VSt	5	VSt	4	St	5	VSt	4	St
700 - 800	4	St	4	St	5	VSt	5	VSt	6	VSt
800 - 900	4	St	5	VSt	4	D	4	D	5	D
900 - 1000	5	VSt	4	St	6	D	6	D	7	D

VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

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DYNAMIC CONE PENETROMETER (DCP) TEST CERTIFICATES

(AS 1289.6.3.2)

Density Correlation - Table 6.4.6.1 (A) & (B) HB 160 - 2006

Reference	LGK0632024SC	Test ID	DCP106-110
Client	Department of Communities	Date Tested	4 December 2024
Project	Geotechnical Site Classification	Tested by	Y Chen
Site	Warmun Community, WA	Checked by	H Meer

DCP No.	DCP106		DCP107		DCP108		DCP109		DCP110	
Depth (mm)	**Penetration Resistance/Density Classification - Blows/100mm**									
0 - 100	2	F	1	F	1	F	2	F	1	F
100 - 200	2	F	2	F	2	F	2	F	2	F
200 - 300	3	St	2	F	3	St	3	St	3	St
300 - 400	2	F	3	St	5	VSt	2	F	4	St
400 - 500	3	St	4	St	4	St	4	St	4	St
500 - 600	4	St	4	St	5	VSt	6	VSt	5	VSt
600 - 700	5	VSt	6	VSt	5	VSt	4	St	5	VSt
700 - 800	4	St	5	VSt	4	St	5	VSt	6	VSt
800 - 900	4	D	4	D	6	VSt	6	VSt	6	VSt
900 - 1000	4	D	6	D	6	VSt	5	VSt	5	VSt

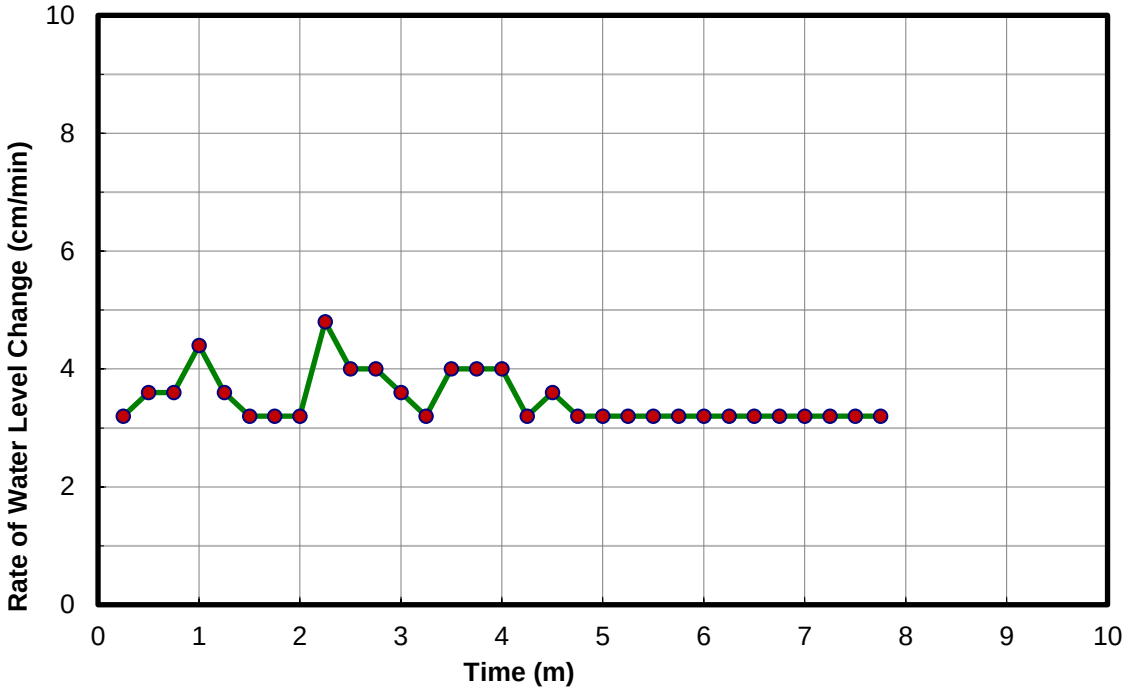
VS = **V**ery **S**oft to Soft	**F** = **F**irm	**St** = **St**iff	**VSt** = **V**ery **St**iff	**H** = **H**ard
<1	1 - 2	3 - 4	5 - 10	>10

VL = **V**ery **L**oose	**L** = **L**oose	**MD** = **M**edium **D**ense	**D** = **D**ense	**VD** = **V**ery **D**ense
<1	1 - 2	2 - 3	4 - 8	>8

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

Reference	LGK0632024SC	Test ID	FPT1
Client	Department of Communities	Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton	Date Completed	03-Dec-24
Location	Warmun Community, WA	Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 116 958 Easting: 416 786	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **3.1E-06** **m/sec**
2.7E-01 **m/day**

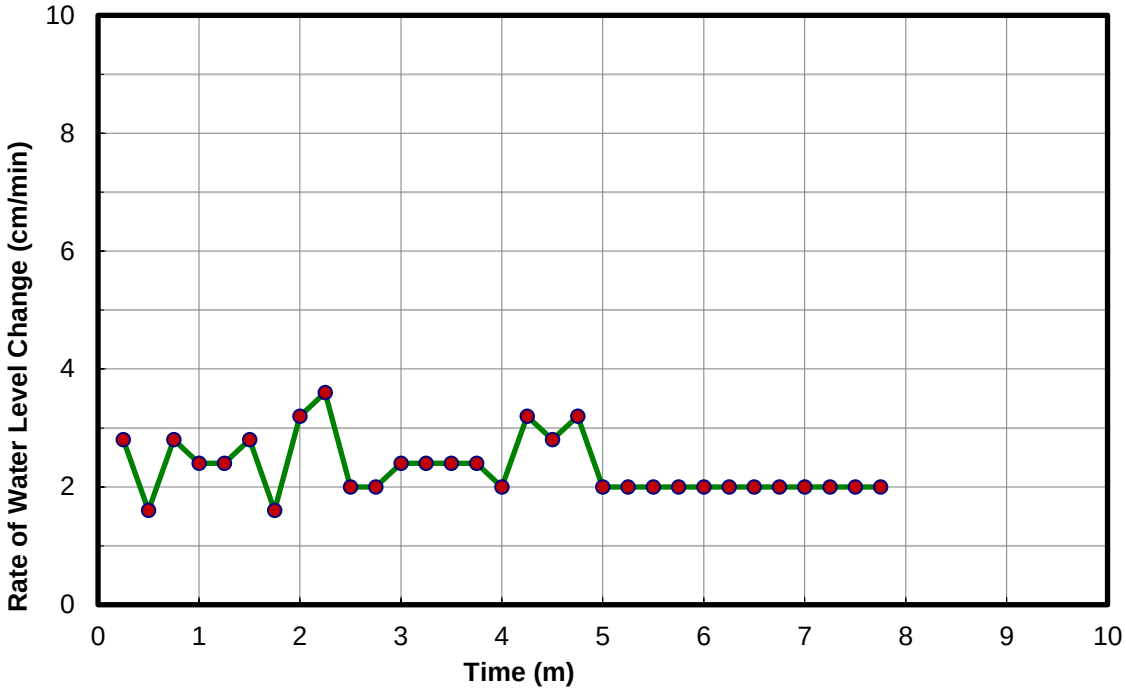
Signatory: [redacted]

Date: 03 December 2024

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

Reference	LGK0632024SC	Test ID	FPT2
Client	Department of Communities	Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton	Date Completed	03-Dec-24
Location	Warmun Community, WA	Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 116 989 Easting: 416 857	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **4.5E-06** **m/sec**

3.9E-01 **m/day**

Signatory: [redacted]

Date: 03 December 2024

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
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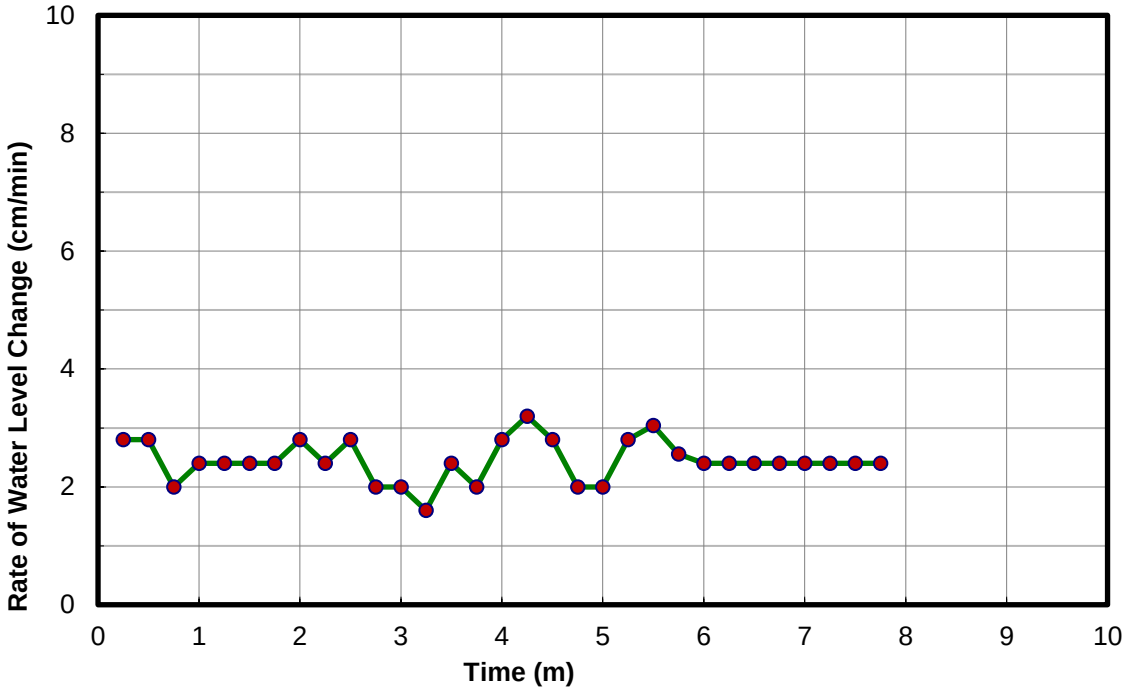
admin@localgeotechnics.com.au

Reference	LGK0632024SC	Test ID	FPT3
Client	Department of Communities	Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton	Date Completed	03-Dec-24
Location	Warmun Community, WA	Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 116 860 Easting: 416 158	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **3.1E-06** **m/sec**
2.6E-01 **m/day**

Signatory: [redacted]

Date: 03 December 2024

ABN: 61 737 984 867
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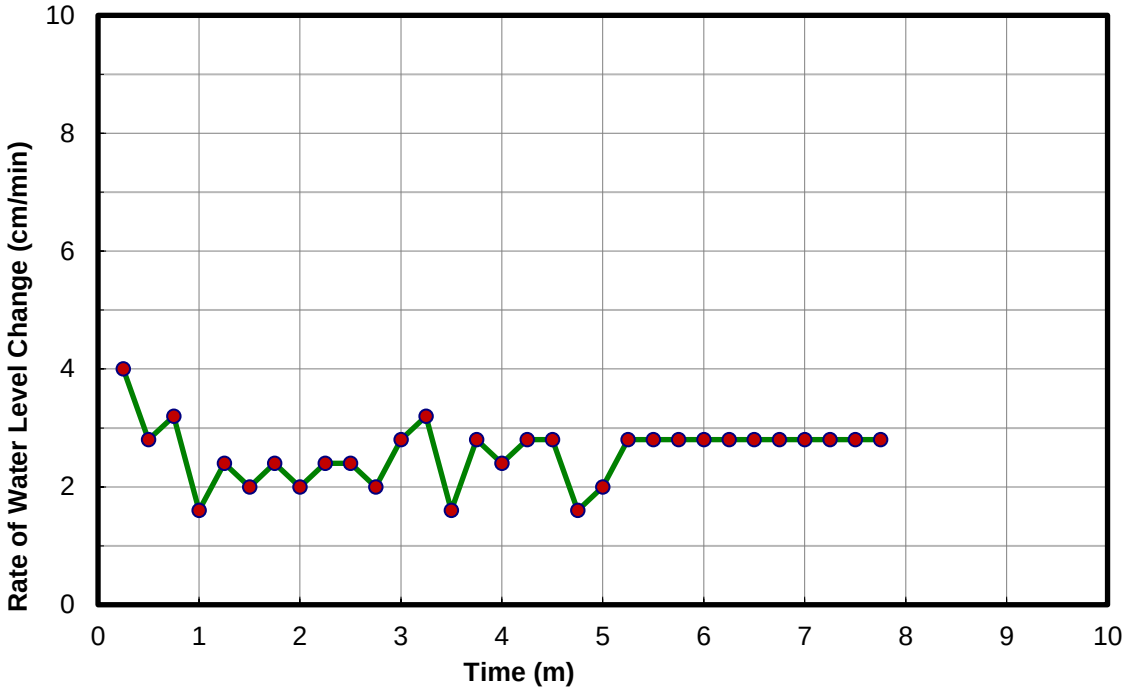
admin@localgeotechnics.com.au

INFILTRATION TEST CERTIFICATES (AS1547)

Reference	LGK0632024SC	Test ID	FPT4
Client	Department of Communities	Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton	Date Completed	03-Dec-24
Location	Warmun Community, WA	Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 116 807 Easting: 415 961	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **3.8E-06** **m/sec**

3.3E-01 **m/day**

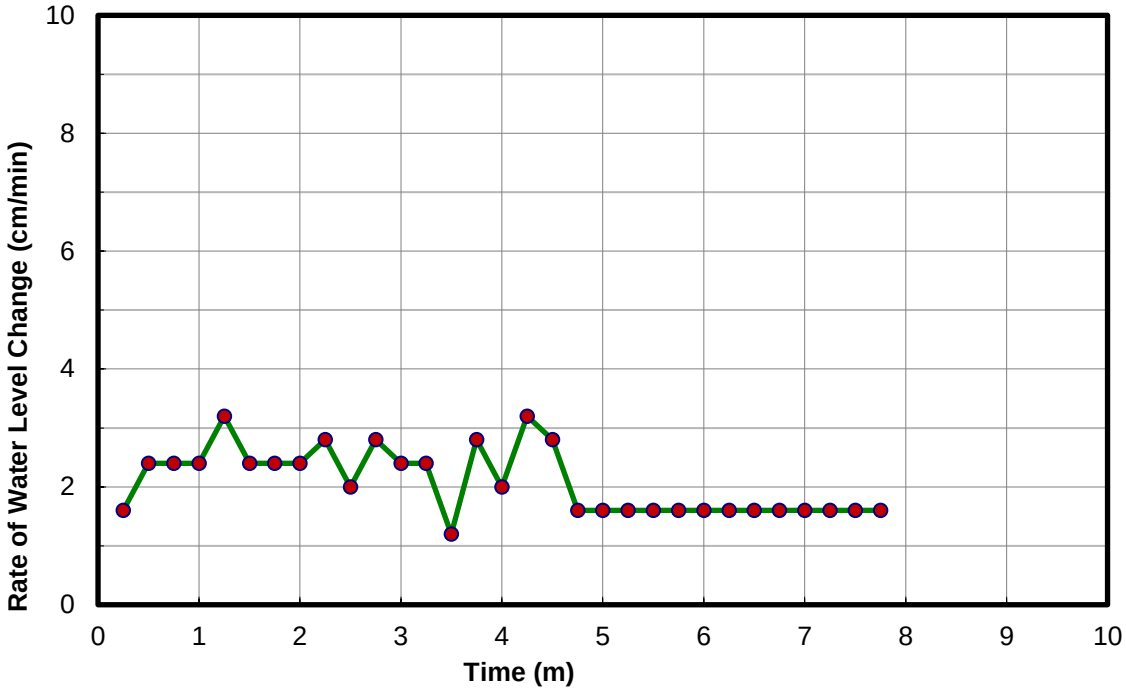
Signatory: [redacted]

Date: 03 December 2024

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

Reference	LGK0632024SC	Test ID	FPT5
Client	Department of Communities	Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton	Date Completed	03-Dec-24
Location	Warmun Community, WA	Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 117 754 Easting: 416 387	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **3.0E-06** **m/sec**
2.6E-01 **m/day**

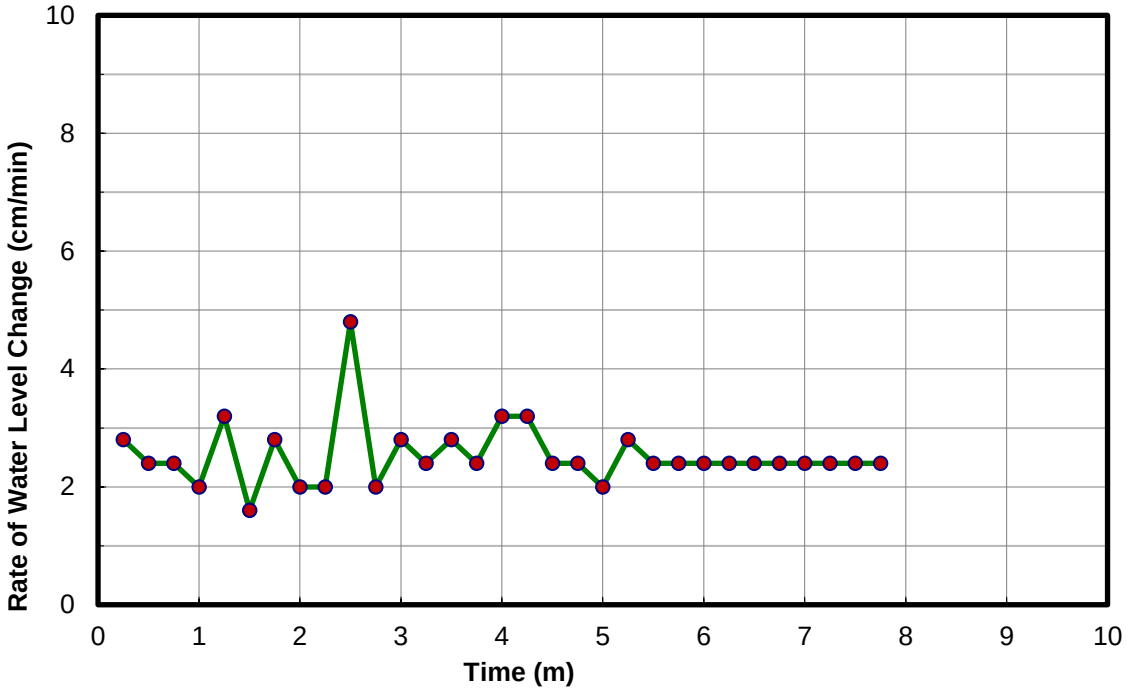
Signatory: [redacted]

Date: 03 December 2024

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

INFILTRATION TEST CERTIFICATES (AS1547)

Reference	LGK0632024SC			Test ID	FPT6
Client	Department of Communities			Date Tested	03-Dec-24
Project	Geotechnical Site Classificaiton			Date Completed	03-Dec-24
Location	Warmun Community, WA			Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 117 790	Easting:	416 504	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **2.9E-06** **m/sec**

2.5E-01 **m/day**

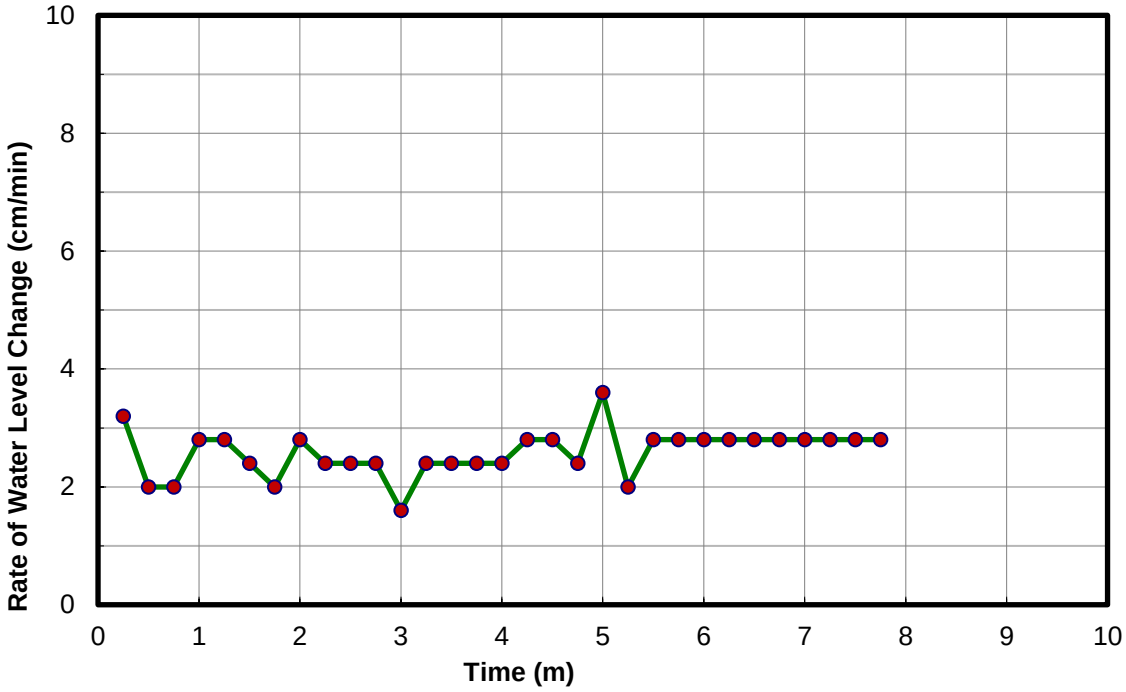
Signatory: [redacted]

Date: 03 December 2024

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

Reference	LGK0632024SC			Test ID	FPT7
Client	Department of Communities			Date Tested	04-Dec-24
Project	Geotechnical Site Classificaiton			Date Completed	04-Dec-24
Location	Warmun Community, WA			Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 117 162	Easting:	417 467	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **2.5E-06** **m/sec**

2.2E-01 **m/day**

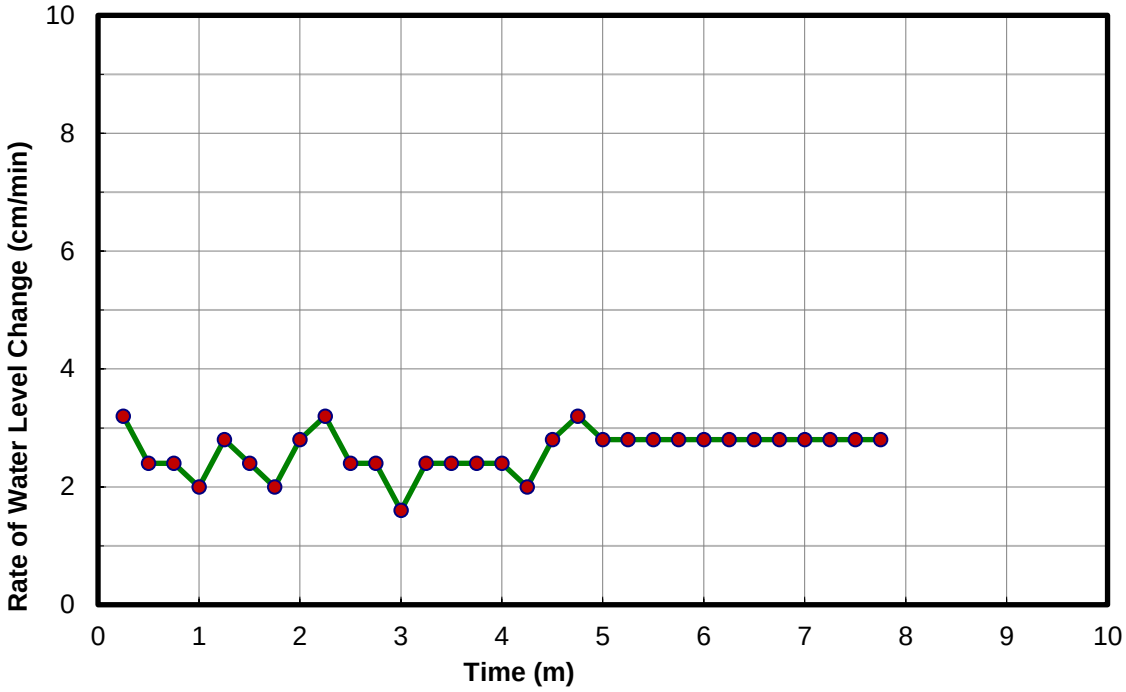
Signatory: [redacted]

Date: 04 December 2024

INFILTRATION TEST CERTIFICATES (AS1547)

ABN: 61 737 984 867
PO Box 5050 Canning Vale South
WA 6155
admin@localgeotechnics.com.au

Reference	LGK0632024SC			Test ID	FPT8
Client	Department of Communities			Date Tested	04-Dec-24
Project	Geotechnical Site Classificaiton			Date Completed	04-Dec-24
Location	Warmun Community, WA			Instrument Type	Guelph Permeameter
Position	Northing: 52L 8 117 210	Easting:	417 601	Tested by	Y Chen



Notes: Test was conducted at a depth of 0.45 m from the existing surface level

Water Hydraulic conductivity K_{fs}: **3.4E-06** **m/sec**
2.9E-01 **m/day**

Signatory: [redacted]

Date: 04 December 2024

APPENDIX C

SITE PHOTOS

Photo 1. General Site Condition (Lot 200 - Lot 204)

Photo 2. Test Location 01 (TP1), Sub-surface Probing by Using an Excavator

Photo 3. Soil from Test Location 01 (TP1)

Photo 4. Test Location 09 (DCP9), Testing by using a Dynamic Cone Penetrometer

Photo 5. Soil from Test Location 11 (TP11)

Photo 6. General Site Condition (Lot 105)

Photo 7. General Site Condition (Lot 95)

Photo 8. Soil from Test Location 22 (TP22)

Photo 9. Test Location 22 (DCP22), Testing by Using a Dynamic Cone Penetrometer

Photo 10. General Site Condition (Lot 706)

Photo 11. Soil from Test Location 49 (TP49)

Photo 12. Soil from Test Location 53 (TP53)

Photo 13. General Site Condition (Lot 914)

Photo 14. Soil from Test Location 68 (TP68)

Photo 15. General Site Condition (Lot 915)

Photo 16. Soil from Test Location 91 (TP91)

LOCAL
GEOTECHNICS

APPENDIX D

LABORATORY TEST CERTIFICATES

Material Test Report

Local Geotechnics Pty Ltd
Canning Vale Laboratory
Unit 9/8 Production Road Canning Vale WA 6155
Phone: (08) 9457 3517
Email: admin@localgeotechnics.com.au

Accredited for complia[redacted] C 17025 - Testing

[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617A
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

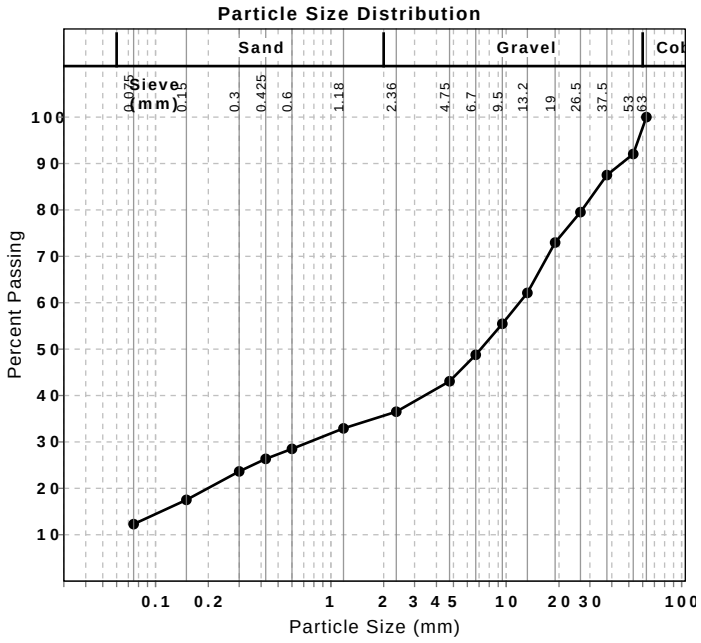
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP1, Depth: (0.8 - 1.5m)**
Material: Rocky clayey sand

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
63 mm	**100**		
53 mm	**92**		
37.5 mm	**88**		
26.5 mm	**80**		
19 mm	**73**		
13.2 mm	**62**		
9.5 mm	**55**		
6.7 mm	**49**		
4.75 mm	**43**		
2.36 mm	**37**		
1.18 mm	**33**		
0.6 mm	**29**		
0.425 mm	**26**		
0.3 mm	**24**		
0.15 mm	**18**		
0.075 mm	**12**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	29		
Plastic Limit (%)	21		
Plasticity Index (%)	**8**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**4.0**		
Cracking Crumbling Curling	Cracking		



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Local Geotechnics Pty Ltd
Canning Vale Laboratory
Unit 9/8 Production Road Canning Vale WA 6155
Phone: (08) 9457 3517
Email: admin@localgeotechnics.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617B
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

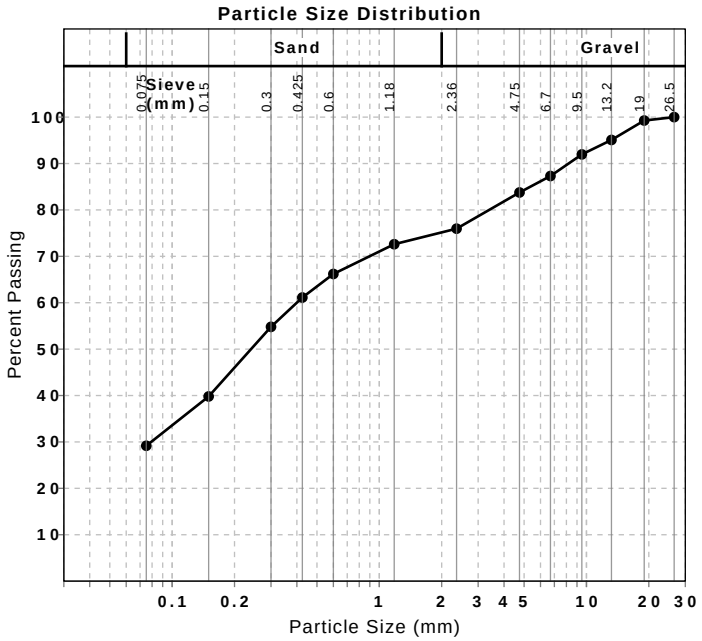
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP8, Depth: (0.1 - 0.2m)**
Material: Rocky sandy clay

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
26.5 mm	**100**		
19 mm	**99**		
13.2 mm	**95**		
9.5 mm	**92**		
6.7 mm	**87**		
4.75 mm	**84**		
2.36 mm	**76**		
1.18 mm	**73**		
0.6 mm	**66**		
0.425 mm	**61**		
0.3 mm	**55**		
0.15 mm	**40**		
0.075 mm	**29**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	36		
Plastic Limit (%)	16		
Plasticity Index (%)	**20**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**7.5**		
Cracking Crumbling Curling	Cracking		



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[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617C
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

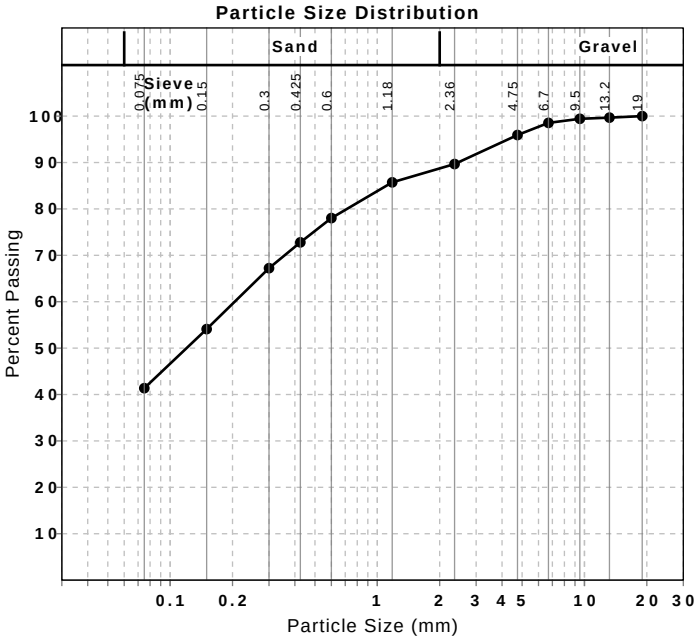
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP15, Depth: (0.3 - 1.0m)**

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
19 mm	**100**		
13.2 mm	**100**		
9.5 mm	**99**		
6.7 mm	**99**		
4.75 mm	**96**		
2.36 mm	**90**		
1.18 mm	**86**		
0.6 mm	**78**		
0.425 mm	**73**		
0.3 mm	**67**		
0.15 mm	**54**		
0.075 mm	**41**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	41		
Plastic Limit (%)	13		
Plasticity Index (%)	**28**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**7.0**		
Cracking Crumbling Curling	Cracking		



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[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617D
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

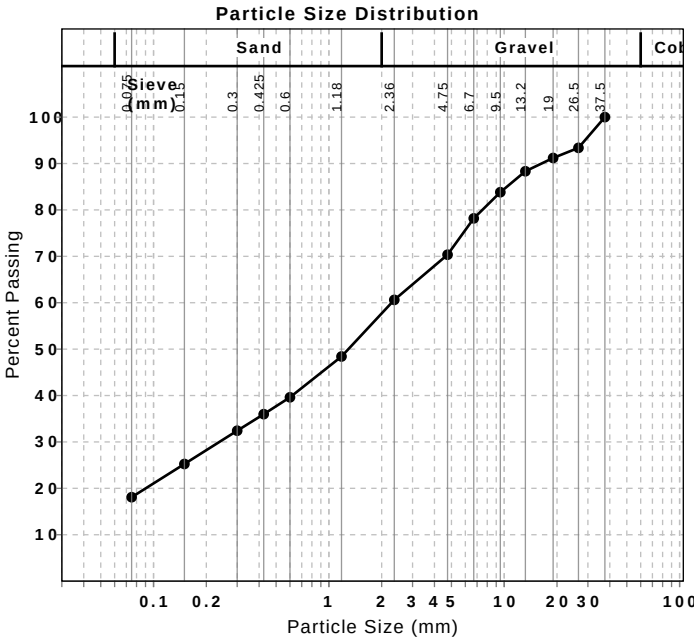
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP16, Depth: (1.2 - 1.5m)**
Material: Clayey sand

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
37.5 mm	**100**		
26.5 mm	**93**		
19 mm	**91**		
13.2 mm	**88**		
9.5 mm	**84**		
6.7 mm	**78**		
4.75 mm	**70**		
2.36 mm	**61**		
1.18 mm	**48**		
0.6 mm	**40**		
0.425 mm	**36**		
0.3 mm	**32**		
0.15 mm	**25**		
0.075 mm	**18**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	38		
Plastic Limit (%)	23		
Plasticity Index (%)	**15**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**5.5**		
Cracking Crumbling Curling	Cracking		



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Material Test Report

Local Geotechnics Pty Ltd
Canning Vale Laboratory
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Phone: (08) 9457 3517
Email: admin@localgeotechnics.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617E
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

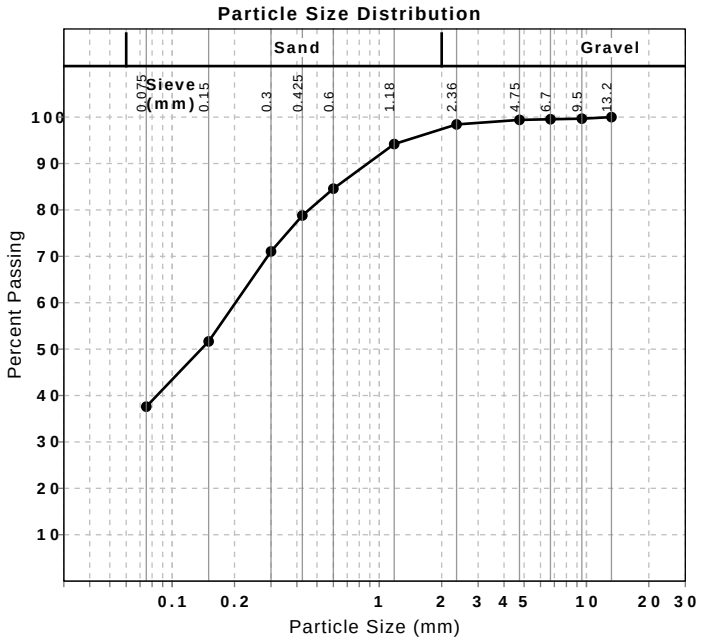
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP20, Depth: (0.7 - 1.2m)**
Material: Clayey sand

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
13.2 mm	**100**		
9.5 mm	**100**		
6.7 mm	**100**		
4.75 mm	**99**		
2.36 mm	**98**		
1.18 mm	**94**		
0.6 mm	**85**		
0.425 mm	**79**		
0.3 mm	**71**		
0.15 mm	**52**		
0.075 mm	**38**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	38		
Plastic Limit (%)	19		
Plasticity Index (%)	**19**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**9.5**		
Cracking Crumbling Curling	Cracking		



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Material Test Report

Local Geotechnics Pty Ltd
Canning Vale Laboratory
Unit 9/8 Production Road Canning Vale WA 6155
Phone: (08) 9457 3517
Email: admin@localgeotechnics.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617F
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

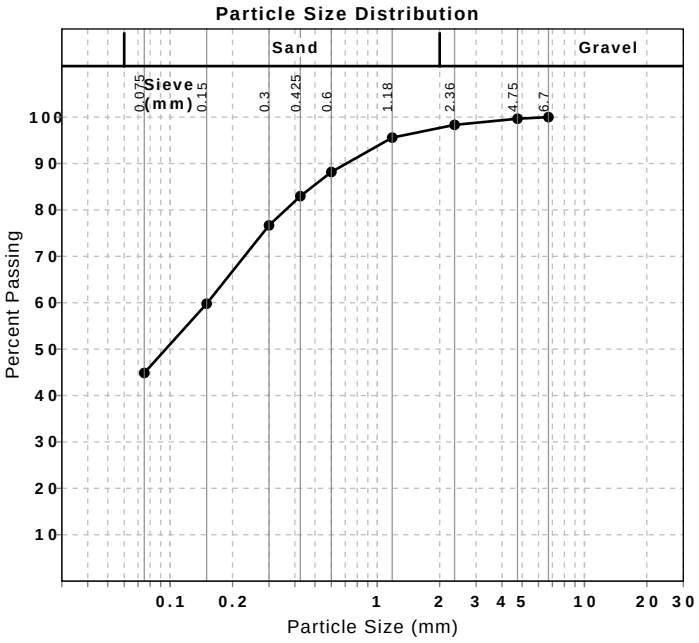
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP29, Depth: (0.0 - 0.3m)**
Material: Clayey sand

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
6.7 mm	**100**		
4.75 mm	**100**		
2.36 mm	**98**		
1.18 mm	**96**		
0.6 mm	**88**		
0.425 mm	**83**		
0.3 mm	**77**		
0.15 mm	**60**		
0.075 mm	**45**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	35		
Plastic Limit (%)	17		
Plasticity Index (%)	**18**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**8.5**		
Cracking Crumbling Curling	Cracking		



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Material Test Report

Local Geotechnics Pty Ltd
Canning Vale Laboratory
Unit 9/8 Production Road Canning Vale WA 6155
Phone: (08) 9457 3517
Email: admin@localgeotechnics.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617G
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

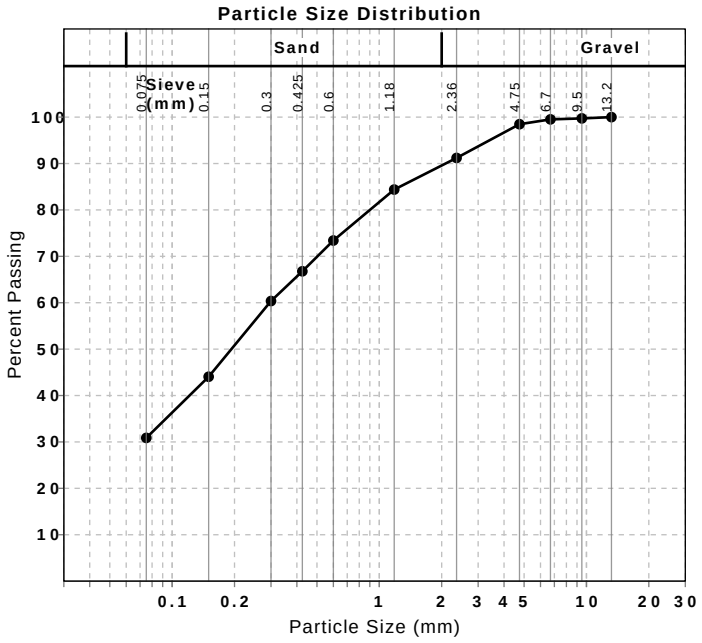
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP38, Depth: (1.2 - 1.5m)**
Material: Sandy clay

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
13.2 mm	**100**		
9.5 mm	**100**		
6.7 mm	**100**		
4.75 mm	**98**		
2.36 mm	**91**		
1.18 mm	**84**		
0.6 mm	**73**		
0.425 mm	**67**		
0.3 mm	**60**		
0.15 mm	**44**		
0.075 mm	**31**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	38		
Plastic Limit (%)	15		
Plasticity Index (%)	**23**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**7.5**		
Cracking Crumbling Curling	Cracking		



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[redacted]

Approved Signatory: [redacted]
Senior Lab Technician
Laboratory Accreditation Number: 20038

Report Number: **LG/795-1**
Issue Number: 1
Date Issued: 10/01/2025
Client: Local Geotechnics
U12/8 Production Road, Canning Vale WA 6155
Contact: [redacted]
Project Number: LG/795
Project Name: Department of Communities
Project Location: 17 Lots - Warmun Community, WA
Client Reference: LGK0632024SC
Work Request: 617
Sample Number: S25617H
Date Sampled: 08/01/2025
Dates Tested: 08/01/2025 - 09/01/2025
Sampling Method: Sampled by Client

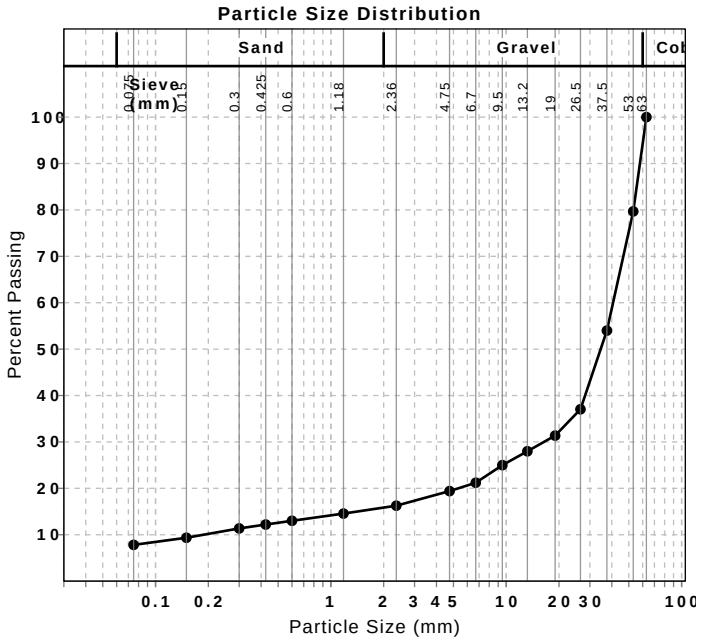
The results apply to the sample as received

Preparation Method: In accordance with the test method
Remarks: All Project and sampling details are provided by the Client. Local Geotechnics Laboratory is not responsible for the accuracy of these Details. Results apply to the sample as received.
Site Selection: Selected by Client
Sample Location: **TP41, Depth: (0.8 - 1.0m)**
Material: Rocks and sand

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
63 mm	**100**		
53 mm	**80**		
37.5 mm	**54**		
26.5 mm	**37**		
19 mm	**31**		
13.2 mm	**28**		
9.5 mm	**25**		
6.7 mm	**21**		
4.75 mm	**19**		
2.36 mm	**16**		
1.18 mm	**15**		
0.6 mm	**13**		
0.425 mm	**12**		
0.3 mm	**11**		
0.15 mm	**9**		
0.075 mm	**8**		
Insufficent sample supplied by client			

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	46		
Plastic Limit (%)	12		
Plasticity Index (%)	**34**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**12.5**		
Cracking Crumbling Curling	Crumbling & Curling		



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APPENDIX C
Drawings

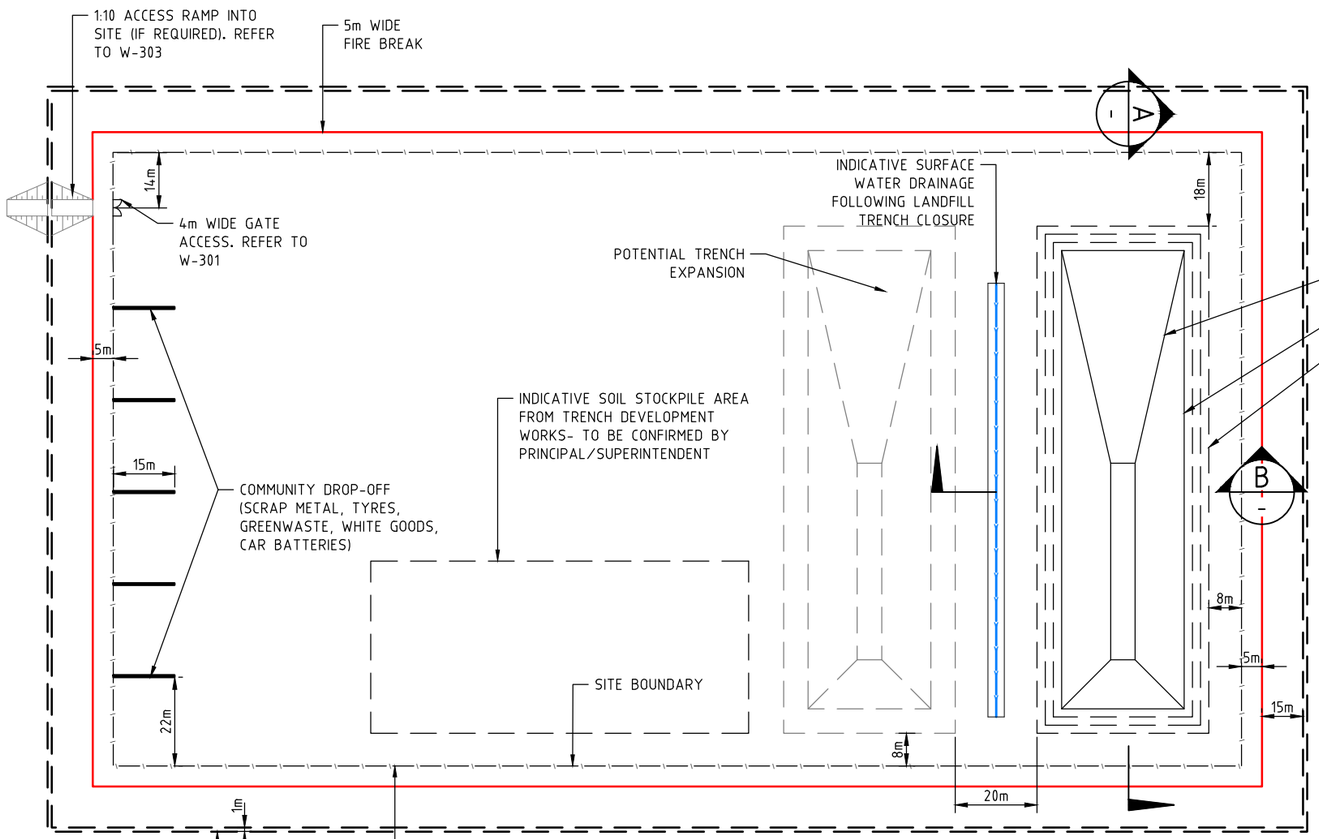
Drawing W-102: Trench Design C

Drawing W-301: Fencing Detail

Drawing W-302: Sign Detail

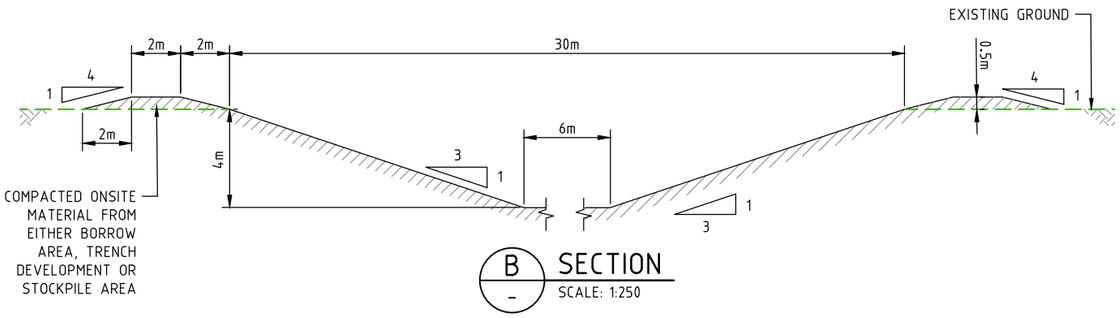
Drawing W-303: Bund Detail

Printed by Yulha Jeong on 02.07.2024 03:05 PM



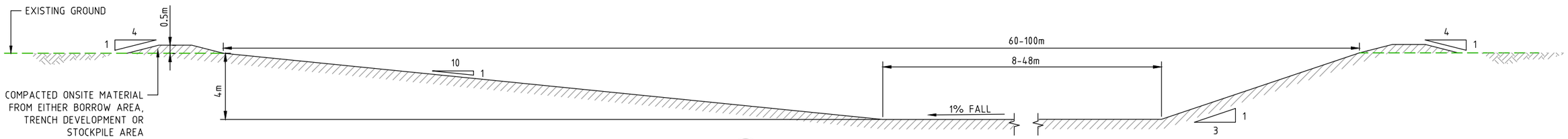
PLAN - TRENCH DESIGN C

SCALE: 1:1500



B SECTION

SCALE: 1:250



A SECTION

SCALE: 1:250

NOTES:

1. COMMUNITY DROP-OFF AREAS TO BE DELINEATED USING READILY AVAILABLE MATERIALS FOUND WITHIN THE COMMUNITY (E.G. USED TYRES, WITCHES HATS, TRAFFIC BOLLARDS ETC.)
2. TRENCH DIMENSIONS ARE TYPICAL. REFER TO TECHNICAL SPECIFICATION TO CONFIRM TRENCH DIMENSIONS.
3. FINISHED GROUND LEVELS SHOULD FALL AWAY FROM THE SITE'S LANDFILL TRENCH AREA AT A MINIMUM 1%
4. IT IS ASSUMED THAT THE LANDFILL TRENCH WILL BE CAPPED WITH AT LEAST 1M DEPTH OF SOILS TO MINIMISE LONG-TERM ENVIRONMENTAL RISK

1:1500 @ A3

1:500 @ A3

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B	01.07.2024	YJ	AB	TRENCH DESIGN UPDATED	
A	31.05.2024	YJ	AB	PRELIMINARY ISSUE	

Project: LANDFILL DESIGN TEMPLATE

Title: TRENCH DESIGN C

Scale: AS SHOWN @ A3 | Date: 31.05.2024
Drawn: YJ | Checked: AB | Approved:
Job No: TW24038 | Drg. No: W-102 | Rev: C
Filename: TW24038.DWG

FILENAME: \\SERVER\TALIS\SECTIONS\WASTE\PROJECTS\TW2024\TW24038 - DEPT OF COMMUNITIES LANDFILL DESIGN TEMPLATE\DRAWINGS\1_DRAWINGS\TW24038.DWG

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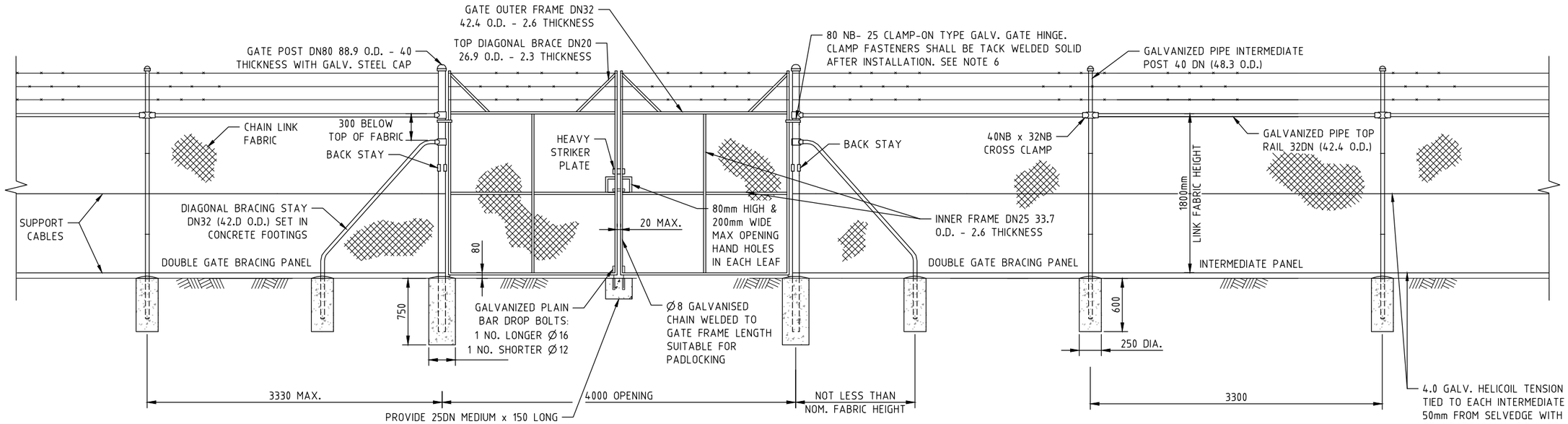
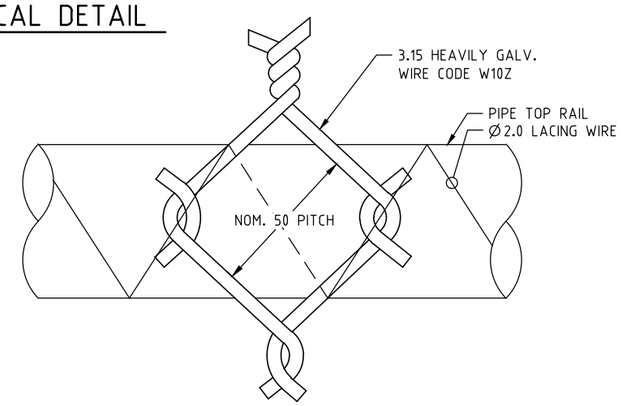


DOUBLE GATES TYPICAL DETAIL

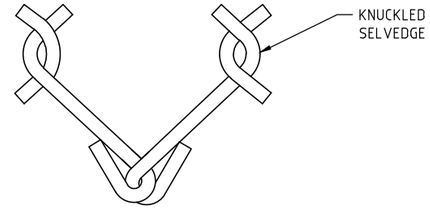
SCALE: 1:50

NOTES:

1. FENCE DETAILS NOT SHOWN SHALL BE IN ACCORDANCE WITH AS 1725.1
2. ALL CLAMPS, PIPE FITTINGS, HINGES, FASTENERS, CATCHES AND BASE PLATES SHALL BE MANUFACTURED FROM PLAIN CARBON STEEL, SUITABLE FOR HOT-DIP GALVANISING COMPLYING WITH AS 4680
3. ALL FASTENERS TO BE HOT DIP GALVANISED TO AS 1214
4. JOINTS TO BE FULL SEAL WELDS IN ACCORDANCE WITH AS 1554.1
5. CONCRETE FOOTING MIN. GRADE N20 CONCRETE. FOOTINGS MAY BE EITHER SQUARE OR CIRCULAR
6. DAMAGED COATING TO BE THOROUGHLY WIRE BRUSHED AND TREATED WITH TWO COATS OF DIMET SINC RICH PAINT No. 10 OR APPROVED EQUIVALENT, OVERLAPPING ORIGINAL COATING
7. REFER TO AS 2423 FOR INFORMATION REGARDING CORROSION OF GALVANISED COATINGS



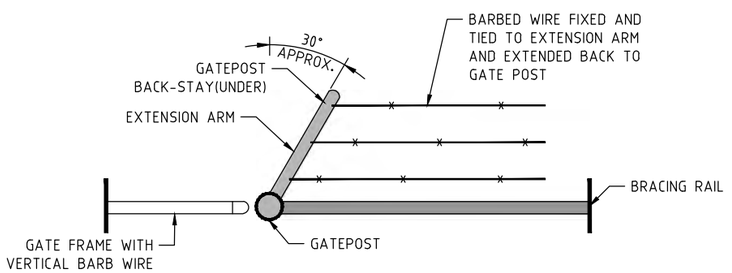
CHAIN LINK FABRIC BOTTOM

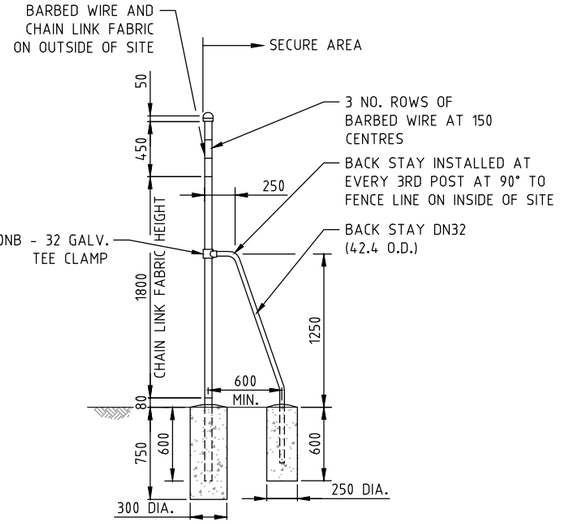


CHAIN LINK FABRIC BOTTOM

SELVEDGE EDGE TYPICAL DETAIL

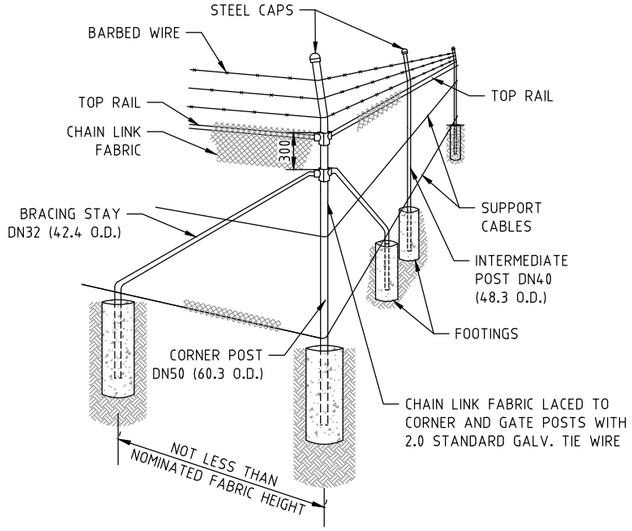
SCALE: N.T.S





INTERMEDIATE GATEPOST AND BACKSTAY DETAILS

SCALE: 1:50



CORNER POST TYPICAL DETAIL

SCALE: 1:50

PLAN AT GATEPOSTS

SCALE: N.T.S

1.0m 0m 1.0m 2.0m

1:50 @ A3

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B	01.07.2024	YJ	AB	TRENCH DESIGN UPDATED	
A	31.05.2024	YJ	AB	PRELIMINARY ISSUE	

Project: LANDFILL DESIGN TEMPLATE

Title: TYPICAL FENCING DETAILS

Scale: AS SHOWN @ A3 | Date: 31.05.2024
Drawn: YJ | Checked: AB | Approved:
Job No: TW24038 | Drg. No: W-301 | Rev: C
Filename: TW24038.DWG

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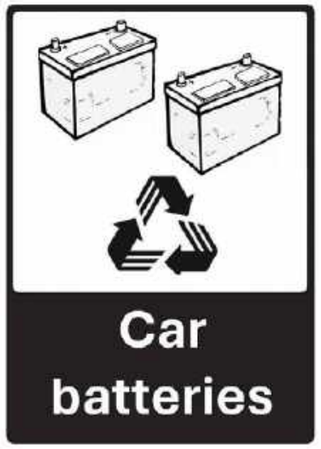
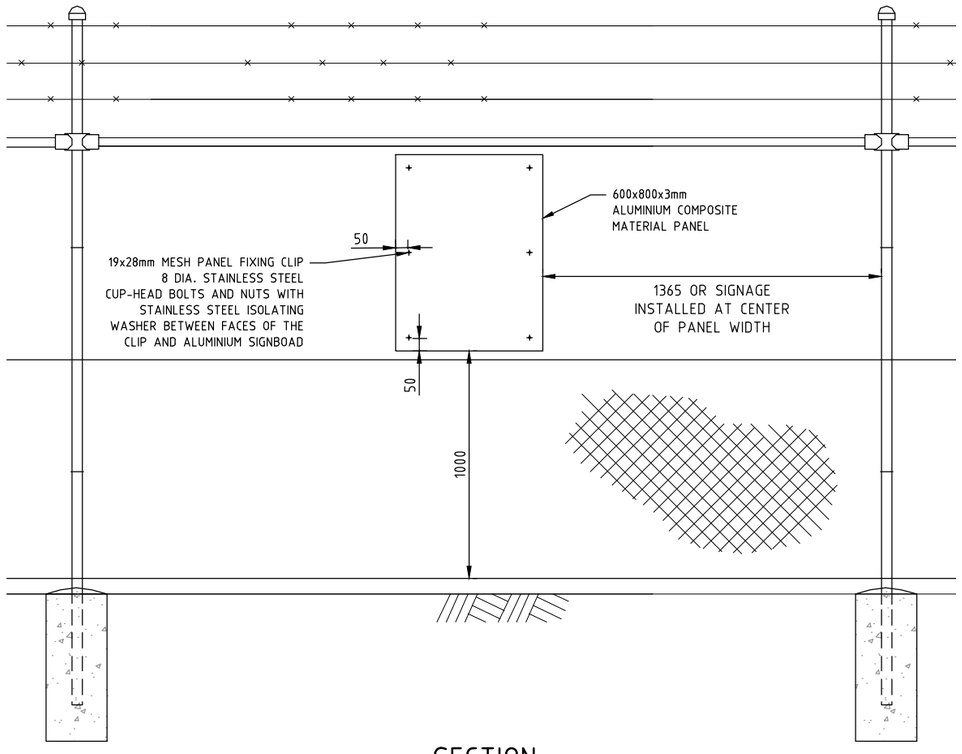


TYPICAL SIGNAGE

SCALE: N.T.S

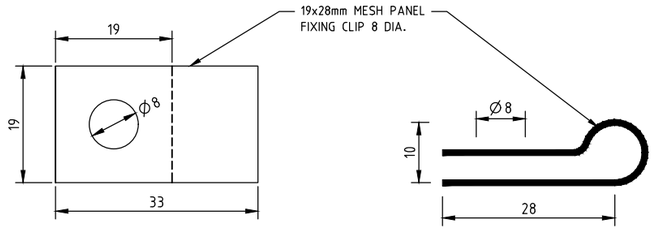


SECTION

SCALE: 1:25

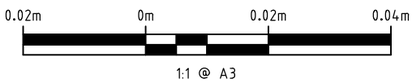
NOTES:

1. FACE OF SIGNBOARD SHALL BE TAPED PRIOR TO DRILLING OF FIXING HOLES
2. MESH PANEL FIXING CLIPS SHALL BE INSTALLED TO ALLOW FOR A MINIMUM OF 15mm HORIZONTAL AND VERTICAL THERMAL EXPANSION MOVEMENT OF SIGNBOARD
3. SOURCE FOR SIGNAGE DEVELOPMENT IS FROM THE NEW SOUTH WALES ENVIRONMENT PROTECTION AUTHORITY. WEB SITE IS AS FOLLOWS: https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs

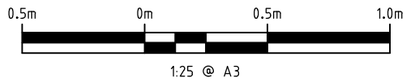


MESH PANEL FIXING CLIP TYPICAL DETAILS

SCALE: 1:1



1:1 @ A3



1:25 @ A3

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A	31.05.2024	YJ	AB	PRELIMINARY ISSUE	

Project: LANDFILL DESIGN TEMPLATE

Title: TYPICAL SIGN DETAILS

Scale: AS SHOWN @ A3	Date: 31.05.2024		
Drawn: YJ	Checked: AB	Approved:	
Job No: TW24038	Drg. No: W-302	Rev: C	
Filename: TW24038.DWG			

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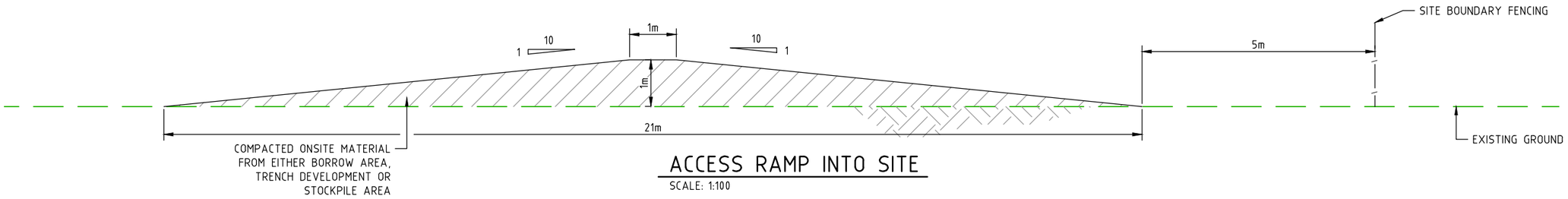
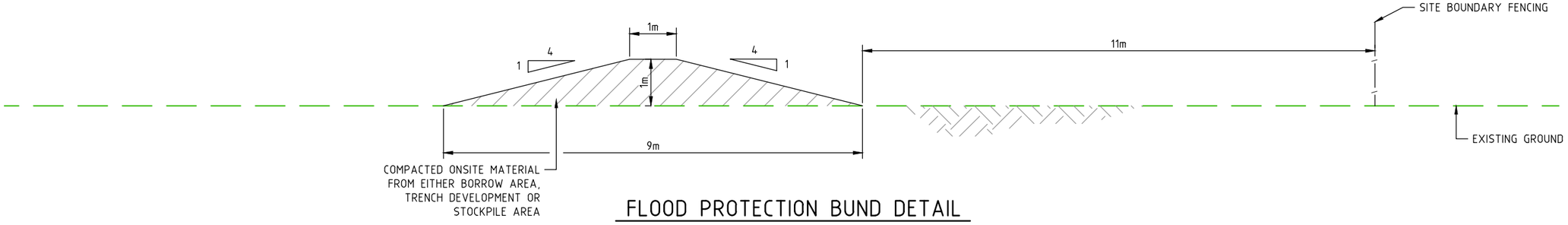


ACCESS RAMP INTO SITE

SCALE: 1:100



FLOOD PROTECTION BUND DETAIL

SCALE: 1:100

2.0m 0m 2.0m 4.0m

1:100 @ A3

FILENAME: \\SERVER\TALIS\SECTIONS\WASTE\PROJECTS\TW2024\TW24038 - DEPT OF COMMUNITIES LANDFILL DESIGN TEMPLATE\DRAWINGS\1_DRAWINGS\TW24038.DWG

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B	01.07.2024	YJ	AB	TRENCH DESIGN UPDATED	
A	31.05.2024	YJ	AB	PRELIMINARY ISSUE	

Project: LANDFILL DESIGN TEMPLATE

Title: TYPICAL FLOOD PROTECTION BUND DETAILS

Scale: AS SHOWN @ A3		Date: 31.05.2024	
Drawn: YJ	Checked: AB	Approved:	
Job No: TW24038	Drg. No: W-303	Rev: C	
Filename: TW24038.DWG			

APPENDIX D
Trench Sizing

Department of Communities

Table A: Determining Trench Capacity Requirements

Aspect	Key Inputs
Community Population (No.)	**228**
Consumption Rate per person (m^3)	**6**
Required Length of Operation (yrs.)	**4**
Required Trench Capacity (m^3)	**5,472**
Total Annual Consumption (m^3)	**1,368**

LEGEND

User Input
Locked. Do not overwrite

Table B: Determining Trench Design

Aspect	Trench A	Trench B	Trench C	Trench D	Other
Width (m)	18	24	**30**	10	27
Length (m)	100	100	**100**	100	100
Depth (m)	2	3	**4**	2	3.5
Side Slope (1:V)	3	3	**3**	1	3
Base Width (m)	6	6	**6**	6	6
Base Length (m) [ex. 1:10 access ramp]	74	61	**48**	80	54.5
Approximate Total Capacity (m^3)	2,140	3,798	**5,744**	1,453	4,740
Conditions for Use	- Shallow groundwater (5-7m below ground level), but can still be used if groundwater is >7m below ground level - Self-managed and small remote communities (max. 159 ppl) - Sand/Loam soils - Minimum length is 35m - Maximum length is 100m	- Shallow groundwater (6-7m below ground level), but can still be used if groundwater is >7m below ground level - Self-managed and small remote communities (max. 159 ppl) - Sand/Loam soils - Minimum length is **45m** - Maximum length is **100m**	**- Groundwater >7m below ground level** **- Small & large remote communities (max. 800 ppl)** **- Sand/Loam soils** **- Minimum length is 60m** **- Maximum length is 100m**	- Shallow groundwater (5-7m below ground level), but can still be used if groundwater is >7m below ground level - Self-managed and small remote communities (max. 159 ppl) - Clay/Loam soils - Minimum length is **30m** - Maximum length is **100m**	- For use if other designs are not appropriate for the Site - Trench depth should not exceed **4m**
North Buffer (m)	24	21	**18**	29	
South Buffer (m)	12	12	**12**	12	12
East buffer (m)	8	8	**8**	8	8
Fire break (m)	5	5	**5**	5	5
Flood Protection Bund (m)	15	15	**15**	15	15
Number Trenches	5	4	**4**		
Trench Buffer (m)	20	20	**20**	20	20
CRC Length (m)	15	15	**15**	15	15
Site Length (m)	213	199	**223**	23	23
Site Width (m)	136	133	**130**	141	112
Fire Break Length (m)	223	209	**233**	33	33
Fire Break Width (m)	146	143	**140**	151	122
SW Bund Length (m)	253	239	**263**	63	63
SW Bund Width (m)	176	173	**170**	181	152
Total Length of Operation	20	16	**16**	0	0

APPENDIX E
Technical Specification

Technical Specification

Rural Landfill Site Development

Government of **Western Australia**
Department of **Communities**

Prepared for Department of Communities

July 2024

Project Number: TW24038

DOCUMENT CONTROL

Version	Description	Date	Author	Reviewer	Approver
0.1	Internal Review	14/05/2024	[redacted]		
1.0	Draft Released to Client	13/06/2024			
2.0	Final Released to Client	1/07/2024			

Approval for Release

Name	Position	File Reference
[redacted]	Senior Waste Engineer	TW24038 - Communities Landfill Development Technical Specification_2.0
Signature	[redacted]	

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Table of Contents

Tables

Appendices

1 Introduction

The work under this Technical Specification consists of all stages of work associated with landfill site development (the Works) within the Warmun Landfill (the Site). The Department of Communities (Communities) is the Principal for the Works and will oversee the contract for the Works.

This document forms part of the Contract Documents with the full list described in Section 1.4.

1.1 Site Description & Location

The Site is located in the East Kimberley region of Western Australia, approximately 200 kilometres south-west of the town of Kununurra in the Shire of Halls Creek-East Kimberley Local Government area. The Site is located on Warmun Road, Warmun Community. The Site is planned on Lot 915 and encompasses approximately 5.8ha.

The Site is part of Crown Reserve 34593 Aboriginal Lands Trust. Lot 915 is located within Lot 500 which also covers parts of the Warmun townsite. Access to the Site is via the eastern end of Warmun Road and allows vehicles to enter and exit the Site from its western boundary.

The landfill operations at the new Site will be undertaken through the use of engineered trenches. The establishment of the Site as a whole, including the construction of its first landfill trench will be undertaken for the Works. The Site will be registered with the Department of Water and Environmental Regulation (DWER) to undertake waste disposal, up to 5,000 tonnes per annum.

1.2 Geology

According to National Map (https://nationalmap.gov.au/), the surface geology at the Site is Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; which may include minor alluvial or sand plain deposits, local calcrete and reworked laterite. Soils in the area are characterised by red sandy earth soils.

The Geotechnical Site Classification Report (Geotechnical Report) prepared by Local Geotechnics presents findings of site investigations conducted in December 2024. The Geotechnical Report classified the soil as follows:

• 0.0 – 1.0 m: Uncontrolled Fill, Sandy clay (CL) – low plasticity, dark grey, with fine to medium grained sand, sub-angular gravel up to 30 mm in size, grass, moist, firm to stiff;

• 1.0 – 1.7 m: Sandy Gravel (GW) – fine to medium grained, sub-angular gravel up to 60 mm in size at depths, grey, with fine to medium grained sand, moist, dense to very dense, extended up to maximum investigated depth (Local Geotechnics, 2025).

1.3 Scope of Works

The works to be carried out under this Specification include, but are not limited, to the following:

- Site clearance and surface rationalising;
- Bulk earthworks excavation to construct a new landfill trench;
- Surface water management system, as needed;
  - Surface water bunds; and
  - Surface water swales;
- Construction of perimeter fencing;
- Construction of a 5m wide firebreak;
- Construction of a 1m high flood protection bund, if required; and
- Installation of signage.

The landfill trench development is to have the following geometry as outlined in Table 1-1.

Table 1-1: Landfill Trench Development Summary

Parameter	Value	Unit
Length	100	m (inclusive of a 1:10 access ramp)
Width	30	m
Depth	4	m
Side slopes	1: 3	m : m (V:H)

1.4 Tender Documentation

The following reports and contracts form the Tender Documentation for the Works:

- Technical Specification;
- Schedule of Rates;
- Drawings (refer to Table 1-2);
- Request for Tender; and
- Conditions of Contract.

1.5 Drawings

The following Drawings form part of the Tender Documentation.

Table 1-2: List of Drawings

Drawing Number	Drawing Title
TW24038-W-102	Trench C Design
TW24038-W-301	Typical Fencing Details
TW24038-W-302	Typical Sign Details
TW24038-W-303	Typical Flood Protection Bund Details

1.6 Interpretation

Whether or not the words 'provide,' 'install' and/or 'supply' appear in the Tender Document, all equipment for the complete installation shall be provided and installed by the Contractor. Where equipment is to be provided and installed by others, it will be stated.

Terms in use within this Specification are clarified as follows:

- 'Approved', 'directed', 'required', 'rejected', and similar expressions, shall mean approved, directed, required, rejected, and the like, by the Superintendent;
- 'Provide' shall mean the supply and complete installation of the item in accordance with this Specification;
- 'Supply' shall mean supply and delivery without installation;
- 'Install' shall mean complete installation of the item to the satisfaction of this Specification excluding supply;
- Manufacturer's Specifications – applied as directed by the manufacturer by an experienced person with the nominated product;
- 'Give notice', 'submit', 'furnish', and similar expressions, shall mean given notice, submit, furnish, and the like, to the Superintendent;
- 'The Contractor' shall be as defined in the Conditions of Contract;
- 'The Principal' shall be as defined in the Conditions of Contract and for this Project will be the Western Australia Housing Authority, specifically the Department of Communities (Communities); and
- 'The Superintendent' or 'Superintendent' shall be as defined in the Conditions of Contract.

2 General

2.1 Hold Points

The critical hold points for completed works that require the Superintendent to check and sign off before the preceding works commence are listed in Table 2-1.

Table 2-1: Project Hold Points

Number	Item	Description
1	Approval of Site Clearance and Rationalisation	Section 4.2
2	Approval of Formation Surface / Earthworks	Section 4.4
3	Approval of the Fencing	Section 5
4	Approval of the Signage	Section 6

2.2 Drawings and Schedules

The Contractor shall be responsible for checking all Drawings prior to the commencement of the works. If the Contractor discovers any discrepancies between the various Contract Documents or if the Contractor considers that additional Drawings or information are required, then in either case the Contractor shall report such inconsistency to the Superintendent for instruction or apply in writing for such detail drawings or information at least 28 days before the work concerned is to be initiated. This four week time period shall allow the Superintendent to provide any additional information that may be required.

The Contractor shall not be entitled to claim for any additional cost during this four week period as a result of delays or other increased expenditure which it may incur by not advising the Superintendent in a timely fashion of any discrepancy or query in the information provided.

2.3 Surface Water and Groundwater Management

Where not included in the permanent works, the Contractor shall make allowances in his system of working and pricing for dewatering both surface and subsurface water if required and permitted.

The Contractor shall sequence the works to minimise the build-up of surface water within and outside the Site as a result of its actions and allow for all arrangements for evaporation on-site. Where it is necessary and permitted to discharge water or groundwater, the Contractor shall not cause overtopping and erosion of any part of the downstream surface water network. In any case, measures shall be implemented to prevent silt entering the offsite surface water network.

Where the sequence or method of work is such that there is a build-up of water within or outside the Site Boundary, the Contractor shall be liable for the expense of dewatering, control and, if necessary, remediation to the infrastructure.

Unless permitted, the build-up of any surface water may not be discharged to the groundwater regime.

2.4 Variations of Work

Where extra works are ordered, they shall be valued in accordance with the Rates in the Schedule of Rates (Appendix B), where they exist or otherwise in accordance with the Conditions of Contract. Where any additional works are not fully covered by the rates in the Schedule of Rates, the Superintendent will request a separate quotation for the work. Where approved, the Superintendent may commission these works using the Day Rates.

Such works shall not be carried out until a written order has been issued by the Superintendent, and if it is authorised to be carried out on a Time and Materials basis, the Contractor shall submit to the Superintendent weekly time and material sheets for checking and approval. Payment will not be made for work carried out in this manner unless previously authorised by the Superintendent.

The Superintendent reserves the right on the Principal's behalf to omit any part or parts of the Contract and claims for any loss of profit due to any omissions will not be entertained by the Superintendent unless further specified in the Conditions Contract.

2.5 Containment of Leachate and/or Surface Water Run-Off

Should the Contractor in the course of the works cause a leachate or surface water break out, the Contractor shall immediately inform the Superintendent.

Should the Contractor notice a leachate or surface water breakout, the Contractor shall immediately inform the Superintendent and await instruction as to what course of action is required.

2.6 Stability of Ground Conditions

The Contractor is to make all personnel aware (particularly those operating heavy plant and those placing earth) of the hazards associated with working on a landfill site. The Contractor is to demonstrate to the Superintendent that work practices and sequencing of earth movement shall not increase the risks associated with ground subsidence and slope failure.

The Contractor is to immediately inform the Superintendent should the Contractor become aware of signals indicating subsidence and/or slippage.

3 Site Works

3.1 Interference with Land Interests

The Contractor shall confine its constructional operations within the Site boundary, or such other area of land as may be negotiated and shall instruct its employees not to trespass.

Subject to any unavoidable disturbance which may be necessitated by the execution of the Contract, the Contractor shall not interfere with any sporting, fishing or other rights which may be enjoyed on or near the Facility.

3.2 Location of Existing Services

The Contractor shall be responsible for the maintenance and protection of existing services which may be affected by the contract works. It is not warranted that the services shown on the Drawings are in the exact position or are to the full extent shown. Prior to commencing any works, the Contractor should make such investigations with all service authorities and Dial Before You Dig (http://www.1100.com.au/)) that are necessary to locate all services on-site or within the work areas adjacent to the Site.

If services are located which are not shown on the Drawings, the Contractor shall give at least three (3) working days' notice to the Superintendent prior to commencement of any construction activity that may affect the service.

The Contractor shall make good any damage resulting from its operations and shall indemnify the Principal against any claim for damage to drains, sewers, mains, cables, water pipes, fittings, boxes or other property, caused by its operations. The tendered rates are to include for all identification, protection, repair and/or other necessary work to the presence of the services.

Existing private and public statutory services such as water mains, gas mains, cables, house drains, culverts, etc., shall be located insofar as possible before commencement of the works. The Contractor shall proceed with the works in such a manner that the works shall be constructed without interference.

The Contractor shall make its own arrangements for any diversion or removal of services which it may require for its own convenience or because of its proposed method of work and shall, in all cases, inform the Superintendent in advance of its proposals.

Should any service be found to exist which are not indicated, or not as indicated in the Contract, the Contractor shall, at once, give written notice to the Superintendent.

All located services shall be surveyed for size, position and level, by the Contractor and a record of these services given to the Superintendent.

3.3 Fencing, Watching and Lighting

In the case of all excavations to which the public may have access, the Contractor shall include for the temporary fencing off of such excavations and for temporary watching and lighting of the excavations during the hours of darkness. If spoil heaps obtrude on public areas or Contractor's plant is parked on public areas during the hours of darkness, the Contractor shall define the boundary of its operations as part of an approved Traffic Management Plan.

3.4 Tidiness of Site

The Contractor shall be responsible for the proper upkeep and maintenance of the Site and the works and shall remove, from the Facility, rubbish and other waste as it accumulates. Materials and equipment shall be positioned, stored and stacked in an orderly manner.

4 Earthworks

All works carried out under this section of the Specification shall comply with the following standards, and those specified therein, which shall be held to be incorporated in the Specification:

- AS 3798: Guidelines on earthworks for commercial and residential developments; and
- AS 1289: Methods for testing of soils.

4.1 Definitions

The following definitions of earthworks material shall apply to this and other clauses of the Specification in which reference is made to the defined materials.

“Top Soil” shall mean the top layer of soil that can support vegetation.

“Suitable materials” imported or on Site won material complying with the requirements for use in the permanent works.

“Un-suitable material” shall mean material other than suitable material and shall include:

- Peat materials from swamps, marshes or bogs;
- Logs, stumps and perishable material;
- Material susceptible to spontaneous combustion;
- Material in a frozen condition;
- Clay of liquid limit exceeding 80% and/or plasticity index <10% or exceeding 55%;
- Material having a moisture content greater than the maximum permitted for such materials in the Contract, unless otherwise permitted by the Superintendent; and/or
- Non-hazardous material other than those permitted in the Contract.

“Unacceptable Hazardous Material” shall be material having hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal.

“Rock” shall mean hard rock in mass formation which can only be removed by the use of a rock breaker or explosives. Boulders in excess of 0.25 m3 volume in pipe trenches or in excess of 1.0 m3 in mass excavation shall be deemed to be rock excavation.

“Cohesive Soil” shall include clays and marls with up to 20% of gravel or rock and have a moisture content not less than the value of the plastic limit minus 4.

“Well-graded granular and dry cohesive soils” shall include clays and marls containing more than 20% of gravel or rock and/or having a moisture content less than the value of the plastic limit minus 4 and well-graded sands and gravels with the uniformity coefficient exceeding 10.

“Uniformly-graded material” shall include sands and gravels with uniformity coefficient of 10 or less, and all silts. Any soil containing 80% or more of material in the practical size range 0.06-0.002 m will be regarded as silt for this purpose.

4.2 Site Clearance

The limits of clearing, topsoil/growth medium strip, shall be marked on Site for the Superintendent's inspection prior to the commencement of works.

Clearing operations shall be undertaken to meet the requirements for erosion and sedimentation control as specified in this Specification.

Clearing shall include, but not be limited to;

- The felling, cutting and removal of all trees standing or fallen;
- The removal of all brush, shrubs, grasses and other vegetation;
- The removal of rubbish and debris;
- The removal of surface boulders and boulders dislodged during vegetation removal; and
- The grubbing out of all stumps and roots larger than 80mm diameter or with any dimension greater than 300mm to a depth of 300mm below either the existing surface or the finished subgrade surface, whichever is the lower.

Depressions caused by grubbing out tree roots and stumps, in cleared areas with no topsoil removal, shall be promptly backfilled with clean fill and compacted to the density and surface levels of the surrounding undisturbed ground.

Cleared vegetation shall be temporarily stockpiled onsite at a location to be agreed with the Superintendent. Following the completion of the clearing works or when directed by the Superintendent, the Contractor shall be required to transport the vegetation and growth medium material to the approved stockpile locations, which shall be in close proximity to the Site.

The stockpiled material shall have a maximum height of 2.0m and covered with the mulched vegetation material.

Burning of cleared vegetative materials shall not be permitted under any circumstances.

4.3 Products and Materials

4.3.1 Use of Materials

The Contractor shall be responsible for any assumptions made by the Contractor in relation to the nature and types of materials encountered in excavations and the bulking and compaction characteristics of materials incorporated in any earthworks. The summary of the estimated quantity for general earthworks provided includes all types of materials that may be encountered in the cuttings.

Where material from excavations is suitable for use in the earthworks, but the Contractor elects to:

- Spoil it; or
- Use it for the Contractor's own purposes; or
- Use it as a source of pavement materials; or
- Construct embankments with dimensions other than those shown on the Drawings, or to dimensions as otherwise authorised by the Superintendent,

and a deficiency of material for earthwork construction is thereby created, the Contractor shall make good that deficiency from sources of suitable material. The making good of such deficiency of material shall be affected at no cost to the Principal.

4.3.2 Unsuitable Material

Some materials are unsuitable for forming structural fill and should be either removed to spoil or used in non-critical areas. In addition to the definition in Section 4.1, unsuitable materials, as detailed in AS 3798 may include:

- Organic soils, such as many topsoils, severely root-affected subsoils and peat;
- Materials contaminated through past Site usage which may contain toxic substances or soluble compounds harmful to water supply or agriculture;
- Materials containing substances that can be dissolved or leached out in the presence of moisture (e.g. gypsum), or which undergo volume change or loss of strength when disturbed and exposed to moisture (e.g. some shales and sandstones), unless these matters are specifically addressed in the design;
- Silts, or materials that have the deleterious engineering properties of silt;
- Other materials with properties that are unsuitable for the forming of structural fill; and
- Fill that contains wood, metal, plastic, boulders or other deleterious material, in sufficient proportions to affect the required performance of the fill.

In some circumstances a design may allow for the use of some of these materials in structural fill. Before allowing for such use, the Contractor must supply specialised advice from a geotechnical professional. The use of any material in structural fill not specified in the Drawings or otherwise must be approved by the Superintendent before using such materials.

4.3.3 Sub-base

The sub-base shall be well consolidated, with minimal settlement as to supply a firm platform for any following layers.

4.4 Trench Excavation

4.4.1 Protection of Excavations

The Contractor shall provide all the necessary supports to secure the sides of any excavations whether mass excavation or trench excavation. Except where required by or permitted under the Contract, sides of the excavations shall not be battered. The Contractor shall be responsible for all trench boxes, planking and strutting necessary to ensure the stability of the side slopes of excavation. The Contractor will be responsible for the costs associated with such temporary works. Any battering or collapsed excavations shall be backfilled with material approved by the Superintendent.

All excavations shall have adequate warning lights, handrail and guarding to allow safe work within and on top of the excavations.

4.4.2 Excavated Materials

Excavated material shall be disposed of in accordance with the Contract. No excavated materials, suitable for use in the works shall be removed from the Site except on the direction, or with the permission, of the Superintendent.

Any material resulting from earthwork operations which is deemed unsuitable for use (such as rocky material), shall be removed from the site and disposed of by hauling to and spreading in spoil areas as directed by the Superintendent. Waste material deposited in spoil areas shall be graded to a uniform surface to drain.

4.4.3 Water in Excavations

The Contractor shall not allow water to lie in any part of the works unless required to do so under the Contract. Water arising from or draining into the works shall be drained or pumped to an approved disposal point. Any drainage sumps required shall, where practicable, be sited outside the area excavated for the Permanent Works and shall be refilled with suitable approved fill material to the level of the underside of the adjacent Permanent Works.

The Contractor shall take all the necessary precautions to prevent any adjacent ground from being adversely affected by loss of fines through any dewatering process. The Contractor shall likewise take all necessary precautions to prevent any ground water from entering mains to be used for the conveyance of potable water. The Contractor shall install efficient settling basins or grit traps through which such water will pass before discharge, to the approval of the Superintendent.

Leachate encountered in excavations shall not be pumped to any watercourse and the location and method of removal shall be agreed with the Superintendent.

4.4.4 Excavation below Formation Level

If the Contractor encounters ground below formation level which is considered unsuitable, or if the formation level is damaged and allowed to deteriorate, the Superintendent shall be promptly informed. Any unauthorised excavation to a depth greater than is necessary for the proper execution of the works shall be filled with suitably approved fill material to bring it to the correct formation level.

4.4.5 Hand Excavation

Hand excavation shall be used in confined spaces where the use of excavating machinery is unsuitable and for other operations such as trimming the formation to final level whether in open cut or in trench. Hand excavation shall be used around and adjacent to existing services to expose and locate them.

4.4.6 Rock Excavation

The Contractor shall nominate in the Schedule of Rates (Appendix B) a specific provisional rate per cubic metre for rock excavation operations, should rock be encountered. Material removed from excavations shall be classified either as ‘Common Excavation’ or ‘Rock Excavation’.

‘Common Excavation’ shall mean all materials in excavation that is not defined as rock. All excavation shall be classified as ‘Common Excavation’ unless the Contractor indicates to the Superintendent, in each case, that part or all the material the Contractor claims should be classified as ‘Rock Excavation’. The Superintendent will not classify any material as ‘Rock Excavation’ unless he has examined it before excavation.

'Rock Excavation' shall mean all material defined as sound solid rock, boulders, and any cemented material which:

- In bulk excavation, cannot be broken or ripped by a bulldozer of at least 325kW engine power (435hp engine power) with matching single tyne hydraulic ripper in good condition when operated by a qualified, experienced operator in accordance with the manufacturer's instructions, at a production rate of 150 bulk cubic metres per hour or more or which cannot be removed until loosened by blasting or by pneumatic tools.
- In limited trench excavation, cannot be broken or excavated by a hydraulically operated track mounted excavator of at least 125kW fly wheel power (Cat 325B or equivalent) fitted with a 600mm wide rock bucket, when operated by a qualified, experienced operator in accordance with the manufacturers' instructions, at a production rate of 20 bulk cubic metres per hour and which requires drilling and blasting or power operated hand tools for removal.

The condition of the equipment to be used for testing the material classification and the operator shall be approved by the Superintendent prior to works being undertaken.

4.4.6.1 *Measurement of Rock*

If the material that must be removed has been classified as 'Rock Excavation', then it shall be uncovered and exposed for inspection by the Superintendent before the Contractor can proceed further. If required by the Superintendent, the Contractor shall demonstrate, in the presence of the Superintendent or provide photographic record/evidence with coordinates that the material is rock as defined in Section 4.4.6.

The Superintendent shall then delineate the extent over which the extra payment will be made at the scheduled rate for 'Rock Excavation'. The Contractor shall then take such measurements as are necessary to calculate the volume of rock to be excavated and shall offer the Superintendent the opportunity of checking such measurements before commencing with the rock excavation. Failure of the Contractor to notify the Superintendent when rock is encountered or to allow sufficient time for surveying the undisturbed surface of such material may forfeit the Contractors right to claim excavation as rock. Measurement shall be to neat lines and levels as determined by the Drawings and no consideration will be given to over-break (i.e. when the rock is excavated beyond the planned extent).

The Superintendent in their absolute discretion may elect to alter the length, depth, and width of excavations for the trenches in order to achieve satisfactory volumetric measurements at shallower depths. In this instance, and at no additional cost to the Principal, the Contractor shall excavate to achieve similar volumetric measurements to the design excavation albeit to different dimensions as directed on site by the Superintendent.

4.4.7 Finishing of Batters and Ground Surfaces

Except during the construction of benched or stepped batters, batter slopes shall be smoothly shaped to a uniform plane from top to bottom as shown on the Drawings.

The top and toe of all batters shall be rounded, where practical, to match the shape of the surrounding topography as shown in the Drawings.

The surface of all batters and other areas nominated for revegetation and landscaping works shall be excavated and filled, shaped and/or graded as necessary to achieve the finished soil levels, prior to any surface preparation and soil improvements.

The toe of mounds shall be graded evenly to meet adjoining surface levels. The ground surface shall be shaped and/or graded evenly to avoid abrupt changes in levels abutting structures and paved surfaces.

4.5 Filling

4.5.1 General Filling

This Specification defines general fill as material to be used in fill locations upon which embankments and other areas of structural fill are not required. All general fill shall still meet the requirements for suitable materials as per AS 3798 and be deemed acceptable by the Superintendent.

Filling shall, wherever practicable, be undertaken immediately after the specified operations preceding it have been completed. Filling shall not, however, be commenced until the works to be covered have achieved a strength sufficient to withstand all loading imposed thereon.

Filling around tanks and other structures shall be undertaken in such a manner as to avoid uneven loading.

No filling shall take place in water. All filling with on-site won and imported fill material shall be compacted in accordance with AS 3798. Unless specified elsewhere, general fill shall be compacted to 98% of its standard maximum dry density in layers not exceeding 300mm, unconsolidated thickness and compacted to form stable backfill.

4.5.2 Formation Preparation

Subgrade preparation shall be completed in all areas where a structural fill is to be placed.

The subgrade surface shall be constructed to the shape and levels as shown in the Drawings and to the specified requirements and tolerances of this Clause.

Following excavation to form the trench, the subgrade surface (prior to placement of clay liner) shall be proof rolled by at least 8 passes of a minimum 10 tonnes sheepfoot or padfoot roller. Proof roll testing shall be undertaken in the presence of the Superintendent/CQA Consultant.

Should the subgrade surface be deemed adequate, the surface will be ripped to approximately 250mm depth, moisture conditioned and compacted to form a firm unyielding surface upon which to install the compacted clay liner.

If unsuitable material is encountered, all unsuitable material including loose sand and soft soils and any other unforeseen foreign matter shall be removed from formation level to the satisfaction of the Superintendent. Removal of this material shall be performed under the supervision of the Superintendent to verify the unsuitable material and to ensure that the formation level is not damaged or over excavated. Unsuitable material shall be disposed to a nominated area on site if approved by the Superintendent.

Where soft spots are encountered, the Contractor shall excavate these areas out to a depth such that the soft region is removed. The excavated area shall be replaced with approved fill to reach the formation levels and compacted, and proof rolled to the satisfaction of the Superintendent.

In areas where the subgrade surface has been reworked or repaired, at the direction of the Superintendent, the compacted subgrade layer may be tested for field density to achieve a minimum dry density ratio of 95% standard compaction.

The formation surface/ subgrade shall be approved by the Superintendent prior to the subsequent placement of the compacted clay liner.

4.5.3 Filling against Structures

Filling shall not be placed against structures until the structure has been inspected and approved for filling. Fill materials shall be placed in horizontal uniform layers not exceeding 150mm thickness and shall be compacted to a minimum dry density ratio of 98% when tested in accordance with AS1289 E2.1 or E3.3. Backfilling over and around structures shall avoid unbalanced loading or create movement.

The Contractor shall be responsible for any damage to existing structures as a result of filling and compacting operations.

4.5.4 Finishing of Batters and Ground Surfaces

Except during the construction of benched or stepped batters, batter slopes shall be smoothly shaped to a uniform plane from top to bottom as shown on the Drawings.

The top and toe of all batters shall be rounded, where practical, to match the shape of the surrounding topography as shown in the Drawings.

The surface of all batters and other areas nominated for revegetation and landscaping works shall be excavated and filled, shaped and/or graded as necessary to achieve the finished soil levels and contours nominated in the Drawings, prior to any surface preparation and soil improvements.

The toe of mounds shall be graded evenly to meet adjoining surface levels. The ground surface shall be shaped and/or graded evenly to avoid abrupt changes in levels abutting structures and paved surfaces.

4.6 Site Drainage

4.6.1 Flood Protection Bund

If deemed required by the Principal, a flood protection bund shall be installed at the extent shown on the Drawings to protect the Site from external floodwaters. A ramp over the flood protection bund shall be 1:10 in order to provide access into the Site. The continuous bund shall be neatly formed from suitable excavated material and shall be compacted to 95% of its standard maximum dry density in layers not exceeding 300mm, unconsolidated thickness and compacted to form stable formation.

4.6.2 Trench Surface Water Bund

A 0.5m high safety protection and surface water bund shall be installed along the entire perimeter of the landfill trench as shown in the Drawings to prevent surface water run-off ingress into the trench.

4.6.3 Additional Infrastructure

If deemed required by the Principal, the Superintendent may direct the Contractor to install additional site drainage infrastructure. Any diversion swale drains shall be constructed as required to manage surface water run-off away from the fenced compound. Completed drains are to be finally trimmed, graded, well compacted, and cleared of all debris in a manner that will result in effective drainage. Any additional surface water bunds shall be neatly formed from suitable fill materials and well compacted in layers to 95% maximum dry density.

5 Fencing

The work under this Section consists of all operations involved in the supply and installation of fencing and gates including concrete footings, and fence materials. Locations and types of fencings are shown on the Drawings.

5.1 Products and Materials

5.1.1 Concrete Footings

Concrete used in the construction of footings and any other concrete elements of fencing shall be in accordance with this Specification. Concrete shall be Class N20 unless otherwise specified in the Drawings.

Where concrete is mixed on Site:

- Cement shall be fresh and in sealed bags;
- Contractor to provide slump testing records and provide certified aggregate and cement for the mix;
- Aggregate shall be well graded, clean, sharp and free from clay and organic impurities.
- Water shall be clean and of potable standard;
- Sand shall be of uniform grading and free from all deleterious substances, roots, clay, or any organic matter;
- Admixtures shall comply with AS 1478;
- Concrete shall be mixed in an approved mechanical batch mixer. All concrete works shall comply with the following Standards listed in Section 3.7.1.1.

Reinforcing steel used in the construction of reinforced concrete footings, columns, coping and any other reinforced concrete elements of fencing shall be in accordance with AS/NZS 4671.

5.1.2 Steelwork

All steelwork used in the construction of steel sheet fencing including panels, posts, tracks and connection fittings shall be in accordance with the manufacturer's published specifications. Sheets shall have uniform colour, shape and size, free from defects.

5.2 Construction

All fencing materials shall be stored in a manner that will not damage the material. Any damaged materials shall not be incorporated into the Works and be replaced as directed by the Superintendent at no cost to the Principal.

The fence alignment shall be set out in accordance with the Drawings. The provision of any additional markers and sight pegs shall be the responsibility of the Contractor. Survey marks shall not be removed or disturbed. Disturbed survey marks shall be re-established at no cost to the Principal.

Existing fence shall not be cut without first being tied back to a strainer post. Footing, post and strainer holes shall be backfilled using suitable fill material to ground level.

5.2.1 Chain Link Mesh Fencing

1800mm high galvanised chain link fencing shall be installed in accordance with the Drawings and the manufacturer's published specifications.

5.2.2 Gates

All new gates, or gates to be relocated from existing fences, shall be installed at locations in accordance with the Drawings. The Contractor shall supply all hinges, bolts and the like as required in accordance with the Drawings or the manufacturer's published specifications. Gates shall be consistent with the existing fences on either side of the gate unless otherwise directed by the Superintendent. Strainers, posts, columns or piers used to support gates shall be positioned in the ground so that gate panels are able to swing freely in both directions and when brought into line, do not overlap nor have a gap wider than 50mm unless otherwise specified in the Drawings or manufacturer’s published specifications.

6 Signage

The work under this Section consists of all operations involved in the supply and installation of signage.

6.1 Products and Materials

The Contractor shall be responsible for the supply and installation of the following signage:

- 1 x “Car Batteries”
- 1 x “Garden Waste”
- 1 x “Steel”
- 1 x “Tyres”
- 1 x “White Goods”

Artwork for the signs can be found in the Drawings.

6.2 Construction

Signage shall be affixed to chainmesh fencing at the locations agreed to on site by the Superintendent and as shown in the Drawings.

APPENDIX A
Drawings

APPENDIX B
Schedule of Rates

Assets | Engineering | Environment | Noise | Spatial | Waste

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