RTI 24-25-25
The following has been released in relation to a request for information relating to the proposed Rosny Park AFL High Performance Centre.

Document 1

AFL High Performance Centre
Rosny, Tasmania

Aboriginal Heritage Assessment Report
Final Draft Version 1

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CLIENT: State Growth

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CULTURAL
HERITAGE
MANAGEMENT
AUSTRALIA

Report Version Control

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Draft Report V1	Out of scope (CHMA for Internal Review)	20.3.2024
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Executive Summary

Project Details

The Department of State Growth (State Growth) is undertaking the planning for the development and delivery of the new AFL High Performance Centre in Tasmania. The proposed location for the Centre is on the former Rosny Public Golf Course and Charles Hand Park sites (behind Rosny College) and encompasses an area of approximately 26ha (see Figures 1-3). The golf course is modified Parklands with established fairway trees. On the Charles Hands Park side, again it is modified parkland lands and grass turf.

The scope of works involves the High-Performance Centre being built below Rosny Hill Road and an MCG sized oval. A second slightly smaller oval is to be constructed at Charles Hand Park with a small field servicing building and carparks. The existing Kangaroo Bay Oval will not be impacted, but it is proposed that the existing Rosny Skatepark may be removed. The Kangaroo Bay Rivulet would also not be impacted by the project, but is likely to present the opportunity for heritage values interpretation as highlighted by Clarence City Council's draft City Heart Plan. Figure 4 shows a preliminary concept plan for the Rosny AFL High Performance Centre.

CHMA Pty Ltd and Out of scope (AHO) have been engaged by State Growth to undertake an Aboriginal heritage assessment for the proposed Rosny AFL High Performance Centre development (the study area), in order to identify any potential Aboriginal heritage constraints. This report presents the findings of the assessment.

Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the assessment process, a search was undertaken of the Aboriginal Heritage Register (AHR) to determine whether any registered Aboriginal heritage sites are located within or in the general vicinity of the study area.
The search shows that there are a total of 29 registered Aboriginal sites that are

s42

[redacted]

Summary Survey Results

s42

s42 [redacted]

[redacted]

[redacted]

[redacted]

The field survey was able to confirm that there are no stone resources within the study area that would be suitable for stone artefact manufacturing. The field survey also confirmed that there are no rock outcrops present in the study area that would be in any way suited for human habitation. It is therefore possible to rule out the presence of Aboriginal rock shelter sites as well as rock art sites being present.

s42 [redacted]

The detailed survey results and discussions are presented in section 7 of this report.

s42

s42

[redacted]

s42

Management Recommendations
Heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Background research into the extant archaeological and ethno-historic record for the study area and the surrounding region (see sections 3 and 4 of the report).
- The results of the investigation as documented in section 7 this report.
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (The Act); as summarised in section 10.
- Consultation with [redacted] (Aboriginal Heritage Officer), and Aboriginal community consultation, as detailed in section 9 and Appendix 4.

The recommendations are aimed at minimising the impact of the proposed AFL high Performance Centre on Aboriginal heritage resources. [redacted]

[redacted]

[redacted]

As specified in section 10.1 of this report, all Aboriginal relics are protected under the *Aboriginal Heritage Act 1975* (The Act). It is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister. s42 [redacted]

Recommendation 2 (Program of Sub-surface Investigations)

s42 [redacted]

Recommendation 3 (Unanticipated Discovery Plan)

If, during the course of these future works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 3). A copy of the Unanticipated Discovery Plan should be kept on-site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the Aboriginal Heritage Act 1975 (the Act).

Recommendation 4 (Provision of Reports)

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.

s42

[redacted]

1.0 Project Outline

1.1 Project Details

The Department of State Growth (State Growth) is undertaking the planning for the development and delivery of the new AFL High Performance Centre in Tasmania. The proposed location for the Centre is on the former Rosny Public Golf Course and Charles Hand Park sites (behind Rosny College) and encompasses an area of approximately 26ha (see Figures 1-3). The golf course is modified Parklands with established fairway trees. On the Charles Hands Park side, again it is modified parkland lands and grass turf.

The scope of works involves the High-Performance Centre being built below Rosny Hill Road and an MCG sized oval. A second slightly smaller oval is to be constructed at Charles Hand Park with a small field servicing building and carparks. The existing Kangaroo Bay Oval will not be impacted, but it is proposed that the existing Rosny Skatepark may be removed. The Kangaroo Bay Rivulet would also not be impacted by the project, but is likely to present the opportunity for heritage values interpretation as highlighted by Clarence City Council's draft City Heart Plan. Figure 4 shows a preliminary concept plan for the Rosny AFL High Performance Centre.

CHMA Pty Ltd and [redacted] (AHO) have been engaged by State Growth to undertake an Aboriginal heritage assessment for the proposed Rosny AFL High Performance Centre development (the study area), in order to identify any potential Aboriginal heritage constraints. This report presents the findings of the assessment.

1.2 Aims of the Investigation

The principal aims of the current Aboriginal Heritage assessment are as follows.

- To undertake an Aboriginal cultural heritage assessment for the footprint of the proposed Rosny AFL High Performance Centre development (the study area as shown in Figures 1-3). The assessment is to be compliant with the *Aboriginal Heritage Standards and Procedures (2023)*
- Search the Aboriginal Heritage Register (AHR) to identify previously registered Aboriginal heritage sites within and in the general vicinity of the study area.
- Undertake relevant archaeological, environmental and ethno-historical background research to develop an understanding of site patterning within the study area.
- To locate, document and assess any Aboriginal heritage sites located within the study area.
- To assess the archaeological and cultural sensitivity of the study area.
- To assess the scientific and Aboriginal cultural values of any identified Aboriginal cultural heritage sites located within the study area.
- Consult with (or ensure the Aboriginal community representative consults with) Aboriginal organisation(s) and/or people(s) with an interest in the study area in order to obtain their views regarding the cultural heritage of the area.

- To develop a set of management recommendations aimed at minimising the impact of the proposed development on any identified Aboriginal cultural heritage values.
- Prepare a report which documents the findings of the Aboriginal heritage assessment and meets the standards and requirements of the *Aboriginal Heritage Standards and Procedures (2023)* prepared by AHT.

1.3 Project Methodology

A three stage project methodology was implemented for this assessment.

Stage 1 (Pre-Fieldwork Background Work)

Prior to field work being undertaken, the following tasks were completed by CHMA staff.

Consultation with Aboriginal Heritage Tasmania

AHT was contacted and informed that a field survey was to be undertaken for the proposed Rosny AFL High Performance Centre. As part of this initial contact a search request of the Aboriginal Heritage Register (AHR) was submitted to AHT in order to ascertain the presence of any previously registered sites in the vicinity of the study area (search request dated 31.1.2024).

The collation of relevant documentation for the project

As part of Stage 1 the following research was carried out and background information was collated for this project:

- A review of the relevant heritage registers (AHR register) and the collation of information pertaining to any registered heritage sites located within the general vicinity of the study area.
- Maps of the study area.
- Relevant reports documenting the outcomes of previous Aboriginal heritage studies in the vicinity of the study area.
- Ethno-historic literature for the region.
- References to the land use history of the study area.
- GIS Information relating to landscape units present in the study area.
- Geotechnical information for the study area, including soil and geology data.

Consultation with Aboriginal Heritage Officer (AHO)

Out of scope is the AHO for this project. As part of Stage 1 works Out of scope (CHMA archaeologist) was in regular contact with Out of scope. The main purpose of this contact was to discuss the scope of the present investigations, to ratify the proposed methodology for the investigations and to co-ordinate the timeframes for implementing field work.

Stage 2 (Field Work)

Stage 2 entailed the field work component of the assessment. The field survey was undertaken over a period of two days (21st and 22nd February 2024) by Out of scope (CHMA archaeologist) and Out of scope (Aboriginal Heritage Officer). Thes study area encompasses approximately 26ha. The field team walked a series of 10.2km of survey transects across the study area footprint, with the average width of each transect being 5m. The survey transects were aligned to cover those parts of the study area where natural ground surfaces and original soil deposits were still present. The survey avoided those areas where there were built surfaces such as carparks and roads. Section 6 provides further details as to the survey coverage achieved within the study area.

As part of the field survey assessment, the field team attempted to relocate any Aboriginal sites that were identified through the Aboriginal Heritage Register (AHR) search as potentially occurring within the study area. For any Aboriginal sites identified by the field team, the following details were recorded.

- The spatial extent of the site (polygon co-ordinates).
- The nature of Aboriginal heritage deposits and features associated with the site.
- Any intra-site variations that occur.
- The condition of the site, and any notable impacts to the site.
- Photos and site maps.
- Proposed management recommendations (as discussed between the archaeologist and AHO).

Aboriginal Heritage Register (AHR) forms for all located Aboriginal sites have been completed and submitted as part of the process.

The results of the field investigation were discussed between [redacted], and [redacted]. This included the potential cultural and archaeological sensitivity of the study area, and management strategies for identified Aboriginal heritage values.

Stage 3 (Report preparation)

Stage three of the project involves the production of a report that includes an analysis of the data obtained from the field survey, an assessment of archaeological sensitivity of the study area and management recommendations. The report was prepared by [redacted] (CHMA), in liaison with [redacted]. The report has been structured to be compliant with the *Aboriginal Heritage Standards and Procedures 2023* prepared by AHT.

A draft copy (one electronic copy) of the report has been submitted to State Growth and AHT for review. In addition, CHMA has provided AHT with all site spatial data files, and mapping associated with the project (in ESRI shape file format (GDA94).

The draft report has been sent out to a range of Tasmanian Aboriginal organisations for review and comment. The outcomes of this consultation are presented in Appendix 4.

1.4 Project Limitations

Most archaeological investigations are subject to limitations that may affect the reliability of the results. The main constraint to the present investigation was restricted surface visibility due primarily to vegetation cover, the presence of introduced gravels, and built road surfaces. Surface visibility across the study area was estimated to average between 20% and 40%, with the occasional embankment cuttings, erosion scalds, and walking tracks providing locales of improved visibility. These constraints in surface visibility limited the effectiveness of the survey assessment to some degree. The issue of surface visibility is further discussed in Section 6 of this report.

[redacted]

Plate 1: [redacted], the designated AHO for the Project

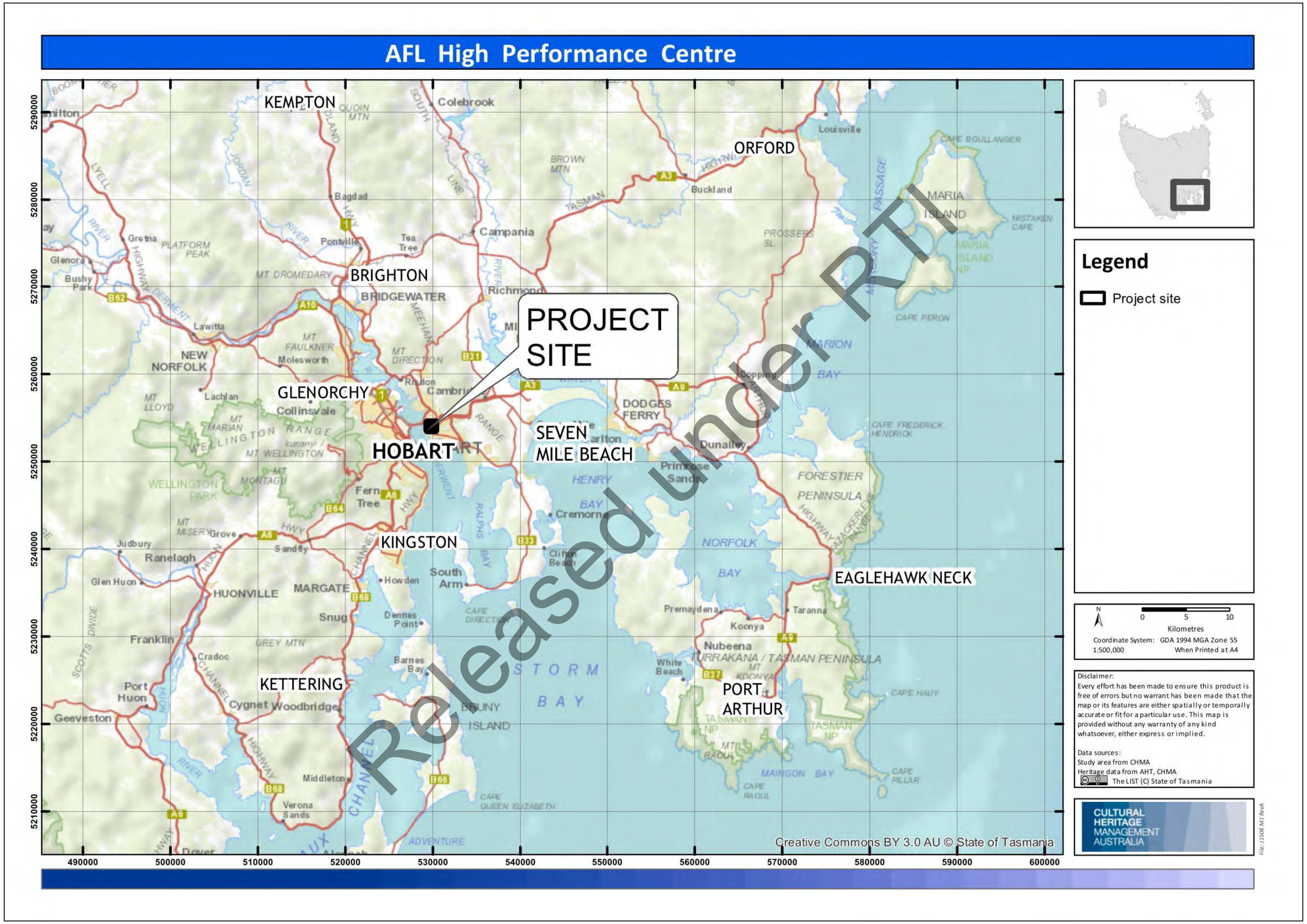


Figure 1: Topographic map showing the general location of the proposed AFL High Performance Centre at Rosny

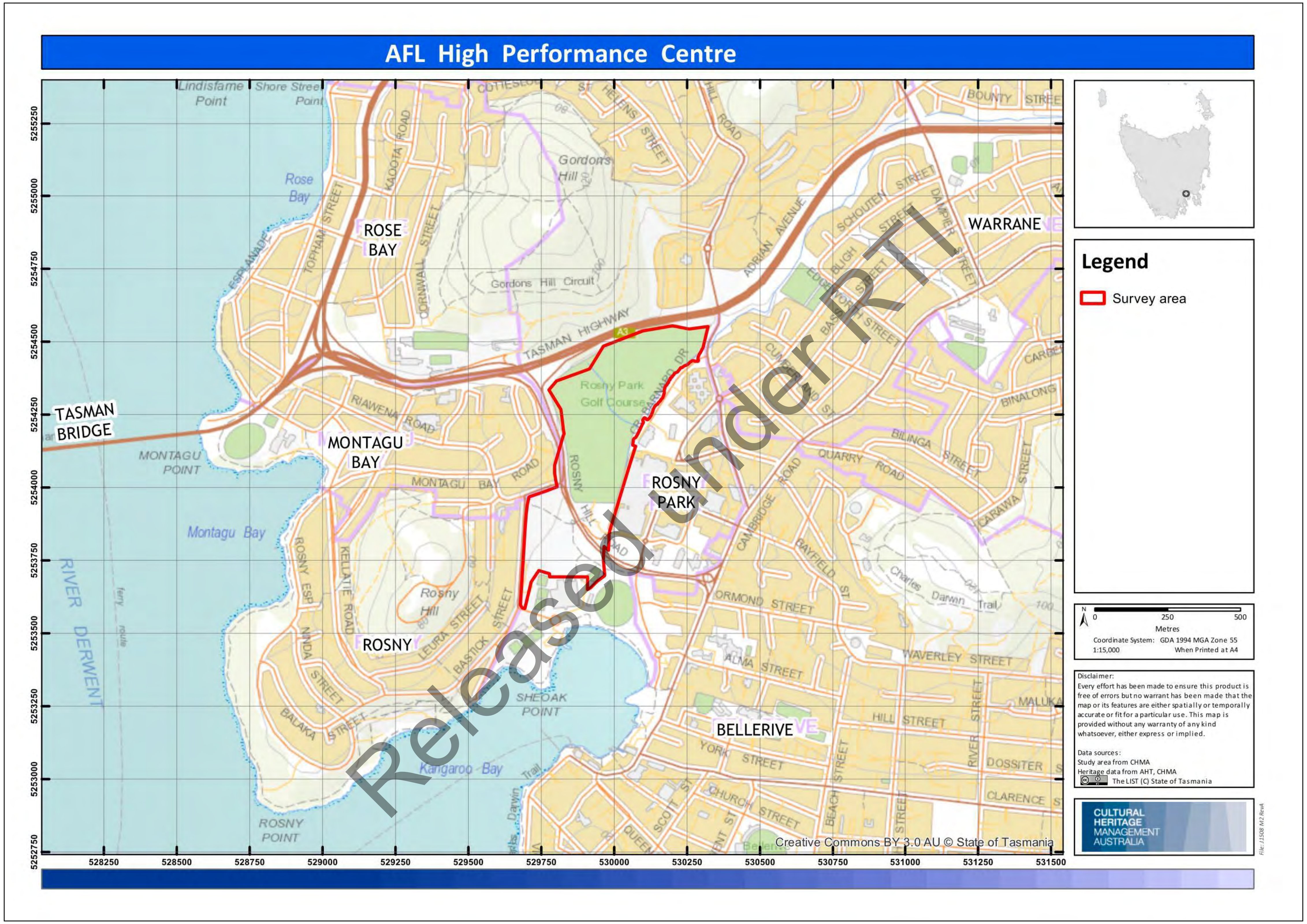


Figure 2: Topographic map showing the landscape setting of the proposed AFL High Performance Centre at Rosny

Figure 3: Aerial image showing the proposed footprint for the proposed AFL High Performance Centre at Rosny

Figure 4: The preliminary concept plan for the proposed AFL High Performance Centre at Rosny

2.0 Environmental Setting of the Study Area

2.1 Introduction

Prior to undertaking archaeological survey of the study area, it is necessary to characterise the landscape. This includes considering environmental factors such as topography, geology, climate, vegetation and past and current landscape use. An assessment of the environmental setting helps to develop an understanding of the nature of Aboriginal occupation and site patterning that might be expected to occur across the study area. In addition, it must be remembered that in Aboriginal society, the landscape extends beyond economic and technological behaviour to incorporate social geography and the embodiment of Ancestral Beings.

The archaeological context is generally only able to record the most basic aspects of Aboriginal behaviour as they relate to artefact manufacture and use and other subsistence related activities undertaken across the landscape such as raw material procurement and resource exploitation. The distribution of these natural resources occurs intermittently across the landscape and as such, Aboriginal occupation and associated archaeological manifestations occur intermittently across space. However, the dependence of Aboriginal populations on specific resources means that an understanding of the environmental resources of an area accordingly provides valuable information for predicting the type and nature of archaeological sites that might be expected to occur within an area.

The primary environmental factors known to affect archaeological patterning include the presence or absence of water, both permanent and ephemeral, animal and plant resources, stone artefact resources and terrain.

Additionally, the effects of post-depositional processes of both natural and human agencies must also be taken into consideration. These processes have a dramatic effect on archaeological site visibility and conservation. Geomorphological processes such as soil deposition and erosion can result in the movement of archaeological sites as well as their burial or exposure. Heavily vegetated areas can restrict or prevent the detection of sites, while areas subject to high levels of disturbance may no longer retain artefacts or stratified deposits.

The following sections provide information regarding the landscape context of the study area including topography, geology, soils and vegetation. Much of this information is derived from The LIST – the Tasmanian Government Land Information System.

2.2 The Environmental Setting of the Study Area

The proposed site for the AFL High Performance Centre is situated at Rosny, just inland of Kangaroo Bay, on the eastern margins of the River Derwent (see Figure 2). The River Derwent estuary is a ‘ria’ or drowned river valley formed by coastal submergence about 6,000 years ago. The shoreline of the estuary in the surrounds of Kangaroo Bay, is a low-energy shore with mudflats and rocky shoals exposed at low tide. The River is estuarine in this area, and subject to tidal influences. This low energy shoreline hosts a range of low energy shell fish species, including mud oyster and black mussel, which would have been important components of the traditional Aboriginal diet.

The study area encompasses approximately 26ha and is situated on the lower southern side slopes of Gordons Hill and the lower east side slopes of Rosny Hill. These two hills are part of the western foothills of the Meehan Range which is located further to the north-east. The terrain across the study area is characteristically moderate to gently sloping with slope gradients in the range of between 3º and 15º. The steeper hill slopes are located within the northern portion of the study area, to the south of the Tasman Highway. Slope direction is typically from north-west to south-east (see Plates 2-4).

The underlying geology across Gordons Hill and Rosny Hill is Tasmanian Dolerite, which extends across the northern and western parts of the study area. Within the eastern portion of the study area, along the margins of the margins of Kangaroo Bay Rivulet, there is a transition to cross-bedded quartzose to feldspathic sandstone commonly with overturned cross-bedding, subordinate siltstone with sparse plant and vertebrate fossils, which are associated with the Knocklofty Formation. There also small patches of alluvium and marsh deposits of modern flood plains along the immediate margins of the rivulet. The soils across the study area to a large extent mirror the underlying geology. Across the majority of the study area the soils are classified as undefined brown soils developed on Jurassic dolerite bedrock and colluvium on rolling to steep land. Within the eastern and southern parts of the study area there are patches of undefined soil developed on Triassic sandstone bedrock and colluvium on undulating to rolling land (TheList 2024).

The Kangaroo Bay Rivulet is the main water course in the vicinity of the study area. This is a permanent water course that flows in a north-east to south-west direction down from the Meehan Range and enters into the River Derwent at Kangaroo Bay. The lower sections of the rivulet runs along the eastern boundary of the study area (see Plates 5 and 6).

The natural landscape of the study area has been heavily modified through farming activity and urban development. The northern portion of the study area is situated within the grounds of the Rosny Park Golf Course, with the southern portion located within Charles Hand Park, which was also once part of the Rosny Park Golf Course.

The study area forms part of the original land grant of the Rosny Farm. The farm was established in the early 19th Century, under a land grant to ex Norfolk Island convict Richard Morgan. He was growing wheat, barley, and potatoes by 1809. He also had pasture for cattle, horses, sheep, goats, and pigs.

Morgan sold the farm in 1829, and it was subsequently leased to Joseph Pedder and his sons, who grew cereal crops. Around 1900, Nichols family were cropping oats on the farm using horse-drawn binders. In 1915, most of the farm’s land was turned into the Rosny golf course which is still in operation. The cottage, barn, outbuildings, and farmyard were left intact, but they fell into disrepair after 1970. In 1988, the Clarence

City Council started restoring and conserving the site. These days the barn precinct is used for exhibitions, installations, performances and small markets and festivals. Rosny Farm is listed on the Tasmanian Heritage Register (THR) with the listing, including an early 19th Century stone barn (c1818), mid-19th Century (c1850) sandstone farm cottage (see plates 7 and 8).

The entire native vegetation across the Golf Course and park has been cleared and replanted with introduced grasses and exotic trees. The hill slopes have been artificially contoured to form the fairways and greens. The margins of the lower stretches of the Kangaroo Bay Rivulet has been heavily been heavily modified and landscaped as part of the development of the Rosny Golf Course and general urban development. There is a small dam constructed along the rivulet and a series of walking paths along the rivulet margins. Much of the immediate riparian zone has been landscaped and replanted. The lower stretches of the rivulet, where it runs under Rosny Hill Road, through to Kangaroo Bay has been artificially tunnelled underground.

From an Aboriginal cultural heritage perspective, the ramifications of this extensive disturbance are that any Aboriginal sites that are situated within this modified landscape are are likely to have been either completely or partially destroyed.

The original vegetation structure of the study area (prior to European occupation) would have comprised a mixture of *Eucalyptus viminalis* grassy forest and woodland and *Allocasuarina verticillata* forest, with patches of native grassland. Patches of this original vegetation structure are still present on Rosny Hill. Early descriptions of the area note forested slopes leading down to the River Derwent with low cliffs and narrow beaches separating land from water (AT 2013:6).

Plate 2: View south-west across the study area showing moderately undulating hills

Plate 3: View north-east across the central part of the study area showing the gently undulating hill slopes

Out of scope

Plate 4: View south across Charles Hand Park showing the gently undulating topography

Plate 5: View north along the Kangaroo Bay Rivulet

Plate 6: View north at a small dam on the Rivulet

Plate 7: Rosny Farm showing the landscape setting prior to the establishment of the Golf Course

Plate 8: The historic barn and cottage associated with Rosny Farm

3.0 Ethno-historic Background

3.1 Aboriginal Social Organisation in Tasmania

Ryan (2012) explains that the terms ‘nation’ and ‘clan’ are the preferred terms used by the Tasmanian Aboriginal community in place of ‘tribe’ and ‘band’ respectively. This terminology has been adopted in the following discussion.

According to Jones (1974), the social organisation of Tasmanian Aboriginal society appears to have consisted of three social units, these being the hearth group, the band (clan) and the tribe (nation). The hearth group was the basic family unit and would generally have consisted of a man and woman, their children, aged relatives and sometimes friends and other relatives. The size of hearth groups would generally range from between 2-8 individuals (Jones 1974: Plomley 1983). Plomley (1983) provides a description made by Peron of a hearth group he encountered at Port Cygnet:

> *There were nine individuals in this family, and clearly they represented a hearth group, because Peron visited their campsite with its single hut. The group comprised an older man and wife, a younger man and wife, and five children, one a daughter (Oure-Oure) of the older man and wife, and the other four the children of the younger man and wife. (Plomley 1983:168).*

The clan appears to have been the basic social unit and was comprised of a number of hearth groups (Jones 1974). Jones (1974:324-325) suggests that the clan owned a territory and that the boundaries of this territory would coincide with well-marked geographic features such as rivers and lagoons. Whilst the clan often resided within its territory, it also foraged widely within the territories of other clans. Brown (1986:21) states that the band was led by a man, usually older that the others and who had a reputation as a formidable hunter and fighter. Brown also suggests that the clan (as well as the hearth group) was ideally exogamous, with the wife usually moving to her husband’s band and hearth group.

Each clan was associated with a wider political unit, the nation. Jones (1974:328-329) defines the tribe (or nation) as being:

> *…that agglomeration of bands which lived in contiguous regions, spoke the same language or dialect, shared the same cultural traits, usually intermarried, had a similar pattern of seasonal movement, habitually met together for economic and other reasons, the pattern of whose peaceful relations were within the agglomeration and of whose enmities and military adventures were directed outside it. Such a tribe had a territory, consisting of the sum of the land owned by its constituent bands…The borders of a territory ranged from a sharp well defined line associated with a prominent geographic feature to a broad transition zone.* Jones (1974:328-329)

According to Ryan (2012:11), the Aboriginal population of Tasmania was aligned within a broad framework of nine nations, with each nation comprising between six to fifteen clans (Ryan 2012:14). The mean population of each nation is estimated to have been between 350 and 470 people, with overall population estimates being in the order of between seven to ten thousand people prior to European occupation (Ryan 2012:14).

Ryan (2012:15) presents a map showing the approximate boundaries for the nine Tasmanian Aboriginal Nations. This map shows that the study area is situated within the boundaries of the Oyster Bay Nation (see Figure 5).

The Oyster Bay Nation occupied the area to the east of the Jordan River, with their territory encompassing around 7800 square km. The Nation consisted of ten bands with an estimated total population of between 700-800 people, making it the largest Nation in Tasmania (Ryan 2012:17). Of the ten clans that comprised the Oyster Bay Nation, it is the Moomairremener that probably occupied the land in the vicinity of the study area.

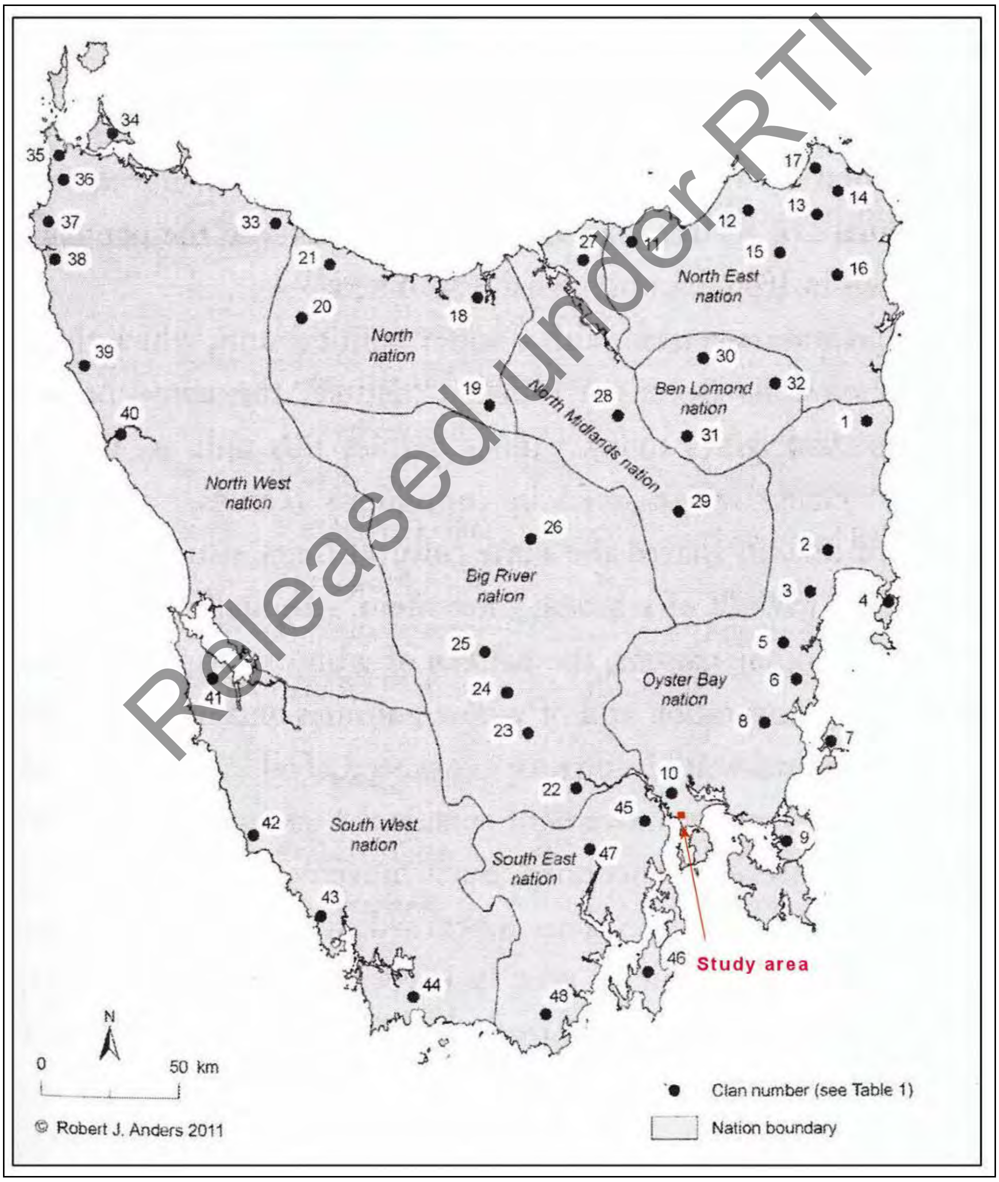


Figure 5: The location of the study area in relation to Aboriginal Nations of Tasmania (based on map from Ryan 2012:15)

The movement of the Oyster Bay Nation through the landscape is thought to have been largely based on the seasonal availability of food resources. In this sense, the Oyster Bay Nation could be divided into two distinct groups: the northern group (from North Oyster Bay through to St Patricks Head) and the southern group (from Little Swanport through to the Tasman Peninsula) (Ryan 2012:18).

According to ethnographic material, of the ten bands that comprised the Oyster Bay Nation, it is the Moomairremener band from the southern group which probably occupied the land closest to the present study area. The southern Oyster Bay people started to move inland in early spring to hunt and fish. The Moomairremener generally commenced moving inland around September/October, travelling up the Derwent River towards New Norfolk, and across to Abysinia, and from there they would travel along the Clyde and Ouse Rivers. Travel was along well-defined routes, generally along the edges of the Band's territory. The two big attractions of the Big River country were the kangaroo hunting grounds around Great Lake and the Clyde and Ouse Rivers, and the availability of a potentially intoxicating gum procured from the *Eucalyptus gunii* tree. The Moomairremener would begin moving back through the Midlands in late February, early March, eventually returning to the coastal areas around June (Ryan 2012:17-20). These routes are shown in Figure 6 below.

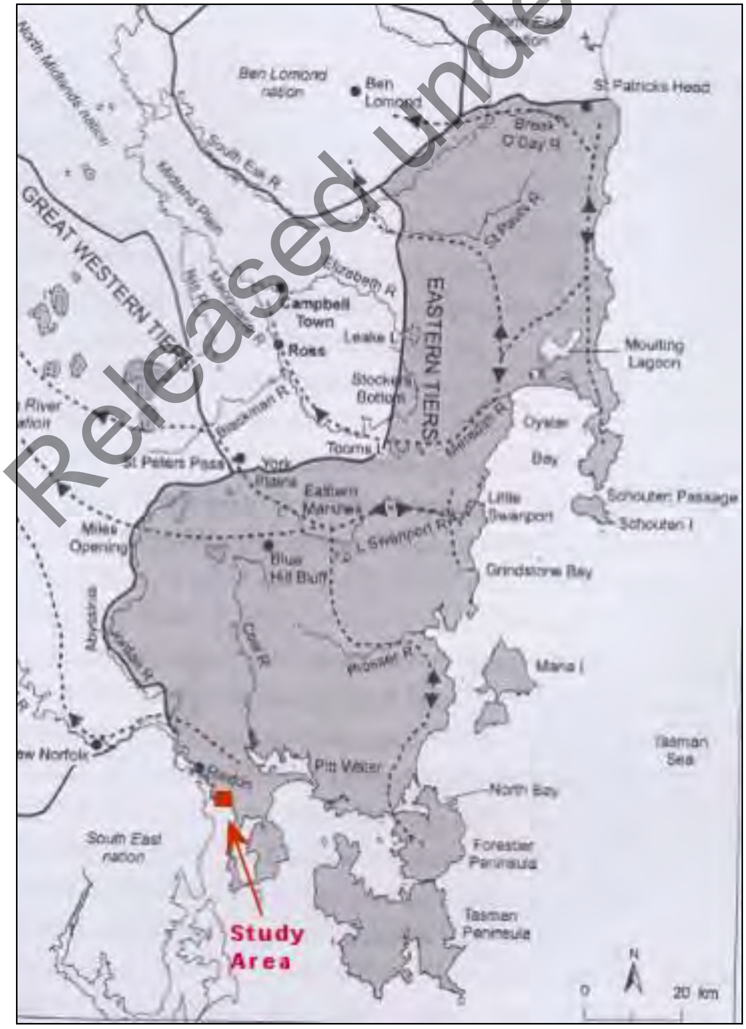


Figure 6: Seasonal movement of the Oyster Bay Nation clans (Ryan 2012:19)

Material Culture, Social Customs and Ethnographic Sources

The ethnographic observations of early European explorers provide a valuable snapshot into aspects of the material cultural and social customs of the Aboriginal Nations inhabiting South Eastern Tasmania. Primary among the ethnographic sources are the diaries of George Augustus Robinson, appointed as government Protector of Aborigines who followed a policy of conciliation with the ultimate aim of removing Aboriginal people to offshore islands (Plomley 2008:515). These observations are especially valuable where they describe to those items and practices that do not survive in the archaeological record.

While the early European explorers generally recorded the people of south east Tasmania as being mostly naked, there are references to kangaroo skin being used for capes, slings and binding for wounds. Both William Anderson (Cook's surgeon in 1777 when he anchored briefly in Adventure Bay) and Labillardiere (the 1793 expedition anchored in Recherche Bay) recorded seeing kangaroo skin used to bind injured feet (Dyer 2005:25). This was very effective it would seem as the people were able to keep up with their companions (Dyer 2005:26). Cook also recorded women using kangaroo skin slings to carry children, and there are several illustrations of this in the paintings by Petit and Lasueur from the Baudin expedition (Bonnemains *et al* 1988). The only other type of protective clothing that appears to have been worn on occasion was a sandal type covering worn on the soles of the feet, which was made from kangaroo skin or possibly a piece of bull kelp (Plomley 1983:123)

Ethnographic sources document a range of shelters used in Tasmania. The most common in the southeast were simple windbreaks of thick strips of bark woven together and supported on vertical wooden poles, as in the artwork from the Baudin expedition (Bonnemains *et al* 1988). Robinson reported seeing huts that were decorated with symbols he recognised as similar to those observed in rock engraving sites at Cape Grim (Plomley 2008:17). In June 1804 Lieutenant Governor Collins made contact with Aboriginal people living on the Huon River (Plomley 2008:18). He recorded an 'Aboriginal village' with about twenty families congregated at the site.

Burial customs were also observed by the ethnographers. Cremation was the usual form of disposing of a deceased person (Plomley 2008:17). Illustrations from the Baudin expedition show 'tombs' at Maria Island (Bonnemains *et al* 1988:131). These were bark tepee-like constructions built over remains that have been covered in fibres or leaves weighted down by rocks (Bonnemains *et al* 1988:131). Robinson also recorded that bones of the deceased, or ash from the cremation, was sometimes carried by relatives as an amulet (Plomley 2008:17).

Robinson recorded that Aboriginal people in the south east would travel along 'well beaten paths' and leave abalone shells at drinking places along rivers (Plomley 2008:59). He also recorded an instance of trying to convince his Aboriginal companions to eat fish, and the strong reluctance they demonstrated (Plomley 2008:59).

Plomley (1983:185-194) provides a comprehensive account of the weapons and implements used by the Tasmanian Aborigines, based on the ethnographic accounts. It appears that the two main weapons used by the local inhabitants were the spear and the club. The spear was a simple flexible rod with a point at one end, the length of which appears to have varied significantly from between 6-12 feet. The club is described as a piece of wood about 60cm long, 2.5cm in diameter and slightly tapered toward the gripping end. This item is reported to have been used as a throwing stick as well as a club. Plomley (1983:22) also makes reference to the use of a wooden spatula which was used primarily for removing shellfish from rocks.

In many of the early ethnographic accounts for the South East Region, there is reference to the baskets carried by the Aboriginal people, however often there is very little detail regards their construction. One of the more detailed descriptions comes from Robinson (in Plomley 1966:58), while he was on Bruny Island.

> *"The native basket is made of rushes of a species of grass called iris. In preparing them for use they place the same on a slow fire which gives them a tenacity that enables the manufacturer to twist them into threads. These are plaited together and then formed into a basket which in shape is somewhat semiglobular."*

There also a number of reports of water vessels constructed from the fronds of giant kelp which could hold up to five to ten litres of water (see Labillardiere 1800:190).

There are numerous ethnographic accounts for the Southeast region describing the watercraft used by the local inhabitants. One of the most detailed descriptions comes from Louis Freycinet, an officer on the Naturalist in 1802 (in Plomley 1983:119-120).

> *We have seen them and have measured several. They had the same dimensions and were constructed in exactly the same way. Three roles of the bark of the eucalypt made up its whole structure…These bundles when taken separately, resemble in a way the yard of a vessel, were joined at their ends, and this caused them to stick up in a point and make up the whole of the canoe. The assemblage was made quite firm with a sort of grass or sedge. In this state, the craft had the following dimensions-*
>
> > *Length inside 2.95m*
> > *Breadth outside 0.89m*
> > *Total height 0.65m*
> > *Depth inside 0.22m*
> > *Size at the ends 0.27m*
>
> *The [group] can put five or six peoples in these canoes; but more commonly only three or four are taken at a time. Their paddles are plain pieces of wood…Usually they sit down to manoeuvre their canoes; in that case they place bundles of grass to serve as seats. At other times they stand up. We have seen them cross the Channel only in fine weather. One can imagine that such a fragile and imperfect craft would never be able to make their way, let alone keep afloat, in a rough sea…It is to be noted that they always put a fire at one end of their canoes, and to prevent the fire from spreading they place under it a bed of earth or ashes of sufficient thickness.*

Interestingly, although stone artefacts dominate the archaeological record for Tasmania (and Australia generally), there are few ethnographic accounts in Tasmania documenting their use. Those observations that are made, primarily relate to the finding of stone implements at campsites. Frustratingly, there are virtually no accounts regarding the form of the implements, how they were made, and what they were used for.

Robinson (in Plomley 1966:113) reports that he

> *"Obtained a stone from one of the Bruny natives with which they sharpen their waddies…It has the resemblance of flint and is found at the Isthmus of Brune.."*

One of the very few descriptions of Aboriginal people carrying out quarrying activity comes from Raynor (in Roth 1899:151) who recounted that his father had come across about 20-30 Aboriginal people, men, women and children, at a quarry near Plenty on the southern side of the middle Derwent Valley.

> *Noisily chatting, they were breaking the stone into fragments, either by dashing them on the rocks or by striking them with other stones, and picking up the sharp edged ones for use…*

This quarry was subsequently visited by Rhys Jones, who noted that the quarried material was an indurated cherty hornfels and that the quarry extended over an area of about 2 ½ hectares (Jones 1971:456).

Ethnographic observations of the Oyster Bay Nation specifically are quite common. Large gatherings of Aboriginal people assumed to be of the Oyster Bay Nation have been recorded in the ethnographic records. McGowan (1985:92) reports that in May 1804 a large group of Aborigines, variously estimated to be up to 500 individuals, including men women and children were observed hunting kangaroo near the first European settlement at Risdon Cove.

Robinson noted that a Mr Earl related *'…that he had seen as many as 500 in one mob together, i.e. the Coal River mob.'* (Robinson in Plomley 1966:595).

One of the earliest and more comprehensive descriptions of the Oyster Bay people comes from Lieutenant Le Dez who was a member of the Marion du Fresne expedition of 1772. The following account was written after he encountered Aboriginal people from the Oyster Bay Nation at Forestier Peninsula at North Bay.

> *Their usual height is 5 ½ feet, their colour very much approaches rust, but they rub themselves with black and make patterns in the form of a crescent on their bodies with this colour: their hair is cottony; they have very little beard, very white teeth, large, harsh features and a wild appearance. In general, they are badly built with thin bodies and slender legs and thighs. They speak with a singular vivacity and we were unable to distinguish any sounds other than these: la-ga – la-ga. I compared them with the inhabitants of New Holland of whom Dampier speaks. They appear to me widely dispersed or wandering like them in bands or in families and the fires we have*

> *often seen along the coast are probably the places where each band stops. They must naturally prefer places near the sea and in coves because of the ease with which they can find their sustenance there. I think they are seafood eaters because we found many places in the woods where they had stopped. One notices easily the place where they slept around a mound of ash and one sees, nearby, fish bones and many burnt shells. It appears that they are always naked and among those that we saw there was one that had a skin belt with long hairs and another had a white feather in his hair: was that a mark of distinction or an ornament. The women we saw only from a distance; they always stayed on the edge of the woods ready to run away (and) seemed to have as their only clothing a piece of skin which covered their breasts and reached to their thighs. I think they must suffer very much during the winter, which must be long and hard, because I do not think they have other ways of fending off the cold than by lighting fires. Thus they appreciate fire very much and when I saw them come to meet our sailors and offer them fire it occurred to me this element was the one they held most useful; it was a sign of friendship to offer it to us. Perhaps they behave in this way among themselves when they meet. We noticed that most of them, besides their spears and a few stones, carry a firebrand as well and each time they stop, and it is often only for a moment, they make a fire and gather round it. It is astonishing how many places we have found where they have lit a fire and how much the woods are devastated by it. We have seen few trees that were not injured at the foot and it was the same throughout the whole bay. We have covered almost all of it without encountering inhabitants or any of their retreats. It was only on the island in the NNE that we found a few pieces of bark, badly arranged with one end resting on a piece of wood set crosswise and the other on the ground; that formed, if you wish, a kind of hut. It seems that they had not long left it; one can conjecture from that that they make similar ones and we did not penetrate sufficiently into the woods to encounter them and that it is for that purpose or to make ropes (because we found a piece that was quite well twisted) that there are numerous trees that we saw stripped of their bark to a height of five or six feet…We have found nothing that could make us suspect that they have canoes or rafts…Their spears are nothing other than sticks about six feet long, pointed at the thick end. They are not poisoned at all…* (Le Dez in Cox 2010:18-19).

Several early explorers and ethnographers have also left accounts of their observations of the Big River Nation that provide an insight into the economy, material culture and social customs of the people prior to European settlement.

Around the Lake Echo area, Robinson records Aboriginal hut sites along the margins of the marshy lagoons that intercept the rugged hills (Plomley 2008:543-44). There are often large numbers of huts that Robinson describes as ‘villages’ (Plomley 2008:548). When Robinson approaches the huts they are empty but show signs of having recently been occupied. He repeatedly describes the abundance of ‘kangaroo’ (Bennett’s wallaby), ‘native bread’ (a tuber, Polyporus myllitae) and duck and bird life that abound: ‘the place of resort … and their hunting grounds’ (Plomley 2008:542). There is also reference to a plant with a red berry that the

Larmairrenener people call Murerleener (Plomley 2008:543). The plant was unknown to the Aboriginal people from the south with Robinson.

The valleys had been burnt by Aboriginal people, to facilitate access and attract game. Robinson records the evidence of this as he travels through the area around modern day Bronte Lagoon (Plomley 2008:545). Robinson also records the petrified wood artefacts that he finds across the southern plateau country (Plomley 2008:548). There are worn paths through the country that Robinson in some cases follows. One runs along the Dee River valley, and it seems that this was a major seasonal travel route for the Big River people (Plomley 2008:549). There is evidence that the Big River people put ochre in their hair. In a wonderful example of contact Robinson records that when his party passes through Campbell Town some of the Big River people pound a brick to a fine powder and mix with animal grease to apply a thick coat to their hair (Plomley 2008:535).

Subsistence and Economy

There are a number of other ethno-historic accounts that comment on the prevalence of shellfish and crustaceans in the diet of the local inhabitants (see Plomley 1966 and 1983), and the archaeological evidence (in the form of midden sites) provides tangible testimony to this. However, the ethnographic and archaeological evidence for the consumption of fish is comparatively very sparse. This has led to some suggestions that fish was not a component of the diet of the Tasmanian Aborigines (see Jones 1974).

Robinson provides an account of the ‘chief’ Mannalargennana of the Oyster Bay Nation cooking wallaby.

> *“…The animal is first thrown on the fire whole as is their custom with all animals, and when the hair is singed they take the carcase off the fire and rub off the scorched hair with their hands. This practice is tenaciously observed with all animals except the possum; the fur of this animal is first pulled off previous to its being placed on the fire. After the chief has rubbed the hair off the wallaby, he broke the fore leg by twisting it with his hands…He then cut the hind legs, after which he made a hole in the belly with his fingers and pulled out the entrails and then thrust in some hot ashes, the animal being previously roasted outside…* (Robinson in Plomley 1966:548-549).

Possum also seems to have been frequently hunted. Plomley (1966:533) describes possums being knocked down out of trees with waddies, or trees were climbed to reach possum holes.

Unfortunately, there are very few accounts available for the hunting of other terrestrial fauna, however, it is likely that a much wider range of species were targeted, including echidna and smaller marsupials.

Certainly within the midlands region, birds and eggs appear to have also formed a major component of the diet of the local inhabitants, with swans, ducks and red bills being some of the main species targeted (Plomley 1966:217). However, there are very few accounts available for the south-east Tasmanian region, for the hunting of birds and the gathering of eggs. Nonetheless, it would be reasonable to assume that this also was carried out at certain times of the year.

Only a few plant foods are documented in the ethohistoric accounts as having been eaten. This includes a bulbous plant known as 'native bread' and a plant that has the appearance of asparagus which was found by the roots of peppermint trees (Plomley 1966). It is very likely that many more plant foods were eaten by the local Aboriginal population. Jones (1971:91-95) for example lists 70 edible plant species that are available in Tasmania, and are likely to have been consumed at times of seasonal availability. This would include pig face, tree ferns, fern roots and a variety of seaweeds.

3.2 Cultural Contact and Frontier Violence

In the first years of the settlement at Hobart the surrounding areas became vital hunting grounds supplying kangaroo meat to the struggling colony on the brink of starvation (Alexander 2006:5). Hunting parties could be away from Hobart for months at a time, and would have needed to learn how to survive in the Tasmanian bush.

The economic importance of the kangaroo hunters to the success of the colony cannot be over emphasised. Without the supply of kangaroo meat the government would have been unable to meet the rations and maintain the settlement (Boyce 2009:52). However, the reliance of the colonisers on kangaroo brought them into direct conflict with the Aboriginal people. Access to seasonal kangaroo hunting grounds was central to the economies of both the Big River and Oyster Bay Nations.

At first, the Europeans were at an advantage as they had hunting dogs that greatly increased the numbers of kangaroo that a hunter could kill (Boyce 2009:52). The Aboriginal people quickly adapted to the use of dogs, an example of rapid cultural and economic adaptation. This brought the two groups onto a more even par (Boyce 2009:66). This period of parity only lasted while the European population was small; as early as 1806 the kangaroo populations around Hobart had been decimated and the hunters were being forced to move further north, towards the Brighton district (Boyce 2009:54). The settlement was literally starving, and there was a strong economic imperative for hunters to extend to the north in search of fresh sources of game. As the settlement continued to expand, both the colonists need for a meat supply, and their transformation of the hunting grounds into cleared, pastoral farms set the scene for an escalation in conflict (Boyce 2009).

As early as February of 1805 Knopwood records his own servants using boats for hunting trips across the river (Nicholls 1977:57). Some of the hunting trips Knopwood records may have been in the hinterland of nippaluna (Hobart), but he records a significant number of trips where his hunters left for long periods of time across the river. It is likely that an increasing food scarcity for the colonists in Hobart through the first years of its occupation resulted in more intensive hunting. By June 1806 Knopwood (Nicholls 1977:103) documents violent conflict near Pittwater between convict hunters and Aboriginal people. Similar violent encounters are documented for the following few years, especially in 1807, and the Risdon Cover Massacre in 1804 had given the Oyster Bay Nation a clear idea of the dangerousness of the colonists.

It is probable that conflict was early and violent along the eastern shore of the Derwent with armed convicts and settlers appropriating resources and, in a number of cases, violently responding to challenges or attacks by Aboriginal people. The landscape around Rosny Park is likely to be the scene of undocumented conflict.

Clashes with Aboriginal communities became more frequent and more violent as European settlement expanded. Lieutenant-Governor George Arthur proclaimed Martial Law in November 1828, leading to the active pursuit, capture and death of many Aboriginal people. A bounty was introduced in February 1830 of five pounds for every adult captured and two pounds for each child. In the two years between November 1828 and November 1830 some twenty Aboriginal people were captured and a further sixty lost their lives (Ryan 2012:102).

A series of six 'roving parties' were established for the purposes hunting and capturing the remaining Aboriginal occupants of the settled areas. This military action resulted in a general increase in the scale of violent conflict between Europeans and Aboriginal people, and by 1830 it was decided that a full-scale military offensive was required in order to quell the Aboriginal uprising. This operation, termed the 'Black Line,' involved the assembly of 2000 men in October 1830, who formed a human chain that swept through the settled districts over a period of three weeks, with the aim of driving the remnant Aboriginal populations from these areas. At the time the military campaign was widely believed to have achieved its objectives, with virtually the entire Aboriginal population having been either killed, or driven out of the settled areas. In 1832 the proclamation of Martial Law was revoked (Ryan 2012:112-113).

The Black Line was Governor Arthur's response to repeated insistence from settlers that Aboriginal people should be removed from the midlands (Alexander 2006:15). This reflects the level to which conflict had reached by 1830. Over three weeks two thousand settlers formed a line across the midlands, attempting to drive Aboriginal people south onto the Tasman peninsula (Alexander 2006:15). The line passed through Brighton in October 1830; no Aboriginal people were captured in the district (Alexander 2006:16).

Whilst the Black Line itself proved to be a dismal failure, with the total capture of two Aborigines and death of another three, it was sufficiently distressing to the general Aboriginal community that more than two hundred people subsequently allowed themselves to be persuaded by George Augustus Robinson (the 'Protector of Aborigines') to relocate to Flinders Island in exchange for food, shelter and safety (Lines 1991:47). They were further promised that they would be returned to their former homes on the Tasmanian mainland as soon as possible.

By 1835, the majority of the 220 Aborigines who arrived with Robinson at the Wybalenna Aboriginal establishment on Flinders Island had died from inadequate shelter, insufficient provisions and introduced disease. Birth rates were extremely low and few children survived infancy. In 1847 six Aborigines at Wybalenna made a petition to Queen Victoria asking that the promises made to them be honoured. In

October 1847, the surviving 47 Aborigines were transferred to their final settlement at Oyster Cove (only 44 people survived the trip).

The Oyster Cove settlement was located just to the north of Kettering. Conditions at Oyster Cove were only marginally better than at Wybalenna and the Aboriginal population continued to experience high mortality rates. However, throughout the 1850s and 1860s the European settlers recorded numerous anecdotes of Aboriginal people at Oyster Cove maintaining elements of their pre-contact lifestyle (AT 2010:26). The best known example is Fanny Cochrane who married ex-convict William Sawyer. She is reputed to have practiced traditional shellfish gathering, basket making, medicine and religious practices (AT 2010:27).

The Oyster Cove station closed in 1862. For most of the next 100 years, parts of the former station land were sold, while some remained as Crown land. In 1981, the majority of the former station area was proclaimed as a Historic Site. Despite strong opposition, the Aboriginal community reoccupied the site on 16 January 1984. Each year since occupying the putalina site, the Tasmanian Aboriginal Corporation has held an annual music and cultural festival (AHT fact sheet accessed 2021).

In 1995, the State Government formally handed the title of Oyster Cove putalina to the Aboriginal Land Council of Tasmania. The site continues to be managed by the Tasmanian Aboriginal Corporation. Today, the putalina festival attracts hundreds of people each January to enjoy local and interstate musicians, cultural activities and interactions with extended family and community (AHT fact sheet accessed 2021).

4.0 Background Archaeology

4.1 Regional Studies

The study area is situated within the South-East region of Tasmania. There have been a number of Aboriginal archaeological studies undertaken within the South-East region over the past two decades. The majority of these have been in the form of survey assessments associated with proposed development activities, and have focused on discreet areas (these are summarised in section 4.2) However, there has also been some broader research based investigations undertaken in the region. Probably the most comprehensive of these and the one most pertinent to the present investigations are that of Officer (1980) and Brown (1986).

Officer (1980)

Iain Officer (1980) carried out an extensive survey of the Derwent Estuary region, as part of his thesis works. The areas covered by the survey investigations extended from Blinking Billy Point (west bank of River) and Trywork (east bank of River), upstream to New Norfolk. The survey assessment in this area involved walking a series of survey transects along the shoreline of the River, with transects in some areas extending up to 1km inland from the River.

In the course of his investigations, Officer recorded a total of 416 midden sites. Of these, 298 were located on the east bank of the River and 118 on the west bank (Officer 1980).

The shell midden sites identified by Officer were predominantly comprised of mussel (*Mytilus planulatus, Xenostrobus secures* or *Brachidontes rostratus*) and oyster (*Ostrea angasi*). A wide range of other shell fish species were represented in low numbers at a number of these sites (Officer 1980).

Stone artefacts were observed at 33 of the recorded midden sites (28 artefacts on the east bank and 5 artefacts on the west bank). A wide range of stone material types were represented in these artefact assemblages, including cherty hornfels, silicified breccia, mudstone, chalcedony, quartz, basalt and dolerite (Officer 1980).

Bone material was observed at only four midden site locations, indicating that for whatever reason, bone material in middens on the Derwent River is a rare occurrence (Officer 1980).

One of the areas intensively surveyed by Officer (1980) was Bedlam Walls, which lies on the east side of the Derwent River, between Geilston Bay and Risdon Cove and extends up to 1.2km inland from the shore of the River. Officer (1980) recorded a total of 74 sites in this area (sites AH 1184-1257). The vast majority of sites are classified as middens, however, three stone quarries and one rock shelter was also identified. A large number of the midden sites (28%) are described as being extensive, covering in excess of 1000m², with the largest site being over 8000m² (Officer 1980). The midden sites range from being located immediately on the shore line through to up to 530m inland from the shore. The dominant shell material represented in these midden sites was the black mussel (*Mytilus planulatus*) and oyster (*Ostrea angasi*).

Officer (1980) notes that a local resident (Dr Jacklyn) also recorded a large number of Aboriginal sites in the Bedlam Walls area, in the period between 1965-1973. The sites recorded by Officer (1980) included those site identified by Dr Jacklyn. Officer identified an additional 19 midden sites to those identified by Jacklyn. As part of his recording efforts, Dr Jacklyn carried out an extensive salvage of stone artefacts in the Bedlam Walls area. Jennings (1983) subsequently undertook an analysis of this collection. Jennings (1983) reports that of the 1016 pieces of stone material collected by Dr Jacklyn, 991 pieces are determined as being stone artefacts, giving an average artefact density for the area of 381 artefacts/km². The majority of artefacts were collected from the shoreline area between Shag Bay and Geilston Bay (641 artefacts). Of the 991 artefacts, 633 were un-worked and 358 are worked. Stone material types represented in the assemblage include hornfels, quartzites, chalcedony and sub-basaltic hornfels (Jennings 1983).

Brown (1986)

Steve Brown (1986) was engaged to carry out the South East Tasmanian Archaeology Project. This was one of nine regional overview studies, funded through National Estate grants, which were directed at examining the Aboriginal archaeological resources of Tasmania. The aims or duty statement for the South East Tasmanian Archaeology Project was to define the prehistory of the region and to define present and potential future impacts on the Aboriginal heritage resources in the region.

As part of his research design, Brown (1986:49-50) divided the landscape of the south-east region into landform unit types. Five major landform unit divisions were identified. These were;

- small offshore islands,
- Bruny Island,
- coastal and estuarine environments (consisting of coastal margins, coastal plains, river estuaries, lagoons and swamps),
- inland hills, plains and river valleys, and
- inland mountains (alpine plateau).

Brown (1986:49-50) then collated available archaeological data for these landscape units, including the range of site types present, the site components and the distribution and frequency of sites. The data was generated from previous archaeological investigations undertaken in the region, as well as the findings from the field work carried out by Brown.

Of the five landscape units identified by Brown (1986), the most pertinent to the present investigations are the coastal and estuarine environments. The following provides an overview of the findings, as presented by Brown (1986) for this landform unit.

Coastal and Estuarine Regions

The Coastal and Estuarine Regions consists of coastal margins, coastal plains, river estuaries, lagoons and swamps. It encompasses the River Derwent.

Brown (1986:79) notes that shell middens are by far the most common site type occurring within the coastal and estuarine environmental zone. A number of trends were observed in relation to the distribution of this site type within the coastal and estuarine environmental zone, and the composition of materials at these sites. These are summarised as follows.

- Middens are generally not present in areas with steep shore profiles.
- The greatest number of middens was identified on coast lines which contain a mixture of rocky headlands and short sandy beaches (mixed coast areas).
- On long sandy beaches the volume of midden material was found to decline with distance from a rocky coast.
- Middens are essentially comprised of two types; rocky coastal and bay estuarine, reflecting different landscape settings. However, middens with shell species common to both these types occur in intermediate zones such as estuary and lagoon mouths.
- The largest rocky coastal shell middens occur on rocky headlands and points, with associated rock platforms, where abalone, turbo, mussels and limpets occur.
- The bay estuarine type middens are generally composed predominantly of mussel and oyster shellfish species. The largest middens are found immediately adjacent to the shoreline, near to the shell fish resources. A few sizeable middens have been noted up to 500m inland, with smaller middens having been identified up to 1km inland.
- Shell middens in South-east Tasmania are comprised almost entirely of shell, and rarely contain large numbers of stone artefacts or faunal remains (Brown 1986:79-82).

Overview for the South-East Tasmanian Region

In summary, Brown (1986:99-102) has identified the following broad patterns of site type distribution in South-East Tasmania.

- Aboriginal archaeological sites occur in all parts of the landscape.
- The coastal margins (including off shore islands), coastal plains and river estuaries are very rich in archaeological resources and contain a high density of sites with large quantities of archaeological remains. The Derwent Estuary in particular was an area of rich archaeological resources.
- Inland sites are dominated by open artefact scatters and isolated artefacts. Artefact densities are highest along the river, rivulet and creek valley floors and adjacent to lower hill slopes, particularly where the hill slopes are gently inclined, with a north aspect, and have sandy well drained soils.
- Shell middens most frequently occur in close proximity to shellfish resources, particularly on cliff tops or headlands where there is easy access to these resources.
- Stone artefact quarries most frequently occur where there is a surface expression of geological contact zones, in particular between Jurassic dolerite and Triassic or Permian strata.

As a general statement, Brown (1986:102) summarises that site numbers and densities in South-east Tasmania are greatest within 300m of the present coastline and in the immediate vicinity of coastal lagoons.

In terms of environmental factors determining site location, Brown (1986:103) is of the opinion that topography is perhaps the most consistent and important factor. Sites in general, but particularly the larger ones (in terms of artefact numbers) are very seldom found on steep gradient slopes.

In terms of duration of Aboriginal occupation, Brown (1986:99-100) believes that the South-eastern Tasmanian region has probably been occupied by Aboriginal people for the past 20 000 years. However, he acknowledges that there are no conclusive dates for sites beyond 6000 years old for the region. Pleistocene dates have however been obtained for sites in close proximity to the region (Beginners Luck Cave and a cave on the Weld River).

4.2 Aboriginal Heritage Assessments carried out in the General Vicinity of the Study Area

Over the past two decades there have been a number of smaller scale Aboriginal heritage studies that have taken place in the general surrounds of the study area. The following presents a summary overview of those studies that are most relevant to the present study area.

Coal River Valley Effluent Re-Use Scheme Stage 1 (Stanton 2003a)
Stanton (2003a) was engaged by the clarence City Council to undertake an Aboriginal heritage assessment for Stage 1 of the coal River Valley Effluent Re-Use Scheme. Stage 1 was the proposed route for a rising main pipeline from Rosny to Tunnel Hill. Stanton (2003a) reported recording one aboriginal site during the survey (AH1126), which was a registered shell midden that had been originally recorded by Officer (1980). It was described by Stanton (2003a:5) as a low density surface scatter of shell fragments which were located at the junction of Bastick Street and the access to Rosny College. Stanton noted that fragments of shell material was present around the base of a street light and road sign and in loose surface soils in a road batter located on the northern junction side of the road. Stanton (2003a:5) observed that the site did not appear to contain any intact layers of cultural material at depth and that it was possible that the shell material was imported into this area during prior cutting and benching as part of the past road construction. Besides AH1126, no other Aboriginal heritage sites or cultural landscape features were identified and the area was noted to have been highly disturbed.

Tasman Highway/Gordons Hills Road Ramps (Stanton 2003ab)
Stanton (2003b) was engaged by GHD to undertake an Aboriginal heritage assessment for the area where the Tasman Highway intersects with Gordons Hill Road, as part of the a proposal to construct ramps in this area. The study area incorporated part of the Rosny Park Golf Course, which is within the current study area. Stanton (2003b:5) did not record any Aboriginal heritage sites during the assessment and noted that the area had been highly modified and that there were no cultural landscapes present.

Clarence Foreshore Trail - Tasman Bridge and Kangaroo Bay, at Rosny (GHS 2018)
GHS (2018) was engaged by the Clarence City Council to undertake a corridor survey of a 3.4km section of the Clarence Foreshore Trail (CFT), between Tasman Bridge and Kangaroo Bay, at Rosny. The assessment resulted in the recording of a total of 20 Aboriginal sites, all of which were classified as shell middens. One of the sites was a new recording (AH13351), with the other sites all correlating with Aboriginal sites that had previously been recorded by Officer (1980). Three of the sites recorded by Officer (1980) were assessed by GHS (2018:33) to be part of one large site complex (AH1147, AH1148 and AH1149). GHS (2018:33) noted that there were an additional two midden sites recorded by Officer that could not be relocated (sites AH1132 and AH1152). GHS (2018:33-34) commented that there was always the potential for additional shell midden sites to be identified along the surveyed sections of shoreline as well as the possibility that some of the recorded sites being larger in extent. However, no specific areas of elevated archaeological potential were noted. GHS (2020) subsequently prepared a report specifically dealing with potential impacts to the recorded Aboriginal sites described above.

Clarence Foreshore Trail - Lindisfarne Bay (GHS 2019)
GHS (2019) were subsequently engaged to carry out an assessment for a 300m section of proposed new/upgraded path and a 150m section of existing concrete footpath between the Tasman Bridge and Lindisfarne Bay. The assessment resulted in the recording of three Aboriginal shell midden sites (AH1169, AH1170 and AH1172). All three sites correlated with sites previously recorded by Officer (1980). All three midden sites were noted to be in heavily disturbed contexts and were residual deposits of what were likely to have been larger sites. A fourth site (AH1171) which had previously recorded by Officer (1980) was no relocated. No other potential features or specific areas of elevated potential were noted (GHS 2019b:20).

4.3 Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the assessment process, a search was undertaken of the Aboriginal Heritage Register (AHR) to determine whether any registered Aboriginal heritage sites are located within or in the general vicinity of the study area.

s42

[redacted]

s42

[redacted]

s42

[redacted]

AFL High Performance Centre

s42 [redacted]

Figure 7: Registered Aboriginal sites s42 [redacted]

AFL High Performance Centre

[redacted]

Figure 8: Aerial image [redacted]

5.0 Predictive Modelling

5.1 Introduction to Predictive Modelling

Predictive modelling, in an archaeological context, is a fairly straightforward concept and has been utilised by archaeologists in Australia for a number of years as a tool for undertaking research into Aboriginal heritage sites. In summary, predictive modelling involves the collation of information generated from previous archaeological research in a given region, and using this information to establish patterns of Aboriginal site distributions within the landscape of that particular region. On the basis of perceived patterns of site distribution, archaeologists can then make predictive statements regarding the potential for various Aboriginal site types to occur within certain landscape settings, and can make preliminary assessments regarding the potential archaeological sensitivity of landscape types within a given region.

5.2 Predictive Models; Strengths and Weaknesses

It should be acknowledged that most, if not all predictive models have a number of potential inherit weaknesses, which may serve to limit their value. These include, but may not be limited to the following:

1) The accuracy of a predictive model is directly influenced by the quality and quantity of available site data and information for a given region. The more data available and the greater the quality of that data, the more likely it is that an accurate predictive model can be developed.
2) Predictive modelling works very well for certain types, most particularly isolated artefacts and artefact scatters, and to a lesser extent scarred trees. For other site types it is far more difficult to accurately establish distribution patterns and therefore make predictive modelling statements. Unfortunately, these site types are generally the rarer site types (in terms of frequency of occurrence) and are therefore generally the most significant sites.
3) Predictive modelling (unless it is very sophisticated and detailed) will generally not take into account micro-landscape features within a given area. These micro features may include (but is certainly not limited to) slight elevations in the landscape (such as small terraces) or small soaks or drainage depressions that may have held water. These micro features have been previously demonstrated to occasionally be focal points for Aboriginal activity.
4) Predictive modelling to a large extent is often predicated on the presence of watercourses. However, in some instances the alignment of these watercourses has changed considerably over time. As a consequence, the present alignment of a given watercourse may be substantially different to its alignment in the past. The consequence of this for predictive modelling (if these ancient water courses are not taken into account) is that predicted patterns of site distributions may be greatly skewed.

5.3 A Predictive Model of Site Type Distribution for the Study Area

The findings of previous archaeological investigations undertaken in the general vicinity of the study area and the information generated from the AHR search, shows that shell midden sites are by far the most common site type recorded along this section of the River Derwent estuary and is the site type most likely to be encountered within the study area. It is also likely that Artefact scatters/Isolated artefacts may be present in the study area, separate from any midden deposits. The following provides a definition of these site types, and a predictive statement for their likely occurrence within the study area.

As noted in section 2 of this report, the study area has been very heavily modified in the past. This level of modification will mean that the potential for shell midden sites or artefact scatters to still survive in this landscape is limited. If present, these sites will be encountered in those areas where natural soil deposits are still in existence.

Other site types such as Aboriginal stone quarries and Aboriginal rock shelters have also been previously recorded in the broader surrounds of the study area. However, given the nature of the underlying geology across the study area and surrounds which is dominated by dolerite it is highly unlikely that these site types will be present.

Shell Midden Sites

<u>Definition</u>

Middens range in thickness from thin scatters to stratified deposits of shell and sediment up to 2m thick. In addition to shell which has accumulated as food refuse, shell middens usually contain other food remains such as bone from fish, birds and terrestrial animals and humus from the decay of plant and animal remains. They also commonly contain charcoal and artefacts made from stone, shell and bone.

<u>Predictive Statement</u>

In the South-East Tasmanian region, the bay estuarine type middens are generally composed predominantly of mussel and oyster shellfish species. The largest middens are found immediately adjacent to the shoreline, near to the shellfish resources, and are on elevated, generally gently sloping or level terrain. A few sizeable middens have been noted up to 500m inland, with smaller middens having been identified up to 1km inland. These shell middens are comprised almost entirely of shell, and rarely contain large numbers of stone artefacts or faunal remains.

s42 [redacted]

Artefact Scatters and Isolated artefacts

Definition

Isolated artefacts are defined as single stone artefacts. Where isolated finds are closer than 50 linear metres to each other they should generally be recorded as an Artefact Scatter. Artefact scatters are usually identified as a scatter of stone artefacts lying on the ground surface. For the purposes of this project, artefact scatters are defined as at least 2 artefacts within 50 linear metres of each other. Artefacts spread beyond this can be best defined as isolated finds. It is recognised that this definition, while useful in most instances, should not be strictly prescriptive. On some large landscape features for example, sites may be defined more broadly. In other instances, only a single artefact may be visible, but there is a strong indication that others may be present in the nearby sediments. In such cases it is best to define the site as an Isolated Find/Potential Archaeological Deposit (PAD).

Artefact scatters can vary in size from two artefacts to several thousand, and may be representative of a range of activities, from sporadic foraging through to intensive camping activity. In rare instances, campsites which were used over a long period of time may contain stratified deposits, where several layers of occupation are buried one on top of another.

Predictive Statement:

Previous archaeological research in the region has identified the following pattern of distribution for this site type:

- Stone artefact scatters are numerous within the larger river valley systems;
- The largest open artefact scatters tend to be situated on well-drained sandy soils, in slightly elevated positions above river and creek floodplains, with a north aspect;
- Site and artefact densities on the lower lying flood plains of watercourses tend to be comparatively lower. This may be reflective of the fact these low lying areas were less favoured as camp locations, due to such factors as rising damp and vulnerability to flooding; and
- Site and artefact densities also tend to be comparatively lower in areas away from watercourses, and on moderate to steeply sloping terrain.

Applying this broad pattern of site distribution described above to the study area, it would be anticipated that elevated site and artefact densities are most likely to be encountered closer to the margins of Kangaroo Bay Rivulet. This is the only named water course that occurs within the study area and is likely to have been a focal point for Aboriginal activity. Higher concentrations of artefact deposits (potentially representing interim camp site locations) could be expected to occur on any elevated, level and well drained landscape features that border the rivulet. As mentioned previously, the margins of the rivulet have been heavily modified, particularly the lower stretches in the areas either side of Rosny Hill Road. These disturbances means that there is reduced potential for artefact deposits to have survived in these areas.

Across the remainder of the study area, artefact densities would be anticipated to be low to very low, representing more sporadic activity, particularly in the more steeply sloping parts in the north and west of the study area.

6.0 Survey Coverage of the Study Area

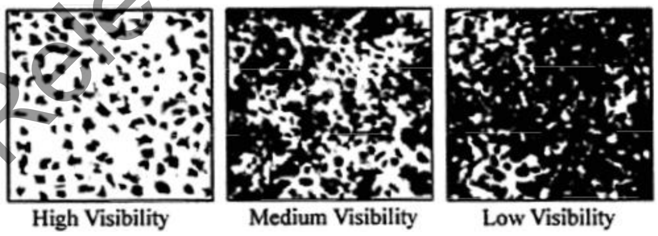
Survey Coverage and Surface Visibility

Survey coverage refers to the estimated portion of a study area that has actually been visually inspected during a field survey. Surface Visibility refers to the extent to which the actual soils of the ground surface are available for inspection. There are a number of factors that can affect surface visibility, including vegetation cover, surface water, built structures and the presence introduced gravels or materials. Figure 9 provides a useful guideline for the estimation of surface visibility.

The field survey was undertaken over a period of two days (21st and 22nd February 2024) by Out of scope (CHMA archaeologist) and Out of scope (Aboriginal Heritage Officer). The study area encompasses approximately 26ha. The field team walked a series of 10.2km of survey transects across the study area footprint, with the average width of each transect being 5m. This equates to an overall estimated survey coverage of 51 000m². The survey transects were aligned to cover virtually all parts of the study area. The survey avoided those areas where there were built surfaces such as carparks and roads. Figure 10 shows the alignment of the transects walked by the field team.

Surface visibility across most parts of the study area was typically in the low to medium range, averaging between 10% and 40% (see Figure 9). The main impediment to visibility was vegetation (mainly grass cover), as well as built surfaces, introduced gravels in areas such as carparks and formed roads (see Plates 9, 12, 13). Occasional erosion scalds throughout the study area provided locales of improved visibility. These were targeted by the field team (see Plates 10, 11, 14, 15, 16).

Visibility



☐Full (100%) ☐High (75%) ☐Medium (50%) ☒Low (24%) ☒None (0%)

Figure 9: Guidelines for the estimation of surface visibility

Effective coverage

Variations in both survey coverage and surface visibility have a direct bearing on the ability of a field team to detect Aboriginal heritage sites, particularly site types such as shell middens, isolated artefacts and artefact scatters, which are the site types most likely to be encountered in the study area. The combination of survey coverage and surface visibility is referred to as effective survey coverage. Table 2 presents the estimated effective survey coverage achieved during the course of the survey assessment of the study area. Effective coverage within the northern portion of the study area (north of Rosny Hill Road) was estimated at 9 750m², and 3 700m² in the southern part of the study area. There is no doubt that this level of effective coverage is quite low and this will obviously have some bearing on the field survey results and the interpretation of these results. However, given the overall levels of disturbances across the study area footprint, the implications of the reduced effective coverage is deemed to be quite minimal. This is discussed further in section 7.

Table 2: Effective Survey Coverage achieved within the study area

Area Surveyed	Total Area Surveyed	Estimated Surface Visibility	Effective Survey Coverage
Northern Study Area Footprint (North of Rosny Hill Road)	6 500m x 5m = 32 500m²	30%	9 750m²
Southern Study Area Footprint (South of Rosny Hill Road)	3 700m x 5m = 18 500m²	20%	3 700m²
Total	***10 200m x 5m = 51 000m²***		***13 450m²***

Out of scope [redacted]

Plate 9: View north across the southern portion of the study area, where visibility averaged 20%

Out of scope

Plate 10: View north at erosion scalds around trees in the southern portion of the study area providing improved visibility

Plate 11: View west at erosion scalds in the southern portion of the study area providing improved visibility

Out of scope

Plate 12: View north-west across the north part of the study area, with visibility at 30%

Out of scope

Plate 13: View north-west showing typical surface visibility in the north part of the study area

Plate 14: View north-west at erosion scalds along Kangaroo Bay Rivulet in the north of the study area providing locales of improved visibility

Plate 15: View south at erosion scalds in the north of the study area providing improved visibility

Out of scope [redacted]

Plate 16: View west at erosion scalds along the north edge of the study area providing improved visibility

Figure 10: Survey transects walked within the study area footprint

7.0 Survey Results and Discussion

7.1 Summary Survey Results

s42

[redacted]

s42 [redacted]

The field survey was able to confirm that there are no stone resources within the study area that would be suitable for stone artefact manufacturing. The field survey also confirmed that there are no rock outcrops present in the study area that would be in any way suited for human habitation. It is therefore possible to rule out the presence of Aboriginal rock shelter sites as well as rock art sites being present.

s42 [redacted]

Table 3: s42 [redacted]

AH No.	Grid Reference (GDA 94)	Site Type	Site Description
s42 [redacted]	[redacted]	[redacted]	[redacted]

7.2 Further Discussions

The available ethnographic information shows that the study area was part of the territory of the Moomairremener people from the Oyster Bay Nation. The River Derwent estuary is a major resource zone, hosting an abundance of estuarine and aquatic resources that would have been important components of the traditional diet of the Moomairremener people. This includes shellfish species such as mud oyster and mussel, which were plentiful. The eastern foreshores of the River Derwent are therefore likely to have been a major focal point of activity as part of their seasonal movement through their country. This is supported by the archaeological evidence which shows a large number of recorded Aboriginal sites clustered along the fringes of the River Derwent Estuary.

The study area is situated just inland (to the north) of Kangaroo Bay, on the eastern side of the River Derwent. There is no doubt that Kangaroo Bay would have been an area where the Moomairremener people focused their activity. The bay is reasonably well sheltered and there are extensive inter-tidal rock platforms lining the bay and surrounds that would have hosted an abundance of shellfish species. Moreover, there are no steep cliffs present in this area, which means that these shellfish species would have been easily accessible. Added to this, was the presence of a reliable fresh water source in the form of the Kangaroo Bay Rivulet. Reliable fresh water is clearly a valued resource and would have enabled the Moomairremener people to stay at this area for extended periods of time.

The archaeological record for the area around Kangaroo Bay to some extent supports the contention that the area was probably a focal point of activity. As

s42 [redacted]

[redacted] As noted previously, the entire study area has been heavily modified through the development of the Rosny Park Golf Course, the landscaping of Charles Hand Park, as well as past farming practices and more recent urban development around Kangaroo Bay. s39 [redacted]

s42 [redacted]

As described in section 6 of this report, surface visibility across the study area ranged between an estimated average of 20% and 40%, due to vegetation cover, built surfaces and the presence of introduced gravels. In light of these constraints, it can't be stated with absolute certainty that there are no undetected Aboriginal heritage sites present within the study area.

s42 [redacted]

AFL High Performance Centre

s42 [redacted]

File:J1508 M6 RevA

Figure 11: Topographic map s42 [redacted]

AFL High Performance Centre

s42 [redacted]

Figure 12: Aerial map s42 [redacted]

AFL High Performance Centre

s42

8.0 Site Significance Assessments

The following provides an outline of the processes used to assess the significance of any cultural heritage sites that were identified during the course of the assessment.

8.1 Assessment Guidelines

There are several different ways of defining types of significance, and many practitioners have developed their own system of significance assessment. However, as Sullivan and Pearson (1995) point out, there seems to be a general advantage in using a set of criteria which is already widely accepted. In Australia cultural significance is usually assessed against the Burra Charter guidelines and the Australian Heritage Commission guidelines (ICOMOS 1988, 1999).

8.2 The Burra Charter

Under the guidelines of the Burra Charter ‘cultural significance’ refers to the ‘aesthetic, historic, scientific, social or spiritual value for past, present or future generations’ of a ‘place’ (ICOMOS 1999:2). The guidelines to the Burra Charter comment:

“Although there are a variety of adjectives used in definitions of cultural significance in Australia, the adjectives ‘aesthetic’, ‘historic’, ‘scientific’ and social’ ... can encompass all other values”.

The following provides the descriptions given for each of these terms.

Aesthetic Value

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and materials of the fabric; the smells and sounds associated with the place and its use (Marquis-Kyle & Walker 1992).

Historic Value

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment (Marquis-Kyle & Walker 1992).

Scientific Value

The scientific or research value of a place will depend upon the importance of the data involved or its rarity, quality or representativeness and on the degree to which the place may contribute further substantial information.

A site or a resource is said to be scientifically significant when its further study may be expected to help current research questions. That is, scientific significance is defined as research potential (Marquis-Kyle & Walker 1992).

Social Value

The social value of a place is perhaps the most difficult value for heritage professionals to substantiate (Johnston 1994). However, social value is broadly defined as 'the qualities for which a place has become a focus of spiritual, political, natural or other cultural sentimental to a majority or minority group' (ICOMOS 1988:30). In What is Social Value, Johnston (1994) has provided a clear definition of social value:

"Social value is about collective attachment to places that embody meaning important to a community, these places are usually community owned or publicly accessible or in some other way 'appropriated' into people's daily lives. Such meanings are in addition to other values, such as the evidence of valued aspects of history or beauty, and these meanings may not be apparent in the fabric of the place, and may not be apparent to the disinterested observer". (Johnston 1994:10)

Although encompassed within the criterion of social value, the spiritual value of a place is a relatively new addition to the Burra Charter (ICOMOS 1999:1). Spiritual value is predominantly used to assess places of cultural significance to Indigenous Australians.

The degree to which a place is significant can vary. As Johnston (1994:3) has stated when trying to understand significance a 'variety of concepts [are] used from a geographical comparison ('national', 'state', 'local') to terms such as 'early', 'rare', or 'seminal''. Indeed, the Burra Charter clearly states that when assessing historic significance, one should note that for:

"any given place the significance will be greater where evidence of the association or event survives in situ, or where the setting are substantially intact, than where it has been changed or evidence does not survive". (ICOMOS 1988:29)

8.3 Significance Criteria Relevant to Indigenous Sites

Indigenous heritage sites and places may have educational, tourism and other values to groups in society. However, their two principal values are likely to be in terms of their cultural / social significance to Aboriginal people and their scientific / archaeological significance. These are the two criteria that are commonly used in establishing the significance of Aboriginal sites. The following provides an explanation of these criteria.

1) Aboriginal Cultural / Social Significance

This relates to the value placed upon a site or suite of sites by the local or regional Aboriginal community. The identification and assessment of those sites that are significant to Aboriginal people is a matter for Aboriginal people. This assessment can only be made by the appropriate Aboriginal representatives of the relevant communities.

2) Scientific (Archaeological) Significance

Archaeological significance values (or scientific values) generally are assessed on the potential of a site or place to generate knowledge through archaeological research or knowledge. Bowdler (1984) states that the scientific significance should be assessed according to timely and specific research questions (research potential) and site representativeness.

Research potential entails the potential of a site or suite of sites for scientific research and excavation. This is measured in terms of a site's ability to provide information on aspects of Aboriginal culture. In this respect, the contents of a site and their state of preservation are important considerations.

Representativeness takes account of how common a site type is (Bowdler 1984). That is, it allows sites to be evaluated with reference to the known archaeological record within the given region. The primary goal of cultural resource management is to afford the greatest protection to a representative sample of sites throughout a region. The corollary of a representative site is the notion of a rare or unique site. These sites may help to understand the patterning of more common sites in the surrounding area, and are therefore often considered of archaeological significance. The concept of a rarity cannot be easily separated from that of representativeness. If a site is determined to be rare, then it will, by definition, be included as part of the representative sample of that site type.

The concepts of both research potential and representativeness are ever changing variables. As research interests shift and archaeological methods and techniques change, then the criteria for assessing site significance are also re-evaluated. As a consequence, the sample of site types which are used to assess site significance must be large enough to account for the change in these variables.

8.4 Summary Significance Ratings for Recorded Sites

s42 [redacted] As discussed in section 8.2, Aboriginal sites are usually assessed in terms of their scientific and social significance. The concepts of Aesthetic significance and Historic significance are rarely applied in the assessment of Aboriginal sites unless there is direct evidence for European/Aboriginal contact activity at the site, or the site has specific and outstanding aesthetic values. However, based on advice received from AHT, aesthetic and historic significance values have also been taken into consideration as part of the assessment of the site.

A five tiered rating system has been adopted for the significance assessment; low, low-medium, medium, medium-high and high. Table 4 provides the summary details for significance ratings for site AH1126. A more detailed explanation for the assessment ratings are presented in sections 8.5 to 8.7. Section 8.8 provides an assessment of significance in relation to the *Aboriginal Heritage Act 1975* (the Act). Section 9 of this report presents a statement of social significance provided by Out of scope [redacted] for the recorded site and the area more broadly.

s42 [redacted]

8.5 Scientific Significance for Recorded Sites

Archaeological (or scientific) significance values generally are assessed on the potential of a site or place to generate knowledge through archaeological research or knowledge. Bowdler (1984) states that the scientific significance should be assessed according to timely and specific research questions (research potential) and site representativeness. Research potential entails the potential of a site or suite of sites for scientific research and excavation. This is measured in terms of a site's ability to provide information on aspects of Aboriginal culture. In this respect, the contents of a site and their state of preservation are important considerations. Representativeness takes account of how common a site type is (Bowdler 1984).

s42 [redacted]

s42 [redacted]

8.6 Aesthetic Significance of Recorded Sites

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and materials of the fabric; the smells and sounds associated with the place and its use (Marquis-Kyle & Walker 1992).

s42 [redacted] his section of the River Derwent estuary around Kangaroo Bay has been heavily modified and developed, which diminishes the aesthetic significance of the site. Nonetheless, the foreshores are still quite picturesque and the aesthetic significance of the site is assessed as medium.

8.7 Historic Significance of Recorded Sites

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment (Marquis-Kyle & Walker 1992).

Historic significance is not an attribute often considered when assessing the significance of Aboriginal sites unless there is direct evidence for some form of European/Aboriginal contact activity. In this instance no such specific evidence exists for site AH1126.

8.8 Significance Under the Aboriginal Heritage Act 1975

In Tasmania, the *Aboriginal Heritage Act 1975* (the Act) is the primary Act for the treatment of Aboriginal cultural heritage. Under Part 1, Section 2(8) of *the Aboriginal Heritage Act 1975,* Aboriginal tradition and significance is defined as follows.

Aboriginal tradition means –

(a) the body of traditions, knowledge, observances, customs and beliefs of Aboriginal people generally or of a particular community or group of Aboriginal people; and
(b) any such tradition, knowledge, observance, custom or belief relating to particular persons, areas, objects or relationships;

significance, of a relic, means significance in accordance with –

(a) the archaeological or scientific history of Aboriginal people; or
(b) the anthropological history of Aboriginal people; or
(c) the contemporary history of Aboriginal people; or
(d) Aboriginal tradition.

In accordance with the *Aboriginal Heritage Standards and Procedures 2018,* Aboriginal heritage assessments in Tasmania have addressed the issue of significance as per the Burra Charter 2013. This approach has been adopted for this assessment (see sections 8.1 to 8.7 above). However, AHT have now advised that in order to ensure compliance with the *Aboriginal Heritage Act 1975* (the Act), assessments are now also to also consider significance and Aboriginal tradition as defined in the Act.

The Act came into effect in 1975, which is several decades before the Burra Charter Guidelines and protocols for determining significance were developed. To a large extent, the definitions of Aboriginal tradition and significance, as defined under Section 2(8) of the Act are covered by the Burra Charter and have been addressed in this report.

The archaeological or scientific history of Aboriginal people (a) is covered under the concept of Scientific significance. This component of significance, as it relates to sites identified during this current assessment, have been addressed in detail in sections 8.2, 8.3 and 8.5 of this report.

Aboriginal cultural, social and spiritual significance under the Burra Charter relates to the value placed upon a site or suite of sites by the local or regional Aboriginal community (see sections 8.2 and 8.3 of this report). The definition of Aboriginal tradition, as provided in the Act, is broadly covered under this section of the Burra Charter. As is the anthropological history of Aboriginal people (b), the contemporary history of Aboriginal people (c) and Aboriginal tradition (d).

The notion of Aboriginal cultural, social and spiritual significance, and the assessment of these values is a matter for Aboriginal people and can only be made by the appropriate Aboriginal representatives of the relevant communities. Section 9 of this report presents a statement of cultural/social significance provided by Out of scope for s42 and the broader area. Out of scope is an experienced Aboriginal Heritage Officer, and a respected member of the Tasmanian Aboriginal community. He is appropriately skilled and experienced to make these cultural values statements. The report has also been distributed to a select range of Tasmanian Aboriginal organisations for review, comment and feedback. The outcome of this consultation is presented in Appendix 4.

As described in section 3 of this report, the available ethnographic information indicates that the study area was part of the territory of the Moomairremener people from the Oyster Bay Nation.

s42 is just one of a large number of Aboriginal sites that have been recorded along the eastern foreshores of the River Derwent estuary. These sites provide important tangible evidence for the Aboriginal occupation of this area and are highly important to the Tasmanian Aboriginal community (see section 9 below). The River Derwent estuary was likely to have been an important major resource zone for the Moomairremener people, and the Aboriginal sites recorded in this area are likely to be a small extant remnant of much larger site complexes that existed in this area prior to European development around this part of the River Derwent.

9.0 Consultation with Aboriginal Communities and Statement of Aboriginal Significance

The designated Aboriginal Heritage Officer (AHO) for this project is Out of scope. One of the primary roles of the Aboriginal Heritage Officer is to consult with Aboriginal community groups. The main purpose of this consultation process is:

- to advise Aboriginal community groups of the details of the project,
- to convey the findings of the Aboriginal heritage assessment,
- to document the Aboriginal social values attributed to Aboriginal heritage resources in the study area,
- to discuss potential management strategies for Aboriginal heritage sites, and
- to document the views and concerns expressed by the Aboriginal community representatives.

s42

s42

Statement of Cultural/Social Significance by Out of scope

Aboriginal heritage provides a direct link to the past, however is not limited to the physical evidence of the past. It includes both tangible and intangible aspects of culture. Physical and spiritual connection to land and all things within the landscape has been, and continues to be, an important feature of cultural expression for Aboriginal people since creation.

Physical evidence of past occupation of a specific place may include artefacts, living places (middens), rock shelters, markings in rock or on the walls of caves and/or rock shelters, burials and ceremonial places. Non-physical aspects of culture may include the knowledge (i.e. stories, song, dance, weather patterns, animal, plant and marine resources for food, medicines and technology) connected to the people and the place. While so much of the cultural landscape that was ***Lutruwita*** *(Tasmania) before invasion and subsequent colonization either no longer exists, or has been heavily impacted on, these values continue to be important to the Tasmanian Aboriginal community and are relevant to the region of the project proposal.*

There is no doubt in my mind that the Kangaroo Bay area would have been a focal point of seasonal occupation for my people. The Bay is situated on the margins of ***Timtumili Minanya (****the River Derwent), where there was (and still is) an abundance of marine resources, and there was fresh water available in the form of the nearby Kangaroo Bay Rivulet. This combination of easily available resources would have meant that our people camped in this area on a regular basis. This occupation is likely to have extended further inland, particularly the gentler sloping areas, closer to the Rivulet. Unfortunately, the archaeological evidence for this occupation now appears to have been largely destroyed by European invasion and development. The few recorded Aboriginal sites that are still present within the surrounds of Kangaroo Bay area are highly valued by the Tasmanian Aboriginal community as they provide a strong tangible link with our* ***Pakana Ngini*** *(the Old People). To that end, the remaining physical evidence must be protected from further destruction.*

s42 [redacted]

Even if the site of the project proposal contains no evidence of Aboriginal heritage there is always the cultural resources (flora, fauna, aquaculture or any other resource values that the earth may offer) and the living landscape, which highlight the high significance to the Aboriginal cultural heritage values to the country.

The River Derwent, including the estuary area has always been an important resource zone for our people, and this estuary system is still rich in resources important to our people. The large number of midden sites recorded along the estuary provide strong tangible evidence of the importance of this area to our ancestors and provides testimony to the occupation of this area by our people for thousands of years. Within the study area that was the focus of our assessment, virtually all of the bushtucker resources have been cleared as part of urban development and the construction of the Rosny Golf Course. As a consequence, the construction of the proposed AFL High Performance Centre will not have any additional impacts on the cultural values of the area.

This project does provide the opportunity for interpretation initiatives to be implemented, which highlight the importance of ***Timtumili Minanya (****the River Derwent) and the mountains fringing the River to the Tasmanian Aboriginal community, past and present. I would urge State Growth and the Clarence city council to pursue these interpretation initiatives.*

10.0 Statutory Controls and Legislative Requirements

The following provides an overview of the relevant State and Federal legislation that applies for Aboriginal heritage within the state of Tasmania.

10.1 State Legislation

In Tasmania, the *Aboriginal Heritage Act 1975* (the Act) is the primary Act for the treatment of Aboriginal cultural heritage. The Act is administered by the Minister for Aboriginal Affairs through Aboriginal Heritage Tasmania (AHT). AHT is the regulating body for Aboriginal heritage in Tasmania and '[n]o fees apply for any application to AHT for advice, guidance, lodgement or permit application'.

The Act applies to 'relics' which are any object, place and/or site that is of significance to the Aboriginal people of Tasmania (as defined in section 2(3) of the Act). The Act defines what legally constitutes unacceptable impacts on relics and a process to approve impacts when there is no better option. Aboriginal relics are protected under the Act and it is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister. It is illegal to sell or offer for sale a relic, or to cause or permit a relic to be taken out of Tasmania without a permit (section 2(4) qualifies and excludes 'objects made, or likely to have been made, for purposes of sale').

Section 10 of the Act sets out the duties and obligations for persons owning of finding an Aboriginal relic. Under section 10(3) of the Act, a person shall, as soon as practicable after finding a relic, inform the Director or an authorised officer of the find.

It should be noted that with regard to the discovery of suspected human skeletal remains, the *Coroners Act 1995* takes precedence. The *Coroners Act 1995* comes into effect initially upon the discovery of human remains, however once determined to be Aboriginal the *Aboriginal Heritage Act* overrides the *Coroners Act.*

In August 2017, the Act was substantively amended and the title changed from the *Aboriginal Relics Act 1975*. As a result, the AHT *Guidelines to the Aboriginal Heritage Assessment Process* were replaced by the *Aboriginal Heritage Standards and Procedures*. The Standards and Procedures are named in the statutory *Guidelines* of the Act issued by the Minister under section 21A of the Act. Other amendments include:

- An obligation to fully review the Act within three years.
- Increases in maximum penalties for unlawful interference or damage to an Aboriginal relic. For example, maximum penalties (for deliberate acts) are 10,000 penalty unites (currently $1.57 million) for bodies corporate other than small business entities and 5,000 penalty units (currently $785,000) for individuals or small business entities; for reckless or negligent offences, the maximum penalties are 2,000 and 1,000 penalty units respectively (currently $314,000 and $157,000). Lesser offences are also defined in sections 10, 12, 17 and 18.
- Prosecution timeframes have been extended from six months to two years.

- The establishment of a statutory Aboriginal Heritage Council to advise the Minister.

Section 21(1) specifies the relevant defence as follows: “It is a defence to a prosecution for an offence under section 9 or 14 if, in relation to the section of the Act which the defendant is alleged to have contravened, it is proved … that, in so far as is practicable … the defendant complied with the guidelines”.

10.2 Commonwealth Legislation

There are also a number of Federal Legislative Acts that pertain to cultural heritage. The main Acts being; *The Australian Heritage Council Act 2003*, *The Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *Environment Protection and Biodiversity Conservation Act 1999*

Australian Heritage Council Act 2003 (Comm)

The *Australian Heritage Council Act 2003* defines the heritage advisory boards and relevant lists, with the Act’s Consequential and Transitional Provisions repealing the Australian Heritage Commission Act 1975. The Australian Heritage Council Act, like the Australian Heritage Commission Act, does not provide legislative protection regarding the conservation of heritage items in Australia, but has compiled a list of items recognised as possessing heritage significance to the Australian community. The Register of the National Estate, managed by the Australian Heritage Council, applies no legal constraints on heritage items included on this list.

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984.

This Federal Act was passed to provide protection for the Aboriginal heritage, in circumstances where it could be demonstrated that such protection was not available at a state level. In certain instances, the Act overrides relevant state and territory provisions.

The major purpose of the Act is to preserve and protect from injury and desecration, areas and objects of significance to Aborigines and Islanders. The Act enables immediate and direct action for protection of threatened areas and objects by a declaration from the Commonwealth minister or authorised officers. The Act must be invoked by, or on behalf of an Aboriginal or Torres Strait Islander or organisation.

Any Aboriginal or Torres Strait Islander person or organization may apply to the Commonwealth Minister for a temporary or permanent 'Stop Order' for protection of threatened areas or objects of significant indigenous cultural heritage.

The Commonwealth Act 'overrides' State legislation if the Commonwealth Minister is of the opinion that the State legislation (or undertaken process) is insufficient to protect the threatened areas or objects. Thus, in the event that an application is made to the Commonwealth Minister for a Stop Order, the Commonwealth Minister will, as a matter of course, contact the relevant State Agency to ascertain what protection is being imposed by the State and/or what mitigation procedures have been proposed by the landuser/developer.

In addition to the threat of a 'Stop Order' being imposed, the Act also provides for the following:

- If the Federal Court, on application from the Commonwealth Minister, is satisfied that a person has engaged or is proposing to engage in conduct that breaches the 'Stop Order', it may grant an injunction preventing or stopping such a breach (s.26). Penalties for breach of a Court Order can be substantial and may include a term of imprisonment;
- If a person contravenes a declaration in relation to a significant Aboriginal area, penalties for an individual are a fine up to $10,000.00 and/or 5 years gaol and for a Corporation a fine up to $50,000.00 (s.22);
- If the contravention is in relation to a significant Aboriginal object, the penalties are $5,000.00 and/or 2 years gaol and $25,000.00 respectively (s.22);
- In addition, offences under s.22 are considered 'indictable' offences that also attract an individual fine of $2,000 and/or 12 months gaol or, for a Corporation, a fine of $10,000.00 (s.23). Section 23 also includes attempts, inciting, urging and/or being an accessory after the fact within the definition of 'indictable' offences in this regard.

The Commonwealth Act is presently under review by Parliament and it is generally accepted that any new Commonwealth Act will be even more restrictive than the current legislation.

Environment Protection and Biodiversity Conservation Act 1999 (Comm)

This Act was amended, through the Environment and Heritage Legislation Amendment Act (No1) 2003 to provide protection for cultural heritage sites, in addition to the existing aim of protecting environmental areas and sites of national significance. The Act also promotes the ecologically sustainable use of natural resources, biodiversity and the incorporation of community consultation and knowledge.

The 2003 amendments to the *Environment Protection and Biodiversity Conservation Act 1999* have resulted in the inclusion of indigenous and non-Indigenous heritage sites and areas. These heritage items are defined as:
'*indigenous heritage value of a place means a heritage value of the place that is of significance to indigenous persons in accordance with their practices, observances, customs, traditions, beliefs or history'*;

Items identified under this legislation are given the same penalty as actions taken against environmentally sensitive sites. Specific to cultural heritage sites are §324A-324ZB.

Environment and Heritage Legislation Amendment Act (No1) 2003 (Comm)

In addition to the above amendments to the *Environment Protection and Biodiversity Conservation Act 1999* to include provisions for the protection and conservation of heritage, the Act also enables the identification and subsequent listing of items for the Commonwealth and National Heritage Lists. The Act establishes the *National Heritage List*, which enables the inclusion of all heritage, natural, Indigenous and non-Indigenous, and the *Commonwealth Heritage List*, which enables listing of sites nationally and internationally that are significant and governed by Australia.

In addition to the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, amendments made to the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* enables the identification and subsequent listing of indigenous heritage values on the Commonwealth and/or National Heritage Lists (ss. 341D & 324D respectively). Substantial penalties (and, in some instances, gaol sentences) can be imposed on any person who damages items on the National or Commonwealth Heritage Lists (ss. 495 & 497) or provides false or misleading information in relation to certain matters under the Act (ss.488-490). In addition, the wrongdoer may be required to make good any loss or damage suffered due to their actions or omissions (s.500).

11.0 Aboriginal Cultural Heritage Management Plan

Heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Background research into the extant archaeological and ethno-historic record for the study area and the surrounding region (see sections 3 and 4 of the report).
- The results of the investigation as documented in section 7 this report.
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (The Act); as summarised in section 10.
- Consultation with [redacted] (Aboriginal Heritage Officer), and Aboriginal community consultation, as detailed in section 9 and Appendix 4.

The recommendations are aimed at minimising the impact of the proposed AFL high Performance Centre on Aboriginal heritage resources. Figures 14 shows the location of the site discussed in the management recommendations.

[redacted]

[redacted]

- s42

As specified in section 10.1 of this report, all Aboriginal relics are protected under the *Aboriginal Heritage Act 1975* (The Act). It is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister. s42

Recommendation 2 (Program of Sub-surface Investigations)

s42

[redacted]

[redacted]

Recommendation 3 (Unanticipated Discovery Plan)

If, during the course of these future works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 3). A copy of the Unanticipated Discovery Plan should be kept on-site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the Aboriginal Heritage Act 1975 (the Act).

Recommendation 4 (Provision of Reports)

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.

AFL High Performance Centre

[redacted]

s42

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Glossary of Terms

Aboriginal Archaeological Site
A site is defined as any evidence (archaeological features and/or artefacts) indicating past Aboriginal activity, and occurring within a context or place relating to that activity. The criteria for formally identifying a site in Australia vary between States and Territories.

Artefact
A portable object that has been humanly made or modified (see also stone artefact).

Assemblage (lithic)
A collection of complete and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting artefacts scattered on the ground surface, or by controlled excavation.

Broken Flake
A flake with two or more breakages, but retaining its area of break initiation.

Chert
A highly siliceous rock type that is formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. Like chalcedony, chert was valued by Aboriginal people as a stone material for manufacturing stone tools. The rock type often breaks by conchoidal (shell like) fracture, providing flakes that have hard, durable edges.

Cobble
Water worn stones that have a diameter greater than 64mm (about the size of a tennis ball) and less than 256mm (size of a basketball).

Core
A piece of stone, often a pebble or cobble, but also quarried stone, from which flakes have been struck for the purpose of making stone tools.

Core Fragments
A piece of core, without obvious evidence of being a chunky primary flake.

Cortex
The surface of a piece of stone that has been weathered by chemical and/or physical means.

Debitage
The commonly used term referring to the stone refuse discarded from knapping. The manufacturing of a single implement may result in the generation of a large number of pieces of debitage in an archaeological deposit.

Flake (general definition)
A piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually shows evidence of hard indenter initiation, or occasional bending initiation. The most common type of flake is the 'conchoidal flake'. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front.

Flake fragment
An artefact that does not have areas of fracture initiation, but which displays sufficient fracture surface attributes to allow identification as a stone artefact fragment.

Flake portion (broken flake)
The proximal portion of a flake retaining the area of flake initiation, or a distal portion of a flake that retains the flake termination point.

Flake scraper
A flake with retouch along at least one margin. The character of the retouch strongly suggests shaping or rejuvenation of a cutting edge.

Nodules
Regular or irregular cemented masses or nodules within the soil. Also referred to as concretions and buckshot gravel. Cementing agents may be iron and/or manganese oxides, calcium carbonate, gypsum etc. Normally formed in situ and commonly indicative of seasonal waterlogging or a fluctuating chemical environment in the soil such as; oxidation and reduction, or saturation and evaporation. Nodules can be redistributed by erosion. (See also 'concretion').

Pebble
By geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.

Quartz
A mineral composed of crystalline silica. Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. Quartz is abundantly common and was used by Aboriginal people throughout Australia to make light-duty cutting tools. Despite the often unpredictable nature of fracture in quartz, the flakes often have sharp cutting edges.

Quartzite
A hard silica rich stone formed in sandstone that has been recrystallised by heat (metaquartzite) or strengthened by slow infilling of silica in the voids between the sand grains (Orthoquartzite).

Retouch (on stone tools)
An area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after breakage or blunting of a cutting edge. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', retouch flake' etc).

Scraper
A general group of stone artefacts, usually flakes but also cores, with one or more retouched edges thought to have been used in a range of different cutting and scraping activities. A flake scraper is a flake with retouch along at least one margin, but not qualifying for attribution to a more specific implement category. Flake scrapers sometimes also exhibit use-wear on the retouched or another edge.

Silcrete
A hard, fine grained siliceous stone with flaking properties similar to quartzite and chert. It is formed by the cementing and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material, by a low temperature physico-chemical process. Silcrete is essentially composed of quartz grains cemented by microcrystalline silica. The clasts in silcrete bare most often quartz grains but may be chert or chalcedony or some other hard mineral particle. The mechanical properties and texture of silcrete are equivalent to the range exhibited by chert at the fine-grained end of the scale and with quartzite at the coarse-grained end of the scale. Silcrete was used by Aboriginal people throughout Australia for making stone tools.

Site Integrity
The degree to which post-depositional disturbance of cultural material has occurred at a site.

Stone Artefact
A piece (or fragment) of stone showing evidence of intentional human modification.

Stone procurement site
A place where stone materials is obtained by Aboriginal people for the purpose of manufacturing stone artefacts. In Australia, stone procurement sites range on a continuum from pebble beds in water courses (where there may be little or no evidence of human activity) to extensively quarried stone outcrops, with evidence of pits and concentrations of hammerstones and a thick layer of knapping debris.

Stone tool
A piece of flaked or ground stone used in an activity, or fashioned for use as a tool. A synonym of stone tool is ‘implement’. This term is often used by archaeologists to describe a flake tool fashioned by delicate flaking (retouch).

Use wear
Macroscopic and microscopic damage to the surfaces of stone tools, resulting from its use. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding bevelling.

Appendix 1

Gazetteer of Recorded Sites

AH No.	**Grid Reference (GDA 94)**	**Site Type**	**Site Description**

s42

Appendix 2

Detailed Site Descriptions

s42

s42 [redacted]

[redacted]

[redacted]

s42

[redacted]

s42

[redacted]

Appendix 3

Unanticipated Discovery Plan

Unanticipated Discovery Plan

Procedure for the management of unanticipated
discoveries of Aboriginal relics in Tasmania

For the management of unanticipated discoveries of Aboriginal relics in accordance with the *Aboriginal Heritage Act 1975* and the *Coroners Act 1995*. The Unanticipated Discovery Plan is in two sections.

Discovery of Aboriginal Relics other than Skeletal Material

Step 1:

Any person who believes they have uncovered Aboriginal relics should notify all employees or contractors working in the immediate area that all earth disturbance works must cease immediately.

Step 2:

A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal relics, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal relics have been assessed by a consulting archaeologist, Aboriginal Heritage Officer or Aboriginal Heritage Tasmania staff member.

Step 3:

Contact Aboriginal Heritage Tasmania on **1300 487 045** as soon as possible and inform them of the discovery. Documentation of the find should be emailed to **aboriginalheritage@dpac.tas.gov.au** as soon as possible. Aboriginal Heritage Tasmania will then provide further advice in accordance with the *Aboriginal Heritage Act 1975*.

Discovery of Skeletal Material

Step 1:

Call the Police immediately. Under no circumstances should the suspected skeletal material be touched or disturbed. The area should be managed as a crime scene. It is a criminal offence to interfere with a crime scene.

Step 2:

Any person who believes they have uncovered skeletal material should notify all employees or contractors working in the immediate area that all earth disturbance works cease immediately.

Step 3:

A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal material, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and/or Coroner.

Step 4:

If it is suspected that the skeletal material is Aboriginal, Aboriginal Heritage Tasmania should be notified.

Step 5:

Should the skeletal material be determined to be Aboriginal, the Coroner will contact the Aboriginal organisation approved by the Attorney-General, as per the *Coroners Act 1995*.

Guide to Aboriginal site types

Stone Artefact Scatters

A stone artefact is any stone or rock fractured or modified by Aboriginal people to produce cutting, scraping or grinding implements. Stone artefacts are indicative of past Aboriginal living spaces, trade and movement throughout Tasmania. Aboriginal people used hornfels, chalcedony, spongelite, quartzite, chert and silcrete depending on stone quality and availability. Stone artefacts are typically recorded as being 'isolated' (single stone artefact) or as an 'artefact scatter' (multiple stone artefacts).

Shell Middens

Middens are distinct concentrations of discarded shell that have accumulated as a result of past Aboriginal camping and food processing activities. These sites are usually found near waterways and coastal areas, and range in size from large mounds to small scatters. Tasmanian Aboriginal middens commonly contain fragments of mature edible shellfish such as abalone, oyster, mussel, warrener and limpet, however they can also contain stone tools, animal bone and charcoal.

Rockshelters

An occupied rockshelter is a cave or overhang that contains evidence of past Aboriginal use and occupation, such as stone tools, middens and hearths, and in some cases, rock markings. Rockshelters are usually found in geological formations that are naturally prone to weathering, such as limestone, dolerite and sandstone

Quarries

An Aboriginal quarry is a place where stone or ochre has been extracted from a natural source by Aboriginal people. Quarries can be recognised by evidence of human manipulation such as battering of an outcrop, stone fracturing debris or ochre pits left behind from processing the raw material. Stone and ochre quarries can vary in terms of size, quality and the frequency of use.

Rock Marking

Rock marking is the term used in Tasmania to define markings on rocks which are the result of Aboriginal practices. Rock markings come in two forms; engraving and painting. Engravings are made by removing the surface of a rock through pecking, abrading or grinding, whilst paintings are made by adding pigment or ochre to the surface of a rock.

Burials

Aboriginal burial sites are highly sensitive and may be found in a variety of places, including sand dunes, shell middens and rock shelters. Despite few records of pre-contact practices, cremation appears to have been more common than burial. Family members carried bones or ashes of recently deceased relatives. The Aboriginal community has fought long campaigns for the return of the remains of ancestral Aboriginal people.

Further information on Aboriginal Heritage is available from:

Aboriginal Heritage Tasmania
Community Partnerships and Priorities
Department of Premier and Cabinet
GPO Box 123 Hobart TAS 7001

Telephone: **1300 487 045**
Email: **aboriginalheritage@dpac.tas.gov.au**
Web: **www.aboriginalheritage.tas.gov.au**

Tasmanian Government

Appendix 4

Aboriginal Community Consultation Outcomes

Document 2

Tasmanian AFL High Performance Centre

Rosny Park

Natural Values Constraints Analysis

29 May 2024

For Department of State Growth

DSG054

313 Macquarie Street, Hobart Tasmania, 7000

03 62319788

admin@northbarker.com.au www.northbarker.com.au

Summary

Three location options for an AFL High Performance Centre are reviewed for constraints imposed by natural values. The options include two at Rosny in Clarence and one at Kingston in Kinborough.

Option 1: Rosny - Charles Hand Park and Rosny Parklands

Option 2: Rosny - Rosny Parklands only

Option 3: Kingston - Twin Ovals Park

Each option includes the construction of two ovals, the high-performance centre, car parks and other facilities. Relocation of existing sporting facilities form part of option 3.

The timeframe for the development of the AFL High Performance Centre is partially dependent on the planning approvals pathway, which amongst other things, will need to address any natural values impacts in accordance with relevant Commonwealth, State and local authority approvals.

The passage through the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) can be drawn out where matters of national environmental significance are prominent. This process risks delay in the scheduled development timeframe.

s39

[redacted]

[redacted]

[redacted]

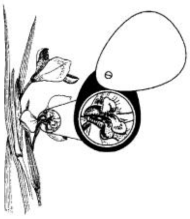
Out of scope

s39

[redacted]

Document version control:

V0.1	Prepared by [redacted] [redacted] NBES	First Draft Option 1	27/02/2024
V1.0	[redacted] [redacted]r NBES	Review	01/03/2024
V2.0	[redacted] [redacted]NBES	Three Options	24/05/2024
V 2.1	[redacted] [redacted] NBES	Include figures	29/05/2024



CONTENTS

FIGURES

1 INTRODUCTION

1.1 Purpose

The Department of State Growth is tasked with the delivery of a new AFL High Performance Centre that will include the construction of two ovals, along with associated buildings and car parks.

The preferred location for the AFL High Performance Centre at Rosny Park (Figure 1), in Clarence is assessed for potential impacts to biodiversity values. Specific consideration is made of two concept design options. Option 1 includes one oval at Charles Hand Park with a second oval across Rosny Hill Road on Rosny Parklands. Option 2 concentrates all development on Rosny Parklands avoiding Charles Hand Park entirely.

A third option at Twin Ovals site in Kingborough is also considered (Section 5).

This assessment considers legislative implications relating to natural values with primary focus on the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) which would have the most significant time constraint consequences due to the protracted approvals process where significant impacts to matters of national environmental significance (MNES) are possible.

Consideration is also given to the Tasmanian *Threatened Species Protection Act 1995* (TSP Act) and the Natural Assets Code of the Tasmanian Planning Scheme plus relevant codes under the Kinborough Interim Planning Scheme 2015.

Comparison is made between the three options with regard to the complexities of the approval's pathway for impacts to natural values.

1.2 Date of Surveys

Rosny: Site reconnaissance 19 February 2024. Detailed tree surveys 13, 14, 20 May.

Out of scope

1.3 Method

The site reconnaissance work involved a broad meander across the sites investigating all perceivable variations in vegetation. There was a focus on likely or known habitats of threatened species with particular attention to habitat trees.

<u>Rosny</u>

The assessment was supported with desktop review of relevant data[1].

Documents reviewed:

- Natural Values Assessment, Rosny Parklands[2]
- Natural Values Atlas Report (NVA)[3]
- Chilean needle grass map, Charles Hand Park[4], .
- *Thelymitra* map, Rosny Parklands[5]

Detailed tree assessment was undertaken from the ground by an ecologist. Each tree was identified to species, labelled with metal tag with id number and measured for trunk diameter 1.4m above ground level (upper side on sloped ground) to classify diameter at breast height (dbh). Each tree was assessed for canopy health (nearest 10 %) applying guidelines described in Vegetation Condition Assessment

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[1] Natural Values Atlas report, TASVEG 4,0 and TASVEG live

[22] Enviro-dynamics 2023

[3] Department of Natural Resources and Environment (2024) downloaded 21/02/2024.

[4] Clarence City Council 2020

[5] Clarence City Council 2023

Manual [6]and searched from multiple angles using binoculars for any evidence of tree hollows. Any trees that were considered to have a potential to support hollows were noted. Potential hollow bearing trees were identified from evidence of unclear dark marks, fissures and shadows (possible hollows) and evidence of outer branches showing sudden angle changes, or swellings (potential spouts). Trees with hollows or potential hollows were selected for further assessment by a tree climber and/or drone.

1.4 Limitations

Rosny

The site reconnaissance does not constitute a thorough natural values assessment in accordance with standard guidelines[7] necessary to properly assess a development project.

The site reconnaissance was undertaken in late summer when ephemeral spring flowering flora are unlikely to be visible. Survey limitations are in part compensated for by considering all listed threatened species from data from the Tasmanian Natural Values Atlas. These data include records of all threatened species known to occur, or with the potential to occur, up to 5 km from the study area. With Rosny Parklands it is also compensated for by access to information from a natural values assessment conducted in 2023 for Clarence City Council [8].

Tree locations were accurately survey by Veris surveyors to provide cm accuracy of their locations. 19 of the 159 trees were not picked up in this survey. Locations for these rely on hand held GPS and so have an accuracy likely to be 3-5 m (up to 10 m) although all have been adjusted to align with aerial imagery, so likely to reasonably close. Two of these trees are included in our assessment as being significantly encroached for option 2, a determination that requires verification with accurate survey.

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[6] Michaels 2022

[7] DPIPWE 2019 Guidelines for Natural Values Assessment for Terrestrial Developments

[8] Enviro-dynamics 2023

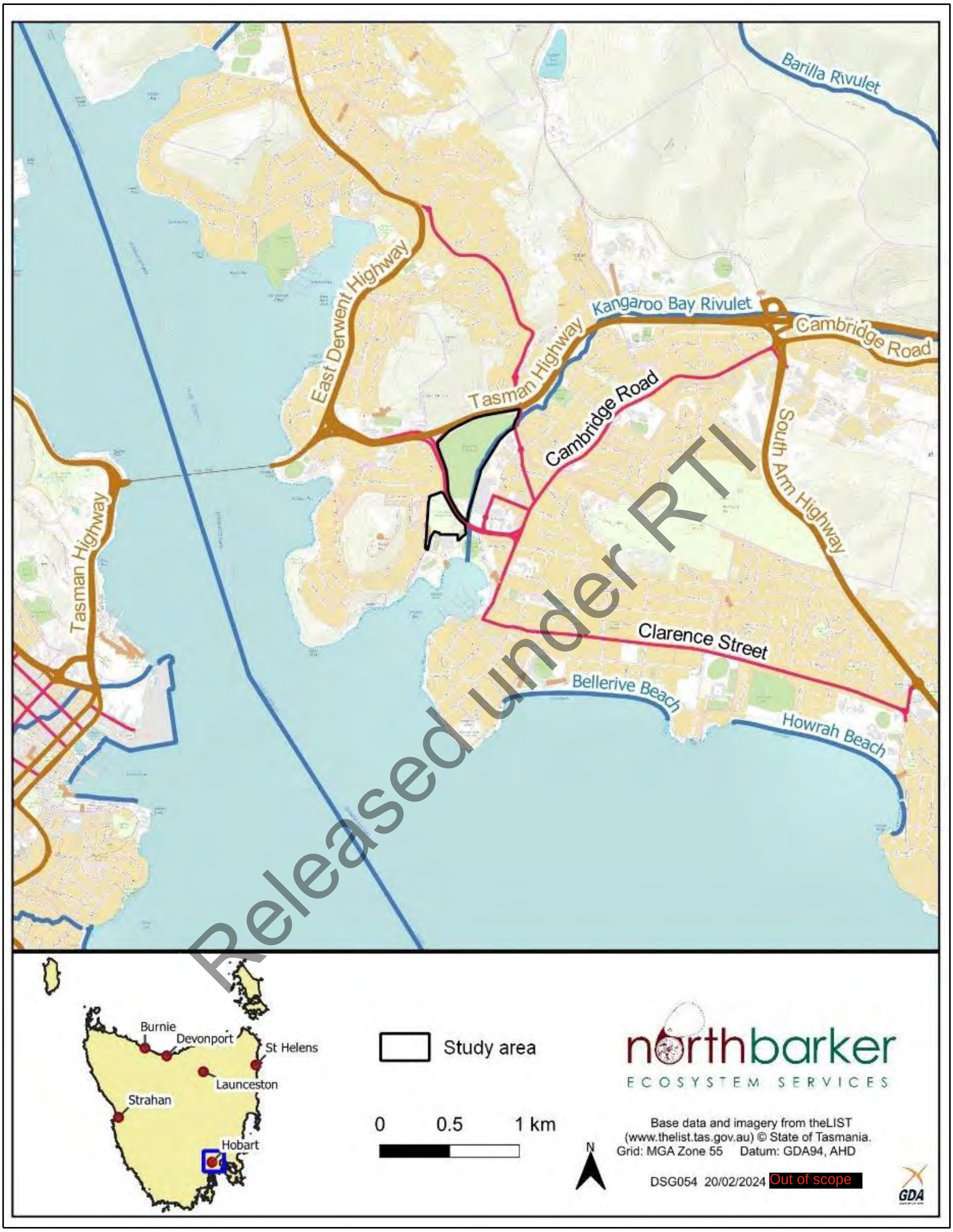

Figure 1: Rosny Project Area

2 ROSNY PARKLANDS AND CHARLES HAND PARK

2.1 Site Description

Rosny Parklands (part of the formerly named Rosny Public Golf Course) occupies 20.6 ha. Charles Hand Memorial Park (Charles Hand Park) is 6.2 ha. Rosny Park and Charles Hand Park are owned and managed by Clarence City Council. The study area also includes some land in the road reserve managed by the Department of State Growth.

Situated within Clarence City Council, Rosny Park is zoned Recreation and Charles Hand Park is zoned Open Space. The overlay 'Waterway and Coastal Protection Area' of the Natural Assets Code applies to a buffer of up to 40 m on the Kangaroo Bay Rivulet.

The land extends from 10 to 50 m asl on a gentle south-east facing slope towards the Kangaroo Bay Rivulet, which runs along the south-eastern boundary of Rosny Park.

The underlying geology of the site is predominantly Jurassic dolerite, excluding a section of Permian – Triassic quartz sandstone by the Kangaroo Bay Rivulet. It is in the Tasmanian Southeast Bioregion.

The site was converted to farmland in the 1800s, then to a golf course in 1915, and managed as a golf course until 2021. Currently, it is managed as public open space by Clarence City Council. Due to this management history, it has a ground layer dominated by introduced pasture and groundcover species, and a mixture of introduced and native trees between the former fairways, some of which are potentially over 100 years old. There is a higher frequency of native species, predominantly wallaby grass, in the ground layer between eucalyptus trees. The most common native tree in these areas is blue gum (*Eucalyptus globulus*), although it is likely most of these are of planted origin. The former fairways continue to be regularly mown, while the eastern and northwestern boundaries of Rosny Parklands are unmown and undergoing assisted and passive regeneration.

The site includes the margins of the Kangaroo Bay Rivulet, which hosts regenerating forest with primarily native canopy over a weed dominated ground layer. The banks of the rivulet are well vegetated with a mix of native and introduced sedges and grasses. Some planting of native understory species has occurred around the weir across the rivulet.

The northern boundary of the site contains a mix of naturally regenerating native forest and planted and invading introduced species.

Charles Hand Park formally formed part of a larger original golf course. This area includes more formal parklands and is contiguous with the grounds of the nearby Rosny College.

2.2 Threatened Vegetation Communities

The entire site is depicted as the mapping unit *urban areas* (FUR) on TASVEG 4 of the Tasmanian vegetation mapping system[9]. TASVEG Live, accessible on The List, adds a polygon of *Eucalyptus ovata* forest and woodland (DOV) along Kangaroo Bay Rivulet.

The 2023 Natural Values Assessment [10] has preferred to allocate the vegetated margins of Kangaroo Bay Rivulet to 'regenerating cleared land' (FRG) with none represented as DOV. That report also identifies a two small patches of Lowland *Themeda triandra* grassland (GTL) and *Bursaria – Acacia* woodland (NBA), both adjacent to the Tasman Highway, retaining the balance as FUR or FRG

The distribution of potentially threatened vegetation communities (with TASVEG codes in brackets) are depicted in Figures 2a and 2b. Taking the precautionary approach we have retained the mapping of

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[9] Kitchener, A. and Harris, S. 2013

[10] Enviro-dynamics 2023

DOV from TASVEG live as there is a clear persisting tree canopy of mature eucalypts dominated by *Eucalyptus ovata* and some elements of other native flora, albeit significantly modified.

The patches of GTL have been digitised from site assessment and cross referring of the natural values report figure.

Potentially threatened vegetation on site:

- *Eucalyptus ovata* forest and woodland (DOV) -from TASVEG live
- Lowland *Themeda triandra* grassland (GTL) – from natural values report[11]

The two vegetation communities recorded on site (DOV and GTL) have the potential to qualify as nationally EBPC listed threatened ecological communities.

Lowland *Themeda triandra* grassland (GTL) occurs in two distinct patches within Rosny Park. GTL can qualify as the threatened ecological community Lowland Native Grasslands of Tasmania (LNGT) where it meets condition thresholds. GTL on site is unlikely to meet these condition thresholds as the combined area of the two patches is less than the minimum 1 ha. GTL is not listed threatened under the *Nature Conservation Act 2002.*

Eucalyptus ovata forest and woodland (DOV) around the Kangaroo Bay Rivulet has the potential to qualify as the threatened ecological community Tasmanian Forests and Woodlands dominated by black gum or Brookers gum. The DOV on site is considered marginal as to whether it meets the condition thresholds of this threatened ecological community and requires further survey to assess relative cover of introduced and native species. The DOV is a listed community under the *Nature Conservation Act 2002*. The concept design footprint avoids direct impact to the DOV within the site.

2.3 Threatened Flora

Nationally threatened flora species are listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

State threated flora species are listed on the Tasmanian *Threatened Species Protection Act 1995* (TSP Act).

The natural values assessment[12] of the Rosny Parklands identified 45 native vascular plant species including two listed threatened species.

The Natural Values Atlas report (Appendix A) lists all threatened flora previously recorded in the vicinity.

One nationally listed threatened species *Dianella amoena* (grassland flaxlily, EPBCA: Endangered, TSPA: rare) exists within the native grassland at the north-east of the site. Targeted survey in December 2023 estimated there to be 35-50 plants dispersed over an area of 600 sqm.

One state listed threatened species *Bolboschoenus caldwellii* (sea clubsedge, TSPA: rare) exists along the margins of the Kangaroo Bay Rivulet to the north of the weir. Targeted survey in December 2023 determined the species to occupy 100-150 sqm being made up of 300-450 plants.

The natural values assessment[13] suggests there is potential habitat for twelve State listed and two nationally listed species. Several other species are documented from the vicinity on the Natural Values Atlas. There remains the potential for some of these to occur, most notably seasonally ephemeral herbs such as orchids.

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[11] Enviro-dynamics 2023

[12] Enviro-dynamics 2023

[13] Enviro-dynamics 2023

One of the patches of the vegetation community Lowland *Themeda triandra* grassland (GTL) found within the site aligns with a patch of unidentified sun orchid (*Thelymitra sp.*)[14]. These provide suitable habitat for the state listed species *Thelymitra bracteata* (leafy sun orchid*,* TSPA: endangered) known from similar habitat on Rosny Hill. Timing of survey should align with the flowering time (usually early October) of the known population at Rosny Hill which can be used as a reference population.

Habitat for nationally listed *Caladenia caudata* (tailed spider orchid, EPBCA: vulnerable, TSPA: vulnerable), known locally from Waverly Flora Park is considered 'marginal'[15]. Timing of survey should align with the flowering time (usually late August) of the known population at Waverly Flora Park which can be used as a reference population.

The location of threatened flora and potential threatened flora habitat is included in Figures 2a and 2b.

Both options largely avoid direct impact to the locations of threatened vegetation and threatened flora.

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[14] Clarence City Council 2023

[15] Environmental Dynamics 2023

s42

[redacted]

Figure 2a: Threatened vegetation and threatened flora Rosny - Option 1

s42

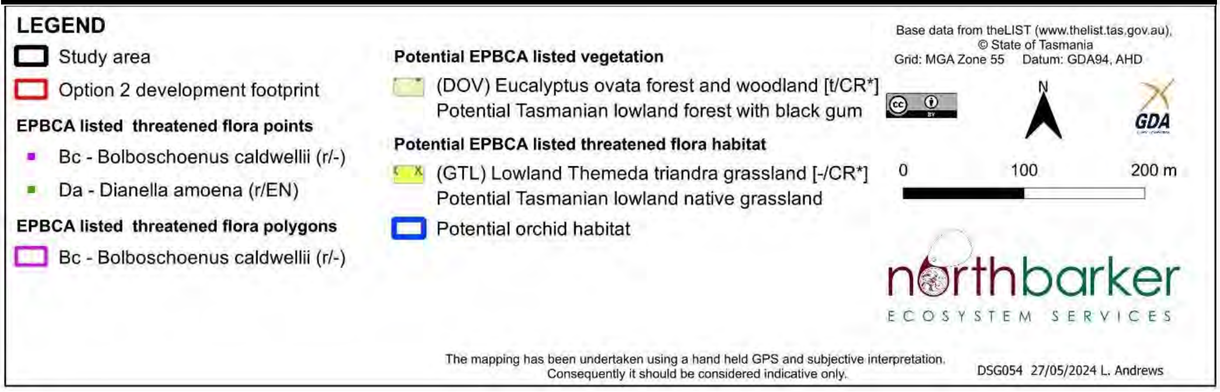

Figure 2b: Threatened vegetation and threatened flora Rosny – Option 2

2.4 Threatened Fauna

The natural values assessment for Rosny Parklands[16] considers 17 threatened fauna species recorded within 2 km of which habitat on site is suitable for eight species. The Natural Values Atlas report (Appendix A) lists all threatened fauna considered to potentially occur, based on habitat values.

The natural values assessment concludes that there is significant habitat for just one species - the nationally listed swift parrot (*Lathamus discolor*, EPBCA: critically endangered, TSPA: endangered). It also makes reference to there being suitable habitat for the eastern barred bandicoot (*Perameles gunnii,* EPBC Act: vulnerable, TSP Act: not listed).

Swift parrot

Eucalyptus globulus (blue gum), distributed throughout the site, and *Eucalyptus ovata* (black gum), confined to Kangaroo Bay Rivulet, are foraging trees for the swift parrot. A total of 155 foraging trees (with a trunk diameter dbh of more than 40 cm) were identified on site. Accepted guidelines suggest trees with dbh > 40 cm constitute significant foraging habitat[17].

Although there are few observation records for swift parrots from the vicinity of Rosny Parklands on the Natural Values Atlas there are numerous anecdotal reports[18] and it can be expected that foraging occurs whenever there is large flowering event. Foraging trees area premium where they occur in proximity to known nesting areas such as the Meehan Range, little more than 2 km to the north west.

Potential nesting habitat for swift parrots includes trees supporting suitably sized hollows, often as spouts on outlying branches. The likelihood of hollow formation in trees increases with age. An accepted guideline for trees in dry forests having the greatest likelihood of hollow formation is with trunk diameter > 70 cm, of which there are 109 trees [19].

Two trees have a dbh > 150 cm, and a further 59 have a dbh > 100 cm (two of these are other eucalypt species, *Eucalyptus pulchella* and *E. viminalis*). Trees of this girth are generally considered to have a high likelihood of containing hollows suitable for nesting of swift parrots and other hollow nesting threatened species such as the Tasmanian masked owl (*Tyto novaehollandiae castanops*, EPBCA Vulnerable, TSPA: endangered) and blue winged parrot (*Neophema chrysostoma*, EPBCA: vulnerable).

The proxy of girth for likelihood of bearing hollows was developed from observations in a forest situation. In the context of an irrigated parkland, trees are likely to have grown faster and be healthier than in a forest situation, reducing the likelihood of hollows at this girth compared to trees of the same size in a forest.

A targeted ground survey conducted in May 2024 involved considered assessment of all trees. We identified 23 with observable hollows plus another 18 with high likelihood of hollows based on conformation of tree limbs allowing for possible spouts (hollows at end of broken-off branches) or scars of excised branches high in the tree that may or may not be hollow.

The most obvious hollows could be seen to be in use with well-polished entrances and galahs were seen investigating two of them.

Approximately 25 % of trees on site carry or have a very high potential to carry hollows. All these trees will be assessed in closer detail by a zoologist tree climber supported with aerial drone inspection of the out of reach hollows. This will confirm with greater certainty which trees are currently hollow bearing.

It is unlikely that swift parrots would ever nest on Rosny Parklands, and extremely unlikely at Charles Hand Park. Swift parrots prefer to nest in more extensive forest environments such as are found in the

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[16] Enviro-dynamics 2023
[17] Forest Practices Authority 2014
[18] Observed foraging in larger trees on the grounds of Rosny College that adjoin Charles Hand Park (Andrew North pers obs).
[19] Forest Practices Authority 2014

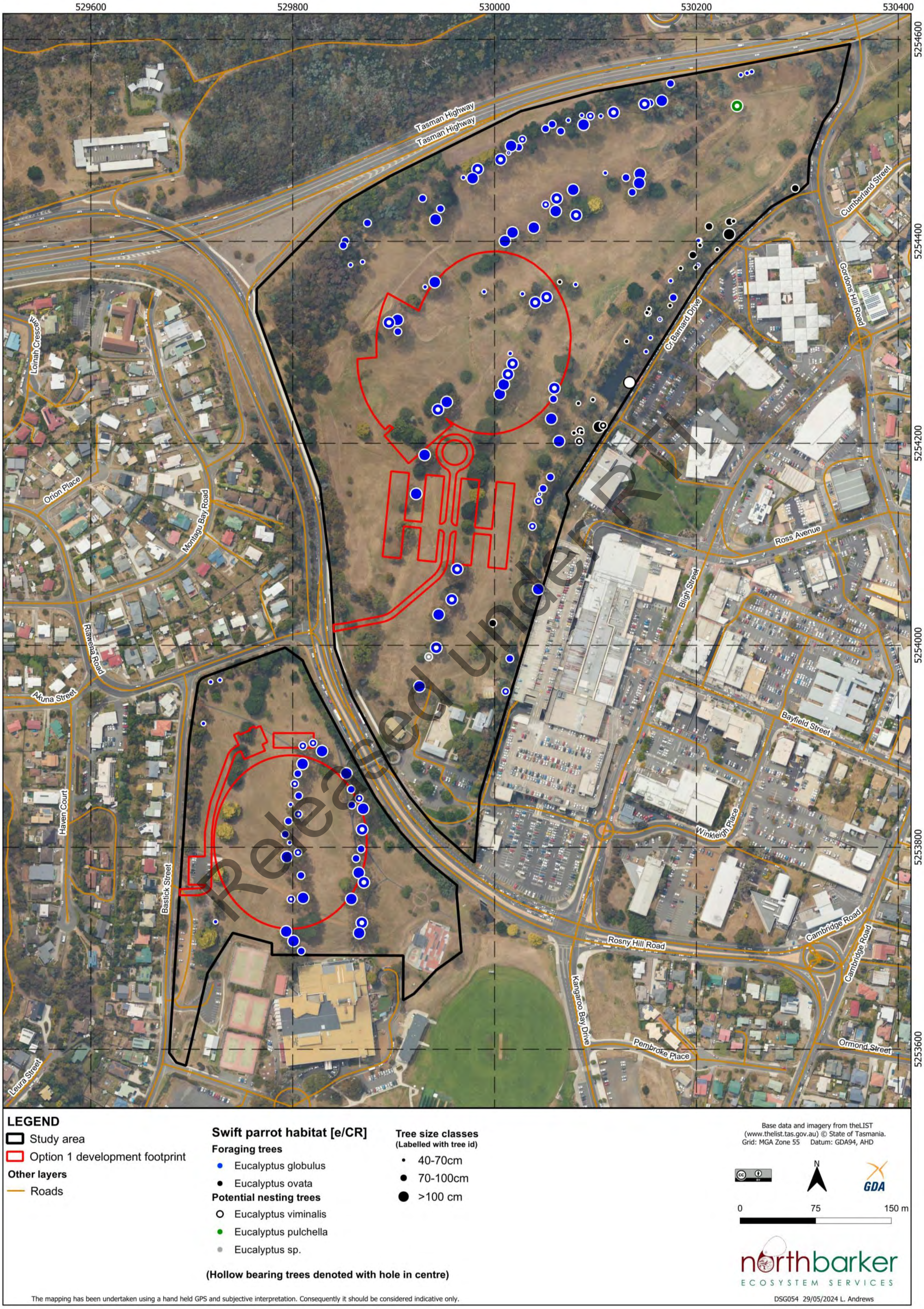
nearby Meehan Range where nesting has been confirmed. There are significant levels of use of Rosny Parklands by more aggressive and disturbance tolerant species of hollow nesting birds including musk lorikeets, eastern rosellas and galahs. All three species are more adapted to open parklands and with an abundant food resource in nearby gardens and parks occur in elevated in the urban fringe.

Although less is known about the nesting preference of blue winged parrot, they too are unlikely to nest on site. The Tasmanian masked owl which prefers more contiguous intact tracts of forest is also considered very unlikely to nest.

Figures 3a and 3b present the locations of potential habitat trees, differentiating species and tree size. This allows for swift parrot foraging habitat trees plus hollow bearing (potential, though low possibility) nesting habitat trees to be differentiated. The tree locations have been accurately surveyed by a land surveyor.

Easten barred bandicoot

The woodland and grassland habitat on site is suitable for the eastern barred bandicoot and numerous bandicoot diggings were discerned on Rosny Parklands. These are likely to originate from the more common southern brown bandicoot (*Isoodon obesulus*) which was observed on site during the tree inspection work. There are no confirmed observation records of the eastern barred bandicoot within 500 m.



The mapping has been undertaken using a hand held GPS and subjective interpretation. Consequently it should be considered indicative only.

Figure 3a: Threatened fauna habitat- Option 1

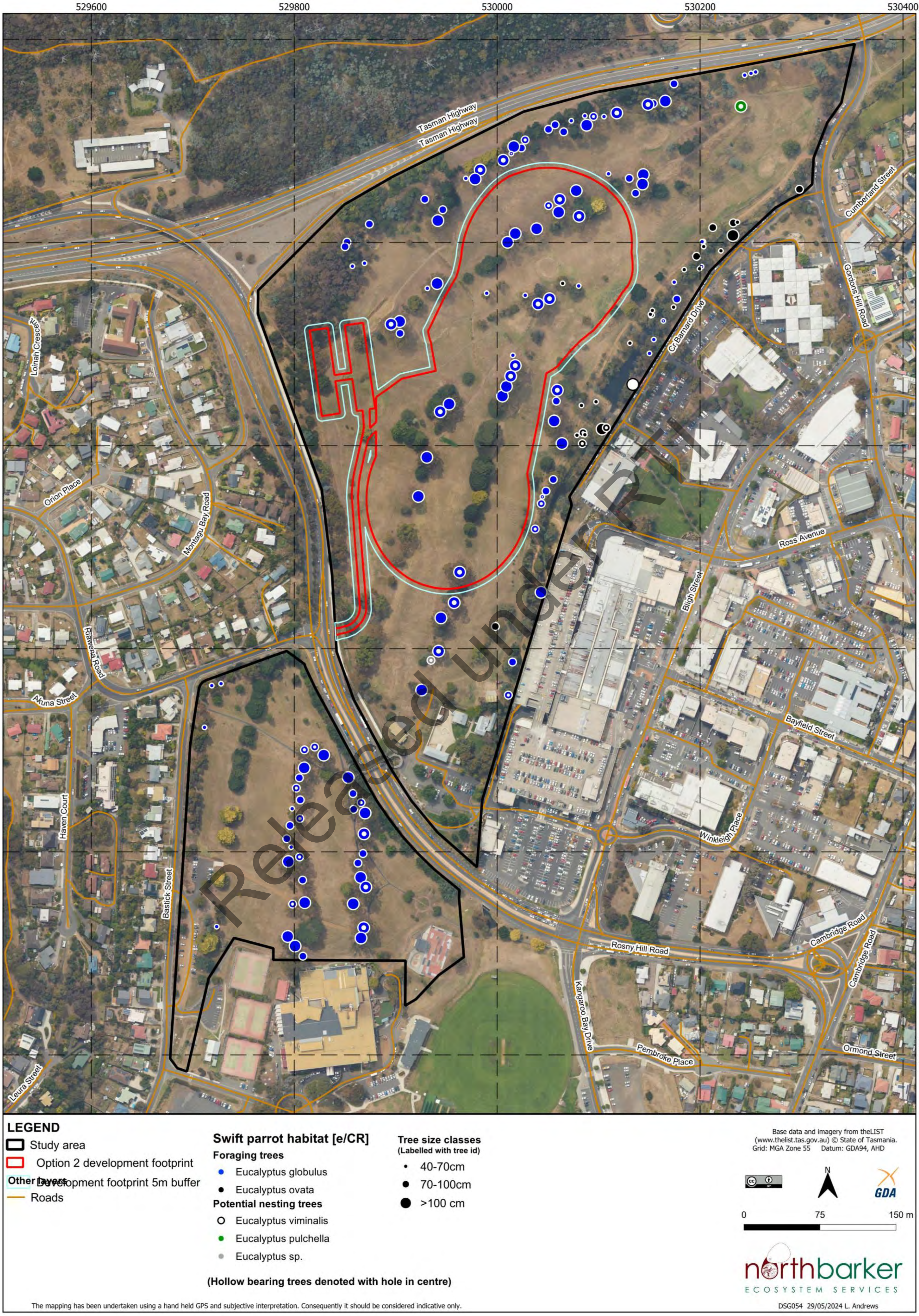


Figure 3b: Threatened fauna habitat Option 2

2.5 Impact to threatened fauna habitat

The impacts to habitat trees can be compared between the two options. Some trees fall within the design and so will be unavoidably lost. Many tees can be retained with both options. There is a subset that will be located in close proximity to the sites which warrant further assessment by an arborist.

Indirect impacts can occur through incursion into the root zone. The Australian Standard AS4970-2009 Protection of Trees on Development Sites defines impacts based on Tree Protection Zones (TPZ) which are calculated from trunk diameter (12 x DBH for single stem tree with a modified formula for multi-stem trees). According to the standard any impact to > 10% of the tree protection zone is a significant encroachment that is likely to impact on a tree, requiring the services of an arborist to make formal determination.

The scale of impact to trees is summarised in Table 1 noting that the layouts being assessed are taken from concept plans. To allow for minor variation all trees with any encroachment into the tree protections zones are included.

Table 1: Impact to habitat trees

Impact	Direct loss	Significant encroachment	Minor encroachment
Definition	> 50 % loss of TPZ	>10 -50 % loss of TPZ	0-10% loss of TPZ
Option 1	s39 [redacted]	[redacted]	[redacted]
Option 2	[redacted]	[redacted]	[redacted]

Figures 4a and 4b differentiate between trees that will be lost and those that may be impacted from encroachment into the tree protection zones.

s39 [redacted]

2.6 Impact to threatened fauna

In addition to habitat loss fauna can be impacted through disturbance and introduction of new causes of mortality.

The propensity of swift parrots to forage in blue gums adjacent to the buildings at Rosny College suggest foraging birds are tolerant of noise disturbances. Nesting behaviour is likely to be more affected. However, the likelihood of nesting by swift parrots at Rosny Parklands is remote (refer section 2.4). Consequently, the development of the site is not likely to impact on the suitability of foraging habitat in the vicinity.

A significant cause of mortality to swift parrot is from collision with built structures particularly in the vicinity of foraging habitat. These can include chain link fences, glass balustrades and other transparent features such as corner windows and reflective glass, especially where windows reflect the sky in the absence of deep eaves. The scale of collision hazard is dependent on various design features of buildings and infrastructure.

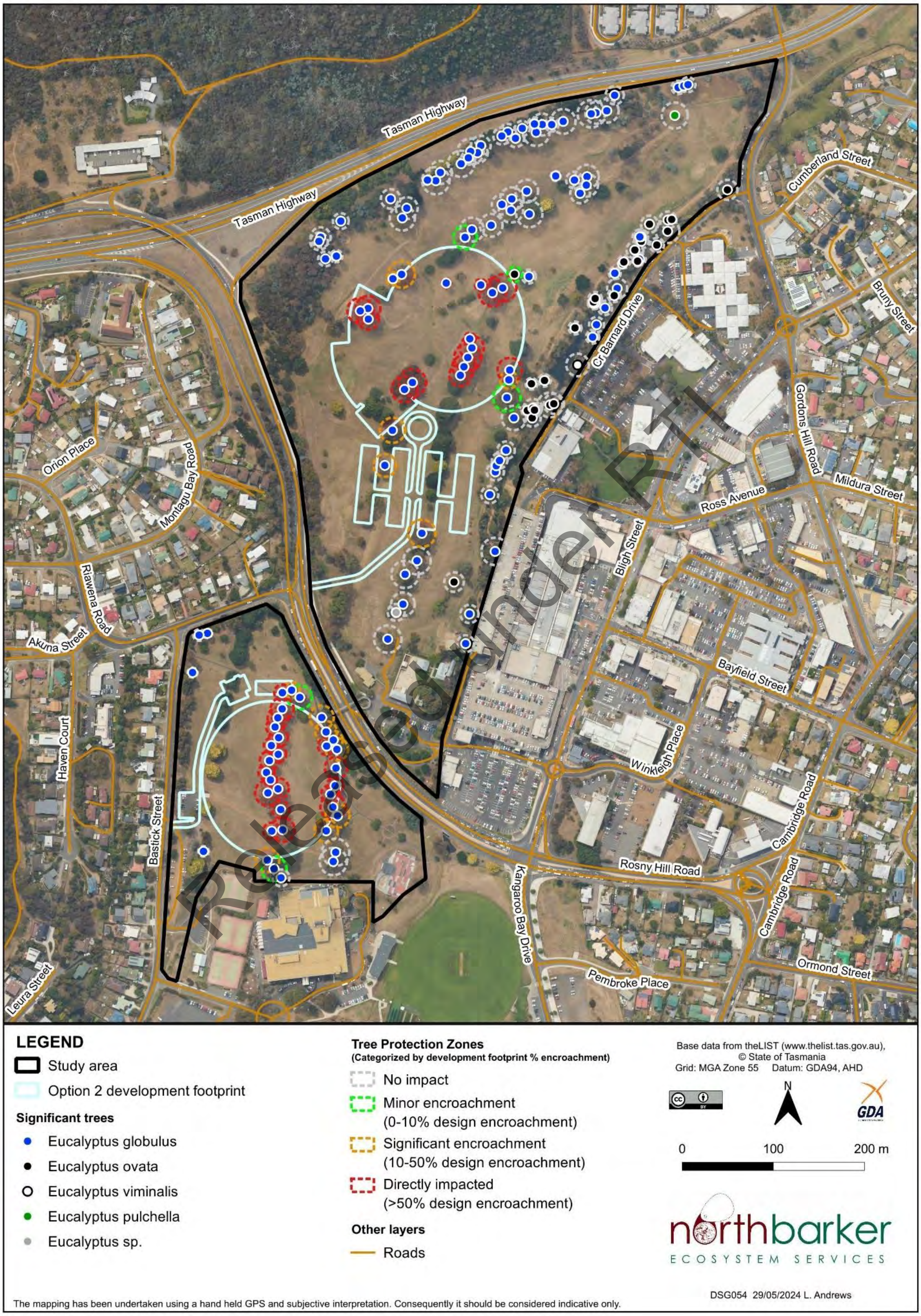


Figure 4a: Impact to threatened fauna habitat Rosny - Option 1

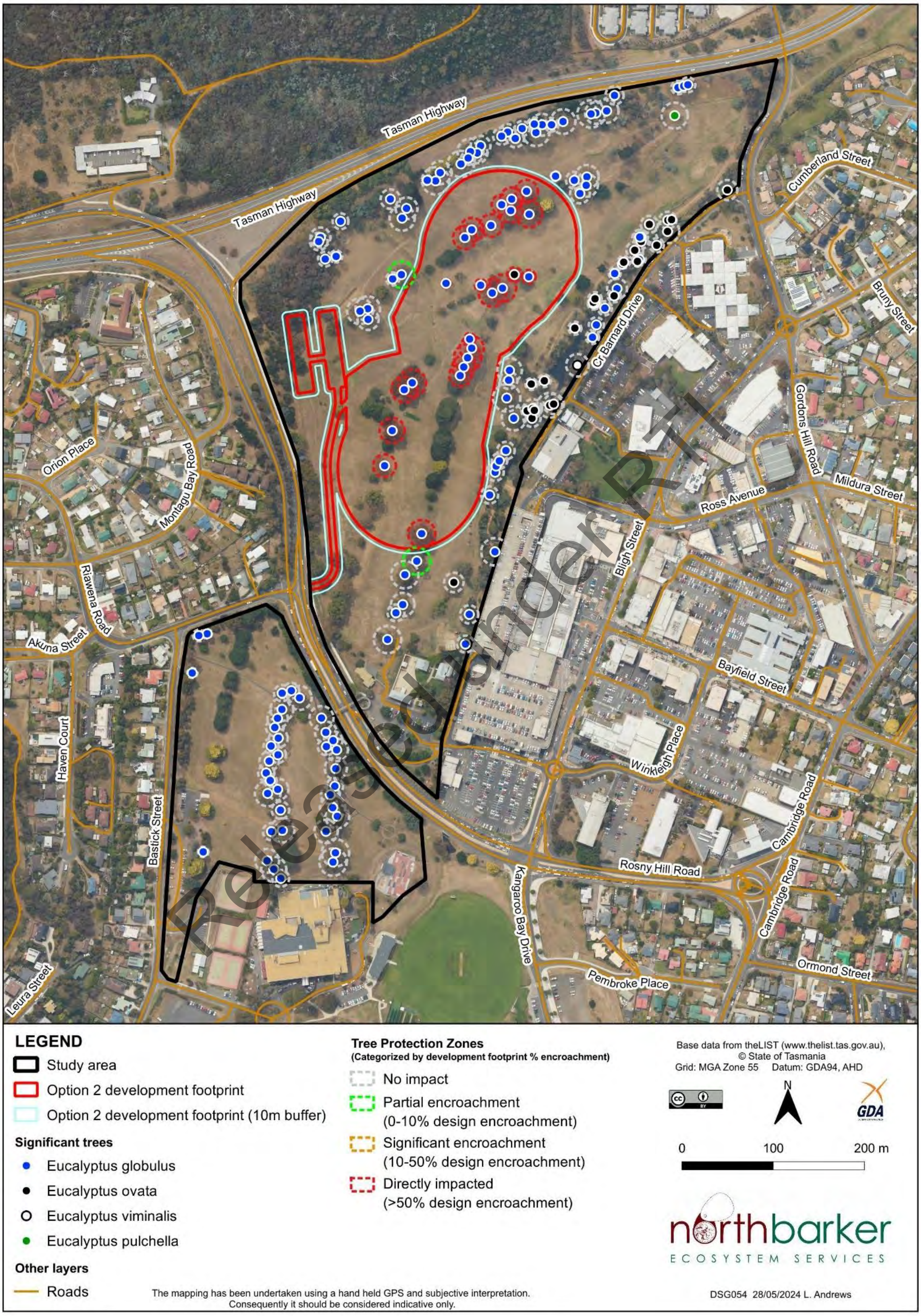


Figure 4b: Impact to threatened fauna habitat Rosny - Option 2

3 LEGISLATIVE REQUIREMENTS - ROSNY

Commonwealth *Environment Protection and Biodiversity Conservation Act1999* (EPBCA)

The EPBCA is structured for self-assessment; the proponent must determine whether the project is likely to have a significant impact on a matter of national environmental significance (MNES) such as a listed threatened species or community. If this is likely, then the Department of Climate Change, Energy, the Environment and Water (DCCEEW) may determine the proposed activity to be a 'controlled action' which would require approval from the Commonwealth Minister. The EPBC Act Environment Assessment Process is presented in Attachment 1.

This proposal will impact breeding habitat of the swift parrot in the form of foraging trees, blue gums (*Eucalyptus globulus*). The scale of tree loss will influence whether the scale of impact is likely to be significant. s39 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Two potential EPBC listed ecological communities occur on site:

- Lowland Native Grasslands of Tasmania. s39 [redacted]
- Tasmanian forests and woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata / E. brookeriana*). s39 [redacted]

Conclusion:

s39 [redacted]

s39 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Tasmanian *Threatened Species Protection Act 1995* (TSPA)

s39 [redacted]

[redacted]

Conclusion: s39 [redacted]

[redacted]

Table 2: EPBC Act Referral Options

Option	Benefit	Risk
Don't refer	[redacted]	[redacted]
Refer	[redacted]	[redacted]

Table 3: Scenarios -Referral pathways Need for referral

Based on a self assessment determining no significant Impact to MNES

Action	Outcome	DCCEEW response	DCCEEW decision	DAWE full assessment
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

4 TASMANIAN PLANNING SCHEME – CLARENCE COUNCIL:

4.1 Zoning

Rosny Parklands is zoned as Recreation and Charles Hand Memorial Park is zoned Public Open Space under the Tasmanian Planning Scheme - Clarence.

RECREATION ZONE

28.1 Zone Purpose:

28.1.1 To provide for active and organised recreational use and development ranging from small community facilities to major sporting facilities.

28.1.2 To provide for complementary uses that do not impact adversely on the recreational use of the land.

28.1.3 To ensure that new major sporting facilities do not cause unreasonable impacts on adjacent sensitive uses.

28.2 Use Table

Sports and recreation is a permitted use.

Tourist operation is a discretionary use.

28.3 Use Standards

The application will have to be assessed against standards for Discretionary 28.3.1 A1-A3 or P1-P3 and 28.3.2 A1 or P1.

None of these relate to natural values matters.

28.4 Development standards for buildings and works

The development will have to be assessed against the various standards:

20.4.1 Building height

20.4.2 Outdoor storage areas

Not all of these are necessarily applicable, and none refer to natural values matters

PUBLIC OPEN SPACE

29.1 Zone Purpose:

29.1.1 To provide land for open space purposes including for passive recreation and natural or landscape amenity

23.1.2 To provide for use and development that supports the use of the land for open space purposes or for other compatible uses.

29.2 Use Table

Tourist Operation

Sports and recreation is a discretionary use.

29.3 Use Standards
The application will have to be assessed against standards for Discretionary 29.3.1 A1-A2 or P1-P2. None of these relate to natural values matters.
29.4 Development Standards for Buildings and Works
The development will have to be assessed against the various standards: 29.4.1 Building height 29.4.2 Outdoor storage areas
Not all of these are necessarily applicable, and none refer to natural values matters

4.2 Code Overlays

The only code overlay relating to natural values within the investigation area in the Waterway and Coastal Protection Area under the Natural Assets Code (Figure 5a and 5b).

The development proposal should aim to be consistent with the purpose statements of the Natural Assets Code.

NATURAL ASSETS CODE **7.1 Code Purpose:**
C7.1.1 To minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes. C7.1.2 To minimise impacts on coastal and foreshore assets, native littoral vegetation, natural coastal processes and the natural ecological function of the coast. C717.3 To protect vulnerable coastal areas to enable natural processes to continue to occur, including the landward transgression of sand dunes, wetlands, saltmarshes and other sensitive coastal habitats due to sea-level rise. C7.1.4 To minimise impacts on identified priority vegetation. C7.1.5 To manage impacts on threatened fauna species by minimising clearance of significant habitat.

Clause C7.1.1 is served through the Development Standards for Building and Works in a waterway and coastal protection area C7.6.1. The riparian and adjacent vegetation along Kangaroo Bay Rivulet falls within the waterway and coastal protection area (figures 5a and 5b).

C7.1.3 and C7.1.3 are not applicable to this project.

Clauses C7.1.4 and C7.1.5 are unable to be served as the appropriate provisions through the Development Standards for Building and Works C7.6.2 are limited to land within a priority vegetation area overlay. Although the site supports priority vegetation the absence of an overlay renders them inapplicable.

C7.6 Development Standards for Buildings and Works

The Development Standards for development within a waterways and coastal protection area is addressed in Section C7.6.1.

C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area

Objective		
That buildings and works within a waterway and coastal protection area or future coastal refugia area will not have an unnecessary or unacceptable impact on natural assets.		
Acceptable Solutions		
A1	Buildings and works within a waterway and coastal protection area must: (a) be within a building area on a sealed plan approved under this planning scheme; (b) in relation to a Class 4 watercourse, be for a crossing or bridge not more than 5m in width; or (c) if within the spatial extent of tidal waters, be an extension to an existing boat ramp, car park, jetty, marina, marine farming shore facility or slipway that is not more than 20% of the area of the facility existing at the effective date.	The Acceptable solution cannot be met and so the project needs to meet the performance criteria P1.1
Performance Criteria		
P1.1 Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to:		
	(a) impacts caused by erosion, siltation, sedimentation and runoff; (b) impacts on riparian or littoral vegetation; (c) maintaining natural streambank and streambed condition, where it exists; (d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation; (e) the need to avoid significantly impeding natural flow and drainage; (f) the need to maintain fish passage, where known to exist; (g) the need to avoid land filling of wetlands; (h) the need to group new facilities with existing facilities, where reasonably practical; (i) minimising cut and fill; (j) building design that responds to the particular size, shape, contours or slope of the land; (k) minimising impacts on coastal processes, including sand movement and wave action; (l) minimising the need for future works for the protection of natural assets, infrastructure and property; (m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and (n) the guidelines in the Tasmanian Coastal Works Manual.	All aspects of P1.1 can be achieved through appropriate project design and impact mitigation measures including exclusion zones around waterways and sensitive surrounding vegetation. Option 1 avoids the waterways and coastal protection area. Option 2 is likely to stray into the overlay and so require detailed consideration of these provisions.
P1.2 Buildings and works within the spatial extent of tidal waters		
Not applicable. No works proposed within tidal waters		

A2, P2.1 and P2.2 Buildings and works within a future coastal refugia area
Not applicable. No works proposed within a future coastal refugia area
A3 P3 Development within a waterway and coastal protection area or a future coastal refugia area involving a new stormwater point
A stormwater management plan will be required if stormwater is directed into the Crown land or nearby streams to address applicable clauses.
A4 P4.1 P4.2 Dredging or reclamation within a waterway and coastal protection area or a future coastal refugia area..
Not applicable. None proposed
A5 P5 Coastal protection works or watercourse erosion or inundation protection works
Not applicable. None proposed

Conclusion:

Natural values mostly do not require consideration under the Tasmanian Planning Scheme for this proposal. Priority vegetation provisions in the Natural Assets Code do not apply as the site is not within a priority vegetation area.

The waterways and coastal protection provisions apply to works affecting Kangaroo Bay Rivulet. These can be met with appropriate project design and impact mitigation measures.

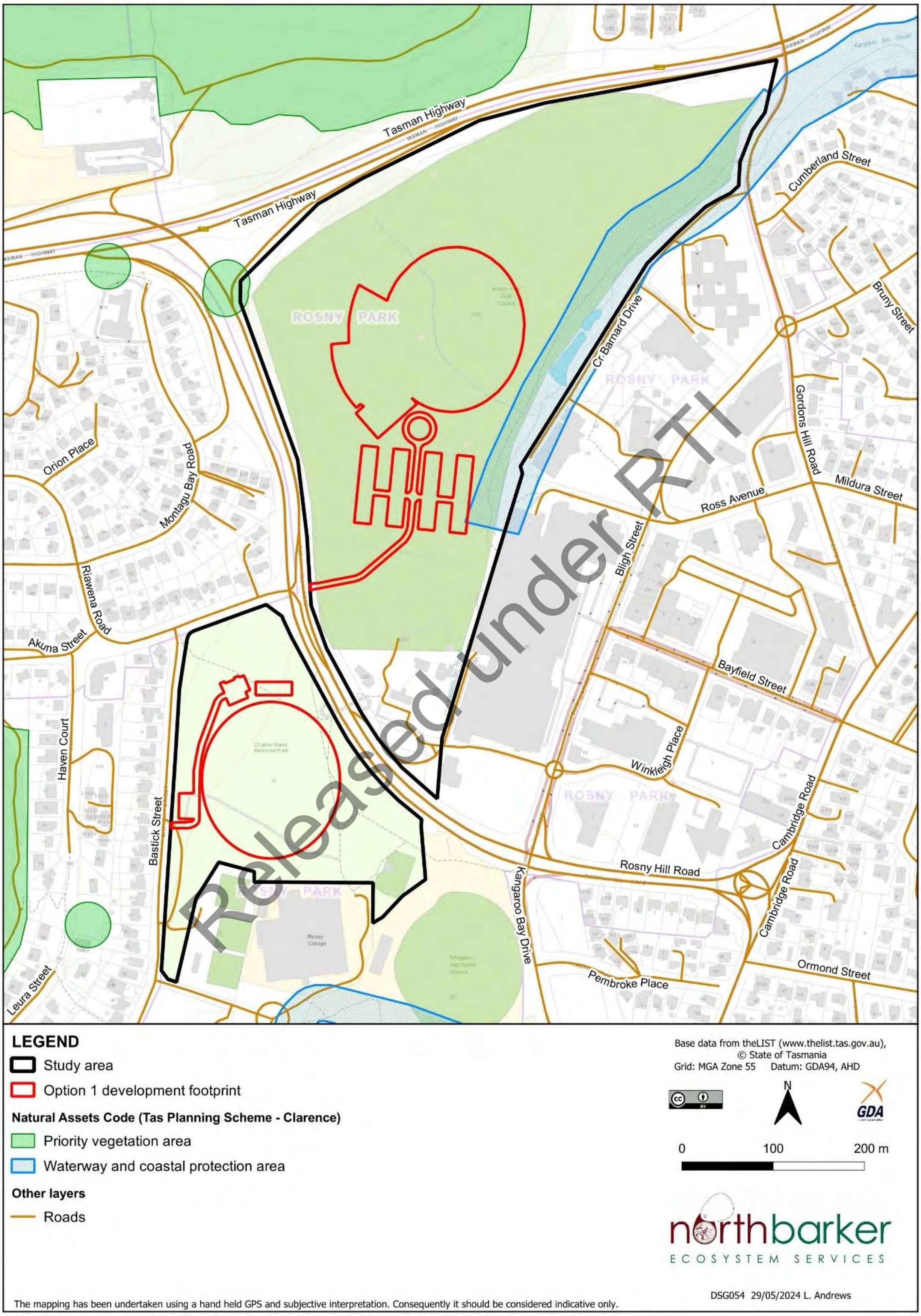


Figure 5a: Waterway and Coastal Protection Area – Option 1

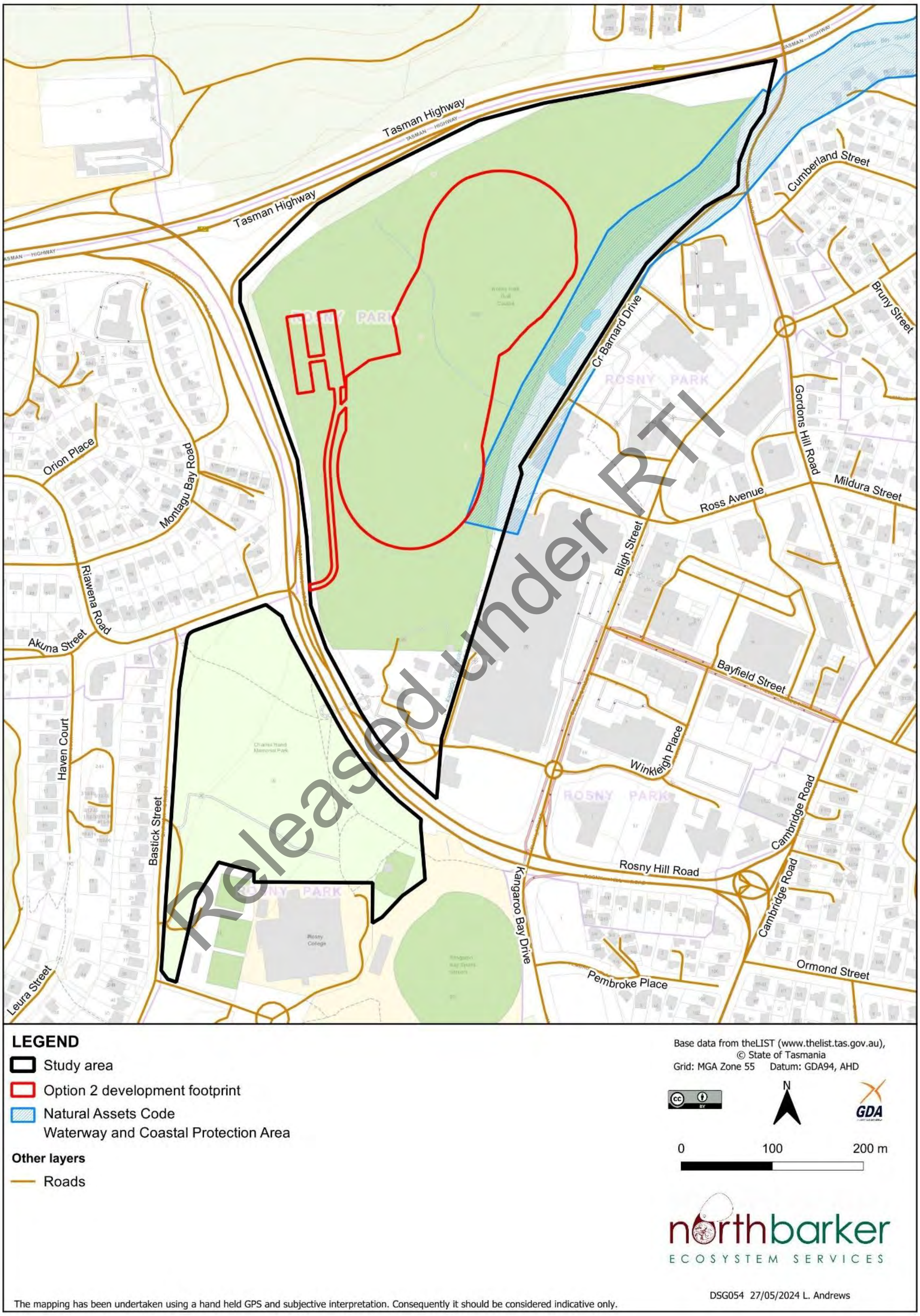


Figure 5b: Waterway and Coastal Protection Area – Option 2

Out of scope

Out of scope

Out of scope

Out of scope

Out of scope

Out of scope

Out of scope

6 SUMMARY OF CONSTRAINTS

6.1 Rosny Parklands Options 1 and 2

The proposed development presents a series of challenges to ensure the impacts to natural biodiversity values can be minimised and the necessary approvals obtained. The following statements are based on the known and anticipated values that are potentially at risk of impact. There is some uncertainty that will only be resolved following more intensive investigations. However, the risk of an issue not anticipated in this report is considered remote.

s39

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

6.2 Kingston Option 3

Out of scope

[redacted]t.

Out of scope [redacted]

[redacted]

7 ASSESSMENT AND APROVALS PROCESS

The following summary is based on the tasks to inform the reporting necessary to support planning approvals and a referral under the EPBC Act.

All Options

- Undertake detailed tree hollow assessment by a wildlife biologist tree climber supported with drone surveys.
- Arborist assessment of trees within proximity of the development footprint. Include consideration of natural life expectancy of trees with or without the project proceeding and of changes to hydrology on site.
- MNES assessment (prior to referral under EPBC Act). Consideration of the following species against significant impact criteria:
    - Blue winged parrot – hollow assessment
    - Masked owl - hollow assessment
    - Eastern barred bandicoot – camera survey
    - Grassland flax lily – detailed DGPS mapping to microsite and define exclusion zone
    - Tailed spider orchid – August targeted survey
    - Basalt peppercress -–August targeted survey
    - Tasmanian black gum forest – Condition assessment against qualifying thresholds
    - Tasmanian lowland native grassland– Condition assessment against qualifying thresholds
- TSP Act threatened species further assessment including surveys (these can occur after EPBC Act referral).
    - Leafy sun orchid -October survey
    - Sea clubsedge - Micrositing survey once impact to habitat is properly defined
    - Grassland skink – targeted survey - Oct-Dec
- Prepare a Matters of National Environmental Significance Impact Assessment report. This may require review following detailed design to re-quantify impacts.
- Identify residual impacts and mitigation measures.
- Prepare referral under the EPBCA. Possible approval pathway scenario in Table 4.
- Prepare threatened species permit.
- Prepare natural values report that addresses all impacts to inform development application. This will require updated survey.

Table 4: EPBCA Referral pathways scenario –

Task	Date	Comment
s39		

Out of scope

[redacted]

References

Clarence City Council (2023). Rosny Park *Thelymitra* map (31/08/2023).

Department of Natural Resources and Environment (2024). Natural Values Report nvr_20-Feb-2024, NRET, Natural Values Atlas, Threatened Species Section, Department of Natural Resources and Environment, Hobart.

Department of Primary Industries, Parks, Water, and Environment (2019) Guidelines for Natural Values Survey – Terrestrial Development Proposals. Version 1.1. 13th August 2019. Policy and Conservation Advice Branch. Department of Primary Industries, Parks, Water and Environment, Hobart.

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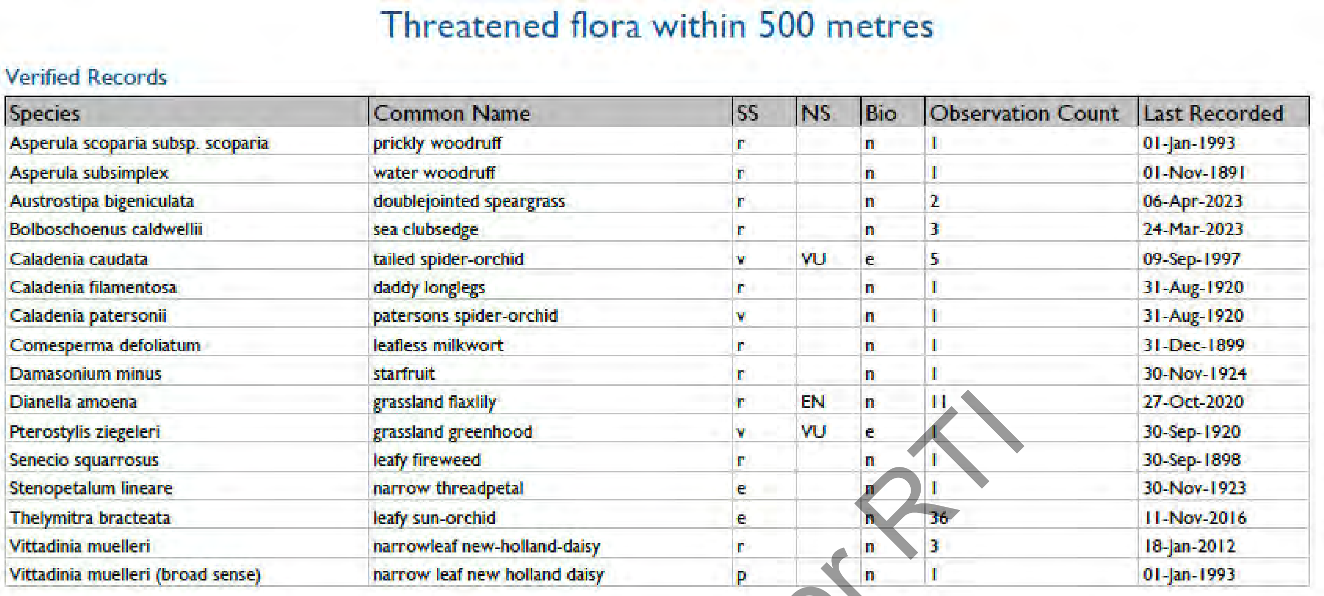
Forest Practices Authority (2014), '*Identifying Swift Parrot breeding habitat*', Fauna Technical Note No. 3, Forest Practices Authority, Hobart, Tasmania.

Kitchener, A. and Harris, S. (2013). *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation*. Edition 2. Department of Primary Industries, Parks, Water and Environment, Tasmania.

APPENDIX A: THREATENED SPECIES RECORDED FROM THE VICINITY OF ROSNY OPTIONS 1AND 2

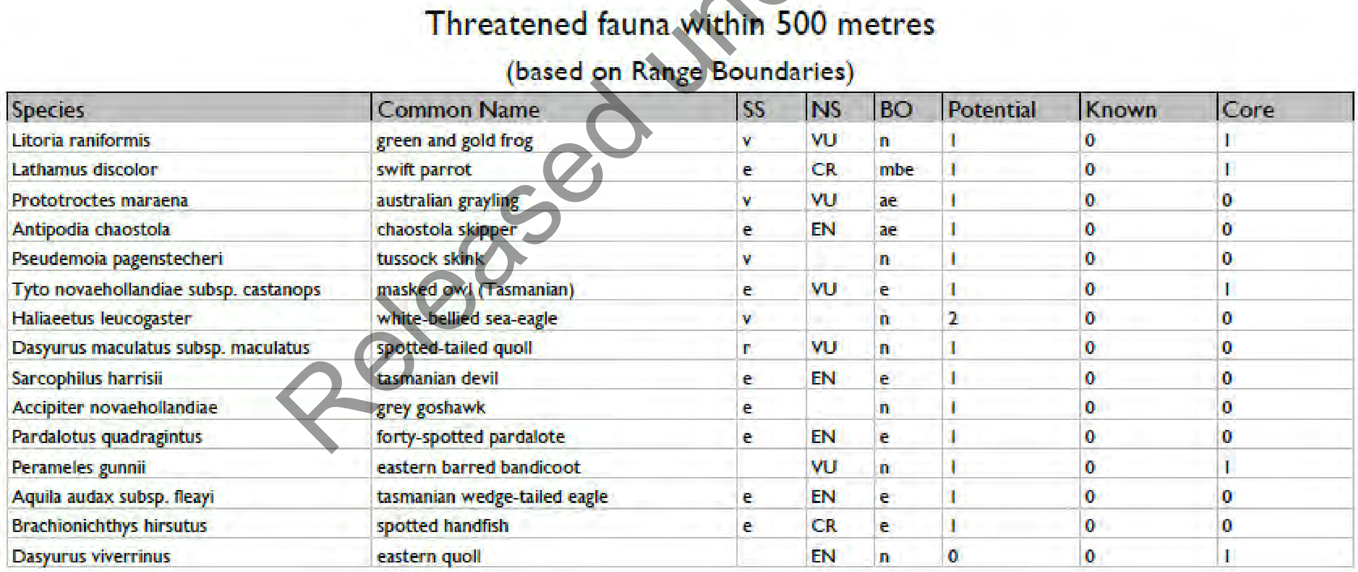
(from the Natural Values Report)[21]



Threatened flora within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Asperula scoparia subsp. scoparia	prickly woodruff	r		n	1	01-Jan-1993
Asperula subsimplex	water woodruff	r		n	1	01-Nov-1891
Austrostipa bigeniculata	doublejointed speargrass	r		n	2	06-Apr-2023
Bolboschoenus caldwellii	sea clubsedge	r		n	3	24-Mar-2023
Caladenia caudata	tailed spider-orchid	v	VU	e	5	09-Sep-1997
Caladenia filamentosa	daddy longlegs	r		n	1	31-Aug-1920
Caladenia patersonii	patersons spider-orchid	v		n	1	31-Aug-1920
Comesperma defoliatum	leafless milkwort	r		n	1	31-Dec-1899
Damasonium minus	starfruit	r		n	1	30-Nov-1924
Dianella amoena	grassland flaxlily	r	EN	n	11	27-Oct-2020
Pterostylis ziegeleri	grassland greenhood	v	VU	e	1	30-Sep-1920
Senecio squarrosus	leafy fireweed	r		n	1	30-Sep-1898
Stenopetalum lineare	narrow threadpetal	e		n	1	30-Nov-1923
Thelymitra bracteata	leafy sun-orchid	e		n	36	11-Nov-2016
Vittadinia muelleri	narrowleaf new-holland-daisy	r		n	3	18-Jan-2012
Vittadinia muelleri (broad sense)	narrow leaf new holland daisy	p		n	1	01-Jan-1993



Threatened fauna within 500 metres

(based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Litoria raniformis	green and gold frog	v	VU	n	1	0	1
Lathamus discolor	swift parrot	e	CR	mbe	1	0	1
Prototroctes maraena	australian grayling	v	VU	ae	1	0	0
Antipodia chaostola	chaostola skipper	e	EN	ae	1	0	0
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	2	0	0
Dasyurus maculatus subsp. maculatus	spotted-tailed quoll	r	VU	n	1	0	0
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	0
Pardalotus quadragintus	forty-spotted pardalote	e	EN	e	1	0	0
Perameles gunnii	eastern barred bandicoot		VU	n	1	0	1
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0
Brachionichthys hirsutus	spotted handfish	e	CR	e	1	0	0
Dasyurus viverrinus	eastern quoll		EN	n	0	0	1

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[21] nvr_1_21-Feb-2024 The centroid for this query GDA94: 529949.0, 5254123.0

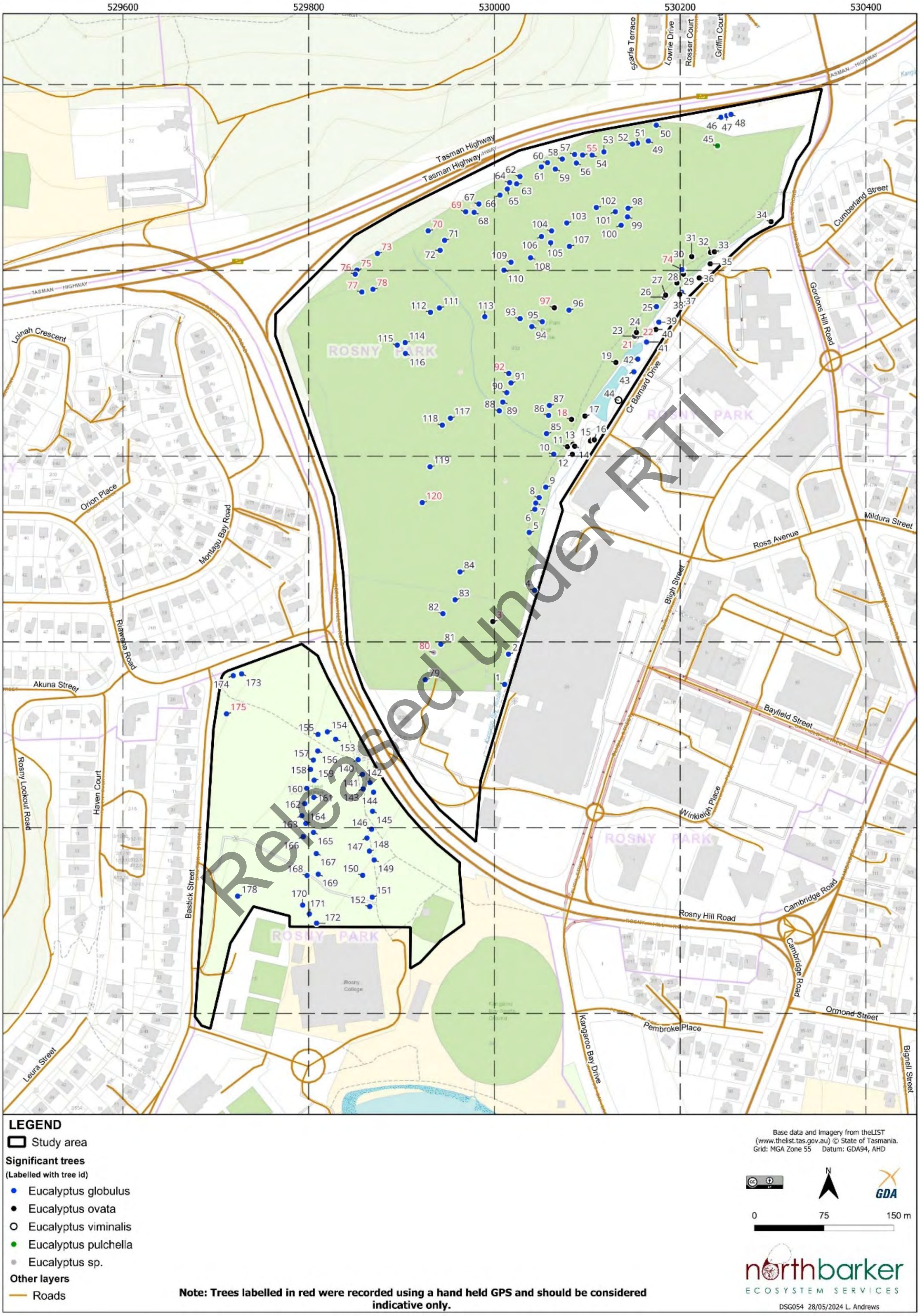
APPENDIX B: THREATENED FAUNA RECORDED FROM THE VICINITY OF KINGSTON OPTION 3

(from the Natural Values Report)

Out of scope

[redacted]

APPENDIX C: TREE IDS



Note: Trees labelled in red were recorded using a hand held GPS and should be considered indicative only.

APPENDIX D: TREE DATA

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	1	Tree # 1, BG, DBH 77, 30% ch, One potential hollow 2m high requires
Eg	blue gum	Eucalyptus globulus	2	Tree # 2, BG, DBH 83, 40% ch, No hollows, No Further Assessment Requited
Eo	black gum	Eucalyptus ovata	3	Tree # 3, OV, DBH 89, 20% ch,
Eg	blue gum	Eucalyptus globulus	4	Tree # 4, BG, split in 2 at chest height DBH 97 & 84. 70% ch, Three spouts
Eg	blue gum	Eucalyptus globulus	5	Tree # 5, BG, DBH 78, 20% ch, no potential hollows
Eg	blue gum	Eucalyptus globulus	6	Tree # 6, BG, DBH 79, 30% ch, no potential hollows
Eo	blue gum	Eucalyptus globulus	6	Tree # 25, BG, DBH 54, 20% ch,
Eg	blue gum	Eucalyptus globulus	7	Tree # 7, BG, DBH 49, 30% ch, no potential hollows
Eg	blue gum	Eucalyptus globulus	8	Tree # 8, BG, DBH 71, 20% ch,
Eg	blue gum	Eucalyptus globulus	9	Tree # 9, BG, DBH 80, 50% ch,
Eg	blue gum	Eucalyptus globulus	10	Tree # 10, BG, DBH 111, 50% ch,
Eo	black gum	Eucalyptus ovata	11	Tree # 11, OV, DBH 39 & 36, 20% ch,
Eo	black gum	Eucalyptus ovata	12	Tree # 12, OV, DBH 66 & 42, 20% ch, Senescent with one hollow present
Eo	black gum	Eucalyptus ovata	13	Tree # 13, OV, DBH 62 & 58, 20% ch, Likely to contain hollows
Eo	black gum	Eucalyptus ovata	14	Tree # 14, OV, DBH 62, 20% ch,

Code	Common	Scientific	Tree Id	Note
Eo	black gum	Eucalyptus ovata	15	Tree # 15, OV, DBH 86 & 74, 30% ch,
Eo	black gum	Eucalyptus ovata	16	Tree # 16, OV, DBH 63 & 67, 40% ch,
Eo	black gum	Eucalyptus ovata	17	Tree # 17, OV, DBH 56, 10% ch,
Eo	black gum	Eucalyptus ovata	18	Tree # 18, OV, DBH 53, 20% ch,
Eo	black gum	Eucalyptus ovata	19	Tree # 19, OV, DBH 59, 10% ch,
Eo	black gum	Eucalyptus ovata	20	Tree # 20, OV, DBH 24 & 30
Eo	black gum	Eucalyptus ovata	21	Tree # 21, OV, DBH 33 & 43,
Eo	black gum	Eucalyptus ovata	22	Tree # 22, OV, DBH 55, 20% ch,
Eo	black gum	Eucalyptus ovata	23	Tree # 23, OV, DBH 49, 30% ch,
Eo	black gum	Eucalyptus ovata	24	Tree # 24, OV, DBH 61, 20% ch, NFSR
Eo	black gum	Eucalyptus ovata	26	Tree # 26, OV, DBH 40, 20% ch,
Eo	black gum	Eucalyptus ovata	27	Tree # 27, OV, DBH 56,
Eo	black gum	Eucalyptus ovata	28	Tree # 28, 47 & 61, few spouts but unlikely to contain hollows
Eo	black gum	Eucalyptus ovata	29	Tree # 29, OV, DBH 36 & 34 & 44, 30% ch,
Eo	black gum	Eucalyptus ovata	30	Tree # 30, OV, DBH65, 20% ch,
Eo	black gum	Eucalyptus ovata	31	Tree # 31, OV, DBH 78, 30% ch

Code	Common	Scientific	Tree Id	Note
Eo	black gum	Eucalyptus ovata	32	Tree # 32, OV, DBH 78, 20% ch
Eo	black gum	Eucalyptus ovata	33	Tree # 33, OV, DBH 43, 20%ch,
Eo	black gum	Eucalyptus ovata	34	Tree # 34, OV, DBH 71 & 58, 30% ch,
Eo	black gum	Eucalyptus ovata	35	Tree # 35, OV, DBH 108, 30% ch,
Eo	black gum	Eucalyptus ovata	36	Tree # 36, OV, DBH 65, 20% ch,
Eg	blue gum	Eucalyptus globulus	37	Tree # 37, BG, DBH 57, 50% ch, Contains hollow 5 cm x 8 cm
Eo	black gum	Eucalyptus ovata	38	Tree # 38, OV, DBH 48, 20% ch,
Eg	blue gum	Eucalyptus globulus	39	Tree # 39, BG, DBH 92, 30% ch,
Eo	black gum	Eucalyptus ovata	40	Tree # 40, OV, DBH 52 & 20 & 20,
Eg	blue gum	Eucalyptus globulus	41	Tree # 41, BG, DBH 64, 20% ch, potential hollows,
Eg	blue gum	Eucalyptus globulus	42	Tree # 42, BG, DBH 69, 30% ch,
Eg	blue gum	Eucalyptus globulus	43	Tree # 43, BG, DBH 60, 20% ch,
Ev	white gum	Eucalyptus viminalis	44	Tree # 44 Vim, DBH 103,
Ev	white gum	Eucalyptus viminalis	45	Tree # 45, Vim, DBH 119, 20% ch, One hollow seen from the ground
Eg	blue gum	Eucalyptus globulus	46	Tree # 46, BG, DBH 61, 40% ch, healthy and unlikely to contain hollows
Eg	blue gum	Eucalyptus globulus	47	Tree # 47, BG, DBH 53, 20% ch,

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	48	Note- tree IDs to be separated in QGIS Tree # 48, BG, DBH 68, very healthy unlikely to contain hollows
Eg	blue gum	Eucalyptus globulus	49	Note- tree IDs to be separated in QGIS Tree 49, BG, DBH 108, 30% ch, healthy unlikely to contain hollows
Eg	blue gum	Eucalyptus globulus	51	To tree 51.BG, Foraging, 99cm dbh, CH 50%,
Eg	blue gum	Eucalyptus globulus	52	To tree 52, BG 130cm dbh, potential hollows on trunk, at fork.. CH 50%
Eg	blue gum	Eucalyptus globulus	53	To 53, BG, 1.13 dbh, hollow in dead upper limb. CH 40%
Eg	blue gum	Eucalyptus globulus	54	To 54, BG, 0.62 dbh, foraging, 20%ch
Eg	blue gum	Eucalyptus globulus	56	To 56- BG, 123cm dbh, foraging only, 40%ch
Eg	blue gum	Eucalyptus globulus	57	To 57, BG, 60cm, foraging only, 10%ch
Eg	blue gum	Eucalyptus globulus	58	To 58, BG, 68cm, half dead, foraging only, <10%ch
Eg	blue gum	Eucalyptus globulus	59	To 59, BG, 80cm, foraging only, 40%ch
Eg	blue gum	Eucalyptus globulus	66	To 66, BG, 120cm, potential hollows, 60%ch
Eg	blue gum	Eucalyptus globulus	67	To 67. BG, 105cm, hollow at 3m, nest (miner?) at 10m, 20cm wide. 50%ch
Eg	blue gum	Eucalyptus globulus	68	To t68, BG, 125cm, foraging only, 60%ch
Eg	blue gum	Eucalyptus globulus	79	To T79. BG, 151cm, foraging only, 50%ch
Eg	blue gum	Eucalyptus globulus	81	To T81. BG, 108cm, potential hollow on main trunk, two hollows on upper branch, one being used by galahs

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	82	To T82. BG, 137cm, foraging only, 60%ch
Eg	blue gum	Eucalyptus globulus	83	To t83, BG, 126cm, 2 small hollows ~5cm, 2 scrappy nests 20-30 cm, raven?
Eg	blue gum	Eucalyptus globulus	84	To T84. BG, 151cm, 2 small 5cm hollows, 1 possible spout. Scrappy nest around 30cm raven? 60% CH
Eg	blue gum	Eucalyptus globulus	85	To T85, BG, 135cm, foraging only, 70%ch
Eg	blue gum	Eucalyptus globulus	86	To T86. BG, 80cm, foraging only. 40%ch
Eg	blue gum	Eucalyptus globulus	87	To T87. BG, 112cm, 1 hollow 10x25cm, 40%ch
Eg	blue gum	Eucalyptus globulus	88	To T88. BG, 101cm, foraging only, 60%
Eg	blue gum	Eucalyptus globulus	89	To T89. BG, 106cm, foraging only, 60%ch
Eg	blue gum	Eucalyptus globulus	90	To T90. BG, 128cm, hollow at 6m, 60%ch
Eg	blue gum	Eucalyptus globulus	91	To T91, BG, 110cm 4cm hollow on main trunk, 60%ch
Eg	blue gum	Eucalyptus globulus	92	To T92, BG, 53cm, foraging only, 30%ch
Eg	blue gum	Eucalyptus globulus	93	To T93, BG, 54cm, foraging only, 50%ch
Eg	blue gum	Eucalyptus globulus	94	To T94, BG, 138cm, at least 4 hollows, 50%ch
Eg	blue gum	Eucalyptus globulus	95	To T95. BG, 126cm, 1 potential hollow on main trunk, 60%ch
Eg	blue gum	Eucalyptus globulus	96	To T96, BG, 63cm, foraging, 80%ch
Eg	blue gum	Eucalyptus globulus	98	To T98, BG, foraging, 108cm, 50%ch

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	99	To T99. BG, 106cm, foraging, 50%ch
Eg	blue gum	Eucalyptus globulus	100	To T100, BG, 90cm foraging, 50%ch
Eg	blue gum	Eucalyptus globulus	101	To T101, BG, 76cm foraging, 40%ch
Eg	blue gum	Eucalyptus globulus	102	To T102, BG, 44cm, foraging, 40%ch
Eg	blue gum	Eucalyptus globulus	103	To T103, BG, 104cm, foraging, 40%ch
Eg	blue gum	Eucalyptus globulus	104	To T104, BG, 106cm, hollow on trunk 10x5cm, 50%ch
Eg	blue gum	Eucalyptus globulus	105	To T105, BG, 111cm, foraging, 50%ch
Eg	blue gum	Eucalyptus globulus	106	To T105, BG, 92cm, hollow 20x8cm, 30%ch
Eg	blue gum	Eucalyptus globulus	107	To T107, BG, 120cm, possible hollow , 40%ch
Eg	blue gum	Eucalyptus globulus	108	To T108 BG, foraging, 40%ch
Eg	blue gum	Eucalyptus globulus	109	To T109, BG, 109cm, foraging, raven nest, 60%ch
Eg	blue gum	Eucalyptus globulus	110	To T110, BG, 107cm, foraging, 50%ch
Eg	blue gum	Eucalyptus globulus	111	To T111, BG, 121cm, foraging, 60%ch
Eg	blue gum	Eucalyptus globulus	113	To T113, BG,
Eg	blue gum	Eucalyptus globulus	114	To T114, BG, 113cm, foraging, raven nest 30cm, 50%ch
Eg	blue gum	Eucalyptus globulus	115	To T115, BG, potential hollows, climb, 50%ch

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	116	To T116, BG, 97cm, foraging, 60% ch
Eg	blue gum	Eucalyptus globulus	117	To T117, BG, 130cm, foraging, 60%ch
Eg	blue gum	Eucalyptus globulus	118	To T118, BG, 119cm, potential hollows, 49%ch
Eg	blue gum	Eucalyptus globulus	119	To T119, BG, foraging, 60%ch
Eg	blue gum	Eucalyptus globulus	120	To T120, BG, foraging, 50%ch
Eg	blue gum	Eucalyptus globulus	140	Tree # 140, BG, DBH 110, 40% ch,
Eg	blue gum	Eucalyptus globulus	141	Tree # 141, BG, DBH 99, 40% ch,
Eg	blue gum	Eucalyptus globulus	142	Tree # 142, BG, DBH 85, 20% ch, One hollow seen - Small 8 cm x 6 cm, spout south facing
Eg	blue gum	Eucalyptus globulus	143	Tree # 143, BG, DBH 79, 30% ch,
Eg	blue gum	Eucalyptus globulus	144	Tree # 144, BG, DBH 103, 40% ch,
Eg	blue gum	Eucalyptus globulus	145	Tree # 145, BG, DBH 101, 50% ch, Main trunk South West facing potential hollow.
Eg	blue gum	Eucalyptus globulus	146	Tree # 146, BG, DBH 75, 40% ch,
Eg	blue gum	Eucalyptus globulus	147	Tree # 147, BG, DBH 85, 40% ch,
Eg	blue gum	Eucalyptus globulus	148	Tree # 148, BG, DBH 115, 30% ch,
Eg	blue gum	Eucalyptus globulus	148	Tree # 148, BG, DBH 115, 30% ch,
Eg	blue gum	Eucalyptus globulus	149	Tree # 149, BG, DBH 109, 30% ch, One hollow North facing & one potential North East facing.

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	150	Tree # 150, BG, DBH 107, 30% ch,
Eg	blue gum	Eucalyptus globulus	151	Tree # 151, BG, DBH 125, 40% ch, One hollow on main stem 10 m up 20 - 30 cm
Eg	blue gum	Eucalyptus globulus	152	Tree # 152, BG, DBH 139, 30% ch,
Eg	blue gum	Eucalyptus globulus	153	Tree # 153, BG, DBH 110, 40% ch,
Eg	blue gum	Eucalyptus globulus	154	Tree # 154, BG, DBH 71, 30% ch, 10 cm x 5 cm hollow (galah using it)
Eg	blue gum	Eucalyptus globulus	155	Tree # 155, BG, DBH 74, 20% ch, One potential hollow seen depth unknown,
Eg	blue gum	Eucalyptus globulus	156	Tree # 156, BG, DBH 105, 40% ch,
Eg	blue gum	Eucalyptus globulus	157	Tree # 157, BG, DBH 93, 40% ch,
Eg	blue gum	Eucalyptus globulus	158	Tree # 158, BG, DBH 80, 20% ch, One hollow seen 6 cm x 10 cm 8 m up North facing
Eg	blue gum	Eucalyptus globulus	159	Tree # 159, BG, DBH 85, 20% ch,
Eg	blue gum	Eucalyptus globulus	160	Tree # 160, BG, DBH 69, 20% ch,
Eg	blue gum	Eucalyptus globulus	161	Tree # 161, BG, DBH 73, 20% ch, potential hollow 5 m up main stem
Eg	blue gum	Eucalyptus globulus	162	Tree # 162, BG, DBH 88, 30% ch,
Eg	blue gum	Eucalyptus globulus	163	Tree # 163, BG, DBH 74, 40% ch,
Eg	blue gum	Eucalyptus globulus	164	Tree # 164, BG, DBH 59, 30% ch,
Eg	blue gum	Eucalyptus globulus	165	Tree # 165, BG, DBH 98, 40% ch, One potential hollow up main stem 12 m facing South West.

Code	Common	Scientific	Tree Id	Note
Eg	blue gum	Eucalyptus globulus	166	Tree # 166, BG, DBH 117, 50% ch,
Eg	blue gum	Eucalyptus globulus	167	Tree # 167, BG, DBH 80, 30% ch,
Eg	blue gum	Eucalyptus globulus	168	Tree # 168, BG, DBH 78, 20% ch, Potential small hollow 5 cm x 5 c,
Eg	blue gum	Eucalyptus globulus	169	Tree # 169, BG, DBH 110, 40% ch,
Eg	blue gum	Eucalyptus globulus	170	Tree # 170, BG, DBH 109, 40% ch,
Eg	blue gum	Eucalyptus globulus	171	Tree # 171, BG, DBH 115, 40% ch,
Eg	blue gum	Eucalyptus globulus	173	Tree # 173, BG, DBH 42, 30% ch,
Eg	blue gum	Eucalyptus globulus	174	Tree # 174, BG, DBH 53, 40% ch,
Eg	blue gum	Eucalyptus globulus	175	Tree # 175, BG, DBH 45, 30% ch,
Eg	blue gum	Eucalyptus globulus	176	Tree # 176, BG, DBH 32 & 30, 60% ch,
Eg	blue gum	Eucalyptus globulus	177	Tree # 177, BG, DBH 38, 60% ch,
Eg	blue gum	Eucalyptus globulus	178	Tree # 178, BG, 5 stem DBH 25/25/18/16/26, 40% ch, heavily coppiced

Attachment 1: EPBC Act Environment Assessment Process

Document 3

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Tasmania

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Department of State Growth
Infrastructure Tasmania
ATTENTION: Out of scope, AFL High Performance Centre)
GPO Box 536
Hobart TAS 7001

29 May 2024

RE: AFL High Performance Centre
Natural Values Constraints Analysis – Peer Review

Preamble

Environmental Consulting Options Tasmania (ECO*tas*) has been engaged by the Department of State Growth (Infrastructure Tasmania) (DSG) to provide a peer review of the natural values constraints analysis produced by North Barker Ecosystem Services (NBES), prepared to provide guidance to DSG on the legislative implications relating to natural values with the primary focus on the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBCA), which would have the most significant time constraint consequences due to the potentially protracted approvals process if significant impacts to matters of national environmental significance were identified.

Note that this statement does not constitute legal advice, and provides my interpretation of the legislation, which may not represent the views of the relevant agency. It is recommended that formal advice be sought from the relevant agency prior to acting on any aspect of this statement.

Peer review

This peer review is not intended to replicate assessments of natural values undertaken by NBES to produce their natural values constraints analysis. However, I have undertaken my own field reconnaissance of the three site options discussed in the NBES report to inform my review (undertaken primarily on 27 May 2024 with some follow-up at Twin Ovals on 29 May 2024). In addition, I have run my own database reviews by downloading reports from the Department of Natural Resources and Environment Tasmania's (DNRET) *Natural Values Atlas*, the Commonwealth's *Protected Matters Report* and the Forest Practices Authority's *Biodiversity Values Database* (all appended for reference).

This peer review is based primarily on the natural values constraints analysis provided by NBES dated 29 May 2024.

[redacted]

This peer review covers several matters related to natural values that may need to be taken into account during the planning and implementation of the AFL High Performance Centre, summarised as follows:

- adequacy of natural values assessment to inform the natural values constraints analysis;
- native vegetation communities;
- threatened flora;
- threatened fauna; and
- legislative implications including findings related to matters of national environmental significance (MNES) and possible significant impacts on these under the EPBCA.

Adequacy of natural values assessment

It is usual for proposed developments in Tasmania that will potentially impact on natural values to be subject to detailed natural values assessments that follow, at least in general terms, the *Guidelines for Natural Values Assessments – Terrestrial Development Proposals*, as issued by DPIPWE 2015, updated by NRE Tas 2023 but still suggested to be cited as DPIPWE (2015). The natural values constraints analysis provided by NBES does not purport to satisfy these *Guidelines* at this time, which I find to be entirely appropriate. It is reasonable to make reference to these *Guidelines* but produce preliminary findings such as a critical constraints analysis, pending a fully detailed presentation of all relevant findings at a later date.

The key question is whether the assessments undertaken to date provide sufficient information to guide the recommendations, with particular reference to legislative implications (especially as related to the EPBCA). s39 [redacted]

Native vegetation communities (Rosny)

s39 [redacted]

[redacted]

[redacted]

[redacted]

s39

s39 [redacted]

Native vegetation communities (Twin Ovals)

Out of scope [redacted]

Threatened flora (Rosny)

s39 [redacted]

s39 [redacted]

[redacted]

[redacted]

Threatened flora (Twin Ovals)

Out of scope [redacted]

Threatened fauna (Rosny)

s39 [redacted]

[redacted]

[redacted]

s39 [redacted]

Figure 1. Aerial imagery, 26 Mar. 1946 of the Rosny site

Threatened fauna (Twin Ovals)

Out of scope [redacted]

[redacted]

Out of scope

Figure 2. Aerial imagery, 15 Apr. 1946 of the Twin Ovals site

Legislative implications

- Tasmanian *Land Use Planning and Approvals Act 1993* (i.e. relevant planning scheme)

s39

- Tasmanian *Threatened Species Protection Act 1995*

s39

- s39 [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Out of scope [redacted]

[redacted]

s39

- [redacted]
- [redacted]
- s39 [redacted] Out of scope s39 [redacted]
- [redacted] Out of scope [redacted]
- s39 Out of scope) s39 [redacted]

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[redacted]

[redacted]

s39 Out of scope

s39 Out of scope s39

Further assessments required

s39

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

Conclusion

s39

[redacted]

[redacted]

s39 [redacted] Out of scope

Please do not hesitate to contact me further if additional information is required.

Kind regards

Out of scope [redacted]

Senior Scientist/Manager

[redacted]

Document 4

AFL High Performance Centre Rosny Parklands & Charles Hand Park

Geotechnical Factual Report (Revision 1)

Department of State Growth

02 August 2024

The Power of Commitment

Project name	AFL High Performance Centre Strategic Alignment
Document title	AFL High Performance Centre Rosny Parklands & Charles Hand Park | Geotechnical Factual Report (Revision 1)
Project number	12626209
File name	12626209-REP_AFL HPC Rosny Parkland & Charles Hand Park GFR .docx

Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
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The Power of Commitment

Investigation overview

Department of State Growth engaged GHD Pty Ltd to undertake preliminary geotechnical investigations at both Charles Hand Park and Rosny Parklands for a proposed AFL High Performance Centre (HPC) and associated secondary oval.

It is understood that the proposed AFL HPC consists of a main MCG sized oval, a secondary training oval and two-storey building, generally with a training facility on the 6000 m^2 ground floor and office space on the 3000 m^2 first floor. The preferred site or general layout was not decided during the investigation, so the investigation scope was based on pre-feasibility sketches of multiple options at the time of planning.

This report presents the factual information obtained from the investigations and is subject to, and must be read in conjunction with, the limitations set out in sections 1.4 and 6, and the assumptions and qualifications contained throughout the Report.

The factual data is presented for Designers and Contractors to make their own assessment of the site conditions and design and price accordingly.

In summary, field investigations across both sites comprised geophysical surveys, test pits and boreholes. Both sites are mapped by Mineral Resource Tasmania as being underlain by Jurassic dolerite, with an inferred fault, striking roughly north-south, mapped centrally through Rosny Parklands. Triassic aged sediments (Upper Parmeener Supergroup) mapped to the east of the inferred fault were not observed at the test sites.

The intrusive investigations typically encountered the following subsurface profile:

– Fill and/or Topsoil (variable Fill layers typically associated with former greens or tee-off areas).

  Overlying

– Residual soils (typically brown, high plasticity clay and sandy clay, less than 1m thick).

  Overlying

– Extremely weathered dolerite (typically orange-brown, sandy clays/silts and clayey/silty sand, with variable and sometimes significant quantities of gravel and cobbles. This unit has an average thickness of about 1.2m but ranged between 0.2m to 3.4m thick at the investigated sites.

  Overlying

– Highly weathered (or less weathered) dolerite:
  - Typically, high strength (with zones of medium and very high strength) and fractured, with close defect spacing to about 5.5m to 7m below ground level.
  - Below 5.5m to 7m, the dolerite rockmass is generally less fractured and weathered, and of high to very high strength (with zones of extremely high strength).

Detailed descriptions of the subsurface materials and conditions encountered during the investigations are provided in the geotechnical logs in Appendix F and should be referred to for detail at each location. Geophysical sections, groundwater levels, point load testing and laboratory testing are also contained within the report.

Contents

Table index

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Appendices

1. Introduction

1.1 Background

GHD Pty Ltd (GHD) was engaged by Department of State Growth to undertake geotechnical investigations for the proposed AFL High Performance Centre (HPC) and associated secondary oval at both Charles Hand Park and Rosny Parklands, Rosny Park, Tasmania.

It is understood that the AFL HPC consists of a main oval and two-storey building, generally with a training facility on the 6000 m^2 ground floor and office space on the 3000 m^2 first floor.

No decision had been made on the preferred site or general layout during the investigation, so the investigation scope is based on pre-feasibility sketches of multiple options at the time of planning.

A plan showing the location of the investigated sites is presented as Appendix A.

This revision of the report (Rev 1) includes the inclusion of the preceding investigation overview and minor amendments to the borehole logs.

1.2 Purpose of this report

The purpose of this report is to present the factual data obtained from the geotechnical investigation at both the Charles Hand Park and Rosny Parklands sites.

1.3 Scope of work

The scope of work is based on the accepted proposal, dated 24 January 2024, with an increased scope of geotechnical test sites. The scope generally comprised of the following:

- Review of existing relevant geotechnical data.
- A fieldwork programme, including geophysical survey, test pits and boreholes.
- Laboratory testing programme on representative soil and rock samples collected during the fieldwork.
- Preparation of this geotechnical factual report to summarise the findings of the investigation.

1.4 Limitations

This report has been prepared by GHD for Department of State Growth and may only be used and relied on by Department of State Growth for the purpose agreed between GHD and Department of State Growth as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Department of State Growth arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

This report should be read in conjunction with the attached Standard Sheets presented in Appendix B and the limitations and exclusions included in Section 6.

2. Desktop review

A geotechnical review, including desktop study and site walkover was undertaken in February 2024 to determine anticipated geological conditions and potential geohazards at the site. The desktop study entailed a review of published available data.

The full report is included in Appendix C, with the site geology replicated below for ease of reference. Please note that the geotechnical review report includes an indicative preferred conceptual layout of the development at the time of writing; however, it is understood that this arrangement is outdated and likely to change.

2.1 Geology

A review of Mineral Resources Tasmania’s (MRT) 1:25,000 scale geology map of Hobart, indicates that the entire proposed development at Charles Hand Park and majority of the Rosny Parkland proposed development is underlain by Jurassic dolerite and related rocks (Jd). The lower lying, eastern portion of the Rosny Parkland site is mapped to be underlain by Undifferentiated Upper Parmeener Supergroup rocks (R), with an inferred faulted contact between the two units.

Quaternary sediments (Q, Qham) associated with Kangaroo Bay Rivulet are shown intermittently to the east of the sites.

An extract of the geology map, together with investigated test sites, is provided in Appendix D.

3. Field investigation

3.1 General

The geotechnical field investigations were carried out between the 14 May and 14 June 2024 across Rosny Parklands and Charles Hand Park and comprised the following:

- Geophysical survey
- Excavation of 24 test pits
- Drilling of 10 boreholes

The fieldwork was carried out under the full-time supervision of a Geotechnical Engineer from GHD and in general accordance with Australian Standard AS 1726:2017 – Geotechnical Site Investigations and standard GHD procedures.

Archers Underground Services Pty Ltd was engaged to confirm that the test locations were clear of underground services prior to commencement of the intrusive investigation.

Two representatives from Cultural Heritage Management Australia (CHMA) were engaged directly by Department of State Growth to be in full time attendance of the test pit excavations to inspect for potential artifacts of historical significance in the upper profile.

Veris was engaged to survey the site and provided surveyed coordinates and elevations for each cleared location; except for site BH_C02A, which was estimated using site measurements from the surveyed BH_C02 site. A test site location plan is included in Appendix A.

3.2 Geophysical survey

The geophysical acquisition comprised of:

- Six (6) seismic lines at Rosny Parklands.
- One (1) seismic line at Charles Hand Park.

A summary of the survey lines is provided in Table 1, whilst the surveyed traverses are shown on the site plan in Appendix A.

Table 1 Seismic survey line lengths

Location	Line ID	Line Position	Coordinates (MGA 2020, Zone 55)		Survey line length (m)
			Easting (m)	Northing (m)	
Rosny Parklands	SL1	Start	529965	5254385	156
		End	530096	5254470	
	SL2	Start	530007	5254472	96
		End	530060	5254395	
	SL3	Start	529858	5254224	192
		End	529975	5254376	

	SL4	Start	529838	5254332	120
		End	529932	5254261	
	SL5	Start	529890	5254087	132
		End	529910	5254217	
	SL6	Start	529857	5254146	84
		End	529938	5254128	
Charles Hand Park	SL7	Start	529703	5253800	136
		End	529776	5253915	

A report covering the methodology used for data acquisition and processing, together with the seismic sections, is presented in Appendix E.

3.3 Test pits

Test pits were carried out using a 13-tonne excavator provided and operated by Digga Excavation Pty Ltd. The test pits were excavated to a maximum depth of 3.5 m below existing surface level and were typically terminated upon reaching the target depth or refusal. TP21 was the only exception, being terminated due to the unanticipated discovery of a potential aboriginal artifact in the topsoil layer.

Dynamic Cone Penetrometer (DCP) tests were undertaken at the test pit locations prior to excavation to assess the in-situ density/consistency. The DCP blows per 100 mm of penetration are recorded on the logs.

Pocket Penetrometer (PP) tests were undertaken within cohesive soils to assess their consistency and the unconfined compressive strength values are recorded on the logs.

Materials excavated from the test pits were logged in general accordance with AS1726-2017. On completion of logging the test pits were reinstated with the excavated material as backfill and tamped with the base of the excavator bucket. The set-aside topsoil was spread over the disturbed area and grass seeded.

Descriptive logs indicating the observed soil profile in each test pit and the associated test pit photographs are presented in Appendix F, with explanatory notes summarising general nomenclature and symbols used, included in Appendix B. A summary of the test pit locations is included in Table 2.

Table 2 Test pit summary

ID	Coordinates (MGA 2020, Zone 55)		Elevation (mAHD)	Depth (m)	Termination reason
	Easting (m)	Northing (m)			
TP01	529869.3	5254039.6	20.42	2.4	Target depth
TP02	529951.6	5254149.9	14.52	2.6	Refusal*
TP03	529848.0	5254275.1	31.67	3.4	Near refusal*
TP04	529997.8	5254077.1	10.48	3.5	Target depth
TP05	530026.9	5254154.5	9.51	2.1	Target depth/Refusal*
TP06	529973.8	5254298.5	19.35	1.5	Refusal with ripper
TP08	530089.8	5254465.2	30.77	3.0	Refusal*
TP10	530013.2	5254457.9	38.38	1.8	Refusal*
TP11	530046.9	5254380.9	25.19	2.4	Refusal*
TP15	529889.6	5254089.1	19.77	2.6	Refusal*
TP16	529879.2	5254189.4	23.82	3.0	Refusal*
TP17	529921.3	5254070.8	15.8	2.4	Refusal*
TP18	529974.1	5254218.0	15.61	2.2	Target depth (slow excavation only)
TP19	529902.1	5254241.6	22.84	2.8	Refusal*
TP20	530046.1	5254298.5	18.01	1.7	Target depth / Near refusal*
TP21	530018.3	5254210.1	12.66	0.2	Potential artifact encountered
TP22	529859.5	5254144.2	26.41	2.6	Refusal*
TP23	530126.1	5254408.8	22.59	1.7	Refusal*
TP24	529906.0	5254191.0	20.02	1.6	Refusal*
TP25	529983.7	5254419.6	33.30	2.2	Refusal*
TP_C01	529720.6	5253886.6	27.22	3.0	Near refusal / slow excavation*
TP_C02	529750.2	5253825.6	21.31	1.5	Bucket refusal at 1.3m, ripper required to penetrate. Ripper refusal at 1.5m
TP_C03	529847.6	5253796.7	13.87	1.8	Refusal*
TP_C04	529826.2	5253746.1	13.31	1.2	Near refusal*
Please note that TP07, TP09, TP12, TP13 & TP14 were not undertaken. * Using 13t excavator with a 3-toothed, 450mm wide bucket					

3.4 Boreholes

South Western Drilling Pty Ltd was engaged to perform geotechnical drilling services using a Comacchio Geo 405, track mounted drill rig. A total of 10 boreholes were drilled across the two sites to target depths up to a maximum of 13 m below existing surface level.

Solid flight auguring techniques were used to advance the boreholes to refusal on bedrock, with Standard Penetration Testing (SPT) conducted at 1.5 m depth intervals. The boreholes were drilled into the bedrock using HQ diamond coring techniques.

The uncorrected results of the SPTs are presented on the associated borehole logs in Appendix F.

Pocket penetrometers were undertaken within cohesive materials at the base of push tube (U63) samples to assess the consistency of the soils. Where undertaken, the unconfined compressive strength values are recorded on the logs.

Upon completion, either a groundwater standpipe or soil casing was installed within the borehole, as outlined in Table 3. The soil casing was installed (with a gatic cover for protection) to allow future ATV/OTV testing of the rockmass if required (subject to no blockages).

Borehole details are summarised in Table 3, with logs and photographs presented in Appendix F. Explanatory notes summarising general nomenclature and symbols used are provided in Appendix B.

Table 3 Borehole summary

ID	Location	Coordinates (MGA 2020, Zone 55)		Elevation (mAHD)	Depth (m)	Installed on completion
		Easting (m)	Northing (m)			
BH01	Rosny Parklands	529896.1	5254136.3	20.22	8.9	Soil casing
BH02	Rosny Parklands	529902.0	5254284.1	25.25	9.3	Soil casing
BH03	Rosny Parklands	529938.7	5254328.2	25.01	8.4	Standpipe
BH04	Rosny Parklands	530029.1	5254426.2	32.30	13.0	Soil casing
BH05	Rosny Parklands	529993.1	5254403.7	30.43	12.1	Standpipe
BH06	Rosny Parklands	529869.3	5254239.5	25.96	7.9	Standpipe
BH10	Rosny Parklands	530019.6	5254099.0	8.69	5.2	Standpipe
BH_C01	Charles Hand Park	529710.8	5253809.7	23.54	7.9	Soil casing
BH_C02	Charles Hand Park	529761.4	5253892.8	23.46	1.5	N/A - Backfilled
BH_C02A	Charles Hand Park	529765*	5253896*	23.3*	7.9	Soil casing

Please note that BH07, BH08 and BH09 do not exist.

* Coordinates estimated using site measurements from the surveyed BH_C02 site, elevation deduced from survey.

4. Site conditions

4.1 Subsurface conditions

Detailed descriptions of the subsurface materials and conditions encountered during the investigations are provided in the geotechnical logs in Appendix F and should be referred to for detail at each location. Photographs of each test site are included after the logs.

4.2 Groundwater

Groundwater seepage was not encountered in any of the test pits during the geotechnical investigation.

Standpipe piezometers with gatic covers were installed within boreholes BH03, BH05, BH06 and BH10 at Rosny Parklands. The boreholes were developed using airlifting techniques to enable groundwater levels to be obtained and future groundwater sampling if required. The groundwater levels were measured a minimum of three weeks following borehole completion, with recorded groundwater levels presented in Table 4. It should be noted that groundwater levels may fluctuate, and higher water table or perched groundwater may be encountered during wetter periods of the year.

Table 4 Measured borehole groundwater levels

Sample location	Reading date – 08/07/2024	
	Depth (m below existing ground level)	Groundwater RL (m)
BH03	8.1*	16.9
BH05	Dry	< 18.3
BH06	Dry	<18.1
BH10	2.4	6.3
*100mm above bottom of well		

5. Laboratory testing

Geotechnical testing was carried out on selected samples collected from the test sites to confirm field logging and provide material properties. The following tests were undertaken, according to the relevant Australian Standard test methods:

- Atterberg limits.
- Linear Shrinkage.
- In-situ moisture content.
- Particle size distribution.
- Emerson Class.
- Standard compaction.
- Soaked CBR (with % swell).
- Point load testing (on block samples from the test pits).
- Unconfined Compression Strength (UCS).

The soil samples were tested at the NATA accredited ADG Laboratory in Mornington, Tasmania. UCS testing of rock core and point load testing of select rock blocks taken from the test pits were tested at GHD's NATA accredited laboratory in Artarmon, New South Wales.

Tabulated summaries of the laboratory soil and rock test results are presented in Table 5 and Table 6 respectively, with laboratory test certificates included in Appendix G. Atterberg Limits and Particle Size Distribution results are presented graphically in Figure 1 and Figure 2 respectively.

Additional point load testing was also conducted at GHD's Hobart store on selected rock core obtained during the borehole investigation. This point load testing, whilst not NATA accredited, was undertaken in accordance with AS4133.4.1-2007. The $Is_{(50)}$ results for tested samples are included on the geotechnical logs and summarised in Table 7, with the full set of data included in Appendix H.

Shrink-swell testing was proposed to be undertaken on five push tube samples collected from the upper soils during the investigation, however ADG informed GHD that the samples were unable to be tested due to their hardness.

Table 5 *Summary of Soil Laboratory Test Results*

Test Site ID	Depth (m)	Laboratory Classification	Soil Symbol	MC (%)	Plasticity (%)		LS (%)	Emerson Class No.	Particle Size Distribution (%)			Compaction		% Swell	4-day Soaked CBR (%)
					LL	PI			Fines	Sand	Gravel	MSDD (t/m³)	OMC (%)		
BH01	0.5 - 0.7	CLAY, trace sand	-	7.9	-	-	-	-	-	-	-	-	-	-	-
BH02	0.5 - 0.9	CLAY, trace sand	-	18.8	-	-	-	6	-	-	-	-	-	-	-
BH06	0.5 - 0.9	CLAY with sand	CH	17.7	60	43	10	-	81	19	0	-	-	-	-
BH10	0.5 - 0.8	SILT with gravel, trace sand	-	13.7	-	-	-	-	-	-	-	-	-	-	-
TP_01	0.3 - 0.6	Sandy CLAY, trace gravel	CI	14.1	44	27	11	-	63	33	4	1.65	19.0	1.8	3
TP_03	1.2 - 1.6	CLAY with sand, trace gravel	CH	32.5	71	50	16	6	75	24	1	1.41	30.4	-	-
TP_03	1.6 - 2.0	CLAY with sand, trace gravel	CH	27.2	63	48	13	6	68	30	2	1.57	26.0	-	-
TP_04	0.6 - 0.8	Sandy CLAY, trace gravel	CH	19.1	53	27	11	6	43	55	2	-	-	-	-
TP_05	0.8 - 1.0	Sandy CLAY, trace gravel	CH	18.8	57	39	11	-	68	31	1	-	-	-	-
TP_06	0.4 - 0.7	Sandy CLAY	CI	15.0	50	28	8	6	49	51	0	-	-	-	-
TP_08	0.2 - 0.7	Sandy CLAY, trace gravel	CH	16.9	51	33	13	6	61	36	3	1.63	21.4	-	-
TP_11	0.4 - 0.65	Sandy CLAY, trace gravel	CL	15.2	31	16	4	6	46	51	3	1.62	19.9	-	-
TP_15	0.3 - 0.5	Sandy CLAY, trace gravel	CH	15.0	54	36	14	-	58	40	2	1.66	20.0	-	-
TP_16	0.2 - 0.4	Sandy CLAY, trace gravel	CH	15.3	51	32	14	-	62	34	4	1.64	20.2	-	-
TP_18	0.2 - 0.5	CLAY with sand, trace gravel	CH	22.6	68	49	17	-	75	24	1	-	-	-	-
TP_19	1.1 - 1.4	Clayey SAND, trace gravel	SC	9.9	38	13	6	-	16	76	8	1.79	17.2	-	-
TP_20	0.7 - 0.85	Clayey SAND with gravel	SC	9.8	38	14	8	-	17	53	30	-	-	-	-
TP_22	0.2 - 0.6	Sandy CLAY, trace gravel	CH	15.4	59	40	13	-	64	35	1	1.63	21.4	4.5	1.5
TP_22	0.6 - 0.8	Sandy CLAY, trace gravel	CH	17.4	52	28	11	6	40	48	12	1.53	23.1	4.2	2
TP_C01	0.3 - 0.6	CLAY with sand, trace gravel	CH	31.6	79	57	15	6	69	30	1	-	-	-	-
TP_C01	0.8 - 1.0	Clayey SAND, trace gravel	SC	13.4	43	18	15	6	16	77	7	1.69	20.2	-	-
TP_C02	0.2 - 0.4	CLAY with sand, trace gravel	CH	24.5	62	44	16	6	69	30	1	1.51	27.6	1.9	1
TP_C03	0.5 - 0.8	CLAY with sand, trace gravel	CH	22.5	78	56	18	-	70	29	1	-	-	-	-
TP_C03	0.9 - 1.1	Clayey Gravelly SAND	SC	6.9	37	15	7	-	13	52	35	-	-	-	-

Notes: MC – Moisture Content; LL – Liquid Limit; PI – Plasticity Index; LS – Linear Shrinkage; MSDD – Maximum Standard Dry Density; OMC – Optimum MC

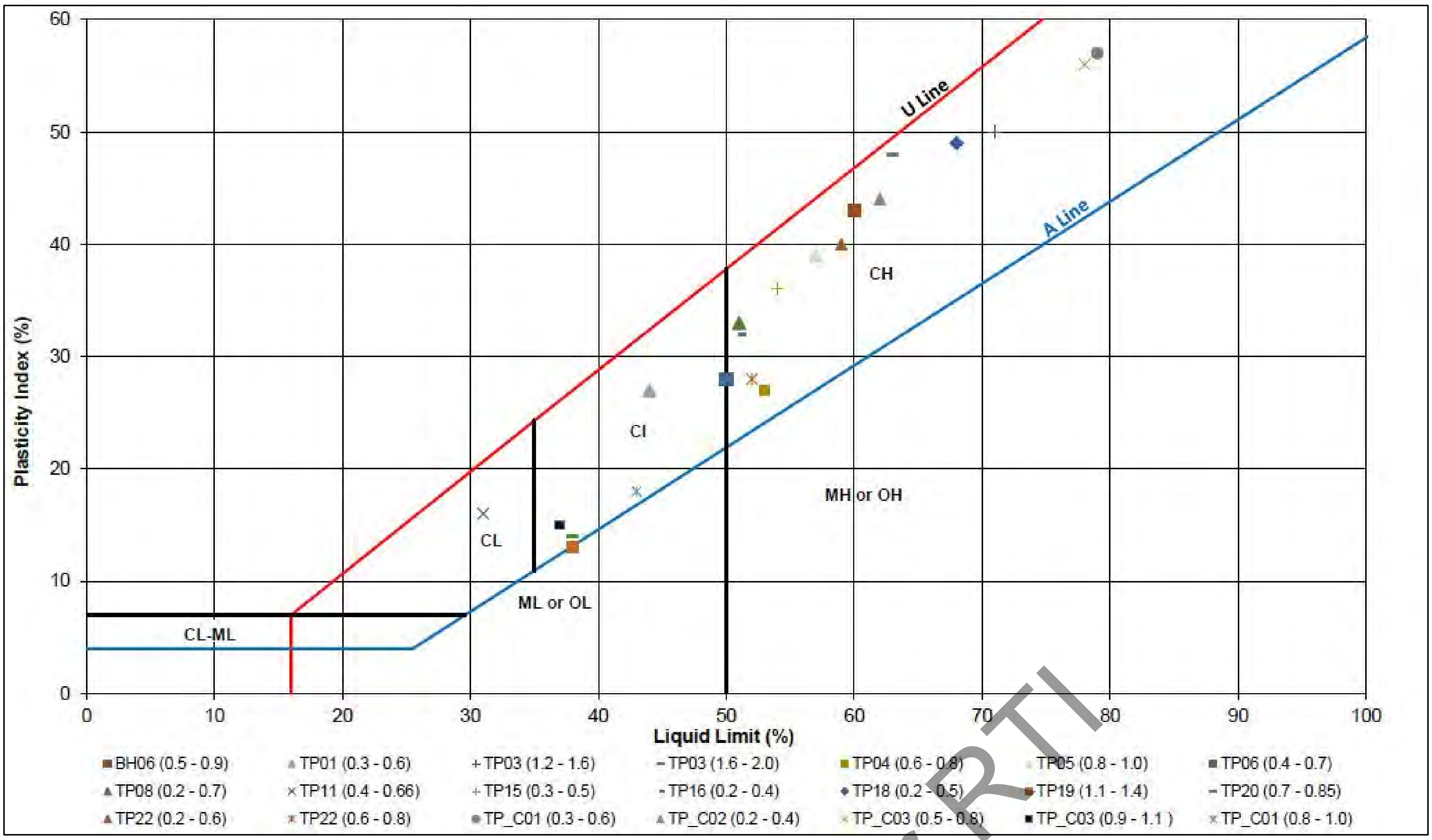

Figure 1 *Atterberg Limits Testing Results*

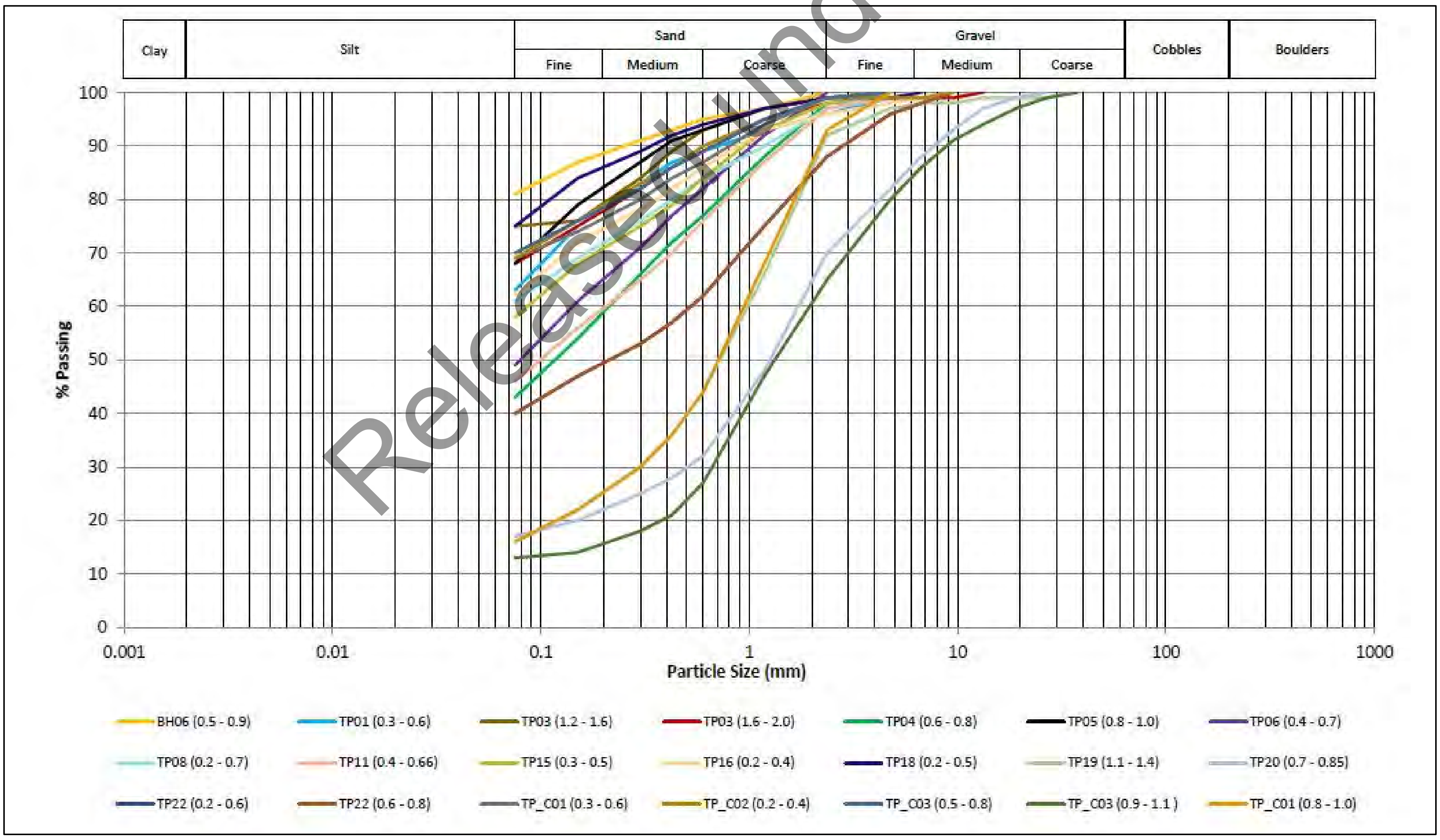

Figure 2 *Particle Size Distribution Testing Results*

Table 6 Summary of laboratory rock strength testing

Borehole	Depth (m)	Rock Type	Weathering	Test Type	Is(50) (MPa)	Mode of Failure	MC (%)	Dry Density (t/m³)	UCS (MPa)
BH_C01	7.06 - 7.31	Dolerite	MW-SW	UCS	-	Shattered	0.4	2.83	293
BH04	7.64 - 7.80	Dolerite	MW	UCS	-	Axial Multiple	1.5	2.75	51.6
BH04	12.4 - 12.55	Dolerite	MW	UCS	-	Axial Multiple	1.4	2.72	25.8
BH05	9.07 - 9.26	Dolerite	MW-SW	UCS	-	Axial Multiple	1.2	2.76	41.6
BH05	11.51 - 11.75	Dolerite	SW	UCS	-	Shattered	0.5	2.82	171
TP02	1.60 - 1.70	Dolerite	HW	Point load (block)	0.81	Fracture through rockmass	-	-	-
					1.25	Fracture through rockmass	-	-	-
					0.78	Fracture through rockmass	-	-	-
					0.81	Fracture through rockmass	-	-	-
TP10	1.30 - 1.80	Dolerite	MW	Point load (block)	8.35	Fracture through rockmass	-	-	-
					9.91	Fracture through rockmass	-	-	-
					10.54	Fracture through rockmass	-	-	-
					3.66	Fracture through rockmass	-	-	-
TP24	1.00 - 1.20	Dolerite	MW	Point load (block)	1.01	Fracture through rockmass	-	-	-
					1.34	Fracture through rockmass	-	-	-
					1.29	Fracture through rockmass	-	-	-
TP24	1.20 - 1.50	Dolerite	MW	Point load (block)	2.11	Fracture through rockmass	-	-	-
					1.78	Fracture through rockmass	-	-	-
HW – Highly Weathered; MW – Moderately Weathered; SW – Slightly Weathered									

Table 7 Point load test summary

Test Site ID	Depth (m)	Rock Type	Weathering	Test Type	Is(50) (MPa)	Strength Term	Mode of Failure
BH01	2.6	Dolerite	HW	Diametric	0.32	M	Fracture through rockmass
BH01	3.7	Dolerite	HW	Diametric	0.41	M	Fracture through rockmass
BH01	4.7	Dolerite	HW	Axial	0.36	M	Fracture through rockmass
BH01	5.3	Dolerite	HW	Axial	0.32	M	Fracture through rockmass
BH01	6.4	Dolerite	HW	Diametric	0.38	M	Fracture through rockmass
BH01	7.7	Dolerite	HW	Diametric	0.65	M	Fracture through rockmass
BH01	8.4	Dolerite	HW	Diametric	0.51	M	Fracture through rockmass
BH02	3.4	Dolerite	MW	Axial	4.17	VH	Fracture along defect
BH02	3.8	Dolerite	MW	Axial	3.23	VH	Fracture along defect
BH02	4.6	Dolerite	MW	Axial	2.61	H	Fracture through rockmass
BH02	5.3	Dolerite	MW	Diametric	3.70	VH	Fracture through rockmass
BH02	6	Dolerite	MW	Axial	8.11	VH	Fracture through rockmass
BH02	6.5	Dolerite	MW	Axial	3.40	VH	Fracture through rockmass
BH02	7.3	Dolerite	MW	Axial	2.17	H	Fracture through rockmass
BH02	7.95	Dolerite	MW	Diametric	1.44	H	Fracture through rockmass
BH02	9.2	Dolerite	MW	Diametric	1.18	H	Fracture along defect
BH03	4	Dolerite	HW	Axial	0.62	M	Fracture through rockmass
BH03	4.9	Dolerite	HW	Axial	0.31	L	Fracture through rockmass
BH03	5.5	Dolerite	HW	Axial	0.70	M	Fracture through rockmass
BH03	6.3	Dolerite	HW	Axial	0.54	M	Fracture through rockmass
BH03	6.7	Dolerite	MW	Diametric	1.53	H	Fracture through rockmass
BH03	8.1	Dolerite	MW	Axial	2.86	VH	Fracture through rockmass
BH04	1.5	Dolerite	MW	Diametric	0.65	M	Fracture through rockmass
BH04	3.5	Dolerite	MW	Axial	1.68	H	Fracture through rockmass
BH04	4.75	Dolerite	HW	Diametric	0.59	M	Fracture through rockmass
BH04	6.5	Dolerite	MW	Diametric	0.56	M	Fracture through rockmass
BH04	7.1	Dolerite	MW	Diametric	0.59	M	Fracture along defect
BH04	7.9	Dolerite	MW	Diametric	1.41	H	Fracture through rockmass
BH04	8.5	Dolerite	MW	Diametric	1.47	H	Fracture through rockmass
BH04	9.65	Dolerite	MW	Diametric	5.29	VH	Fracture through rockmass
BH04	10.08	Dolerite	MW	Diametric	0.68	M	Fracture through rockmass
BH04	11.18	Dolerite	MW	Axial	2.72	H	Fracture through rockmass
BH04	11.65	Dolerite	MW	Axial	2.96	VH	Fracture through rockmass
BH04	12.3	Dolerite	MW	Axial	3.43	VH	Fracture along defect
BH05	3.35	Dolerite	MW	Axial	4.89	VH	Fracture through rockmass

Test Site ID	Depth (m)	Rock Type	Weathering	Test Type	Is(50) (MPa)	Strength Term	Mode of Failure
BH05	4.5	Dolerite	MW	Axial	1.8	H	Fracture along defect
BH05	5.7	Dolerite	MW	Axial	9.7	VH	Fracture through rockmass
BH05	6.7	Dolerite	MW	Axial	1.6	H	Fracture through rockmass
BH05	7.4	Dolerite	MW	Axial	2.3	H	Fracture through rockmass
BH05	8.1	Dolerite	MW	Axial	1.8	H	Fracture through rockmass
BH05	8.9	Dolerite	MW	Diametric	3.4	VH	Fracture through rockmass
BH05	9.5	Dolerite	SW	Diametric	2.3	H	Fracture through rockmass
BH05	10.5	Dolerite	SW	Diametric	4.4	H	Fracture through rockmass
BH05	11.5	Dolerite	SW	Axial	2.8	H	Fracture along defect
BH06	3.45	Dolerite	HW	Axial	0.9	M	Fracture through rockmass
BH06	3.83	Dolerite	HW	Axial	1.1	H	Fracture through rockmass
BH06	4.54	Dolerite	HW	Diametric	0.4	M	Fracture along defect
BH06	4.54	Dolerite	HW	Axial	1.5	H	Fracture through rockmass
BH06	5.85	Dolerite	HW	Axial	0.97	M	Fracture along defect
BH06	6.48	Dolerite	MW	Axial	1.3	H	Fracture through rockmass
BH06	6.95	Dolerite	MW	Axial	0.8	M	Fracture along defect
BH06	7.5	Dolerite	MW	Axial	1.0	H	Fracture along defect
BH06	7.8	Dolerite	MW	Diametric	0.6	M	Fracture through rockmass
BHC01	4.3	Dolerite	HW	Axial	0.8	M	Fracture through rockmass
BHC01	4.95	Dolerite	HW	Axial	0.5	M	Fracture along defect
BHC01	5.55	Dolerite	MW	Axial	0.6	M	Fracture along defect
BHC01	5.95	Dolerite	MW	Diametric	1.9	H	Fracture along defect
BHC01	6.65	Dolerite	SW	Diametric	> 10	EH	Unable to fail
BHC01	7.45	Dolerite	SW	Axial	5.5	VH	Fracture through rockmass
BHC02A	2.4	Dolerite	MW	Diametric	5.4	VH	Fracture along defect
BHC02A	2.7	Dolerite	MW	Axial	6.9	VH	Fracture through rockmass
BHC02A	3.3	Dolerite	MW	Axial	10.5	EH	Fracture through rockmass
BHC02A	4.0	Dolerite	MW	Diametric	5.9	VH	Fracture along defect
BHC02A	5	Dolerite	MW	Axial	6.7	VH	Fracture through rockmass
BHC02A	5.8	Dolerite	SW	Axial	6.1	VH	Fracture through rockmass
BHC02A	6.5	Dolerite	SW	Diametric	5.5	VH	Fracture through rockmass
BHC02A	7.0	Dolerite	SW	Diametric	> 10	EH	Unable to fail

HW – Highly Weathered; MW – Moderately Weathered; SW – Slightly Weathered; L – Low; M – Medium; H – High; VH – Very High; EH – Extremely High

6. Limitations and exclusions

This report is limited to factual information only. The following exclusions apply to this investigation:

- The scope of this geotechnical investigation is based on pre-feasibility sketches at the time of planning.
- No advanced testing was undertaken on soil materials as the design is not yet resolved.
- Although groundwater levels within the standpipes have been provided, hydrogeological assessment is excluded from this report.
- A preliminary excavatibility assessment has been undertaken separately as part of this project (project number 12626209) and is excluded from this report.

7. Recommendations

- After finalising the concept, a geotechnical gap analysis needs to be carried out to identify data gaps. Based on this gap analysis, complimentary site investigations may be required.
- Given the current topography, as well as significant earthworks (i.e. cut and fill) proposed for the new development, a detailed hydrological study (both surface and groundwater) is recommended.

References

- Australian Standard, AS 1289 – Method of testing soils for engineering purposes. Standards Australia.
- Australian Standard, AS 1726-2017. Geotechnical site investigations. Standards Australia.
- Australian Standard, AS 4133.4.1-2007. Methods of testing rocks for engineering purposes, Method 4.1: Rock strength tests — Determination of point load strength index. Standards Australia.
- (GHD 2024). AFL High Performance Centre Rosny Parklands Option 2 Geotechnical Review, 20 February 2024.
- Mineral Resources Tasmania (MRT): http://www.mrt.tas.gov.au/

Appendices

Appendix A

Site plan with test site locations

1:3,500 @ A3

0 40 80 120 160

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

—	Elevation contours (10m)
—	Roads
—	Watercourses

GHD

Department of State Growth
AFL High Performance Centre

Job Number	12626209
Revision	C
Date	18 Jul 2024

Site Location

Appendix A

G:\32\12626209\GIS\Maps\Deliverables\Rosny Parklands Site Option\12626209_SiteLoc_A3L_RevA.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

1:1,500 @ A3

0 10 20 30 40 50

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

Test Location Type

⊕	Borehole (7)
▨	Test Pit (20)
—	Seismic Investigation Lines
—	Roads
—	Watercourses

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Department of State Growth
AFL High Performance Centre Strategic Alignment

Job Number	12626209
Revision	A
Date	18 Jul 2024

Site Plan with
Test Locations (Rosny)

Appendix A1

2 Salamanca Square, Hobart Tasmania 7000 Australia T 61 3 6210 0600 E hbamail@ghd.com W www.ghd.com

G:\32\12626209\GIS\Maps\Deliverables\Rosny Parklands Site Option\12626209_SitePlan_A3L_RevC.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

1:1,200 @ A3

0 10 20 30 40 50

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

Test Location Type

⊕ Borehole (3)

▨ Test Pit (4)

— Seismic Investigation Lines

— Roads

— Watercourses

— Roads (26)

GHD

Department of State Growth
AFL High Performance Centre Strategic Alignment

Site Plan with Test Locations (Charles Hand Park)

Job Number	12626209
Revision	A
Date	18 Jul 2024

Appendix A2

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G:\32\12626209\GIS\Maps\Deliverables\Charles Hand Park Site Option\12626209_SitePlan_A3L_RevA.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

Appendix B

Standard sheets

GENERAL NOTES

The report contains the results of a geotechnical investigation or study conducted for a specific purpose and client. The results may not be used or relied on by other parties, or used for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically required to do so by the client.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the report are excluded unless they are expressly stated to apply in the report.

TEST HOLE LOGGING

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information. Moreover, the location of test holes should be considered approximate, unless noted otherwise (refer report). Reference should also be made to the relevant standard sheets for the explanation of logging procedures (Soil and Rock Descriptions, Core Log Sheet Notes etc.).

GROUNDWATER

Unless otherwise indicated, the water depths presented on the test hole logs are the depths of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater depth may differ from this recorded depth depending on material permeabilities (i.e. depending on response time of the measuring instrument). Further, variations of this depth could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities such as a change is ground surface level. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate surveys, instrumentation techniques and monitoring programmes.

INTERPRETATION OF RESULTS

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data, often with only approximate locations (e.g. GPS). Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

CHANGE IN CONDITIONS

Local variations or anomalies in ground conditions do occur in the natural environment, particularly between discrete test hole locations or available observation sites. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural processes.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to GHD for appropriate assessment and comment.

GEOTECHNICAL VERIFICATION

Verification of the geotechnical assumptions and/or model is an integral part of the design process - investigation, construction verification, and performance monitoring. Variability is a feature of the natural environment and, in many instances, verification of soil or rock quality, or foundation levels, is required. There may be a requirement to extend foundation depths, to modify a foundation system and/or to conduct monitoring as a result of this natural variability. Allowance for verification by appropriate geotechnical personnel must be recognised and programmed for construction.

FOUNDATIONS

Where referred to in the report, the soil or rock quality, or the recommended depth of any foundation (piles, caissons, footings etc.) is an engineering estimate. The estimate is influenced, and perhaps limited, by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The material quality and/or foundation depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications should provide for variations in the final depth, depending upon the ground conditions at each point of support, and allow for geotechnical verification.

REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions must include at least all of the relevant test hole and test data, together with the appropriate Standard Description sheets and remarks made in the written report of a factual or descriptive nature.

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SOIL DESCRIPTION AND CLASSIFICATION

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Soil is described in general accordance with Australian Standard AS 1726-2017 (Geotechnical Site Investigations) in terms of visual and tactile properties, with potential refinement by laboratory testing. AS 1726 defines soil as particulate materials that occur in the ground and can be disaggregated or remoulded by hand in air or water without prior soaking. Classification of the soil is undertaken following description.

SOIL DESCRIPTION

The soil description includes a) Composition, b) Condition, c) Structure, d) Origin and e) Additional observations. 'FILL', 'TOPSOIL' or a 'MIXTURE OF SOIL AND COBBLES / BOULDERS' (with dominant fraction first) is denoted at the start of a soil description where applicable.

a) Soil Composition (soil name, colour, plasticity or particle characteristics, secondary and then minor components)

Soil Name: A soil is termed a *coarse grained soil* where the dry mass of sand and gravel particles exceeds 65% of the total. Soils with more than 35% fines (silt or clay particles) are termed *fine grained soils*. The soil name is made up of the primary soil component (in BLOCK letters), prefixed by applicable secondary component qualifiers. Minor components are applied as a qualifiers to the soil name (using the words 'with' or 'trace').

Particles are differentiated on the basis of size. 'Boulders' and 'cobbles' are outside the soil particle range, though their presence (and proportions) is noted. While individual particles may be designated as silt or clay based on grain size, fine grained soils are characterised as silt or clay based on tactile behaviour or Atterberg Limits, and not the relative composition of silt or clay sized particles.

Colour: The prominent colour is noted, followed by (spotted, mottled, streaked etc.) then secondary colours as applicable. Roughly equally proportioned colours are prefixed by (spotted, mottled, streaked etc.). Colour is described in its moist condition, though both wet and dry colours may also be provided if appropriate.

Plasticity: Fine grained soils are designated within standard ranges of plasticity based on tactile assessment or laboratory assessment of the Liquid Limit.

Particle Characteristics: The particle shape, particle distribution and particle size range within a coarse grained soil is described using standard terms. Particle composition may be described using rock or mineral names, with specific terms for carbonate soils.

Secondary and Minor Components: The primary soil is described and modified by secondary and minor components, with assessed ranges as tabulated.

Carbonate Soils: Carbonate content can be assessed by use of dilute '10%' HCl solution. Resulting clear sustained effervescence is interpreted as a *Carbonate soil* (approximately >50% carbonate), while weak or sporadic effervescence indicates *Calcareous soil* (< 50% carbonate). No effervescence is interpreted as a non-calcareous soil.

Organic and Peat Soils: Where identified, organic content is noted. *Organic soil* (2% to 25% organic matter) is usually identified by colour (usually dark grey/black) and odour (i.e. 'mouldy' or hydrogen sulphide odour). *Peat* (>25% organic matter) is identified by a spongy feel and fibrous texture. Peat soils' decomposition may be described as '*fibrous*' (little / no decomposition), '*pseudo-fibrous*' (moderate decomposition) or '*amorphous*' (full decomposition).

Fraction	Components		Particle Size (mm)
Oversize	BOULDERS		> 200
	COBBLES		63 - 200
Coarse grained soil particles	GRAVEL	Coarse	19 - 63
		Medium	6.7 -19
		Fine	2.36 - 6.7
	SAND	Coarse	0.6 - 2.36
		Medium	0.21 - 0.6
		Fine	0.075 - 0.21
Fine grained soil particles	SILT		0.002 - 0.075
	CLAY		< 0.002

Plasticity Terms (Fine Grained Soils)		Laboratory Liquid Limit Range
Silt	**Clay**	
N/A	N/A	(Non Plastic)
Low Plasticity	*Low Plasticity*	≤ 35%
	Medium Plasticity	> 35% and ≤ 50%
High Plasticity	*High Plasticity*	> 50%

Particle Distribution Terms (Coarse Grained Soils)	
Well graded	good representation of all particle sizes
Poorly graded	one or more intermediate sizes poorly represented
Gap graded	one or more intermediate sizes absent
Uniform	essentially of one size

Particle Shape Terms (Coarse Grained Soils)		
Rounded	*Sub-angular*	*Flaky or Platy*
Sub-rounded	*Angular*	*Elongated*

Secondary and Minor Components for Coarse Grained Soils			
Fines (%)	**Modifier** (as applicable)	**Accessory coarse (%)**	**Modifier** (as applicable)
≤ 5	*'trace silt / clay'*	≤ 15	*'trace sand / gravel'*
> 5, ≤ 12	*'with clay / silt'*	> 15, ≤ 30	*'with sand / gravel'*
> 12	*prefix 'silty / clayey'*	> 30	*prefix 'gravelly / sandy'*

Secondary and Minor Components for Fine Grained Soils	
% Coarse	**Modifier** (as applicable)
≤ 15	add *"trace sand / gravel"*
> 15, ≤ 30	add *"with sand / gravel"*
> 30	prefix soil *"sandy / gravelly"*

b) Soil Condition (moisture, relative density or consistency)

Moisture: Fine grained soils are described relative to plastic or liquid limits, while coarse grained soils are assessed based on appearance and feel. The observation of seepage or free water is noted on the test hole logs.

Moisture - Coarse Grained Soils		
Term		**Tactile Properties**
Dry	*('D')*	Non-cohesive, free running
Moist	*('M')*	Feels cool, darkened colour, tends to stick together
Wet	*('W')*	Feels cool, darkened colour, tends to stick together, free water forms when handling

Moisture - Fine Grained Soils		
Term		**Tactile Properties**
Moist, dry of plastic limit	('$w < PL$')	Hard and friable or powdery
Moist, near plastic limit	('$w \approx PL$')	Can be moulded
Moist, wet of plastic limit	('$w > PL$')	Weakened, free water forms on hands with handling
Wet, near liquid limit	('$w \approx LL$')	Highly weakened, tends to flow when tapped
Wet, wet of liquid limit	('$w > LL$')	Liquid consistency, soil flows

Relative Density (Non Cohesive Soils): The Density Index is inherently difficult to assess by visual or tactile means, and is normally assessed by penetration testing (e.g. SPT, DCP, PSP or CPT) with published correlations. Assessment may be affected by moisture and *in situ* stress conditions. Density Index assessment may be refined by combination of *in situ* density testing and laboratory reference maximum and minimum density ranges.

Consistency (Cohesive Soils): May be assessed by direct measurement (shear vane, CPT etc.), or approximate tactile correlations. Cohesive soils include fine grained soils, and coarse grained soils with sufficient fine grained components to induce cohesive behaviour. A 'design shear strength' must consider the mode of testing, the *in situ* moisture content and potential for variations of moisture which may affect the shear strength.

Relative Density (Non-Cohesive Soils)		
Term and (Symbol)		**Density Index (%)**
Very Loose	*(VL)*	≤ 15
Loose	*(L)*	> 15 and ≤ 35
Medium Dense	*(MD)*	> 35 and ≤ 65
Dense	*(D)*	> 65 and ≤ 85
Very Dense	*(VD)*	> 85

Consistency assessment can be influenced by moisture variation.

Consistency (Cohesive Soils)			
Term and (Symbol)		**Tactile Properties**	**Undrained Shear Strength**
Very Soft	*(VS)*	Extrudes between fingers when squeezed	< 12 kPa
Soft	*(S)*	Can be moulded by light finger pressure	12 - 25 kPa
Firm	*(F)*	Can be moulded by strong finger pressure	25 - 50 kPa
Stiff	*(St)*	Cannot be moulded by fingers	50 - 100 kPa
Very Stiff	*(VSt)*	Can be indented by thumb nail	100 - 200 kPa
Hard	*(H)*	Can be indented with difficulty by thumb nail	> 200 kPa
Friable	*(Fr)*	Easily crumbled or broken into small pieces by hand	-

c) Structure (zoning, defects, cementing)

Zoning: The *in situ* zoning is described using the terms below. *'Intermixed'* may be used for an irregular arrangement.

'layer' (a continuous zone across the exposed sample)

'lens' (a discontinuous layer with lenticular shape)

'pocket' (an irregular inclusion of different material).

'interbedded' or *"interlaminated'* (alternating soil types)

Defects: Described using terms below, with dimension orientation and spacing described where practical.

'parting' (an open or closed surface or crack sub parallel to layering with little / no tensile strength - open or closed)

'fissure' (as per a parting, though not parallel or sub parallel to layering – may include desiccation cracks)

'sheared seam' (zone of sub parallel near planar closely spaced intersecting smooth or slickensided fissures dividing the mass into lenticular or wedge shaped blocks)

'sheared surface' (a near planar, curved or undulating smooth, polished or slickensided surface, indicative of displacement)

'softened zone' (in clayey soils, usually adjacent to a defect with associated higher moisture content)

'tube' (tubular cavity, singly or one of a large number, often formed from root holes, animal burrows or tunnel erosion)

'tube cast' (an infilled tube – infill may vary from uncemented through to cemented or have rock properties)

'infilled seam' (sheet like soil body cutting through the soil mass, formed by infilling of open defects)

Cementation: Soils may be cemented by various substances (e.g. iron oxides and hydroxides, silica, calcium carbonate, gypsum), and the cementing agent shall be identified if practical. Cemented soils are described as:

'weakly cemented'	easily disaggregated by hand in air or water
'moderately cemented'	effort required to disaggregate the soil by hand in air or water

Materials extending beyond '*moderately cemented'* are encompassed within the rock strength range. Where consistent cementation throughout a soil mass is identified as a duricrust, it is described in accordance with duricrust rock descriptors. Where alternate descriptors of cementation development are applied for consistency with regional practices or geology, or client requirements, these are outlined separately.

SOIL DESCRIPTION AND CLASSIFICATION

d) Origin

An interpretation is provided based on observations of landform, geology and fabric, and may further include assignment of a stratigraphic unit. The use of terms 'possibly' or 'probably' indicates a higher degree of uncertainty regarding the assessed origin or stratigraphic unit. Typical origin descriptors include:

Residual	Formed directly from in situ weathering with no visible structure or fabric of the parent soil or rock.
Extremely weathered	Formed directly from in situ weathering, with remnant and/or fabric from the parent rock.
Alluvial	Deposited by streams and rivers (may be applied more generically as transported by water).
Estuarine	Deposited in coastal estuaries, including sediments from inflowing rivers, streams, and tidal currents.
Marine	Deposited in a marine environment.
Lacustrine	Deposited in freshwater lakes.
Aeolian	Transported by wind.
Colluvial and Slopewash	Soil and rock debris transported down slopes by gravity (with or without assistance of water). Colluvium is typically applied to thicker / localised deposits, and slopewash for thinner / widespread deposits.
TOPSOIL	Surficial soil, typically with high levels of organic material. Topsoils buried by other transported soils are termed *'remnant topsoil'*. Tree roots within otherwise unaltered soil does not characterise topsoil.
FILL	Any material which has been placed by anthropogenic processes (i.e. human activity).

e) Additional Observations

Additional observations may be included to supplement the soil description. Additional observations may consist of notations relating to soil characteristics (odour, contamination, colour changes with time), inferred geology (with delineation of soil horizons or geological time scale) or notes on sampling and testing application (including the reliability, recovery, representativeness, or condition of samples or test conditions and limitations). If the material is assessed to be not representative, terms such as 'poor recovery', 'non-intact', 'recovered as' or 'probably' are applied.

SOIL CLASSIFICATION

Classification allocates the material within distinct soil groups assigned a two character Group Symbol:

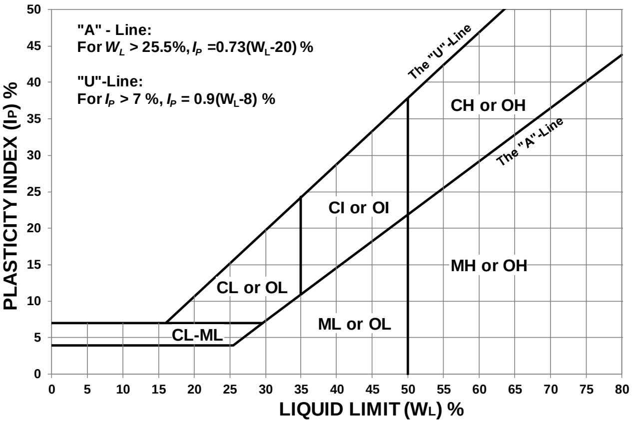
Coarse Grained Soils (sand and gravel: more than 65% of soil coarser than 0.075 mm)		
Major Division	**Group Symbol**	**Soil Group**
GRAVEL (more than half of the coarse fraction is > 2.36 mm)	GW	GRAVEL, well graded
	GP	GRAVEL, poorly graded
	GM	Silty GRAVEL
	GC	Clayey GRAVEL
SAND (more than half of the coarse fraction is < 2.36 mm)	SW	SAND, well graded
	SP	SAND, poorly graded
	SM	Silty SAND
	SC	Clayey SAND

Fine Grained Soils (silt and clay: more than 35% of soil finer than 0.075 mm)		
Major division	**Group Symbol**	**Soil Group**
SILT and CLAY (low to medium plasticity)	ML	SILT, low plasticity
	CL	CLAY, low plasticity
	CI	CLAY, medium plasticity
	OL	Organic SILT
SILT and CLAY (high plasticity)	MH	SILT, high plasticity
	CH	CLAY, high plasticity
	OH	Organic CLAY / SILT
Highly Organic	Pt	PEAT

Coarse grained soils with fines contents between 5% and 12% are provided a dual classification comprising the two group symbols separated by a dash, e.g. for a poorly graded gravel with between 5% and 12% silt fines (poorly graded 'GRAVEL with silt'), the classification is GP-GM.

For the purpose of classification, *poorly graded, uniform,* or *gap graded* soils are all designated as poorly graded. Soils that are dominated by boulders or cobbles are described separately and are not classified.

Classification is routinely undertaken based on tactile assessment with the soil description. Refinement of soil classification may be applied using laboratory assessment, including particle size distribution and Atterberg Limits. Atterberg Limits testing is applied to the sample portion finer than 0.425 mm. Fine grained soil components are assessed on the basis of regions defined within the Modified Casagrande Chart.



ROCK DESCRIPTION AND CLASSIFICATION

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Rock is described in general accordance with Australian Standard AS 1726-2017 (Geotechnical site investigations) in terms of visual and tactile properties, with potential refinement by laboratory testing. AS 1726 defines rock as any aggregate of minerals and/or organic materials that cannot be disaggregated by hand in air or water without prior soaking. The rock description and classification distinguishes between rock material, defects, structure and rock mass.

ROCK DESCRIPTION AND CLASSIFICATION

a) Description of rock material (rock name, grain size and type, colour, texture and fabric, inclusions or minor components, moisture content and durability)

Rock Name: Simple rock names are used to provide a reasonable engineering description rather than a precise geological classification. The rock name is chosen on the basis of origin, with common types summarised below. Additional, non-exhaustive, terminology is included in AS 1726. Rock names not described within AS 1726 may be adopted, with geological characteristics typically noted within accompanying text.

Grain Size (mm)	Sedimentary					Metamorphic		Igneous		
	Clastic or Detrital		Carbonate		Pyroclastic	Foliated	Non-Foliated	Felsic	↔	Mafic
			Low Porosity	Porous						
>2.0	CONGLOMERATE (rounded grains in a finer matrix) BRECCIA (angular or irregular fragments in a finer matrix)		LIMESTONE (Predominantly $CaCO_3$) or DOLOMITE (Predominantly $CaMgCO_3$)	CALCIRUDITE	AGGLOMERATE (rounded grains in a finer matrix) VOLCANIC BRECCIA (angular fragments in a finer matrix)	GNEISS	MARBLE (carbonate) QUARTZITE	GRANITE	DIORITE	GABBRO
2.0-0.06	SANDSTONE			CALCARENITE	TUFF	SCHIST	SERPENTINITE	MICRO-GRANITE	MICRO-DIORITE	DOLERITE
0.06-0.002	MUDSTONE (silt and clay)	SILTSTONE (mostly silt)		CALCISILTITE	Fine grained TUFF	PHYLLITE or SLATE	HORNFELS	RHYOLITE	ANDESITE	BASALT
<0.002		CLAYSTONE (mostly clay)		CALCILUTITE						

Reproduced with modification from Tables 15, 16 and 17, Clause 6.2.3.1, AS 1726-2017, Geotechnical site investigations.

Grain size: For rocks with predominantly sand sized grains the dominant or average grain size is described as follows:

Rock type	Coarse grained	Medium grained	Fine grained
Sedimentary rocks	Mainly 0.6 mm to 2 mm	Mainly 0.2 mm to 0.6 mm	Mainly 0.06 mm (just visible) to 0.2 mm
Igneous and metamorphic rocks	Mainly >2 mm	Mainly 0.06 mm to 2 mm	Mainly <0.6 mm (just visible)

Colour assists in rock identification and interpolation. Rock colour is generally described in a *"moist"* condition, using simple terms (e.g. grey, brown, etc.) and modified as necessary by *"pale"*, *"dark"*, or *"mottled"*. Borderline colours may be described as a combination of these colours (e.g. red-brown).

Texture refers to the arrangement of, or the relationship between, the component grains or crystals (e.g. porphyritic, crystalline or amorphous).

Fabric refers to visible grain arrangement along a preferential orientation or a layering. Fabric may be noted as *"indistinct"* (little effect on strength) or *"distinct"* (rock breaks more easily parallel to the fabric). Common terms include *"massive"* or *"flow banding"* (igneous), *"foliation"* or *"cleavage"* (metamorphic). Sedimentary layering is described as *"bedding"* or (where thickness < 20 mm) *"lamination"*. The typical orientation, spacing or thickness of these structural features can be described directly in millimetres and metres. Further quantification of bedding thickness applied by GHD is as follows:

Bedding Term	Thickness
Very thickly bedded	>2 m
Thickly bedded	0.6 to 2 m
Medium bedded	0.2 to 0.6 m
Thinly bedded	60 to 200 mm
Very thinly bedded	20 to 60 mm
Laminated	6 to 20 mm
Thinly laminated	<6 mm

Features, Inclusions and Minor Components are typically only described when those features could influence the engineering behaviour of the rock. Described features may include: gas bubbles in igneous rocks; veins of quartz, calcite or other minerals; pyrite crystals and nodules or bands of ironstone or carbonate; cross bedding in sandstone; clast or matrix support in conglomerates and breccia.

Moisture content may be described by the feel and appearance of the rock, as follows: *"dry"* (looks and feels dry), *"moist"* (feels cool, darkened in colour, but no water is visible on the surface), or *"wet"* (feels cool, darkened in colour, water film or droplets visible on the surface). The moisture content of rock cored with water may not represent in situ conditions.

Durability of rock samples is noted where there is an observed tendency of samples to crack, breakdown in water or otherwise deteriorate with exposure.

b) Classification of the rock material condition (strength, weathering and/or alteration)

Estimated Strength refers to the rock material and not the rock mass. The strength is defined in terms of uniaxial compressive strength (UCS), though is typically estimated by either tactile assessment or Point Load Strength Index ($Is_{(50)}$) (measured perpendicular to planar anisotropy). A correlation between $Is_{(50)}$ and UCS is adopted for classification, though is not intended for design purposes without appropriate supporting assessment. A field guide follows:

Term and (Symbol)		UCS (MPa)	$Is_{(50)}$ (MPa)	Field Guide
Very Low	*(VL)*	0.6 – 2	0.03 - 0.1	Material crumbles under firm blows with sharp end of geological pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm thick can be broken by finger pressure.
Low	*(L)*	2 - 6	0.1 - 0.3	Easily scored with knife; indentations 1 to 3 mm show in the specimen with firm blows of a geological pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	*(M)*	6 - 20	0.3 - 1.0	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
High	*(H)*	20 - 60	1 - 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a geological pick with a single firm blow; rock rings under hammer.
Very High	*(VH)*	60 - 200	3 -10	Hand specimen breaks with geological pick after more than one blow; rock rings under hammer.
Extremely High	*(EH)*	>200	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Based on Table 19, Clause 6.2.4.1, AS 1726-2017, Geotechnical site investigations. Refer to source document for further detail.

Material with strength less than *"very low"* is described using soil characteristics, with the presence of an original rock texture or fabric noted if relevant.

Weathering and Alteration: The process of weathering involves physical and chemical changes to the rock resulting from exposure near the earth's surface. A subjective scale for weathering is applied as follows:

Weathering Term and (Symbol)		Description
Residual Soil	*(RS)*	Material has weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered	*(XW)*	Material has weathered to such an extent that it has soil properties. Mass structure, material texture and fabric of original rock are still visible.
Highly Weathered	*(HW)*	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered	*(MW)*	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered	*(SW)*	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	*(Fr)*	Rock shows no sign of decomposition of individual minerals or colour changes.

Modified based on Table 20, Clause 6.2.4.2, AS 1726-2017, Geotechnical site investigations. Refer to source document for further detail.

Where physical and chemical changes to the rock are caused by hot gases or liquids at depth, the process is called alteration. Unlike weathering, the distribution of altered material may occur at any depth and show no relationship to topography. Where alteration minerals are identified the terms *"extremely altered" (XA)*, *"highly altered" (HA)*, *"moderately altered" (MA)* and *"slightly altered" (SA)* can be used to describe the physical and chemical changes described above.

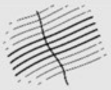
c) Description of defects (defect type, orientation, roughness and shape, coatings and composition of seams, spacing, length, openness and thickness, block shape)

Defects often control the overall engineering behaviour of a rock mass. AS 1726 defines a defect as “a discontinuity, fracture, break or void in the material or materials across which there is little or no tensile strength”. Describing the type, character and distribution of natural defects is an essential part of the description of many rock masses.

Commonly described characteristics of defects within a rock mass include type, orientation, roughness and shape, coatings and composition of seams, aperture, persistence, spacing and block shape.

The degree of detail required for defect descriptions depends on project requirements. All defects judged of engineering significance for the site and project are described individually. Where appropriate, generalised descriptions for less significant, or multiple similar, defects can be provided for delineated parts of rock core or exposures. A general description of delineated defect sets is provided when sufficient orientation data is available.

Defect Type is described using the terms summarised below. On core logs, only natural defects across which the core is discontinuous are described (i.e. inferred artificial fractures such as drill breaks are excluded). Incipient defects are described using the relevant texture or fabric terms. Healed defects (those that have been re-cemented by minerals such as chlorite or calcite) are described using the prefix “healed” (e.g. healed joint).

Type and (Symbol)		Description	Diagram
Parting	(Pt)	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering (e.g. bedding) or a planar anisotropy in the rock material (e.g. cleavage). May be open or closed.	
Joint	(Jt)	A surface or crack with no apparent shear displacement and across which the rock has little or no tensile strength, but which is not parallel or subparallel to layering or to planar anisotropy in the rock material. May be open or closed.	
Sheared Surface	(SS)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided and which shows evidence of shear displacement.	
Sheared Zone	(SZ)	Zone of rock material with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
Sheared Seam	(SSm)	Seam of soil material with roughly parallel almost planar boundaries, composed of soil materials with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge-shaped blocks.	
Crushed Seam	(CSm)	Seam of soil material with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock material which may be more weathered than the host rock. The seam has soil properties.	
Infilled Seam	(ISm)	Seam of soil material usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1 mm thick may be described as a veneer or coating on a joint surface.	
Extremely Weathered Seam	(WSm)	Seam of soil material, often with gradational boundaries. Formed by weathering of the rock material in place.	

Modified based on Table 22, Clause 6.2.5.2, AS 1726-2017, Geotechnical site investigations. Refer to source document for further detail.

Defect Orientation is recorded as the “dip” (maximum angle of the mean plane, measured from horizontal) and the “dip direction” (azimuth of the dip, measured clockwise from true north). Dip and dip direction is expressed in degrees, with two-digit and three-digit numbers respectively, separated by a slash (e.g. 45/090). For vertical boreholes, the defect dip is measured as the acute angle from horizontal. Rock core extracted from vertical boreholes is generally not oriented, so the dip direction cannot be directly measured. For non-oriented inclined boreholes, a defect “alpha” (α) angle is measured as the acute angle from the core axis. For vertical and non-oriented inclined boreholes, the dip direction can sometimes be estimated from the relationship of the defect to a well-defined site structure such as fabric. For oriented inclined boreholes, the measurement of the defect orientation is carried out and recorded in a form suited to the particular device being used and later processed to report true dip and dip direction.

ROCK DESCRIPTION AND CLASSIFICATION

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Roughness and Shape of the defect surface combine to have significant influence on shear strength. Standard descriptions and abbreviations include:

Roughness and (Symbol)		Description
Very Rough	(VR)	Many large surface irregularities (amplitude generally more than 1 mm). Feels like, or coarser than very coarse sand paper.
Rough	(Rf)	Many small surface irregularities (amplitude generally less than 1 mm). Feels like fine to coarse sand paper.
Smooth	(So)	Smooth to touch. Few or no surface irregularities.
Polished	(Pol)	Shiny smooth surface.
Slickensided	(Slk)	Grooved or striated surface, usually polished.

Shape and (Symbol)		Description
Planar	(Pln	The defect does not vary in orientation.
Curved	(Cu)	The defect has a gradual change in orientation.
Undulating	(Un)	The defect has a wavy surface.
Stepped	(St)	The defect has one or more well defined steps.
Irregular	(Ir)	The defect has many sharp changes of orientation.

Although the surface roughness of defects can be described at small (10-100 mm) scales of observation, the overall shape of the defect surface can usually be observed only at medium (0.1-1 m) and large (>1 m) scale.

Where it is necessary to assess the shear strength of a defect, observations are generally made at multiple scales. Surface roughness may also be characterised by using the joint roughness coefficient (JRC) profiles established by Barton and Choubey (1977). Where large-scale observations are possible, further measurement of defect "waviness" (angle of the asperities relative to the overall dip angle of the plane) is made.

Coatings and Composition of Seams: Many defects have surface coatings, which can affect their shear strength. Standard descriptions include:

Coating and (Symbol)		Description
Clean	(Cn)	No visible coating.
Stained	(Sn)	No visible coating but surfaces are discoloured.
Veneer	(Ve)	A visible coating of soil or mineral substance, but too thin to be measured may be patchy.
Coating	(Co)	A visible coating up to 1 mm thick. Soil material greater than 1 mm thick is described using defect terms (e.g. infilled seam). Rock material greater than 1 mm thick is described as a vein (Vn).

The composition of seams are described using soil description terms as given on the SOIL DESCRIPTION AND CLASSIFICATION Standard Sheet. Where possible the mineralogy of coatings is identified. Common mineral coatings include:

Common Minerals and (Symbol)	
Clay	(CLAY)
Calcite	(Ca)
Carbonaceous	(X)
Chlorite	(Kt)
Iron Oxide	(Fe)
Micaceous	(Mi)
Manganese	(Mn)
Pyrite	(Py)
Quartz	(Qz)

Aperture: Defects across which there is little or no tensile strength can be either *"open"* (*Op*) or *"closed"* (*Cl*). For rock core, the width of the "open" defect is measured whilst still in the core barrel splits. The descriptor *"tight"* (*Ti*) can only apply to healed or incipient defects (i.e. veins, foliation, etc.).

Persistence and Spacing of defects is described directly in millimetres and metres. If the measurement of defect persistence is limited by the extent of the exposure, the end conditions are noted (i.e. 0, 1 or 2 defect ends observed). The spacing between defects of similar orientation (i.e. within a specific defect set) is recorded when possible.

The frequency of defects within rock core can be measured as either: the spacing between successive defects; or the "Fracture Index", which is the number of defects per metre of core.

Spacing Term	Thickness
Very wide	>2 m
Wide	0.6 to 2 m
Medium	0.2 to 0.6 m
Closely	60 to 200 mm
Very closely	20 to 60 mm
Extremely closely	6 to 20 mm

Block Shape: Where it is considered significant, block shape can be described using the subjective terms as follows:

Block Shape	Description
Polyhedral	Irregular discontinuities without arrangement into distinct sets, and of small persistence.
Tabular	One dominant set of parallel discontinuities, for example bedding planes, with other non-continuous joints; thickness of blocks much less than length or width.
Prismatic	Two dominant sets of discontinuities, approximately orthogonal and parallel, with a third irregular set; thickness of blocks much less than length or width.
Equidimensional	Three dominant sets of discontinuities, approximately orthogonal, with occasional irregular joints, giving equidimensional blocks.
Rhomboidal	Three (or more) dominant, mutually oblique, sets of joints giving oblique-shaped, equidimensional blocks.
Columnar	Several, usually more than three sets of continuous, parallel joints usually crossed by irregular joints; lengths much greater than other dimensions.

Modified based on Table 23, Clause 6.2.5.7, AS 1726-2017, Geotechnical site investigations. Refer to source document for further detail.

d) Interpreted stratigraphic unit

Stratigraphic units may be interpreted and reported, in accordance with The Australian Stratigraphic Units Database (ASUD). The terms *"possibly"* or *"probably"* indicate increased uncertainty in this interpretation.

e) Geological structure

After describing the rock material and defects, an interpretation of the nature and configuration of rock mass defects may be presented in logs, charts, 2D sections and 3D models (e.g. dipping strata, folds, unconformities, weathering profiles, defect sets, geological faults, etc.).

PARAMETERS RELATED TO CORE DRILLING

Drill Depth and Core Loss: Drilling intervals are shown on GHD Core Log Sheets by depth increments and horizontal marker lines.

"Core loss", or its inverse "total core recovery" (TCR), is measured as a percentage of the core run. If the location of the core loss is known, or strongly suspected, it is shown in a region of the column bounded by dashed horizontal lines. If unknown, core loss is assigned to the bottom of a core run.

Rock Quality Designation (RQD), described by Deere et al. (1989), may be recorded on GHD Core Log Sheets.

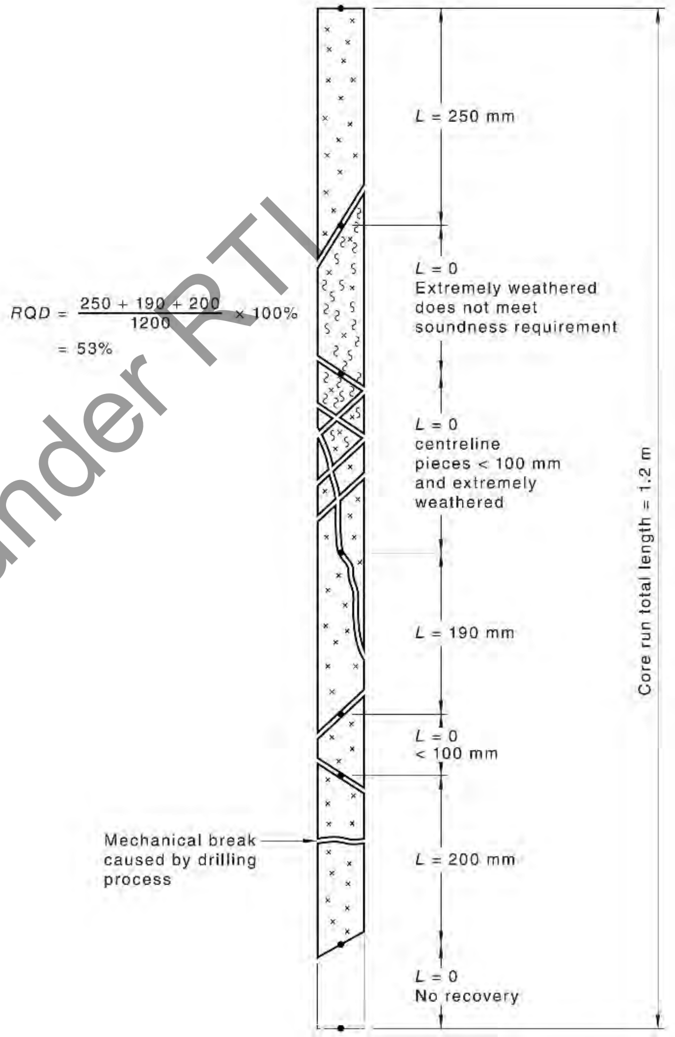
For certain projects, such as tunnelling or underground mining investigations, rock mass ratings or classifications can be required as part of the design process. The RQD forms a component of these rock mass ratings and provides a quantitative estimate of rock mass quality from rock core logs.

The rock core must be "N" sized (nominally 50 mm) or greater for derivation of RQD. The RQD is expressed as a percentage of intact rock core (excluding residual soil and extremely weathered rock) greater than 100 mm in length over the total selected core length.

Deere et al. (1989) recommends measuring lengths of core along the centreline, as shown right.

RQD is expressed as:

$$RQD = \frac{\sum Length\ of\ sound\ core\ pieces > 100\ mm\ in\ length}{Length\ of\ core\ run}\ x\ 100\%$$



RQD measurement procedure
(reproduced from Figure 13, Clause 6.2.9.4, AS 1726-2017, Geotechnical site investigations)

ROCK MASS CLASSIFICATION

Rock mass classification schemes may be used to represent the engineering characteristics of a rock mass. A large variety of classification schemes have been developed by various authors, ranging from simple to complex. All of the schemes are limited in their application and many rock mass classification systems assume that the rock mass is isotropic, which is rarely the case.

References

STANDARDS AUSTRALIA (2017). AS 1726-2017. GEOTECHNICAL SITE INVESTIGATIONS.
BARTON, N. AND CHOUBEY, V. (1977). THE SHEAR STRENGTH OF ROCK JOINTS IN THEORY AND PRACTICE. ROCK MECHANICS 10, 1-54. SPRINGER.
DEERE, D.U. AND DEERE, D.W. (1989). ROCK QUALITY DESIGNATION (RQD) AFTER TWENTY YEARS. CONTRACT REPORT GL-89-1. ARMY CORPS OF ENGINEERS. WASHINGTON DC, 1989.

GLOSSARY OF SYMBOLS

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This standard sheet should be read in conjunction with all test hole log sheets and any idealised geological sections prepared for the investigation report.

GENERAL

Symbol	Description	Symbol	Description
D	Disturbed Sample	**R**	Rising Head Permeability Test
B	Bulk Sample	**F**	Falling Head Permeability Test
U(50)	Undisturbed Sampled (suffixed by sample size or tube diameter in mm if applicable)	**PBT**	Plate Bearing Test
CS	Core Sample (suffixed by diameter in mm)	▶	Water Inflow (make)
ES	Soil sample for environmental sampling	—◀	Water Outflow (loss)
PID	Photoionisation Detector	▽	Temporary Water Level
SPT	Standard Penetration Test (with blows per 0.15m)	▼	Final Water Level
N	SPT Value	●	Point Load Test (axial)
HB/HW	SPT Hammer Bouncing/Hammer Weight	○	Point Load Test (diametric)
PP/HP	Pocket/Hand Penetrometer (suffixed by value kPa)	**PL**	Point Load (kPa)
PK	Packer Test (kPa)	**IMP**	Impression Device Test
PZ	Piezometer Installation	**PM**	Pressuremeter Test
SV/VS	Shear Vane Test (suffixed by value in kPa)		

SOIL SYMBOLS

Main Components				Minor Components			
░	SAND	▩	FILL	⁛	sandy	⁙	vegetation, roots
⁂	GRAVEL	▥	SILT	⁂	gravelly	▥	silty
▨	CLAY	⁘	TOPSOIL	▨	clayey	*Note: Natural soils are generally a combination of constituents, e.g. sandy CLAY*	▨

ROCK SYMBOLS

Sedimentary						Igneous			
░	SANDSTONE	▤	SILTSTONE	⁂	CONGLOMERATE	✚	GRANITIC ROCK	▤	IGNEOUS DYKE
☰	CLAYSTONE	▤	SHALE	■	COAL	⟋	BASALTIC ROCK		

Note: Additional rock symbols may be allocated for a particular project

NATURAL DEFECTS *(Coding)*

Defect Type		Orientation					
Jt	Joint	For vertical non-oriented core ... "Dip" angle (eg. 5°) measured relative to horizontal.					
Pt	Parting	For inclined non-oriented core ... "Angle" measured relative to core axis.					
SS	Sheared Surface	For inclined oriented core ... "Dip" angle and "Dip Direction" angle (eg. 45°/225° mag.).					
WSm	Weathered Seam	**Orientation (con't)**		**Roughness**		**Coating**	
SSm	Sheared Seam	**VT**	Vertical	**Pol**	Polished	**Cn**	Clean
CSm	Crushed Seam	**HZ or 0°**	Horizontal	**So**	Smooth	**Sn**	Stained
ISm	Infilled Seam	**d / °**	Degrees	**Rf**	Rough	**Ve**	Veneer
SZ	Sheared Zone			**VR**	Very Rough	**Co**	Coating
VN	Vein			**Slk**	Slickensided		
Shape				**Infilling / Common Materials**			
Pln	Planar	**St**	Stepped	**CLAY**	Clay	**Mi**	Micaceous
Cu	Curved	**Ir**	Irregular	**Ca**	Calcite	**Mn**	Manganese
Un	Undulating	**Dis**	Discontinuous	**X**	Carbonaceous	**Py**	Pyrite
				Kt	Chlorite	**Qz**	Quartz
				Fe	Iron Oxide	**MU**	Unidentified Mineral

Others					
OP	Open	**CL**	Closed	**Ti**	Tight

LABORATORY TESTING

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GENERAL

Samples extracted during the fieldwork stage of a site investigation may be “disturbed” or “undisturbed” (as generally indicated on the test hole logs) depending upon the nature and purpose of the sample as well as the method of extraction, transportation, extrusion and testing. This aspect should be taken into account when assessing test results, which must of necessity, reflect the effects of such disturbance.

All soil properties (as measured by laboratory testing) exhibit inherent variability and thus a certain statistical number of tests is required in order to predict an average property with any degree of confidence. The site variability of soil strata, future changes in moisture and other conditions and the discrete sampling positions must also be considered when assessing the representative nature of the laboratory programme.

Certain laboratory test results provide interpreted soil properties as derived by conventional mathematical procedures. The applicability of such properties to engineering design must be assessed with due regard to the site, sample condition, procedure and project in hand.

TESTING

Laboratory testing is normally carried out in accordance with Australian Standard AS 1289 as amended, or in NSW, Roads and Maritime Services (RMS) standards when specified. The routine Australian Standard tests are as follows:

Moisture Content	AS1289 2.1.1	
Liquid Limit	AS1289 3.1.1	collectively known as Atterberg Limits
Plastic Limit	AS1289 3.2.1	
Plasticity Index	AS1289 3.3.1	
Linear Shrinkage	AS1289 3.4.1	
Particle Density	AS1289 3.5.1	
Particle Size Distribution	AS1289 3.6.1, 3.6.2 and 3.6.3	
Emerson Class Number	AS1289 3.8.1	collectively, Dispersive Classification
Percent Dispersion	AS1289 3.8.2	
Pinhole Dispersion Classification	AS1289 3.8.3	
Hole Erosion (HE)	GHD Method	
No Erosion Filter (NEF)	GHD Method	
Organic Matter	AS1289 4.1.1	
Sulphate Content	AS1289 4.2.1	
pH Value	AS1289 4.3.1	
Resistivity	AS1289 4.4.1	
Standard Compaction	AS1289 5.1.1	
Modified Compaction	AS1289 5.2.1	
Dry Density Ratio	AS1289 5.4.1	
Minimum Density	AS1289 5.5.1	
Density Index	AS1289 5.6.1	
California Bearing Ratio	AS1289 6.1.1 and 6.1.2	
Shear Box	AS1289 6.2.2	
Undrained Triaxial Shear	AS1289 6.4.1 and 6.4.2	
One Dimensional Consolidation	AS1289 6.6.1	
Permeability Testing	AS1289 6.7.1, 6.7.2 and 6.7.3	

Where tests are used which are not covered by appropriate standard procedures, details are given in the report.

LABORATORIES

Our Australian laboratories are NATA accredited to AS ISO / IEC17025 for the listed tests.

The oedometer, triaxial and shear box equipment are fully automated for continuous operation using computer controlled data acquisition, processing and plotting systems.

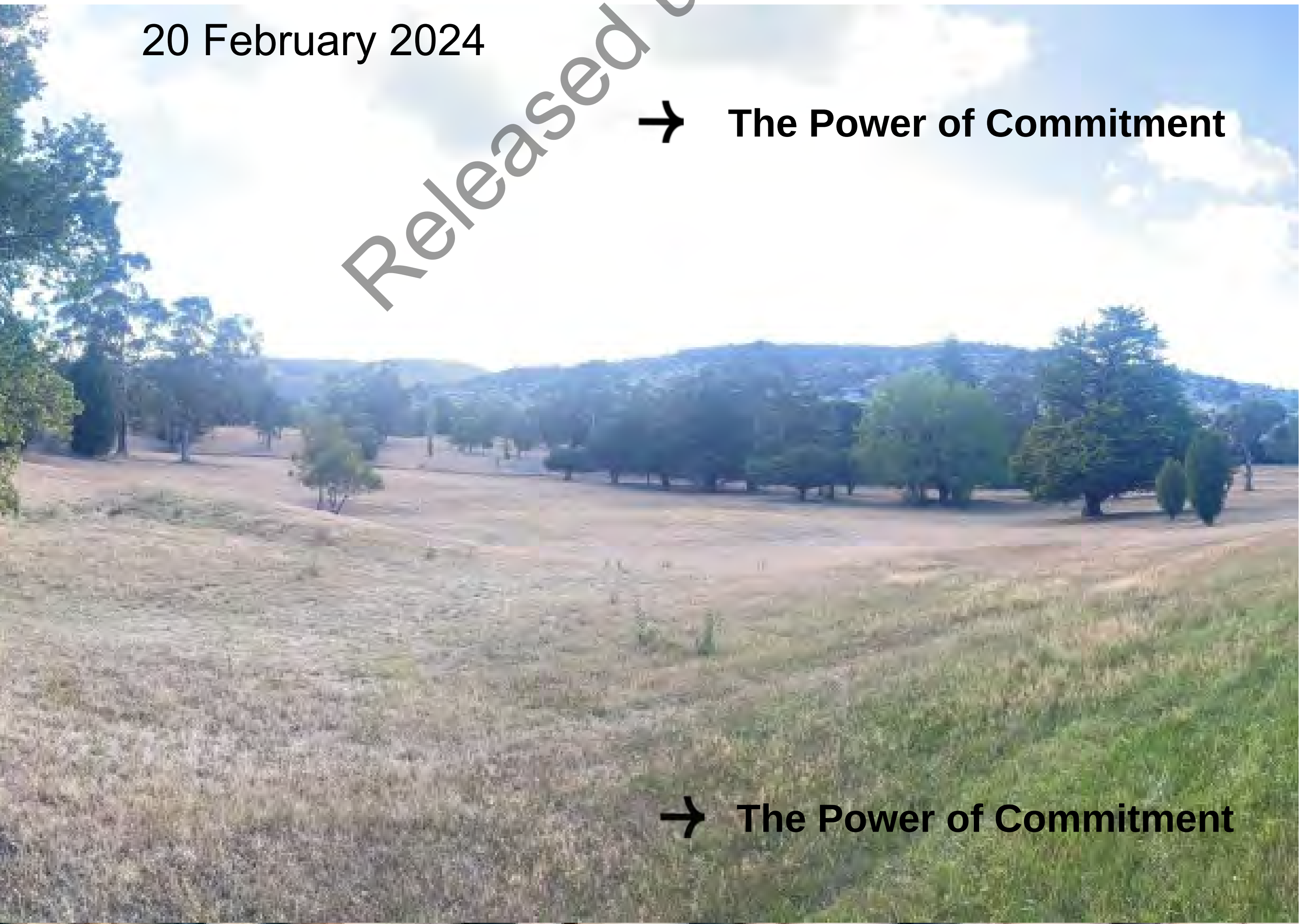
Appendix C

Geotechnical review (GHD 2024)

AFL High Performance Centre Rosny Parklands Option 2

Geotechnical Review

Department of State Growth



20 February 2024

→ **The Power of Commitment**

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Project name	AFL High Performance Centre Strategic Alignment
Document title	AFL High Performance Centre Rosny Parklands Option 2 | Geotechnical Review
Project number	12626209
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[Status code]							

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The Power of Commitment

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Appendices

1. Introduction

1.1 Background

GHD Pty Ltd (GHD) was engaged by Department of State Growth to undertake a preliminary geotechnical review of the preferred site for the AFL High Performance Centre (HPC), referred to as Rosny Parklands Option 2, which comprises the AFL HPC situated on the Rosny Parklands site and a secondary oval within Charles Hand Park, both sites located in Rosny Park, Tasmania.

It is understood that the AFL HPC consists of a main oval and two-storey building, generally with a training facility on the 4000 m^2 ground floor and office space on the 2000 m^2 first floor.

The conceptual layout of the development is provided in Figure 1 below. It is understood that the locations of the ovals can be further optimised at each site to maximise usage and minimise construction costs. Furthermore, the size of the buildings and location of the car parks in the figures above are indicative only and are subject to refinement during design.

Figure 1 Proposed Rosny Site – Option 2, HPC in Rosny Parklands with second oval in Charles Hand Park

A broader plan showing the location of the proposed site is presented as Appendix A.

1.2 Purpose of this report

The purpose of this report is to present the factual data obtained from the desktop review and site walkover at the proposed site and provide recommendations for the next stage of investigations.

1.3 Scope of work

The scope of work is as per the accepted proposal, dated 24 January 2024, and generally comprised of the following:

- Review of existing relevant geotechnical data and proposed development.
- A site walkover
- Preparation of this geotechnical report to summarise the findings, data gaps and scope the next stage of investigations.

1.4 Limitations

This report has been prepared by GHD for Department of State Growth and may only be used and relied on by Department of State Growth for the purpose agreed between GHD and Department of State Growth as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Department of State Growth arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

This report should be read in conjunction with the attached Standard Sheets presented in Appendix B.

2. Desktop review

2.1 General

A desktop study was undertaken to determine anticipated geological conditions and potential geohazards at the site and entailed a review of published available data and project information.

2.2 Site description and topography

The proposed development site is located on the 'old Royal Hobart golf course' which presumably following the construction of Rosny Hill Road, was split into two, and is now referred to separately as Charles Hand Park to the west of the road and Rosny Parkland to the east. It is understood that Rosny Parkland was an operational golf course (Rosny Golf Course) up until about April 2021.

Charles Hand Park and Rosny Parkland are at the foot of Rosny Hill and Gordons Hill respectively and slope generally towards the southeast and Kangaroo Bay Rivulet at about 5 to 6° generally, with Rosny Parklands steepening to about 12° towards the Tasman Highway and Rosny Hill Road in the northwest of the site.

A drainage line is noted to exist through the Rosny Parkland oval site.

Large road fill embankments are noted downslope of both Rosny Hill Road and the Tasman Highway adjacent to the boundary of Rosny Parkland. Earthworks associated with golf course construction (i.e. greens and bunkers) are evident in the hillshade imagery, as shown in Figure 2.

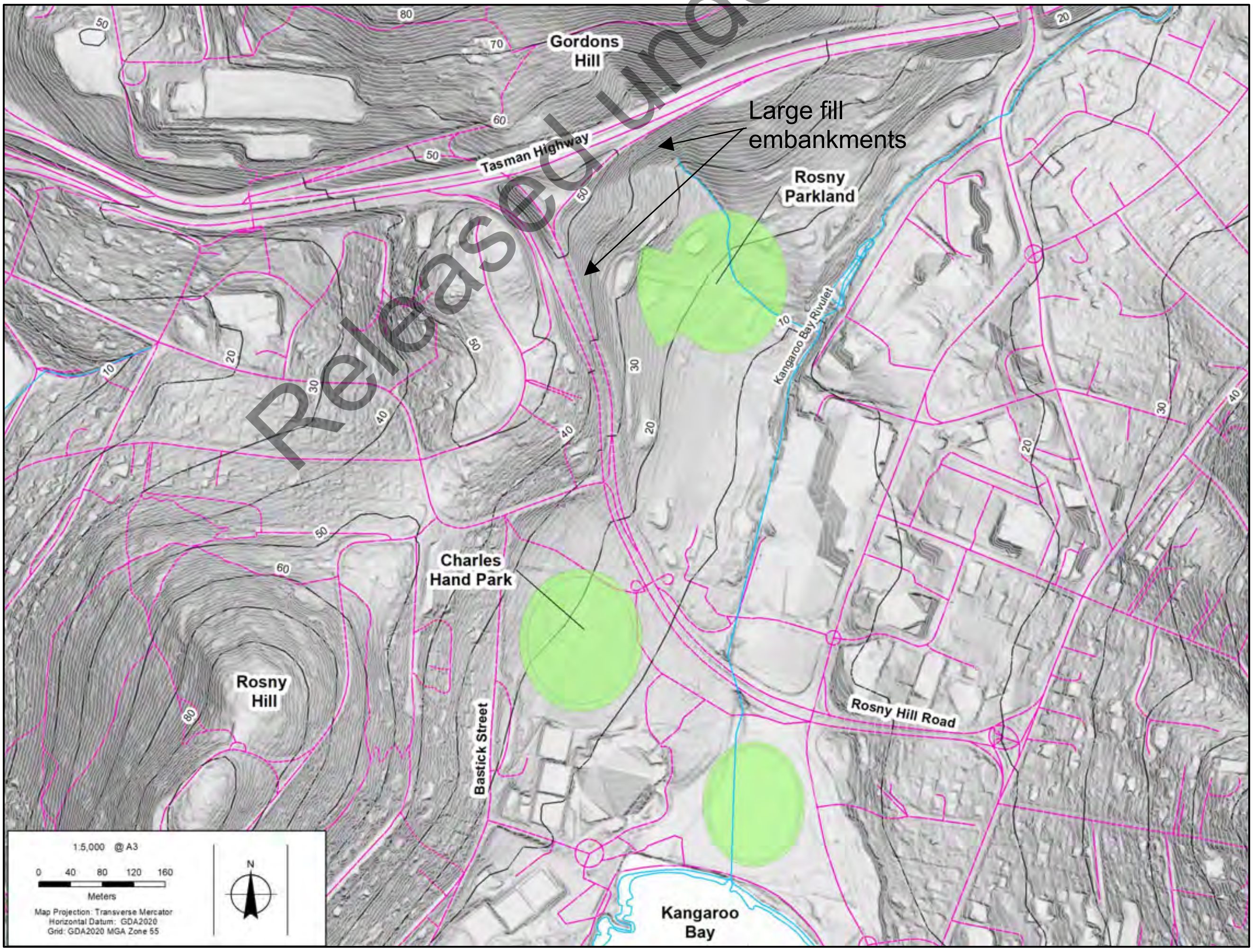

Figure 2 Annotated hillshade imagery of the site

2.3 Regional geology

A review of Mineral Resources Tasmania's (MRT) 1:25,000 scale geology map of Hobart, indicates that the entire proposed development at Charles Hand Park and majority of the Rosny Parkland proposed development is underlain by Jurassic dolerite and related rocks (Jd). The lower lying, eastern portion of the Rosny Parkland site is mapped to be underlain by Undifferentiated Upper Parmeener Supergroup rocks (R), with an inferred faulted contact between the two units.

Quaternary sediments (Q, Qham) associated with Kangaroo Bay Rivulet are shown intermittently to the east of the sites.

An extract of the geology map is provided in Appendix C.

2.4 Landslide susceptibility

A review of the MRT landslide susceptibility mapping and hazard bands, available through the Department of Natural Resources and Environment Tasmania LISTmap services, indicates that the site is not mapped as being susceptible to landslides and no known landslides are mapped near the site.

Isolated hazard bands are mapped identifying 'Medium' rockfall susceptibility on dolerite cuttings along the nearby Rosny Hill Road and Tasman Highway, however if rockfalls are to occur, these are not mapped to runout onto the development sites.

2.5 Acid sulfate soils

A review of the Acid Sulfate Soils (ASS) database available through the Department of Natural Resources and Environment Tasmania LISTmap services, indicates that the site is not mapped as having ASS occurrence.

The Quaternary sediments mapped to the east of the site are shown to have a low probability of ASS occurrence, with low probability defined as a 6 to 70% chance of occurrence in the mapping unit, refer to Appendix D.

2.6 Borehole database

A database search of existing subsurface information was conducted using LISTmap and MRT's borehole database.

Five boreholes, a magnetic survey and an accompanying report (TR15_102_105) were obtained for the site of the Rosny Matriculation College (now referred to as Rosny College), located immediately south of Charles Hand Park. Whilst a map is provided in the report, the exact locations of the test sites are not clear. LISTmap only shows borehole BH02 in the southwest corner of Rosny College.

The report concludes that the boundary between the dolerite (Jd) and sandstone (R) is faulted and is expected to be '*very decomposed and to include much travertine*'.

Generally the boreholes revealed 2 m to 7.4 m of soil, which increases thickness towards the north-east of the College site, overlying weathered and highly fractured dolerite. 'Fairly fresh to fresh dolerite' ([*Sic]* - inferred moderately weathered to fresh dolerite) with variable joint spacing, was encountered between 7.3 m and 10.2 m below the surface level.

The report with brief logs are included in Appendix E for reference.

2.7 Groundwater

An online search of the Groundwater Information Access Portal (GWIMS), maintained by the Department of Natural Resources and Environment Tasmania was completed on 13 February 2024. No registered groundwater bores were recorded to be within 1 km of the site.

3. Site walkover

3.1 General

A site walkover was undertaken on 14 February 2024 by an experienced geotechnical engineer from GHD to record salient features of the site. The weather conditions were fine and sunny during the inspection however some showers occurred within the previous 24 hours. Key observation locations were recorded using a hand-held GPS with a reported accuracy of ±5 m.

3.2 Rosny Parkland

The Rosny Parkland site generally slopes to the southeast as described in Section 2.2. The parklands are vegetated with low grass and lines of large trees that previously separated the golf course fairways (refer to Figure 3 and Figure 4). Localised earthworks are apparent where former greens and bunkers previously resided.

Figure 3 Looking northeast across the site

Figure 4 Panorama looking west across the site

Large road fill embankments exist on the downslope side of both Rosny Hill Road and Tasman Highway. Culverts are noted centrally at the low point of both embankments, with lush grass and water at the outfalls. The culvert below the Tasman Highway follows a gully feature that snakes across the parkland and beneath the proposed oval site.

The surficial soils within the drainage channel, and generally across the site, appear to be derived from dolerite (i.e. either colluvium or residual soil). Desiccation cracking up to 30 mm wide was observed within these surficial soils, which is typical for doleritic soils (refer to Figure 5) due to their high plasticity.

Figure 5 High plasticity surficial soils within the drainage channel (left) and generally across the site (right)

Dolerite cuttings with minimal overburden are noted on the high side of the respective roads, however cuttings were not inspected in detail.

Kangaroo Rivulet appears to be sporadically lined with alluvial cobbles and boulders of dolerite origin, with some possible moderately to slightly weathered dolerite outcrop in the lower bank (refer to Figure 6).

Figure 6 Possible outcropping dolerite in Kangaroo Rivulet

3.3 Charles Hand Park

The parkland is well maintained with short grass and some established lines of trees through the site (refer to Figure 7 and Figure 8). The park boundary is also vegetated with trees adjacent to Bastick Street and Rosny Hill Road. A small fill road embankment is noted on the downhill side of Bastick Street (see Figure 9). The site has a gentle slope (about 5 to 6°) towards the southeast.

Figure 7 Panoramic photo taken near the Rosny Hill Road Pedestrian Overpass looking west

Figure 8 The site looking east-south-east towards Rosny College.

Figure 9 *Tree line and minor fill embankment below Bastick Street*

An isolated area of lush, green grass was observed in the northeastern quadrant of the proposed oval, which may be indicative of seepage or perhaps a leaking service.

Figure 10 *Green, lush grass potentially a sign of seepage*

Similarly to the doleritic soils at the Rosny Parklands site adjacent, the surficial soils were noted to be high plasticity, with desiccation cracking evident at localised areas.

A small linear hump was noted to exist immediately to the northeast of the proposed oval. The reason for this feature is unknown, but it is inferred to be man-made and perhaps remnant earthworks from the old Royal Tasmania golf course or associated with an underground service trench (refer to Figure 11).

Figure 11 *Linear hump to northeast of the proposed oval of unknown origin*

4. Preliminary assessment

4.1 General

In general, the desktop review and site walkover did not expose any geotechnical risk that would preclude the construction of the proposed development across the sites. However, there are a number of important geotechnical data gaps that require further investigation and assessment to permit concept clarification, design and accurate construction cost estimation.

Dolerite (rock), when moderately weathered to fresh, is typically very high to extremely high strength, and excavation of such materials is largely a function of the defect spacing of the rockmass. Where defect spacing is wide, blasting may be required to excavate. The depth to dolerite and it’s rockmass properties are currently unknown across the two sites. With excavations in the order of 5 m to 7 m proposed, excavation of the rock presents as a key risk to the feasibility of the development.

4.2 Gap analysis

Based on the desktop review and site walkover, the following information gaps were identified (refer to Table 1). This gap analysis has aided development of our scope for the preliminary geotechnical investigation presented in Section 4.3**.**

Table 1 Gap analysis

Design Aspect	Risk Event	Current Information	Proposed investigation / additional information required
Cuttings / excavations for service trenches	Excavation cost higher than anticipated due to difficult excavation or blasting required to excavate rock. Instability of cutting and upslope infrastructure (e.g. road embankment or services)	Mapped surface geology and site observations (no outcrop observed).	Drill boreholes and undertake strength testing of rock requiring relatively deep excavation (i.e. say >2 m). Log overburden, weathering, strength, defect spacing and dip angles. Test pitting and laboratory testing to determine type, strength, likely behaviour of the excavated materials and suitability for reuse. Test pits also aimed at determining top of rockhead across the site as a minimum.
Fill embankments	Instability within fill embankments due to weak foundations. Inaccurate estimate for stripping or embankment batter slopes.	Mapped surface geology and site observations (fissured clays at surface).	Test pitting and insitu testing to determine type, strength and likely behaviour of the foundation materials. Stability modelling to design fill embankments as required.
AFL HPC Building	No information to design foundation system and/or excessive deformation or bearing failure.	Mapped surface geology and site observations (note: fissured clays at surface).	Drill boreholes and/or excavate test pits with insitu testing to characterise the foundation conditions at the proposed building site(s). Test pits to be positioned outside of the building footprint(s).
General pavement and embankment subgrade	Damage to pavements or fill embankments due to inadequate subgrade.	Mapped surface geology and site observations (high plasticity surficial soils suggest high swell potential of colluvium/residual soils).	Test pitting, insitu and laboratory testing to determine type, strength and likely behaviour of the subgrade materials.

Design Aspect	Risk Event	Current Information	Proposed investigation / additional information required
Light Towers	Insufficient geotechnical capacity or excessive deformation	Mapped surface geology. Locations of light towers not yet determined.	Not included in current scope of work.

4.3 Recommended preliminary investigation

It is understood that the conceptual layout of the HPC and ovals is still in development. As such, and with reference to the geotechnical gap analysis, scoping of the next stage of preliminary geotechnical investigations has been limited to reducing uncertainty in excavation conditions across the site (i.e. ease and subsequent cost of excavation being considered the highest geotechnical risk to the feasibility of the development). The aim of these investigations is to characterise the subsurface conditions primarily in areas of cut, which will aid feasibility assessment as well as assist initial design.

Prior to any intrusive investigations, it is recommended that a seismic refraction survey be undertaken to enable test site locations to be moved if needed to target key subsurface features (i.e. anomalies in the seismic response), allow extrapolation between test site locations and assist with the excavatibility assessment.

A plan showing proposed positions for the preliminary geotechnical investigations, subject to underground service clearance, is included in Appendix F. The recommended scope of works for the preliminary investigations includes:

- Clearance of underground services at each test site location by an underground service locator prior to excavation.
- Undertake seismic refraction surveys, including:
  - One longitudinal and one transverse line along the deeper areas of cut at Rosny Parklands HPC and Oval Site.
  - One longitudinal traverse along the deeper areas of cut at Charles Hand Park Oval Site.
  - Seismic Refraction Tomography (SRT) and Frequency Time Analysis (FTAN) is recommended.
- A drilling investigation, comprising:
  - 6 No. boreholes across the Rosny Parklands HPC and Oval Site.
  - 3 No. boreholes across the Charles Hand Park Oval Site.
  - The target depth for the boreholes is recommended to extend to a minimum of 1 m and 2 m below the expected depth of excavation for cuttings and building foundation level respectively. Whilst not anticipated, the boreholes may need to be deeper if the borehole are within soil strength materials (i.e. including extremely weathered dolerite). On this basis, the boreholes are anticipated to be up to about 8 m deep.
  - Logging, in-situ testing (SPTs or pocket penetrometer if cohesive soils are encountered) and sampling (disturbed SPT and/or U63 pushtubes) for laboratory testing where appropriate. At least two shallow push tube samples are recommended to be collected in cohesive materials for testing to assist with estimation of characteristic surface movement.
  - Standpipes should be installed within the boreholes and developed for groundwater monitoring.

- Test pit investigation, comprising:
  - Excavation of up to 7 test pits across the Rosny Parklands Site.
  - Excavation of up to 5 test pits across the Charles Hand Park Oval Site.
  - The test pits are to be excavated to maximum reach or refusal with a 13t excavator using a toothed bucket. The excavator size recommended considers reach requirements, whilst trying to minimise

disturbance to the open public parks. The primary objective is to characterise the overburden and determine depth to top of rock.

- Insitu testing (i.e. dynamic cone penetrometer and/or pocket penetrometer / shear vane as appropriate for the materials encountered) and bulk sampling for laboratory testing to determine suitability for reuse.

A nominal laboratory testing schedule outlined in Table 2 is recommended based on the anticipated subsurface conditions. Following the intrusive investigations and collection of samples, the nominal schedule should be reviewed for adequacy.

Table 2 Provisional laboratory testing schedule

Test	Estimated Number of Tests
Atterberg Limits	20
Particle Size Distribution	20
Moisture Content	20
Shrink-Swell	2
Standard Compaction	12
Soaked CBR with % swell	3
Point load testing on rock	45
UCS testing on rock	9

Note that additional targeted investigations may be required once the layout and design has been further developed.

Please also note that access to the Rosny Parkland site is via a locked boom gate adjacent to the car park and Rosny Farm Arts Centre and Barn; whilst access to Charles Hand Park is via a locked boom gate adjacent to a car park off Bastick Street.

5. References

- Australian Standard, AS 1289 – Method of testing soils for engineering purposes. Standards Australia.
- Australian Standard, AS 1726-2017. Geotechnical site investigations. Standards Australia.
- Mineral Resources Tasmania (MRT): http://www.mrt.tas.gov.au/
- Tasmanian Government, Department of Natural Resources and Environment Tasmania, The Groundwater Information Access Portal: https://wrt.tas.gov.au/groundwater-info/
- Tasmanian Government, Department of Natural Resources and Environment Tasmania LISTmap services, The List: http://www.thelist.tas.gov.au
- (TR15_102_105), D.E. Leaman, Ch 28. Rosny Matriculation College [extract from larger report, page 102 to 105], 1972.

Appendices

Appendix A

Site location plan

1:3,500 @ A3

0 40 80 120 160

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

🟩 Proposed Concept Design

— Elevation contours (10m)

— Roads

— Watercourses

GHD

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Job Number	12626209
Revision	C
Date	19 Feb 2024

Site Location

Appendix A

G:\32\12626209\GIS\Maps\Deliverables\12626209_SiteLoc_A3L_RevA.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

Appendix B

Standard sheets

General notes

GENERAL NOTES

The report contains the results of a geotechnical investigation or study conducted for a specific purpose and client. The results may not be used or relied on by other parties, or used for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically required to do so by the client.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the report are excluded unless they are expressly stated to apply in the report.

TEST HOLE LOGGING

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information. Moreover, the location of test holes should be considered approximate, unless noted otherwise (refer report). Reference should also be made to the relevant standard sheets for the explanation of logging procedures (Soil and Rock Descriptions, Core Log Sheet Notes etc.).

GROUNDWATER

Unless otherwise indicated, the water depths presented on the test hole logs are the depths of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater depth may differ from this recorded depth depending on material permeabilities (i.e. depending on response time of the measuring instrument). Further, variations of this depth could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities such as a change is ground surface level. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate surveys, instrumentation techniques and monitoring programmes.

INTERPRETATION OF RESULTS

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data, often with only approximate locations (e.g. GPS). Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

CHANGE IN CONDITIONS

Local variations or anomalies in ground conditions do occur in the natural environment, particularly between discrete test hole locations or available observation sites. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural processes.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to GHD for appropriate assessment and comment.

GEOTECHNICAL VERIFICATION

Verification of the geotechnical assumptions and/or model is an integral part of the design process - investigation, construction verification, and performance monitoring. Variability is a feature of the natural environment and, in many instances, verification of soil or rock quality, or foundation levels, is required. There may be a requirement to extend foundation depths, to modify a foundation system and/or to conduct monitoring as a result of this natural variability. Allowance for verification by appropriate geotechnical personnel must be recognised and programmed for construction.

FOUNDATIONS

Where referred to in the report, the soil or rock quality, or the recommended depth of any foundation (piles, caissons, footings etc.) is an engineering estimate. The estimate is influenced, and perhaps limited, by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The material quality and/or foundation depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications should provide for variations in the final depth, depending upon the ground conditions at each point of support, and allow for geotechnical verification.

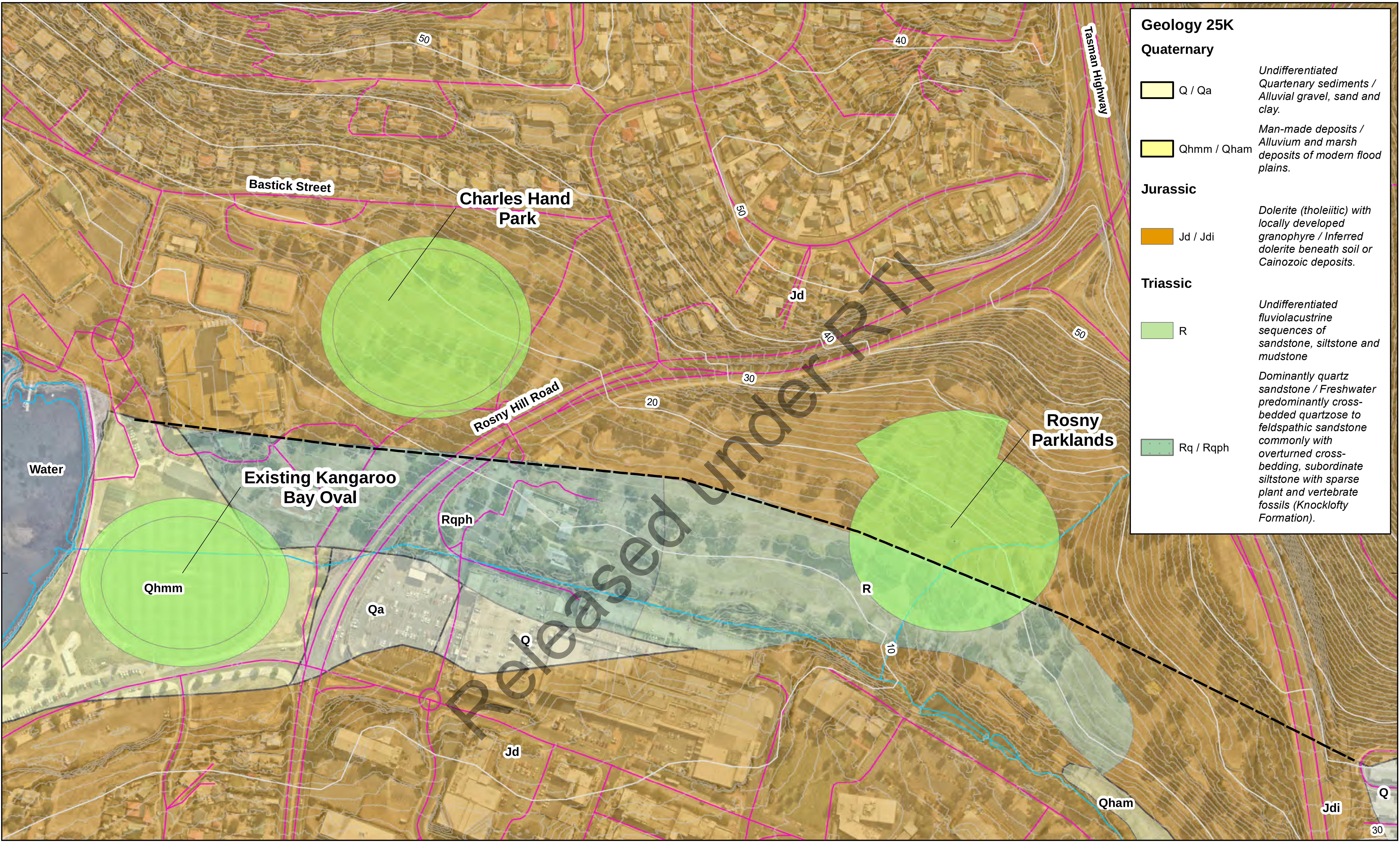
REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions must include at least all of the relevant test hole and test data, together with the appropriate Standard Description sheets and remarks made in the written report of a factual or descriptive nature.

Reports are the subject of copyright and shall not be reproduced either totally or in part without the prior written consent of GHD. GHD expressly disclaims responsibility to any person other than the client arising from or in connection with this report.

Appendix C

Site geology



Geology 25K

Quaternary

🟨	Q / Qa	*Undifferentiated Quartenary sediments / Alluvial gravel, sand and clay.*
🟨	Qhmm / Qham	*Man-made deposits / Alluvium and marsh deposits of modern flood plains.*

Jurassic

🟧	Jd / Jdi	*Dolerite (tholeiitic) with locally developed granophyre / Inferred dolerite beneath soil or Cainozoic deposits.*

Triassic

🟩	R	*Undifferentiated fluviolacustrine sequences of sandstone, siltstone and mudstone*
🟩	Rq / Rqph	*Dominantly quartz sandstone / Freshwater predominantly cross-bedded quartzose to feldspathic sandstone commonly with overturned cross-bedding, subordinate siltstone with sparse plant and vertebrate fossils (Knocklofty Formation).*

1:3,000 @ A3

0 25 50 75 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

🟩 Proposed Design	Watercourses
Elevation contours (10m)	Inferred Fault
Roads	

Department of State Growth
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Date	20 Feb 2024

Site Geology

Appendix C

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

Appendix D

Acid sulfate soils mapping

1:3,000 @ A3

0 25 50 75 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

🟩 Proposed Design

— Elevation contours (10m)

— Roads

— Watercourses

Coastal acid sulfate soils - Probability of Occurrence

🟦 Extremely Low (<5%)

🟧 Low (6-70%)

🟥 High (>70%)

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Revision	A
Date	19 Feb 2024

GHD

Site Acid Sulfate Soils Mapping

Appendix D

G:\32\12626209\GIS\Maps\Deliverables\12626209_SiteASS_A3L_RevA.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

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Appendix E

Previous report (TR15_102_105)

TR15-102-105

28. Rosny Matriculation College

D.E. Leaman

PART 1. PRELIMINARY REPORT ON FOUNDATION CONDITIONS

An examination has been made of the site for the Rosny Matriculation College at the request of Daly, Milledge and Power, consulting engineers. The college is situated to the west of the Tasman Highway on the low paddock of the old Royal Hobart golf course and adjacent to Rosny tennis courts.

Few exposures are present in the region of the proposed building. The shoreline where the south-east corner will be placed shows a continuous outcrop of Triassic sandstone. In places this is thinly bedded and micaceous. Jurassic dolerite crops out on the shoreline some 60 m south of the proposed building and although the nature of the junction between sandstone and dolerite is not clear, it may be faulted. Dolerite also crops out at the tennis courts about 45 m west of the site.

Some small trenches have been dug within the site area. With two exceptions (Holes 8, 12) which showed sandstone, all holes revealed weathered dolerite. It is not clear whether the dolerite material is *in situ*. Holes 8 and 12 are situated toward the south-east corner of the proposed building. However, Hole 9 which is comparable in position to Hole 12 and also in this part of the area showed dolerite. There is no obvious consistency of line with the known rock junction on the shore with that implied in the holes.

Without deeper, cored boring it is not possible to determine the exact nature of the junction between the two rock types. It is possible that much of the dolerite revealed in these holes (to 3 m deep) could be surface material which has crept downslope.

It is recommended that a few (up to 6) diamond drill holes be made at the site:

(1) One hole between Holes 9 and 12 to locate or indicate the nature of the rock junction.

(2) Three holes, one at each of the NE, NW and SW corners of the site.

(3) Two holes as necessary to determine the line of the fault (if present), or if there is no fault, the foundation conditions at the centre of the site.

PART 2. SITE INVESTIGATIONS

Site investigations are summarised below. Prior to the geological survey some back hoe trenches were dug on the site. As some discrepancies of observation and/or interpretation have occurred concerning this details are given below. As recommended in Part 1 of this report, bore holes have been drilled to solid and fresh rock. In addition, a magnetic survey of the eastern half of the site has been undertaken in order to delimit the junction between dolerite and sandstone.

OBSERVATIONS ON THE SITE AS INDICATED BY TRENCHES

Fourteen trenches dug under the supervision of Daly, Milledge and Power consulting engineers, revealed in all but one case (Trench 8) very weathered dolerite. Location of all trenches is shown in Figure 25. Trench 12 is indicated as being of sandstone on a plan prepared by the engineers but checking of the original description verifies observation of dolerite. Another apparent discrepancy occurs in regard to Trench 7 (see magnetic survey and Bore Hole 5).

The material revealed by these trenches, to a depth of up to 3 m, is very weathered, granular dolerite with significant weathering on joints to travertine (a calcium carbonate). Joint density is also high due to the nearness of either a fault or igneous boundary. This has induced extreme weathering.

MAGNETIC SURVEY

As dolerite has a higher magnetic susceptibility, than sandstone, due to the proportion of ferromagnetic minerals present, a detailed magnetic survey was undertaken to reveal the boundary between the two rock types. Contours on the magnetic field are shown on the figure. The field over the western two-thirds of the side is never less than 30 units and commonly more than 31. Close to the shore, and along the eastern side of the site the field is in the range 27-27.5 units. Between the two regions is a narrow belt in which there is an abrupt step. This gradient of the field runs out into Kangaroo Bay at the area in which neither sandstone nor dolerite outcrop. The survey may be interpreted as showing a fairly straight boundary between the two rock types with values less than 28 being typical of sandstone and more than 30 of dolerite.

Some comments may be made of observations in trenches and bore holes with regard to these conclusions:

(1) Bore Holes 1 to 4 which proved weathered dolerite are located in that part of the area where the field is in excess of 30 units. Trench 12 is also in this region, confirming the comment made previously.

(2) Trenches 7 and 8 are in the region where the field is less than 28 units. However only Trench 8 appears to have revealed sandstone. In addition, Bore Hole 5 revealed dolerite somewhat unexpectedly as the field value is here less than 28.

The figure shows the direct interpretation of the field and also the likely position of the boundary considering all available information. No reasons can be advanced at this time to account for the 30° discrepancy in trend between 'actual' and interpreted boundary. Displacement of the field, weathering and drift effects or an angled fault will not produce the required divergence effect. This problem does not affect the examination of this site but it should be borne in mind in future surveys.

OBSERVATIONS ON THE SITE AS INDICATED IN BORE HOLES

Bore Hole 1

m	
0 - 2	Soil (no recovery)
2 - 5	Very weathered dolerite, with friable, granular zones. Recovery 20%. In excess of 65 joints per metre.
5 - 6.5	Weathered dolerite showing mainly vertical jointing, some horizontal jointing. Recovery 80%. Up to 100 joints per metre.
6.5 - 9	Weathered, badly decomposed dolerite. Recovery 10-20%.

[Bore Hole 1]

m	
9 - 11	Fairly fresh, blue medium-grained dolerite. 20 joints per metre with thin green clay coatings.

Bore Hole 2

m	
0 - 2	Soil (no recovery)
2 - 6	Weathered dolerite, showing firm, bluish kernels coated thinly with iron oxides. Recovery 50%.
6 - 8.3	Weathered, granular dolerite with many horizontal joints coated with iron oxides and travertine. Recovery 75-80%. 20-40 joints per metre.
8.3 - 11	Fairly fresh blue dolerite. Thin coatings of iron oxides on joints at 0-30° to core. 7 joints per metre.

Bore Hole 3

m	
0 - 4.5	Soil and clay (no recovery)
4.5 - 6.2	Weathered dolerite, finely jointed. 20% recovery. Weathering products mainly iron oxides.
6.2 - 7.3	Very oxidised, weathered and broken dolerite. 20% recovery. Joint frequency exceeds 40 per metre.
7.3 - 8.5	Fairly fresh dolerite. 20-40 joints per metre, 95% recovery. Joints at 65-90° to core; weathering products include coatings of iron oxides, green clays and calcite.

Bore Hole 4

m	
0 - 6.4	Soil and clay (no recovery)
6.4 - 7.2	Weathered dolerite. 20-50 joints per metre at 60-90° to core. Recovery 50%.
7.2 - 7.8	Moderately fresh dolerite. Joints 45-60°. Coatings of iron oxides on joints.

Bore Hole 5

m	
0 - 7.4	Soil and clay (no recovery)
7.4 - 10.2	Weathered, broken dolerite. Significant coatings of iron oxides, travertine on fragments. Recovery 20%.
10.2 - 10.4	Massive fresh dolerite.

CONCLUSIONS

The junction between the two rock types is a fault. The dolerite is medium- to coarse-grained. The rocks along the fault zone are expected to be very decomposed and to include much travertine. The approximate position of the junction as suggested by pits and borehole has been indicated in Figure 25. The reason for the non-reliability of the magnetic results is unknown.

The thickness of weathered, and/or soil and clay cover increases to the north-east of the site area.

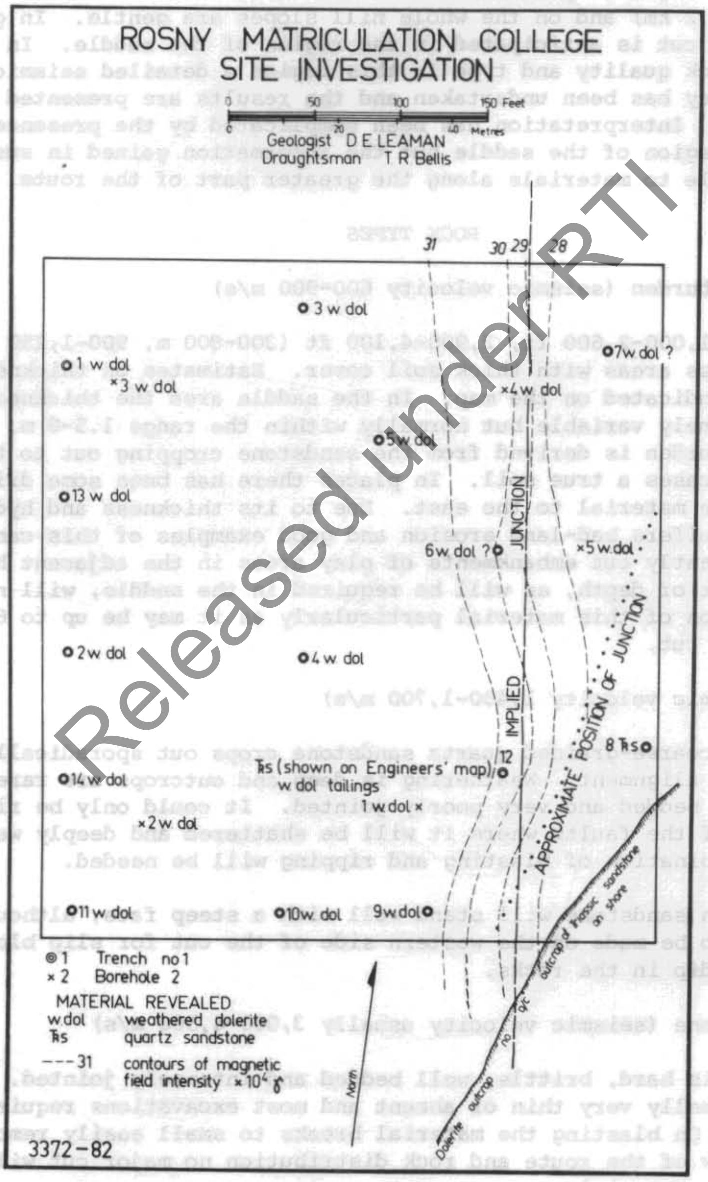

Figure 25.

5 cm

Appendix F

Site plan with proposed test site locations

1:2,500 @ A3

0 30 60 90 120

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

Civil Works Design	Roads
Proposed Seismic Lines	Elevation contours
	Watercourses

Proposed Test Locations

Borehole (9)

Test Pit (12)

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Site plan with proposed test locations

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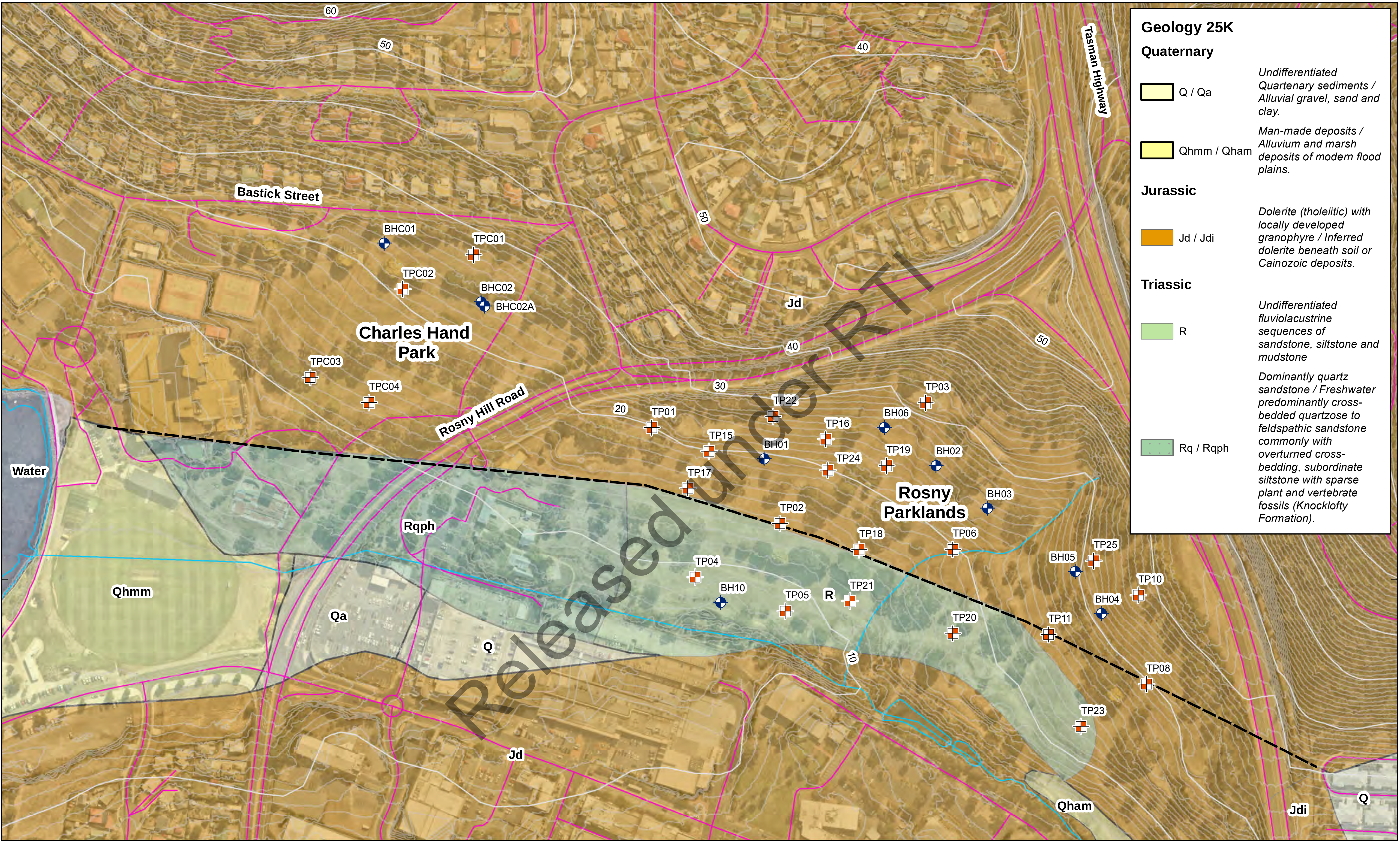
Appendix F

G:\32\12626209\GIS\Maps\Deliverables\12626209_SitePlan_A3L_RevA.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:tdcoates

Appendix D

Site geology



1:3,000 @ A3

0 25 50 75 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 55

N

LEGEND

Test Location Type

- ⊕ Borehole
- ⊞ Test Pit

- Elevation contours (10m)
- Roads
- Watercourses
- Inferred Fault

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Revision	C
Date	18 Jul 2024

Site Geology

Appendix D

G:\32\12626209\GIS\Maps\Deliverables\Rosny Parklands Site Option\12626209_SiteGeology_A3L_RevB.mxd

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Appendix E

Geophysical methodology & sections

1. Overview

Seismic Refraction Tomography (SRT) is a geophysical survey method that maps the spatial distribution of seismic P-wave velocity (*Vp*), which is sensitive to bulk incompressibility of sub-surface material. Specifically, *Vp* is strongly sensitive to Bulk (κ) and Shear (μ) Moduli, and to a lesser degree to bulk density (ρ). The relationship between *Vp* and these geophysical parameters are given in eq. (1).

$$Vp = \sqrt{\frac{\kappa + \frac{4}{3}\mu}{\rho}} \qquad eq. (1)$$

Relatively loose material, therefore, exhibits lower *Vp*, whereas material that has undergone consolidation and lithification has higher *Vp*. This enables separating, for example unconsolidated soil from hard rock because *Vp* of unconsolidated soil is discernibly less than hard rock.

2. Data acquisition

2.1 Instrumentation and survey configuration

A SUMMIT X One seismic system consisting of 48 Remote Units (RU) was used along a total individual spread length of 48 m, with geophones spaced at 1 m intervals. The standard sledgehammer strikes on a steel bash plate were used as seismic sources (shots) with the shot points located at 2 m intervals, within 0.5 m off-end of either end of the spread. Vertical stacking of shots was performed where enhancing signal-to-noise ratio (SNR) was necessary to minimise the influence of external noise sources.

High-resolution seismic data was acquired consistently with a quarter-spread move-up between successive spreads to cover profile lengths of 48 m for each survey line.

A georeferenced PDF map was used as a survey location guidance prior to the data acquisition phase and was loaded on GPS enabled phone and tablet with a spatial accuracy of 5 m. Two 100 m tape measures were used to estimate chainage reference up to 200 m for seismic spread deployment.

Upon completion of each spread layout, the location of the seismic traverse was surveyed using a South Galaxy G2 GNSS receiver operating on the AusCORS GNSS correction network to an accuracy of +/-50 mm horizontally and +/-100 mm vertically.

Table 1 presents the seismic acquisition parameters and spatial reference frame for the survey.

Table 1 Seismic survey parameters

Parameter	Value
Seismograph	
System	DMT Summit X One System
Output sample resolution	32 bit
Sample rate	0.125 ms
Record length	2,048 ms
Frequency bandwidth	0 Hz to 3200 Hz
Instantaneous dynamic range	>131 dB @ 2 ms
System dynamic range	>145 dB
Pre-amp gain	20 dB

Parameter	Value
Operating temperature	-20 to +60 ºC
Receivers	
Geophone group	Single vertical geophone per channel
Natural Frequency	4.5 Hz
Tolerance	+/- 0.5 Hz
Max tilt angle for specified (Fn)	+/- 5º
Typical spurious frequency	>160 Hz
Distortion (0.7 V p-p) @ 12 Hz	<0.3%
Open circuit damping	0.7
Damping tolerance	+/- 10%
Coil resistance	395 Ω
Sensitivity	23.4 V/m/s
Moving mass	11 g
Maximum coil excursion	1.5 mm
Spread	
No. of channels	48
Geophone interval	1 m
No. of shots per spread	25
Distance between shots	2 m
Spread move-up overlap	12 receivers
Seismic source	12 lb sledgehammer and 40 mm Nic-alloy bash plate
Stacking	Each shot saved individually as well as vertical stack of all shots (3 to 5 shots as necessary)/
Spatial reference frame parameters	
Horizontal Datum	GDA2020 at epoch 2022.6
Vertical Datum	AHD (AusGEOID09)
Projection	Map Grid of Australia (Transverse Mercator)
Zone	55S
Central Meridian	147°
False Easting	500,000
False Northing	10,000,000
Central Scale Factor	0.9996

2.2 In-field data QA/QC

Seismic data quality, specifically signal to noise ratio (SNR), was improved by the vertical stacking of seismic records. This procedure offsets the limitations of the seismic source energy (sledge-hammer and bash plate) and minimises the influence of noise (ambient and transient vibrations) on seismic data. Additionally, considerable data redundancy was built into the acquisition geometry to ensure that the results reflected the true subsurface response rather than noise-induced artefacts.

The location of the site meant that the survey was rarely affected by vibrations from surrounding plant or vehicle activity. However, data quality was occasionally affected by intermittent wind gusts. The field geophysicist was responsible for real-time quality assurance and quality control (QA/QC) of seismic records. When the data quality was deemed inadequate, a period of recording standby was commenced with intermittent testing of the signal strength until acceptable recording conditions prevailed. The quality of the acquired seismic dataset, as determined by generally observed high SNR, is well suited for the two seismic processing techniques.

3. Processing

SRT is based on the measurement of the travel times of seismic waves refracted at the interfaces between sub-surface strata of different velocity. Beyond a certain distance from the shot point, known as the “crossover distance”, the refracted signal is observed as a first-arrival signal (P-wave) at the geophones. To produce a P-wave velocity cross-section model, the P-wave onset time would be picked for each trace in every shot record, which then is inverted using a tomography algorithm within a finite-element computing framework in the Rayfract software package.

SRT inversion involves the determination of a two-dimensional (2D) simulated model of the sub-surface, based on which P-wave travel times are predicted. A model of the sub-surface P-wave velocity structure is obtained by iteratively minimising the difference between these predictions and measured travel times using a non-linear genetic algorithm least squares optimisation.

3.1 SRT processing workflow

The processing workflow used for this project involved the use of a wave-path Eikonal travel time (WET) tomography algorithm (Schuster and Quintus-Bosz, 1993) to solve the forward problem (i.e., predicting travel times based on simulated velocity models), and a non-linear genetic algorithm with least squares optimisation to solve the inverse problem (i.e., minimising predicted versus measured travel time) in the Rayfract software. The advantage of the WET algorithm is that it can accommodate arbitrary complexity of P-wave velocity structure by accounting for wave propagation effects such as diffraction and band-limited signals. The non-linear optimisation algorithm provides ability to sufficiently explore parameter space (>35% from starting conditions). The above two combine to provide excellent capability at resolving complex structure and positive or negative velocity gradients.

The processing flow for Rayfract was as follows:

1. A database was created for measured travel time data and ray path geometry to be stored.
2. The seismic data were imported into the database and first breaks were picked (Figure 1).
3. Once the first breaks were picked and ray path geometry was specified, the geophysical inversion process was applied.

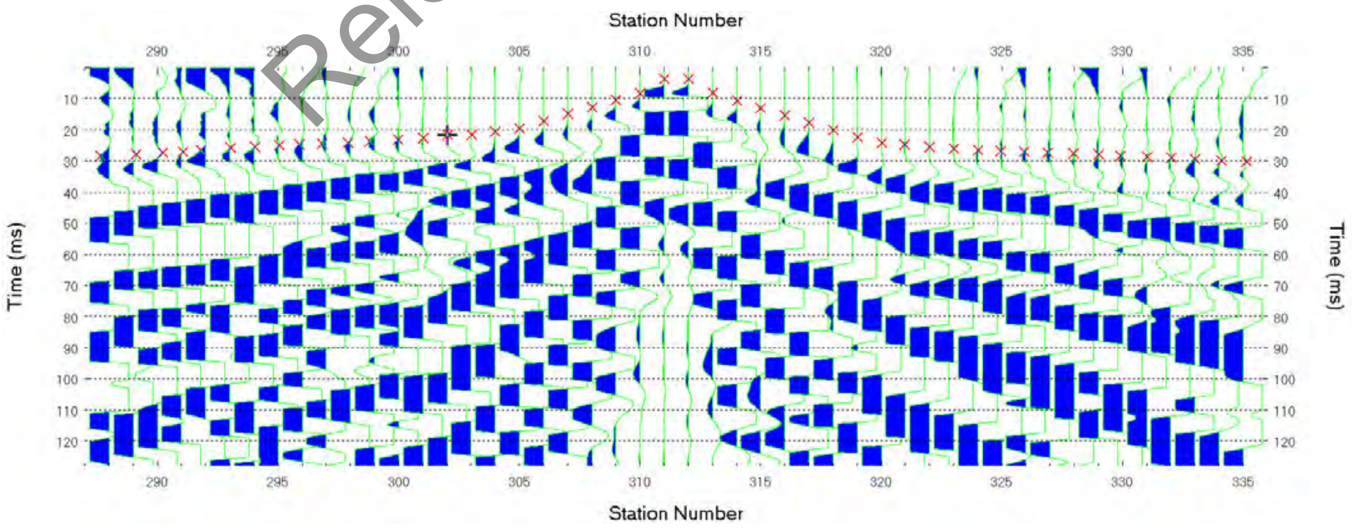

Figure 1 ***Example seismic shot record showing P-wave refractor first arrivals. First break picks are indicated by red cross***

As a starting point, Rayfract implements a Smooth Inversion algorithm method to generate a pseudo-2D Delta-t-V initial model. This produces an individual velocity vs depth profile below each profile station. The smooth inversion averages the resulting velocities over all profile stations at common depths to produce an average velocity vs depth profile. This average velocity vs depth profile is then extended laterally along the whole seismic section. A 1-D gradient velocity grid was generated based on these average velocities using the method of Rohdewald (1999). This grid then becomes the starting point for the subsequent inversion.

The starting model was then iteratively refined with WET tomography algorithm using a linearised conjugate gradient optimisation algorithm with non-linear optimised inner loops. Wave propagation was modelled with wave paths, based on a first-order Eikonal solver (forward modelling algorithm for modelling of first breaks). Solving the Eikonal equations directly guarantees that the global minimum travel time is found (Husen and Kissling, 2001).

Quality control of the WET inversion output was achieved by visually examining the computed vs actual travel times to validate the absence of any systematic misfit minimisation deviation.

3.2 Frequency-time analysis (FTAN) overview

The FTAN technique involves collecting suitable surface wave seismic data in the field, and subsequent processing to exploit the strong sensitivity of Rayleigh wave dispersion to subsurface shear wave velocity (Vs) to construct models of Vs structure. These computer programs were developed in-house and are based on peer-reviewed and published numerical methods (Hermann, 2013; Kristekova et al., 2006; Luu et al., 2020). The application of FTAN-procedure on seismic surface waves recorded on the vertical component of geophones (i.e., Rayleigh waves) generates group velocity dispersion maps in the frequency-time domain. From these dispersion maps, dispersion curves are hand-picked by following the highest energy contours under the assumption that the fundamental mode surface wave energy is dominant. Following the picking of dispersion curves, models of subsurface Vs structure are estimated using geophysical inversions driven by differential evolution algorithms. An example of GHD's surface wave inversion is provided in Figure 2.

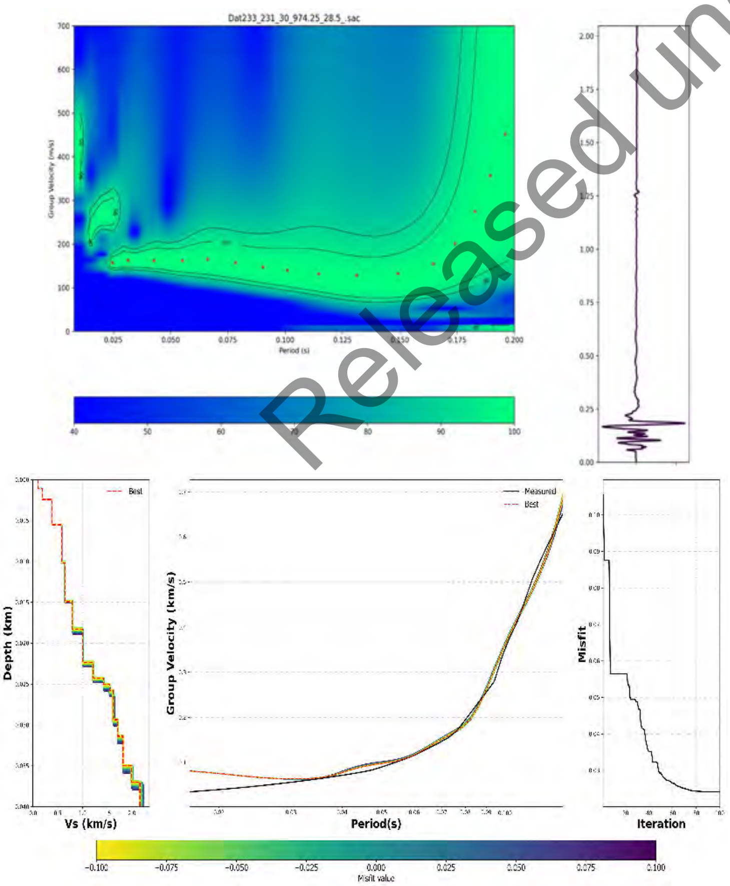

Figure 2: ***An example surface wave inversion result. Top panel: the surface wave dispersion curve (red crosses) picked for the seismogram shown on the right. Bottom panel: Inverted 1-D shear velocity model ensemble with the best-fitting model (red line, left), the comparison between the picked (black line) and best-fitting (red line) dispersion curves (middle), and the solution convergence (right).***

The shot record traces were pre-processed using ObsPy (Beyreuther et al., 2010), following which individual traces were extracted and sorted based on the constant shot-receiver separation distance of 25 m and offset of 10 m along the respective survey lines. FTAN procedure is then applied on each seismic shot record trace to compute dispersion maps, from which dispersion curves were picked. The 1D Vs model obtained from inverting the dispersion curve for a given shot-receiver combination was mapped to the midpoint of the line connecting that shot and receiver. This procedure was applied to all shot-receiver combinations along the survey lines. Finally, a Vs cross section was generated along a survey line from interpolating all 1D Vs models in a survey line.

4. Results

The results from the seismic surveys are provided in the Figures on the following page.

5. References

Beyreuther, M., Barsch, R., Krischer, L., Megies, T., Behr, Y., and Wassermann, J., 2010. ObsPy: A Python Toolbox for Seismology, Seismol. Res. Lett., 81 (3), 530-533.

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Kristeková, M., Kristek, J., Moczo, P., and Day, S. M. (2006). Misfit Criteria for Quantitative Comparison of Seismograms. *Bull. Seismol. Soc. Am.,* 96 (5): 1836–1850.

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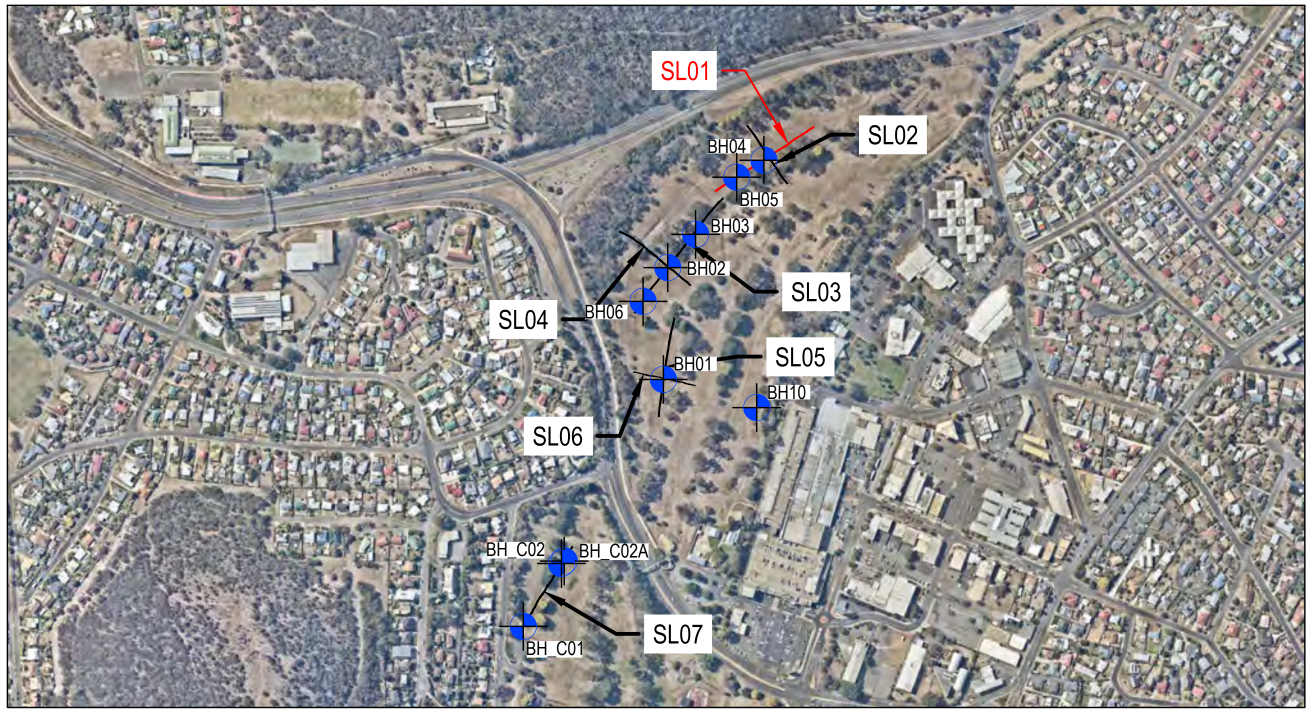
Rohdewald, S., Burton, B., Sheehan, J., Doll, W., 2010, *Processing of seismic refraction tomography data*, SAGEEP short course notes, Keystone, Colorado.

Schuster, G.T., Quintus-Bosz, A., 1993, *Wave path Eikonal travel time inversion: Theory*, Geophysics, Vol. 58, 1314-1323.

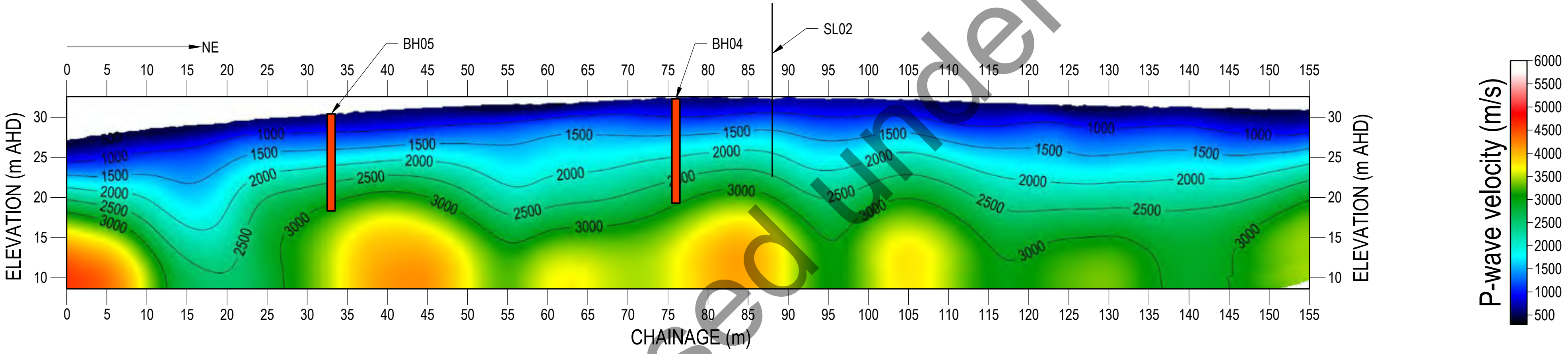


SITE PLAN

SCALE 1:10,000

SL01 - PLAN

SCALE 1:1000



SRT SL01 - PROFILE

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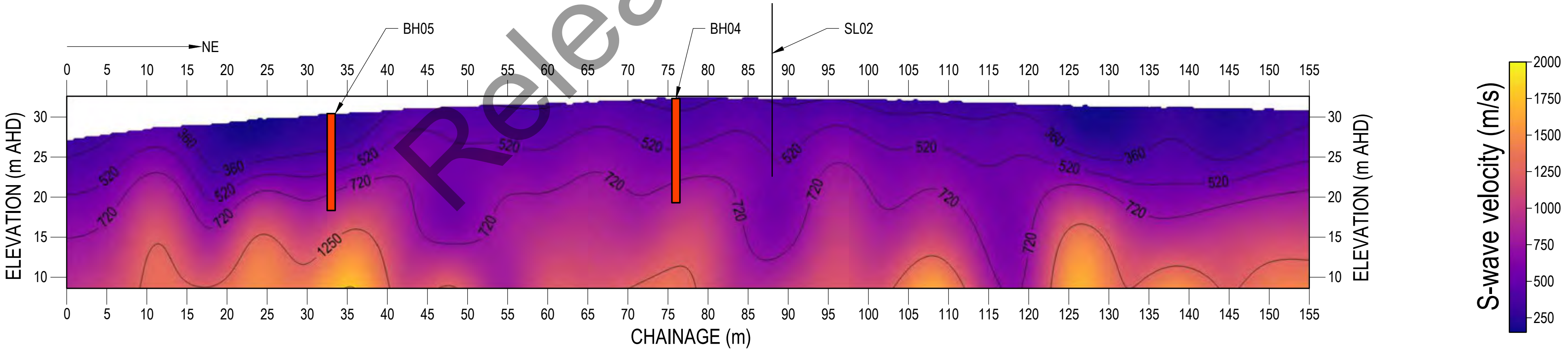

FTAN SL01 - PROFILE

SCALE 1:750

LEGEND:

SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

GHD

AFL HIGH PERFORMANCE CENTRE
STRATEGIC ALIGNMENT

GEOPHYSICAL INVESTIGATION
SL01 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
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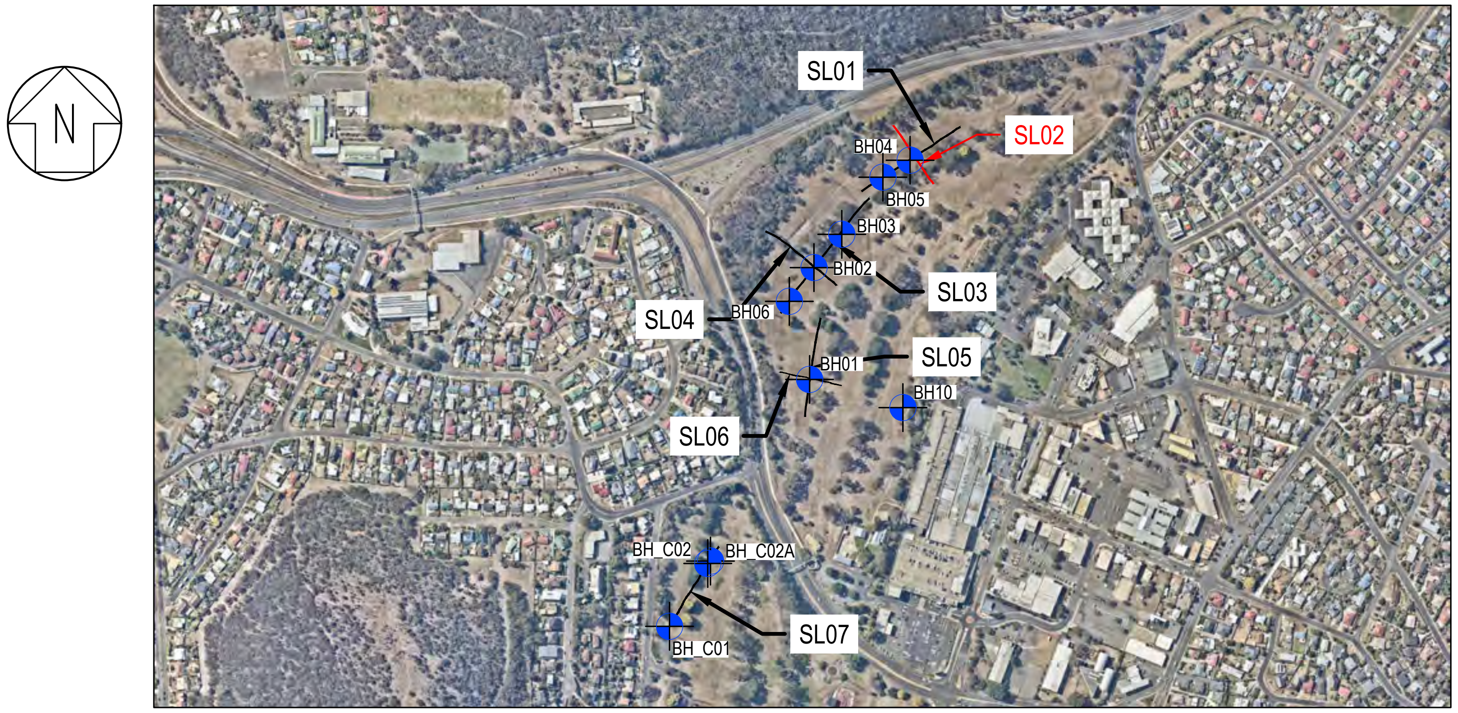
Figure 02

Plot Date: 17 July 2024 - 5:05 PM   Plotted by: Victoria Jenkins   Cad File No: \\ghdnet\ghd\AU\hobart\Projects\32\12626209\CADD\Drawings\GEOPHYSIC INVEST\12626209-FIG02-FIG08.dwg

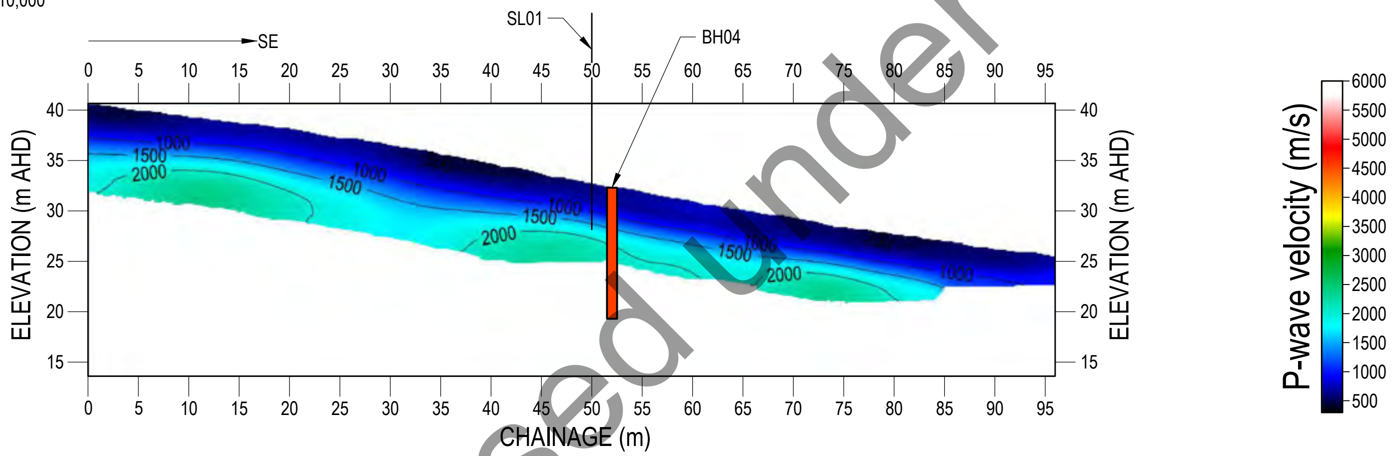


SITE PLAN

SCALE 1:10,000

SL02 - PLAN

SCALE 1:2000



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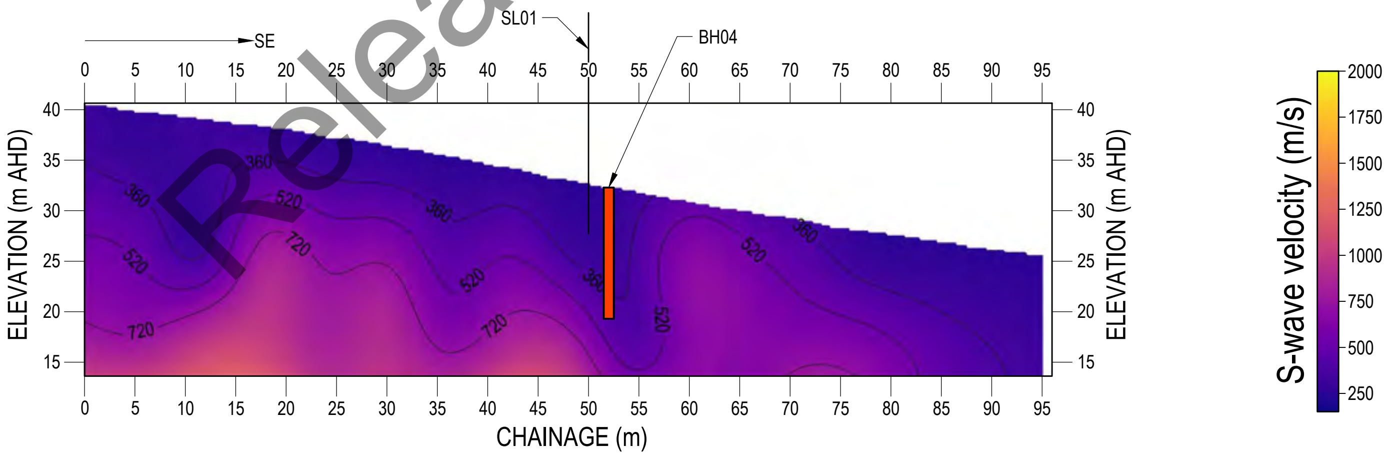

FTAN SL02 - PROFILE

SCALE 1:750

LEGEND:

SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

GHD

AFL HIGH PERFORMANCE CENTRE
STRATEGIC ALIGNMENT

GEOPHYSICAL INVESTIGATION
SL02 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

Figure 03

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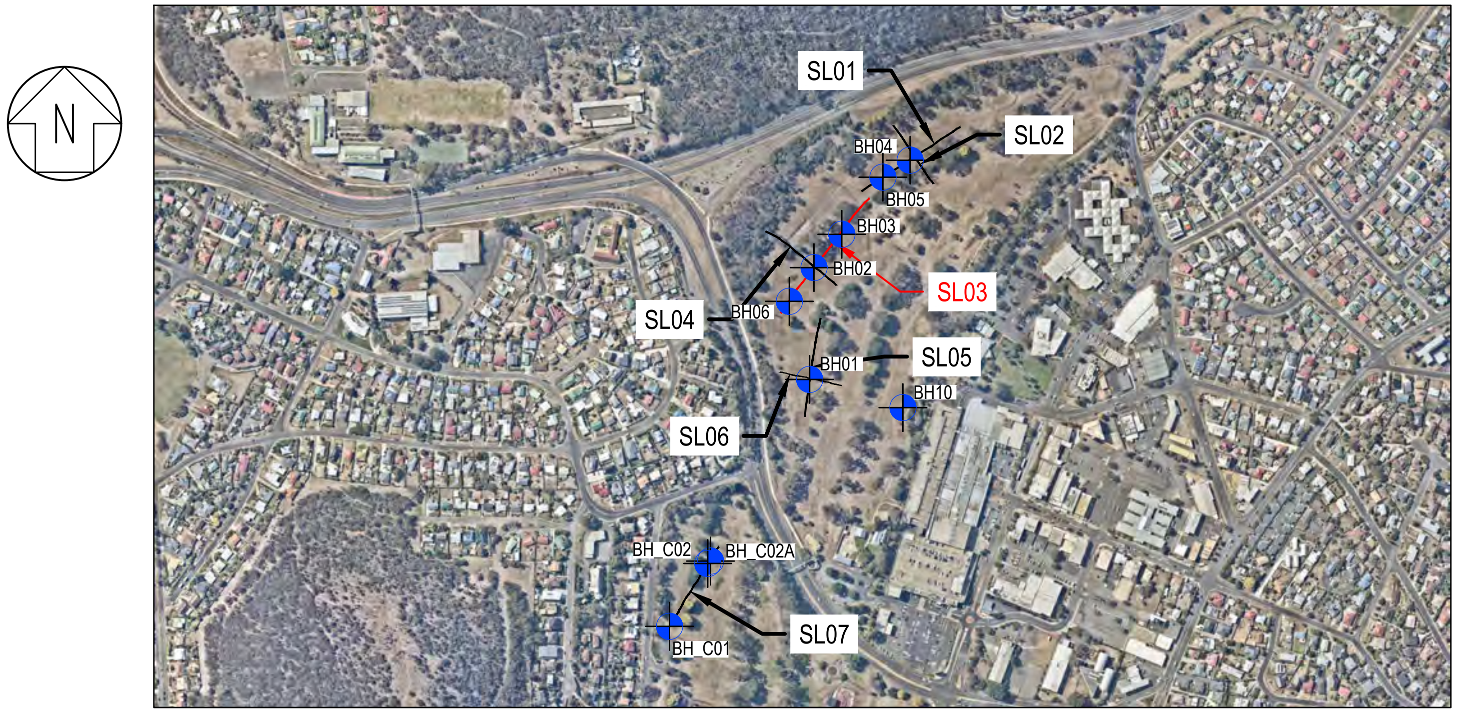
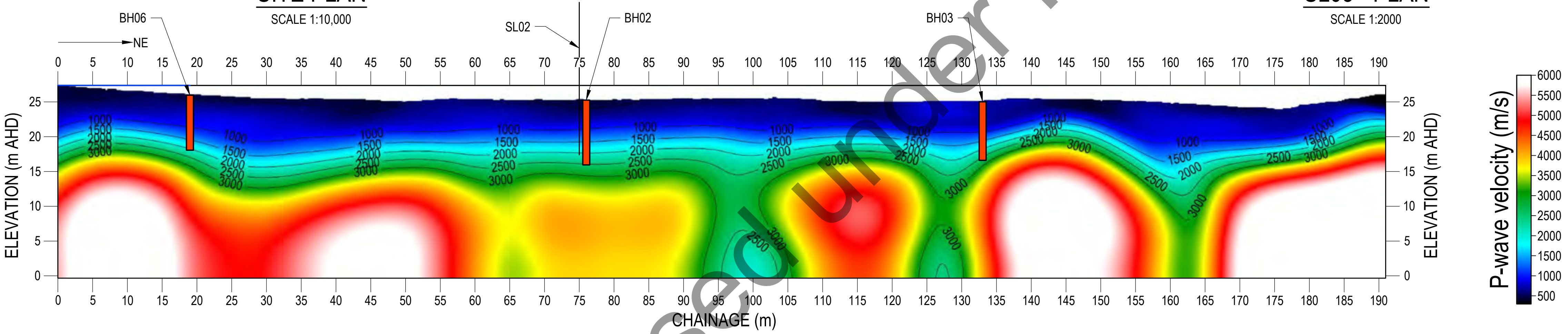


SITE PLAN
SCALE 1:10,000

SL03 - PLAN
SCALE 1:2000



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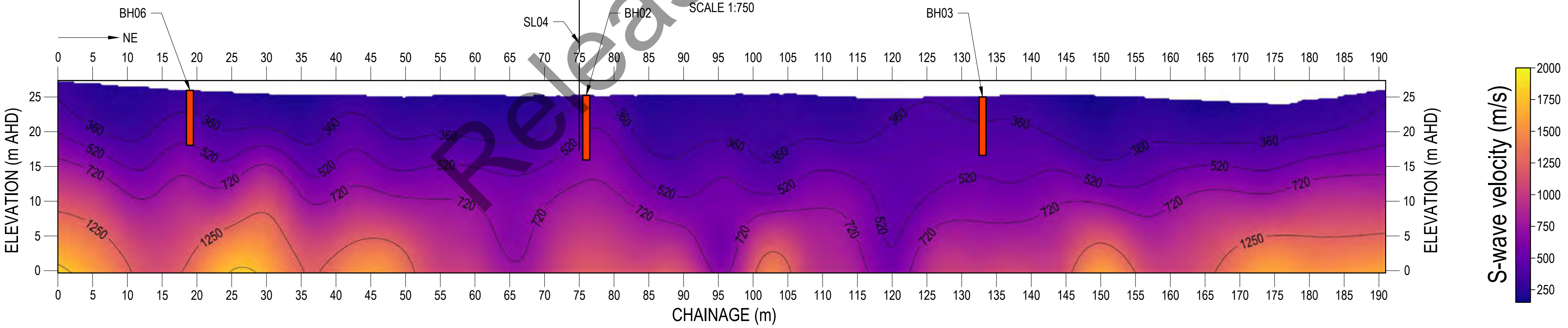

FTAN SL03 - PROFILE
SCALE 1:750

LEGEND:
SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

GHD

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STRATEGIC ALIGNMENT

GEOPHYSICAL INVESTIGATION
SL03 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

Figure 04

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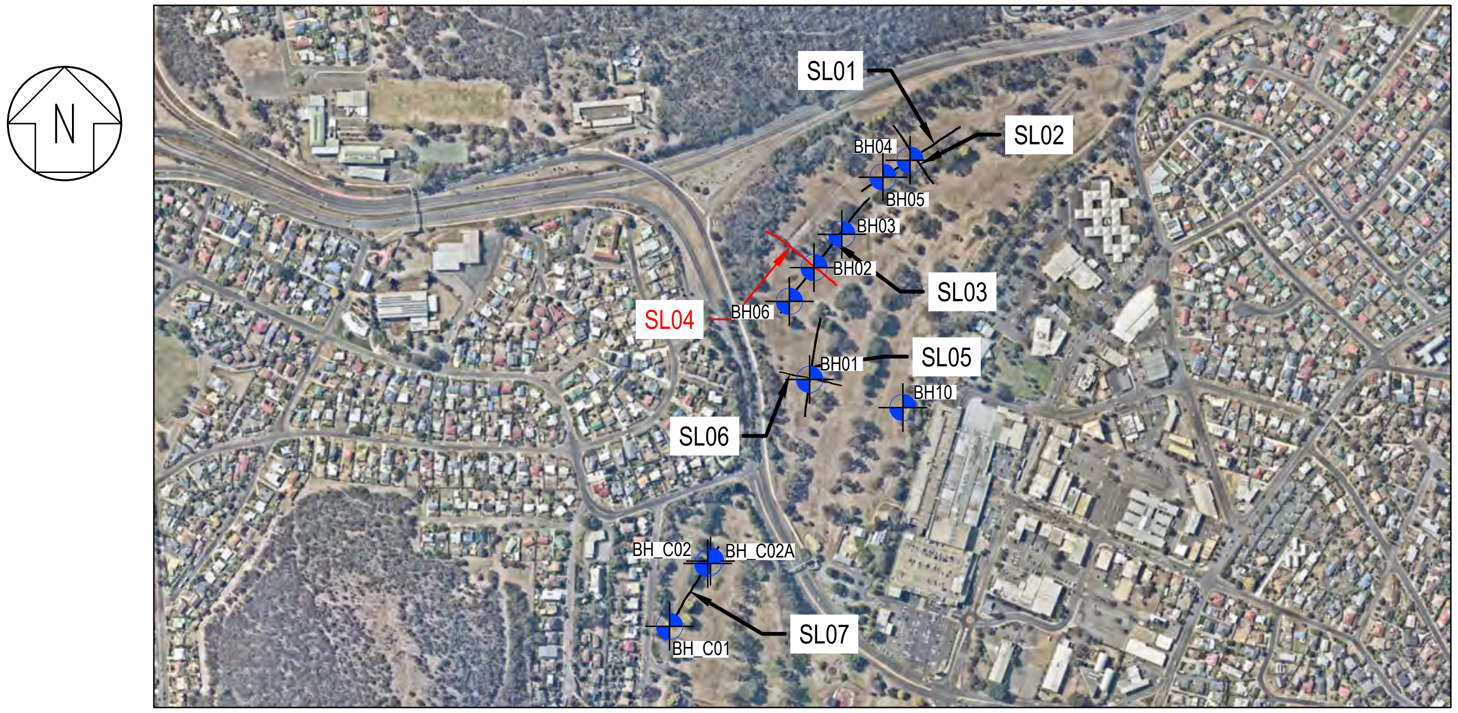
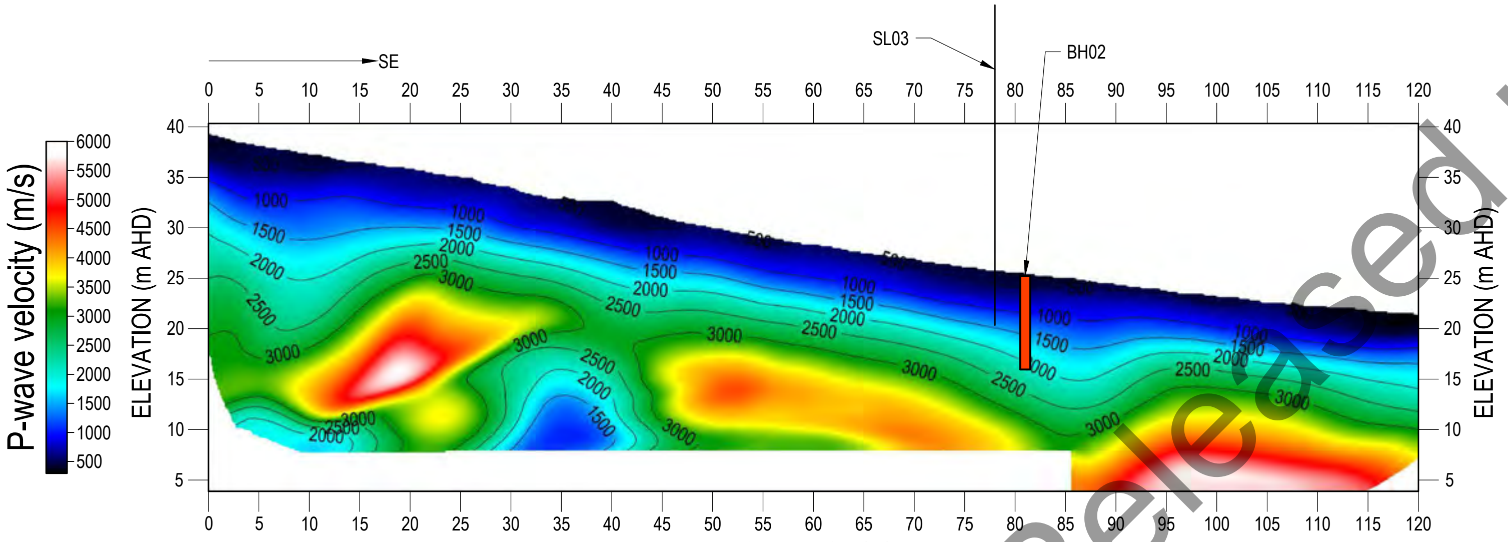


SITE PLAN

SCALE 1:10,000

SL04 - PLAN

SCALE 1:2000



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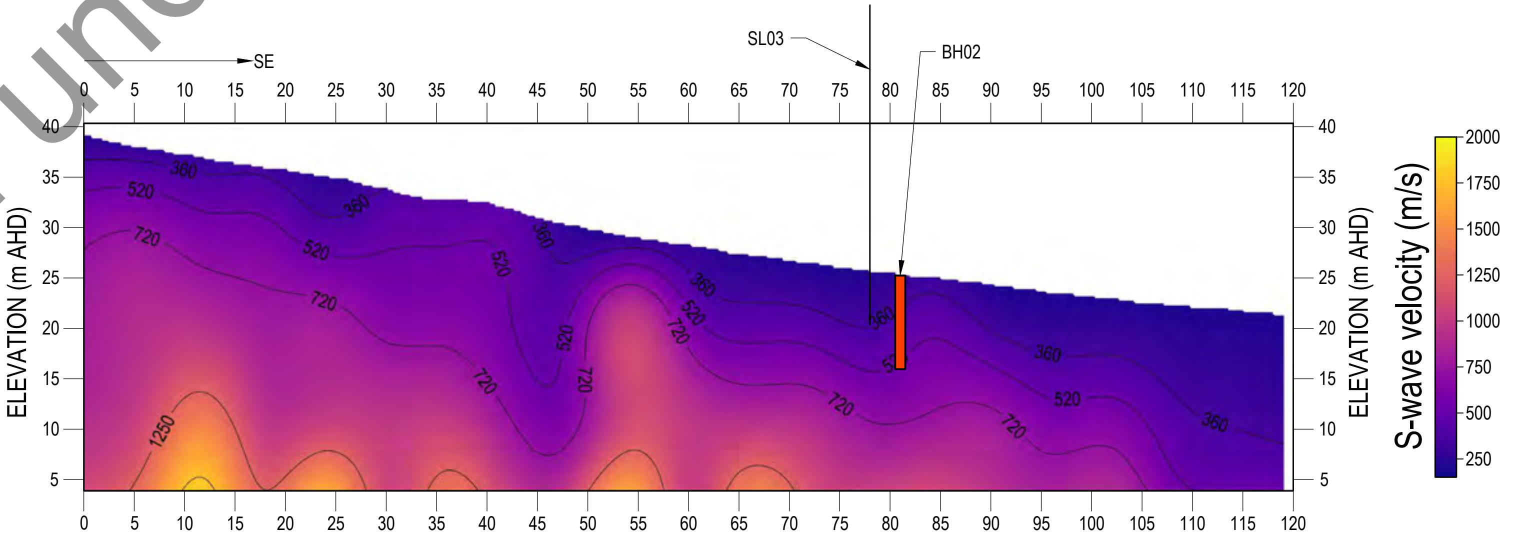

FTAN SL04 - PROFILE

SCALE 1:750

LEGEND:

SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

GHD

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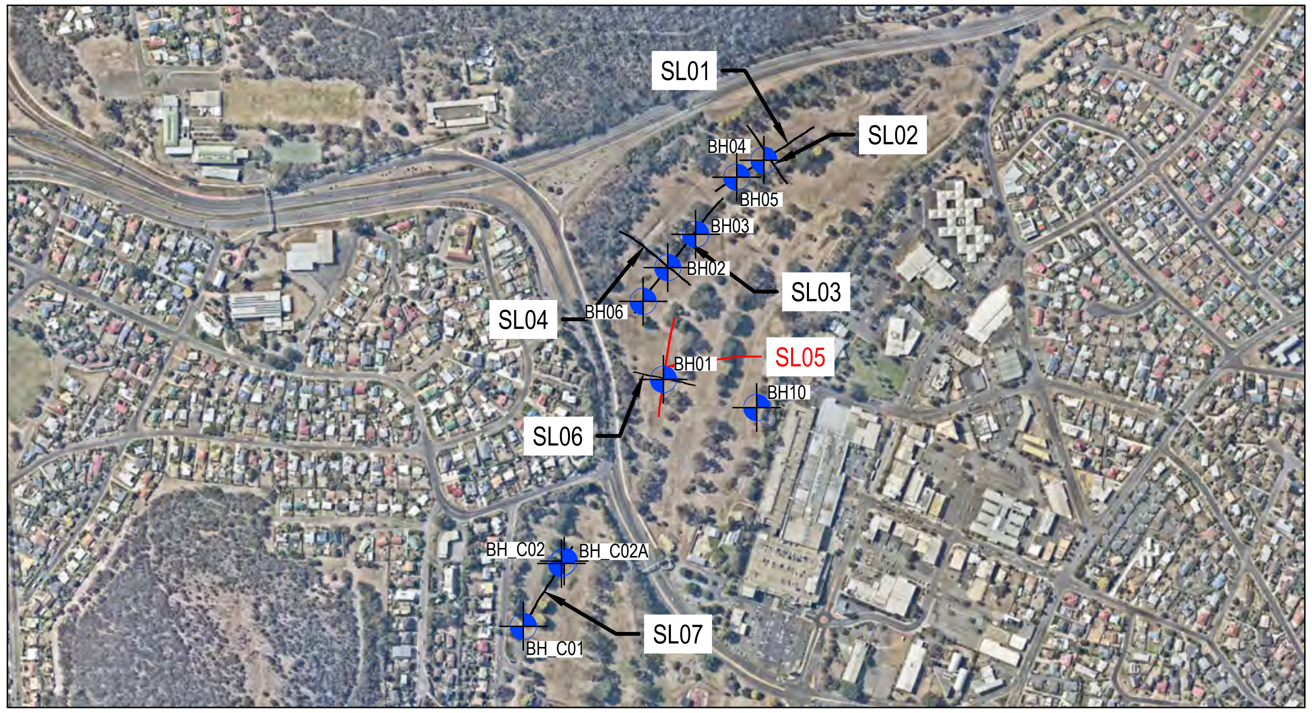
GEOPHYSICAL INVESTIGATION
SL04 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

Figure 05

Plot Date: 17 July 2024 - 5:09 PM Plotted by: Victoria Jenkins Cad File No: \\ghdnet\ghd\AU\hobart\Projects\32\12626209\CADD\Drawings\GEOPHYSIC INVEST\12626209-FIG02-FIG08.dwg

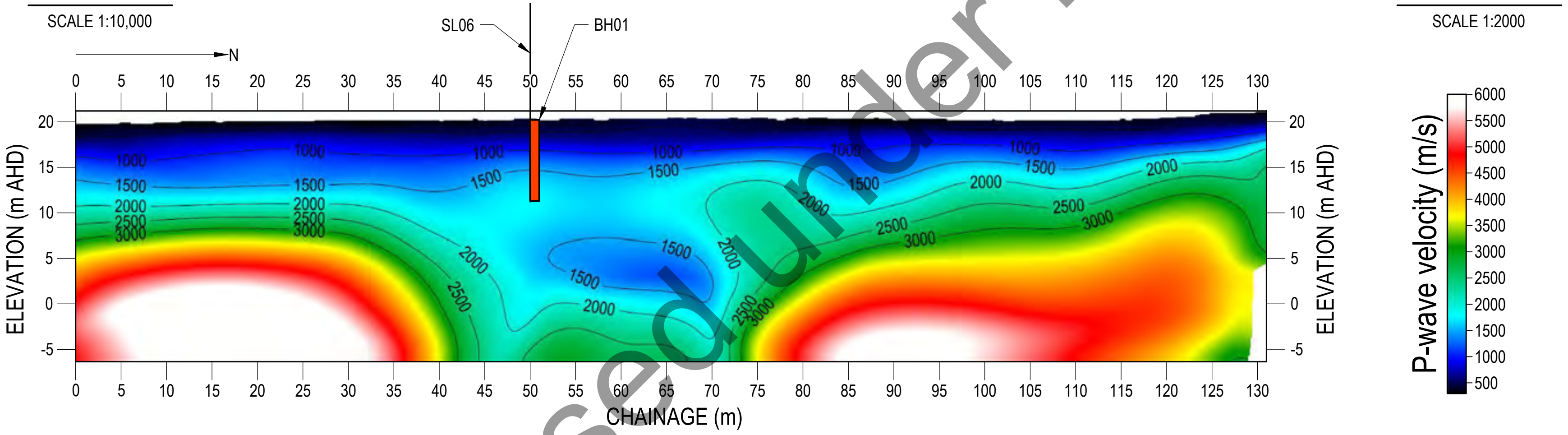


SITE PLAN

SCALE 1:10,000

SL05 - PLAN

SCALE 1:2000



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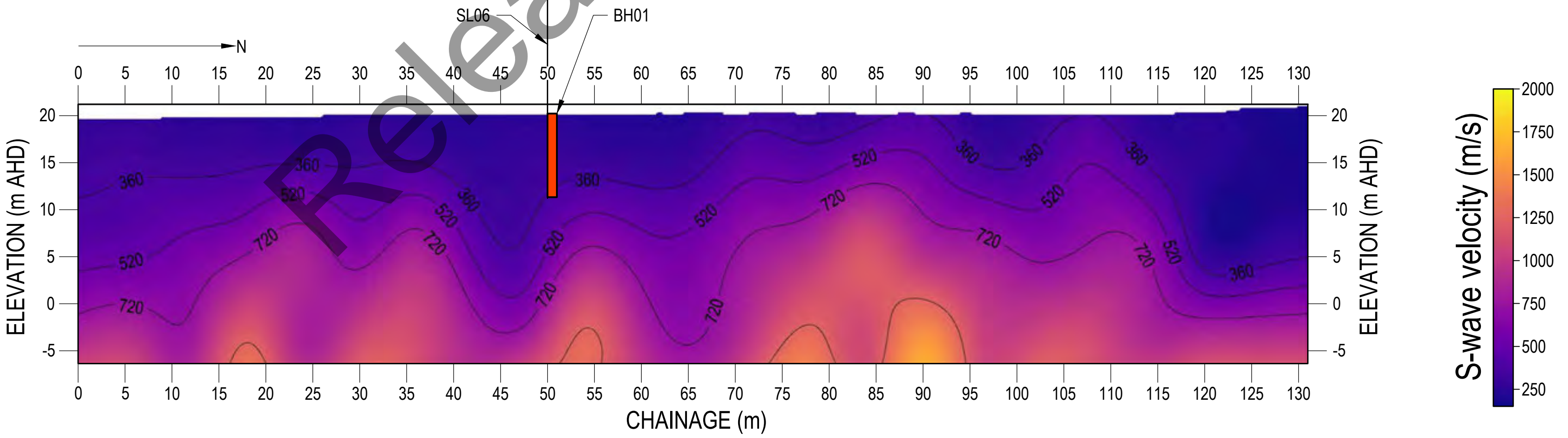

FTAN SL05 - PROFILE

SCALE 1:750

LEGEND:

SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

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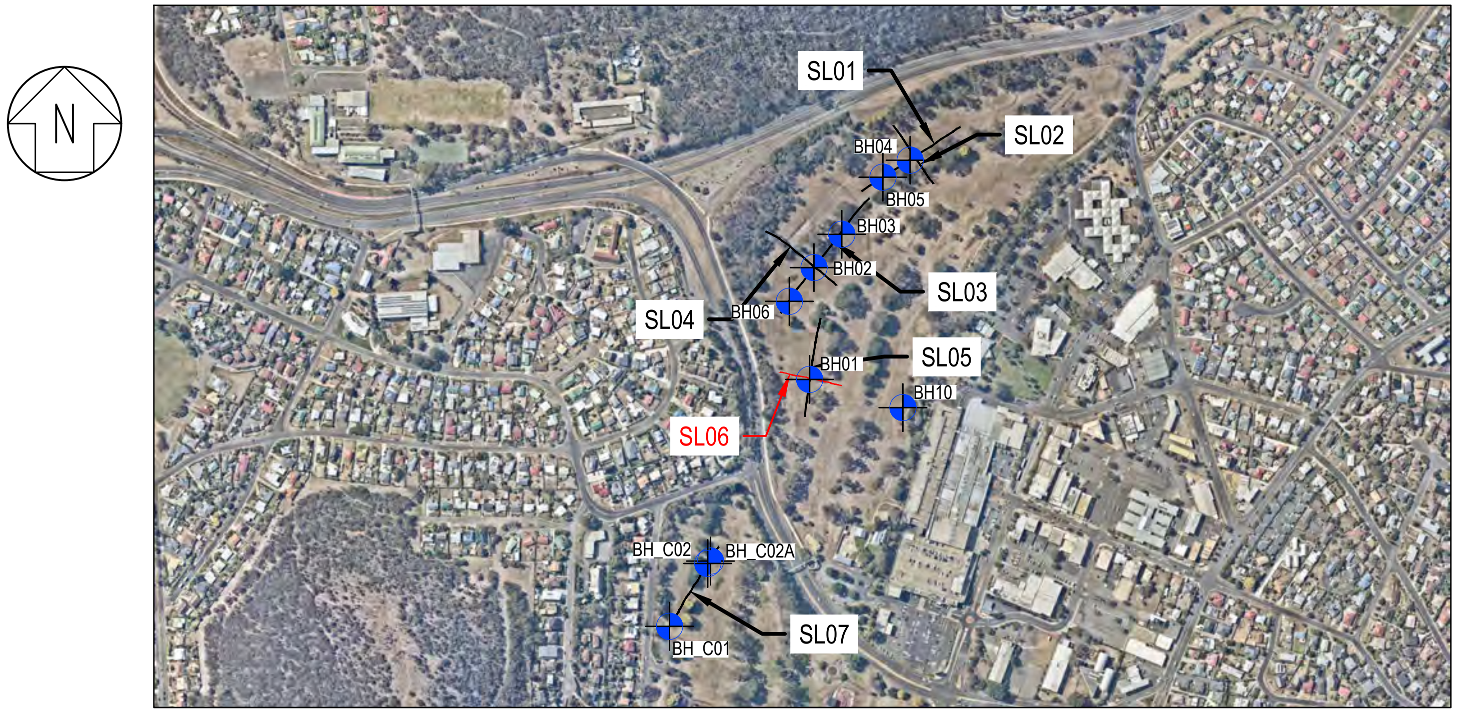
GEOPHYSICAL INVESTIGATION
SL05 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

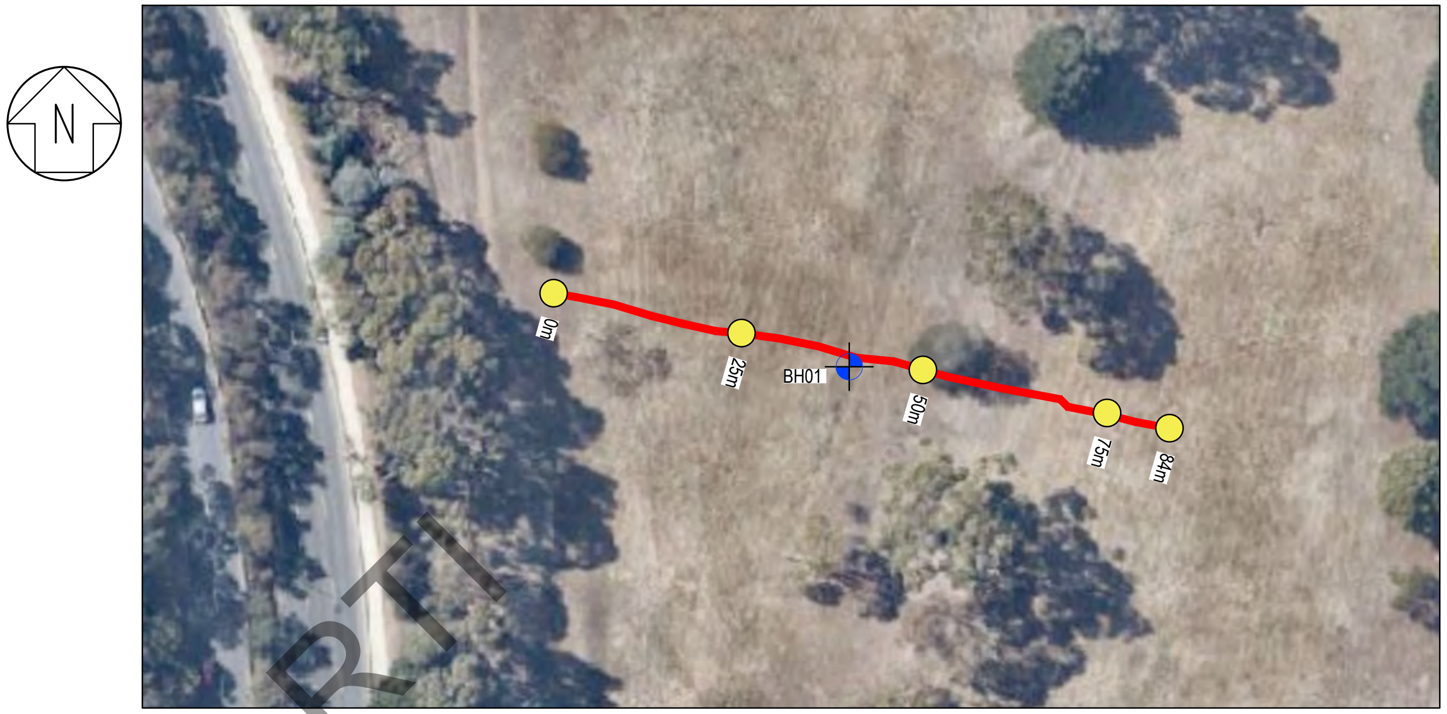
Figure 06

Plot Date: 18 July 2024 - 12:37 PM Plotted by: Victoria Jenkins Cad File No: \\ghdnet\ghd\AU\hobart\Projects\32\12626209\CADD\Drawings\GEOPHYSIC INVEST\12626209-FIG02-FIG08.dwg



SITE PLAN

SCALE 1:10,000



SL06 - PLAN

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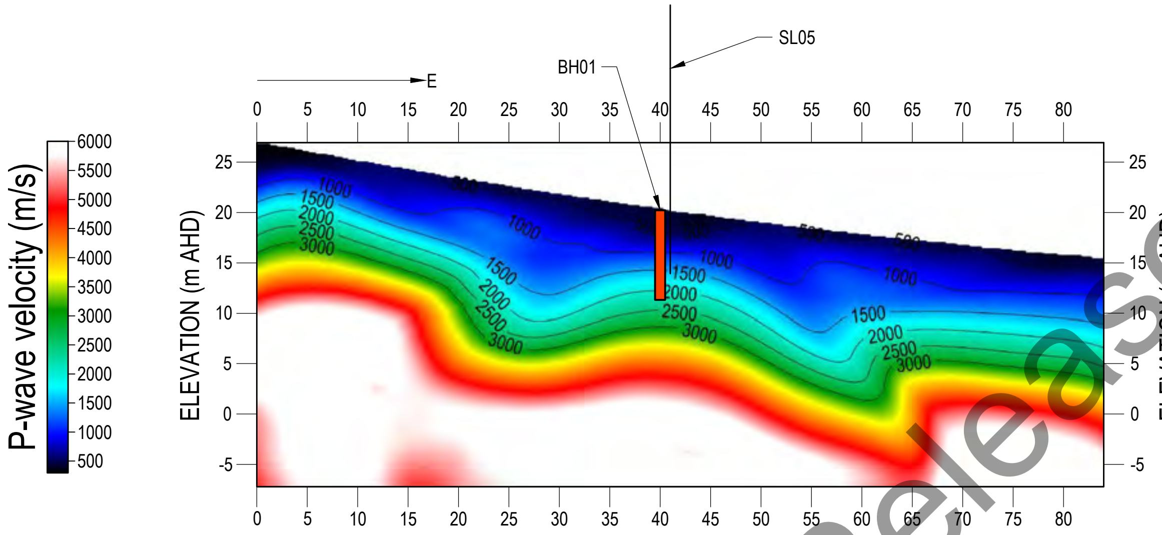

SRT SL06 - PROFILE

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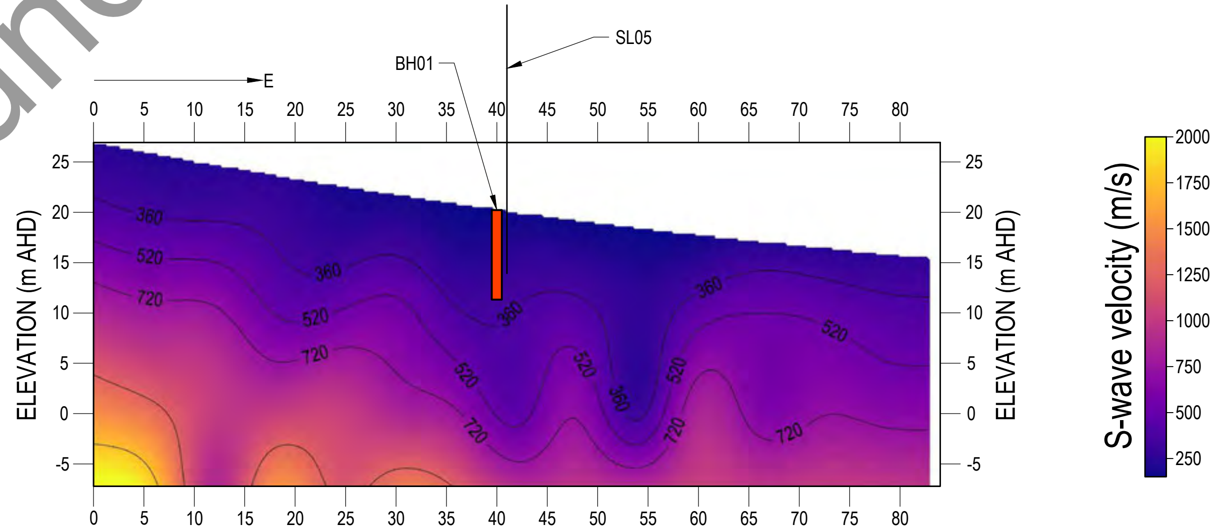

FTAN SL06 - PROFILE

SCALE 1:750

LEGEND:

SEISMIC LINE

0 100 200 300m
SCALE 1:10,000 AT ORIGINAL SIZE

0 10 20 30m
SCALE 1:1000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

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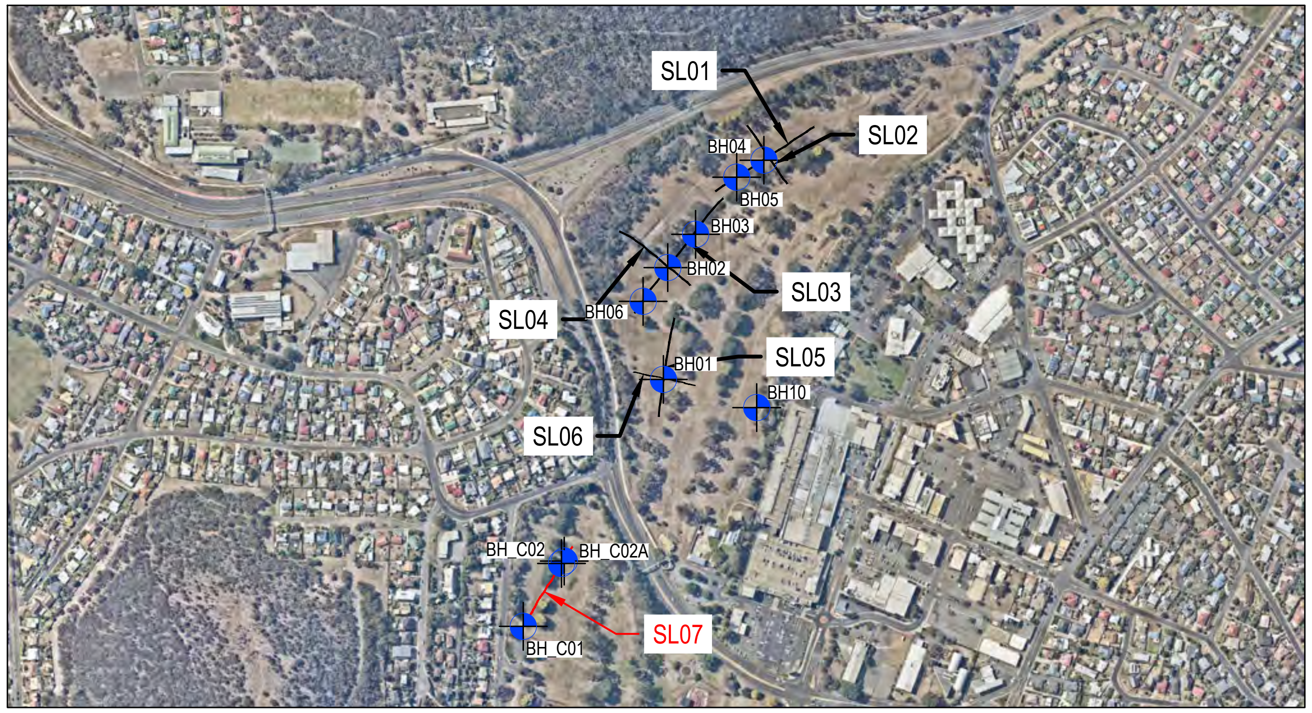
STRATEGIC ALIGNMENT

GEOPHYSICAL INVESTIGATION
SL06 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

Figure 07

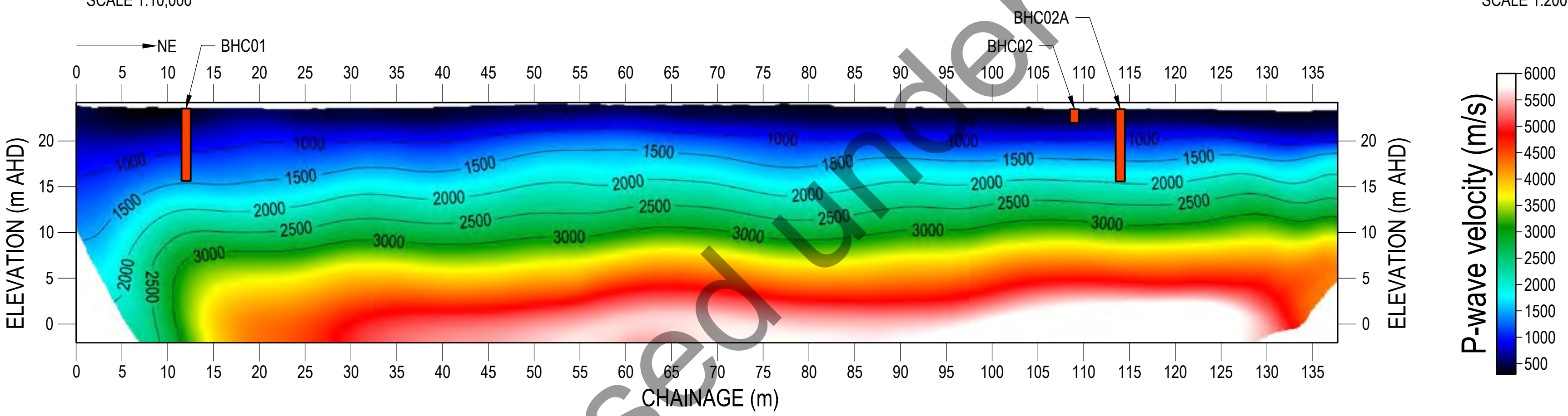


SITE PLAN

SCALE 1:10,000

SL07 - PLAN

SCALE 1:2000



SRT SL07 - PROFILE

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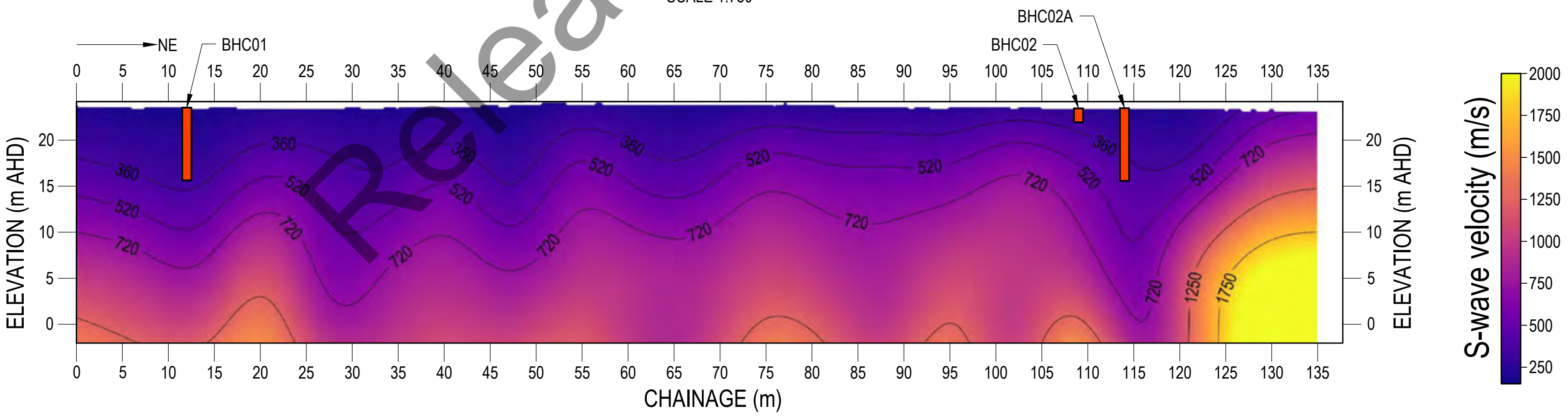

FTAN SL07 - PROFILE

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LEGEND:

SEISMIC LINE

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0 20 40 60m
SCALE 1:2000 AT ORIGINAL SIZE

0 7.5 15 22.5m
SCALE 1:750 AT ORIGINAL SIZE

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STRATEGIC ALIGNMENT

GEOPHYSICAL INVESTIGATION
SL07 - SRT AND FTAN - PLAN AND SECTION

Project Number	12626209
Revision	A
Date	JUN 2024

Figure 08

Plot Date: 18 July 2024 - 12:38 PM Plotted by: Victoria Jenkins Cad File No: \\ghdnet\ghd\AU\hobart\Projects\32\12626209\CADD\Drawings\GEOPHYSIC INVEST\12626209-FIG02-FIG08.dwg

Appendix F

Geotechnical logs and photographs

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP_C01

SHEET 1 OF 1

Position : 529720.6 E, 5253886.6 N MGA2020
Surface RL : 27.20m
Pit Width : 1.6
Processed : AOK
Contractor : Digga Excavation
Machine : 13T Excavator
Pit Length : 3.0
Checked : ASH
Date : 27 May 24
Logged by : AH/JP
Date : 17 Jul 24

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
		0.25 26.95		TOPSOIL: SILT with sand, high plasticity, dark-brown, sand is fine grained, frequent rootlets (top 100mm) w>PL	MH	M	S-F	DCP	DCP Blows/100mm: 2/2/2/4/4/5/7/9/27* *Refusal after 80mm	
		0.75 26.45		CLAY with sand, trace gravel, high plasticity, brown, sand is fine to coarse grained, gravel is fine, w>PL [Residual Soil]	CH	M	St	D PP PP	D (0.3-0.6m) PP @ 0.5m = 150kPa (UCS) PP @ 0.6m = 140kPa (UCS)	
1		2.00 25.20		Clayey SAND, trace gravel and cobbles, sand is fine to coarse grained, orange-brown, clay is medium plasticity, gravel is fine, cobbles are subrounded <100mm, friable, [XW Dolerite]	SC	M	MD-D	D	D (0.8-1.0m)	1
2		2.30 24.90		With HW cobbles (dolerite), subrounded to subangular, blue-grey with orange-brown weathering						2
	GNE	3.00 24.20		DOLERITE, grey-brown, MW, H - VH strength, close to very close defects, trace corestones, Fe staining						
3				Limit of Test Pit					Slow excavation, near refusal	3
4										4
5										5

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number
12626209

A4

TP_C01

Title
Charles Hand Park

Photographic Record

Client
Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP_C02

SHEET 1 OF 1

Position : 529750.2 E, 5253825.6 N MGA2020 **Surface RL : 21.30m** **Pit Width : 1.6** **Processed : AOK**
Contractor : Digga Excavation **Machine : 13T Excavator** **Pit Length : 3.0** **Checked : ASH**
Date : 28 May 24 **Logged by : JP** **Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	GNE	0.20 21.10		FILL/TOPSOIL: Sandy SILT, low to medium plasticity, dark-brown, sand is fine grained, frequent rootlets, w=PL	ML	M	F-St	DCP	DCP Blows/100mm: 3/4/6/8/9/20	
		0.50 20.80		CLAY with sand, trace gravel, high plasticity, dark-brown, sand is fine to coarse grained, gravel is fine, trace rootlets,w>PL [Residual Soil]	CH	M	VSt	D PP PP	D (0.2 - 0.4m) PP @ 0.25m = 200kPa (UCS) PP @ 0.4m = 450kPa (UCS)	
		0.80 20.50		Gravelly SAND with cobbles, fine to coarse grained, orange-brown, friable, gravel and cobbles are subrounded to subangular, HW-XW cobbles <200mm, Fe staining [XW Dolerite]	SP	D-M	D-VD		0.5m: Hit XW dolerite	
1		1.20 20.10		Sandy GRAVEL with cobbles, trace boulders, fine to coarse, subangular to subrounded gravel and cobbles, MW-HW, brown to orange, Fe staining, sand is fine to coarse grained, boulders are H strength, up to 400mm [XW Dolerite]	GP	D-M	VD			1
		1.50 19.80		DOLERITE, orange-brown, some pale grey, MW, high to very high strength, Fe staining, defects typically <200mm					bucket refusal @ 1.3m, changed to ripper	
				Limit of Test Pit @ 1.5m. Refusal with ripper and toothed bucket						
2										2
3										3

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Charles Hand Park	Department of State Growth
TP_C02		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP_C03

SHEET 1 OF 1

Position : 529826.2 E, 5253746.1 N MGA2020	**Surface RL : 13.90m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.4**	**Checked : ASH**
Date : 28 May 24		**Logged by : ASH/KP**	**Date : 17 Jul 24**

EXCA		**MATERIAL**							**ADDITIONAL DATA**	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	GNE			TOPSOIL: CLAY with sand, high plasticity, dark-brown, sand is fine to medium grained, some rootlets and roots	CH	M	St	DCP	DCP Blows/100mm: 8/7/6/2/2/6/8/9/16/20*	
		0.30 13.60		CLAY with sand, high plasticity, brown, sand is fine to medium grained, w>PL [Residual Soil]	CH	M	St-VSt	PP	PP @ 0.4m = 200kPa (UCS)	
		0.50 13.40		trace gravel, sand is fine to coarse grained, gravel is fine, fissured, slickensided surfaces, w~PL		M-D	H	PP D PP	PP @ 0.5m = >600kPa (UCS) D (0.5-0.8m) PP @ 0.7m = >600kPa (UCS)	
1		0.80 13.10		Clayey, Gravelly SAND, trace cobbles, fine to coarse grained, orange-brown, clay is medium plasticity, gravel is fine to coarse, subangular, HW dolerite [XW Dolerite]	SC	M-D	D-VD	D	D (0.9-1.1m)	1
		1.20 12.70		DOLERITE, orange-brown, Fe stained, HW, L-H strength, typically L, very close defects (20-200mm)					1.2m: Teeth grinding, variable strength. Recovered as Sandy GRAVEL with cobbles (up to 200mm)	
		1.70 12.20		HW-MW, M-H strength						
2 3		1.80 12.10		Refusal with 3-toothed, 450mm wide bucket.						2 3

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Charles Hand Park Photographic Record	Department of State Growth
TP_C03			

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP_C04

SHEET 1 OF 1

Position : 529847.6 E, 5253796.7 N MGA2020	**Surface RL :** 13.30m	**Pit Width :** 1.6	**Processed :** AOK
Contractor : Digga Excavation	**Machine :** 13T Excavator	**Pit Length :** 3.1	**Checked :** ASH
Date : 28 May 24		**Logged by :** ASH/KP	**Date :** 17 Jul 24

EXCA		MATERIAL					ADDITIONAL DATA
Scale (m)	Water	Depth / (RL) metres	Description Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	Comments/Observations Insitu test results
	GNE		TOPSOIL: Sandy SILT, low plasticity, dark-brown, fine grained, friable, rootlets and roots	ML	M	St	DCP	DCP Blows/100mm: 4/5/6/11 *Refusal after 20mm penetration
		0.30 13.00	Mixture of COBBLES/BOULDERS (50%) and CLAY with sand (50%), brown, boulders up to 500mm, H-EH strength, subrounded to subangular dolerite, clay is high plasticity, sand is fine to coarse grained, w>PL [Residual Soil]		M	St-VSt		
		0.60 12.70	Clayey SAND with gravel and cobbles, fine to coarse grained, orange-brown, high plasticity, gravel is fine to coarse, subangular, HW dolerite, cobbles up to 100mm [XW Dolerite]	SC	M	D-VD		
		0.75 12.55	Silty, Gravelly SAND, fine to coarse grained, orange-brown, gravel is fine to coarse, angular to subrounded, HW dolerite [XW Dolerite]	SM	M	VD		
1		0.90 12.40	DOLERITE, HW-MW, H-VH strength, grey-brown, Fe stained, very close to close defects (20-200mm)					Excavated as GRAVEL with cobbles, slow excavation
2		1.20 12.10	Limit of Test Pit. Near Refusal - very slow excavation with 3 toothed, 450mm wide bucket					
3								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Charles Hand Park Photographic Record	Department of State Growth
TP_C04			

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP01

SHEET 1 OF 1

Position : 529869.3 E, 5254039.6 N MGA2020 **Surface RL :** 20.40m **Pit Width :** 1.6 **Processed :** AOK
Contractor : Digga Excavation **Machine :** 13T Excavator **Pit Length :** 3.5 **Checked :** ASH
Date : 22 May 24 **Logged by :** ASH **Date :** 17 Jul 24

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				FILL: Sandy SILT, dark-brown to grey-brown, sand is fine grained, frequent rootlets (in upper 100mm) trace orange brick fragments	ML	M	MD-D	DCP	Mud bucket used in FILL layer DCP Blows/100mm: 5/16/16/16	
		0.30 20.10		Sandy CLAY, trace gravel, medium plasticity, brown, sand is fine to coarse grained, gravel is fine, subangular, HW dolerite, w<PL [Residual Soil]	CI	D	H	D PP DCP	D (0.3 - 0.6m) PP @ 0.4m = >600kPa (UCS) DCP (0.5 - 0.75m) Blows/100mm: 16/12/20*, 50mm penetration	
1		0.65 19.75		Silty SAND trace gravel, fine to coarse grained, orange-brown, low plasticity, gravel is HW dolerite, friable [XW Dolerite]	SM	D	D-VD	DCP	DCP (0.9 - 0.95m) Blows/100mm: 20*, for 50mm penetration	1
		1.50 18.90		with gravel, trace cobble, subrounded, HW dolerite, spheroidal weathering					1.5m: Excavator teeth grinding	
2	GNE	1.80 18.60		Gravelly SAND with silt and cobbles, fine to coarse grained, orange-brown, gravel is fine to medium, trace coarse, subangular, HW dolerite [XW Dolerite]	SP - SM	D	D-VD		Increasing gravel content	2
3 4		2.40 18.00		Limit of Test Pit.					Slow excavation, ripper needed to progress	3 4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Rosny Parkland	Client Department of State Growth
TP01		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP02

SHEET 1 OF 1

Position : 529951.6 E, 5254149.9 N MGA2020	**Surface RL : 14.50m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.7**	**Checked : ASH**
Date : 23 May 24		**Logged by : ASH**	**Date : 17 Jul 24**

EXCA		**MATERIAL**							**ADDITIONAL DATA**	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, dark brown, frequent rootlets, sand is fine coarse grained, trace ironstone fragments	ML	M	L - MD	DCP	DCP Blows / 100mm: 2/6/7/7/9/13/20* *50mm penetration	
		0.20 14.30		Sandy CLAY, high plasticity, dark-brown, sand is fine to coarse grained, w<PL [Residual Soil]	CH	M	VSt	D	Consistent with DCP note below D (0.2 - 0.5m)	
								PP	PP @ 0.4m = >600kPa (UCS)	
		0.50 14.00		brown, w~PL			H	D	D (0.5 - 0.7m)	
								PP	PP @ 0.6m = >600kPa (UCS)	
		0.70 13.80		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	VD	DCP	DCP @ 0.7 - 0.81m: Top of XW rock (saprolite). Blows / 100mm: 20/21*. *20 blows for 10mm penetration	
1										1
		1.10 13.40		with HW gravel and cobbles, subangular, low to medium strength						
									1.5m: Teeth scraping	
		1.60 12.90		DOLERITE, orange-brown, Fe Staining throughout, HW, VL-H, typically M, very close to close defects				Is(50)	1.6m: Ripper used to penetrate. Recovered as Silty GRAVEL with cobbles. Intact cobbles shatter with firm pick blow PL (1.6 - 1.7m): 4x samples tested - results below: Is(50) = 0.78 MPa, 0.81 MPa, 0.61 MPa, 1.25 MPa	
2	GNE									2
									2.1m: Ripper used to penetrate	
		2.60 11.90		Limit of test Pit. Refusal with 3-toothed, 450mm wide bucket					*Requires ripper to penetrate due to test pit confinement	
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Rosny Parkland	Client Department of State Growth
TP02		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client :	**Department of State Growth**		**LOCATION No. TP03**
Project :	**AFL Training Facility and High Performance Centre**		
Location :	**Rosny Parklands**		**SHEET 1 OF 1**
Position :	**529848.0 E, 5254275.1 N MGA2020**	**Surface RL : 31.70m**	**Pit Width : 1.5**	**Processed : AOK**
Contractor :	**Digga Excavation**	**Machine : 13T Excavator**	**Pit Length : 3.0**	**Checked : ASH**
Date :	**22 May 24**		**Logged by : ASH**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	GNE			FILL: SAND, fine to coarse grained, pale-brown, frequent rootlets	SP	M-D	L	DCP	DCP Blows/100mm: 1/4/6/11/8/5/3/4/4/4/3/4/3/4/5/8/12/15/16	
		0.10 31.60		FILL: Silty SAND, fine to coarse grained, grey-brown to dark-brown	SM	M	L-MD			
		0.30 31.40		FILL: Clayey GRAVEL, medium, subangular, brown to dark-brown, poorly graded, clay is high plasticity	GC	M-D	MD			
1		0.40 31.30		FILL: CLAY, high plasticity, dark-brown, mottled orange-brown, trace organics (rootlets), w<PL	CH	M	VSt St-VSt	PP PP PP	PP @ 0.45m = 410 kPa (UCS) PP @ 0.50m = 240kPa (UCS) PP @ 0.60m = 180-250kPa (UCS) Mild odour at 0.5mBGL	1
		1.20 30.50		with sand, trace gravel, sand is fine to coarse grained, gravel is fine, subangular, dark-brown/grey, brown/black, w>PL				PP D	PP @ 1.2m = 200kPa (UCS) D (1.2-1.6m)	
2		1.60 30.10		CLAY with sand, trace gravel, high plasticity, brown, sand is fine to coarse grained, gravel is fine to medium, w>PL [Possibly Residual Soil]	CH	M	St	PP D	PP @ 1.6m = 160kPa (UCS) D (1.6-2.0m) Sand increases with depth	2
3		2.50 29.20		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	D-VD			3
		3.20 28.50		trace cobbles, HW dolerite					Toothed bucket scraping at 3.2 mBGL	
4		3.40 28.30		Limit of Test Pit. Near refusal with 3-toothed, 450mm wide bucket.					Teeth scraping in base. Difficult to excavate further without extending pit	4

See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

TP03

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP03		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP04

SHEET 1 OF 1

Position : 529997.8 E, 5254077.1 N MGA2020 **Surface RL : 10.50m** **Pit Width : 1.6** **Processed : AOK**
Contractor : Digga Excavation **Machine : 13T Excavator** **Pit Length : 3.5** **Checked : ASH**
Date : 27 May 24 **Logged by : JP/ASH** **Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
		0.25 10.25		FILL/TOPSOIL: Sandy SILT, trace gravel, low plasticity, dark-brown, sand is fine grained, trace glass fragments, rootlets and roots, gravel is fine to coarse, angular to subrounded, dolerite, sandstone	ML	M-D	MD	DCP	DCP Blows/100mm: 4/11/10/10/11/11/13* *Skewed @ 0.7m	
		0.60 9.90		Sandy CLAY, high plasticity, dark-brown, sand is fine to coarse grained (<2mm) (white), trace rootlets, w<PL [Residual Soil]	CH	M-D	H	PP PP PP	PP @ 0.3m = >600kPa (UCS) PP @ 0.4m = >600kPa (UCS) PP @ 0.5m = >600kPa (UCS)	
		1.00 9.50		Sandy CLAY, trace gravel, high plasticity, orange-brown, sand is fine to coarse grained, typically fine, gravel is fine, friable, w<PL [XW Dolerite]	CH	M-D	H	D DCP	0.6m: rock fabric present D (0.6-0.8m) DCP (0.7-0.9m): Blows/100mm: 21/31	
1		1.50 9.00		Silty SAND, trace gravel and cobbles, orange-brown, fine to medium grained, trace coarse grained, silt low to no plasticity, gravel is fine to medium, angular, cobbles <100mm, HW dolerite [XW Dolerite]	SM	M-D	VD			1
2	GNE	3.00 7.50		trace white (possibly travertine?)						2
3		3.50 7.00		with gravel and cobbles (<150mm), subrounded to subangular, HW, VL-L strength dolerite						3
4				Limit of Test Pit (Not refusal)						4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP04		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP05

SHEET 1 OF 1

Position : 530026.9 E, 5254154.5 N MGA2020	**Surface RL : 9.50m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.3**	**Checked : ASH**
Date : 27 May 24		**Logged by : JP/ASH**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, low plasticity, dark-brown, fine grained, frequent rootlets	ML	M-D	MD	DCP	DCP Blows/100mm: 5/12/13/9/9 *Skewed	
		0.25 9.25		Sandy CLAY, high plasticity, dark-brown, sand is fine grained, trace rootlets, w<PL	CH	M-D	H	D PP PP PP	D (0.25-0.5m) PP @ 0.35m = >600kPa (UCS) PP @ 0.5m = >600kPa (UCS) PP @ 0.7m = >600kPa (UCS)	
		0.80 8.70		trace gravel, sand is fine to coarse grained, gravel is fine, brown, trace pale grey-white, trace rootlets, w<PL				DCP PP D	DCP Blows/100mm: 15/15/17/22/8* *Refusal after 25mm penetration PP @ 0.9m = >600kPa (UCS). Pocket of white silt (travertine?) in Rivulet end of test pit D (0.8-1.0m)	
1		1.10 8.40		SAND with silt, trace gravel, fine to coarse grained, orange-brown, silt is low plasticity, gravel is subangular to angular, <35mm dolerite, trace siltstone [Possibly Alluvium]	SP-SM	D-M	D-VD		1.1m: Possibly transported. No structure evident, dolerite derived, trace siltstone, fine gravel size	1
		1.60 7.90		with cobbles and boulders (<300mm), subangular to subrounded dolerite					Switched to ripper @ 1.6m*	
2	GNE	1.80 7.70		DOLERITE, MW-SW, VH-EH strength, blue-grey, orange-brown at joints, 30-300mm defect spacing					*Rockhead slopes from 1.6m depth on uphill side to 2.1m depth on downhill side (rivulet)	2
3		2.10 7.40		Refusal with 3-toothed, 450mm wide bucket						3
4										4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP05		Photographic Record	

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2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP05		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client :	**Department of State Growth**	**LOCATION No. TP06**
Project :	**AFL Training Facility and High Performance Centre**	
Location :	**Rosny Parklands**	**SHEET 1 OF 1**

Position :	**529973.8 E, 5254298.5 N MGA2020**	**Surface RL : 19.40m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor :	**Digga Excavation**	**Machine : 13T Excavator**	**Pit Length : 3.1**	**Checked : ASH**
Date :	**23 May 24**		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
		0.20		TOPSOIL: Sandy SILT, low plasticity, dark-brown, rootlets/organics in upper 100mm, sand is fine to coarse grained	ML	M	L	DCP	DCP Blows/100mm: 3/4/5/7/9/17/16/13/27* *Double bounce after 70mm penetration	
		19.20 0.60		Sandy CLAY, medium to high plasticity, dark-brown/black/grey-brown, sand is fine to coarse grained, fissured [Residual Soil], w<PL	CI/ CH	D- M	St- VSt H	D PP PP	D (0.2-0.8m) PP @ 0.3 = 600kPa (UCS) PP @ 0.5 = >600kPa (UCS) Sand content increasing > 20%	
1		18.80 1.20		Silty SAND, trace cobbles, fine to coarse grained, orange-brown, silt is low plasticity, friable, cobbles are subrounded, HW dolerite, up to 200mm, VL - M strength, angular to subrounded [XW Dolerite]	SM	M	D	DCP	Bucket scraping @ 0.8m DCP Blows/100mm: 20*, *20 blows for 50mm penetration. Ripper used from 1.2m - slow excavation	1
		18.20 1.40		DOLERITE, HW, VL-L strength, orange-brown to grey-brown, Fe staining throughout					Recovered as Silty GRAVEL with cobbles (inferred very close to close defects)	
		18.00 1.50		VL - H strength					Variable strength	
2 3 4	GNE	17.90		Limit of Test Pit. Ripper refusal @ 1.5m						2 3 4

See standard sheets for details of abbreviations & basis of descriptions	GHD	**Job No.** **12626209**

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

TP06

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP08

SHEET 1 OF 1

Position : 529951.6 E, 5254149.9 N MGA2020	**Surface RL :** 30.80m	**Pit Width :** 1.6	**Processed :** AOK
Contractor : Digga Excavation	**Machine :** 13T Excavator	**Pit Length :** 3.6	**Checked :** ASH
Date : 24 May 24		**Logged by :** TC	**Date :** 17 Jul 24

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, low plasticity, dark-brown, sand is fine to coarse grained, frequent organics, large rootlets at 0.2m	ML	M	L-MD	DCP	DCP Blows/100mm: 3/9/8/7/8/11/15/27	
		0.20 30.60		Sandy CLAY trace gravel, high plasticity, dark-brown to brown, sand is fine to coarse grained, gravel is fine, w~PL	CH	M	VSt	D	Clay is dry/hard @ interface D (0.2-0.7m)	
		0.40 30.40		orange-brown to brown [Residual Soil]			H	PP	PP @ 0.45m = 550 - 600kPa (UCS) (variable)	
		0.70 30.10		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	D-VD			
1		1.00 29.80		trace cobbles (100-200mm), subrounded to angular, HW, L - M strength						1
2	GNE	1.70 29.10		Mixture of Silty Gravelly SAND (50%) and COBBLES (50%), orange-brown, fine to coarse grained, gravel is fine to coarse, angular to subangular, dolerite, cobbles are HW-MW, typically H strength dolerite [XW Dolerite]	-	M-D	VD		Bucket scraping @ 1.7m, fast excavation prior. Variable weathering some pockets of HW-MW dolerite	2
3		3.00 27.80		Refusal with 3-toothed, 450mm wide bucket (inferred on HW dolerite).						3
4										4

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

TP08

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP10

SHEET 1 OF 1

Position : 529848.0 E, 5254275.1 N MGA2020	**Surface RL : 38.40m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.5**	**Checked : ASH**
Date : 24 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, trace gravel, low plasticity, dark-brown, sand is fine grained, frequent rootlets	ML	M	St	DCP	DCP Blows/100mm: 4/9/13/10/20* *50mm penetration	
		0.20 38.20		Sandy CLAY with gravel, trace cobble, high plasticity, brown to orange-brown, sand is fine to coarse grained, gravel is subrounded to angular, cobbles up to 200mm , w<PL [Residual Soil]	CH	M-D	VSt			
		0.40 38.00		Mixture of Sandy CLAY with gravel (60%) and cobbles (40%), matrix is as above, orange-brown, cobbles, blue/grey to orange-brown, HW Dolerite, L - M strength, up to 200mm [XW Dolerite]	-		H	PP PP	PP @ 0.4m = >600kPa (UCS) PP @ 0.6m = >600kPa (UCS) Slow excavation in cobble matrix	
1		0.80 37.60		DOLERITE, coarse grained, porphyritic, HW, VL-M strength, orange-brown to grey, very close to close jointing (<100mm), Fe staining at joints and XW material						1
		1.30 37.10		As above, MW, VH - EH strength, close defects (60 - 200mm)				Is(50)	Ripper used to progress @ 1.3mBGL. Slow excavation requires ripper to progress. Recovered typically as cobble size blocks. PL (1.3 - 1.8m): 4x samples tested - results below: Results = 3.7 MPa, 10.5 MPa, 8.4 MPa, 9.9 MPa Joint set (6x joints) within TP sidewall, typically 300mm spacing, 80° dip, dip direction is 020-030° north (020 true bearing)	
2	GNE	1.80 36.60		Refusal with 3 toothed, 450mm wide bucket.						2
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP10		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client :	**Department of State Growth**		**LOCATION No. TP11**
Project :	**AFL Training Facility and High Performance Centre**		
Location :	**Rosny Parklands**		**SHEET 1 OF 1**

Position :	**529997.8 E, 5254077.1 N MGA2020**	**Surface RL : 25.20m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor :	**Digga Excavation**	**Machine : 13T Excavator**	**Pit Length : 3.3**	**Checked : ASH**
Date :	**24 May 24**		**Logged by : TC/ASH**	**Date : 17 Jul 24**

EXCA		**MATERIAL**							**ADDITIONAL DATA**	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				FILL: Silty SAND, dark-brown to grey-brown, fine to coarse grained, trace log (~80mm diameter, 600mm long)	SM	M	L-MD	DCP	DCP Blows/100mm: 4/5/6/7/7/12/10/7/14/11/15/28	
		0.40 24.80		Sandy CLAY, trace gravel, low plasticity, brown, trace orange, sand is fine to coarse grained, gravel is fine to medium, angular to subrounded, HW dolerite, trace rootlets to 0.45m, voids within matrix (<2mm), w<PL	CL	M-D	MD	D	D (0.4 - 0.65m) Natural	
		0.65 24.55		Sandy CLAY with gravel, high plasticity, brown, sand is fine to medium grained, gravel is fine to coarse, subangular dolerite, w<PL [Residual Soil]	CH	M	VSt			
1		0.90 24.30		Silty SAND with gravel and cobbles, fine to coarse grained, orange-brown, silt is low plasticity, gravel is fine to coarse, HW dolerite, cobbles are HW-MW, H-VH strength, up to 150mm, typically 100mm [XW Dolerite]	SM		D-VD		0.9m: Highly variable composition. Pocket of green-grey Silty GRAVEL with sand and cobbles (XW Dolerite)	1
		1.30 23.90		DOLERITE*, MW, grey-brown, Fe stained, H-VH strength, very close to close defects (30-150mm)					*Variable weathering and strength on opposing sides of pit. Log represents NW side of pit. NE side is XW with HW pockets to 1.9m	
2	GNE	1.70 23.50		Up to 300mm defect spacing, VH-EH strength						2
3 4		2.40 22.80		Refusal with 3 toothed, 450mm wide bucket.					Slow excavation requires ripper to progress	3 4

See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP11		Photographic Record	

GHD Pty Ltd
2 Salamance Square Hobart TAS 7000

Job Number
12626209

A4

TP11

Title
Rosny Parkland
Photographic Record

Client
Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP15

SHEET 1 OF 1

Position : 530026.9 E, 5254154.5 N MGA2020	**Surface RL : 19.80m**	**Pit Width : 1.8**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.5**	**Checked : ASH**
Date : 22 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL					ADDITIONAL DATA		
Scale (m)	Water	Depth / (RL) metres	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	GNE		TOPSOIL: Silty SAND, fine to medium grained, trace coarse grained, dark-brown, silt is low plasticity, frequent rootlets in upper 150mm	SM	M	L-MD	DCP	DCP Blows/100mm: 2/6/7/13/13	
		0.30 19.50	Sandy CLAY, trace gravel, high plasticity, grey-brown, sand is fine to coarse grained, gravel is fine, friable, trace rootlets, w<PL [Residual Soil]	CH	M-D	H	D	D (0.3-0.5m)	
		0.50 19.30	brown, sand is fine grained, fissured		D		PP D	PP @ 0.5m = >600kPa (UCS) D (0.5 - 0.7m)	
		0.70 19.10	orange-brown, sand is fine to coarse grained, fissuring at transitional zone [RS/XW Dolerite]				DCP	DCP @ 0.8m: Blows/100mm: 14/20/17	
1		0.90 18.90	Silty SAND with gravel, fine to coarse grained, orange-brown, silt is low plasticity, gravel is fine to medium, subangular [XW Dolerite]	SM	D	D-VD	DCP	DCP @ 1.0m: Blows/100mm: 22 Increasing gravel content with depth	1
2									2
		2.40 17.40	DOLERITE, HW, H strength, orange-brown to grey-brown, very close to close defects (20-200mm)					Switch to ripper @ 2.5m, slow excavation, scraping on rock at base	
		2.50 17.30	Refusal @ 2.5m. Possibly less weathered dolerite						
3									3
4									4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP15		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP16

SHEET 1 OF 1

Position : 529973.8 E, 5254298.5 N MGA2020	**Surface RL :** 23.80m	**Pit Width :** 1.5	**Processed :** AOK
Contractor : Digga Excavation	**Machine :** 13T Excavator	**Pit Length :** 3.0	**Checked :** ASH
Date : 22 May 24		**Logged by :** TC	**Date :** 17 Jul 24

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, dark-brown to grey-brown, frequent rootlets in upper 100mm, trace fragments of XW dolerite	ML	M	L	DCP	DCP Blows / 100mm: 1/6/5/2/2/5/15* *15 blows over 50mm	
		0.20 23.60		Sandy CLAY, trace gravel, high plasticity, brown/grey-brown, sand is fine to coarse grained, gravel is fine to medium, w<PL [Residual Soil]	CH	M-D	H	D PP	D (0.2-0.4m) Small voids evident between 0.2-0.4m spoil PP @ 0.3m = 600kPa (UCS)	
		0.40 23.40		w~PL		M	St - VSt	PP	PP @ 0.4m = 200kPa (UCS)	
		0.50 23.30		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	VD			
		0.70 23.10		trace HW gravel, fine to medium, subangular						
1								DCP	DCP @ 1.0-1.05m: Blows/100mm: 15* *50mm penetration	1
		1.60 22.20		with cobbles, HW dolerite, H strength, subangular						
2	GNE									2
		2.50 21.30		DOLERITE, HW, VL - L strength, trace M strength, orange-brown trace grey-brown					Switch to ripper @ 2.5 mBGL. Slow excavation prior (<2.5m) using the toothed bucket	
3		3.00 20.80		Refusal with 3-toothed, 450mm wide bucket						3
4										4

See standard sheets for details of abbreviations & basis of descriptions

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Job No.

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2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Rosny Parkland	Client Department of State Growth
TP16		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP17

SHEET 1 OF 1

Position : 529921.3 E, 5254070.8 N MGA2020	**Surface RL : 15.80m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 2.9**	**Checked : ASH**
Date : 23 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				FILL: Sandy SILT, low plasticity, dark grey to brown, sand is fine grained, rootlets, trace ceramic fragments	ML	M	L	DCP	DCP Blows/100mm: 3/14/20/16/15/17/18	
		0.20 15.60		Sandy CLAY, trace gravel and cobbles, dark-brown, cobbles up to 100mm, rounded, fissured, w<PL [Residual Soil]	CH	D	H	D	D (0.2 - 0.5m)	
		0.50 15.30		orange-brown				PP PP	PP @ 0.5m = >600kPa (UCS) PP @ 0.6m = >600kPa (UCS)	
1		0.70 15.10		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	M-D	VD	DCP	Increase in sand content DCP @ 0.7m: Blows/100mm = 23/27	1
		1.10 14.70		with SW-MW cobbles, cobbles are H - VH strength, up to 200mm					Bucket scraping at 1.1m. Switched to ripper at 1.1m. XW matrix with less weathered corestones	
		1.50 14.30		DOLERITE, orange-brown to grey-brown, HW, Fe staining, spheroidial weathering, H strength, with HW - MW, EH strength corestones, up to 270mm, rounded					Rock layer @ 1.5mBGL. Ripper used to penetrate - slow excavation	
2	GNE	2.00 13.80		grey-brown, MW, VH-EH strength					Weathering is highly variable	2
		2.40 13.40		Refusal for 3-toothed, 450mm wide bucket					Slow excavation with ripper as base of pit	
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP17		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth

Project : AFL Training Facility and High Performance Centre

Location : Rosny Parklands

LOCATION No. TP18

SHEET 1 OF 1

Position : 529974.1 E, 5254218.0 N MGA2020	**Surface RL : 15.60m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.1**	**Checked : ASH**
Date : 23 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		**MATERIAL**							**ADDITIONAL DATA**	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, low plasticity, dark-brown, organics/rootlets in upper 100mm, sand is fine to coarse grained	ML	M	St-VSt	DCP	DCP Blows/100mm: 8/7/4/2/12/20* *double bouncing after 40mm penetration	
		0.20 15.40		CLAY with sand, trace gravel, high plasticity, dark-brown, sand is fine to coarse grained, gravel is fine, w>PL [Residual Soil]	CH	M	St-H	D PP	D (0.2 - 0.5m) PP @ 0.3m = 450kPa (UCS)	
		0.50 15.10		cobbles, orange-brown, MW - HW, cobbles are rounded to subrounded, H strength (white silt/calcium carbonate coating) [XW Dolerite]		D	H	PP	PP @ 0.5m = >600kPa (UCS) 0.6 - 0.7m: bucket scraping	
1		1.00 14.60		Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	D-VD		Ripper used @ 1.7m, slow digging with toothed bucket	1
2	GNE	2.00 13.60		DOLERITE, orange-brown to grey-brown, HW with Fe staining throughout, VL - M strength, typically low strength, close to very close defects (20-200mm)						2
		2.20 13.40		Limit of Test Pit @ 2.2m - slow excavation (not refusal)						
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

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Job No.

12626209

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Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP18		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP19

SHEET 1 OF 1

Position : 529902.1 E, 5254241.6 N MGA2020	**Surface RL : 22.80m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.5**	**Checked : ASH**
Date : 23 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				FILL: Sandy SILT with organics & shells, trace gravel, dark-brown, gravel is subrounded, siltstone (orange-red), organics (large roots and sticks)	ML-MH	D	St	DCP	DCP Blows/100mm: 5/8/5/7/9/14/15/13/15/17/15/23	
		0.30 22.50		Sandy CLAY, high plasticity, brown, sand is fine to coarse grained, trace fissures, w<PL [Residual Soil]	CH	D	H	D PP	D (0.4 - 0.7m) PP @ 0.4-0.7m = >600kPa (UCS)	
1		0.70 22.10		with white silt coating (calcium carbonate?)						1
2	GNE	1.10 21.70		Clayey SAND, trace gravel, fine to coarse grained, orange-brown, clay is medium plasticity, gravel is fine to coarse, friable [XW Dolerite]	SC	D	D-VD	DCP D	DCP @ 1.1m: Blows/100mm = 9/24/25 D (1.1 - 1.4m) White silt coating persists across interface	2
		2.30 20.50		trace gravel and cobbles, gravel and cobbles are HW dolerite, VL - H strength (variable)			VD		Toothed bucket scraping at 2.3m Ripper used @ 2.4m, slow excavation	
3 4		2.80 20.00		Refusal with 3 toothed, 450mm wide bucket (inferred on HW dolerite).						3 4

See standard sheets for details of abbreviations & basis of descriptions

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Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP19		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP20

SHEET 1 OF 1

Position : 530046.1 E, 5254298.5 N MGA2020	**Surface RL : 18.00m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 3.3**	**Checked : ASH**
Date : 24 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
		0.25 17.75		TOPSOIL: Sandy SILT, low plasticity, dark-brown, sand is fine grained, rootlets and roots up to 20mm diameter	ML	M	L-MD	DCP	DCP Blows/100mm: 3/10/26	
		0.35 17.65		Sandy SILT, trace gravel, low plasticity, grey-brown, sand is fine grained, gravel is subangular, HW dolerite	ML	M	VSt			
		0.65 17.35		Sandy CLAY, high plasticity, brown, fine to medium grained, some fissures, trace rootlets, w<PL [Residual Soil]	CH	D-M	H	D PP	D (0.35 - 0.65m) PP @ 0.35-0.65m = >600kPa (UCS)	
		0.85 17.15		Clayey SAND with gravel, trace cobble, fine to coarse grained, orange-brown, clay is medium plasticity, gravel is fine to medium, HW-MW dolerite [XW Dolerite]	SC	M-D	D-VD	D	D (0.7 - 0.85m)	
1		1.10 16.90		with HW/MW cobbles, H - VH strength						1
		1.70 16.30		DOLERITE, grey-brown to orange-brown, Fe stained, HW - MW, L - VH strength, up to 300mm defect spacing					Rockhead 0.7 to 1.1m in test pit. Variable weathering and strength. Rivulet side of test pit typically more weathered	
				Limit of Test Pit @ 1.7m - Near refusal with 3 toothed, 450mm wide bucket*					*Weaker zone centrally in base, however pit would require lengthening to continue	
2	GNE									2
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

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Job No.

12626209

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2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP20		Photographic Record	

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

TP20

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP21

SHEET 1 OF 1

Position : 530018.3 E, 5254210.1 N MGA2020	**Surface RL : 12.70m**	**Pit Width : 1.6**	**Processed : AOK**
Contractor : Digga Excavation	**Machine : 13T Excavator**	**Pit Length : 2.8**	**Checked : ASH**
Date : 24 May 24		**Logged by : TC**	**Date : 17 Jul 24**

EXCA		**MATERIAL**							**ADDITIONAL DATA**	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
		0.18 12.52	^ ^ ^	TOPSOIL: Sandy SILT, dark-brown, rootlets	ML-MH	M	MD	DCP	DCP Blows/100mm: 6/11/11/12* Skewed @ 400mm	
				Potential heritage item encountered - pit abandoned						
1										1
2	GNE									2
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP21		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP22

SHEET 1 OF 1

Position : 529859.5 E, 5254144.2 N MGA2020 **Surface RL : 26.40m** **Pit Width : 1.6** **Processed : AOK**
Contractor : Digga Excavation **Machine : 13T Excavator** **Pit Length : 3.5** **Checked : ASH**
Date : 22 May 24 **Logged by : TC** **Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, low plasticity, dark-brown, sand is fine grained, frequent rootlets	ML	M-D	L	DCP	DCP Blows/100mm: 8/12/9/14/20	
		0.20 26.20		Sandy CLAY, trace gravel, high plasticity, dark-brown to brown, sand is fine to coarse grained, gravel is fine, w<PL [Residual Soil]	CH	M-D	H	D PP	D (0.2 - 0.6m) PP @ 0.4m = >600kPa (UCS)	
		0.60 25.80		gravel is fine to medium, orange-brown, friable [XW Dolerite]		D		PP D PP	PP @ 0.6m = >600 kPa (UCS) D (0.6 - 0.8m) PP @ 0.7m = >600kPa (UCS)	
1		0.80 25.60		Silty SAND, trace gravel, fine to coarse grained, orange-brown, silt is fine, gravel is fine to medium, subangular to subrounded [XW Dolerite]	SM	D	D	DCP	DCP @ 0.9m: Blows/100mm = 12/13/14/20 1.0m: Sand becoming finer with depth	1
2	GNE	1.90 24.50		with gravel and cobbles, subangular dolerite cobbles, MW-HW, VH strength					Matrix tightening up @ 1.8-1.9m (ripper scraping on HW-MW corestones)	2
		2.60 23.80		Refusal @ 2.6m with 3 toothed, 450mm wide bucket					Bucket teeth grinding @ 2.6 mBGL - unable to penetrate	
3										3
4										4

See standard sheets for details of abbreviations & basis of descriptions

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Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP22		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP23

SHEET 1 OF 1

Position : 530126.1 E, 5254408.8 N MGA2020
Surface RL : 22.60m
Pit Width : 1.6
Processed : AOK
Contractor : Digga Excavation
Machine : 13T Excavator
Pit Length : 3.3
Checked : ASH
Date : 24 May 24
Logged by : TC
Date : 17 Jul 24

EXCA		MATERIAL					ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Description Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	Comments/Observations Insitu test results
			TOPSOIL: Sandy SILT, low plasticity, dark-brown, sand is fine grained, frequent rootlets in upper 100mm	ML	M	L	DCP	DCP Blows/100mm: 2/4/11/5/5/7/12/29
		0.20 22.40	Sandy CLAY, high plasticity, brown, sand is fine to coarse grained, w>PL [Residual Soil]	CH	M	VSt-H		Variable consistency
		0.50 22.10	with gravel, gravel is subangular to angular, orange-brown, HW dolerite [Residual Soil]			H	PP	PP @ 0.45m = 600kPa (UCS)
		0.70 21.90	Silty SAND, trace gravel and cobbles, sand is fine to coarse grained, orange-brown, friable, cobbles are subrounded, HW, 100-200mm, [XW Dolerite]	SM	D	D-VD		
1		1.10 21.50	DOLERITE, coarse grained, porphyritic, grey to orange-brown, MW-HW, H strength					Material recovered as gravel to boulder size (300mm) Typically recovered as cobbles (60-200mm)
		1.20 21.40	grey-brown, Fe stained, MW, H-VH strength, very close to close defects (20 - 300mm)					
		1.70 20.90	Refusal with 3 toothed, 450mm wide bucket					
2	GNE							
3								
4								

SCALE (m): 1, 2, 3, 4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

TP23

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP24

SHEET 1 OF 1

Position : 529906.0 E, 5254191.0 N MGA2020
Surface RL : 20.00m
Pit Width : 1.6
Processed : AOK
Contractor : Digga Excavation
Machine : 13T Excavator
Pit Length : 3.3
Checked : ASH
Date : 23 May 24
Logged by : ASH
Date : 17 Jul 24

Water	Depth / (RL) metres	Description Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	Comments/Observations Insitu test results
GNE		TOPSOIL: Sandy SILT, dark-brown, sand is fine grained, trace to frequent rootlets in upper 100-200mm	ML	M	L-MD	DCP	DCP Blows/100mm 2/7/6/9/8/6/9/9/12* *double bouncing after 70mm
	0.40 19.60	Sandy CLAY, high plasticity, dark-brown to grey-brown, sand is fine to coarse grained, w<PL [Residual Soil]	CH	M-D	VSt-H	D PP	trace ironstone at top of clay D (0.4 - 0.6m) PP @ 0.5m = >600kPa (UCS)
	0.60 19.40	brown to orange brown, sand is fine to coarse grained, w=PL				PP D PP	PP @ 0.6 = >600kPa (UCS) D (0.6 - 0.8m) PP @ 0.7 = >600kPa (UCS)
	0.80 19.20	Silty SAND, fine to coarse grained, orange-brown, friable [XW Dolerite]	SM	D	D	DCP	DCP @ 0.8m: Blows/100mm = 15/20, double bouncing after 130mm Bucket scraping at 0.9-1.0m
	1.00 19.00	DOLERITE, HW, H strength, orange-brown to grey-brown, Fe stained, very close to close defects (30-100mm)				Is(50)	Ripper used to penetrate PL (1.0 - 1.2m): 3x samples tested - results below: Results = 1.01 - 1.34 MPa
	1.20 18.80	grey-brown, Fe throughout, MW, H strength				Is(50)	PL (1.2 - 1.5m) : 2x samples tested - results below: Results = 1.78 - 2.11 MPa
	1.50 18.50	blue-grey with iron staining on defects, SW, VH-EH strength					
	1.60 18.40	Refusal with 3-toothed, 450mm wide bucket					Slow excavation with ripper

Scale (m): 1, 2, 3, 4

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP24		Photographic Record	

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
TP24		Photographic Record	

TESTPIT/EXCAVATION LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands

LOCATION No. TP25

SHEET 1 OF 1

Position : 529983.7 E, 5254419.6 N MGA2020 **Surface RL : 33.30m** **Pit Width : 1.6** **Processed : AOK**
Contractor : Digga Excavation **Machine : 13T Excavator** **Pit Length : 3.6** **Checked : ASH**
Date : 24 May 24 **Logged by : TC/ASH** **Date : 17 Jul 24**

EXCA		MATERIAL							ADDITIONAL DATA	
Scale (m)	Water	Depth / (RL) metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
				TOPSOIL: Sandy SILT, low plasticity, dark-brown, sand is fine to coarse grained, frequent rootlets in upper 150mm of layer	ML	M	L-MD	DCP	DCP Blows/100mm: 3/12/18/27 *skewed	
		0.20 33.10		Mixture of Sandy CLAY with gravel (55%) and COBBLES (45%), high plasticity, brown, sand is fine to coarse grained, gravel is fine to coarse, angular to subangular, dolerite, cobbles are subrounded to angular, up to 200mm [Residual Soil]	CH	M-D	VSt-H	PP	PP @ 0.4m = >600kPa (UCS)	
		0.50 32.80		orange-brown, cobbles reducing (30%) [XW Dolerite]			H	PP	PP @ 0.6m = >600kPa (UCS)	
1		0.70 32.60		DOLERITE, orange-brown to grey-brown, Fe staining on most faces throughout, MW, H-EH, very close to close defects (20-200mm), trace silt and Fe staining on joints					Recovered as silty gravel/cobbles Jt, 85°/ 017°N, Pln Jt, 85° / 155°N, Pln Ripper used @ 1.5mBGL - slow excavation, toothed bucket unable to penetrate.	1
2	GNE								Ripper used again @ 2mBGL, pocket of XW with HW cobbles & boulders @ 1.3 onwards (variable). Limited to south-western corner of pit	2
3		2.20 31.10		Refusal with 3-toothed, 450mm wide bucket					Slow excavation, ripper required to continue	3
4										4

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Rosny Parkland Photographic Record	Client Department of State Growth
TP25			

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH01

SHEET 1 OF 1

Position : 52986.1 E, 5254136.3 N \
Surface RL : 20.54m
Angle from Horiz. : 90°
Processed : AOK
Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH
Date Started : 22 May 24
Date Completed : 22 May 24
Logged by : OP/JN
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	Solid Flight Auger				0.10 (20.44)		TOPSOIL: SILT, trace sand, low plasticity, dark-brown, sand is fine grained, rootlets, w~PL	ML	M	S			
							CLAY, trace sand, high plasticity, brown, sand is fine grained, w<PL, [Residual Soil]	CH	D-M	H			
											U63	U63 (0.5-0.7m)	
					0.85 (19.69)						SPT1	SPT1 (0.7m): 7/22/10*, N=R, Refusal after 370mm Recovery = 370mm	
1					1.00 (19.54)		SILT with sand, low plasticity, cream, sand is fine grained, w<PL [XW Dolerite]	ML	D	H			1
2					2.00		Becoming gravelly, gravel is fine to medium, subangular to subrounded HW, Dolerite						2
							Start of coring at 2 metres. See Core Log Sheet for cored interval.						
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

CORE LOG SHEET

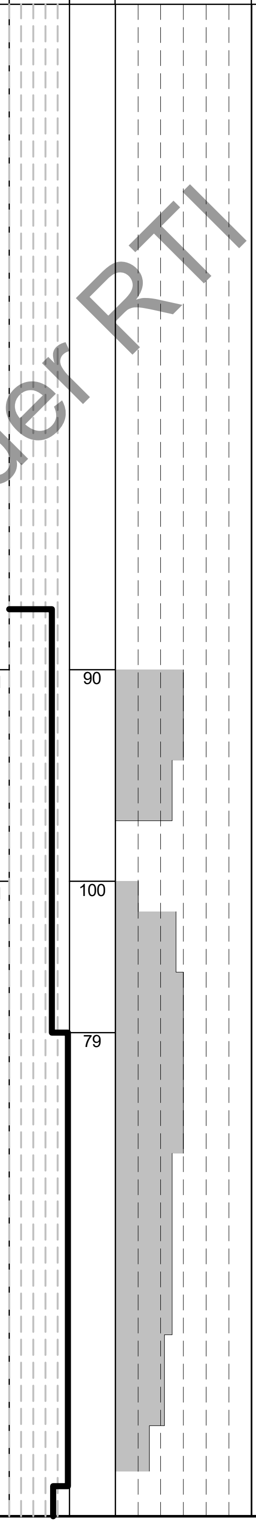
Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH01

SHEET 1 OF 2

Position : 52986.1 E, 5254136.3 N \	**Surface RL :** 20.54m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 22 May 24	**Date Completed :** 22 May 24	**Logged by :** OP/JN	**Date :** 18 Jul 24

Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
				Start of coring at 2 metres. See Soil Log Sheet for soil interval.					
HQ Coring	1	GNO	2.00 (18.54)	CORE LOSS = 200mm					
			2.20 (18.34)	DOLERITE, orange-brown, mottled cream, medium grained, Fe staining, healed defects throughout	HW	L - M	90	Is(50)	2.57m: Jt, 60°, Pln (healed) Is(50) (2.6m) = 0.32 MPa 2.63m: Jt, 20°, Un, Rf, Fe Sn 2.70m: Jt, 20°, Un, Rf, Fe Sn
	2		2.70 (17.84)	CORE LOSS = 200mm					
			2.90 (17.64)	DOLERITE, orange-brown, mottled cream, medium grained, Fe staining, healed defects throughout	HW	L - M	100		
	3						79	Is(50)	Is(50) (3.7m) = 0.41 MPa 3.84m: Jt, 90°, Cu, Rf, Fe Sn 4.04m: Jt, 70°, Pln, Rf, Fe Sn 4.2m: Jt, 45°, Pln, Rf, Fe Sn 4.42m: Jt, 30°, Pln, Rf, Fe Sn
								Is(50)	4.64m: Jt, 10°, Un, Rf, Fe Sn 4.64-4.85m: @ all sa? 4.67m: Jt, 10°, Un, Rf, Fe Sn Is(50) (4.7m) = 0.36 MPa 4.75m: Jt, 10°, Un, Rf, Fe Sn 4.80m: Jt, 10°, Un, Rf, Fe Sn
			4.85 (15.69)	CORE LOSS = 50mm					
	4		4.90 (15.64)	CORE LOSS = 400mm					



See standard sheets for details of abbreviations & basis of descriptions

Job No. 12626209

CORE LOG SHEET

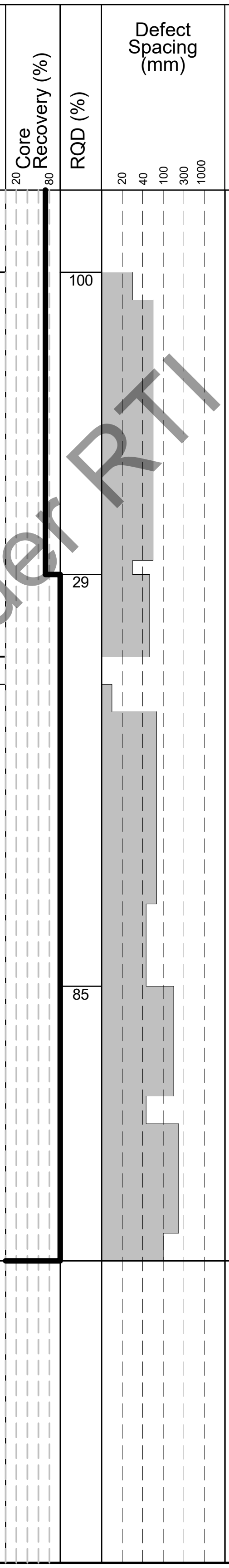
Client :	Department of State Growth	**LOCATION No. BH01**
Project :	AFL Training Facility and High Performance Centre	
Location :	Rosny Parklands Rosny Parklands	**SHEET 2 OF 2**

Position :	52986.1 E, 5254136.3 N \	**Surface RL :**	20.54m	**Angle from Horiz. :**	90°	**Processed :**	AOK
Contractor :	South Western Drilling	**Rig Type :**	Comacchio Geo 405			**Checked :**	ASH
Date Started :	22 May 24	**Date Completed :**	22 May 24	**Logged by :**	OP/JN	**Date :**	18 Jul 24

DRILLING — Method: HQ Coring; Run 4 (to 6.5 m), Run 5 (6.5–8.0 m), Run 6 (8.0–8.9 m)

MATERIAL

Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests
5.30 *(15.24)*	DOLERITE, orange-brown, medium grained, Fe staining, healed defects throughout	HW	M	100	Is(50)
				29	Is(50)
6.70 *(13.84)*	6.7-6.8: Silty GRAVEL, trace sand, fine to coarse, subangular, orange-brown, silt is low plasticity, sand is medium to coarse grained (XW zone)	XW	Soil		
6.80 *(13.74)*		HW	M		Is(50)
				85	Is(50)
8.90 *(11.64)*	EOH @ 8.9m Target depth reached End of hole at 8.9 metres.				



ADDITIONAL DATA

Joints, partings, seams, zones and veins
Fracture type, orientation, infilling or coating, shape, roughness, other
Insitu test results

4.85m: Jt, 10°, Un, Rf, Fe Sn
Is(50) (5.3m) = 0.32 MPa
5.40m: Jt, 80°, Pln, Rf, Fe Sn
5.89m: Jt, 60°, Vn, Rf, Fe Sn
6.18m: Jt, 50°, Un, Rf, Fe Sn
Is(50) (6.4m) = 0.38 MPa
6.47m: Jt, 40°, Pln, Rf, Fe Sn
6.53m: Jt, 30°, Pln, Rf, Fe Sn
6.7m: Jt, 20°, Pln, Rf, Fe Sn
6.75m: Jt, 70°, Un, Rf, Silt (XW)
6.83m: Jt, 90°, Cu, Rf, Fe Sn
6.92m: Jt, 80°, Un, Rf, Fe Sn
7.09m: Jt, 30°, Pln, Rf, Fe Sn
7.2m: Jt, 70°, Un, Rf, Fe Sn
7.28m: Jt, 90°, Cu, Rf, Fe Sn
7.51m: Jt, 80°, Pln, Rf, Fe Sn - dist
7.6m: Jt, 60°, Pln, Rf, Fe Sn
7.65m: Jt, 60°, Pln, Rf, Fe Sn
7.69m: Jt, 30°, Pln, Rf, Fe Sn
Is(50) (7.7m) = 0.65 MPa
8.3m: Jt, 20°, Pln, Rf
8.35m: Jt, 45°, LR, Rf, Fe Sn
Is(50) (8.4m) = 0.51 MPa
8.8m: Jt, 15°, Un, Rf, Fe Sn
8.85m: Jt, 60°, Un, Rf, Silt (XW)
Soil cased upon completion. Gatic cover installed for protection.

SCALE (m): 6, 7, 8, 9, 10

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number

12626209

A4

BH01

Title

Rosny Parkland

Photographic Record

Client

Department of State Growth

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH02

SHEET 1 OF 1

Position : 529902.0 E, 5254284.1 N \	**Surface RL :** 25.44m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 22 May 24	**Date Completed :** 23 May 24	**Logged by :** OP/JN	**Date :** 18 Jul 24

DRILLING					MATERIAL						ADDITIONAL DATA
Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results
Solid Flight Auger						TOPSOIL: SILT, trace sand, low plasticity, dark-brown, sand is fine grained, rootlets, w~PL	ML	D-M	L		
				0.20 *(25.24)*		CLAY, trace sand, high plasticity, sand is fine grained, brown, w<PL [Residual Soil]	CH	D-M	H	U63	U63 @ (0.5-0.9m)
				0.80 *(24.64)*		Sandy SILT, low plasticity, orange-brown, sand is fine grained, w<PL, [XW Dolerite]	ML	D		SPT	SPT @ 0.9m = 4/17/26, N = 43 Recovery = 450mm
				1.50 *(23.94)*		Becoming gravelly, gravel is fine to medium, sand is fine to coarse grained.					
				1.60		Start of coring at 1.6 metres. See Core Log Sheet for cored interval.					

SCALE (m): 1, 2, 3, 4, 5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH02

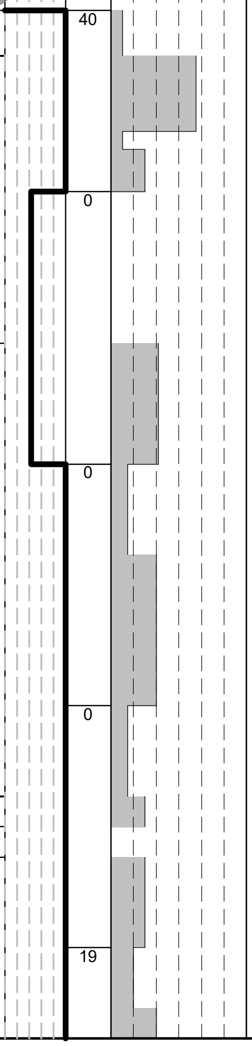
SHEET 1 OF 2

Position : 529902.0 E, 5254284.1 N \
Surface RL : 25.44m
Angle from Horiz. : 90°
Processed : AOK
Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH
Date Started : 22 May 24
Date Completed : 23 May 24
Logged by : OP/JN
Date : 18 Jul 24

DRILLING | **MATERIAL** | **ADDITIONAL DATA**

Method: HQ Coring
Water: GNO

Run	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
		Start of coring at 1.6 metres. See Soil Log Sheet for soil interval.					
1	1.60 (23.84)	1.6 - 1.75m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	MW	VH	40		
	1.75 (23.69)	DOLERITE, blue-grey, massive	SW	VH - EH			7.76m: Jt, 70°, PLN, Rf, Fe Sn 7.78m: Jt, 70°, Pln, Rf, Fe Sn (healed)
	2.06 (23.38)	2.06 - 2.2m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	MW				2.02m: Jt, 50°, Pln, Rf, Fe Sn 2.04m: Jt, 50°, Pln, Rf, Fe Sn 2.06m: Jt, 50°, Pln, Rf, Fe Sn
2	2.20 (23.24)	CORE LOSS = 500mm			0		
	2.70 (22.74)	DOLERITE, grey-brown, Fe Sn, highly fractured	MW	VH			2.95m: Jt, 10°, Pln, Rf, Fe Sn 3.05m: Jt, 80°, Pln, Rf, Fe Sn
3	3.10 (22.34)	3.1 - 3.4m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam			0		3.4m: Jt, 10°, Pln, Rf, Fe Sn 3.44m: Jt, 40°, Un, Rf, Fe Sn 3.48m: Jt, 30°, Pln, Rf, Fe Sn 3.50m: Jt, 20°, Sandy Clay, 20mm, low Fe 3.60m: Jt, 0°, Pln, Rf, Fe Sn 3.65m: Jt, 45°, Un, Rf, Fe Sn 3.68-3.75m: 3x Jt's, 10°, Pln, Fe @ 20mm spacing 3.75m: Jt, 80°, Pln, Rf, Fe Sn
4	3.90 (21.54)	3.9 - 4.2m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	MW - HW		0		
	4.20 (21.24)	orange-brown	HW	L - M			
	4.30 (21.14)	Sandy GRAVEL, fine to medium, subangular, orange-brown, sand is fine to coarse grained, potential WSm [XW Dolerite]	XW	Soil			4.3m: Jt, 20°, clay, 5mm, Fe Sn, Pln
	4.40 (21.04)	DOLERITE, grey-brown, Fe Sn	MW	H		Is(50)	4.5m: Jt, 20°, Pln, Rf, Fe Sn Is(50) (4.6m) = 2.61 MPa 4.61m: Jt, 0°, Pln, Rf, Fe Sn
5	4.70 (20.74)	4.7 - 5.0m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam			19		
	5.00						



SCALE (m): 1, 2, 3, 4, 5

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH02

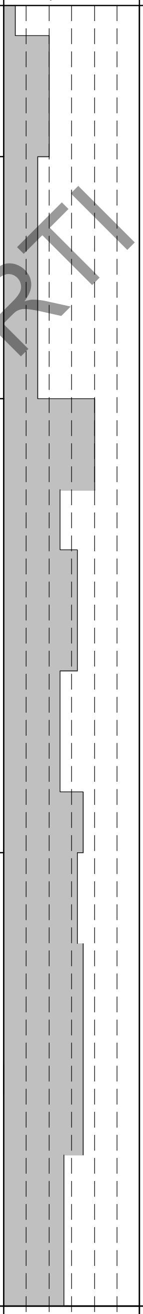
SHEET 2 OF 2

Position : 529902.0 E, 5254284.1 N \	**Surface RL :** 25.44m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 22 May 24	**Date Completed :** 23 May 24	**Logged by :** OP/JN	**Date :** 18 Jul 24

DRILLING | **MATERIAL** | **ADDITIONAL DATA**

Method: HQ Coring

Run	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests
5	(20.44)	orange-brown	MW - HW	H		
5	5.10 (20.34)	highly fractured, grey-brown, trace blue-grey, Fe Sn	MW	H-VH		Is(50)
6	5.50 (19.94)	5.5 - 5.85m: Fractured zone, angular fragments		VH	0	Is(50)
7	6.30 (19.14)	less fractured, healed defects throughout	MW	VH	66	Is(50)
7	7.30 (18.14)	orange-brown		H		Is(50)
8					60	Is(50)
8	8.50 (16.94)	HW zone, orange-brown	HW MW	M H		
	9.30 (16.14)	EOH @ 9.3m Target depth reached End of hole at 9.3 metres.				



Joints, partings, seams, zones and veins
Fracture type, orientation, infilling or coating, shape, roughness, other
Insitu test results

5.1m: Jt, 0°, Pln, Rf, Fe Sn
5.13m: Jt, 0°, Pln, Rf, Fe Sn
5.28m: Jt, 85°, Pln, Rf, Fe Sn
Is(50) (5.3m) = 3.70 MPa
5.35m: Jt, 50°, Un, Rf, Fe Sn
5.4m: Jt, 10°, Pln, Rf, Fe
5.6m: Jt, 0°, Pln, Rf, Fe Sn
5.88m: Jt, 70°, Pln, Rf, Fe Sn
5.89m: Jt, 30°, Pln, Rf, Fe Sn
5.92m: Jt, 20°, Pln, Rf, Fe Sn
5.95m: Jt, 30°, Pln, Rf, Fe Sn
6.0m: Jt, 90°, Cu, Fe Sn, Rf
Is(50) (6.0m) = 8.11 MPa
6.02m: Jt, 30°, Pln, Rf, Fe Sn
6.04m: Jt, 0°, Un, Rf, Fe Sn
6.08m: Jt, 50°, Un, Rf, Fe Sn
6.10m: Jt, 10°, Un, Rf, Fe Sn
6.15m: Jt, 20°, Pln, Silt, Fe Sn
6.20m: Jt, 0°, Pln, Rf, Fe Sn
Is(50) (6.5m) = 3.4 MPa
6.6m: Jt, 0°, Un, Rf, Fe Sn
6.67m: Jt, 70°, Pln, Rf, Fe Sn
6.71m: Jt, 10°, Pln, Rf, Fe Sn
6.77m: Jt, 10°, Pln, Rf, Fe Sn
7.1m: Jt, 10°, Pln, Rf, Fe Sn
7.18m: Jt, 30°, Pln, Rf, Fe Sn
7.28m: Jt, 30°, Pln, Rf, Fe Sn
Is(50) (7.3m) = 2.17 MPa
7.37m: Jt, 10°, Pln, Rf, Fe Sn
7.88m: Jt, 10°, Un, Rf, Fe Sn
Is(50) (7.95m) = 1.44 MPa
8.02m: Jt, 20°, Un, Rf, Fe Sn
8.16m: Jt, 20°, Un, Rf, Fe Sn
8.33m: Jt, 10°, Un Rf, Fe Sn
8.75m: Jt, 20°, Pln, Rf, Fe Sn
9.1-9.2m: 3x Jt's, 10°, Pln, Rf, Fe Sn @ 30mm spacing
9.25m: Jt, 10°, Un, Rf, Fe Sn
Soil cased upon completion. Gatic cover installed for protection.

SCALE (m): 6, 7, 8, 9, 10

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12626209

SPT1 (0.9 - 1.35), N* = 43, 350 mm recovered

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
BH02		Photographic Record	

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH03

SHEET 1 OF 1

Position : 530029.1 E, 5254328.2 N \
Surface RL : 24.95m
Angle from Horiz. : 90°
Processed : AOK
Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH
Date Started : 12 Jun 24
Date Completed : 12 Jun 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
							TOPSOIL: CLAY with sand, trace gravel, grey-brown, sand is fine to coarse grained, gravel is fine to medium, subangular, w<PL	CI	D-M	St			
					0.30 *(24.65)*		Clayey GRAVEL with sand, fine to medium, subangular, grey-brown, clay is medium plasticity, sand is fine to coarse grained [XW Dolerite]	GC	D-M	D			
1	Solid Flight Auger										SPT	SPT @ 1.0m = 2/18*/- , N=R after 280mm Recovery = 280mm (Bouncing) Auger grinding on XW dolerite material.	1
											SPT	SPT @ 1.5m = 5/20*/- N=R after 230mm Recovery = 230mm Bouncing	
					1.70		Start of coring at 1.7 metres. See Core Log Sheet for cored interval.						
2													2
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH03

SHEET 1 OF 2

Position : 530029.1 E, 5254328.2 N \	**Surface RL :** 24.95m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 12 Jun 24	**Date Completed :** 12 Jun 24	**Logged by :** OP	**Date :** 18 Jul 24

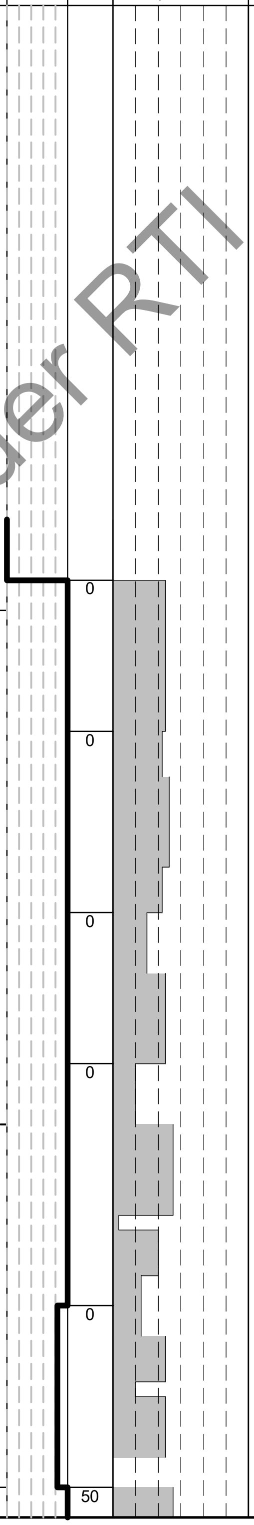
DRILLING | **MATERIAL** | **ADDITIONAL DATA**

SCALE (m) | Method | Run | Water | Depth/ (RL)metres | Graphic Log | **Description** ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin) | Weathering | Estimated Strength | Core Recovery (%) | RQD (%) | Defect Spacing (mm) | Samples & Tests | Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results | SCALE (m)

Method: HQ Coring
Water: GNO

Depth/ (RL)metres	Description	Weathering	Estimated Strength
	Start of coring at 1.7 metres. See Soil Log Sheet for soil interval.		
1.70 (23.25)	CORE LOSS = 200mm		
1.90 (23.05)	1.9 - 2.0m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	MW	
2.00 (22.95)	DOLERITE, grey-brown, Fe Sn, highly fractured		M - H
3.50 (21.45)	3.5 - 3.7m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	HW	
3.70 (21.25)	orange-brown, trace grey		M
3.98 (20.97)	3.98 - 4.03m: Highly fractured zone, recovered as gravel sized fragments, potential crushed seam		
4.20 (20.75)	4.2 - 4.4m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam		
4.55 (20.40)	4.55 - 4.6m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam		
4.80 (20.15)	CORE LOSS = 100mm		
4.90 (20.05)	DOLERITE, orange-brown, Fe Sn	HW -	L - M

Run	RQD (%)
1	
2	0
3	0
4	0
5	0
6	0
7	50



Samples & Tests: Is(50) (at 4.0m); Is(50) (at 4.9m)

2.08m: Jt, 70°, Pln, Rf, Fe Sn
2.12m: Jt, 10°, Pln, Rf, Fe Sn
2.21m: Jt, 40°, Pln, Rf, Fe Sn
2.26m: Jt, 60°, Pln, Rf, Fe Sn
2.3m: Jt, 0°, Pln, Rf, Fe Sn
2.39m: Jt, 20°, Pln, Rf, Fe Sn
2.44m: Jt, 0°, Cu, Pln, Rf, Fe Sn
2.65m: Jt, 70°, Pln, Rf, Fe Sn, 500mm
2.66m: Jt, 0°, Cu, Rf, Fe Sn
2.71m: Jt, 60°, Pln, Rf, Fe Sn
2.74m: Jt, 30°, Pln, Rf, Fe Sn
2.84m: Jt, 30°, Un, Rf, Fe Sn
3.1m: Jt, 10°, Pln, Rf, Fe Sn
3.15m: Jt, 10°, Pln, Rf, Fe Sn
3.2m: Jt, 10°, Pln, Rf, Fe Sn
3.28m: Jt, 10°, Pln, Rf, Fe Sn
3.35m: Jt, 80°, Pln, Rf, Fe Sn, 300mm
3.4m: Jt, 80°, Pln, Rf, Fe Sn, 200mm
3.7m: Jt, 10°, Pln, Rf, Fe Sn
3.81m: Jt, 10°, Pln, Rf, Fe Sn, silt ~20mm
3.93m: Jt, 10°, Pln, Rf, Fe Sn
3.98m: Jt, 10°, Pln, Rf, Fe Sn
Is(50) (4.0m) = 0.62 MPa
4.03m: Jt, 10°, Pln, Rf, Fe Sn
4.11m: Jt, 60°, Cu, Rf, Fe Sn
4.16m: Jt, 10°, Pln, Rf, Fe Sn
4.42m: Jt, 10°, Pln, Rf, Fe Sn
4.48m: Jt, 80°, Pln, Rf, Fe Sn, 200mm
4.53m: Jt, 10°, Pln, Rf, Fe Sn
4.56m: Jt, 80°, Pln, Rf, Fe Sn, 100mm
4.6m: Jt, 20°, Pln, Rf, Fe Sn
4.64m: Jt, 20°, Pln, Rf, Fe Sn
Is(50) (4.9m) = 0.31 MPa

SCALE (m): 1, 2, 3, 4, 5

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

CORE LOG SHEET

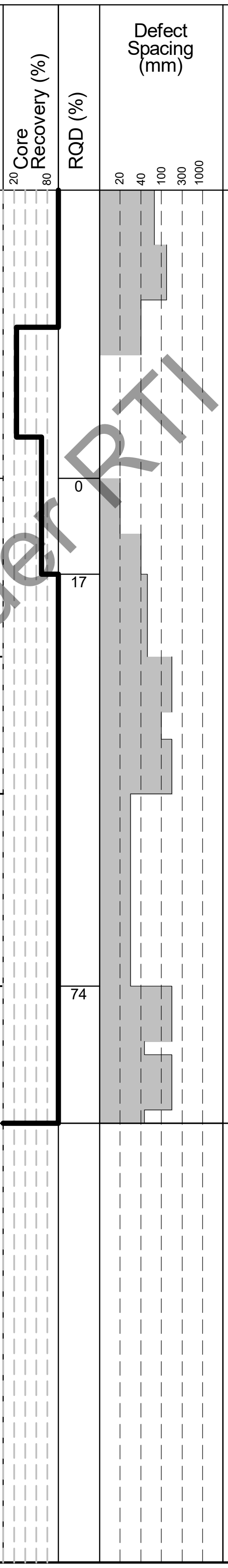
Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH03

SHEET 2 OF 2

Position : 530029.1 E, 5254328.2 N \
Surface RL : 24.95m
Angle from Horiz. : 90°
Processed : AOK
Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH
Date Started : 12 Jun 24
Date Completed : 12 Jun 24
Logged by : OP
Date : 18 Jul 24

DRILLING		MATERIAL					ADDITIONAL DATA
Method	Run	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
HQ Coring	7			MW			Is(50)	4.96m: Jt, 10°, Pln, Rf, Fe Sn 5.15m: Jt, 80°, Pln, Rf, Fe Sn, 300mm 5.19m: Jt, 10°, Pln, Rf, Fe Sn 5.28m: Jt, 10°, Pln, Rf, Fe Sn 5.40m: Jt, 10°, Pln, RC, Fe Sn 5.42m: Jt, 10°, Pln, Rd, Fe Sn 5.46m: Jt, 30°, Cu, Rf, Fe Sn Is(50) (5.5m) = 0.7 MPa
	8	5.60 (19.35)	CORE LOSS = 300mm					
	9	5.90 (19.05)	CORE LOSS = 150mm					
		6.05 (18.90)	6.05 - 6.25m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	HW	M	0		
		6.25 (18.70)	DOLERITE, orange-brown, Fe Sn, highly fractured				Is(50)	6.25m: Jt, 0°, Pln, Rf, Fe Sn 6.30m: Jt, 0°, Pln, Rf, Fe Sn Is(50) (6.3m) = 0.54 MPa
	10					17		6.32m: Jt, 10°, Pln, Rf, Fe Sn 6.35m: Jt, 10°, Pln, Rf, Fe Sn 6.37m: Jt, 10°, Pln, Rf, Fe Sn 6.4m: Jt, 10°, Pln, Rf, Fe Sn 6.44m: Jt, 10°, Pln, Rf, Fe Sn, Ca
		6.70 (18.25)	grey-brown, Fe Sn, healed defects throughout	MW	H		Is(50)	6.47m: Jt, 10°, Pln, Rf, Fe Sn, Ca 6.57m: Jt, 10°, Cu, Rf, Fe Sn 6.65m: Jt, 0°, Pln, Rf, Fe Sn 6.7m: Jt, 10°, Pln, Rf, Fe Sn Is(50) (6.7m) = 1.53 MPa 6.85m: Jt, 70°, Pln, Rf, Fe Sn, Ca 6.98m: Jt, 10°, Pln, Rf, Fe Sn, Ca
		7.20 (17.75)	orange-brown, highly fractured	HW	M			7.23m: Jt, 90°, Cu, Rf, Fe Sn 7.45m: Jt, 80°, Cu, Rf, Fe Sn, 400mm 7.65m: Jt, 70°, Cu, Rf, Fe Sn 7.87m: Jt, 10°, Pln, Rf, Fe Sn
	11	7.90 (17.05)	grey-brown, Fe Sn, trace blue-grey	MW	VH	74	Is(50)	7.9m: Jt, 0°, Pln, Rf, Fe Sn Is(50) (8.1m) = 2.86 MPa 8.11m: Jt, 0°, Pln, Rf, Fe Sn, Ca 8.15m: Jt, 0°, Pln, Rf, Fe Sn Ca 8.32m: Jt, 0°, Cu, Rf, Fe Sn, Ca
		8.40 (16.55)	EOH @ 8.4m - target depth reached. Standpipe installed upon completion. End of hole at 8.4 metres.					Standpipe Construction Details (mBGL): 0.0 - 0.3m: Gatic cover and concrete plug 0.3 - 4.4m: Backfill 4.4 - 4.9m: Bentonite Plug 4.9 - 8.4m: Sand 5.4 - 8.4m: Screen



SCALE (m): 6, 7, 8, 9, 10

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

SPT1 (1.0 - 1.28), N* = R, 280 mm recovered

SPT2 (1.5 - 1.73), N* = R, 230 mm recovered

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Charles Hand Park Photographic Record	Client Department of State Growth
BH03			

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH04

SHEET 1 OF 1

Position : 530029.1 E, 5254426.2 N \
Surface RL : 32.33m
Angle from Horiz. : 90°
Processed : AOK

Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH

Date Started : 23 May 24
Date Completed : 24 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	Solid Flight Auger						TOPSOIL: CLAY with sand, dark-brown, w>PL, rootlets in upper 0.1m	CH	M	St			
					0.30 (32.03)		Silty GRAVEL with sand, grey-brown, fine to medium, trace coarse, subangular to angular, sand is fine to coarse grained [XW Dolerite]	GM	M-D	D	SPT	SPT @ 0.5m = 14/30*, N=R after 220mm Recovery = 220mm Auger grinding from 0.7m	
1					1.00		Start of coring at 1 metres. See Core Log Sheet for cored interval.						1
2													2
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH04

SHEET 1 OF 3

Position : 530029.1 E, 5254426.2 N \	**Surface RL :** 32.33m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 23 May 24	**Date Completed :** 24 May 24	**Logged by :** OP	**Date :** 18 Jul 24

DRILLING – Method: HQ Coring; Water: GNO

Run	RQD (%)
1	0
2	0
3	0
4	0
5	21
6	0
7	20
8	0
9	0
10	

MATERIAL / **ADDITIONAL DATA**

Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
	Start of coring at 1 metres. See Soil Log Sheet for soil interval.				
1.00 (31.33)	DOLERITE, grey-brown, Fe Sn, highly fractured, medium grained	MW	M	Is(50)	1.0 - 1.4m: Highly fractured. Some irregular defects, sub vertical joints apparent in fractured zone, 5 - 30mm, Fe Sn 1.35m: Jt, ~70°, Pln, RF, 10-35mm 1.40m: Jt, 50°, Pln, Rf, Fe Sn 1.43m: Jt, 60°, Pln, Rf, Fe Sn 1.45m: Jt, 0°, Un, Rf, Fe Sn Is(50) (1.5m) = 0.65 MPa 1.55m: Jt, 60°, Pln, Rf, Fe Sn 1.69m: Jt, 40°, Pln, Rf, Fe Sn 1.73m: Jt, 30° Pln, Rf, Fe Sn 1.83m: Jt, 80°, Pln, Rf, Fe Sn, Silt infill
1.90 (30.43)	1.9 - 2.0m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potentially extremely weathered seam	HW	L		
2.00 (30.33)	grey-brown, Fe Sn, highly fractured	HW	H		
2.20 (30.13)	CORE LOSS = 50mm				
2.25 (30.08)	DOLERITE, grey-brown, Fe Sn, highly fractured	HW	H		
2.40 (29.93)	orange-brown, Fe Sn, healed defects throughout				2.55m: Jt, 20°, Pln, Rf, Fe Sn
2.70 (29.63)	trace grey-brown, Fe Sn	MW - HW			2.7m: Jt, 80°, Un, Rf, Fe Sn 2.85m: Jt, 90°, Cu, Rf, Fe Sn
2.90 (29.43)	2.9- 3.3m: highly fractured, grey-brown, Fe Sn	MW	H	Is(50)	3.3m: Jt, 0°, Pln, Rf, Fe Sn 3.43m: Jt, 0°, Pln, Rf, Fe Sn Is(50) (3.5m) = 1.68 MPa 3.53m: Jt, 40°, Pln, Rf, Fe Sn 3.54m: Jt, 0°, Pln, Rf, Fe Sn 3.57m: Jt, 0°, Pln, Rf 3.65m: Jt, 60°, Pln, Rf, Fe Sn 3.76m: Jt, 60°, Pln, Rf, Fe Sn 3.77m: Jt, 0°, Pln, Rf, Fe Sn 3.82m: Jt, 10°, Pln, Rf, Fe Sn 3.84m: Jt, 10°, Pln, Rf, Fe Sn 3.9m: Jt, 70°, Pln, Rf, Fe Sn
4.00 (28.33)	CORE LOSS = 100mm				
4.10 (28.23)	DOLERITE, grey-brown, Fe Sn, highly fractured	HW - MW	M		4.45m: Jt, 80°, Pln, Rf, Fe Sn 4.49m: Jt, 30°, Pln, Rf, Fe Sn 4.53m: Jt, 30°, Rf, Fe Sn
4.55 (27.78)	4.55 - 4.7m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite			Is(50)	Is(50) (4.75m) = 0.59 MPa 4.76m: Jt, 70°, Pln, Rf, Fe Sn 4.88m: Jt, 20°, Pln, Rf, Fe Sn 4.92m: Jt, 70°, Pln, Rf, Fe Sn
5.00					

See standard sheets for details of abbreviations & basis of descriptions

Job No. **12626209**

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH04

SHEET 2 OF 3

Position : 530029.1 E, 5254426.2 N \
Surface RL : 32.33m
Angle from Horiz. : 90°
Processed : AOK
Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH
Date Started : 23 May 24
Date Completed : 24 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING — Method: HQ Coring

MATERIAL

Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength
(27.33)	CORE LOSS = 200mm		
5.20 (27.13)	DOLERITE, grey-brown, Fe Sn, highly fractured	HW - MW	H
5.70 (26.63)	Sandy GRAVEL with silt, (GP-GM), fine to coarse, subangular-angular, orange-brown, sand is fine to coarse grained [XW Dolerite]	XW	Soil
5.80 (26.53)	CORE LOSS = 300mm		
6.10 (26.23)	DOLERITE, grey-brown, Fe Sn	MW	H
6.50 (25.83)	orange-brown to grey-brown, Fe Sn	HW	M
6.75 (25.58)	grey-brown, Fe Sn	MW	H
6.90 (25.43)	6.9 - 7.0m: Highly fractured, grey brown		
7.10 (25.23)	trace blue-grey		
			H - VH
10.00			

Run	RQD (%)
10	0
11	0
12	0
13	0
14	
15	0
16	29
17	55
18	45
19	8
20	50

Core Recovery (%): 20 – 80
Defect Spacing (mm): 20, 40, 100, 300, 1000

Samples & Tests: Is(50), UCS, Is(50), Is(50), Is(50)

ADDITIONAL DATA

Joints, partings, seams, zones and veins
Fracture type, orientation, infilling or coating, shape, roughness, other
Insitu test results

5.0m: Difficult to drill due to fractures
5.35m: Jt, 60°, Pln, Rf, Fe Sn
6.2m: Drill bit changed
6.33m: Jt, 30°, Un, Rf, Fe Sn
6.37m: Jt, 30°, Pln, Rf, Fe Sn
6.39m: Jt, 0°, Cu, Rf, Fe Sn
6.43m: Jt, 30°, Cu, Rf, Fe Sn
Is(50) (6.5m) = 0.56 MPa
6.51m: Jt, 30°, Cu Rf, Fe Sn (x3 @ 10mm)
6.67m: Jt, 40°, Pln, Rf, Fe Sn
6.72m: Jt, 60°, Pln, Rf, Fe Sn
6.82m: Jt, 30°, Pln, Rf, Fe Sn
7.03m: Jt, 30°, Pln, Rf, Fe Sn
7.12m: Jt, 60°, Cu, Rf, Fe Sn
7.15m: Jt, 70°, Pln, Rf, Fe Sn
7.18m: Jt, 30°, Pln, Rf, Fe Sn
7.25m: Jt, 0°, Cu, Rf, Fe Sn
7.3m: Jt, 20°, Cu/Un, Rf, Fe Sn
7.56-7.6m: 3x Jt, 20°, Cu, Fe Sn, Rf, 15mm
7.64m: Jt, 50°, Pln, Rf, Fe Sn
UCS (7.64-7.8m) = 51.6 MPa
7.85m: Jt, 40°, Pln, Rf, Fe Sn
7.88m: Jt, 40°, Un, Rf, Fe Sn
Is(50) (7.9m) = 1.41 MPa
8.02m: Jt, 40°, Pln, Rf, Fe Sn
8.10m: Jt, 10°, Pln, Rf, Fe Sn
8.15m: Jt, 10°, Cu, Rf, Fe Sn
8.20m: Jt, 50°, Pln, Rf, Fe Sn
8.28m: Jt, 30°, Pln, Rf, Fe Sn
8.30m: Jt, 20°, Pln, Rf, Fe Sn
8.39m: Jt, 70°, Pln, Rf, Fe Sn
8.42m: Jt, 0°, Cu, Rf, Fe Sn
Is(50) (8.5m) = 1.47 MPa
8.64m: Jt, 0°, Cu, Rf, Fe Sn
8.70m: Jt, 30°, Cu, Rf, Fe Sn
8.72m: Jt, 30°, Cu, Rf, Fe Sn
8.82m: Jt, 0°, Cu, Rf, Fe Sn
8.92m: Jt, 0°, Cu, Rf, Fe Sn
9.0-9.2m: Healed Jts, Cu, 0°
9.22m: Jt, 60°, Cu Rf, Fe Sn
9.30m: Jt, 70°, Pln, Rf, Fe Sn
9.4-9.45m: 3x Jt, Cu, Rf, 30°, Fe, 10mm
9.5m: Jt, Pln, Rf, Fe Sn
9.6m: Jt, 0°, Cu, Rf, Fe Sn
Is(50) (9.65m) = 5.29 MPa
9.72m: Jt, 60°, Pln, Rf, Fe Sn
9.75m: Jt, 40°, Pln, Rf, Fe Sn
9.85m: Jt, 70°, Pln, Rf, Fe Sn

See standard sheets for details of abbreviations & basis of descriptions

Job No. 12626209

CORE LOG SHEET

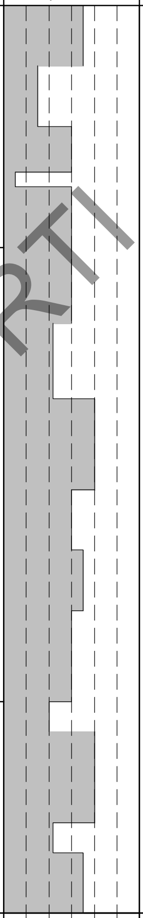
Client :	Department of State Growth
Project :	AFL Training Facility and High Performance Centre
Location :	Rosny Parklands Rosny Parklands

LOCATION No. BH04

SHEET 3 OF 3

Position : 530029.1 E, 5254426.2 N \	**Surface RL :** 32.33m	**Angle from Horiz. :** 90°	**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 23 May 24	**Date Completed :** 24 May 24	**Logged by :** OP	**Date :** 18 Jul 24

SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Core Recovery (%)	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
	HQ Coring	20		(22.33)	grey-brown, trace blue-grey and orange-brown, healed fractures throughout	MW	M - H			Is(50)	Is(50) (10.08m) = 0.68 MPa 10.1m: Jt, 10°, Pln, Rf, Fe Sn 10.23m: Jt, 10°, Pln Rf, Fe Sn 10.25m: Jt, 10°, Pln, Rf, Fe Sn 10.27-10.3m: WSm, Cu, Fe Sn, Pln, 0° 10.33m: Jt, 10°, Pln, Rf, Fe Sn 10.34m: Jt, 60°, Pln, Rf, Fe Sn 10.37m: Jt, 10°, Pln, Rf, Fe Sn 10.46m: Jt, 80°, Pln, Rf, Fe Sn 10.47m: Jt, 70°, Un, Rf, Fe Sn 10.54m: Jt, 10°, Pln, WSm, 10mm, Cu
11		21							66		10.57m: Jt, 10°, Pln, Rf, Fe Sn 10.6m: Jt, 0°, Pln/Cu, Rf, Fe Sn 10.65m: Jt, 50°, Pln, Rf, Fe Sn 10.97m: Jt, 0°, Pln, Rf, Fe Sn 11.05m: Jt, 0° Pln, Rf, Fe Sn
							H			Is(50)	11.13m: Jt, 0°, Pln, Rf, Fe Sn 11.16m: Jt, 0°, Pln, Rf, Fe Sn Is(50) (11.18m) = 2.72 MPa 11.21m: Jt, 20°, Pln, Rf, Fe Sn 11.33m: Jt, 30°, Pln, Rf, Fe Sn 11.57m: Jt, 30°, Un, Rf, Fe Sn
							H - VH			Is(50)	11.63m: Jt, 40°, Un, Rf, Fe Sn Is(50) (11.65m) = 2.96 MPa 11.79m: Jt, 20°, Un, Rf, Fe Sn
12											12.15m: Jt, 20°, Cu, Rf, Fe Sn
		22		13.00			H		86	UCS	12.35m: Jt, 0°, Pln, Rf, Fe Sn (x3 @ 20mm) UCS (12.4-12.55m) = 25.8 MPa 12.55m: Jt, 0°, Un, Rf, Fe Sn 12.7m: Jt, 10°, Pln, Rf, Fe Sn 12.73m: WSm, 20°, Pln, 10mm, Ca 12.80m: Jt, 0°, Pln, Cu, Rf, Fe Sn
13				(19.33)	EOH @ 13.0m - target depth reached. End of hole at 13.0 metres.						Soil cased upon completion. Gatic cover installed for protection.
14											
15											



See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Rosny Parkland	Client Department of State Growth
BH04		Photographic Record	

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Rosny Parkland	Department of State Growth
BH04		Photographic Record	

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH05

SHEET 1 OF 1

Position : 529993.1 E, 5254403.7 N \
Surface RL : 30.86m
Angle from Horiz. : 90°
Processed : OP

Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH

Date Started : 24 May 24
Date Completed : 25 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	Solid Flight Auger						TOPSOIL: CLAY with sand, trace gravel, medium plasticity, dark-brown, w>PL	CI	M	St			
					0.30 *(30.56)*		Silty GRAVEL with sand, fine to medium, subangular to angular, grey-brown, silt is low plasticity, sand is fine to coarse grained [XW Dolerite]	GM	D-M	VD	SPT	SPT @ 0.5m = 9/35/R, N = R after 300mm Recovery = 300mm	
1													1
2					2.00		Start of coring at 2 metres. See Core Log Sheet for cored interval.						2
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH05

SHEET 1 OF 3

Position : 529993.1 E, 5254403.7 N \
Surface RL : 30.86m
Angle from Horiz. : 90°
Processed : OP

Contractor : South Western Drilling
Rig Type : Comacchio Geo 405
Checked : ASH

Date Started : 24 May 24
Date Completed : 25 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING — Method: HQ Coring; Water: GNO

MATERIAL

Start of coring at 2 metres.
See Soil Log Sheet for soil interval.

Depth/ (RL)metres	Description	Weathering	Estimated Strength	Run	RQD (%)	Samples & Tests
2.00 (28.86)	Sandy GRAVEL with silt, fine to coarse, subangular, orange-brown, sand is fine to coarse grained, Fe Sn [XW Dolerite]	XW	Soil	1		
2.60 (28.26)	Cobble, MW Dolerite, H strength					
2.90 (27.96)	DOLERITE, orange-brown to grey-brown, Fe Sn, fractured	HW - MW	H - VH	2	40	
3.12 (27.74)	grey-brown, trace blue-grey					Is(50)
				3	0	
				4	0	
4.35 (26.51)	4.35 - 4.4m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam					
4.45 (26.41)	4.45 - 4.51m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam			5	0	
4.80 (26.06)	Highly fractured			6	0	
5.00						

ADDITIONAL DATA

2.95m: Jt, 60°, Pln, Rf, Fe Sn, silt (15mm)
3.05m: Jt, 30°, Pln, Rf, Fe Sn
3.08m: Jt, 30°, Cu, Rf, Fe Sn
3.12m: Jt, 30°, Cu, Rf, Fe Sn
3.15m: Jt, 30°, Pln, Rf, Fe Sn
3.19m: Jt, 30°, Pln, Rf, Fe Sn
3.23m: Jt, 30°, Pln, Rf, Fe Sn
3.24m: Jt, 90°, Pln, Rf, Fe Sn
3.33m: Jt, 30°, Pln, Rf, Fe Sn
Is(50) (3.35m) = 4.89 MPa
3.37m: Jt, 30°, Pln, Rf, Fe Sn
3.57m: Jt, 40°, Pln, Rf, Fe Sn
3.67m: Jt, 30°, Pln, Rf, Fe Sn
3.73m: Jt, 20°, Pln, Rf, Fe Sn
3.75m: Jt, 20°, Pln, Rf, Fe Sn
3.78m: Jt, 20°, Pln, Rf, Fe Sn
3.87m: Jt, 0°, Un, Rf, Fe Sn
3.89m: Jt, 0°, Un, Rf, Fe Sn
3.98m: Jt, 10°, Pln, Rf, Fe Sn
4.05m: Jt, 30°, Pln, Rf, Fe Sn
4.14m: Jt, 60°, Pln, Rf, Fe Sn, silt (5mm)
4.16m: Jt, 0°, Pln, Rf, Fe Sn,
4.4m: Jt, 30°, Pln, Rf, Fe Sn
4.51m: Jt, 30°, Pln, Rf, Fe Sn
4.58m: Jt, 30°, Pln, Rf, Fe Sn
4.63m: Jt, 30°, Pln, Rf, Fe Sn
4.69m: Jt, 80°, Pln, Rf, Fe Sn
4.76m: Jt, 30°, Pln, Rf, Fe Sn
4.8 - 5.0m: 30% water loss

See standard sheets for details of abbreviations & basis of descriptions

Job No. **12626209**

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

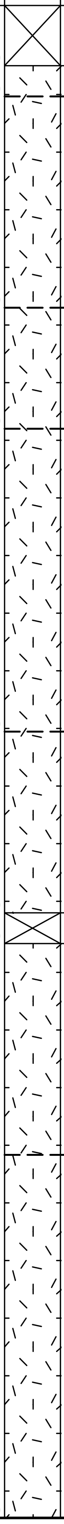
LOCATION No. BH05

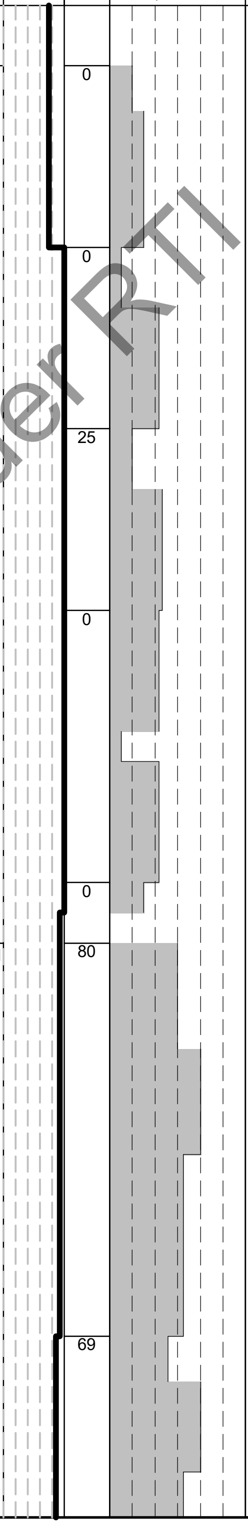
SHEET 2 OF 3

Position : 529993.1 E, 5254403.7 N \ **Surface RL :** 30.86m **Angle from Horiz. :** 90° **Processed :** OP
Contractor : South Western Drilling **Rig Type :** Comacchio Geo 405 **Checked :** ASH
Date Started : 24 May 24 **Date Completed :** 25 May 24 **Logged by :** OP **Date :** 18 Jul 24

DRILLING | **MATERIAL** | **ADDITIONAL DATA**

Method: HQ Coring





Run	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
7	(25.86) – 5.20	CORE LOSS = 200mm					
	5.20 (25.66)	DOLERITE, grey-brown, Fe Sn, highly fractured, healed defects throughout	MW	VH	0		5.25m: Jt, 30°, Pln, Rf, Fe Sn
	5.30 (25.56)	5.3 - 5.35m: Highly fractured zone, recovered as cobble sized fragments of highly weathered dolerite				Is(50)	5.41m: Jt, 20°, Pln, Rf, Fe Sn 5.42m: Jt, 60°, Pln, Rf, Fe Sn 5.45m: Jt, 30°, Pln, Rf, Fe Sn 5.48m: Jt, 0°, Pln, Rf, Fe Sn 5.51m: Jt, 80°, Pln, Rf, Fe Sn 5.58m: Jt, 10°, Pln, Rf, Fe Sn 5.61m: Jt, 10°, Pln, Rf, Fe Sn 5.7m: Jt, 0°, Pln, Rf, Fe Sn Is(50) (5.7m) = 9.73 MPa
8					0		
	6.00 (24.86)	6.0 - 6.4m: Highly fractured zone					6.0m: Jt, 0°, Pln, Rf, Fe Sn 6.05m: Jt, 90°, Pln, Rf, Fe Sn 6.07m: Jt, 20°, Pln, Rf, Fe Sn 6.16m: Jt, 60°, Pln, Rf, Fe Sn 6.24m: Jt, 60°, Pln, Rf, Fe Sn
9	6.40 (24.46)	6.4 - 6.6m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam			25	Is(50)	6.58m: Jt, 10°, Pln, Rf, Fe Sn 6.62m: Jt, 10°, Pln, Rf, Fe Sn Is(50) (6.7m) = 1.57 MPa 6.84m: Jt, 10°, Pln, Rf, Fe Sn 6.89m: Jt, 0°, Pln, Rf, Fe Sn
10					0		7.04m: Jt, 70°, Pln, Rf, Fe Sn 7.12m: Jt, 40°, Pln, RF, Fe Sn 7.17m: Jt, 30°, Pln, Rf, Fe Sn 7.24m: Jt, 30°, Pln, Rf, Fe Sn 7.25m: Jt, 90°, Cu, Rf, Fe Sn 7.33m: Jt, 20°, Pln, Rf, Fe Sn
	7.40 (23.46)	7.4 - 7.5m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam				Is(50)	Is(50) (7.4m) = 2.26 MPa 7.51m: Jt, 20°, Pln, Rf, Fe Sn 7.55m: Jt, 10°, Pln, Rf, Fe Sn 7.59m: Jt, 60°, Pln, Rf, Fe Sn 7.63m: Jt, 20°, Pln, Rf, Fe Sn 7.68m: Jt, 20°, Pln, Rf, Fe Sn 7.73m: Jt, 30°, Un, Rf, Fe Sn 7.74m: Jt, 70°, Pln, Rf, Fe Sn 7.83m: Jt, 10°, Pln, Rf, Fe Sn
11					0		
12	8.00 (22.86) – 8.10	CORE LOSS = 100mm					Water loss: 7.0 - 8.0m
	8.10 (22.76)	DOLERITE, blue-grey to grey-brown, Fe Sn in joints, healed defects throughout	MW - SW	H - VH	80	Is(50)	Is(50) (8.1m) = 1.79 MPa 8.15m: Jt, 10°, Un, Rf, Fe Sn 8.19m: Jt, 10°, Pln, Rf, Fe Sn 8.33m: Jt, 50°, Cu, Rf, Fe Sn 8.45m: Jt, 60°, Pln, Rf, Fe Sn
	8.80 (22.06)	8.8 - 8.83m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam				Is(50) UCS	8.8 - 8.83m: CSm, 10°, Pln, Fe Sn, 30mm Is(50) (8.9m) = 3.41 MPa 8.98m: Jt, 40°, Cu, Rf, Fe Sn 9.0m: Jt, 0°, Pln, Rf, Fe Sn 9.07m: Jt, 0°, Pln, Rf, Fe Sn UCS (9.07 - 9.26m) = 41.6 MPa 9.26m: Jt, 10°, Pln, Rf, Fe Sn
13					69	Is(50)	9.37m: Jt, 20°, Pln, Rf, Fe Sn 9.48m: Jt, 30°, Pln, Rf, Fe Sn Is(50) (9.5m) = 2.29 MPa 9.55m: Jt, 10°, Pln, Rf, Fe Sn 9.85m: Jt, 10°, Cu, Rf, Fe Sn 9.9m: WSm, 90°, Cu, Fe Sn
	10.00						

SCALE (m): 6, 7, 8, 9, 10

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. **12626209**

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH05

SHEET 3 OF 3

Position : 529993.1 E, 5254403.7 N \	**Surface RL :** 30.86m	**Angle from Horiz. :** 90°	**Processed :** OP
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405		**Checked :** ASH
Date Started : 24 May 24	**Date Completed :** 25 May 24	**Logged by :** OP	**Date :** 18 Jul 24

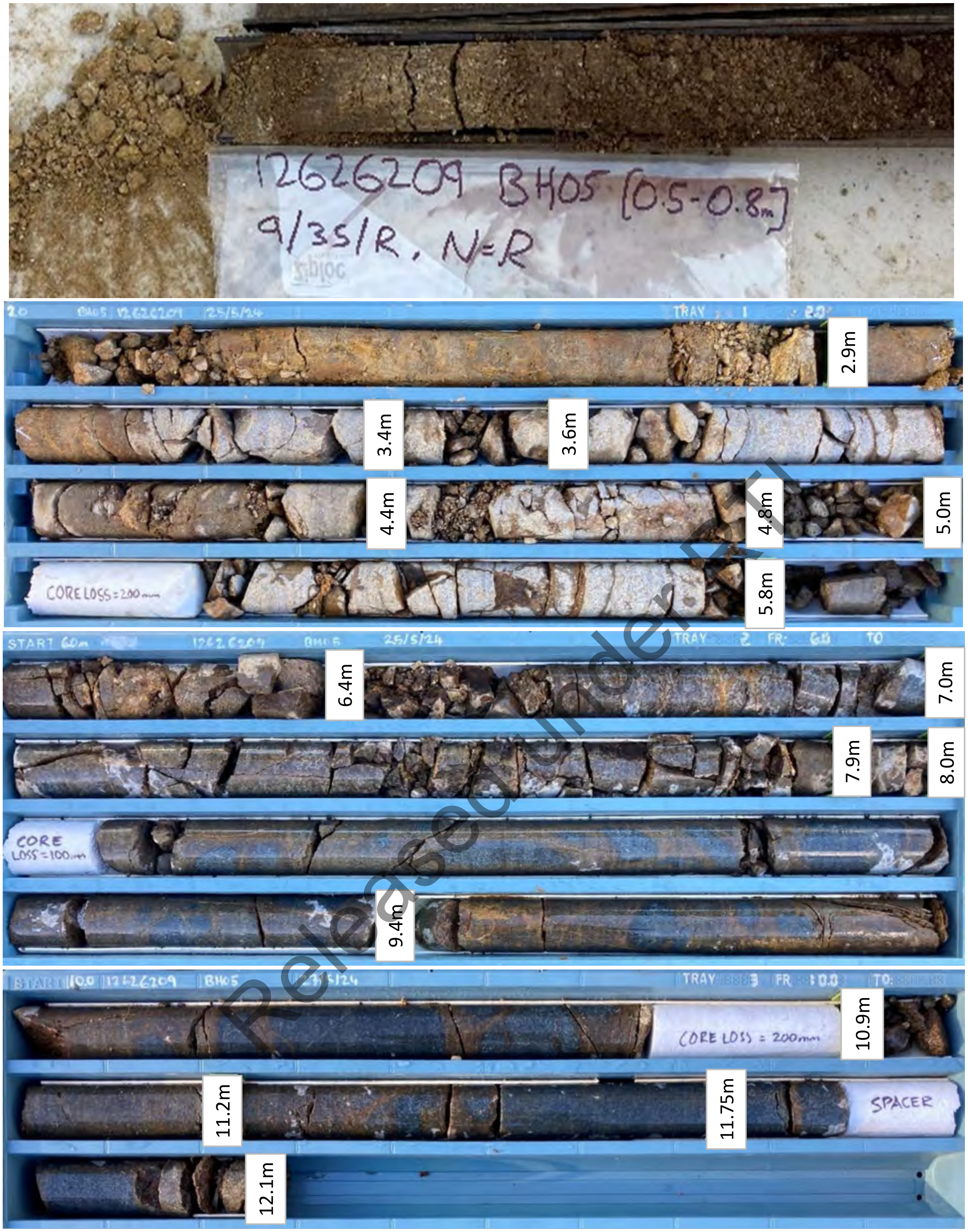
DRILLING				MATERIAL									ADDITIONAL DATA	
SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Core Recovery (%) 20 80	RQD (%)	Defect Spacing (mm) 20 40 100 300 1000	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results	SCALE (m)
	HQ Coring	13		(20.86)			MW - SW	VH				Is(50)	9.98m: Jt, 20°, Pln, Rf, Fe Sn 10.05m: Jt, 70°, Pln, Rf, Fe Sn 10.2m: Jt, 20°, Pln, Rf, Fe Sn 10.45m: Jt, 20°, Pln, Rf, Fe Sn Is(50) (10.5m) = 4.41 MPa 10.6m: Jt, 40°, Pln, Rf, Fe Sn 10.67m: Jt, 10°, Pln, Rf, Fe Sn	
		14		10.70 (20.16)		CORE LOSS = 200mm								
11		15 16		10.90 (19.96)		DOLERITE, blue-grey to grey-brown, Fe Sn, healed defects throughout	MW - SW	H - VH		66 76			11.19m: Jt, 20°, Cu, Rf, Fe Sn 11.3m: Jt, 20°, Pln, Rf, Fe Sn 11.46m: Jt, 10°, Pln, Rf, Fe Sn 11.50m: Jt, 0°, Pln, Rf, Fe Sn	11
		17		11.50 (19.36)		blue-grey, Fe Sn on defects	SW	VH		50		UCS	UCS (11.51 - 11.75m) = 171 MPa 11.82m: Jt, 10°, Pln, Rf, Fe Sn 11.88m: Jt, 10°, Cu, Rf, Fe Sn	
12				12.00 (18.86)		grey-brown, Fe Sn, highly fractured	MW	H					12.05m: Jt, 10°, Pln, Rf, Fe Sn	12
				12.10 (18.76)		EOH at 12.1m - Target depth reached. Standpipe installed upon completion. End of hole at 12.1 metres.							12.08m: Jt, 70°, Pln, Rf, Fe Sn Standpipe Construction Details (mBGL): 0.0 - 0.3m: Gatic cover and concrete plug 0.3 - 4.5m: Backfill 4.5 - 5.5m: Bentonite Plug 5.5 - 12.0m: Sand 6.0 - 12.0m: Screen	
13														13
14														14
15														15

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209



GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number
12626209

A4

BH05

Title
Rosny Parkland

Photographic Record

Client
Department of State Growth

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH06

SHEET 1 OF 1

Position : 529869.3 E, 5254239.5 N \
Surface RL : 26.90m
Angle from Horiz. : 90°
Processed : OP
Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH
Date Started : 12 Jun 24
Date Completed : 12 Jun 24
Logged by : OP
Date : 18 Jul 24

DRILLING				MATERIAL						ADDITIONAL DATA
Method	Hole Support	Run	Water	Depth/ (RL)metres	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results
Solid Flight Auger					TOPSOIL: CLAY, trace sand and gravel, high plasticity, dark-brown, sand is fine to medium grained, gravel is fine, subangular, w~PL	CH	M	VSt		
				0.20 *(26.70)*	CLAY with sand, high plasticity, dark-brown, sand is fine to coarse grained, w~PL [Residual Soil]	CH	M	VSt	U63 PP SPT	U63 (0.5 - 0.9m) PP @ 0.9m = >600 kPa (UCS) SPT @ 0.9m = 9/22/25, N = 47
				1.00 *(25.90)*	CLAY with sand and gravel, medium plasticity,brown mottled orange, sand is fine to coarse grained, gravel is fine, subangular, w~PL [XW Dolerite]	CI	M-D	H		Recovery = 450mm
				1.40 *(25.50)*	Becoming orange-brown				SPT	SPT @ 1.5m = 19/25*/-, N = R after 220mm (bouncing) Recovery = 220mm
				1.90	Start of coring at 1.9 metres. See Core Log Sheet for cored interval.					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH06

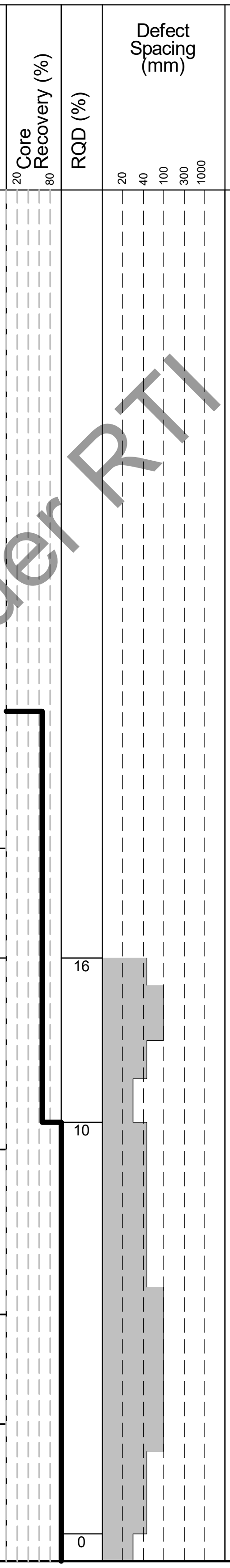
SHEET 1 OF 2

Position : 529869.3 E, 5254239.5 N \	**Surface RL :** 26.90m	**Angle from Horiz. :** 90°	**Processed :** OP
Contractor : South Western Drilling	**Rig Type :** Commachio Geo 405		**Checked :** ASH
Date Started : 12 Jun 24	**Date Completed :** 12 Jun 24	**Logged by :** OP	**Date :** 18 Jul 24

DRILLING | **MATERIAL** | **ADDITIONAL DATA**

Method: HQ Coring (from 1.90 m)
Run: 1 (1.90 – 3.45 m), 2 (3.45 – 4.90 m), 3 (from 4.90 m)
Water: GNO

Depth/ (RL)metres	Description: ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins. Fracture type, orientation, infilling or coating, shape, roughness, other. Insitu test results
	Start of coring at 1.9 metres. See Soil Log Sheet for soil interval.					
1.90 *(25.00)*	CORE LOSS = 500mm					
2.40 *(24.50)*	Clayey SAND with gravel (SC), medium to coarse grained, orange-brown, clay is low plasticity, gravel is fine, subangular [XW Dolerite]	XW	Soil			
2.80 *(24.10)*	DOLERITE, orange-brown, Fe Sn, highly fractured	HW	M	16		2.84m: Jt, 0°, Un, Rf, Fe Sn 2.9m: Jt, 10°, Cu, Rf, Fe Sn 3.03m: Jt, 10°, Pln, Rf, Fe Sn 3.11m: Jt, 10°, Pln, Rf, Fe Sn 3.17m: Jt, 10°, Cu, Rf, Fe Sn 3.24 - 3.35m: Jt, 10°, Pln, Rf, Fe Sn Joint set - 5x at 30mm spacing
				10	Is(50)	3.49m: Jt, 30°, Pln, Rf, Fe Sn Is(50) (3.45m) = 0.9 MPa
3.50 *(23.40)*	trace grey-brown	HW - MW	M - H		Is(50)	3.55m: Jt, 20°, Pln, Rf, Fe Sn 3.63m: Jt, 20°, Un, Rf, Fe Sn 3.66m: Jt, 70°, Pln, Rf, Fe Sn 3.77m: Jt, 20°, Pln, Rf, Fe Sn Is(50) (3.83m) = 1.1 MPa 3.84m: Jt, 20°, Pln, Rf, Fe Sn (10mm) 3.9m: Jt, 20°, Pln, Rf, Fe Sn 3.95m: Jt, 10°, Pln, Rf, Fe Sn 3.98m: Jt, 20°, Pln, Rf, Fe Sn
4.10 *(22.80)*	orange-brown	HW	M			4.11m: Jt, 20°, Pln, Rf, Fe Sn 4.23m: Jt, 10°, Un, Rf, Fe Sn 4.44m: Jt, 30°, Cu, Rf, Fe Sn
4.50 *(22.40)*	grey-brown, Fe Sn	MW	H		Is(50)	Is(50) (4.54m) = 1.49 MPa 4.57m: Jt, 60°, Pln, Rf, Fe Sn 4.58m: Jt, 0°, Pln, Rf, Fe Sn 4.63m: Jt, 20°, Cu, Rf, Fe Sn 4.71m: Jt, 10°, Cu, Rf, Fe Sn 4.74m: Jt, 30°, St, Rf, Fe Sn 4.81m: Jt, 60°, Pln, Rf, Fe Sn
				0		4.94m: Jt, 70°, Pln, Rf, Fe Sn



See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH06

SHEET 2 OF 2

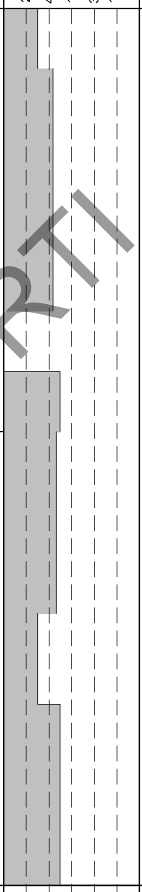
Position : 529869.3 E, 5254239.5 N \	**Surface RL :** 26.90m	**Angle from Horiz. :** 90°	**Processed :** OP
Contractor : South Western Drilling	**Rig Type :** Commachio Geo 405		**Checked :** ASH
Date Started : 12 Jun 24	**Date Completed :** 12 Jun 24	**Logged by :** OP	**Date :** 18 Jul 24

DRILLING | **MATERIAL** | **ADDITIONAL DATA**

SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Core Recovery (%)	RQD (%)	Samples & Tests
	HQ Coring	3		5.05 (21.85)	5.05 - 5.16m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential crushed seam					
6				6.05 (20.85)	Sandy SILT, orange-brown, sand is fine grained, WSm (50mm)	XW	Soil			
				6.10 (20.80)	DOLERITE, grey-brown, Fe Sn, highly fractured, possible travertine	MW	H			
				6.15 (20.75)	Sandy SILT, orange-brown, sand is fine grained, WSm (50mm)	XW	Soil			
				6.20 (20.70)	DOLERITE, grey-brown, Fe Sn, highly fractured	MW	H			
		4							0	Is(50)
7				6.95 (19.95)	healed defects throughout		M - H			
										Is(50)
8				7.90 (19.00)	EOH at 7.9m - target depth reached. Standpipe installed upon completion. End of hole at 7.9 metres.					
9										
10										

Core Recovery (%): 20 40 60 80

Defect Spacing (mm)



Joints, partings, seams, zones and veins
Fracture type, orientation, infilling or coating, shape, roughness, other

Insitu test results

5.02m: Jt, 70°, Pln, Rf, Fe Sn
5.15m: Jt, 0°, Pln, Rf, Fe Sn
5.26m: Jt, 10°, Un, Rf, Fe Sn
5.34m: Jt, 0°, Un, Rf, Fe Sn
5.43m: Jt, 60°, Pln, Rf, Fe Sn
5.48m: Jt, 65°, Pln, Rf, Fe Sn
5.53m: Jt, 60°, Pln, Rf, Fe Sn
5.56m: Jt, 60°, Pln, Rf, Fe Sn
5.62m: Jt, 30°, Pln, Rf, Fe Sn
5.66m: Jt, 0°, Pln, Rf, Fe Sn
5.73m: Jt, 60°, Pln, Rf, Fe Sn
5.77m: Jt, 30°, Pln, Rf, Fe Sn
5.8m: Jt, 60°, Cu, Rf, Fe Sn
5.83m: Jt, 60°, Cu, Rf, Fe Sn
5.88m: Jt, 30°, Pln, Rf, Fe Sn
5.99m: Jt, 30°, Un, Rf, Fe Sn
6.1m: Jt, 60°, Pln, ~50mm thick - possibly carbonate infill. XW Silt infill on either side.
6.27m: Jt, 70°, Pln, Rf, Fe Sn
6.31m: Jt, 30°, Pln, Rf, Fe Sn
6.43m: Jt, 60°, Pln, Rf, Fe Sn
Is(50) (6.48m) = 1.27 MPa
6.54m: Jt, 30°, Pln, Rf, Fe Sn
6.6m: Jt, 70°, Pln, Rf, Fe Sn
6.71m: Jt, 60°, Pln, Rf, Fe Sn
6.77m: Jt, 50°, Cu, Rf, Fe Sn
6.81m: Jt, 10°, Pln, Rf, Fe Sn
6.82m: Jt, 0°, Pln, Rf, Fe Sn
6.9m: Jt, 0°, Pln, Rf, Fe Sn
6.98m: Jt, 20°, Pln, Rf, Fe Sn
7.05m: Jt, 10°, Un, Rf, Fe Sn
7.25m: Jt, 10°, Un, Rf, Fe Sn
7.35m: Jt, 0°, Pln, Rf, Fe Sn
7.41m: Jt, Pln, 30°, Rf, Fe Sn
7.49m: Jt, 0°, Un, Rf, Fe Sn
7.53m: Jt, 20°, Pln, Rf, Fe Sn
7.6 - 7.9m: Jt, 80°, Pln, ~ 300mm
7.6 - 7.9m: Ca infilled vein, 60°, Pln, 300mm
7.7m: Jt, 10°, Pln, Rf, Fe Sn
Is(50) (7.8m) = 0.56 MPa

Standpipe Construction Details (mBGL):
0.0 - 0.3m: Gatic cover and concrete plug
0.3 - 3.9m: Backfill
3.9 - 4.4m: Bentonite Plug
4.4 - 7.9m: Sand
4.9 - 7.9m: Screen

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12626209

SPT1 (0.9 - 1.35), N* = 47, 450 mm recovered

SPT2 (1.5 - 1.72), N* = R, 220 mm recovered

GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number 12626209	A4	Title Charles Hand Park Photographic Record	Client Department of State Growth
BH06			

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH10

SHEET 1 OF 1

Position : 530019.6 E, 5254099.0 N \
Surface RL : 8.70m
Angle from Horiz. : 90°
Processed : OP

Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH

Date Started : 13 Jun 24
Date Completed : 13 Jun 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL						ADDITIONAL DATA
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results
	Solid Flight Auger				0.20 (8.50)	TOPSOIL: SILT with gravel, trace sand and cobbles, low plasticity, dark-brown, gravel is fine to medium, subangular, sand is medium to coarse grained, cobbles are 60 - 100mm, w~PL	ML	D-M	L		
					0.70 (8.00)	SILT with gravel, trace sand and cobbles, low plasticity, dark-brown, gravel is fine to medium, subangular, sand is medium to coarse grained, cobbles are 60 - 100mm, w~PL	ML	D-M	-	U63	U63 (0.5 - 0.8m)
1					1.80	Clayey SAND with gravel, fine to coarse grained, pale grey to brown, clay is low plasticity, gravel is fine to medium, subangular [XW Dolerite]	SC	D	VD	SPT SPT	SPT @ 0.8m = 5/20/18, N = 38 Recovery = 350mm U63 at 1.5m = refusal SPT @ 1.5m = 19/30*/-, N = R after 280mm Recovery = 280mm
2						Start of coring at 1.8 metres. See Core Log Sheet for cored interval.					
3											
4											
5											

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

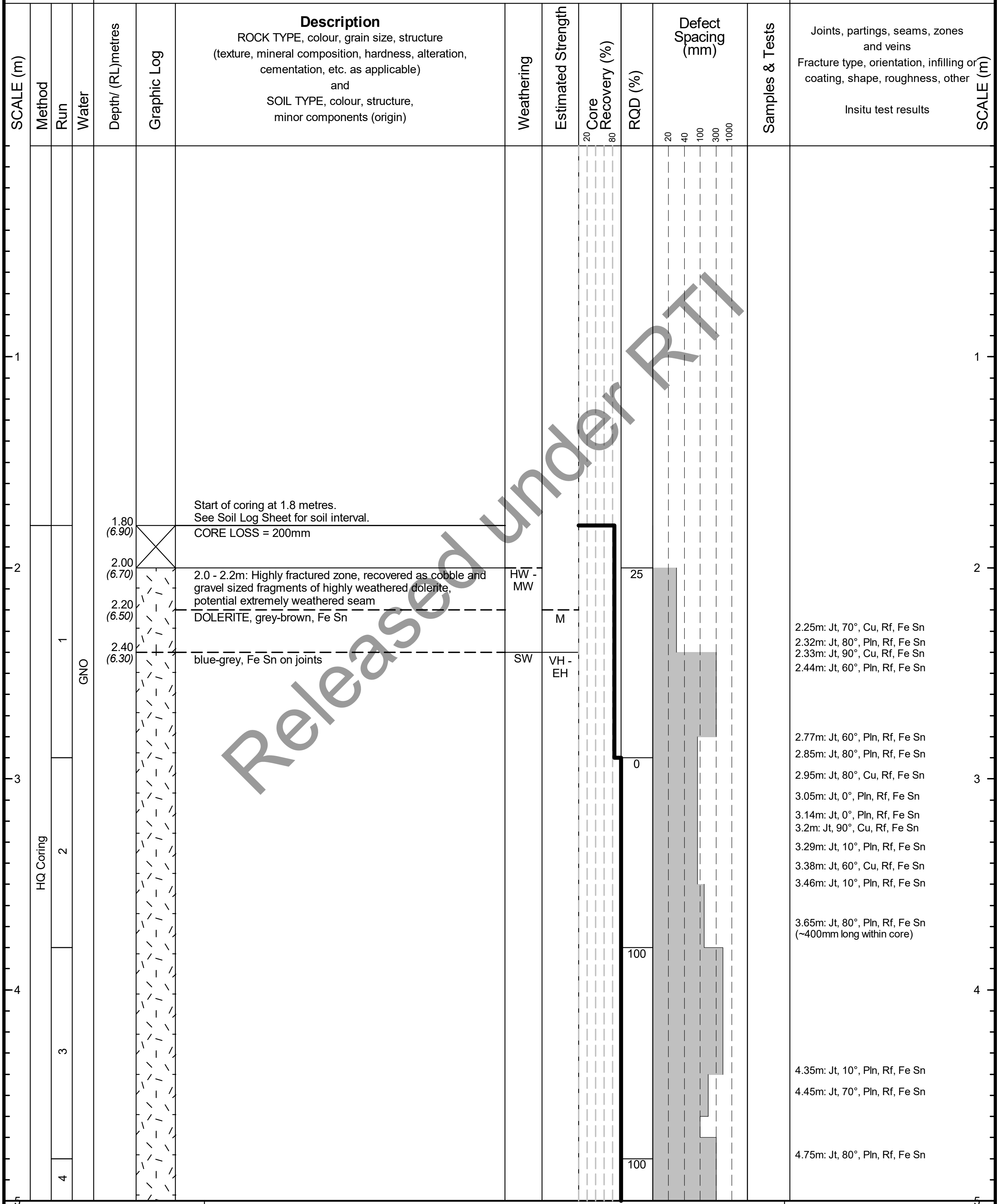
CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH10

SHEET 1 OF 2

Position : 530019.6 E, 5254099.0 N \	**Surface RL :** 8.70m	**Angle from Horiz. :** 90°	**Processed :** OP
Contractor : South Western Drilling	**Rig Type :** Commachio Geo 405		**Checked :** ASH
Date Started : 13 Jun 24	**Date Completed :** 13 Jun 24	**Logged by :** OP	**Date :** 18 Jul 24



Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
				Start of coring at 1.8 metres. See Soil Log Sheet for soil interval.				
HQ Coring	1	GNO	1.80 *(6.90)*	CORE LOSS = 200mm				
			2.00 *(6.70)*	2.0 - 2.2m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	HW - MW		25	
			2.20 *(6.50)*	DOLERITE, grey-brown, Fe Sn		M		2.25m: Jt, 70°, Cu, Rf, Fe Sn 2.32m: Jt, 80°, Pln, Rf, Fe Sn 2.33m: Jt, 90°, Cu, Rf, Fe Sn
			2.40 *(6.30)*	blue-grey, Fe Sn on joints	SW	VH - EH		2.44m: Jt, 60°, Pln, Rf, Fe Sn 2.77m: Jt, 60°, Pln, Rf, Fe Sn 2.85m: Jt, 80°, Pln, Rf, Fe Sn
	2						0	2.95m: Jt, 80°, Cu, Rf, Fe Sn 3.05m: Jt, 0°, Pln, Rf, Fe Sn 3.14m: Jt, 0°, Pln, Rf, Fe Sn 3.2m: Jt, 90°, Cu, Rf, Fe Sn 3.29m: Jt, 10°, Pln, Rf, Fe Sn 3.38m: Jt, 60°, Cu, Rf, Fe Sn 3.46m: Jt, 10°, Pln, Rf, Fe Sn 3.65m: Jt, 80°, Pln, Rf, Fe Sn (~400mm long within core)
	3						100	4.35m: Jt, 10°, Pln, Rf, Fe Sn 4.45m: Jt, 70°, Pln, Rf, Fe Sn 4.75m: Jt, 80°, Pln, Rf, Fe Sn
	4						100	

See standard sheets for details of abbreviations & basis of descriptions

Job No. **12626209**

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Rosny Parklands Rosny Parklands

LOCATION No. BH10

SHEET 2 OF 2

Position : 530019.6 E, 5254099.0 N \
Surface RL : 8.70m
Angle from Horiz. : 90°
Processed : OP
Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH
Date Started : 13 Jun 24
Date Completed : 13 Jun 24
Logged by : OP
Date : 18 Jul 24

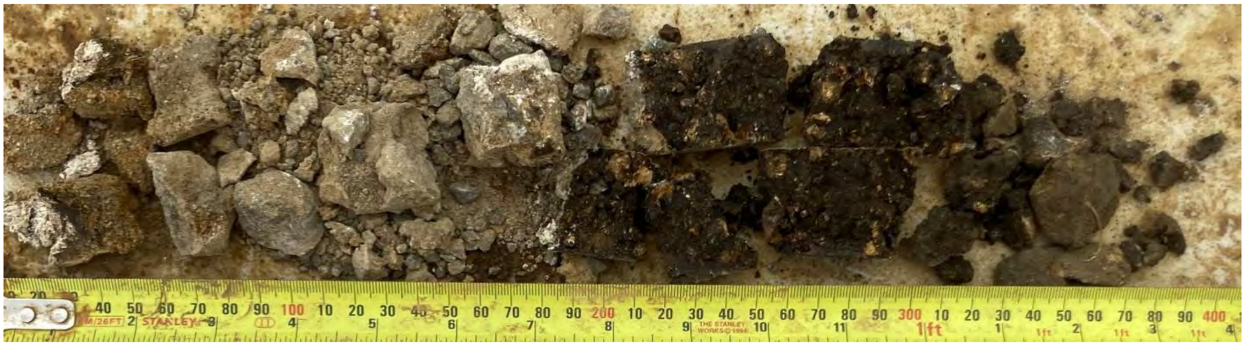
DRILLING				MATERIAL									ADDITIONAL DATA	
SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Core Recovery (%) 20 80	RQD (%)	Defect Spacing (mm) 20 40 100 300 1000	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results	SCALE (m)
		4		5.20										
				(3.50)		EOH at 5.2m - target depth achieved. Standpipe installed upon completion End of hole at 5.2 metres.							Standpipe Construction Details (mBGL): 0.0 - 0.3m: Gatic cover and concrete plug 0.3 - 1.0m: Backfill 1.0 - 1.5m: Bentonite Plug 1.5 - 5.0m: Sand 2.0 - 5.0m: Screen	
6														6
7														7
8														8
9														9
10														10

See standard sheets for details of abbreviations & basis of descriptions

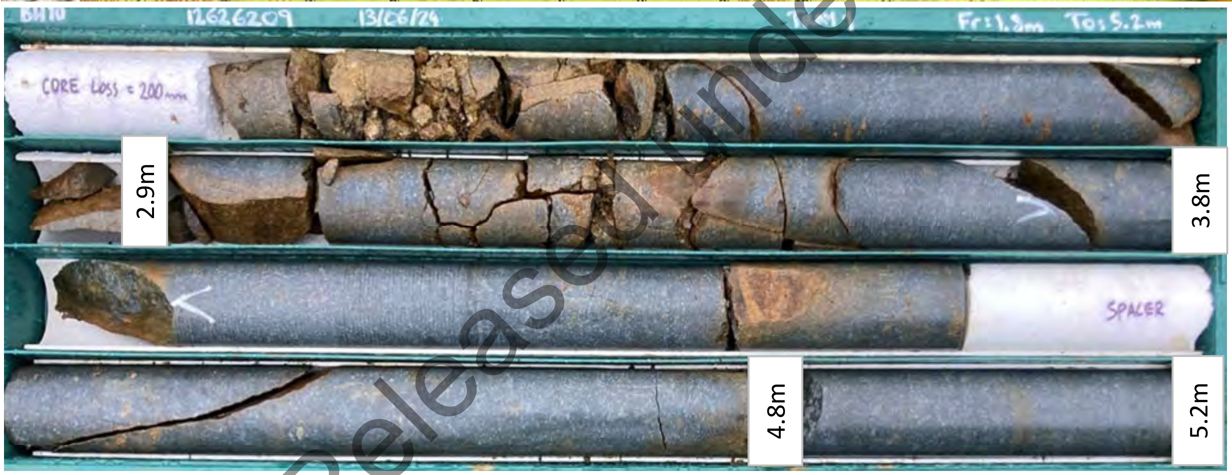
GHD

Job No.
12626209

SPT1 (0.8 - 1.25), N* = R, 220 mm recovered



SPT2 (1.5 - 1.78), N* = R, 220 mm recovered



GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number
12626209

A4

BH10

Title
Rosny Parkland

Photographic Record

Client
Department of State Growth

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park

LOCATION No. BH_C01

SHEET 1 OF 1

Position : 529710.8 E, 5253809.7 N \	**Surface RL :** 23.50m	**Angle from Horiz. :** 90°		**Processed :** AOK
Contractor : South Western Drilling	**Rig Type :** Comacchio Geo 405			**Checked :** ASH
Date Started : 28 May 24	**Date Completed :** 28 May 24	**Logged by :** OP		**Date :** 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
							TOPSOIL: Sandy CLAY, trace gravel, low plasticity, dark-brown, sand is fine to coarse grained, gravel is fine, subangular, w<PL	CL	D-M	St			
					0.30 *(23.20)*		CLAY with sand and gravel, high plasticity, brown, sand is fine to coarse grained, gravel is fine to medium, subangular, w~PL, [Residual Soil]	CH	M	VSt	SPT	SPT @ 0.5m = 10/16/19, N=35 Recovery = 300mm	
					0.70 *(22.80)*		CLAY with sand and gravel, low plasticity, pale-brown, sand is fine to coarse grained, gravel is fine to coarse, subangular, w~PL [XW Dolerite]	CL	M	H			
1													1
					1.30		Start of coring at 1.3 metres. See Core Log Sheet for cored interval.						
2													2
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

CORE LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park Rosny Parklands

LOCATION No. BH_C01

SHEET 1 OF 2

Position : 529710.8 E, 5253809.7 N \ **Surface RL :** 23.50m **Angle from Horiz. :** 90° **Processed :** AOK
Contractor : South Western Drilling **Rig Type :** Comacchio Geo 405 **Checked :** ASH
Date Started : 28 May 24 **Date Completed :** 28 May 24 **Logged by :** OP **Date :** 18 Jul 24

Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
				Start of coring at 1.3 metres. See Soil Log Sheet for soil interval.					
HQ Coring	1	GNO	1.30 *(22.20)*	Sandy CLAY, trace gravel, high plasticity, orange-brown, sand is fine to coarse grained, gravel is fine, subangular, [XW Dolerite]	XW	Soil			
	2								
			2.80 *(20.70)*	CORE LOSS = 600mm					
	3		3.40 *(20.10)*	Sandy CLAY with gravel, high plasticity, orange-brown, sand is fine to medium grained, gravel is HW Dolerite, [XW Dolerite]	XW	Soil			
	4		4.00 *(19.50)*	CORE LOSS = 100mm					
			4.10 *(19.40)*	Sandy CLAY with gravel, high plasticity, orange-brown, sand is fine to medium grained, gravel is HW Dolerite, [XW Dolerite]	XW	Soil			
			4.20 *(19.30)*	DOLERITE, orange-brown, highly fractured, healed defects throughout	HW	L - M	38	Is(50)	4.21m: Jt, 90°, CU, Rf, Fe Sn 4.24m: Jt, 20°, Pln, Rf, Fe Sn 4.28m: Jt, 30°, Cu, Rf, Fe Sn Is(50) (4.3m) = 0.78 MPa 4.36m: Jt, 20°, Pln, Rf, Fe Sn 4.40m: Jt, 20°, Pln, Rf, Fe Sn 4.51m: Jt, 70°, Pln, Rf, Fe Sn, (200mm) 4.62m: Jt, 30°, Pln, Rf, Fe Sn 4.73m: Jt, 50°, Pln, Rf, Fe Sn
			4.80 *(18.70)*	XW at joints					4.80m: Jt, 90°, Cu, Rf, Fe Sn, (200mm)
	5		4.90 *(18.60)*				0		4.93m: Jt, 20°, Pln, Rf, Fe Sn

See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209

CORE LOG SHEET

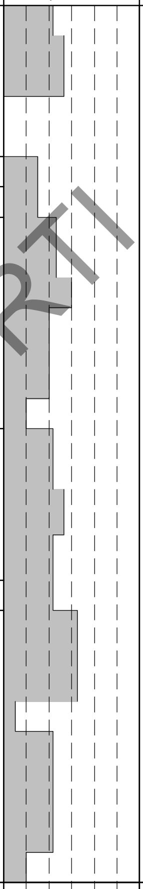
Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park Rosny Parklands

LOCATION No. BH_C01

SHEET 2 OF 2

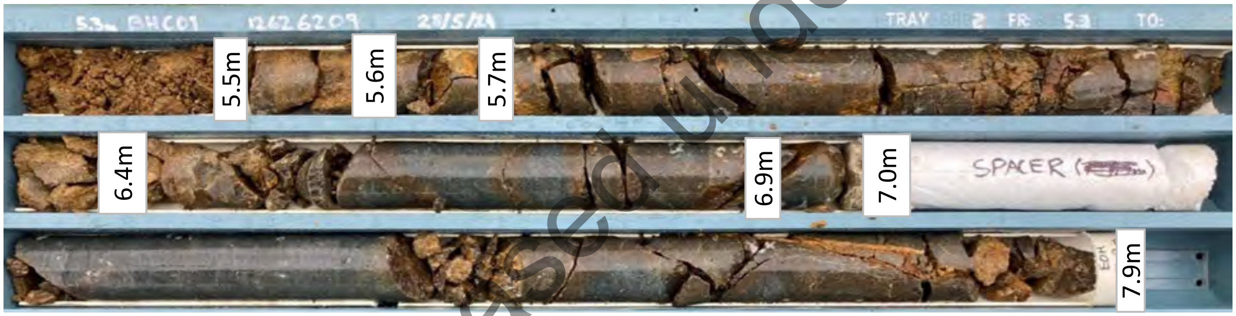
Position : 529710.8 E, 5253809.7 N \ **Surface RL :** 23.50m **Angle from Horiz. :** 90° **Processed :** AOK
Contractor : South Western Drilling **Rig Type :** Comacchio Geo 405 **Checked :** ASH
Date Started : 28 May 24 **Date Completed :** 28 May 24 **Logged by :** OP **Date :** 18 Jul 24

DRILLING				MATERIAL									ADDITIONAL DATA	
SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	Core Recovery (%) 20 80	RQD (%)	Defect Spacing (mm) 20 40 100 300 1000	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results	SCALE (m)
	HQ Coring	5											5.03m: Jt, 20°, Cu, Rf, Fe Sn 5.09m: Jt, 0°, Pln, Rf, Fe Sn 5.21m: Jt, 90°, Cu, Rf, Fe Sn 5.28m: Jt, 10°, Pln, Rf, Fe Sn	
				5.30 (18.20)		Sandy SILT, low plasticity, orange-brown, fine to medium grained [XW Dolerite]	XW	Soil						
		6		5.50 (18.00)		DOLERITE, grey-brown, Fe Sn, highly fractured	HW	M		0			5.56m: Jt, 20°, Pln, Rf, Fe Sn	
		7								0			5.64m: Jt, 60°, Pln, Rf, Fe Sn	
6		8					HW - MW	H - VH		16			5.66m: Jt, 0°, Pln, Rf, Fe Sn 5.73m: Jt, 20°, Pln, Rf, Fe Sn 5.77m: Jt, 20°, Pln, Rf, Fe Sn 5.83m: Jt, 10°, Cu, Rf, Fe Sn 5.87m: Jt, 60°, Cu, Rf, Fe Sn 6.01m: Jt, 10°, Cu, Rf, Fe Sn 6.08m: Jt, 80°, Pln, Rf, Fe Sn 6.1m: Jt, 10°, Pln, Rf, Fe Sn 6.14m: Jt, 10°, Cu, Rf, Fe Sn 6.18m: Jt, 10°, Pln, Rf, Fe Sn 6.24m: Jt, 10°, Pln, Rf, Fe Sn 6.28m: Jt, 80°, Pln, Rf, Fe Sn	6
				6.30 (17.20)		6.3 - 6.6m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam							NOTE: Switched drill bit at 6.4m	
		9					MW			0				
				6.60 (16.90)		Becoming, grey-brown, Fe Sn on joints	MW - SW	EH				Is(50)	6.58m: Jt, 30°, Cu, Rf, Fe Sn 6.64m: Jt, 60°, Pln, Rf, Fe Sn Is(50) (6.65m) = >10 MPa (unable to break) 6.72m: Jt, 30°, Pln, Rf, Fe Sn 6.77m: Jt, 10°, Pln, Rf, Fe Sn 6.81m: Jt, 0°, Pln, Rf, Fe Sn	
7		10								0			6.90m: Jt, 60°, Pln, Rf, Fe Sn	7
		11								33		UCS	7.06m: Jt, 60°, Pln, Rf, Fe Sn UCS (7.06 - 7.31m)	
				7.30 (16.20) 7.32 (16.18)		Becoming MW, grey-brown, Fe Sn 7.32 - 7.4m: Highly fractured zone, recovered as gravel sized fragments of highly weathered dolerite, potential extremely weathered seam	MW	VH					7.32m: Jt, 30°, Pln, Rf, Fe Sn	
												Is(50)	7.44m: Jt, 45°, Pln, Rf, Fe Sn Is(50) (7.45m) = 5.48 MPa 7.54m: Jt, 70°, Pln, Rf, Fe Sn 7.59m: Jt, 45°, Pln, Rf, Fe Sn 7.62m: Jt, 45°, Un, Rf, Fe Sn 7.69m: Jt, 80°, Pln, Rf, Fe Sn, Ca (5mm) 7.74m: Jt, 10°, Un, Rf, Fe Sn 7.79m: Jt, 10°, Un, Rf, Fe Sn	
				7.80 (15.70)		7.8 - 7.9m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite								
8				7.90 (15.60)		EOH @ 7.9m - Target depth reached. End of hole at 7.9 metres.							Soil cased upon completion. Gatic cover installed for protection.	8
9														9
10														10



See standard sheets for details of abbreviations & basis of descriptions

Job No.
12626209



GHD Pty Ltd
2 Salamance Square Hobart TAS 7000

Job Number
12626209
A4
BH_C01

Title
Charles Hand Park
Photographic Record

Client
Department of State Growth

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park

LOCATION No. BH_C02

SHEET 1 OF 1

Position : 529761.4 E, 5253892.8 N \
Surface RL : 25.69m
Angle from Horiz. : 90°
Processed : OP
Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH
Date Started : 28 May 24
Date Completed : 29 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	Solid Flight Auger						TOPSOIL: CLAY, trace sand, high plasticity, dark-brown, sand is fine grained, rootlets, w>PL	CH	M	F-St			
					0.20 (25.49)		CLAY, trace sand, high plasticity, dark-brown, sand is fine grained, trace rootlets, w>PL [Residual Soil]	CH	M	St			
					0.50 (25.19)		with cobbles			VSt-H	U63 SPT	U63 (0.5 - 0.55m) - refusal after 50mm SPT @ 0.55m = 15*/-/-, N = R after 75mm	
					0.70 (24.99)		Clayey GRAVEL with sand, fine to coarse, subangular, pale-brown, clay is low plasticity, sand is fine to coarse grained [XW Dolerite]	GC	D	VSt-H			
1												1.2m: Auger grinding in gravel unit	1
					1.50 (24.19)		Auger refusal at 1.5m. Returned following day to commence HQ coring, but rig had subsided ~300mm in to the topsoil. Rig was moved ~5m NE and restarted. Refer to BH_C02A					Borehole backfilled with spoil	
2													2
3													3
4													4
5													5

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12626209

SOIL LOG SHEET

Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park

LOCATION No. BH_C02A

SHEET 1 OF 1

Position : 529765.0 E, 5253896.0 N \
Surface RL : 23.30m
Angle from Horiz. : 90°
Processed : OP

Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH

Date Started : 29 May 24
Date Completed : 9 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING					MATERIAL							ADDITIONAL DATA	
SCALE (m)	Method	Hole Support	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** Soil Name (USC Symbol) Other Minor Components, Plasticity or Particle Characteristics, Colour, Moisture Condition, Consistency, Structure	Group Symbol	Moisture Condition	Consistency / Relative Density	Samples & Tests	**Comments/Observations** Insitu test results	SCALE (m)
	Solid Flight Auger				0.20		TOPSOIL: CLAY, trace sand, high plasticity, dark-brown, sand is fine grained, rootlets, w>PL	CH	M	St			
					0.60 (22.70)		CLAY, trace sand, high plasticity, dark-brown, sand is fine grained, trace rootlets, w>PL [Residual Soil]	CH	M	St			
1					1.50		Clayey GRAVEL with sand, fine to coarse, subangular, pale-brown, clay is low plasticity, sand is fine to coarse grained [XW Dolerite]	GC	D-M	D			1
2							Start of coring at 1.5 metres. See Core Log Sheet for cored interval.						2
3													3
4													4
5													5

(Depth 0.20 is followed by (23.10) at the base of the topsoil.)

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12626209

CORE LOG SHEET

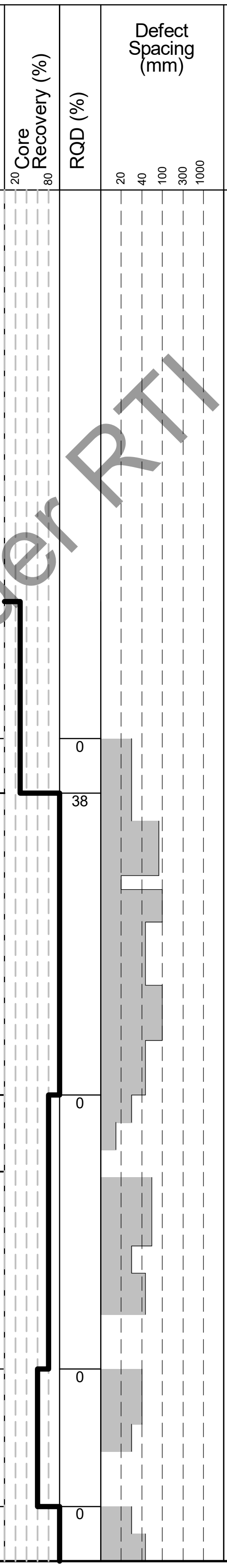
Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park Rosny Parklands

LOCATION No. BH_C02A

SHEET 1 OF 2

Position : 529765.0 E, 5253896.0 N \
Surface RL : 23.30m
Angle from Horiz. : 90°
Processed : OP
Contractor : South Western Drilling
Rig Type : Commachio Geo 405
Checked : ASH
Date Started : 29 May 24
Date Completed : 9 May 24
Logged by : OP
Date : 18 Jul 24

DRILLING				MATERIAL								ADDITIONAL DATA
SCALE (m)	Method	Run	Water	Depth/ (RL)metres	Graphic Log	**Description** ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests		Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
1						Start of coring at 1.5 metres. See Soil Log Sheet for soil interval.						
	HQ Coring	1	GNO	1.50 (21.80)		CORE LOSS = 500mm						
2				2.00 (21.30)		DOLERITE, grey-brown, Fe Sn, highly fractured	HW	M	0			
		2		2.20 (21.10)		Less fractured	HW - MW	VH	38	Is(50)		2.23m: Jt, 10°, Pln, Rf, Fe Sn 2.25m: Jt, 60°, Pln, Rf, Fe Sn 2.32m: Jt, 60°, Pln, Rf, Fe Sn 2.39m: Jt, 0°, Pln, Rf, Fe Sn 2.5m: Jt, 0°, Pln, Rf, Fe Sn 2.52m: Jt, 0°, Pln, Rf, Fe Sn 2.54m: Jt, 10°, Pln, Rf, Fe Sn 2.56m: Jt, 0°, Pln, Rf, Fe Sn 2.67m: Jt, 10°, Pln, Rf, Fe Sn Is(50) (2.7m) = 6.85 MPa 2.72m: Jt, 10°, Pln, Rf, Fe Sn 2.76m: Jt, 80°, Cu, Rf, Fe Sn (100mm) 2.8m: Jt, 20°, Cu, Rf, Fe Sn 2.81m: Jt, 80°, St, Rf, Fe Sn (200mm) 2.89m: Jt, 10°, Pln, Rf, Fe Sn
3		3		3.30 (20.00)		3.3 - 3.5m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam		VH - EH	0	Is(50)		3.01m: Jt, 10°, Un, Rf, Fe Sn 3.1m: Jt, 0°, Pln, Rf, Fe Sn 3.11m: Jt, 80°, Pln, Rf, Fe Sn 3.17m: Jt, 60°, Pln, Rf, Fe Sn 3.22m: Jt, 0°, Cu, Rf, Fe Sn 3.27m: Jt, 0°, Cu, Rf, Fe Sn Is(50) (3.3m) = 10.47 MPa
				3.50 (19.80)		Silty GRAVEL, trace sand, fine to coarse, typically fine, subangular, orange-brown, silt is low plasticity, sand is medium to coarse grained [crushed seam]						3.5 - 3.58m: CSm, sub-horizontal, Sandy GRAVEL, fine to coarse, orange brown
				3.58 (19.72)		DOLERITE, grey-brown, Fe Sn	MW	H				3.58m: Jt, 0°, Pln, Rf, Fe Sn 3.62m: Jt, 10°, Pln, Rf, Fe Sn 3.72m: Jt, 90°, Un, Rf, Fe Sn (400mm) 3.75m: Jt, 60°, Un, Rf, Fe Sn 3.87m: Jt, 0°, Cu, Rf, Fe Sn 3.89m: Jt, 10°, Pln, Rf, Fe Sn 3.91m: Jt, 10°, Pln, Rf, Fe Sn 3.96m: Jt, 60°, Pln, Rf, Fe Sn 4.06m: Jt, 70°, Pln, Rf, Fe Sn (100mm)
4				4.10 (19.20)		CORE LOSS = 200mm						Core loss at 4.1m - possibly from the fratured zone in 3.3 - 3.6m
		4		4.30 (19.00)		DOLERITE, grey-brown, Fe Sn	MW	VH	0			4.36m: Jt, 70°, Cu, Rf, Fe Sn 4.4m: Jt, 80°, Pln, Rf, Fe Sn (200mm) 4.43m: Jt, 60°, Pln, Rf, Fe Sn 4.44m: Jt, 20°, Pln, Rf, Fe Sn
				4.50 (18.80)		4.5 - 4.6m: Highly fractured zone, recovered as cobble and gravel sized fragments of highly weathered dolerite, potential extremely weathered seam						
				4.60 (18.70)		CORE LOSS = 200mm						
		5		4.80 (18.50)		DOLERITE, grey-brown, Fe Sn, fractured	MW	VH	0			4.95m: Jt, 30°, Pln, Rf, Fe Sn 4.97m: Jt, 70°, Pln, Rf, Fe Sn
5												



See standard sheets for details of abbreviations & basis of descriptions

Job No.

12626209

CORE LOG SHEET

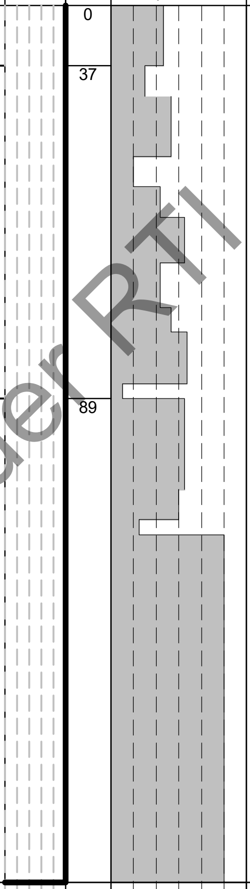
Client : Department of State Growth
Project : AFL Training Facility and High Performance Centre
Location : Charles Hand Park Rosny Parklands

LOCATION No. BH_C02A

SHEET 2 OF 2

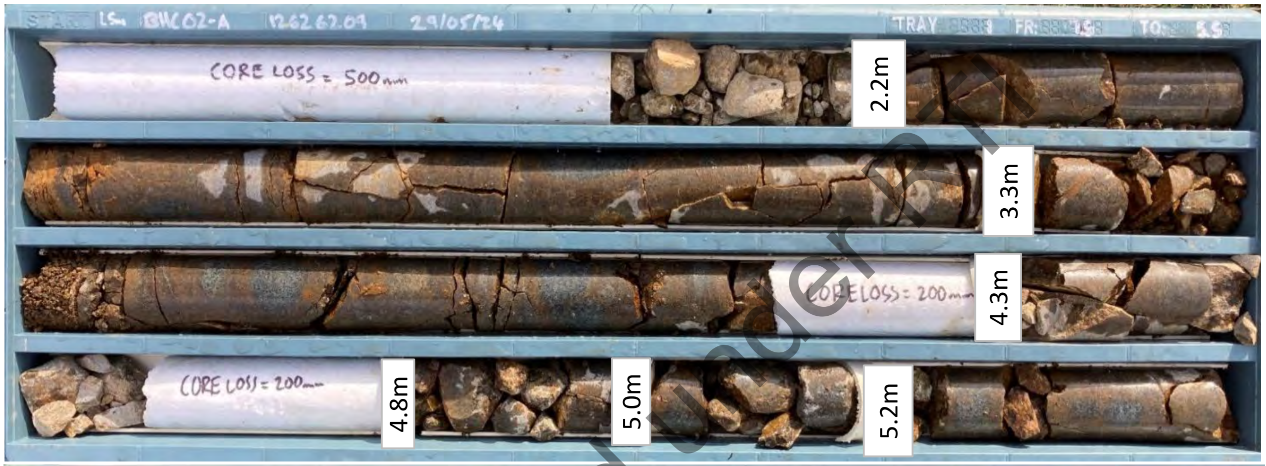
Position : 529765.0 E, 5253896.0 N \ **Surface RL :** 23.30m **Angle from Horiz. :** 90° **Processed :** OP
Contractor : South Western Drilling **Rig Type :** Commachio Geo 405 **Checked :** ASH
Date Started : 29 May 24 **Date Completed :** 9 May 24 **Logged by :** OP **Date :** 18 Jul 24

DRILLING			MATERIAL						ADDITIONAL DATA
Method	Run	Water	Depth/ (RL)metres	Description ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and SOIL TYPE, colour, structure, minor components (origin)	Weathering	Estimated Strength	RQD (%)	Samples & Tests	Joints, partings, seams, zones and veins Fracture type, orientation, infilling or coating, shape, roughness, other Insitu test results
HQ Coring	6		5.20 (18.10)		MW		0	Is(50)	Is(50) (8.0m) = 6.66 MPa
	7		6.30 (17.00)	DOLERITE, grey-brown to blue-grey, Fe Sn on joints	MW - SW	VH	37	Is(50)	5.3m: Jt, 30°, Un, Rf, Fe Sn 5.35m: Jt, 10°, Un, Rf, Fe Sn 5.54m: Jt, 10°, Un, Rf, Fe Sn 5.6m: Jt, 0°, Pln, Rf, Fe Sn 5.61m: Jt, 70°, Cu, Rf, Fe Sn Is(50) (5.8m) = 6.12 MPa 5.83m: Jt, 10°, Pln, Rf, Fe Sn 5.88m: Jt, 10°, Pln, Rf, Fe Sn 5.95m: Jt, 10°, Pln, Rf, Fe Sn 6.01m: Jt, 10°, Pln, Rf, Fe Sn 6.08m: Jt, 10°, Pln, Rf, Fe Sn 6.25m: Jt, 10°, Pln, Rf, Fe Sn
	8		7.90 (15.40)	blue-grey, slight Fe Sn on joints	SW - Fr	VH - EH	89	Is(50) Is(50)	6.28m: WSm, 10mm, clay 6.43m: Jt, 10°, Pln, Rf, Fe Sn Is(50) (6.5m) = 5.5 MPa 6.56m: Jt, 40°, Pln, Rf, Fe Sn 6.65m: Jt/WSm, 0°, 10mm, Fe Sn 6.73m: Jt, 10°, Cu, Rf, Fe Sn 6.75 - 7.9m: Healed defects broken to fit into core box Is(50) (7.0m) = >10 MPa (unable to break)
				EOH at 7.9m - target depth reached. End of hole at 7.9 metres.					Soil cased upon completion. Gatic cover installed for protection.



See standard sheets for details of abbreviations & basis of descriptions

Job No. **12626209**



GHD Pty Ltd

2 Salamance Square Hobart TAS 7000

Job Number		Title	Client
12626209	A4	Charles Hand Park	Department of State Growth
BH_C02A		Photographic Record	

Appendix G

Laboratory test certificates

ADG LABORATORIES

Materials Testing Laboratories

Unit 8a 121 Mornington Road Mornington   Ph (03) 62446884 Fax (03) 62451498   ACN 117 593 254

Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/783**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP01 0.3-0.6m**
Test Report No.	**0047/24/4H/AA**

Test Description	Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit	3.1.2	**44**	%	Air dried dry sieved		
Plastic Limit	3.2.1	**17**	%			
Plasticity Index	3.3.1	**27**	%			
Linear Shrinkage	3.4.1	**11**	%	curling -	cracking y	crumbling -
Maximum Dry Density	5.2.1	**1.65**	t/m^3			
Optimum Moisture Content	5.2.1	**19.0**	%			
Moisture Content	2.1.1	**14.1**	%	as received		
Particle Size Distribution	3.6.1					
mm						
finer than 75			%			
53			%			
37.5			%			
26.5			%			
19			%			
13.2			%			
9.5			%			
6.7		**100**	%			
4.75		**99**	%			
2.36		**96**	%			
1.18		**93**	%			
0.600		**89**	%			
0.425		**87**	%			
0.300		**83**	%			
0.150		**75**	%			
0.075		**63**	%			

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/784**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP03 1.2-1.6m**
Test Report No.	**0047/24/4H/AB**

Test Description		Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit		3.1.2	**71**	%	Air dried dry sieved		
Plastic Limit		3.2.1	**21**	%			
Plasticity Index		3.3.1	**50**	%			
Linear Shrinkage		3.4.1	**16**	%	curling -	cracking -	crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used		
Maximum Dry Density		5.2.1	**1.41**	t/m^3			
Optimum Moisture Content		5.2.1	**30.4**	%			
Moisture Content		2.1.1	**32.5**	%	as received		
Particle Size Distribution		3.6.1					
	mm						
finer than	75			%			
	53			%			
	37.5			%			
	26.5			%			
	19			%			
	13.2			%			
	9.5			%			
	6.7			%			
	4.75		**100**	%			
	2.36		**99**	%			
	1.18		**97**	%			
	0.600		**93**	%			
	0.425		**89**	%			
	0.300		**84**	%			
	0.150		**76**	%			
	0.075		**75**	%			

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/786**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP04 0.6-0.8m**
Test Report No.	**0047/24/4H/AD**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**53**	%	Air dried dry sieved
Plastic Limit	3.2.1	**26**	%	
Plasticity Index	3.3.1	**27**	%	
Linear Shrinkage	3.4.1	**11**	%	curling - cracking y crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Moisture Content	2.1.1	**19.1**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75		**100**	%	
2.36		**98**	%	
1.18		**88**	%	
0.600		**77**	%	
0.425		**72**	%	
0.300		**66**	%	
0.150		**54**	%	
0.075		**43**	%	

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ACN 117 593 254

Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/787**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP05 0.8-1.0m**
Test Report No.	**0047/24/4H/AE**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**57**	%	Air dried dry sieved
Plastic Limit	3.2.1	**18**	%	
Plasticity Index	3.3.1	**39**	%	
Linear Shrinkage	3.4.1	**11**	%	curling - cracking - crumbling -
Moisture Content	2.1.1	**18.8**	%	as received
Particle Size Distribution	3.6.1			
finer than mm 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75		**100**	%	
2.36		**99**	%	
1.18		**97**	%	
0.600		**93**	%	
0.425		**91**	%	
0.300		**87**	%	
0.150		**79**	%	
0.075		**68**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/788**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP06 0.4-0.7m**
Test Report No.	**0047/24/4H/AF**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**50**	%	Air dried dry sieved
Plastic Limit		3.2.1	**22**	%	
Plasticity Index		3.3.1	**28**	%	
Linear Shrinkage		3.4.1	**8**	%	curling - cracking - crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used
Moisture Content		2.1.1	**15.0**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2			%	
	9.5			%	
	6.7			%	
	4.75			%	
	2.36			%	
	1.18			%	
	0.600			%	
	0.425			%	
	0.300			%	
	0.150			%	
	0.075			%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/789**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP08 0.2-0.7m**
Test Report No.	**0047/24/4H/AG**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**51**	%	Air dried dry sieved
Plastic Limit	3.2.1	**18**	%	
Plasticity Index	3.3.1	**33**	%	
Linear Shrinkage	3.4.1	**13**	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Maximum Dry Density	5.2.1	**1.63**	t/m^3	
Optimum Moisture Content	5.2.1	**21.4**	%	
Moisture Content	2.1.1	**16.9**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75		**100**	%	
2.36		**97**	%	
1.18		**90**	%	
0.600		**84**	%	
0.425		**80**	%	
0.300		**76**	%	
0.150		**69**	%	
0.075		**61**	%	

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1289-psd-0617

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/791**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP15 0.3-0.5m**
Test Report No.	**0047/24/4H/AI**

Test Description		Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit		3.1.2	**54**	%	Air dried dry sieved		
Plastic Limit		3.2.1	**18**	%			
Plasticity Index		3.3.1	**36**	%			
Linear Shrinkage		3.4.1	**14**	%	curling -	cracking -	crumbling -
Maximum Dry Density		5.2.1	**1.66**	t/m^3			
Optimum Moisture Content		5.2.1	**20.0**	%			
Moisture Content		2.1.1	**15.0**	%	as received		
Particle Size Distribution		3.6.1					
	mm						
finer than	75			%			
	53			%			
	37.5			%			
	26.5			%			
	19			%			
	13.2			%			
	9.5			%			
	6.7			%			
	4.75		**100**	%			
	2.36		**98**	%			
	1.18		**93**	%			
	0.600		**84**	%			
	0.425		**79**	%			
	0.300		**75**	%			
	0.150		**68**	%			
	0.075		**58**	%			

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/792**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP16 0.2-0.4m**
Test Report No.	**0047/24/4H/AJ**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**51**	%	Air dried dry sieved
Plastic Limit		3.2.1	**19**	%	
Plasticity Index		3.3.1	**32**	%	
Linear Shrinkage		3.4.1	**14**	%	curling y cracking - crumbling -
Maximum Dry Density		5.2.1	**1.64**	t/m^3	
Optimum Moisture Content		5.2.1	**20.2**	%	
Moisture Content		2.1.1	**15.3**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2		**100**	%	
	9.5		**99**	%	
	6.7		**98**	%	
	4.75		**98**	%	
	2.36		**96**	%	
	1.18		**93**	%	
	0.600		**86**	%	
	0.425		**82**	%	
	0.300		**78**	%	
	0.150		**72**	%	
	0.075		**62**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/793**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP18 0.2-0.5m**
Test Report No.	**0047/24/4H/AK**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**68**	%	Air dried dry sieved
Plastic Limit		3.2.1	**19**	%	
Plasticity Index		3.3.1	**49**	%	
Linear Shrinkage		3.4.1	**17**	%	curling - cracking - crumbling -
Moisture Content		2.1.1	**22.6**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2			%	
	9.5			%	
	6.7		**100**	%	
	4.75		**99**	%	
	2.36		**99**	%	
	1.18		**97**	%	
	0.600		**94**	%	
	0.425		**92**	%	
	0.300		**89**	%	
	0.150		**84**	%	
	0.075		**75**	%	

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Unit 8a 121 Mornington Road Mornington Ph (03) 62446884 Fax (03) 62451498 ACN 117 593 254 1of1

Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/794**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP19 1.1-1.4m**
Test Report No.	**0047/24/4H/AL**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**38**	%	Air dried dry sieved
Plastic Limit	3.2.1	**25**	%	
Plasticity Index	3.3.1	**13**	%	
Linear Shrinkage	3.4.1	**6**	%	curling - cracking y crumbling -
Maximum Dry Density	5.2.1	**1.79**	t/m^3	
Optimum Moisture Content	5.2.1	**17.2**	%	
Moisture Content	2.1.1	**9.9**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5		**100**	%	
26.5		**99**	%	
19		**99**	%	
13.2		**99**	%	
9.5		**98**	%	
6.7		**98**	%	
4.75		**97**	%	
2.36		**92**	%	
1.18		**66**	%	
0.600		**44**	%	
0.425		**36**	%	
0.300		**30**	%	
0.150		**22**	%	
0.075		**16**	%	

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Unit 8a 121 Mornington Road Mornington Ph (03) 62446884 Fax (03) 62451498 ACN 117 593 254 1of1

Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/795**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Grey/Brown Sandy Gravel**
Sampled By	**Client**
Client Identification	**TP20 0.7-0.85m**
Test Report No.	**0047/24/4H/AM**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**38**	%	Air dried dry sieved
Plastic Limit		3.2.1	**24**	%	
Plasticity Index		3.3.1	**14**	%	
Linear Shrinkage		3.4.1	**8**	%	curling - cracking y crumbling -
Moisture Content		2.1.1	**9.8**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5		**100**	%	
	19		**99**	%	
	13.2		**97**	%	
	9.5		**93**	%	
	6.7		**88**	%	
	4.75		**82**	%	
	2.36		**70**	%	
	1.18		**48**	%	
	0.600		**32**	%	
	0.425		**28**	%	
	0.300		**25**	%	
	0.150		**20**	%	
	0.075		**17**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/796**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP22 0.2-0.6m**
Test Report No.	**0047/24/4H/AN**

Test Description	Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit	3.1.2	**59**	%	Air dried dry sieved		
Plastic Limit	3.2.1	**19**	%			
Plasticity Index	3.3.1	**40**	%			
Linear Shrinkage	3.4.1	**13**	%	curling -	cracking y	crumbling -
Maximum Dry Density	5.2.1	**1.63**	t/m^3			
Optimum Moisture Content	5.2.1	**21.4**	%			
Moisture Content	2.1.1	**15.4**	%	as received		
Particle Size Distribution	3.6.1					
mm						
finer than 75			%			
53			%			
37.5			%			
26.5			%			
19			%			
13.2			%			
9.5			%			
6.7			%			
4.75		**100**	%			
2.36		**99**	%			
1.18		**94**	%			
0.600		**86**	%			
0.425		**82**	%			
0.300		**79**	%			
0.150		**73**	%			
0.075		**64**	%			

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/797**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP22 0.6-0.8m**
Test Report No.	**0047/24/4H/AO**

Test Description		Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit		3.1.2	**52**	%	Air dried dry sieved		
Plastic Limit		3.2.1	**24**	%			
Plasticity Index		3.3.1	**28**	%			
Linear Shrinkage		3.4.1	**11**	%	curling -	cracking -	crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used		
Maximum Dry Density		5.2.1	**1.53**	t/m^3			
Optimum Moisture Content		5.2.1	**23.1**	%			
Moisture Content		2.1.1	**17.4**	%	as received		
Particle Size Distribution		3.6.1					
	mm						
finer than	75			%			
	53			%			
	37.5			%			
	26.5			%			
	19			%			
	13.2			%			
	9.5		**100**	%			
	6.7		**98**	%			
	4.75		**96**	%			
	2.36		**88**	%			
	1.18		**75**	%			
	0.600		**62**	%			
	0.425		**57**	%			
	0.300		**53**	%			
	0.150		**47**	%			
	0.075		**40**	%			

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/798**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Gravel**
Sampled By	**Client**
Client Identification	**BH01 0.5-0.7m**
Test Report No.	**0047/24/4H/AP**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**-**	%	Air dried dry sieved
Plastic Limit	3.2.1	**-**	%	
Plasticity Index	3.3.1	**-**	%	
Linear Shrinkage	3.4.1	**-**	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Moisture Content	2.1.1	**7.9**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75			%	
2.36			%	
1.18			%	
0.600			%	
0.425			%	
0.300			%	
0.150			%	
0.075			%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/799**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Mottled Brown Clayey Sand**
Sampled By	**Client**
Client Identification	**BH02 0.5-0.9m**
Test Report No.	**0047/24/4H/AQ**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	-	%	Air dried dry sieved
Plastic Limit	3.2.1	-	%	
Plasticity Index	3.3.1	-	%	
Linear Shrinkage	3.4.1	-	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Moisture Content	2.1.1	**18.8**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75			%	
2.36			%	
1.18			%	
0.600			%	
0.425			%	
0.300			%	
0.150			%	
0.075			%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/800**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TPC01 0.3-0.6m**
Test Report No.	**0047/24/4H/AR**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**79**	%	Air dried dry sieved
Plastic Limit		3.2.1	**22**	%	
Plasticity Index		3.3.1	**57**	%	
Linear Shrinkage		3.4.1	**15**	%	curling - cracking - crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used
Moisture Content		2.1.1	**31.6**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2			%	
	9.5			%	
	6.7			%	
	4.75		**100**	%	
	2.36		**99**	%	
	1.18		**94**	%	
	0.600		**87**	%	
	0.425		**84**	%	
	0.300		**80**	%	
	0.150		**74**	%	
	0.075		**69**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/801**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Clayey Sand**
Sampled By	**Client**
Client Identification	**TPC01 0.8-1.0m**
Test Report No.	**0047/24/4H/AS**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**43**	%	Air dried dry sieved
Plastic Limit	3.2.1	**25**	%	
Plasticity Index	3.3.1	**18**	%	
Linear Shrinkage	3.4.1	**15**	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Maximum Dry Density	5.2.1	**1.69**	t/m^3	
Optimum Moisture Content	5.2.1	**20.2**	%	
Moisture Content	2.1.1	**13.4**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75		**100**	%	
2.36		**93**	%	
1.18		**68**	%	
0.600		**44**	%	
0.425		**36**	%	
0.300		**30**	%	
0.150		**22**	%	
0.075		**16**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/803**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TPC03 0.5-0.8m**
Test Report No.	**0047/24/4H/AU**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**78**	%	Air dried dry sieved
Plastic Limit		3.2.1	**22**	%	
Plasticity Index		3.3.1	**56**	%	
Linear Shrinkage		3.4.1	**18**	%	curling y cracking - crumbling -
Moisture Content		2.1.1	**22.5**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2			%	
	9.5			%	
	6.7			%	
	4.75		**100**	%	
	2.36		**99**	%	
	1.18		**95**	%	
	0.600		**89**	%	
	0.425		**86**	%	
	0.300		**82**	%	
	0.150		**76**	%	
	0.075		**70**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/804**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Grey/Brown Gravelly Sand**
Sampled By	**Client**
Client Identification	**TPC03 0.9-1.1m**
Test Report No.	**0047/24/4H/AV**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**37**	%	Air dried dry sieved
Plastic Limit		3.2.1	**22**	%	
Plasticity Index		3.3.1	**15**	%	
Linear Shrinkage		3.4.1	**7**	%	curling - cracking - crumbling -
Moisture Content		2.1.1	**6.9**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5		**100**	%	
	26.5		**99**	%	
	19		**97**	%	
	13.2		**94**	%	
	9.5		**91**	%	
	6.7		**86**	%	
	4.75		**80**	%	
	2.36		**65**	%	
	1.18		**44**	%	
	0.600		**27**	%	
	0.425		**21**	%	
	0.300		**18**	%	
	0.150		**14**	%	
	0.075		**13**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/806**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Mottled Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**BH06 0.5-0.9m**
Test Report No.	**0047/24/4H/AW**

Test Description		Test Method **AS 1289**	Results	Units	Remarks		
Liquid Limit		3.1.2	-	%	Air dried dry sieved		
Plastic Limit		3.2.1	-	%			
Plasticity Index		3.3.1	-	%			
Linear Shrinkage		3.4.1	-	%	curling -	cracking -	crumbling -
Moisture Content		2.1.1	**17.7**	%	as received		
Particle Size Distribution		3.6.1					
	mm						
finer than	75			%			
	53			%			
	37.5			%			
	26.5			%			
	19			%			
	13.2			%			
	9.5			%			
	6.7			%			
	4.75			%			
	2.36			%			
	1.18			%			
	0.600			%			
	0.425			%			
	0.300			%			
	0.150			%			
	0.075			%			

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Unit 8a 121 Mornington Road Mornington Ph (03) 62446884 Fax (03) 62451498 ACN 117 593 254

Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/807**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Mottled Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**BH10 0.5-0.8m**
Test Report No.	**0047/24/4H/AX**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	-	%	Air dried dry sieved
Plastic Limit	3.2.1	-	%	
Plasticity Index	3.3.1	-	%	
Linear Shrinkage	3.4.1	-	%	curling - cracking - crumbling -
Moisture Content	2.1.1	**13.7**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75			%	
2.36			%	
1.18			%	
0.600			%	
0.425			%	
0.300			%	
0.150			%	
0.075			%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/785**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Sandy Clay**
Sampled By	**Client**
Client Identification	**TP03 1.6-2.0m**
Test Report No.	**0047/24/4H/AC**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**63**	%	Air dried dry sieved
Plastic Limit		3.2.1	**15**	%	
Plasticity Index		3.3.1	**48**	%	
Linear Shrinkage		3.4.1	**13**	%	curling - cracking y crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used
Maximum Dry Density		5.2.1	**1.57**	t/m³	
Optimum Moisture Content		5.2.1	**26.0**	%	
Moisture Content		2.1.1	**27.2**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2		**100**	%	
	9.5		**99**	%	
	6.7		**99**	%	
	4.75		**99**	%	
	2.36		**98**	%	
	1.18		**95**	%	
	0.600		**89**	%	
	0.425		**86**	%	
	0.300		**82**	%	
	0.150		**75**	%	
	0.075		**68**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/788**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Grey/Brown Silty Clayey Sand**
Sampled By	**Client**
Client Identification	**TP06 0.4-0.7m**
Test Report No.	**0047/24/4H/AF-r**

Test Description		Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit		3.1.2	**50**	%	Air dried dry sieved
Plastic Limit		3.2.1	**22**	%	
Plasticity Index		3.3.1	**28**	%	
Linear Shrinkage		3.4.1	**8**	%	curling - cracking - crumbling -
Emerson Class Number		3.8.1	**6**		distilled water used
Moisture Content		2.1.1	**15.0**	%	as received
Particle Size Distribution		3.6.1			
	mm				
finer than	75			%	
	53			%	
	37.5			%	
	26.5			%	
	19			%	
	13.2			%	
	9.5			%	
	6.7			%	
	4.75			%	
	2.36		**100**	%	
	1.18		**92**	%	
	0.600		**82**	%	
	0.425		**77**	%	
	0.300		**71**	%	
	0.150		**61**	%	
	0.075		**49**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/790**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Clayey Sand**
Sampled By	**Client**
Client Identification	**TP11 0.4-0.66m**
Test Report No.	**0047/24/4H/AH**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**31**	%	Air dried dry sieved
Plastic Limit	3.2.1	**25**	%	
Plasticity Index	3.3.1	**16**	%	
Linear Shrinkage	3.4.1	**4**	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Maximum Dry Density	5.2.1	**1.62**	t/m^3	
Optimum Moisture Content	5.2.1	**19.9**	%	
Moisture Content	2.1.1	**15.2**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7		**100**	%	
4.75		**99**	%	
2.36		**97**	%	
1.18		**87**	%	
0.600		**76**	%	
0.425		**70**	%	
0.300		**65**	%	
0.150		**56**	%	
0.075		**46**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/802**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Brown Clayey Sand**
Sampled By	**Client**
Client Identification	**TPC02 0.2-0.4m**
Test Report No.	**0047/24/4H/AT**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**62**	%	Air dried dry sieved
Plastic Limit	3.2.1	**18**	%	
Plasticity Index	3.3.1	**44**	%	
Linear Shrinkage	3.4.1	**16**	%	curling - cracking - crumbling -
Emerson Class Number	3.8.1	**6**		distilled water used
Maximum Dry Density	5.2.1	**1.51**	t/m^3	
Optimum Moisture Content	5.2.1	**27.6**	%	
Moisture Content	2.1.1	**24.5**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5		**100**	%	
6.7		**99**	%	
4.75		**99**	%	
2.36		**99**	%	
1.18		**95**	%	
0.600		**90**	%	
0.425		**86**	%	
0.300		**83**	%	
0.150		**76**	%	
0.075		**69**	%	

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Client	**GHD**
Project	**AFL High Performance Centre**
Location	**Rosny**
Project No.	**0047/24/4H**
Sample No.	**H24/806**
Date Received	**18/6/2024**
Date Tested	**3/7/2024**
Sample Description	**Mottled Brown Sandy Silty Clay**
Sampled By	**Client**
Client Identification	**BH06 0.5-0.9m**
Test Report No.	**0047/24/4H/AW-r**

Test Description	Test Method **AS 1289**	Results	Units	Remarks
Liquid Limit	3.1.2	**60**	%	Air dried dry sieved
Plastic Limit	3.2.1	**17**	%	
Plasticity Index	3.3.1	**43**	%	
Linear Shrinkage	3.4.1	**10**	%	curling - cracking - crumbling -
Moisture Content	2.1.1	**17.7**	%	as received
Particle Size Distribution	3.6.1			
mm				
finer than 75			%	
53			%	
37.5			%	
26.5			%	
19			%	
13.2			%	
9.5			%	
6.7			%	
4.75			%	
2.36		**100**	%	
1.18		**97**	%	
0.600		**95**	%	
0.425		**93**	%	
0.300		**91**	%	
0.150		**87**	%	
0.075		**81**	%	

NATA

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Accreditation No 16752

Out of scope
Approved Signatory
Out of scope

16/7/2024
Date of issue

SOAKED CBR TEST
AS 1289 6.1.1, 2.1.1

ADG LABORATORIES
materials testing laboratories
Unit 8a 121 Mornington Rd Ph (03) 6244 6884 Fax 03 6245 1498 ACN 117 593 254

client	**GHD**
project	**High Performance Centre**
location	**rosny**
project no	**0047/24/4H**
sample no	**H24/783**
date received	**18/6/2024**
date tested	**8/7/2024**
sample identification	**TP01 0.3-0.6m**
sampled by	**Client**
test report no	**0047/24/4H/AY**

compaction details 1		
test method		AS 1289 5.1.1 Standard Compaction
maximum dry density	t/m^3	1.65
optimum moisture content	%	19.0
field moisture content	%	14.1
compaction details 2		
required density ratio for remoulding	%	100
retained 19mm (not replaced)	%	NA
specimen details before soaking		
dry density ratio	%	100.0
moisture ratio	%	99.5
test details		
period of soaking	days	4
moisture content top 30mm	%	28.2
surcharge mass	kgs	4.5
swell	%	1.8
C.B.R. VALUE		**3**
penetration	mm	2.5

remarks -

Out of scope

9/7/2024

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date of issue

SOAKED CBR TEST
AS 1289 6.1.1, 2.1.1

ADG LABORATORIES

materials testing laboratories

Unit 8a 121 Mornington Rd Ph (03) 6244 6884 Fax 03 6245 1498 ACN 117 593 254

client	**GHD**
project	**High Performance Centre**
location	**rosny**
project no	**0047/24/4H**
sample no	**H24/786**
date received	**18/6/2024**
date tested	**8/7/2024**
sample identification	**TP22 0.2-0.6m**
sampled by	**Client**
test report no	**0047/24/4H/AZ**

compaction details 1		
test method		AS 1289 5.1.1 Standard Compaction
maximum dry density	t/m^3	1.63
optimum moisture content	%	21.4
field moisture content	%	16.7
compaction details 2		
required density ratio for remoulding	%	100
retained 19mm (not replaced)	%	NA
specimen details before soaking		
dry density ratio	%	102.0
moisture ratio	%	98.5
test details		
period of soaking	days	4
moisture content top 30mm	%	32.8
surcharge mass	kgs	4.5
swell	%	4.5
C.B.R. VALUE		**1.5**
penetration	mm	2.5

remarks -

Out of scope

9/7/2024

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date of issue

SOAKED CBR TEST
AS 1289 6.1.1, 2.1.1

ADG LABORATORIES

materials testing laboratories

Unit 8a 121 Mornington Rd Ph (03) 6244 6884 Fax 03 6245 1498 ACN 117 593 254

client	**GHD**
project	**High Performance Centre**
location	**rosny**
project no	**0047/24/4H**
sample no	**H24/787**
date received	**18/6/2024**
date tested	**8/7/2024**
sample identification	**TP22 0.6-0.8m**
sampled by	**Client**
test report no	**0047/24/4H/BA**

compaction details 1		
test method		AS 1289 5.1.1 Standard Compaction
maximum dry density	t/m^3	1.53
optimum moisture content	%	23.1
field moisture content	%	17.9
compaction details 2		
required density ratio for remoulding	%	100
retained 19mm (not replaced)	%	NA
specimen details before soaking		
dry density ratio	%	98.5
moisture ratio	%	102
test details		
period of soaking	days	4
moisture content top 30mm	%	33.4
surcharge mass	kgs	4.5
swell	%	4.2
C.B.R. VALUE		**2**
penetration	mm	5.0

remarks -

Out of scope

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Laboratory Accreditation No 16752

Approved Signatory

Out of scope

9/7/2024

date of issue

SOAKED CBR TEST
AS 1289 6.1.1, 2.1.1

ADG LABORATORIES

materials testing laboratories

Unit 8a 121 Mornington Rd   Ph (03) 6244 6884 Fax 03 6245 1498   ACN 117 593 254

client	**GHD**
project	**High Performance Centre**
location	**rosny**
project no	**0047/24/4H**
sample no	**H24/802**
date received	**18/6/2024**
date tested	**8/7/2024**
sample identification	**TPC02 0.2-0.4m**
sampled by	**Client**
test report no	**0047/24/4H/BB**

compaction details 1		
test method		AS 1289 5.1.1 Standard Compaction
maximum dry density	t/m^3	1.51
optimum moisture content	%	27.6
field moisture content	%	25.5
compaction details 2		
required density ratio for remoulding	%	100
retained 19mm (not replaced)	%	NA
specimen details before soaking		
dry density ratio	%	100.0
moisture ratio	%	99
test details		
period of soaking	days	4
moisture content top 30mm	%	38.1
surcharge mass	kgs	4.5
swell	%	1.9
C.B.R. VALUE		**1**
penetration	mm	5.0

remarks -

Out of scope

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Laboratory Accreditation No 16752

Approved Signatory
Out of scope

9/7/2024
date of issue

Sydney Laboratory
Unit 5 / 43 Herbert S
Artarmon NSW 2064
email: Out of scope @ghd.com.a
web: ghd.com.au/ghdgeotechnic
Tel: (02) 9462 486
Fax: (02) 9462 471

Uniaxial Compressive Strength - Report

Report No: SYD2401413
Issue No: 1

Client:	Department of State Growth
Project:	AFL High Performance Centre Strategic Allig
Location:	Tasmania
Job No.:	12626209

Accredited for compliance with ISO / IEC 17025 - Testing
Laboratory Accreditation No. 679

Out of scope

Authorised signatory: Out of scope

Date of Issue: 4/07/2024

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Test Method: AS4133.4.2.2 and AS4133.4.2.1
Storage History: Tested as received, wrapped

Sample ID:	SYD24-0223-01	SYD24-0223-0	SYD24-0223-0	SYD24-0223-0	SYD24-0223-0
Client Sample ID:					
Borehole No.:	BH04	BH04	BH05	BH05	BH_C01
Depth (m):	7.64 - 7.80	12.40 - 12.55	9.07 - 9.26	11.51 - 11.75	7.06 - 7.31
Date Sampled:	23/05/2024	23/05/2024	24/05/2024	24/05/2024	28/05/2024
Date Tested:	27/06/2024	27/06/2024	27/06/2024	28/06/2024	28/06/2024
Sample Description:	Dolerite	Dolerite	Dolerite	Dolerite	Dolerite

Test Results

Sample Height (mm):	142.4	135.8	157.6	162.6	161.4
Sample Diameter (mm):	60.9	60.9	60.9	60.9	60.8
Sample Height/Diameter Ratio:	2.3	2.2	2.6	2.7	2.7
Sample Dry Density (t/m3):	2.753	2.720	2.756	2.824	2.829
Moisture Content (%):	1.5	1.4	1.2	0.5	0.4
Time of Failure (min):	27.4	8.1	11.1	36.4	35.3
Uniaxial compressive strength (MPa):	**51.6**	**25.8**	**41.6**	**171**	**293**
Mode of Failure:	Axial Multiple	Axial Multiple	Axial Multiple	Shattered	Shattered

Specimen Comments:
Where rock strength is likely to exceed
50 Mpa, ends are ground flat to 0.02mm

Comments (if applicable):

Note 1	The length to diameter ratio falls outside the test method limits of 2.5:1 to 3:1.
Note 2	Specimen sides not straight to within 0.3mm
Note 3	Specimen ends not parallel or at right angles
Note 4	(T229) The length to diameter ratio falls outside the test method limits of 2.0:1 to 2.5:1.
Note 5	Maximum load falls below the limit of performance of compression machine

Testing machine Matest - 2000 kN

Sydney Laboratory
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Artarmon NSW 2064
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web: ghd.com.au/ghdgeotechnics
Tel: (02) 9462 4860
Fax: (02) 9462 4710

Uniaxial Compressive Strength - Report

Report No: SYD2401413
Issue No: 1

Client: Department of State Growth
Project: AFL High Performance Centre Strategic Allig
Location: Tasmania
Job No.: 12626209

Accredited for compliance
with ISO / IEC 17025
Laboratory Accreditation No. 679

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Photographs


BH04
7.64 - 7.80


BH04
12.40 - 12.55


BH05
9.07 - 9.26


BH05
11.51 - 11.75


BH_C01
7.06 - 7.31

Sydney Laboratory
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Artarmon NSW 2064
email: Out of scope@ghd.com.au
web: ghd.com.au/ghdgeotechnics
Tel: (02) 9462 4860
Fax: (02) 9462 4710

Report No: SYD2401414
Issue No: 1

Point Load Strength Index - Report

Client: Department of State Growth
Project: AFL High Performance Centre
Location: Hobart TAS
Job No.: 12626209
Borehole / Sample No.: see below / SYD24-0223-02
Test Method: AS4133.4.1

Accredited for compliance with
ISO / IEC 17025 - Testing
Laboratory Accreditation No. 679
Out of scope

Authorised Signatory: Out of scope

Date of issue : 4/07/24

Test Results

Depth (m)	Test Type (D,A,I)	Dimensions D (mm)	L (mm)	W (mm)	De (mm)	Results Load, P (kN)	Failure Mode (1,2,3..)	Is (MPa)	Is_{50} (MPa)	Sample Description Rock Type	Structure	Moisture
TP02	I	32.6		42.6	42.1	1.54	3	0.87	**0.81**	Dol	MA	As Drilled
1.6-1.7	I	32.8		38.8	40.3	2.23	3	1.38	**1.25**	Dol	MA	As Drilled
	I	33.0		40.0	41.0	1.44	3	0.86	**0.78**	Dol	MA	As Drilled
	I	30.9		64.0	50.2	2.04	3	0.81	**0.81**	Dol	MA	As Drilled
TP10	I	37.2		46.0	46.7	18.77	3	8.61	**8.35**	Dol	MA	As Drilled
1.3-1.8	I	28.0		50.0	42.2	19.06	3	10.69	**9.91**	Dol	MA	As Drilled
	I	30.0		47.0	42.4	20.38	3	11.35	**10.54**	Dol	MA	As Drilled
	I	31.0		58.0	47.8	8.54	3	3.73	**3.66**	Dol	MA	As Drilled
TP24												
1.0-1.2	I	36.0		50.5	48.1	2.37	3	1.02	**1.01**	Dol	MA	As Drilled
	I	33.0		71.0	54.6	3.85	3	1.29	**1.34**	Dol	MA	As Drilled
	I	30.0		75.0	53.5	3.59	3	1.25	**1.29**	Dol	MA	As Drilled
1.2-1.5	I	40.7		48.7	50.2	5.32	3	2.11	**2.11**	Dol	MA	As Drilled
	I	24.2		30.6	30.7	2.09	3	2.22	**1.78**	Dol	MA	As Drilled

Comments (if applicable):

MOISTURE
(W) Wet
(M) Moist
(D) Dry
(AD) As Drilled
(AR) As Received

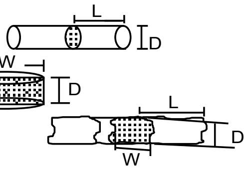
ROCK TYPE
(Dol) Dolerite
(ST) Siltstone
(SH) Shale
(G) Granitic
(MSS) Meta Sandtone
(MST) Meta Siltstone

STRUCTRUE
(MA) Massive
(BE) Bedded
(IB) Interbedded
(LA) Laminated
(CR) Crystalline

FAILURE MODE
1 = Fracture through fabric oblique to bedding
2 = Fracture along bedding
3 = Fracture through rock mass
4 = Fracture influenced by pre-existing:
(J) Joint plane, (M) Microfracture, (F) Foliation, (V) Vein
5 = Partial fracture or chip (Invalid result)

TEST TYPES

D = Diametral — L > 0.5 D
A = Axial — 0.6W < D < W
I = Irregular Lump — 0.6W < D < W



Time Since Sampling = 41 Days
Storage:
☐ CORE BOX ☐ UNDER COVER
☒ WRAPPED ☐ OPEN AIR
☐ UNWRAPPED ☐ UNKNOWN

Sampled By: GHD Geotech
Date Sampled: 24/05/24
Tested By: DB
Date Tested: 4/07/24

Appendix H

Point load test results

AXIAL AND DIAMETRIC POINT LOAD TEST DATA

Testing Type	Location	Depth (m)	Rock type	Weathering	Seperation (mm)	Failure load (P) (kN)	$I_{s(50)}$ corrected (Mpa)	Observed Failure [1]	Strength
Diametric	BH01	2.6	Dolerite	HW	61.0	1.1	0.32	I	M
Diametric	BH01	3.7	Dolerite	HW	61.0	1.4	0.41	I	M
Axial	BH01	4.7	Dolerite	HW	49.6	0.9	0.36	I	M
Axial	BH01	5.3	Dolerite	HW	52.2	0.85	0.32	I	M
Diametric	BH01	6.4	Dolerite	HW	61.0	1.3	0.38	I	M
Diametric	BH01	7.7	Dolerite	HW	61.0	2.2	0.65	I	M
Diametric	BH01	8.4	Dolerite	HW	61.0	1.75	0.51	I	M
Axial	BH02	3.4	Dolerite	MW	40.1	7.4	4.17	D	VH
Axial	BH02	3.8	Dolerite	MW	38.1	5.3	3.23	D	VH
Axial	BH02	4.6	Dolerite	MW	37.6	4.2	2.61	I	H
Diametric	BH02	5.3	Dolerite	MW	61.0	12.6	3.70	I	VH
Axial	BH02	6	Dolerite	MW	46.3	18	8.11	I	VH
Axial	BH02	6.5	Dolerite	MW	35.5	5	3.40	I	VH
Axial	BH02	7.3	Dolerite	MW	48.7	5.2	2.17	I	H
Diametric	BH02	7.95	Dolerite	MW	61.0	4.9	1.44	I	H
Diametric	BH02	9.2	Dolerite	MW	61.0	4	1.18	D	H
Axial	BH03	4	Dolerite	HW	42.5	1.2	0.62	I	M
Axial	BH03	4.9	Dolerite	HW	59.0	1	0.31	I	L
Axial	BH03	5.5	Dolerite	HW	47.1	1.6	0.70	I	M
Axial	BH03	6.3	Dolerite	HW	51.2	1.4	0.54	I	M
Diametric	BH03	6.7	Dolerite	MW	61.0	5.2	1.53	I	H
Axial	BH03	8.1	Dolerite	MW	42.2	5.5	2.86	I	VH
Diametric	BH04	1.5	Dolerite	MW	61.0	2.2	0.65	I	M
Axial	BH04	3.5	Dolerite	MW	57.3	5.2	1.68	I	H
Diametric	BH04	4.75	Dolerite	HW	61.0	2	0.59	I	M
Diametric	BH04	6.5	Dolerite	MW	61.0	1.9	0.56	I	M
Diametric	BH04	7.1	Dolerite	MW	61.0	2	0.59	D	M
Diametric	BH04	7.9	Dolerite	MW	61.0	4.8	1.41	I	H
Diametric	BH04	8.5	Dolerite	MW	61.0	5	1.47	I	H
Diametric	BH04	9.65	Dolerite	MW	61.0	18	5.29	I	VH
Diametric	BH04	10.08	Dolerite	MW	61.0	2.3	0.68	I	M
Axial	BH04	11.18	Dolerite	MW	42.1	5.2	2.72	I	H
Axial	BH04	11.65	Dolerite	MW	41.3	5.5	2.96	I	VH
Axial	BH04	12.3	Dolerite	MW	54.1	9.7	3.43	I	VH
Axial	BH04	12.75	Dolerite	MW	59.7	1.5	0.46	D	M
Axial	BH05	3.35	Dolerite	MW	42.5	9.5	4.89	I	VH
Axial	BH05	4.5	Dolerite	MW	43.6	3.7	1.83	D	H
Axial	BH05	5.7	Dolerite	MW	35.0	14	9.73	I	VH
Axial	BH05	6.7	Dolerite	MW	50.7	4	1.57	I	H
Axial	BH05	7.4	Dolerite	MW	36.7	3.5	2.26	I	H
Axial	BH05	8.1	Dolerite	MW	50.2	4.5	1.79	I	H
Diametric	BH05	8.9	Dolerite	MW	61.0	11.6	3.41	I	VH
Diametric	BH05	9.5	Dolerite	SW	61.0	7.8	2.29	I	H
Diametric	BH05	10.5	Dolerite	SW	61.0	15	4.41	I	H
Axial	BH05	11.5	Dolerite	SW	52.0	7.5	2.82	I	H
Diametric	BH05	12.05	Dolerite	SW	61.0	16	4.70	D	VH
Axial	BH06	3.45	Dolerite	HW	42.4	2.8	0.90	I	M
Axial	BH06	3.83	Dolerite	HW	42.5	3.4	1.10	I	H
Diametric	BH06	4.54	Dolerite	HW	60.8	1.5	0.37	D	M
Axial	BH06	4.54	Dolerite	HW	37.5	4.2	1.49	I	H
Axial	BH06	5.85	Dolerite	HW	37.1	2.7	0.97	D	M
Axial	BH06	6.48	Dolerite	MW	42.1	3.9	1.27	I	H
Axial	BH06	6.95	Dolerite	MW	51.4	2.7	0.75	D	M
Axial	BH06	7.5	Dolerite	MW	31.6	2.5	1.01	D	H
Diametric	BH06	7.8	Dolerite	MW	61.0	1.9	0.56	I	M
Axial	BHC01	4.3	Dolerite	HW	42.2	1.5	0.78	I	M
Axial	BHC01	4.95	Dolerite	HW	42.7	1	0.51	D	M
Axial	BHC01	5.55	Dolerite	MW	53.9	1.8	0.64	D	M
Diametric	BHC01	5.95	Dolerite	MW	61.0	6.3	1.85	D	H
Diametric	BHC01	6.65	Dolerite	SW	61.0	> 30*	-	-	EH
Axial	BHC01	7.45	Dolerite	SW	54.8	15.8	5.48	I	VH
Diametric	BHC02A	2.4	Dolerite	MW	61.0	18.5	5.44	D	VH
Axial	BHC02A	2.7	Dolerite	MW	50.7	17.5	6.85	I	VH
Axial	BHC02A	3.3	Dolerite	MW	41.9	19.9	10.47	I	EH
Diametric	BHC02A	4	Dolerite	MW	61.0	20	5.88	D	VH
Axial	BHC02A	5	Dolerite	MW	44.7	14	6.66	I	VH
Axial	BHC02A	5.8	Dolerite	SW	50.0	15.3	6.12	I	VH
Diametric	BHC02A	6.5	Dolerite	SW	61.0	18.7	5.50	I	VH

*Unable to fail sample

ghd.com → **The Power of Commitment**

Document 5

Out of scope

From: Out of scope @northbarker.com.au>
Sent: Tuesday, September 10, 2024 12:00 PM
To: Out of scope @cohagroup.com.au>
Cc: Out of scope @northbarker.com.au>
Subject: Re: TAHP | Approval to Proceed - Rosny Parklands Spider Orchid Survey

Hi Out of scope

Following on from phone call last week, we will revise our proposal with some additional time/budget to oversee and manage the EPBCA referral should you proceed with the Rosny site and the referral. I will endeavour to do this over the next couple of weeks.

In terms of the recently completed orchid survey, *Caladenia caudata* was observed flowering nearby at the Waverley Flora Park over the last couple of weeks and therefore if present at Rosny Park this species would reasonably be taken to have been detectable during our survey on the 26/8 (it was flowering at Waverley that day and for several days prior). Targeted ground surveys were conducted throughout suitable habitat at your site and none of the orchid plants were observed.

During search efforts, two patches of *Dianella amoena*, were identified in grassland in the northeast of project area. One patch was approx 25 m long and 5 m wide, with > 50 plants/clumps. The second patch had ~ 25 plants within a 3 m^2 area. Previous surveys have detected 35 - 50 plants in the same area. This species is on the list to be targeted in future assessments (noting it is recommended to conduct targeted surveys during flowering / fruiting from October to January), including detailed DGPS mapping to microsite and define exclusion zone/s.

I'll review the existing works order and given you are requesting an update on the broader costing it may make sense to exclude the completed components of the orchid survey and invoice for that along with the proposal update.

Cheers

Out of scope
Managing Director/ Principal Ecologist

[redacted]

Ph. 03 6231 9788

Mob Out of scope

We pay our respects to all Palawa people across Lutruwita / Tasmania, their elders past and present, and their young people. We acknowledge their long and continuing history of sustainable land management.

Out of scope