

Application for Planning Approval

Land Use Planning and Approvals Act 1993

APPLICATION NO.

DA2023/147

LOCATION OF AFFECTED AREA

503 TEA TREE RD & 557 TEA TREE RD, TEA TREE AND 97 NELSONS BUILDINGS RD, BRIGHTON

DESCRIPTION OF DEVELOPMENT PROPOSAL

CLEAN FILL & FARM TRACKS UPGRADE

A COPY OF THE DEVELOPMENT APPLICATION MAY BE VIEWED AT <u>www.brighton.tas.gov.au</u> AND AT THE COUNCIL OFFICES, 1 TIVOLI ROAD, OLD BEACH, BETWEEN 8:15 A.M. AND 4:45 P.M., MONDAY TO FRIDAY OR VIA THE QR CODE BELOW. ANY PERSON MAY MAKE WRITTEN REPRESENTATIONS CONCERNING AN APPLICATION UNTIL 4:45 P.M. ON **09/10/2023**. ADDRESSED TO THE GENERAL MANAGER AT 1 TIVOLI ROAD, OLD BEACH, 7017 OR BY EMAIL AT <u>development@brighton.tas.gov.au</u>.

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JAMES DRYBURGH General Manager





















Planning Report

Clean Fill & Farm Track Upgrades August 2023



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ABN 12 505 460 421

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1. Executive Summary

This report is in support of a development application for planning approval for clean fill at 97 Nelsons Buildings Rd, Brighton, and farm track upgrade at 503 and 557 Tea Tree Rd, Tea Tree.

The affected lands are located within the Agriculture Zone and Landscape Conservation Zone, and the planning assessment against relevant standards under the *Tasmanian Planning Scheme – Brighton* is provided below.

2. Proposal Description

Brighton Council's volume of the landfill has increased over the recent years, and there have been difficulties in disposing of clean fill due to the limited capacity of the existing landfill sites (Cove Hill Rd Quarry & Brighton Waste Transfer Station) and increasing disposal costs at the Copping Refuse Disposal Site and EPA levy. Department of the Natural Resources and Environment Tasmania levy.

Therefore, Brighton Council proposes to manage clean fill as a resource to deliver economic, environmental, and social benefits by using it to rehabilitate an area that was badly scoured from a storm during the 1950s after a long period of drought and upgrading the existing farm tracks.

Address	Certificate of Title	Reference	Type of proposal
503 Tea Tree Rd,	174626/1	Figure 1 (bounded by yellow)	Farm track
Tea Tree	174555/2		upgrade
557 Tea Tree Rd,	133846/1	Figure 1 (bounded by orange)	Farm track
Tea Tree			upgrade
503 Tea Tree Rd,	48449/1	Figure 2 (bounded by white)	Farm track
Tea Tree	85540/1		upgrade
97 Nelsons	134020/2	Figure 2 (bounded by purple)	Farm track
Buildings Rd,	170120/1		upgrade
Brighton			
97 Nelsons	141529/3	Figure 3 (bounded by blue)	Clean fill area
Buildings Rd,			
Brighton			

The following sites have been identified as suitable for the proposal above:



TRACKS TO HAVE MAINTENANCE LAYER APPLIED

Figure 1. Aerial image of the farm track upgrade sites – 503 & 557 Tea Tree Rd, Tea Tree (Courtesy: theList Mapping Services)



TRACKS TO HAVE MAINTENANCE LAYER APPLIED

Figure 2. Aerial image of the farm track upgrade sites –97 Nelsons Buildings Rd, Brighton & 503 Tea Tree Rd, Tea Tree (Courtesy: theList Mapping Services)



CLEAN FILL AREAS

Figure 3. Aerial image of the clean fill areas - 97 Nelsons Buildings Rd, Brighton (Courtesy: theList Mapping Services)

The proposed farm track upgrades will utilise road castings, which are pulverised asphalt and crushed rock. The total track length for the upgrade is approximately 6,465 lineal metres, and it is expected that other tracks on the properties can also benefit from the proposed works.

The clean fill site has a capacity for at least 10,000m3 of fill, and Council will prioritise the access upgrades to take place from Nelson's Buildings Road to ensure the site is accessible under all types of weather conditions.

3. Planning Assessment

The proposed clean fill and farm track upgrades cannot comply with the exemption Clause 4.6.9 of the Scheme. Therefore, the following titles have been assessed under Agriculture Zone and Landscape Conservation Zone requirements and the applicable Codes to obtain planning approval:

Agriculture Zone:

174626/1, 174555/2, 133846/1, 48449/1, 85540/1, 134020/2, 170120/1

Landscape Conservation Zone:

141529/3

3.1 - Agriculture Zone

21.1 Zone Purpose:

21.1.1 To provide for the use or development of land for agricultural use.

The proposed landfilling and farm track upgrades align with the purpose of the zone by supporting the use and development of land for agricultural use.

- 21.1.2 To protect land for the use or development of agricultural use by minimising:
 - (a) Conflict with or interference from non-agricultural uses;

The proposal does not conflict or interfere with non-agricultural uses as it is to upgrade the existing tracks to better service the track users in the area. The residential uses at 134020/2 & 134020/1 (99 Nelsons Buildings Rd, Brighton) are expected to benefit from the proposal. However, considerations should be given to minimise dust generation and noise nuisance.

(b) Non-agricultural use or development that precludes the return of the land to agricultural use; and

N/A

(c) Use of land for non-agricultural use in irrigation districts.

N/A

21.1.3 To provide for use or development that supports the use of the land for agricultural use.

The proposed landfilling and farm track upgrades support the surrounding properties' use and development of land for agricultural use.

21.2 Use Table

The proposed landfill works do not need to be categorised into one of the Use Classes as outlined under Clause 6.2.6 – i.e., "Notwithstanding subclause 6.2.1 of this planning scheme, development which is for subdivision, a sign, **landfilling**, retaining walls or coastal protection works does not need to be into one of the Use Classes." [emphasis added]

C6.0 Local Historic Heritage Code – Local Heritage Place

The applicable title - 174626/1 (503 Tea Tree Rd, Tea Tree), has an overlay of a local heritage place (Strathallan - 503 Tea Tree Road) on the entire land.

The proposed farm track upgrades are not considered minor, and thus, the subject land has been assessed against relevant standards under this Code.

However, given that the proposal does not involve any development or subdivision, it has been assessed under the Code Purpose only.

C6.1 Code Purpose

C6.1.1 To recognise and protect:

(a) The local historic heritage significance of local places, precincts, landscapes and areas of archaeological potential; and

The affected site has the local historic heritage significance of a local heritage place only and according to the BRI-C6.1.14, the specific extent of the heritage place is described as below:

Single storey stone house with hipped roof with boxed eaves and return veranda on three sides. The front has 3 bays separated by pilasters, a central 4 panel timber door with fanlight and half sidelights and large 12 pane windows either side. Includes a stone barn and stables.

Given that the proposed farm track upgrades are for servicing the existing track and as it is setback by at least 600m away from the single storey stone house, a stone barn, and stables, it is considered that the heritage place is protected from the proposed works.

(b) Significant trees

N/A – no significant trees are in the subject area (ref: BRI-Table C6.5 Significant Trees)

C6.1.2 This code does not apply to the Aboriginal heritage values.

N/A

C7.0 Natural Assets Code – Waterway and Coastal Protection Area

The site - 174555/2 – contains a portion of the farm track (see area pointed by an arrow in Figure 4) within the waterway and coastal protection area. Therefore, the subject land has been assessed against relevant standards under this Code.



Figure 4. Aerial image of the farm track within the waterway and coastal protection area overlay

C7.6.1 Works within a Waterway and Coastal Protection Area

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;

SWMP will be provided.

(b) impacts on riparian or littoral vegetation;

N/A

(c) maintaining natural streambank and streambed condition, where it exists;

N/A

(d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;

N/A

(e) the need to avoid significantly impeding natural flow and drainage;

The proposed works in the subject area are not considered to significantly impede natural flow and drainage.

(f) the need to maintain fish passage, where known to exist;

N/A

(g) the need to avoid land filling of wetlands;

N/A

(h) the need to group new facilities with existing facilities, where reasonably practical;

N/A

(i) minimising cut and fill;

No cutting is proposed apart to the potential excavation to prepare the project area for the proposed fill.

(j) building design that responds to the particular size, shape, contours or slope of the land;

N/A

(k) minimising impacts on coastal processes, including sand movement and wave action;

N/A

(I) minimising the need for future works for the protection of natural assets, infrastructure and property;

The proposed site will be revegetated if any natural assets are lost and regularly monitored and maintained to ensure vegetation health and control weed infestations.

(m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and

The proposed works will be undertaken in accordance with the Wetlands and Waterways Work Manual (DPIWE, 2003).

(n) the guidelines in the Tasmanian Coastal Works Manual.

All proposed works will follow the guidelines of Tasmania Coastal Works Manual.

3.2 - Landscape Conservation Zone

Title - 141529/3 has been assessed under Landscape Conservation Zone requirements and the applicable Codes.

22.1 Zone Purpose

22.1.1 To provide for the protection, conservation and management of landscape values.

The proposed clean fill works are to reinstate the track that was scoured badly from a storm. Therefore, it is considered that the proposal will support the protection, conservation, and management of landscape values.

22.1.2 To provide for compatible use or development that does not adversely impact on the protection, conservation and management of the landscape values.

The proposal intends to reinstate the existing track through the clean fill, and no development nor subdivision works are involved.

22.2 Use Table

The proposed landfill works do not need to be categorised into one of the Use Classes as outlined under Clause 6.2.6 – i.e., "Notwithstanding subclause 6.2.1 of this planning scheme, development which is for subdivision, a sign, **landfilling**, retaining walls or coastal protection works does not need to be into one of the Use Classes." [emphasis added]

C7.0 Natural Assets Code – Waterway and Coastal Protection Area

The proposed clean fill area is within the waterway and coastal protection area, as indicated by an arrow in Figure 5. Therefore, it has been assessed against relevant standards under this Code.



Figure 5. Aerial image of the clean fill area within the waterway and coastal protection area overlay

C7.6.1 Works within a Waterway and Coastal Protection Area

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;

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

(b) impacts on riparian or littoral vegetation;

N/A

(c) maintaining natural streambank and streambed condition, where it exists;

N/A

(d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;

N/A

(e) the need to avoid significantly impeding natural flow and drainage;

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

(f) the need to maintain fish passage, where known to exist;

N/A

(g) the need to avoid land filling of wetlands;

N/A

(h) the need to group new facilities with existing facilities, where reasonably practical;

N/A

(i) minimising cut and fill;

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

(j) building design that responds to the particular size, shape, contours or slope of the land;

N/A

(k) minimising impacts on coastal processes, including sand movement and wave action;

N/A

(I) minimising the need for future works for the protection of natural assets, infrastructure and property;

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

(m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

(n) the guidelines in the Tasmanian Coastal Works Manual.

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

Ρ5

Coastal protection works or watercourse erosion or inundation protection works within a waterway and coastal protection area or a future coastal refugia area must be designed by a suitably qualified person and minimise adverse impacts on natural coastal processes, having regard to:

(a) impacts on sand movement and wave action; and

N/A

(b) the potential for increased risk of inundation to adjacent land.

Please refer to Natural Values Assessment – Waterway and Coastal Protection Area (GEO-Environmental Solutions, dated 11 August 2023).

4. Conclusion

This application is for planning approval for clean fill at 97 Nelsons Buildings Rd, Brighton, and farm track upgrade at 503 and 557 Tea Tree Rd, Tea Tree.

The applicable titles have been assessed against the relevant standards of the *Tasmanian Planning Scheme – Brighton*.

The proposal has triggered the Local Historic Heritage Code – Local Heritage Place at 174626/1 (503 Tea Tree Rd, Tea Tree) and Natural Assets Code – Waterway and Coastal Protection Area at 174555/2 (503 Tea Tree Rd, Tea Tree) and 141529/3 (97 Nelsons Buildings Rd, Brighton).

Therefore, the assessment against the applicable performance criteria has been completed and is considered to meet all the standards. A permit should be granted with conditions.

GEO-Environmental Solutions 29 Kirksway Place, Battery Point Tasmania 7004 Phone: 03 62231839



11 August 2023

Natural Values Assessment – Waterway and Coastal Protection Area

Proposed Works- 97 Nelsons Buildings Road, Brighton, TAS 7030

PID: 9705079

C/T: 141529/3

The proposed works are to use a part of the site for the storage of "clean" earthworks material obtained from civil and landscaping projects within the municipality by the Brighton Council. The primary objective is to fill the designated area with "clean fill" material and integrate it into the existing natural ground, effectively reducing the depth of scoured soil in that specific location.

The site is characterized by the presence of a dam near its northern boundary and a tributary watercourse that runs through its central area which are associated Waterway and Coastal Protection Overlay. The proposed works will occur within this area and the following report is intended to demonstrate compliance with Code C7.0 Natural Assets Code of the Tasmanian Planning Scheme, in particular Clause C7.6.1. The proposed development will not meet the Acceptable Solution in Clause C7.6.1 A1 and this report outlines additional information of how the proposal meets the corresponding Performance Criteria.

Table 1. Extract of Tasmanian Planning Scheme C7.6.1

 P1.

 Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to:

 Performance Criteria
 Comment / Compliance

 (a) impacts caused by erosion, siltation, sedimentation and runoff;
 The proposed works should only be approved with an appropriate, site specific soil and water management plan. The site should regularly maintain and progressively stabilised through vegetation and landscaping to reduce potential of erosion.

(b) impacts on riparian or littoral vegetation;	No riparian or littoral vegetation is present on the site	
(c) maintaining natural streambank and streambed condition, where it exists;	Not applicable	
(d) impacts on in-stream natural habitat, such as fallen logs,	Not applicable	
bank overhangs, rocks and trailing vegetation;		
(e) the need to avoid significantly impeding natural flow and drainage;	Before proceeding with any proposed fill works for the existing gully it must be ensure that natural flow and drainage are not significantly impeded. While it may be beneficial to redirect some water along specific contours, it is crucial to undertake comprehensive hydraulic studies before implementing any such measures. Full hydraulic studies are necessary to assess the potential impacts of the proposed diversion on the overall hydrological system, including factors such as water flow	
	rates, sediment transport, and potential erosion risks.	
(f) the need to maintain fish passage, where known to exist;	Not applicable	
(g) the need to avoid land filling of wetlands;	No wetlands are located on the site.	
(h) the need to group new facilities with existing facilities, where reasonably practical;	Not applicable for this site	
(i) minimising cut and fill;	There is no proposed cutting for the site apart to the excavation to prepare the project area for the proposed fill. The primary purpose of using the fill is to address ongoing issues such as the depth of the existing gully and erosion within the site. Before the fill is placed, careful attention must be given to the drainage aspect. It is crucial to ensure that proper drainage systems are in place to manage water flow effectively and prevent any potential issues associated with inadequate drainage. Moreover, the fill material to be used must meet the requirement of being "clean," free from any traces of contaminants or unwanted substances.	
(j) building design that responds to the particular size, shape,	There are no proposed buildings at this stage.	
contours or slope of the land;		
(k) minimising impacts on coastal processes, including sand	Not applicable	
movement and wave action;		

(I) minimising the need for future works for the protection of natural assets, infrastructure and property;	The proposed site should be monitored and maintained regularly after revegetation to make sure the plants establish, and weeds are controlled.
(m) the environmental best practice guidelines in the Wetlands and Waterways Works Manual; and	Approval of subsequent works should be conditional on works being undertaken in compliance with the "Wetlands and Waterways Work Manual' (DPIWE, 2003)
(n) the guidelines in the Tasmanian Coastal Works Manual.	All proposed works should be following the guidelines of Tasmania Coastal Works Manual.

P2.1

Buildings and works within the spatial extent of tidal waters must be for a use that relies upon a coastal location to fulfil its purpose, having regard to:

Performance Criteria		Comment / Compliance	
(a)	the need to access a specific resource in a coastal		
	location;		
(b)	the need to operate a marine farming shore facility;		
(C)	the need to access infrastructure available in a coastal	Not Applicable the site is not located within a coastal	
	location;	location	
(d)	the need to service a marine or coastal related activity;		
(e)	provision of essential utility or marine infrastructure; or		
(f)	provisions of open space or for marine-related		
	educational, research, or recreational facilities.		

A2.	
Acceptable Criteria	Comment / Compliance
Buildings and works within a future coastal refugia area must	
be located within a building area on a sealed plan approved	The project area is not within a Future Coastal Refugia Area
under this planning scheme.	

A3	
Acceptable Criteria	Comment / Compliance
Development within a waterway and coastal protection area	
or a future coastal refugia area must not involve a new	No new stormwater discharge point is proposed at this stage.

stormwater point discharge into a watercourse, wetland or	
lake.	

A4.	
Acceptable Criteria	Comment / Compliance
Dredging or reclamation must not occur within a waterway	No dredging or reclamation works is required.
and coastal protection area or a future coastal refugia area.	

Ρ5.

Coastal protection works or watercourse erosion or inundation protection works within a waterway and coastal protection area or a future coastal refugia area must be designed by a suitably qualified person and minimise adverse impacts on natural coastal processes, having regard to:

Acceptable Criteria		Comment / Compliance	
		a) not applicable	
(a)	impacts on sand movement and wave action; and	b) Further hydrological modelling required to be assessed by	
		a suitably qualified person to design the impact of the	
(b)	the potential for increased risk of inundation to	proposed works for overland water flows and possible	
adjacent land.		discharge areas of the overflow.	

Table 1 and the associated figures demonstrate compliance with C7.6.1 of the Tasmanian Planning Scheme. The attached plan of the proposed works shows the approximate proposed works area (refer to Appendix 1). The Integrated Conservation Value for the waterway has been identified as LOW (NVA report run on the 22/06/23). The vegetation on the site is mapped according to TASVEG as native grassland and modified land, and no threatened species (flora or fauna) are listed within 500m of the site. In considering the objectives of C7.6.1 it is anticipated that there will be no unnecessary or unacceptable impacts on natural values as a result of the proposed works if provided recommendations are followed accordingly.

Report Certified by

Dr John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD Environmental and Engineering Soil Scientist





Appendix 2 - Natural Value Report

Natural Values Atlas Report Authoritative, comprehensive information on Tasmanio's natural values.

Reference: Requested For: 97 Nelsons Building Road Brighton Report Type: Summary Report Timestamp: 03:04:50 PM Thursday 22 June 2023 Threatened Flora: buffers Min: 500m Max: 5000m Threatened Fauna: buffers Min: 500m Max: 5000m Raptors: buffers Min: 500m Max: 5000m Tasmanian Weed Management Act Weeds: buffers Min: 500m Max: 5000m Priority Weeds: buffers Min: 500m Max: 5000m Geoconservation: buffer 1000m Acid Sulfate Soils: buffer 1000m TASVEG: buffer 1000m Threatened Communities: buffer 1000m Fire History: buffer 1000m Tasmanian Reserve Estate: buffer 1000m Biosecurity Risks: buffer 1000m

The centroid for this query GDA94: 523515.0, 5271906.0 falls within:

Property: 9705079

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Front cover of NVA report (full report available on request).

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Please note that some layers may not display at all requested map scales

Department of Natural Resources and Environment Tasmania

Threatened flora within 500 metres

522138, 5270385

Please note that some layers may not display at all requested map scales

Department of Natural Resources and Environment Tasmania

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Tasmanian

GEO-ENVIRONMENTAL SOLUTIONS

GEOTECHNICAL SITE INVESTIGATION

(Limited Scope)

SITE ADDRESS

97 Nelsons Buildings Road Brighton

<u>CLIENT</u>

Brighton Council

DOCUMENT CONTROL

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1 INTRODUCTION

Geo-Environmental Solutions Pty Ltd (GES) were engaged by Brighton Council to carry out a limited scope geotechnical site investigation on a portion of an agricultural property at 97 Nelsons Buildings Road, Brighton – hereby referred to as 'The Site' (CT 141528/3).

The proposed development site is within a working agricultural property called "Nathan Park" situated on the foothills of the Meehan Range, specifically on the lower slopes of northern portion of 'Jews Hill', the site is located on the outskirts of the Brighton township, see Figure 1 and Figure 2.

This report outlines the key findings of the geotechnical site investigation, which comprised an overview of the site and current conditions at the site, soil profile observations and sampling.

Figure 1 - Location of the site, outlined in red.

1.1 Proposed Development

It is understood the proposed works are, that with the landowner's permission, Brighton Council intend to use a portion of the site to store 'clean' bulk earthworks material excavated from local civil & landscaping projects in the municipality. The fill is to be stockpiled across the site to be later placed over and into the landscape, to rehabilitate the previously eroded lineaments and drainage lines in this area, the area is to be filled with 'clean fill' material and 'keyed' into the existing natural ground to reduce the depth of scoured soil in this location.

Figure 2 – Location of proposed works outlined in white.

2 OBJECTIVES & SCOPE OF WORK

2.1 Project Objectives

Based on our understanding of the project and the information provided by the client, the following outlines the main objectives of the geotechnical investigation:

- Assess the subsurface conditions at the site relevant to the proposed development;
- Assess soil/rock conditions and suitability for the civil design;
- Comment on expected depth of groundwater if encountered;
- Provide any necessary geotechnical recommendations and construction considerations.

2.2 Scope of Work

The scope of work for the geotechnical investigation is as follows:

- Carry out a limited scope geotechnical site investigation below the existing ground surface to obtain site specific information for the proposed design of the development; and
- Provide a suitably qualified person to log, photograph and sample onsite.

3 INFORMATION PROVIDED

3.1 Client Supplied Information

GES have not been provided with any documentation with relevant information in relation to the project design.

3.2 Previous Investigations

GES are not aware of any previous investigations having been carried out at the site.

4 GEOLOGICAL CONTEXT

4.1 Site Details and Setting

The title the 'site' is located on covers an area of approximately 48ha, however the specific area of the 'site' being assessed is approx. 6ha and is bound in all directions but the north by the slopes of the foothills of 'Jews Hill', to the north are cropping paddocks park of the same property, but not on the title being assessed.

4.2 Geological Mapping

The 1:25,000 scale geology map 'Tea Tree' (Map Number 5227), indicates the site is underlain by the following geological unit:

- Map Unit: Jd Dolerite (tholeiitic) with locally developed granophyre; and
- Map Unit: Rlp Dominantly medium-course-grained sandstone, minor mudstone, minor mica and feldspar content, contains clay pellet beds, sandstone to mudstone ratio is 3:1 or less.

Figure 3 - Mapped Geology (1:25,000)

5 GEOTECHNICAL INVESTIGATION

5.1 Field Investigations

The fieldwork was performed by a GES representative who inspected and made observations across the site, nominated sampling and testing, recovered samples, photographed, and prepared engineering logs.

The site inspection was carried out by GES on the 24th February 2023, carrying out testing at the proposed development site.

The following activities were carried out during the investigation:

- Hand auger boreholes were drilled to obtain samples across the site.
- Boreholes were terminated on reaching their target depth;
- Cutting/drainage line profiles were examined, logged and samples collected.
- Photographs were taken of the site to visually represent the current site conditions.

6 Current Site Conditions

6.1 Sub-surface Conditions

During the site inspection much of the site was covered with vegetation including native & improved pasture grasses with some localised weeds species. The eroded scour watercourses or hydrological lineament embankments were generally covered with minimal vegetation with exposed soil of varying depths visible with assorted fill material overlying the natural profile of some sections of the drainage lines. The soils encountered were, firm to stiff (locally stiff) high plasticity CLAY dominating the subsoils of the proposed area of investigation. **Error! Reference source not found.** illustrates the Hydrological lineaments/Drainage lines at the site.

These clays are representative of the up slope weathered dolerite deposits. Major surface cracking was observed in the site soils which is attributed to the shrink/swell properties of the highly reactive clay soils. See Appendix A for typical soil profile logs.

Photo 1 – Site condition

6.2 Soil properties

The soils encountered were, firm to stiff high plasticity clay soils. The soils are developing from Jurassic dolerite and associate slope deposits. The soils have a low estimated permeability (in the range 0.05-0.15m/day). Localised the permability may be improved by the presence of stones and gravels in the soil profile. The soils gnerally have a high bulk denisty and a resistant to chemical erosion (all samples tested negative for dispersion with emerson class 8 results).

Sample ID	Texture	Emerson class	Description		
#1 - Upper	Clay	Class 8	No dispersion		
#2 - Upper-Mid	Clay	Class 8	No dispersion		
#3 - Lower-Mid	Clay	Class 8	No dispersion		
#4 - Lower	Clay	Class 8	No dispersion		

Table 1 - Emerson Dispersion Test Results

NOTE: The results shown are typical of the test results completed, 8 total tests were conducted, all with the same results showing no evidence of dispersion.

The topography of the site shows quite a large horseshoe-like catchment to where the lineaments commence, the Hillshade plan presented in Figure 4 and Figure 5 illustrates the contours across the site.

Figure 4 - Hillshade reveals extent of drainage lines and catchment.

Figure 5 - Contours across the site showing the slope direction of catchment.

Figure 6 - Hillshade & Contours overlayed onto aerial plan.

Figure 7 - Hillshade Overlayed on 2013 Aerial Photograph

7 Earth Retaining Systems and Unsupported Batters

Based on the limited scope and no drawings being provided, it is estimated the most prominent proposed cut batters are to extend on the lower portion of the site on the northern side of the foothills of 'Jews Hill'. At these locations, the following preliminary safe slope batter angles can be recommended within each subsurface unit:

- Topsoil Silty SAND 1V:2H;
- CLAY (dominant site material) 1V:1.5H;
- Clayey Gravel 1.5V:1H; and
- Dolerite rock 2V:1H.

8 DISCUSSION AND RECOMMENDATIONS

8.1 Excavatability Assessment

Excavation of all soil material across the site to required depths at all locations is likely to be achieved with ease with conventional hydraulic excavation machinery to depths where distinctly weathered rock is encountered at depth.

8.2 Construction Considerations and Recommendations

8.2.1 Earthworks Recommendations

The following earthworks recommendations should be adhered to:

- Contaminated fill and organic materials should be screened and removed appropriately from the filling site. This may require multiple stockpiles to separate contaminated and non-contaminated fill materials; and
- Earthworks are to be carried out in accordance with methods outlined in AS 3798-2007.

8.2.2 Site Excavation Considerations

- It is recommended for earthworks activities to be carried out during drier periods of the year. If this is carried out, the risk of water ponding, trafficability and clay softening (reducing shear strength of foundation material) will be reduced;
- Excavation of fill materials and natural soils to required depths at all locations is likely to be achieved with relative ease with conventional hydraulic excavation machinery;
- The natural soil should be stripped of topsoil and excavated to create a keyway into the slope to enable the adequate compaction and tie in between the natural and fill material;
- Care should be taken to ensure that all fill is placed into prepared keyways and suitably compacted;
- It is recommended that excavations be observed by GES during stripping and fill placement to ensure that conditions are consistent with those on which the design recommendations are based.

GROUNDWATER QUALITY (TDS ppm)								1000 – 5000 (>2000 Average)	1000 – 5000 (> 2000 Average)		500 - 1000 (800 Average)		100–5000 (1200 Average)	100–2000 (<1000 Average)	
GROUNDWATER BORE YIELD lisec (gslihour)			0.03 - 3	1004-2-470				0.3+ (240+)	0.03-1.1 124-9,000)	0.03 - 5.6 124 - 5,000)	0.03 - 1.0 (24 - 800)		0.01-0.7 (8-560)	0.25—1,0 (200—800)	
SEPTIC TANK Suitability			Generally suitable. Caution in areas where	sands cover cley pans. Possible groundwater	contamination in areas of high water table.			Areas usually unsuitable due to steep slopes. Some potential in low density residential areas.	Areas of high clay content may be unsuitable due to low permeability.	Areas of high clay content may be unsuitable due to low permeability.	Areas of high clay content may be unsuitable due to low permeability. Black clays	unsurtable.	Generally suitable. Areas of shallow bedrock or solis with high clay contrast may be unsuitable. Care with erosion at outler.	Generally suitable. Areas challow Areas or solis with high clay content may be unsuitable. Eur with erasion at outlet.	
RESOURCES			Sand		Gravel	Sand	Sand	Gravel	Sand Coarse Gravel	Gravel	Gravel Building Stone (minor)		Sand Gravel Gravel (minor)	Gravel Gravel Clay Limestone Building Stone (minor)	
HAZARDS								Potential landslides on steeper slopes or unsupported cuts. Variable compaction possible.	Gulty and tunnel erosion common on cleared slopes.	Potential landslides and soil creep on steep slopes with thick soils. Possible foundation movement due to expansive clays.	Potential landslides and soil creep on steep slopes with thick soils. Possible foundation movement due	to expansive clays.	Gully and tunnel erosion common on cleared slopes.	Gully and tunnet erosion, and landslike common on teneral slopes. Sheet erosion common on rocky hilltops.	
	Seismic	Velocity (m/sec)				500-1500		-	900 - 1 <i>600</i>	500-1500	1800 2500 weathered 3000 7000 mweathered	1700 - 2500 weathered 3000 -	/uuu unweathered	1000 2000 weathered 2500 3000 unweathered	1000 2500 3000 5000 000
BEDROCK DETAILS	Joint	Frequency (/m)										< 4 - 5		< 1-2	v
	Bed	Thickness (m)												1 – 2 sandstone) 0.05 (mudstone)	0.2
	Of manian	% passing				< 10				90-90	50-80	55 - 77		50-80	50 – 94 brackets.
L DETAILS	TS Dr	Linear % Shrinkage								4-15	13-16	14-23 (20)	21-28	2-11 (10)	1-17 (4) indicated in
	ERBERG LIMI	Plasticity Index				Non plastic			Non plastic	6-40 (22-30)	25-33	27 - 50 (30 - 40)	50-85	21-40	3 – 49 (14 – 18) value range
	ATT	Limit %								24 - 60 (50)	45 - 58	50 - 80 (50 - 60)	<u>9</u> 9–112	35-51	21 – 68 (25 – 30) * Commo
SOI	Thiskasa	(m)			0-5+	variable			0-<1 variable	0 — 3+ variable	0-2+	0- <1 0-0.5	0-0.3	0-3+ 0-1+	0-0.5 0- <2
	JSI	nor		SP	SP . SC	SP, GC - SC	SP	SP	6P - 6C	SM SC - CH	CH · CI	CH - CL	CH	SP CH - CL	SM SM
SOIL DESCRIPTION								Gonerally non existent.	Variable from thin grey yellow sand to brown sandy clayiclay.	Red brown high plasticity claytandy clay, variable thickness, sometimes containing baself fragments.	Brown clay, medium to high plasticity, (Dominant soil type on dolerite.) Light brown samby clay. (Thin stony soils often surrounding dolerite outcrop.)	Black cley, high plasticity. (Thin soils with sharp transition to slightly weathered bedrock.)	Yollow gray send of variable thickness, overlying yollow white samely clay. Sand fine grained samilar to minibutor sand. Clay variable theicness. Black, high plasticity clays writishe theicness. Black, high plasticity introdes Tinassi; soliments.	Variable from this pellow grey sitts sand to gravel. Ottan overlines their pellow clappy graveliciny. Soli composition extranely variable over very short distances.	
UNIT DESCRIPTION			Windown sand sneets.	Beach sand, estuarine sand and clay.	Alluvium, gravel, sand, clay, fill, reclaimed land.	Raised beach sand.	Stable and mobile dune sand.	Takus, scree and slope deposits. Slope wash material derived downslope from dokerte and Permian sediments. Weathering usually insignificant.	Agglomerste, clay, sand and comonted gravol- valley – fill softments. Dolerite and sandstone derived material present as late stage landside deposits.	Baselt, fine to coarse grained, and red clay with baselt boulders. Weathering may be extreme and variable.	Dolerite, fine to medium grained, hard, often stronghy jointed. Weathering variable, both in vertical and lateral extent – especially in fine grained intrusions.		Micarones quartz sandstone, white feldpathic sandstone and micarous mudstone. Sometimes ceal bening, Mucktone part, Mucktone parto to day weathering, Sondstone bedow, shurp soil transition.	Fine sandstone, course stittene, fossilitenous mutátione, with occasional thin conglometate and limestone buds. Westhering sizally shallow. Fretting of surface autorops common. Occasionally deuply weathered to clay.	
					110.00										
						VGAN	Q J T E D	U		VAA	11931	112248	111	2122AIRT	DEBWIVW

Figure 9 - Unit description and generalised soil and rock details of typical Hobart geologies (extract from map sheet of Hofto et al 1991)

9 **RECOMMENDATIONS**

The following recommendations have been made by GES:

- Contaminated fill and organic materials should be screened and removed appropriately from the filling site. This may require multiple stockpiles to separate contaminated and non-contaminated fill materials; and
- It is recommended for earthworks activities to be carried out during drier periods of the year. If this is carried out, the risk of water ponding, trafficability and clay softening will be reduced;
- The natural soil should be stripped of topsoil and excavated to create a keyway into the slope to enable the adequate compaction and tie in between the natural and fill material;
- Care should be taken to ensure that all fill is placed into prepared keyways and suitably compacted;
- It is recommended that excavations be observed by GES during stripping and fill placement to ensure that conditions are consistent with those on which the design recommendations are based.
- Detailed survey and drainage design will be required to control slope drainage during and after works.
- Levelling and compaction of footprints with either natural rock fill or imported Class 1 fill should follow AS 1289 5.1.1;
- All earthworks onsite be compliant with AS3798-2007 "Guidelines for Earthworks on commercial and residential subdivision";

10 LIMITATIONS STATEMENT

This Assessment Report has been prepared in accordance with the scope of services between Geo-Environmental Solutions Pty. Ltd. (GES) and Brighton Council ('the Client'). To the best of GES's knowledge, the information presented herein represents the Client's requirements at the time of printing of the Report. However, the passage of time, manifestation of latent conditions or impacts of future events may result in findings differing from that discussed in this Report. In preparing this Report, GES has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations referenced herein. Except as otherwise stated in this Report, GES has not verified the accuracy or completeness of such data, surveys, analyses, designs, plans and other information.

The scope of this study does not allow for the review of every possible geotechnical parameter or soil contaminant over the whole area of the site. Soil and rock samples collected from the investigation area are assumed to be representative of the areas from where they were collected and not indicative of the entire site. The conclusions discussed within this report are based on observations and/or testing at these investigation points.

This report does not purport to provide legal advice. Readers of the report should engage professional legal practitioners for this purpose as required.

No responsibility is accepted for use of any part of this report in any other context or for any other purpose by third party.

11 REFERENCES

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APPENDIX A – Typical Soil Profile Logs

	PROJECT: 97 Nelsons Buildings Road	Log of Trench		
GEO-ENVIRONMENTAL	CLIENT: Peter & Margaret Thompson	EASTING (GDA94):		
SOLUTION S	LOCATION: Brighton	NORTHING (GDA94):		
CONTRACTOR:	EXCAVATOR:	ELEVATION (m AHD):		
PIT WIDTH:	PIT LENGTH:	TOTAL DEPTH (m): 3.3		
EXCAVATOR REACH:	DATE: 03/07/2023	NATURAL GROUND (m): 0		
LOGGED BY: A Plummer		DEPTH WATER STRUCK (m):		
FIELD STRENGTH MATERIAL SOIL ROCK DENSITY kN/m ³	DCP HAND SHEAR VANE	(q		
DEPTH (m) VLOOSE / V SOFT LOOSE / SOFT M DENSE / STIFF M DENSE / STIFF MARD EXT. LOW VERY LOW VERY LOW VERY LOW VERY LOW HIGH HIGH HIGH VERY-EXT. HIGH FIELD (MOIST) BULK (DRY)	Blow Count Alowable Bearing CBR UCS (kPa) CCR Sand Friction Angle Undrained Shear (kPa) Cohesion (kPa) Allowable Bearing Capacity (kPa) Point Load (IS 50) Moisture Geology Unit Geology Unit Capacity (kPa) Moisture Capacity (kPa)	Lithology (J) AI		
0 0.8 0.6 0.4 0.2 0.0	SM CH	Sandy CLAY: high plasticity, dark brown-red-brown-black, slightly moist.		
2.4 2.2 2.0 1.8 1.6 1.4 1.2 1.		Gravely CLAY with cobbles & boulders: medium plasticity, orange-brown, dry, very stiff. Clayey GRAVEL: orange-brown, dry, dense.		

	PROJECT: 97 Nelsons Buildings Road	Log of Trench					
GEO-ENVIRONMENTAL	CLIENT: Peter & Margaret Thompson	EASTING (GDA94):					
SOLUTIONS	LOCATION: Brighton	NORTHING (GDA94):					
CONTRACTOR:	EXCAVATOR:	ELEVATION (m AHD):					
PIT WIDTH:	PIT LENGTH:	TOTAL DEPTH (m): 3.3					
EXCAVATOR REACH:	DATE: 03/07/2023	NATURAL GROUND (m): 0					
LOGGED BY: A Plummer		DEPTH WATER STRUCK (m):					
FIELD STRENGTH MATERIAL SOIL ROCK DENSITY kN/m ³	DCP HAND SHEAR VANE	(QF					
DEPTH (m) VLOOSE / V SOFT LOOSE / SOFT M DENSE / STIFF M DENSE / STIFF V DENSE / V STIFF V DENSE / V STIFF HARD EXT. LOW VERY LOW VERY LOW VERY LOW VERY LOW HIGH HIGH HIGH HIGH HIGH HIGH HIGH HIG	Blow Count Alowable Bearing Capacity (kPa) CBR UCS (kPa) UCS (kPa) Sand Friction Angle Undrained Shear (kPa) Cohesion (kPa) Cohesion (kPa) Allowable Bearing Capacity (kPa) Point Load (IS 50) Moisture Geology Unit Geology Unit	Lithology UIL					
	SM CH	Sandy CLAY: high plasticity, dark brown-red-brown-black, slightly moist.					
2.2 2.0 1.8 1.6 1.4 1.2 1.0	Rlp Cl	Gravely CLAY with cobbles & boulders: medium plasticity, orange-brown, dry, very stiff.					
3.2 3.0 2.8 2.6 2.4 2		Clayey GRAVEL: orange-brown, dry, dense. COLLUVIAL DOLERITE BOULDERS & DOLERITE BEDROCK					
GEO-ENVIRONMENTAL SOLUTIONS - 29 KIRKSWAY PLACE, BATTERY POINT 7004 - T: 03 6223 1839 Page 1 of 1							

APPENDIX B – Site Photographs

Photo 1 - Site Overview, looking from North to South.

Photo 2 - Rock Fill on lower portion of the drainage line

Photo 3 - Lower portion of site, where drainage depth increase

Photo 4 - Main fork in drainage lines, where cutting is deepest, nominally 2-3m deep.

Photo 5 - Three lineaments converge to 1 main drainage line.

Photo 6 - Upper portion of site, looking North-West towards Brighton township.