Application for Planning Approval

Land Use Planning and Approvals Act 1993

APPLICATION NO.

DA2025/065

LOCATION OF AFFECTED AREA

63 MILLVALE ROAD, DROMEDARY

DESCRIPTION OF DEVELOPMENT PROPOSAL

LANDSCAPING & EARTHWORKS

A COPY OF THE DEVELOPMENT APPLICATION MAY BE VIEWED AT www.brighton.tas.gov.au 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 IN ACCORDANCE WITH S.57(5) OF THE LAND USE PLANNING AND APPROVALS ACT 1993 CONCERNING THIS APPLICATION UNTIL 4:45 P.M. ON **14/07/2025**. ADDRESSED TO THE CHIEF EXECUTIVE OFFICER AT 1 TIVOLI ROAD, OLD BEACH, 7017 OR BY EMAIL AT development@brighton.tas.gov.au. REPRESENTATIONS SHOULD INCLUDE A DAYTIME TELEPHONE NUMBER TO ALLOW COUNCIL OFFICERS TO DISCUSS, IF NECESSARY, ANY MATTERS RAISED.

JAMES DRYBURGH
Chief Executive Officer

SCAN ME

Brighton
going places

DRAWING TABLE		
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IMPORTANT
WORKS ARE TO BE IN ACCORDANCE WITH THE APPLICABLE AUSTRALIAN STANDARDS, CONSTRUCTION CODES (NCC) & REQUIREMENTS OF ANY RELEVANT LOCAL AUTHORITIES

DRAWINGS TO BE READ IN CONJUNCTION WITH ANY WRITTEN SPECIFICATIONS AND ASSOCIATED DOCUMENTATION PREPARED BY THE ARCHITECT OR BUILDING DESIGNER AND THE RELEVANT SUB-CONSULTANTS

BASE DRAWING(S) PREPARED AND PROVIDED BY:

-

THE FOLLOWING ARE SURVEY DETAILS USED AS BASIS FOR DESIGN:

SURVEYOR:
SURVEY REF:
SURVEY DATE:
COORDINATE SYSTEM:
VERTICAL DATUM:

WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS
DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DOCUMENTATION IS SUBJECT TO STATUTORY APPROVALS

THIS DESIGN IS INTENDED TO BE BUILT ONLY ONCE AND ONLY ON THE SITE THAT THE DESIGN WAS PREPARED FOR

REV	DESCRIPTION	DRAFT	DES	CHKD	APP	DATE
02	FOR REVIEW	MT	MT	SD	LD	05/09/2024
01	FOR REVIEW	MT	MT	LD	LD	23/07/2024

PLOTTED: Sep 05, 2024 - 9:41am FILE: C:\Users\MTANGE~1\AppData\Local\Temp\AcPublish_28274\EE973-CIVIL20240723.dwg

SHEET: A3

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63 MILVALE ROAD, DROMEDARY
COVER PAGE

PROJECT #:	SHEET #:	REVISION #:
EE973	C100	02

REV	DESCRIPTION	DRAFT	DES	CHKD	APP	DATE
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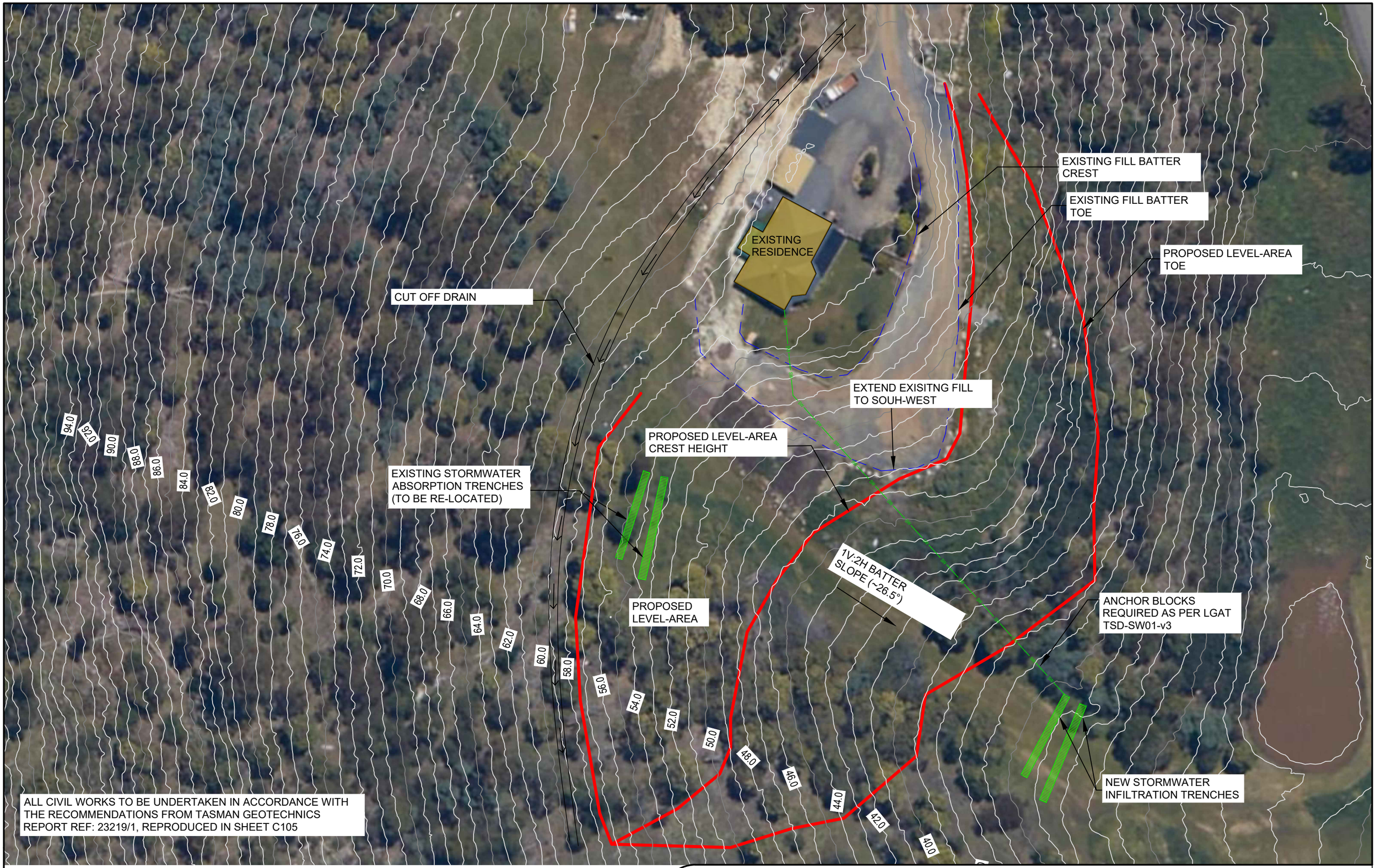
63 MILVALE ROAD, DROMEDARY
LOCATION PLAN

PROJECT #:	SHEET #:	REVISION #:
EE973	C101	02



ALL CIVIL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE RECOMMENDATIONS FROM TASMAN GEOTECHNICS REPORT REF: 23219/1, REPRODUCED IN SHEET C105

REV	DESCRIPTION	DRAFT	DES	CHKD	APP	DATE
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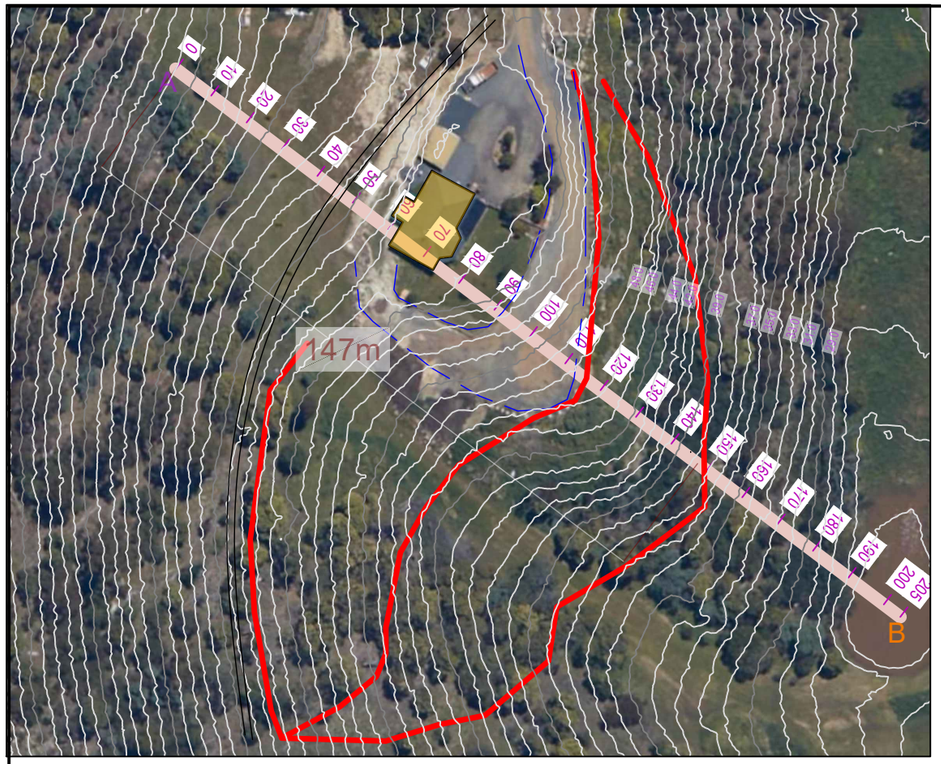
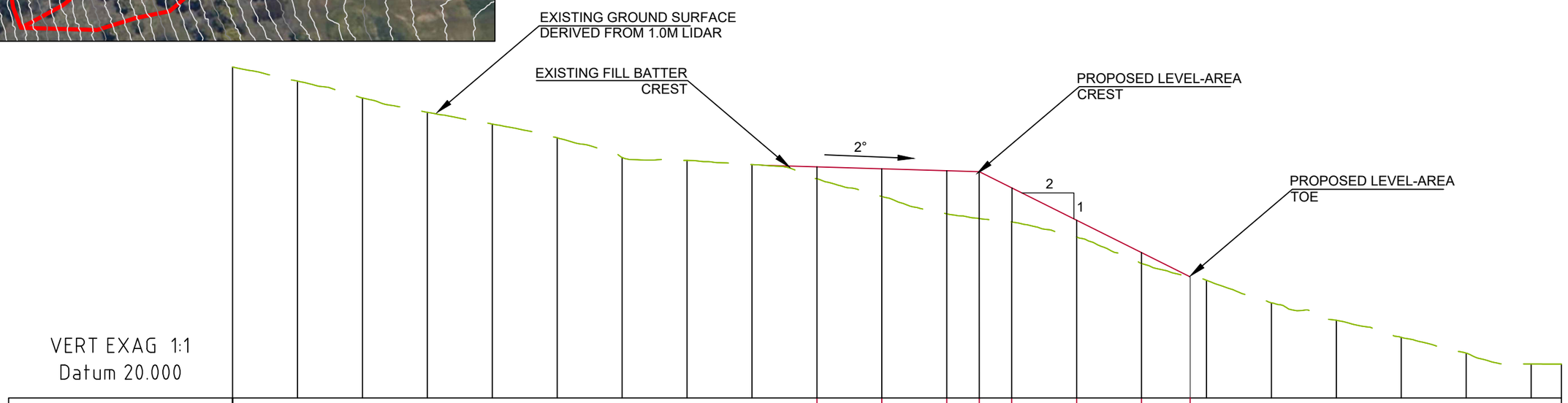
63 MILVALE ROAD, DROMEDARY
SITE PLAN

PROJECT #:	SHEET #:	REVISION #:
EE973	C102	02





VERT EXAG 1:1
Datum 20.000

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EXISTING LEVELS	68.821	66.220	64.009	62.207	60.087	57.054	56.600	55.952	53.775	51.039	48.355		47.111	44.798	40.726	38.136	34.662	31.972	29.343	26.911	25.230	25.220			
CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	204.663				

CROSS-SECTION A-B LONG SECTION

REV	DESCRIPTION	DRAFT	DES	CHKD	APP	DATE
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63 MILVALE ROAD, DROMEDARY
CROSS SECTION

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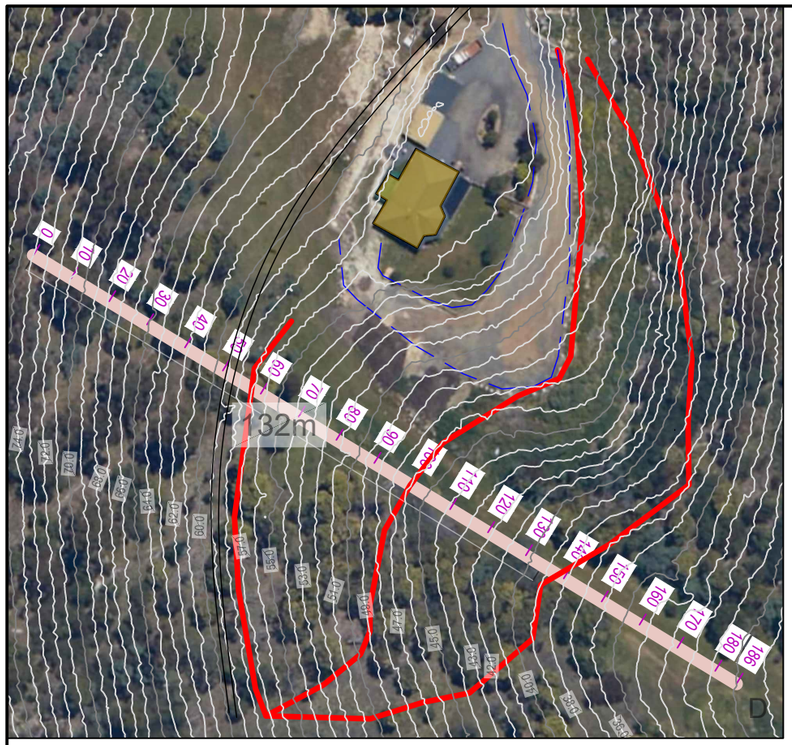
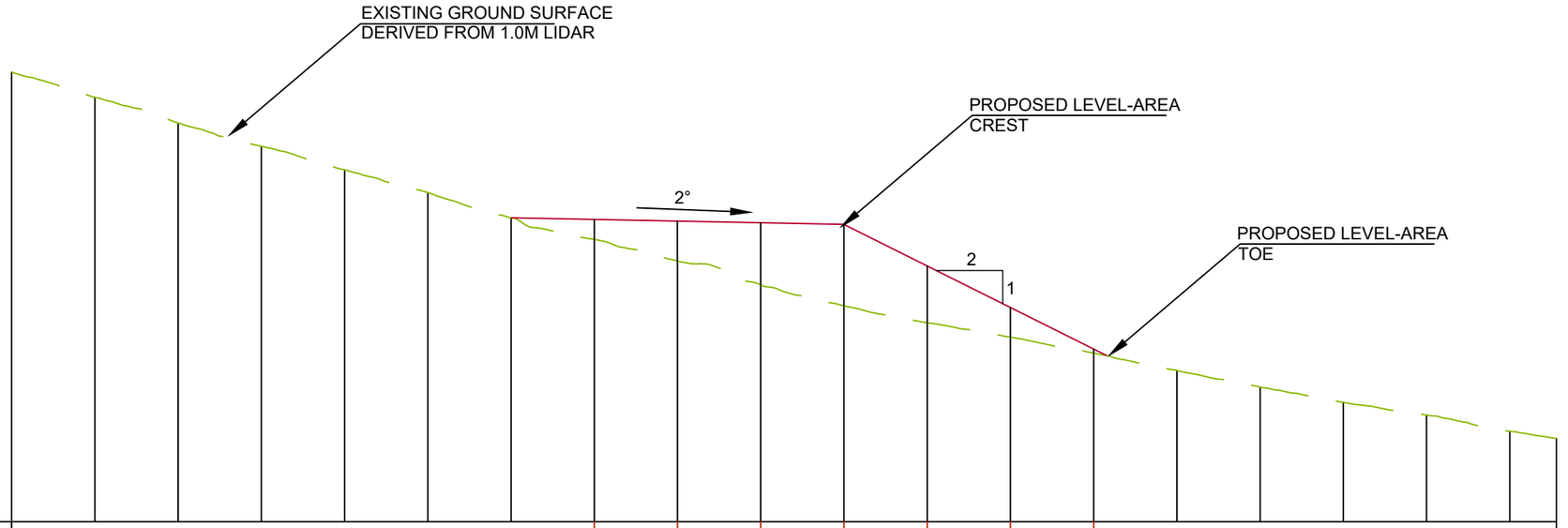
EE973	C103	02





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Datum 20.000

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DEPTH	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	185.600

CROSS-SETION C-D LONG SECTION

REV	DESCRIPTION	DRAFT	DES	CHKD	APP	DATE
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63 MILVALE ROAD, DROMEDARY
CROSS SECTION

PROJECT #:	SHEET #:	REVISION #:
EE973	C104	02

DISCUSSION AND RECOMMENDATIONS FROM TASMAN GEOTECHNICS REPORT REFERENCE TG23219/1 - 01REPORT.

TO ENSURE THAT A PROPOSED DEVELOPMENT MAINTAINS A VERY LOW RISK PROFILE FOR THE SITE, IT IS RECOMMENDED THAT THE FOLLOWING LIMITATIONS BE ENFORCE:

- THE FILL SHOULD HAVE A FINAL BATTER ANGLE NO STEEPER THAN 1V:2H.
- VEGETATION AND TOPSOIL SHOULD BE STRIPPED FROM THE FOOTPRINT OF THE PROPOSED FILL AREA BEFORE PLACEMENT. FOR GROUND SLOPES >8°, BENCHING THE NATURAL SLOPE AND KEY-IN THE FILL IS RECOMMENDED.
- FILL SHOULD BE SPREAD IN 200MM THICK LAYERS AND TRACK ROLLED WITH A 20T (OR LARGER) EXCAVATOR FOR AT LEAST 6 PASSES.
- IF THE FILL IS TO BE CONSTRUCTED ABOVE 60M AHD (ELEVATION), A GEOTECHNICAL ENGINEER MUST REVIEW THE PROPOSAL.
- NO HABITABLE STRUCTURES SHOULD BE BUILT ON THE SITE DOWN SLOPE OF THE FILLED AREA.
- RUNOFF MUST NOT POOL ON OR IMMEDIATELY UPSLOPE OF THE FILLED AREA.
- CUT-OFF DRAINS SHOULD DIVERT SURFACE RUNOFF AROUND THE FILL'S PERIMETER DURING AND AFTER CONSTRUCTION.
- A LAYER OF COARSE MATERIAL WRAPPED IN GEOFABRIC SHOULD BE PLACED AT THE FILL'S BASE TO PREVENT GROUNDWATER PRESSURE BUILD-UP.
- VEGETATION SHOULD BE MAINTAINED ON SLOPES TO PREVENT EROSION, WITH GRASS AS A MINIMUM.
- THE SITE OWNER IS RESPONSIBLE FOR MAINTAINING SURFACE RUNOFF, VEGETATION, RETAINING STRUCTURES, AND OTHER MEASURES.
- THE EXISTING WASTEWATER DISPOSAL AREA MUST BE RELOCATED AT LEAST 10M UPSLOPE OF THE PROPOSED FILL PLATFORM.
- GOOD HILLSIDE CONSTRUCTION PRACTICES SHOULD BE FOLLOWED.

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63 MILVALE ROAD, DROMEDARY
CONSTRUCTION NOTES

PROJECT #: EE973
SHEET #: C105
REVISION #: 02

GENERAL

G1 NO ATTEMPT HAS BEEN MADE TO LOCATE ALL SERVICES. ONLY THOSE SERVICES CONSPICUOUS DURING FIELD SURVEYS ARE SHOWN. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY(S) SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICE AND DETAILED LOCATIONS OF ALL SERVICES. ALL EXISTING SERVICES ARE TO BE PROTECTED DURING CONSTRUCTION. ANY DAMAGE TO EXISTING SERVICES IS TO BE MADE GOOD AT THE CONTRACTOR'S EXPENSE.

G2 NOMINATION OF PROPRIETARY ITEMS DOES NOT INDICATE EXCLUSIVE PREFERENCE BUT INDICATES THE REQUIRED PROPERTIES OF THE ITEM. SIMILAR ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE OFFERED FOR APPROVAL. INSTALL PROPRIETARY ITEMS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.

G3 REFER ANY DISCREPANCY TO THE SUPERINTENDENT BEFORE PROCEEDING WITH THE WORK.

G4 DO NOT OBTAIN DIMENSIONS BY SCALING FROM THE DRAWINGS. DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES U.N.O.

G5 THE DATUM FOR ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CODES AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITY.

G6 ALL CODES REFERENCED IN THESE DOCUMENTS WILL BE THE LATEST EDITION AVAILABLE UNLESS NOTED OTHERWISE.

G7 WHERE ANY COMMON TRENCHING IS REQUIRED, THE FOLLOWING CLEARANCE DISTANCES (BARREL TO BARREL) MUST BE MAINTAINED FROM EXISTING OR PROPOSED SERVICES:
HORIZONTALLY:
300mm ALONG A LENGTH GREATER THAN 2 METRES.
500mm MINIMUM FROM ANY MAIN GREATER THAN 200mm DIA.
150mm MINIMUM ALONG A LENGTH LESS THAN 2 METRES.
VERTICALLY:
150mm MINIMUM
300mm MINIMUM FROM ANY MAIN GREATER THAN 200mm DIA.
ELECTRICAL CABLES SHOULD BE LOCATED ON THE OPPOSITE SIDE OF THE STREET. WHERE THIS IS NOT POSSIBLE A 400mm MINIMUM DISTANCE MUST BE OBSERVED OF WHICH 300mm SHOULD BE IN NATURAL AND UNDISTURBED MATERIAL.

G8 THE SCOPE OF WORKS ARE SHOWN IN THESE DOCUMENTS AND THE SPECIFICATION. IT IS EXPECTED THE CONTRACTOR WILL RESOLVE ALL ISSUES UNCOVERED ON SITE THAT ARE NOT DETAILED IN CONJUNCTION WITH THE SUPERINTENDENT.

G9 CLEARANCE REQUIREMENTS AS FOLLOWS UNLESS NOTED OTHERWISE: - -
GAS MAIN - 500mm HORIZONTAL; 300mm VERTICAL
GAS HOUSE CONNECTIONS - 300mm HORIZONTAL; 150mm VERTICAL
TELSTRA / NBN - 600mm HORIZONTAL; 150mm VERTICAL
TASNETWORKS HV / LV CABLES - 450mm
STORMWATER - 600mm HORIZONTAL; 150mm VERTICAL
TASWATER SEWER MAIN - 600mm HORIZONTAL; 500mm VERTICAL

WATER SENSITIVE URBAN DESIGN / ENVIRONMENTAL

E1 CONSTRUCTION SHALL COMPLY WITH ALL ENVIRONMENTAL AND LEGISLATIVE REQUIREMENTS.

E2 ALL WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH 'SOIL & WATER MANAGEMENT ON BUILDING & CONSTRUCTION SITES' GUIDELINES AVAILABLE FROM EPA/NRM SOUTH, COMPRISING THE FOLLOWING:
FACT SHEET 1: SOIL & WATER MANAGEMENT ON LARGE BUILDING & CONSTRUCTION SITES
FACT SHEET 2: SOIL & WATER MANAGEMENT ON STANDARD BUILDING & CONSTRUCTION SITES
FACT SHEET 3: SOIL & WATER MANAGEMENT PLANS
FACT SHEET 4: DISPERSIVE SOILS - HIGH RISK OF TUNNEL EROSION
FACT SHEET 5: MINIMISE SOIL DISTURBANCE
FACT SHEET 6: PRESERVE VEGETATION
FACT SHEET 7: DIVERT UP-SLOPE WATER
FACT SHEET 8: EROSION CONTROL MATS & BLANKETS
FACT SHEET 9: PROTECT SERVICE TRENCHES & STOCKPILES
FACT SHEET 10: EARLY ROOF DRAINAGE CONNECTION
FACT SHEET 11: SCOUR PROTECTION - STORM WATER PIPE OUTFALLS & CHECK DAMS
FACT SHEET 12: STABILISED SITE ACCESS ·
FACT SHEET 13: WHEEL WASH
FACT SHEET 14: SEDIMENT FENCES & FIBRE ROLLS
FACT SHEET 15: PROTECTION OF STORM WATER PITS
FACT SHEET 16: MANAGE CONCRETE, BRICK & TILE CUTTING
FACT SHEET 17: SEDIMENT BASINS
FACT SHEET 18: DUST CONTROL
FACT SHEET 19: SITE RE-VEGETATION

E2 CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EACH SITE DISTURBANCE AND SITE DISTURBANCE SHALL BE STAGED WHERE POSSIBLE

E4 WORK SHALL BE RESTRICTED TO THE WELL-DEFINED WORKS ZONES

E5 A SOIL RETENTION SYSTEM (E.G., GRAVEL SHAKEDOWN ZONE) SHALL BE PROVIDED AT ALL SITE ACCESS

E6 ANY SOIL MATERIAL TRACKED OFF-SITE ONTO ROADWAYS SHALL BE IMMEDIATELY REMOVED

E7 ALL CHEMICAL STORAGE SHALL BE MANAGED (E.G., BUNDED) IN ACCORDANCE WITH WORKCOVER OR EPA GUIDELINES

E8 THE EXTENT OF CUT AND FILLS SHALL BE MINIMISED. CUT AND FILL BATTER GRADES SHALL IDEALLY BE AT 1:3

E9 DISTURBED SOIL AREAS SHALL BE EFFECTIVELY MANAGED BY STAGING, MINIMISING AREA EXPOSED AT ANY ONE TIME, AND MINIMISING THE EXPOSURE TIMEFRAME OF EACH

E10 SEDIMENT FILTERS (E.G., SEDIMENT FENCE) SHALL BE USED TO FILTER ALL 'SHEET FLOW' RUNOFF FROM DISTURBED AREAS AND STOCKPILES TO PREVENT SEDIMENT FROM ENTERING STORMWATER SYSTEMS

E11 TEMPORARY CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE CATCHMENT THEY ARE SERVICING IS STABILISED (FOR GRASS THIS WILL MEAN 70% GROUNDCOVER).

E12 ALL SOIL LOADED TRUCKS LEAVING OR ENTERING THE SITE SHALL BE TARPED

E13 TOPSOIL SHALL BE RE-SPREAD OVER ALL EXPOSED SOIL SURFACES WHERE VEGETATION IS REQUIRED. A MAXIMUM DEPTH OF 50MM SHALL BE PLACED ON SLOPES STEEPER THAN 1:3 AND A MINIMUM DEPTH OF 100MM SHALL BE PLACED ON SLOPES LESS THAN 1:3

E14 AN NPK 11-34-11 FERTILISER OR SIMILAR AS APPROPRIATE SHALL BE APPLIED AT A RATE OF 200-400KG/HA. CARE IS TO BE TAKEN TO AVOID ANY FERTILISER DIRECTLY ENTERING WATERCOURSES.

E15 SCARIFYING OR DIRECT DRILLING SHOULD BE USED TO IMPROVE SEED STRIKE RATES

E16 REVEGETATION WORKS SHALL BE MAINTAINED/ENHANCED (E.G., RESEEDING, FERTILISING, WATERING) UNTIL A MINIMUM OR 70% GROUND COVER IS ESTABLISHED

E17 NO TREES TO BE REMOVED WITHOUT THE APPROVAL OF THE SUPERINTENDENT REPRESENTATIVE

E18 MINIMISE AIR POLLUTION INCLUDING DUST AND NOISE THAT MIGHT INTERFERE WITH NEIGHBOURING PROPERTIES

STORMWATER

SW1 ALL STORM WATER PLUMBING & DRAINAGE TO COMPLY WITH A.S 3500.3:2021 STORM WATER DRAINAGE.

SW2 WHERE RELEVANT, REFER TO IPWEA/LGAT TASMANIAN STANDARD DRAWINGS ISSUED MAY 2020

SW3 ALL DRAINAGE WORKS SHALL BE SUBJECT TO THE TESTS PRESCRIBED BY THE AUTHORITIES HAVING JURISDICTION OVER THE VARIOUS SERVICES. ANY SECTION FAILING SUCH TESTS SHALL BE REMOVED AND PROPERLY INSTALLED AT THE CONTRACTOR'S EXPENSE.

WATER

W1 ALL WATER SUPPLY CONSTRUCTION TO:
WATER SUPPLY CODE OF AUSTRALIA (WSA 03-2011-3.1 VERSION MRWA EDITION V2.0) - PART 2: CONSTRUCTION ·
WATER SERVICES ASSOCIATION OF AUSTRALIA - TASWATER SUPPLEMENT
TASWATER'S STANDARD DRAWINGS TWS-W-0002 SERIES
WATER METERING POLICY/METERING GUIDELINES
TASWATER'S STANDARD DRAWINGS TWS-W-0003 - FOR PROPERTY SERVICE CONNECTIONS - CAGE FOR WATER METER ASSEMBLY
BOUNDARY BACKFLOW CONTAINMENT REQUIREMENTS AND AS3500.1:2021. ANY DEPARTURES FROM THESE STANDARDS REQUIRES THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE LOCAL WATER AUTHORITY WORKS SUPERVISOR.

WORK HEALTH AND SAFETY

WHS1 ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH:
RELEVANT WORK HEALTH AND SAFETY LEGISLATION
RELEVANT SAFE WORK AUSTRALIA CODES OF PRACTICE
SITE SPECIFIC SAFETY PLANS
IF THE CONTRACTORS PROPOSES AN ALTERNATIVE DESIGN, A SAFETY RISK ASSESSMENT SHOULD BE UNDERTAKEN AND SUBMITTED TO THE SUPERINTENDENT FOR REVIEW

EARTHWORKS

EW1 EARTHWORKS SHALL BE IN ACCORDANCE WITH THIS SPECIFICATION AND AS 3798.

EW2 AREAS OF FILL
REMOVE TOP SOIL AND ORGANIC MATERIAL
PROOF ROLL SUBGRADE IN ACCORDANCE WITH AS1289 TO:
98% STANDARD DRY DENSITY UNDER BUILDING
100% STANDARD DRY DENSITY UNDER ROADS AND CARPARKS
REMOVE ANY SOFT SPOTS AND COMPACT WITH 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE
PLACE FILL AS SPECIFIED AND COMPACT WITHIN 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE

EW3 AREAS OF CUT
REMOVE TOP SOIL AND ORGANIC MATERIAL B. PROOF ROLL SUBGRADE IN ACCORDANCE WITH AS1289 TO:
98% STANDARD DRY DENSITY UNDER BUILDINGS
100% STANDARD DRY DENSITY UNDER ROADS AND CAR PARKS
REMOVE ANY SOFT SPOTS AND COMPACT WITH 2% OF OPTIMUM MOISTURE CONTENT TO STANDARD DRY DENSITY AS STATED ABOVE

ROAD WORKS

WERE RELEVANT, REFER TO IPWEA/ LGATS TASMANIAN SUBDIVISION STANDARD DRAWINGS ISSUED - MAY 2020.

SURVEY

SU1 SURVEY DETAILS ON COVER PAGE

SU2 PROPERTY BOUNDARY OVERLAYS, WHERE SUPPLIED, VARY IN ACCURACY BUT ARE GENERALLY TO 0.5m. THEREFORE A LAND SURVEY, AS DEFINED UNDER THE SURVEYING ACT 2002, SHOULD BE UNDERTAKEN BEFORE ANY CONSTRUCTION ACTIVITY IS CARRIED OUT ON OR NEAR THE LAND BOUNDARIES DEPICTED BY THIS MODEL.

SU3 SURVEY CONTROL INFORMATION IS REGARDED AS SUITABLE FOR THE SURVEY AND CORRECT AT THE TIME OF SURVEY. BUT SHOULD BE VERIFIED BEFORE BEING USED FOR ANY PURPOSE.

SU4 NO DESIGN SHOULD BE UNDERTAKEN OUTSIDE OF SURVEY EXTENTS. IF DESIGN EXCEEDS SURVEY EXTENTS, ADDITIONAL SURVEY DATA SHOULD BE ACQUIRED.

SU5 UNDERGROUND SERVICES: THE LOCATION OF ALL EXISTING UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY. EXCEED TAKES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF SUCH INFORMATION. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL CONFIRM THE LOCATION & DEPTH/ INVERT LEVEL OF ALL EXISTING UNDERGROUND SERVICES, IN CONJUNCTION WITH THE RELEVANT SERVICE AUTHORITY & ANY CONFLICTS WITH THE PROPOSED DESIGN/ PIPE ALIGNMENT ARE TO BE RESOLVED PRIOR TO CONSTRUCTION

SEWERAGE

S1 ALL SEWER WORKS TO BE IN ACCORDANCE WITH WSA SEWER CODE AND TAS WATER STANDARDS AND SUPPLEMENTS. ANY MODIFICATIONS TO THESE STANDARDS REQUIRES APPROVAL FROM SUPERINTENDENT AND TAS WATER.

S2 ALL NEW LIVE SEWER CONNECTIONS TO EXISTING TAS WATER SEWERAGE INFRASTRUCTURE TO BE COMPLETED BY TAS WATER UNLESS OTHERWISE AGREED AND APPROVED AT OWNERS EXPENSE.

S3 ALL DRAINAGE WORKS TO BE INSPECTED AND TESTED IF REQUIRED. CONTRACTOR IS RESPONSIBLE FOR ORGANISING INSPECTIONS AT BUT NOT LIMITED TO THE FOLLOWING STAGES;
TRENCHING AND PIPEWORK BEDDING
PIPE INSTALLED AND PRIOR TO BACKFILLING
AFTER BACKFILLING
SHOULD ANY INSPECTIONS OR TESTING FAIL TO MEET THE REQUIREMENTS PRESCRIBED BY THE STATUTORY AUTHORITY THE SECTION FAILING THE TESTING/INSPECTION SHOULD BE REMOVED AND REINSTALLED TO MEET THE STATUTORY REQUIREMENTS AND DIRECTIONS PROVIDED. COST OF REINSTALLATION IS AT CONTRACTORS EXPENSE.

S4 TRENCHES ARE TO BE EXCAVATED AND BACKFILLED IN ACCORDANCE WITH THE DESIGN DRAWINGS AND TAS WATER STANDARDS. ELECTROMAGNETIC METAL IMPREGNATED TAPE SHOULD BE INSTALLED IN ALL NON METALLIC PIPE TRENCHES

S5 ALL MANHOLES ARE TO BE PRECAST CONCRETE MINIMUM 1050ID AND INSTALLED IN ACCORDANCE WITH WSA AND TAS WATER STANDARDS. MANHOLE COVERS TO BE HEAVY DUTY CLASS D GATIC COVERS AND SURROUNDS IN TRAFFICABLE AREAS AND MEDIUM DUTY CLASS B GATIC COVERS AND SURROUNDS IN NON TRAFFICABLE AREA.

S6 THE CONTRACTOR IS RESPONSIBLE FOR THE PRODUCTION OF ALL AS CONSTRUCTED DRAWINGS AND DOCUMENTATION. AS CONSTRUCTION DOCUMENTATION SHOULD BE IN ACCORDANCE WITH TAS WATER REQUIREMENTS AND STANDARDS AND BE CERTIFIED BY CHARTERED OR REGISTERED ENGINEER.

S7 ALL REDUNDANT SECTIONS OF PIPE TO BE FILLED WITH "LIQUIFILL" GRADE PC.1
0.5-2.0MPa OR APPROVED EQUIVALENT

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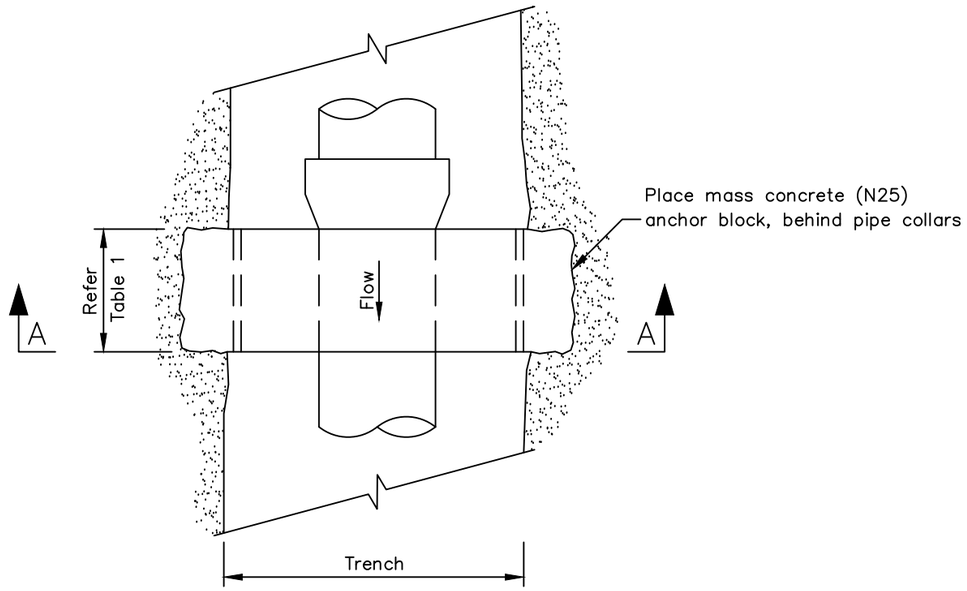
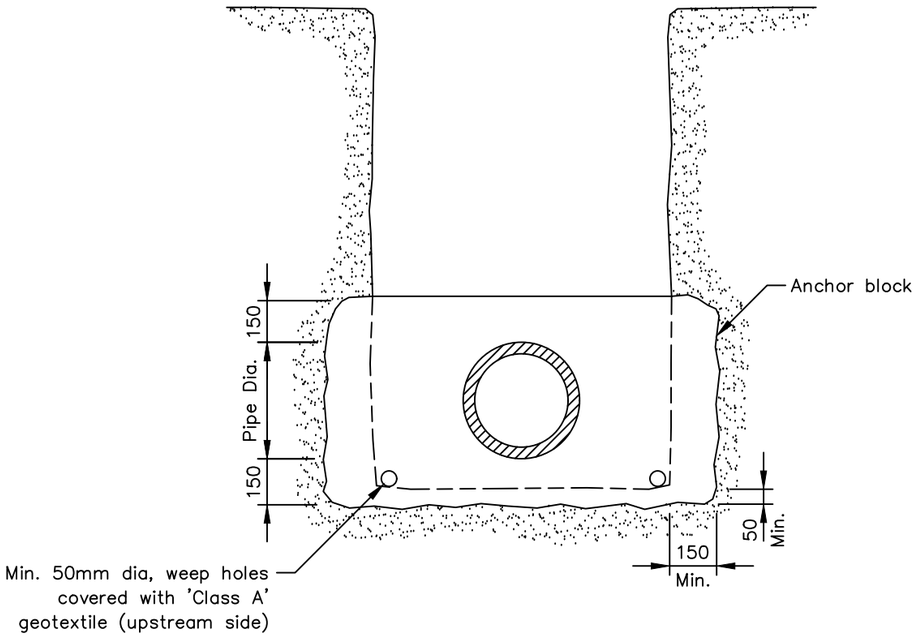
63 MILVALE ROAD, DROMEDARY
CIVIL NOTES

PROJECT #: EE973
SHEET #: C106
REVISION #: 02



PLAN
N.T.S.



SECTION A–A
N.T.S.

TABLE 1

PIPE DIAMETER	ANCHOR BLOCK WIDTH
≤ 450	Pipe diameter + 150 mm
> 450	Design required

NOTES

1. Construct anchor blocks where pipe grades exceed ≥ 10% at
   - 9.6m centres for Concrete pipes
   - 12.0m centres for P.V.C. pipes
2. Landslip areas – site specific design required to ensure land stability risk is not increased.
3. Install bulkheads and trench stops in accordance with Table 5.7 of AS/NZS 2566.2:2002 and provide concrete encasement in accordance with Clause 5.8.3 of AS/NZS 2566.2:2002

SCALES: AS SHOWN
(All scales are correct at A3)

XRef File: TSD-SW01-v3.dwg

REFERENCES

TAS Division
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

Local Government Association Tasmania

STANDARD DRAWING
PIPE INSTALLATION ANCHOR BLOCKS

GPO Box 1521, Hobart Tasmania 7001 I 326 Macquarie Street, Hobart Tasmania 7000
T: 03 6233 5966 F: 03 6233 5986 Email: admin@lgat.tas.gov.au

ISSUE DATE: 18-09-2020
DWG No. TSD-SW01-v3

RED SEAL
Urban & Regional Planning

8200

PLANNING REPORT

Development Application to Brighton Council pursuant to Section 57

***Land Use Planning and Approvals Act 1993* for**

Landscaping & Earthworks

at:

63 Millvale Road, Dromedary
(PID: 2774608, CT: 148313 /1)

Council ref: 5.2024.58.1

For: ES & D Consulting Pty Ltd

TRENT J. HENDERSON
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This Planning Report has been prepared by:

Trent Henderson, a Registered Planner of the Planning Institute of Australia (RPIA) and an Associate Member of Australian ICOMOS. Mr Henderson holds a Bachelor of Arts (Honours) (University of Tasmania), Graduate Certificate of Urban Design (Deakin University), Master of Environmental Planning (University of Tasmania), and Master of Cultural Heritage & Museum Studies (Deakin University) and has nearly twenty years' experience working within the Tasmanian Planning System in community, local government, and private sector roles particularly within rural communities. Mr Henderson also holds qualification and experience in Business Sustainability Management (Institute for Sustainable Leadership, University of Cambridge), On-site implementation of conservation earthworks (Cert L2 QLD TAFE), Risk-based Land Use Planning (Emergency Management Australia), & Rural Operations.

Paul Verne has a Diploma in Civil Engineering & Advanced Diploma in Project Management, plus over 25 years' experience in the construction industry, which includes 20 years assessing the traffic implications of developments, including residential dwellings, multiple units & lot subdivisions, and commercial projects. As Development Engineer, or Roads & Transport Officer, Paul's roles within local government were to assess engineering plans; provide technical advice; inspect and conduct safety audits on all new and existing council assets and proposed developments

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SUMMARY

Client (& Applicant):	*ES & D Consulting Pty Ltd*
Property Owners:	B. Duggan
Project:	Landscaping & Earthworks
The Site:	63 Millvale Road, Dromedary
Property ID:	2774608
Certificate of Title:	Volume 148313 Folio 1
Site Area:	92.24 hectares
Planning Authority:	Brighton Council
Council Reference:	5.2024.58.1
Planning Scheme:	Tasmanian Planning Scheme - Brighton
Zone:	Landscape Conservation
Overlay Areas:	Natural Assets Code (Code 7) - Priority Vegetation Area, Bushfire-prone Areas Code (Code 13), Landslip Hazard Code (Code 15),
Development Code:	Not Applicable
Local Provisions:	Not Applicable
Specific Area Plan:	Not Applicable
Use Class:	Not Applicable
Development:	Works
Date of Assessment:	February 2025
Proposal:	The proposal seeks authority for fill and earthworks located within the curtilage of the existing dwelling on the southern side.

Documents: The following documents have been prepared and form the scope of this development application in accordance with cl. 6.1.2 and cl. 6.1.3 of the Scheme, pursuant to Section 51 of the *Land Use Planning & Approvals Act 1993*, the following documents have formed the base assessment:

a. *Exceed Engineering* "Earthworks Methodology" dated 16 January 2025,
b. *Exceed Engineering* "Site Development Drawings" dated 5 September 2024,
    i. Sheet C100 - Cover Page,
    ii. Sheet C101 – Location Plan,
    iii. Sheet C102 – Site Plan,
    iv. Sheet C103 & 4 – Cross Section Plan,
    v. Sheet C105 – Tasman Notes,
    vi. Sheet C106 – Civil Notes,
    vii. Pip Installation & Anchor Blocks, Standard Drawings LGAT TSD-SW01-v3,
c. Tasman Geotechnics "Landslide Risk Assessment" dated 7 December 2023,
d. ESD Consulting "Soil Management Plan" dated 21 July 2023, and
e. Certificate of Title Volume 148313 Folio 1.

Synopsis: Several standards of the Tasmanian Planning Scheme – Brighton, are applicable to the proposal; however, as demonstrated by the listed documentation above and outlined by this planning report, the works associated with this project have minimal impact on the environmental values of the location.

INTRODUCTION

Red Seal Urban & Regional Planning has been engaged by *ES&D Consulting Pty Ltd* to seek approval pursuant to the provisions of Section 57 of the *Land Use Planning and Approvals Act 1993* to prepare a development application for works at 63 Millvale Road, Dromedary (PID: 2774608 CT: 138313/1).

We have been engaged to review the client-provided documentation and the applicable planning provisions to clarify the scope of the development application to the Planning Authority and the context of the development in accordance with the relevant planning scheme.

1. PROJECT OVERVIEW

1.1 The Proposal

The proposal seeks authority for fill and earthworks located within the curtilage of the existing dwelling at 63 Millvale Road, Dromedary (PID: 2774608 CT: 148313/1), see Figure 1.1a below.

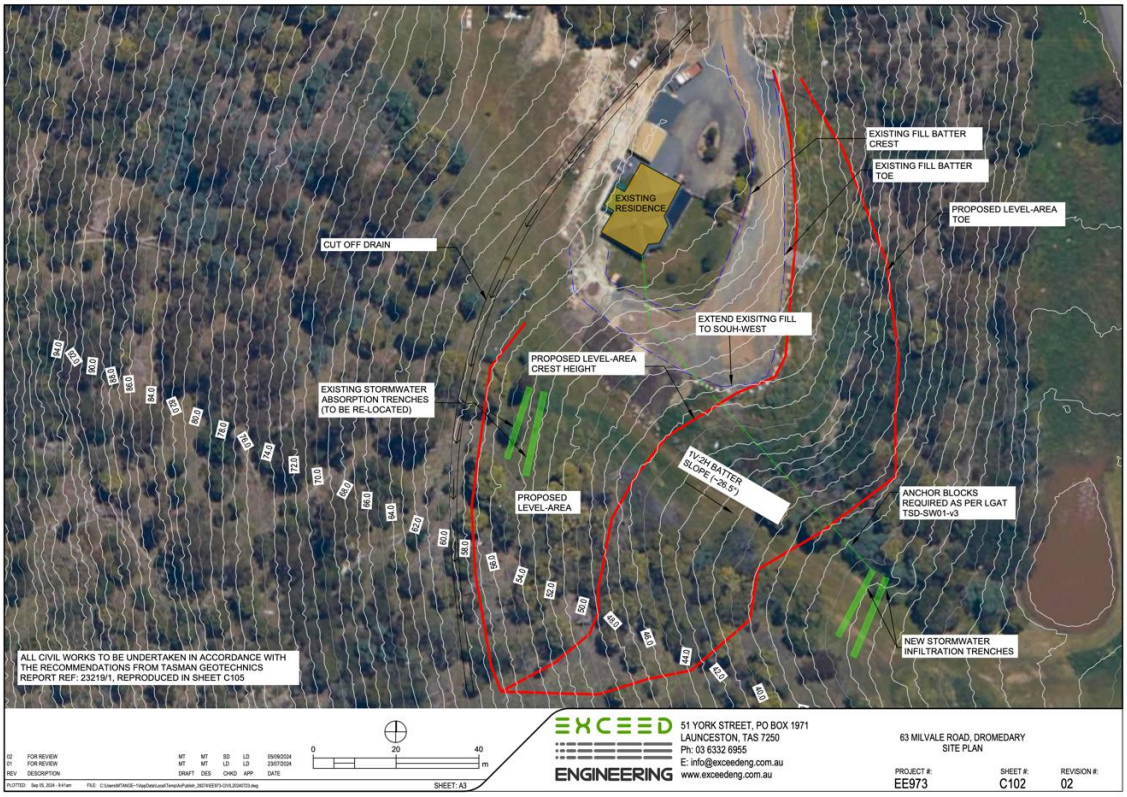

Figure 1.1a – Located on the southern side of the existing dwelling, the extent of works is marked red. (Source: Exceed Engineering)

The fill and earthwork (the works) are located on the south and southeastern side of the dwelling. The works cover just over 8,000m^2 and are to provide a levelled area around the dwelling, which equates to 0.8% of the property. The purpose of the works is to provide a level area and a practical usable outdoor space.

Only clean fill Type 1[1] material will be used, as defined in Section 3(1) of the *Environmental Management and Pollution Control Act 1994*.

1.2 Background

In accordance with the Government Property Report a single dwelling has been on the site since 2012.

Whilst historically some livestock bush grazing or selective logging forestry operations may have taken place, such activities appear to have occurred for some time (Figure 1.2a). The majority of the site is best described as natural environment or vegetation management area with the site around the dwelling the only cleared space, which is consistent with the surrounding properties.

In mid 2023 reuse soil was made available and the pad at the dwelling expanded; however, it was realised that this work would require a development application. Work was halted, and documentation prepared for the extent of works on the site, forming this development application.

Figure 1.2a – Aerial image taken at the end of 1969. The image indicates that the lower slopes and valley floor were cleared, but the upper slopes appear thinner than the current vegetation coverage, potentially due to a combination of livestock grazing and timber or firewood harvesting. (Source: LIST Map; Aerial Photo Image 0538-125.jp2 dated 18 December 1969)

[1] Clean fill type 1 means a mixture – (a) containing natural materials, such as soil, rock, crushed rock, gravel, clay or sand, that are in a raw, unaltered form and that have been excavated from an area of land; and (b) that has been tested and verified as clean fill by a suitably qualified environmental consultant.

1.3 Planning Policy

Unless specifically exempt, all works, development and use on land within Tasmania is subject to the *Land Use Planning and Approvals Act 1993* (the LUPAA). Administration of the LUPAA for this site is the Tasmanian Planning Scheme - Brighton, which sets out several provisions through the category of use, zoning, codes, and specific area plans with standards that exempt, set automatic compliance under acceptable solution, or discretionary compliance subject to being consistent with the relevant performance criteria.

63 Millvale Road, Dromedary, is a privately-owned, bush block located on Deans Hill ridgeline with the dwelling on the lower section of the southeastern spur. As previously noted, some limited livestock grazing may occur in the cleared block around the dwelling, associated with animals that are considered more pets than part of a commercial agricultural venture. Therefore, the works near the dwelling at this site will not impinge on the objectives and values of the *State Policy on the Protection of Agricultural Land 2009*.

The proposed works are within the curtilage of the dwelling and do not impinge on any mapped watercourse, minimising any adverse impact on the values and objectives of the *State Coastal Policy 1996*. Additionally, consideration of the revised location of wastewater management and the reuse of existing access tracks minimises and reduces the potential of new runoff, consistent with the *State Policy on Water Quality Management 1997*.

Regardless, the provisions of the Interim Planning Scheme administrate the aims and objectives of the:

- *State Policy on the Protection of Agricultural Land 2009*
- *State Coastal Policy 1996,* and
- *State Policy on Water Quality Management 1997*

Consideration has been given to the objectives and the values these policies uphold, demonstrating compliance with the provisions of the Scheme and constituting compliance with the Policies.

2 SITE & SURROUNDING ANALYSIS

2.1 The Site

63 Millvale Road, Dromedary (PID: 2774608, CT: 148313/1) is a 92-hectare property containing a single dwelling in the southeastern part with frontage to Millvale Road (Figure 2.1a).

Internal Vehicle access crosses the hillside from the vehicle crossover at the northern end of the frontage to Millvale Road near the boundary with Land known as CT: 92153/3. The dwelling's Land Application area for the wastewater treatment system is to the south of the dwelling.

The site is in the foothills of Mount Dromedary, with Deans Hill at the rear of the property. The dwelling is located on the 60m contour, at the back of the established pad on the hillside with a southeastern aspect and approximately a 35% gradient.

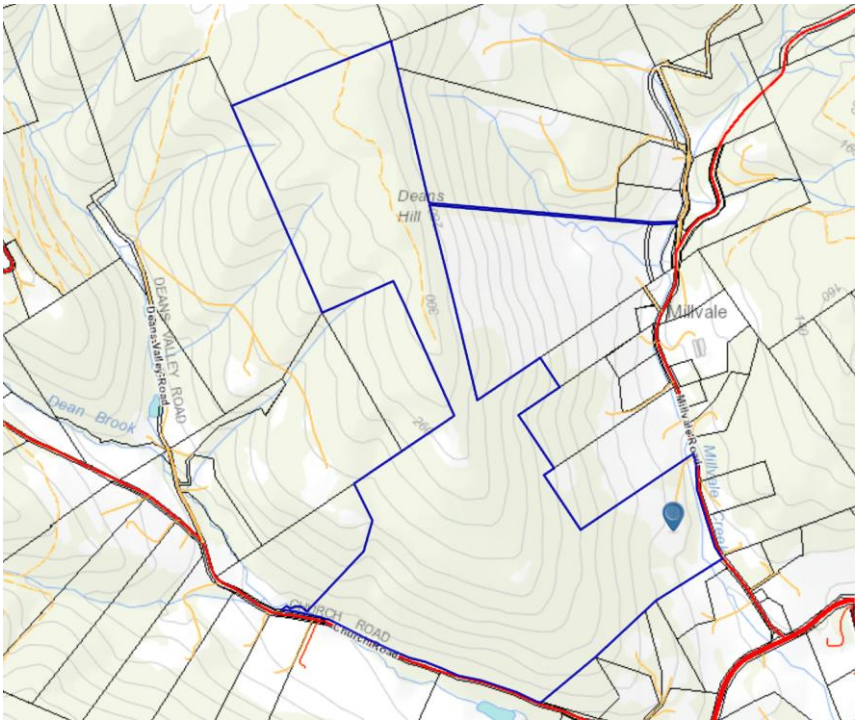

Figure 2.1a - The Site, 63 Millvale Road (blue outlined) and the location of the proposed works (blue tag) where the current single residential dwelling is located. (Source LIST Map)

The property is an irregularly shaped, largely vegetated bush block running along the ridgeline of Deans Hill with frontage to both Church Road and Millvale Road in the south before being cut by several properties branching from Millvale and Church Roads. Millvale Creek runs along the frontage with Millvale Road, roughly following the property boundary.

Vegetation of the site includes *Eucalyptus pulchella* forest and woodland on the south facing section of the site; whilst the ridgeline and northern portions largely *Eucalyptus globulus* dry forest and woodland, with small pockets of *Eucalyptus obliqua* dry forest, Agricultural land and Lowland grassland complex. The area in which works are to occur and the existing dwelling are denoted as Urban Areas (Figure 2.1b).

The development site does not impact any identified priority vegetation, there is threatened vegetation communities approximately 350 metres uphill from the proposed works. The LISTMap TASVEG Live layer indicates that the works are located in both *Eucalyptus Pulchella* forest and woodland (DPU) and Urban areas (FUR) vegetation codes; furthermore, a site visit conducted by ES&D indicated that *Acacia mearnsii* (Black Wattle) is the primary vegetation species in the works area. These vegetation types are not classified as priority vegetation under cl. 7.3.1 of the Scheme.

In accordance with the ES&D report, there are four threatened fauna species observed within a 500-metre buffer of the works; however, none have been observed on the development site itself. The four threatened fauna species are:

- *Dasyurus Maculatus* (Spotted-Tail Quoll),
- *Dasyurus viverrinus* (Eastern Quoll),
- *Perameles gunnii* (Eastern Barred Bandicoot) and
- *Sarcophilus harrisii* (Tasmanian Devil).

As indicated by ES&D, the impact that the works will have on the habitat for these threatened species will be minimal as the vegetation to be cleared is approximately 0.36Ha, or approximately 0.4% of the total 92-hectare property. Furthermore, the majority of the property is regarded as “undeveloped” land or native vegetation, which is more likely to contain appropriate denning areas and habitat for the threatened fauna.

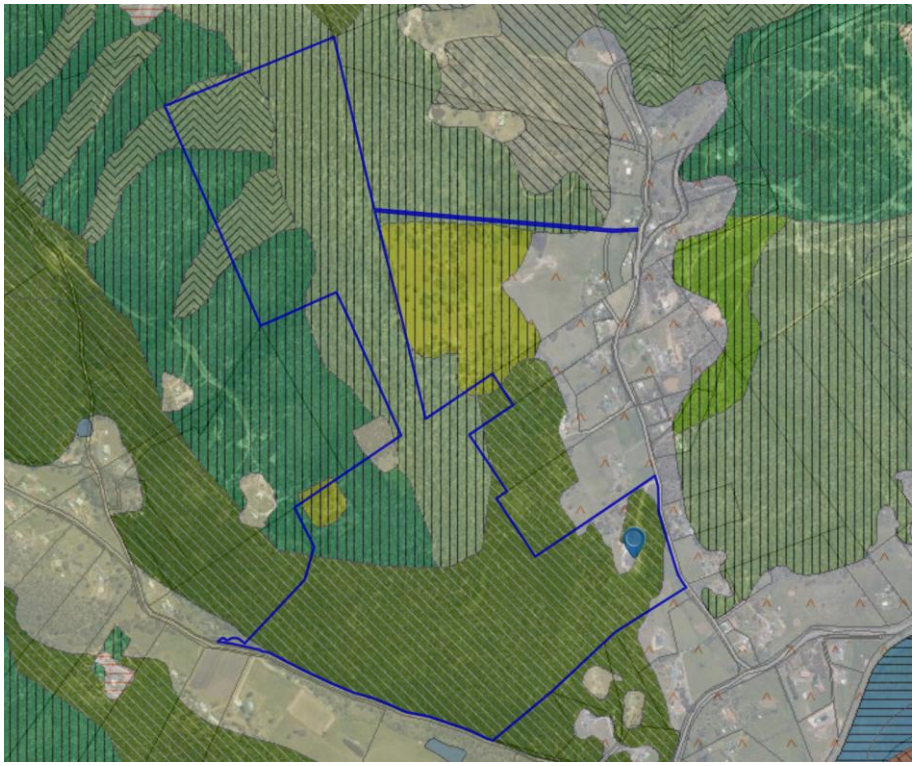

Figure 2.1b – Site outlined in Blue, area of proposed works (Blue Tag), *E. Pulchella* forest (Hatched olive green), *Urban Areas* (Grey circumflex noted), Lowland grassland complex (Hatched yellow), *E. globulus* dry forest and woodland (light green hatched), *E. tenuiramis* forest and woodland on sediments (Hatched dark green), *E. obliqua* dry forest (Light green zigzag hatched), Agricultural land (Cream). (Source LISTMap).

The existing dwelling and the site of the proposed works sit between the 50m and 60m contour, uphill from Millvale Road at the 30m contour. The land is dominated by the prominent ridgeline that extends from Church Road directly through the site, rising to 300m elevation at its highest point at the top of Deans Hill (Figure 1.2c).

2.2 Surrounding Analysis

To the south of the site adjacent land is zoned Rural Living Zone B lots, along Boyer Road, whilst all other adjacent land is also Landscape Conservation zone consistent with the subject land (Figure 2.2a). It is observed that multiple properties in the surrounding area have a dwelling located on an area of fill and excavation to establish a levelled platform.

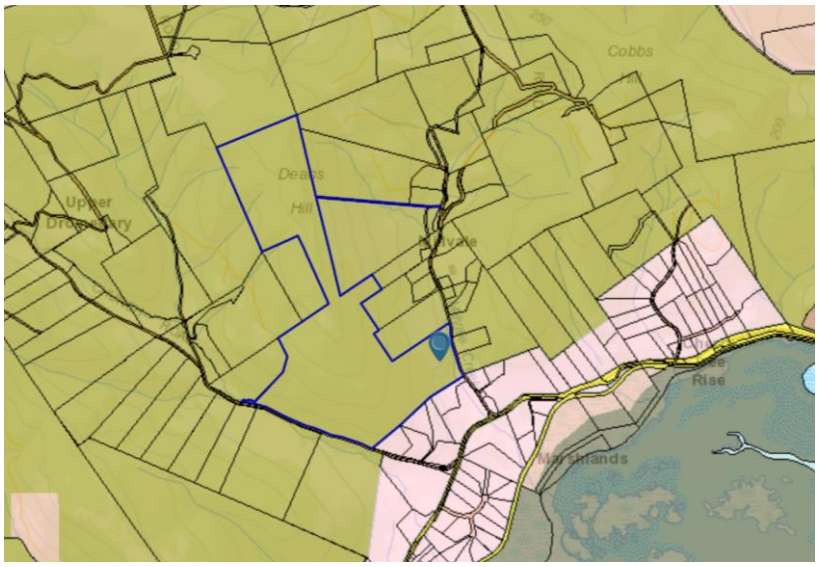

Figure 2.3a – Site and surrounding zone map. Site Boundary (Blue Border), Landscape Conservation Zone (Olive green), Rural Living Zone (Light Pink), Environmental Management Zone (Dark Green), Utilities (Yellow) Rural Zone (Light Brown) (Source LIST Map).

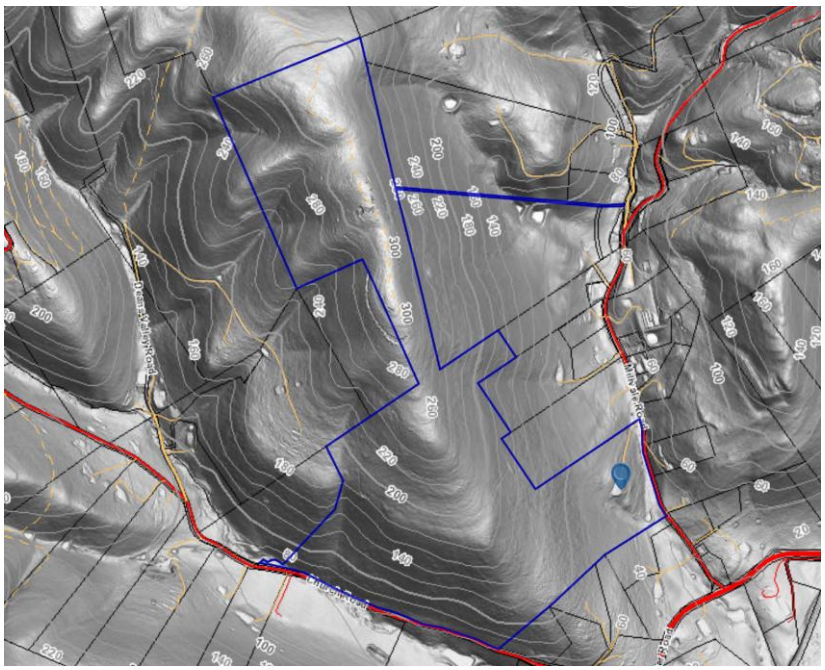

Figure 2.3b – LIDAR imagery of the site (blue outline), showing the existing levelled area of the single dwelling (blue tag) with the prominent ridgeline along to Deans Hill splitting the property. It is also noticeable at the end of the driveways (yellow lines) are levelled areas that have been excavated and filled to establish a levelled site for the dwelling. (Source LISTMap).

3 TASMANIAN PLANNING SCHEME – BRIGHTON

Unless specifically exempt, all works, development and use on land within Tasmania is subject to the *Land Use Planning and Approvals Act 1993* (LUPAA). At the time of lodgement of this development application, administration of the Act for this site is the Tasmanian Planning Scheme - Brighton (the Scheme). Pursuant to Part 5.6, the Scheme sets out applicable standards for use and development of a site through the category of use, zoning, codes, and specific area plans with standards that exempt, or set automatic compliance under the acceptable solution, or discretionary compliance subject to being consistent with the relevant performance criteria.

3.1 Use Category

Works are defined in LUPAA as:

> *…includes any change to the natural or existing condition or topography of land including the removal, destruction or lopping of trees and the removal of vegetation or topsoil, but does not include forest practices, as defined in the Forest Practices Act 1985, carried out in State forests.*

As the proposal is for the inclusion of fill and excavation it alters the topography of the site and meets the requirements to be considered works.

Pursuant to cl. 6.2.1 each proposed use or development must be categorised into one of the Use Classes in Table 6.2, alternatively the best fit description (cl. 6.2.4). This application does not seek to establish a new use on the site. The works themselves do not have a specific use other than for the purpose of improving the outdoor rea of the existing residential dwelling on the site. Therefore, in accordance cl. 6.2.4, the best fit use class is residential.

The Use Class Table 22.2 of the Landscape Conservation Zone, Residential use is permitted for a single dwelling.

Regardless, this application does not establish a new use or vary the parameters of an existing use. As such, the matters associated with the use class standards under Clause 22.3, are not applicable to the determination of this project.

3.2 Purpose of Landscape Conservation Zone Part 22.1

The Landscape Conservation Zone sets out the Purpose of the zone with the Part 22.1:

22.1.1 To provide for 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 scheme does not define landscape values; therefore, the definition must be taken from the context of the site. The Dromedary area consists largely of densely forested woodlands near the peak of the hills. The forest becomes less dense towards the valleys, as this is where peri-urban settlements are more frequent. As the proposed works are within the curtilage of the existing dwelling and an area that is already sparsely vegetated, the works do not adversely impact the landscape values of the site or surrounding areas.

3.3 Development Standards for Buildings & Works – cl. 22.4

As the proposal is for works of fill and earthworks related to an existing dwelling the following standards:

- *cl. 22.4.1 Site Coverage,*
- *cl. 22.4.2 Building height siting and exterior finishes*, and
- *cl. 22.4.3 Access to a road*,

are not applicable to this application.

3.4 Landscape Protection – cl. 22.4

Works associated with development within the Landscape Conservation Zone is governed by the requirements of cl. 22.4.4 of the Scheme that has the objective:

> *The landscape values of the site and surrounding area are protected or managed to minimise adverse impacts.*

To achieve this the standard is separated into two requirements:

3.4.1 Landscape protection – cl. 22.4.4 A1

The Acceptable Solution A1 seeks to achieve the objective of the Clause by requiring:

A1 *Building and works must be located within a building area, if shown on a sealed plan.*

As there is no building area shown on the sealed plan (Appendix B); therefore, the project relies on the performance criteria.

P1 *Building and works must be located to minimise native vegetation removal and the impact on landscape values, having regard to:*

(a) the extent of the area from which vegetation has been removed;
(b) the extent of native vegetation to be removed;
(c) any remedial or mitigation measures or revegetation requirements;
(d) provision for native habitat for native fauna;
(e) the management and treatment of the balance of the site or native vegetation areas;
(f) the type, size, and design of development; and
(g) the landscape values of the site and surrounding area.

The test is that a project's works "*must be located to minimise native vegetation removal and the impact on landscape values".* The standard does not state that there is to be no impact but that works are located to minimise the impact of native vegetation removal on the landscape. It is reiterated that the works are associated adjacent to the existing dwelling.

The extent of the works covers just over 8000m^2 of land[2] and is to provide a levelled area around the dwelling, which equates to 0.8% of the property. Included within the works footprint is the removal of approximately 3600m^2 of vegetation, which equates to 0.4% of native vegetation removed on the 92-hectare property. The native vegetation at this location is sparse vegetation that has been thinned and managed around the existing dwelling, at 0.4% this removal is almost a negligible impact on the broader landscape values of the area; therefore, consistent with sub-clause (a).

[2] Appendix C –Development Plans by Exceed Engineering

The ES&D report[3] states that the vegetation to be removed would be predominately *Acacia meamsii* (Black Wattle), which is not deemed to be threatened under the *Tasmanian Nature Conservation Act 2002*, or individually within the Scheme. This vegetation type is predominately recolonising vegetation and does not present as a native vegetation type of a high conservation value. This is particularly evident in regard to the TASVege Mapping indicates that the broader property is home to a large number of other native flora communities, such as *Eucalyptus tenuiramis* (Silver Peppermint) forest and *Eucalyptus globulus* (Tasmanian Blue Gum) forest and woodlands. The small percentage of native vegetation to be removed is negligible compared to the vast native woodlands and forests that make up the property. Therefore, the proposal is consistent with sub-clause (b).

There are no remedial or mitigation measures or revegetation requirements identified in the ES&D Report; therefore, sub-clause (c) is addressed.

The ES&D Report, in Section 1.2.2 *Desktop Threatened Flora and* Fauna, has identified that although very unlikely, there are chances for native fauna dens to be in the works area. However, due to the small area of native flora to be removed, the report has deemed that the clearing of this land will not have a detrimental impact on the fauna species. Additionally, due to the size of the property and the dense woodlands and forest communities on site, there should be enough alternative denning environments for the native fauna. Therefore, sub-clause (d) has been addressed.

The works associated with the project is 0.8% of the total property. The limited removal of native flora does not disrupt the balance or the landscape values of the site. Furthermore, the area to be affected by works is located adjacent to existing cleared areas, addressing sub-clause (e).

The works associated with the development are cut and fill, with no buildings or significant changes in ground level that would affect the landscape values of the site; therefore, consistent with sub-clause (f).

As observed in the LiDAR image Figure 2.3b above, most dwellings within the surrounding area, are located on sites that had platforms established through fill and excavation. This project seeks approval to expand the established pad to be more practical and functional for the needs of the residential dwelling. It is consistent with landscape values of the site and surrounding area and sub-clause (g) of the Scheme.

Therefore, the proposed works are consistent with the requirements of Landscape Protection Performance Criteria – cl. 24.4.4 P1, of the Scheme.

3.4.2 Landscape protection – cl. 22.4.4 A2

The Acceptable Solution A1 seeks to achieve the objective of the Clause by requiring:

> ***A2*** *Buildings and works must:*
> *(a) be located within a building area, if shown on a sealed plan; or*
> *(b) be an alteration or extension to an existing building providing it is not more than the existing building height; and*
> *(c) not include cut and fill greater than 1m; and*
> *(d) be not less than 10m in elevation below a skyline or ridgeline.*

[3] Appendix D – Soil Management Plan by ESD Consulting

As previously cited, sub-clause (a) is not applicable here. As the proposed works are for cut and fill, sub-clause (b) & (c) are not applicable as these works involve cut and fill that is greater than 1m; therefore, the proposal is reliant Performance Criteria P2.

P2.1 *Buildings and works must be located to minimise impacts on landscape values, having regard to:*
(a) the topography of the site;
(b) the size and shape of the site;
(c) the proposed building height, size and bulk;
(d) any constraints imposed by existing development;
(e) visual impact when viewed from roads and public places; and
(f) any screening vegetation.

The principal test is that works have minimal impact on the landscape. As previously observed, works are contained to the curtilage of the dwelling and covers 0.8% of the property.

The project is consistent with sub-clause (a) & (b), in the context of listed matters, having regard to the surrounding landscape the topography suggests that landscape values of the site are focused on the forested ridgeline of Deans Hill, not that of the existing dwelling area and cleared land that is approximately 150m below the ridgeline when viewed west from Millvale Road.

As no building is proposed, sub-clause (c) is not relevant to the proposal.

There are no existing constraints posed by the dwelling to the works other than the location of the existing wastewater system, which will be relocated; therefore, the project is consistent with sub-clause (d).

The site of the proposed works is partially screened from Millvale Road by vegetation along Millvale Creek, with the lower elevation of approximately 30m at the road compared to approximately 50m at the works site meaning the levelled area will have minimal visible impact from Millvale Road, addressing sub-clause (e) and (f).

P2.2 *If the building and works are less than 10m in elevation below a skyline or ridgeline, there are no other suitable building areas.*

As the works are not less than 10m in elevation below the skyline or ridgeline the performance criteria P2.2 is not applicable.

3.5 Development Standards for Subdivision

The proposal is for works; therefore, the matters listed under cl. 22.5 are not applicable to the determination of this proposal.

4 TASMANIAN PLANNING SCHEME CODE REQUIREMENTS

For matters that transcend specific zones the Planning Scheme addresses these via a Code, either in the form of a development code, such as car parking or a mapped overlay for significant native vegetation.

The proposal is also subject to the mandatory development codes, although the extent that these are applicable does vary. The applicable Codes are addressed below.

4.1 Signs Code C1.0

Pursuant to Clause C1.2 this Code is not applicable to this proposal.

4.2 Parking & Sustainable Transport Code C2.0

Pursuant to Clause C2.2.1 this Code applies to the assessment of the application. Although under cl. C2.4.1 of the Scheme, there are no exemptions from the Parking and Sustainable Transport Code. However, this proposal is for works associated with the existing residential use of the site. There is no new use proposed as part of this development application; therefore, the provisions for use standards are not applicable for the assessment of this proposal.

As the proposal is for works and not altering or adding addition to existing parking areas, access or circulation areas the provisions related to the construction for buildings and works are not applicable for this proposal.

Although the Parking and Sustainable Transport Code is triggered, the standards are not applicable to the determination of this application.

4.3 Road & Railway Assets Code C3.0

Pursuant to Clause C3.2 this Clause is not applicable to this development.

4.4 Electricity Transmission Infrastructure Protection Code C4.0

Pursuant to Clause C4.2 this Clause is not applicable to this development.

4.5 Telecommunications Code C5.0

Pursuant to Clause C5.2 this code is not applicable to this development.

4.6 Local Historic Heritage Code C6.0

Pursuant to Clause C6.2 of the Scheme, this Code is not applicable to this proposal.

4.7 Natural Assets Code C7.0

4.7.1 Purpose of Natural Assets Code - Cl. 7.1

Pursuant to Clause C7.2.1(c) the Natural Assets Code is applicable to this development application as the development is within a priority vegetation area overlay and is zoned Landscape Conservation.

There are five code purpose statements within the Natural Assets Code, although only two are applicable to this project and site, being:

- *7.1.4: To minimise impacts on identified priority vegetation and;*
- *7.1.5: To manage impacts on threatened fauna species by minimising clearance of significant habitat.*

The proposed works are consistent with the two relevant code purposes. Referencing the ES&D report, the LISTMap Threatened Native Vegetation Communities 2020 layer (TNVC 2020) and the TASVEG Live Layer.

4.7.2 Exempt Development - Cl.7.4.1

Pursuant to cl. 3.1 of the Scheme, the land adjacent to a dwelling that has been modified with landscaping or vegetation, including ornamental or edible plants, or the like, is considered private garden. Whilst the land is within the curtilage of the existing house, the land does not neatly meet the definition of private garden; therefore, the project has not been considered exempt pursuant to cl.7.4.1 of the Scheme.

4.7.3 Works within a waterway - Cl.7.6.1

The works do not involve a waterway or vegetation removal within the waterway; therefore, this standard.

4.7.4 Clearance within a priority vegetation area C7.6.2

A priority vegetation area is defined by cl. 3.1 of the Scheme to mean:

> *…land shown on an overlay map in the relevant Local Provisions Schedule, as within a priority vegetation area*.

Although the development site does not involve the removal of significate vegetation (see 2.1 Site Analysis of this Report), the project involves the clarence of native vegetation within a mapped priority vegetation area; therefore, cl. C7.6.2 of the Scheme is applicable.

The objective of this standard is *that clearance of native vegetation within a priority vegetation area:*

a) Does not result in unreasonable loss of priority vegetation;
b) Is appropriately managed adequately protect identified priority vegetation; and
c) Minimises and appropriately manages impacts from construction and development activities.

The Acceptable Solution requires:

A1 *Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.*

No building area is on the sealed plan SP: 148313; therefore, this proposal relies on the Performance Criteria cl. C7.6.2.

The clearance of native vegetation is of limited scale relative to the extent of priority vegetation on the site, noting that whilst native vegetation is being removed it is limited to *Acacia mearnsii* (Black Wattle): therefore, the works are consistent with Performance Criteria P1.1 (f) of the Scheme.

In regard to P1.2 is applicable:

> ***P1.2*** *Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:*
> *(a) the design and location of buildings and works and any constraints such as topography or land hazards;*
> *(b) any particular requirements for the buildings and works;*
> *(c) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings;*
> *(d) any mitigation measures implemented to minimise the residual impacts on priority vegetation;*
> *(e) any on-site biodiversity offsets; and*
> *(f) any existing cleared areas on the site.*

The test of P1.2 is that the removal of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation. Although the works involve the removal of native vegetation, neither *Eucalyptus Pulchella* forest and woodland (DPU) or Urban areas (FUR) vegetation communities are defined as priority vegetation under cl. C7.3.1 of the Scheme. Therefore, the project complies with the test of cl. C7.6.2 P1.2 as no priority vegetation as defined by the cl. C7.3.1 of the Code is to be removed. As such, the matters listed to have regard to are not applicable. Additionally, as stated in Section 1.2.1 of the ES&D report, "the site visit indicates that the vegetation in the development area is sparse".

Therefore, the proposal is consistent with sub-clause (a).

The only recommendations highlighted in the ES&D report is that "*a denning survey is required prior to the clearance of non-threatened vegetation associated with the development prior to filling".* Therefore, the proposal is consistent with sub-clause (b).

Sub-clause (c) is not applicable to the proposed works, as it does not include any new habitable buildings.

As stated in section 1.9 of the ES&D report, "threatened vegetation communities are unlikely to be impacted" as these communities are 350m upgradient from the development area. No mitigation measures will be needed to be implemented to minimise the residual impacts on priority vegetation; therefore, the proposal is consistent with sub-clause (d).

There is no on-site biodiversity offsets listed or required; therefore, sub-clause (e) is not applicable.

The works area is located adjacent to the existing dwelling, the site area is sparse in vegetation; therefore, the proposal addresses subclause (f).

4.8 Scenic Protection Code C8.0

Pursuant to Clause C8.2 this code is not applicable to this development.

4.9 Attenuation Code C9.0

Pursuant to Clause C9.2 this code is not considered to be applicable to this development.

4.10 Coastal Erosion Hazard Code C10.0

Pursuant to Clause C10.2 this code is not applicable to this development.

4.11 Coastal Inundation Hazard Code C11.0

Pursuant to cl. C11.2 the Coastal Inundation Hazard Code is not applicable to this proposal.

4.12 Flood-Prone Areas Hazard Code C12.0

Pursuant to cl. C12.2 the Flood-Prone Areas Hazard Code does not apply to this development assessment.

4.13 Bushfire-Prone Areas Code C13.0

Although the works are located within a Bushfire-Prone Area code overlay, the code does not apply to the development, pursuant to cl. C13.2.1 of the Scheme:

a) Subdivision of land that is located within, or partially within, a bushfire-prone area; and
b) A use, on land that is located within, or partially within, a bushfire-prone area, that is a vulnerable use or hazardous use.

The proposed works are not associated with a subdivision and as stated in Table 3.1 *Planning terms and Definitions,* the works are not associated with a vulnerable use or hazardous use, as stated in C13.3 *Definition of Terms.* Therefore, the standards of the Bushfire-Prone Area code are not applicable to the proposed works.

4.14 Potentially Contaminated Land Code C14.0

Pursuant to Clause C14.2 the Potentially Contaminated Land Code is not applicable to this project; however, there is the prospect that actions could trigger the Standards within the Code.

As previously stated, documentation has indicated that the only clean fill Type 1 material will be used. Pursuant to Section 3(1) of the *Environmental Management and Pollution Control Act 1994,* clean fill type 1 means:

(a) containing natural materials, such as soil, rock, crushed rock, gravel, clay or sand, that are in a raw, unaltered form and that have been excavated from an area of land; and
(b) that has been tested and verified as clean fill by a suitably qualified environmental consultant.

This does not involve rubble or similar waste products from building demolition sites.

Therefore, with these parameters this project does not trigger the Potentially Contaminated Land Code.

The Soil Management Plan[4] highlights that the soil is suitable for use for the development with the approval from Council, with requirements highlighted in Tasman Geotechnics Report[5].

4.15 Landslide Hazard Code C15.0

Pursuant to cl. C15.1.1 the purpose of the Landslide Hazard Code is to:

> *ensure that a tolerable risk can be achieved and maintained for the type, scale and intensity and intended life of use or development on land within a landslip hazard area.*

Pursuant to cl. C15.2.1(a), the project involves works or development within a landslip hazard area as mapped within Figure 4.15a below.

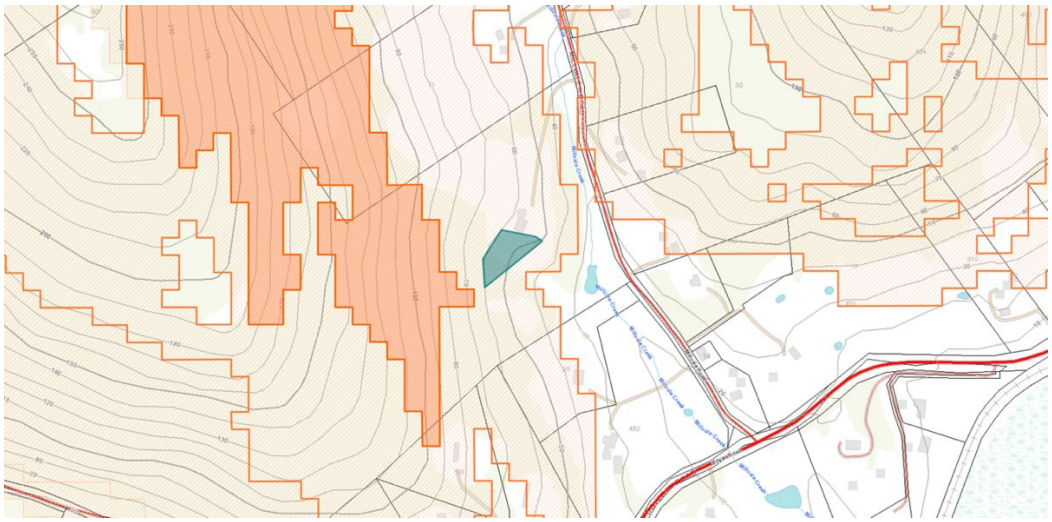

Figure 4.15a – Image indicates the Low (orange hatched area) & Medium (orange area) Landslip Hazard band. The works are in the vicinity of the green polygon in the centre of the image, which is located within the Low Landslip Hazard Band. (Source: LIST Map)

4.15.1 Use or Development Exempt the Landslide Hazard Code – cl. C15.4.1

In accordance with cl. C15.4.1(d)(i) b. of the Scheme, works within a low landslip hazard band are exempt if they are not classified as significant works. The extent of the project exceeds the levels listed under cl. C15.3.1 as such are considered to be significant works and not exempt from the applicable standards of the Code.

4.15.2 Use within a landslip hazard area – cl. C15.5.1

No new use is introduced to the site, and the works do not involve any extension to habitable space associated with the existing dwelling; therefore, this standard is not applicable to the determination of this project.

[4] Appendix D – Soil Management Plan by ESD Consulting

[5] Appendix E– Landslide Risk Assessment by TASMAN Geotechnics

4.15.3 Works within a landslip hazard area - cl. C15.6.1

As the works are located in an area mapped as a low landslip hazard band and are of an extent that means they are not exempt cl. C15.6.1 of the Code applies to the determination of the project.

The objective of the clause is to ensure that works on land within the within a landslip hazard area can:

(a) minimise the likelihood of triggering a landslip event; and
(b) achieve and maintain a tolerable risk from a landslip.

To assess the level of tolerable risk on the site a "Landslide Risk Assessment" by *TASMAN Geotechnics*, has been undertaken and is submitted as part of the documentation for this development application[6].

No acceptable solution is listed under cl. C15.6.1 as a result, all works relying on this standard rely on the Performance Criteria, which states:

P1.1 states that *a building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to:*

a) The type, form, scale and intended duration of the development.
b) Whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures.
c) Any advice from a state authority, regulated entity or a council; and
d) The advice contained in a landslip hazard report.

A Landslip Risk Assessment conducted by Tasmanian Geotechnics deduced that any "small-scale failure of the fill" would result in "insignificant consequences*"* resulting in a *Very Low risk* profile. Conversely, the worst-case scenario, "a large-scale failure leading to debris flow, would yield minor consequences under the current conditions*"*, with a *Low Risk* profile.

Performance Criteria P1.1 stipulates that works must maintain a tolerable risk, the Scheme lacks a specific definition for tolerable risk. The Landslip Risk Assessment considers a tolerable risk level as equivalent to the moderate risk profile. Since the risk assessment has determined that both failure events fall below the moderate risk profile, the Landslip Risk Assessment considers that the works comply with achieving and maintaining a tolerable risk to a landslip exposure.

Performance Criteria P1.2 of C15.6.1 requires that *a landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent and or public infrastructure.*

As stated in section 5.6 *Risk Evaluation* of the Tasman Geotechnics report, the works cause *no increase in the level of risk from a landslip requiring specific hazard reduction or protection measures arising from the proposed works.*

Performance Criteria P1.3 of C15.6.1 requires that if a *landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.*

[6] Appendix E– Landslide Risk Assessment by TASMAN Geotechnics

As stated in section 5.6 *Risk Evaluation* of the Tasman Geotechnics report, the assessment has deemed that *no landslip reduction or protection measures will be required beyond the boundaries of the site.*

The proposed works complies with all relevant performance criteria for C15.6.1, if the recommendations of the report are followed. The recommendations can be seen in section 6 *Discussions and Recommendations* in the Tasman Geotechnics report.

4.16 Safeguarding of Airports Code C16.0

Pursuant to Clause C16.2 this code is not applicable to this development.

5 Specific Area Plans

There are no specific area plans applicable to the site.

6 Recommendation

As demonstrated by this report, the project is consistent with the applicable standards of the Tasmanian Planning Scheme – Brighton; however, the following recommendations are advised to be undertaken:

1) Be in accordance with the following documents which form the base assessment:

   a. *Exceed Engineering*, "Earthworks Methodology" dated 16 January 2025,
   b. *Exceed Engineering,* "Site Development Drawings" dated 5 September 2024,
   c. *Tasman Geotechnics*, "Landslide Risk Assessment" dated 7 December 2023, and
   d. *ESD Consulting,* "Soil Management Plan" dated 21 July 2023,

2) It is recommended that only clean fill Type 1 material be used, as defined in Section 3(1) of the *Environmental Management and Pollution Control Act 1994*. It is recommended that soil transported to the site complies with the following requirements where applicable:

   - EPA's *Information Bulletin No.105: Classification and Management of Contaminated Soil for Disposal* (IB105)
   - National Environment Protection Measures (NEPMs)
   - *Environmental Management and Pollution Control Act 1994* (EMPCA)
   - Environmental Management and Pollution Control (Waste Management) Regulations 2020

   Soil must be sampled as per IB105 with consideration of the NEPM sampling requirements if a PSI/ESA has been conducted, and approval to dispose of soil on the site is required from either the council (LUPA) or EPA (Regulation 21).

3) Whilst an exact depth is difficult to determine prior to completion, it is recommended that once the fill is finalised, a qualified land surveyor check the site and determine the extent of works. The mapped area of the works can then be included within an agreement pursuant to Section 71 *Land Use Planning and Approvals Act 1993* defining the depth and extent of fill for any future property owners. Certification of testing results can form an addendum to the agreement.

7 Conclusion

The works associated with the dwelling at 63 Millvale Road, Dromedary, rely on the performance criteria of the following provisions of the Tasmanian Planning Scheme – Brighton:

- Clause 22.4.4 Landscape protection
- Clause C7.6.2 Clearance within a priority vegetation area, &
- Clause C15.6.1 Building and works within a landslip hazard area

The works proposed will have minimal impact on the landscape values and conservation values of the site and surrounding area. The works are to be conducted in accordance with conditions identified in the Earthworks methodology report with risk of landslip hazard all but mitigated through these conditions and providing for very low risk of landslip hazards.

We would request therefore that after due consideration this application be approved without delay.

RED SEAL
Urban & Regional Planning

Limitations

Red Seal Urban & Regional Planning provides town planning advice based on the information provided by the Client, which is assumed correct in relation to the provisions of the Tasmanian Resource Management Planning System.

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Appendix E –Landslide Risk Assessment by *TASMAN Geotechnics*

Client:	*ES&D Consulting*,
Project No.	TG23219/1 - 01report
Prepared by:	D. Gibbons
Document Dated:	7 December 2023

LANDSLIDE RISK ASSESSMENT
PROPOSED WORKS
63 MILLVALE ROAD, DROMEDARY

Prepared for: **ES&D**

Date: 7 December 2023

Document Reference: TG23219/1 - 01report

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Version	Date	Prepared by	Reviewed by	Distribution
Original	7 December 2023	David Gibbons	Dr Wayne Griffioen	Electronic

1 INTRODUCTION

Tasman Geotechnics was commissioned by ES&D to carry out a Landslide Risk Assessment for proposed works at 63 Millvale Road, Dromedary (title reference 148313/1).

The proposed works are the placement of fill. The Tasmanian Planning Scheme refers to the Land Use Planning and Approvals Act (LUPAA) for the definition of works. The Act defines 'works' to include "… *any change to the natural or existing condition or topography of land* …".

The assessment is required as relevant part of the site is mapped within a "Low" hazard band on the Landslide Planning Map V2 – Hazard Bands overlay on The LIST.

Our scope of work consisted of:

- Reviewing available maps and reports;
- Carrying out a site walkover to note geomorphological features associated with landslide activity;
- Excavation of four test pits (TP1 to TP4) to determine subsurface conditions;
- Conducting a Landslide Risk Assessment.

The assessment is consistent with the Landslide Risk Assessment guidelines published by the Australian Geomechanics Society (2007).

2 BACKGROUND INFORMATION

2.1 Planning Scheme

The Tasmanian Planning Scheme is effective in the Brighton municipality since 14 April 2021. Clause C15.6.1 of the planning scheme stipulates that the objective for building and works within a landslip hazard area is:

> *"That building and works on land within a landslip hazard area can:*
>
> *(a) minimise the likelihood of triggering a landslip event; and*
>
> *(b) achieve and maintain a tolerable risk from a landslip."*

There are no acceptable solutions.

The performance criteria state that:

> *P1.1*
>
> *Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to:*
>
> *(a) the type, form, scale and intended duration of the development;*
>
> *(b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures;*
>
> *(c) any advice from a State authority, regulated entity or a council; and*
>
> *(d) the advice contained in a landslip hazard report.*
>
> *P1.2*
>
> *A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure.*

P1.3

If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

A tolerable risk is one which is tolerable both in terms of risk to property and risk to life.

Although tolerable levels of risk for property loss are rarely quoted in literature, AGS (2007d) suggests a Moderate risk profile as a tolerable level of risk for low-rise residential buildings on existing slopes as well as existing landslides.

AGS (2007c) suggests the tolerable loss of life individual risk should be 10^{-5}/annum for new constructed slopes, new development, or existing landslide, and 10^{-4}/annum for existing slopes or existing development.

For the proposed development, the following tolerable levels of risk are adopted;

- Risk to property: Moderate,
- Risk to life: 10^{-5}/annum.

2.2 Regional Setting

The site is located along Deans Hill, one of several north-west/south-easterly trending ridges on the south-eastern foothills of Mt Dromedary. On the northern bank of the River Derwent, the terrain is dissected by south-easterly drainages including Terra Gully Creek, Dromedary Creek and, close to the site, Millvale Creek.

2.3 Geology

The site is large (c. 92ha) and irregularly shaped. There are several different geological units mapped at the site, although most of them are not directly relevant to this assessment. The published geology for the site is shown on the Mineral Resources Tasmania (MRT) 1:25,000 Series Digital Geological map Broadmarsh and New Norfolk Sheets, and an extract of the MRT geology mapping is presented in Figure 1.

The peak of Deans Hill (in the northern part of the site) is comprised of a conformable, gently south-west dipping sequence of Lower Parmeener Supergroup Permian aged sedimentary rocks. These have been intruded by a Jurassic aged dolerite sill, whose upper contact with the Permian rocks also dips gently to the south-west. The sill appears to have a maximum exposed thickness of about 200 vertical meters.

In the mid-portion of the site, an older east-southeast trending normal fault offsets the Permian sequence but apparently not the dolerite.

There are several younger (Mesozoic/Cenozoic?) north-west/south-east trending faults to the west, and these offset the dolerite and Permian rocks against Upper Parmeener Supergroup Triassic aged sedimentary rocks. Most relevantly, the dolerite is in faulted contact with the Triassic sequence immediately adjacent to the existing house, and in the relevant area of the proposed works. The Triassic unit is described as '*Dominantly freshwater cross-bedded quartzose sandstone, micaceous siltstone and mudstone (correlate of Ross Formation)*.'

2.4 Landslide Mapping

2.4.1 Landslide Inventory

MRT maintain a digital landslide inventory focused primarily on urban areas of Tasmania, but which also includes known landslides statewide. The MRT landslide database shows that the site is not mapped on a known landslide.

There are about nine mapped landslides within a 2.5km radius of the site on the northern bank of the River Derwent, generally of unknown activity state. Almost all the nearby known landslides are mapped on the Parmeener Supergroup rocks, apart from Landslide ID 1343 which is mapped

near the conjunction of two faults in the Jurassic dolerite. Landslide 1343 is described as a 'possible' landslide.

The nearest landslide to the relevant portion of the site is ID 8046, a 'Possible' landslide detected from remote sensing data about 650m to the north.

The only recent or active landslide near the site is ID 1345, a point mapped about 700m north-east of the relevant portion of the site. No other details are available.

2.4.2 Landslide Susceptibility

MRT has been actively mapping landslides and landslide susceptibility since the 1950s, with a particular focus on urban growth areas beginning in the 1960s.

In 2003, MRT embarked on a new phase of landslide zoning in Tasmania. This work targeted the major urban areas of the State and areas of likely future development where it was assessed that a significant landslide hazard may exist. Consequently, there have been landslide hazard parameters developed within specific geographic areas such as the Tamar Valley and the Hobart-Glenorchy region. The parameters may include ground slope angles representative of potential source, regression, and runout areas, applicable specifically to the relevant geologic units within those areas.

Whilst this mapping activity has not been undertaken at the site, the geological units mapped at the site also occur around Hobart and therefore there are threshold values for potential deep-seated landsliding which are applicable. These are 41° for Jurassic dolerite and sand-rich units of the Parmeener Supergroup, and 32° for clay/mud rich units of the Parmeener Supergroup.

Despite the availability of this data, the mapped landslide hazard bands at the site have been generated using a more simplistic approach, which uses fixed slope angles irrespective of the mapped geology. The trigger slope angles are:

Ground Slope	**Hazard Band**
<11°	Not applicable
11 – 20°	Low Hazard Band
>20°	Medium Hazard Band

These trigger angles are based on those for debris flow for Cenozoic aged basalt and are applied universally across the state regardless of the actual rock type, outside of the major urban areas. On this basis, the low hazard band mapped on the relevant portion of the site is based on the ground slope being between 11 and 20°, which is less than the relevant trigger angles for deep-seated landsliding in the type of materials that are known to occur at the site.

The landslide hazard bands are presented on Figure 2.

2.5 Previous Reports

A search was made of the Mineral Resources Tasmania website for previous investigations at or near the site. However, there were no relevant reports identified.

2.6 Proposed Development

The proposed development involves the placement of fill materials, as a means of disposal of excess soil and rock from construction sites. The site owner is an earthmoving contractor.

The materials to be placed are understood to be soil and rock only, equivalent to Level 1 Fill Material per the EPA Information Bulletin 105.

The proposed disposal area is south-west of the existing house. The house itself is constructed on a cut-fill platform, and other fill materials have been dumped on the site south and south-east

of the house in a similar manner to the current proposal. The new fill will extend south-west from an existing filled area. The current site arrangement is shown on Figure 3, and the proposed site arrangement is shown on Figure 4.

The fill is proposed to be placed to an elevation of about 56-57m AHD, giving a maximum vertical height of about 11m. The fill will be placed with a batter angle of 1V:2H, or about ~26°. We estimate this will provide a fill capacity of about 15,000m^3 in the proposed area.

The fill is presumed to be remaining on the site permanently/indefinitely once placed.

3 FIELD INVESTIGATION

The fieldwork was carried out by a Principal Geotechnical Engineer from Tasman Geotechnics on 14 September 2023. The fieldwork involved a site walkover to note topographic features potentially relevant to landslide activity, and excavation of four test pits (TP1 to TP4) to depths of 1.3 to 1.8m below ground level with a 5t excavator.

The test pit logs are presented in Appendix A and the test pit locations are shown on Figure 3.

No laboratory testing was undertaken.

4 RESULTS

4.1 Surface Conditions

The area around the existing house is the relevant portion of the site and comprises c. 4ha of the 92ha total site area. The natural slopes are typically about 15° towards the east.

Millvale Creek runs in a southerly direction along the eastern boundary of the site, just west of (and parallel to) Millvale Road. There is a small dam on Millvale Creek in the south-eastern corner of the site, about 125m south-east of the house, and other dams constructed along the stream on neighbouring properties downstream. The dam was constructed between 2005 and 2009, and the existing house on the site was constructed between 2010 and 2011.

The house is constructed on a cut and fill platform and appears to be in good condition. Cross-bedded Triassic SANDSTONE is exposed in a cut behind the house.

There is a substantial fill platform south-east of the existing house. Based on Google Earth imagery, we estimate the main placement of fill commenced in about 2018, some time after the house was constructed. The existing fill has a batter slope of 30 to 35°.

The toe of the existing fill south of the house is in a shallow (natural) depression. Whilst the depression presumably funnels run-off during rain events, there is no permanent stream within the depression. Moist surface soils and reeds were observed in the depression.

Dolerite boulders and talus were observed on the natural slope downslope of the existing filled area, along with cracked black clay (possibly dolerite derived). Therefore, there appears to be a (possibly thin) layer of dolerite derived colluvial soils overlying the Triassic rocks.

There are cleared areas around the house, but most of the site is vegetated with a dry eucalypt type woodland. The trees are vertical, indicating no soil creep or landslide activity.

South-west of the existing house is the existing wastewater disposal area. This will likely be buried by the proposed placement of fill and hence will require the establishment of a new wastewater disposal area. Design of a replacement wastewater disposal area is outside of the scope of this investigation.

There were no indications of instability in the existing fill, such as slumping, cracking, or previously failed areas.

4.2 Subsurface Conditions

Two test pits (TP1 and TP2) were excavated on the existing fill platform and encountered fill comprised of low to high plasticity (Sandy) CLAY soils with cobbles and boulders of both sandstone and dolerite.

Test pits TP3 and TP4 were excavated within the proposed fill area and encountered naturally occurring high plasticity CLAY soils. TP3 was to the side of the existing wastewater disposal area, close to an existing swale and did not encounter groundwater inflow. TP4 was excavated below the existing wastewater disposal area, in the depression near the toe of the existing fill and encountered trickling inflow of groundwater at about 0.3m below ground level. The deeper parts of TP4 (from about 1m below ground level) had textures suggesting the soil was derived from the in-situ weathering of the Triassic sandstone.

The consistency of the natural soils varied from Stiff to Hard.

5 LANDSLIDE RISK ASSESSMENT

5.1 General

Risk assessment and management principles applied to slopes can be interpreted as answering the following questions;

- What might happen? (HAZARD IDENTIFICATION).
- How likely is it? (LIKELIHOOD).
- What damage or injury might result? (CONSEQUENCE).
- How important is it? (RISK EVALUATION).
- What can be done about it? (RISK TREATMENT).

The risk is a combination of the likelihood and the consequences for the hazard in question. Thus, both likelihood and consequences are considered when evaluating a risk and deciding whether treatment is required.

The qualitative likelihood, consequence and risk terms used in this report for risk to property are given in Appendix B and are based on the Landslide Risk Management Guidelines, published by Australian Geomechanics Society (AGS, 2007). The risk terms are defined by a matrix that brings together different combinations of likelihood and consequence. Risk matrices help to communicate the results of risk assessment, rank risks, set priorities and develop transparent approaches to decision making.

5.2 Geotechnical Model

The natural site conditions consist of at least 1.5m of soil (typically), generally comprised of highly plastic CLAY, overlying rock (such as exposed behind the house). The natural slopes are typically up to about 15°.

Fill has been placed on the site previously, with batter angles of 30-35°. The existing fill appears to be stable under current conditions.

Site drainage generally appears to be acceptable. There are presently no indications of slope instability in either the modified or natural slopes.

5.3 Potential Hazards

Based on the site observations, test pit data and available information discussed in the sections above, two potential landslide hazards are identified for the site associated with the proposed works:

Small scale failure of the fill: (up to about 3m deep): Such landslides can occur where slopes are locally over steepened or have locally elevated groundwater levels (e.g., seepage water collected in fill embankment).

The likelihood of a small-scale failure of the fill is assessed to be Possible. The consequences of any such small-scale failure are insignificant.

Large scale failure of the fill: The worst-case scenario for the development proposal is that the fill becomes saturated and fails *en masse*, turning into a debris flow. Any such event would result in a run-out down the existing natural depression, towards Millvale Creek. Theoretically, such an event could run-out onto the neighbouring sites at No. 29 Millvale Road and potentially 482 Boyer Road. By limiting the size of the fill placement and controlling the drainage, the likelihood of a large-scale failure of the fill becoming a debris flow is assessed to be Unlikely.

Under current conditions, a debris flow from a failure of a fill embankment on the site would not cause damage to any existing dwellings, as there are no dwellings in the potential runout path. Similarly, any such event would be very unlikely to reach the (shared) driveway to No. 29 Millvale Road and 482 Boyer Road. However, future developments on these properties could conceivably result in construction within a potential debris flow path and hence this must be considered in designing the current works.

The identification of the potential hazards considers both the site and nearby properties and is necessary to address stability issues that may negatively impact upon the site and influence the risk to property, both on the site and on neighbouring sites, both under current conditions and in the future.

5.4 Risk to Property

The following table summarises the risk to property of the landslide events in relation to the proposed development, **assuming limitations in Section 6 are incorporated.**

Table 1. Landslide risk profiles

Scenario	Likelihood	Consequence	Risk Profile
Small scale failure of the fill	Possible	Insignificant	Very Low
Large scale failure becoming debris flow	Unlikely	Minor under current conditions; would require reinstatement	Low

The assessment shows that the proposed development presents a Low to Very Low level of risk under current conditions, and **provided the limitations listed in Section 6 are incorporated in the design.**

5.5 Risk to Life

The calculation of risk to life requires a quantitative assessment. However, there is no credible risk to life to any individual from the current development proposal, under current conditions. Therefore, the risk to life is assessed to be tolerable by default.

5.6 Risk Evaluation

The tolerable levels of risk for the proposed development were outline in Section 2.1. In terms of Risk to Property, this assessment shows that the proposed works present a Very Low level of risk and hence the risk is tolerable. In terms of Risk to Life, this assessment shows that the Risk to Life is absent and therefore tolerable by default.

In terms of the performance criteria listed in Section 2.1 for the works, it is our assessment that the proposed works can achieve and maintain a tolerable risk from landslide having regard to the type, form, scale and intended duration of the works, provided the recommendations of this report are followed.

There is no increase in the level of risk from a landslip requiring specific hazard reduction or protection measures arising from the proposed works, provided the recommendations of this report are followed. The works are not expected to cause or contribute to landslip on the site, on adjacent land or public infrastructure.

It is our assessment that no landslip reduction or protection measures will be required beyond the boundaries of the site, provided the recommendations of this report are followed.

6 DISCUSSION & RECOMMENDATIONS

To ensure the proposed development does not change the risk profile above Very Low for the site, it is recommended that the following limitations be enforced:

- The fill should be constructed at a final batter angle no steeper than 1V:2H
- Vegetation and topsoil should be stripped from the footprint of the proposed fill area prior to the placement of new fill. As the ground slope is >8°, it is recommended to bench the natural slope and key-in the fill.
- Fill should be spread in (nominally) 200mm thick layers and track rolled with a 20t (or larger) excavator (at least 6 passes).
- If the fill is proposed to be constructed above 60m AHD (elevation), the proposal must be reviewed by a Geotechnical Engineer
- No habitable structure should be constructed on the site downslope of the filled area.
- Runoff must not be permitted to pool on or immediately upslope of the filled area.
- Cut-off drains should be used to divert surface runoff around the perimeter of the fill, i.e., during and after construction.
- A layer of coarse material (such as cobbles or gravel) wrapped in geofabric should be placed as the base of the fill to prevent build-up of groundwater pressure at the base of the fill.
- Where possible, vegetation should be maintained on the slopes to prevent erosion of surface soils. As a minimum, vegetation should comprise grass. Once the fill is placed to the final extents, any stockpiled topsoil should be used to revegetate the filled area.
- Maintenance of surface runoff, vegetation, retaining structures and other measures described above are the responsibility of the site owner.
- The existing wastewater disposal area must be relocated to a new area, which should be located at least 10m upslope of the proposed fill platform, or cross slope of the proposed fill platform.
- Good hillside construction practices should be followed. A copy of the Guidelines for Hillside Construction is presented in Appendix C.

Important information about your report

These notes are provided to help you understand the limitations of your report.

Project Scope

Your report has been developed on the basis of your unique project specific requirements as understood by Tasman Geotechnics at the time, and applies only to the site investigated. Tasman Geotechnics should be consulted if there are subsequent changes to the proposed project, to assess how the changes impact on the report's recommendations.

Subsurface Conditions

Subsurface conditions are created by natural processes and the activity of man.

A site assessment identifies subsurface conditions at discrete locations. Actual conditions at other locations may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time.

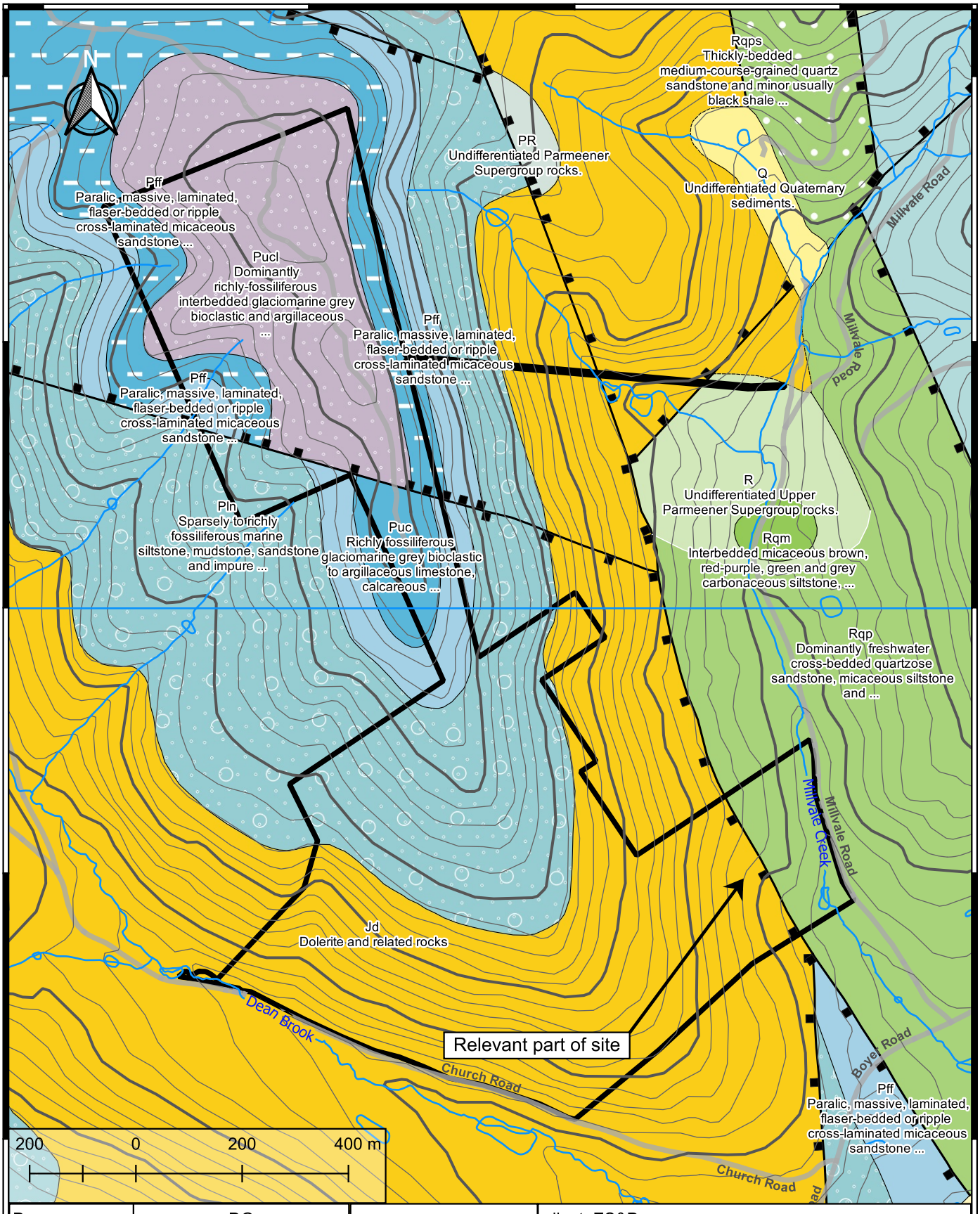
Nothing can be done to change the conditions that exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, the services of Tasman Geotechnics should be retained throughout the project, to identify variable conditions, conduct additional investigation or tests if required and recommend solutions to problems encountered on site.

Advice and Recommendations

Your report contains advice or recommendations which are based on observations, measurements, calculations and professional interpretation, all of which have a level of uncertainty attached.

The recommendations are based on the assumption that subsurface conditions encountered at the discrete locations are indicative of an area. This can not be substantiated until implementation of the project has commenced. Tasman Geotechnics is familiar with the background information and should be consulted to assess whether or not the report's recommendations are valid, or whether changes should be considered.

The report as a whole presents the findings of the site assessment, and the report should not be copied in part or altered in any way.



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Approved:	WG
Date:	24/11/2023
Scale:	1:10000
Size:	A4
Grid:	GDA94 / MGA zone 55

TASMAN geotechnics

client: ES&D

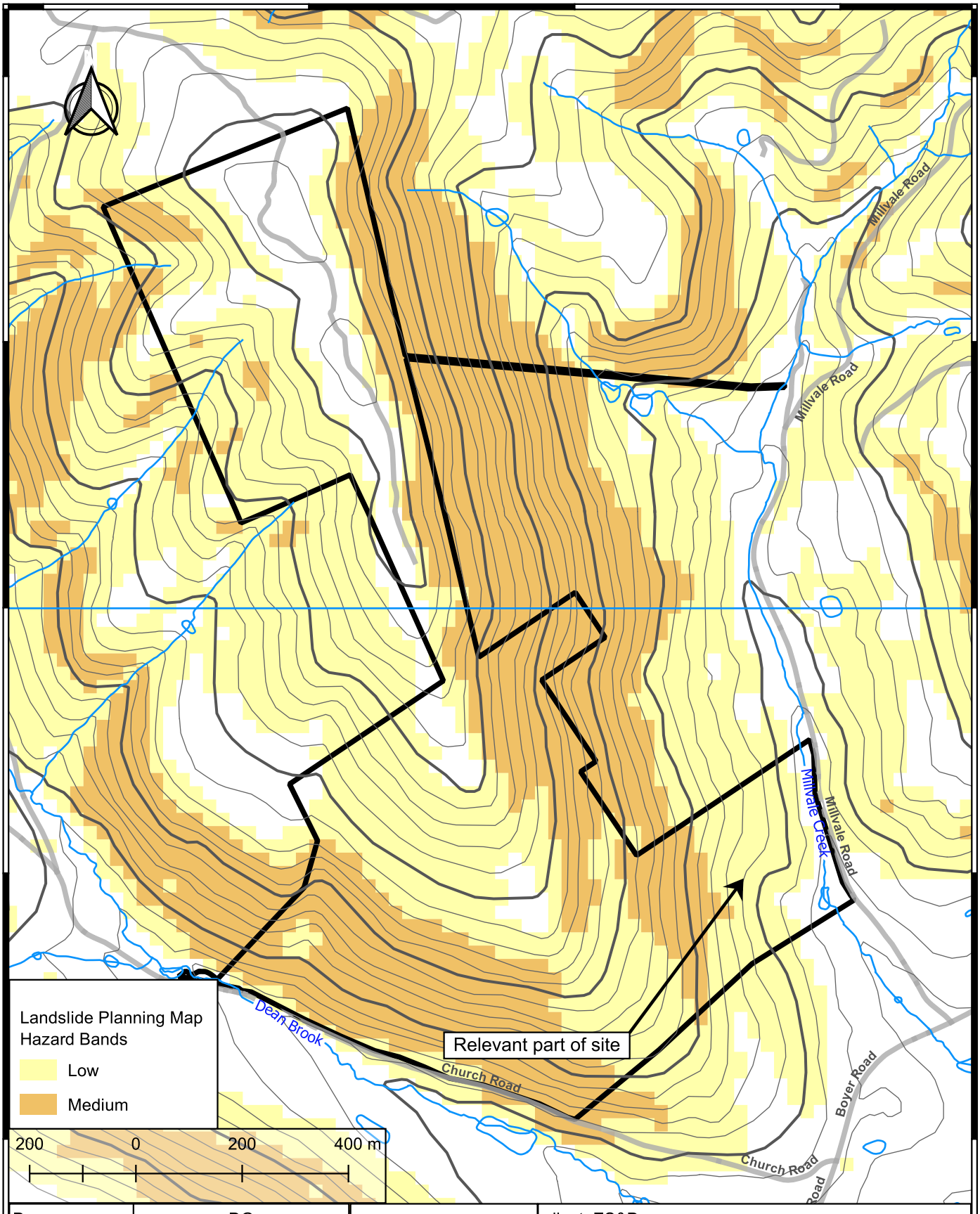
project: Landslide Risk Assessment
63 Millvale Road, Dromedary

title: Extract of MRT Geology Mapping

project no: TG23219/1 - 01report

figure no: 1

Note: basemap airphoto and cadastral boundaries are from TheLIST Web Services (http://services.thelist.tas.gov.au) and were retrieved on the date shown above. Current site conditions may differ from this plan. TheLIST data is copyright of TheLIST, and use is subject to terms found at: http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf.



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TASMAN geotechnics

client: ES&D

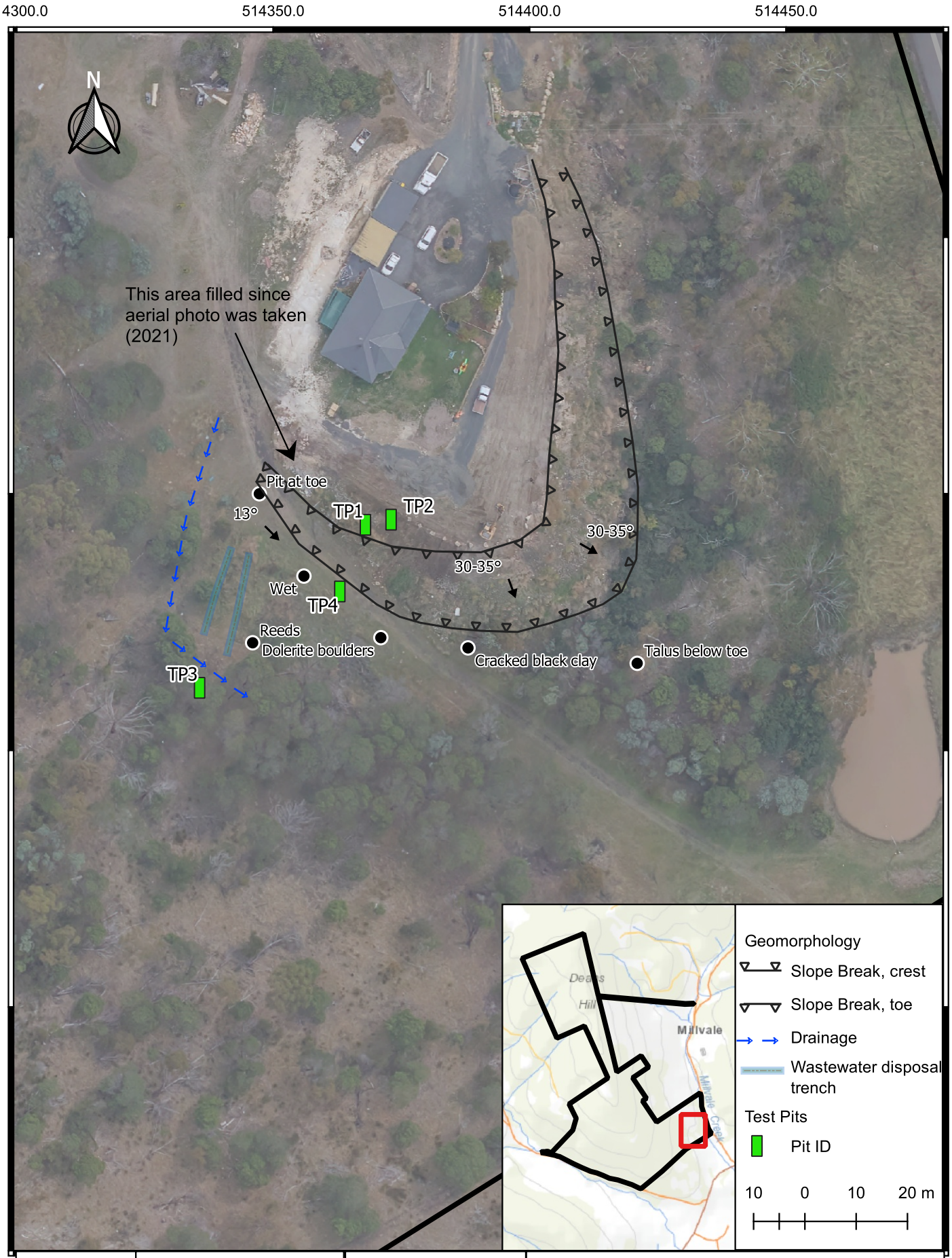
project: Landslide Risk Assessment
63 Millvale Road, Dromedary

title: Landslide Hazard Band Mapping

project no: TG23219/1 - 01report

figure no: 2

Note: basemap airphoto and cadastral boundaries are from TheLIST Web Services (http://services.thelist.tas.gov.au) and were retrieved on the date shown above. Current site conditions may differ from this plan. TheLIST data is copyright of TheLIST, and use is subject to terms found at: http://listdata.thelist.tas.gov.au/public/LISTWebServicesTermsConditions.pdf.



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Date:	30/11/2023
Scale:	1:1000
Size:	A4
Grid:	GDA94 / MGA zone 55

TASMAN geotechnics

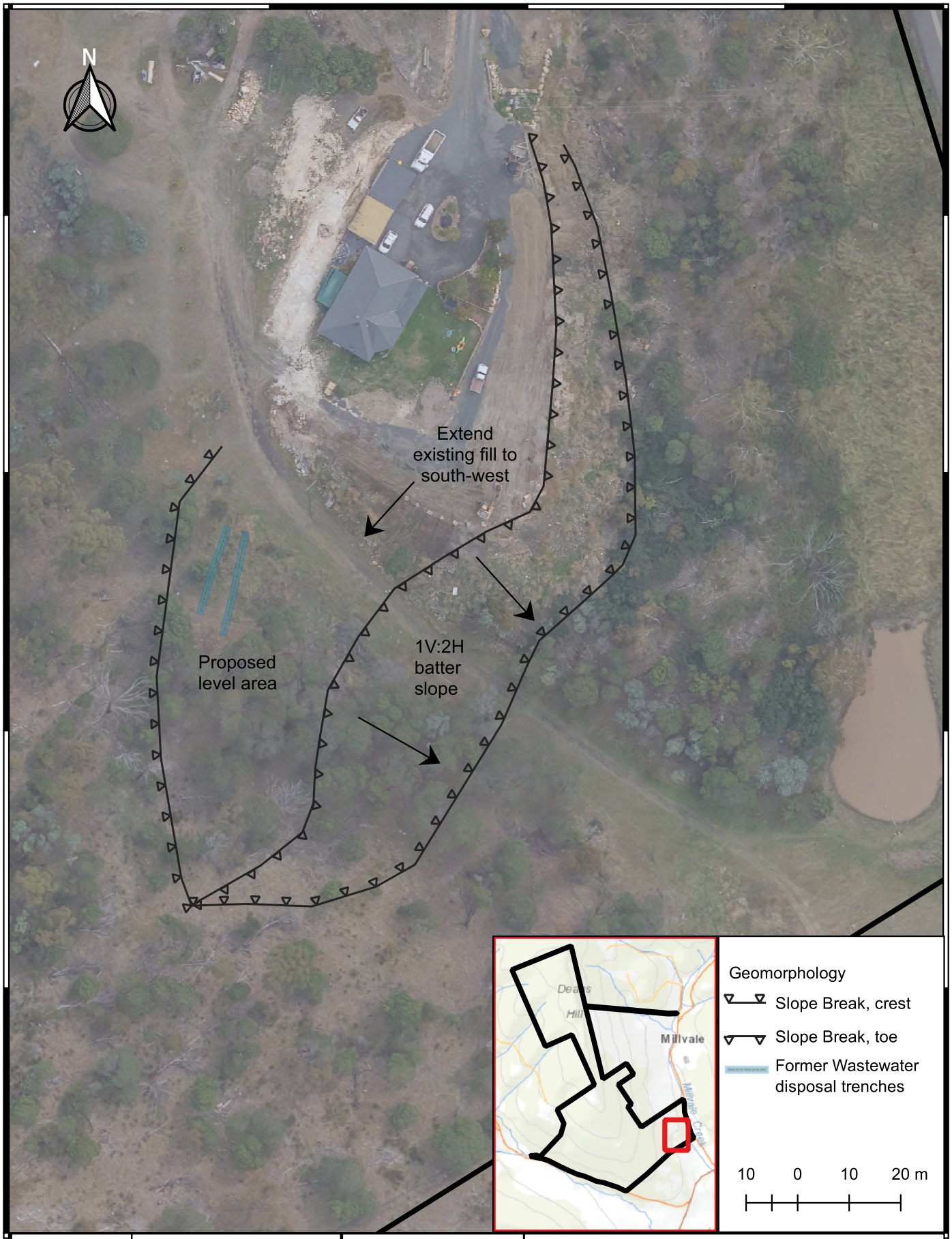
client: ES&D

project: Landslide Risk Assessment
63 Millvale Road, Dromedary

title: Current Conditions

project no: TG23219/1 - 01report

figure no: 3



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Date:	30/11/2023
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Size:	A4
Grid:	GDA94 / MGA zone 55

TASMAN geotechnics

client: ES&D

project: Landslide Risk Assessment
63 Millvale Road, Dromedary

title: Proposed Extent of Fill

project no: TG23219/1 - 01report

figure no: 4

Appendix A

Engineering Test Pit Logs

SOIL DESCRIPTION EXPLANATION SHEET

TASMAN geotechnics

Soils are described in accordance with the Unified Soil Classification System (UCS), as shown in the following table.

FIELD IDENTIFICATION

					DRY STRENGTH	DILATANCY	TOUGHNESS
COARSE GRAINED SOILS	more than 65% of material less than 63mm is larger than 0.075mm	GRAVELS	GW	Well graded gravels and gravel-sand mixtures, little or no fines			
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines			
		GRAVELLY SOILS	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines			
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines			
		SANDS	SW	Well graded sands and gravelly sands, little or no fines			
			SP	Poorly graded sands and gravelly sands, little or no fines			
		SANDY SOILS	SM	Silty sand, sand-silt mixtures, non-plastic fines			
			SC	Clayey sands, sand-clay mixtures, plastic fines			
FINE GRAINED SOILS	more than 35% of material less than 63mm is less than 0.075mm	SILT & CLAY, liquid limit less than 50%	ML	Inorganic silts, very fine sands or clayey fine sands	None to low	Quick to slow	None
			CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays and silty clays	Medium to high	None to very slow	Medium
			OL	Organic silts and organic silty clays of low plasticity	Low to medium	Slow	Low
		SILT & CLAY, liquid limit greater than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts	Low to medium	Slow to none	Low to medium
			CH	Inorganic clays of high plasticity, fat clays	High	None	High
			OH	Organic clays of medium to high plasticity	Medium to high	None to very slow	Low to medium
PEAT			Pt	Peat muck and other highly organic soils			

Particle size descriptive terms

Name	Subdivision	Size
Boulders		>200mm
Cobbles		63mm to 200mm
Gravel	coarse	20mm to 63mm
	medium	6mm to 20mm
	fine	2.36mm to 6mm
Sand	coarse	600μm to 2.36mm
	medium	200μm to 600μm
	fine	75μm to 200μm

Minor Components

Term	Proportions	Observed properties
'Trace of'	Coarse grained: <5% Fine grained: <15%	Presence just detectable by feel or eye. Soil properties little or no different to general properties of primary component.
'With some'	Coarse grained: 5-12% Fine grained: 15-30%	Presence easily detected by feel or eye. Soil properties little different to general properties of primary component.

Density of granular soils

Term	Density index
Very loose	<15%
Loose	15 to 35%
Medium Dense	35 to 65%
Dense	65 to 85%
Very dense	>85%

Consistency of cohesive soils

Term		Undrained strength	Approximate Pocket Penetrometer Reading	Field guide
Very soft	VS	<12kPa	25kPa	A finger can be pushed well into soil with little effort
Soft	S	12 - 25kPa	25-50kPa	Easily penetrated several cm by fist
Firm	F	25 - 50kPa	50-100kPa	Soil can be indented about 5mm by thumb
Stiff	St	50-100kPa	100-200kPa	Surface can be indented but not penetrated by thumb
Very stiff	VSt	100-200kPa	200-400kPa	Surface can be marked but not indented by thumb
Hard	H	>200kPa	>400kPa	Indented with difficulty by thumb nail
Friable	Fb	-	-	Crumbles or powders when scraped by thumb nail

Moisture Condition

Dry (D)	Looks and feels dry. Cohesive soils are hard, friable or powdery. Granular soils run freely through fingers.
Moist (M)	Soil feels cool, darkened in colour. Cohesive soils are usually weakened by moisture presence, granular soils tend to cohere.
Wet (W)	As for moist soils, but free water forms on hands when sample is handled

Cohesive soils can also be described relative to their plastic limit, ie: <Wp, =Wp, >Wp. The plastic limit is defined as the minimum water content at which the soil can be rolled into a thread 3mm thick.

ENGINEERING TEST PIT LOG

Client: ES&D
Project: Landslide Risk Assessment
Location: 63 Millvale Road, Dromedary

Equipment: Hitachi ZX48U
Test Pit Length: 2
Width: 0.6

TASMAN geotechnics

Test Pit no.: TP1
Sheet no. 1 of 1
Job no. TG23219/1
Date: 14 Sep 2023
Logged By: WG
GDA94 Easting: 514369
GDA94 Northing: 5269494

Method	Penetration 1 2 3 4	Notes Samples Tests	Water	Depth	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Pocket Penetro-meter kPa 100 200 300 400 500	Structure, additional observations
Ex				0		CI	FILL: Sandy CLAY, low to medium plasticity, with sandstone cobbles (sub-rounded, High Strength)				Tree roots and branches from 0.5m
				0.5							
				1							
				1.5							
				2			Terminated at 1.8m, still going				
				2.5							

water
- 17/03/18 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss

Moisture Condition
Dry (D)
Moist (M)
Wet (W)

Cohesive soils can also be described relative to their plastic limit, ie:
<Wp
=Wp
>Wp

Consistency

VS	Very soft
S	Soft
F	Firm
St	Stiff
VSt	Very stiff
H	Hard
Fb	Friable

ENGINEERING TEST PIT LOG

Client: ES&D
Project: Landslide Risk Assessment
Location: 63 Millvale Road, Dromedary

Equipment: Hitachi ZX48U
Test Pit Length: 2
Width: 0.6

TASMAN geotechnics

Test Pit no.: TP2
Sheet no. 1 of 1
Job no. TG23219/1
Date: 14 Sep 2023
Logged By: WG
GDA94 Easting: 514374
GDA94 Northing: 5269495

Method	Penetration 1 2 3 4	Notes Samples Tests	Water	Depth	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Pocket Penetro-meter kPa 100 200 300 400 500	Structure, additional observations
Ex				0		CH	FILL: CLAY, high plasticity, black/dark brown, with basalt cobbles (rounded, High Strength) and a boulder				
				0.5							
				1		CH	becomes brown				
				1.5			Terminated at 1.5m, still going				
				2							
				2.5							

water
17/03/18 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss

Moisture Condition
Dry (D)
Moist (M)
Wet (W)

Cohesive soils can also be described relative to their plastic limit, ie:
<Wp
=Wp
>Wp

Consistency

VS	Very soft
S	Soft
F	Firm
St	Stiff
VSt	Very stiff
H	Hard
Fb	Friable

ENGINEERING TEST PIT LOG

Client: ES&D
Project: Landslide Risk Assessment
Location: 63 Millvale Road, Dromedary

Equipment: Hitachi ZX48U
Test Pit Length: 2
Width: 0.6

TASMAN geotechnics

Test Pit no.: TP3
Sheet no. 1 of 1
Job no. TG23219/1
Date: 14 Sep 2023
Logged By: WG
GDA94 Easting: 514339
GDA94 Northing: 5269472

Method	Penetration 1 2 3 4	Notes Samples Tests	Water	Depth	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Pocket Penetro-meter kPa 100 200 300 400 500	Structure, additional observations
Ex				0		CH	CLAY, high plasticity, black, occasional dolerite cobble (sub-rounded)	≈Wp	Fb		Grass roots
				0.5		CH	becomes dark grey with rounded and sub-rounded dolerite cobbles	<Wp	Fb/VSt	+	
						CH	becomes brown, with a faint rock texture	<Wp	VSt/H		
				1							
				1.5			Terminated at 1.3m, still going				
				2							
				2.5							

water
- 17/03/18 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss

Moisture Condition
Dry (D)
Moist (M)
Wet (W)

Cohesive soils can also be described relative to their plastic limit, ie:
<Wp
=Wp
>Wp

Consistency

VS	Very soft
S	Soft
F	Firm
St	Stiff
VSt	Very stiff
H	Hard
Fb	Friable

ENGINEERING TEST PIT LOG

Client: ES&D
Project: Landslide Risk Assessment
Location: 63 Millvale Road, Dromedary

Equipment: Hitachi ZX48U
Test Pit Length: 2
Width: 0.6

TASMAN geotechnics

Test Pit no.: TP4
Sheet no. 1 of 1
Job no. TG23219/1
Date: 14 Sep 2023
Logged By: WG
GDA94 Easting: 514364
GDA94 Northing: 5269481

Method	Penetration 1 2 3 4	Notes Samples Tests	Water	Depth	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Pocket Penetro-meter kPa 100 200 300 400 500	Structure, additional observations
Ex			▶	0		CH	CLAY, high plasticity, black	>Wp	F-Fb		Trickle inflow
				0.5		CH	CLAY, high plasticity, dark grey becoming brown, trace sand	≈Wp	St/VSt	+ +	
				1		CH	with thin layers of yellow sand, possibly after sandstone; trace ironstone gravel	≈Wp	VSt/H	+ +	
				1.5							
							Terminated at 1.6m, still going				
				2							
				2.5							

water
- 17/03/18 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss

Moisture Condition
Dry (D)
Moist (M)
Wet (W)

Cohesive soils can also be described relative to their plastic limit, ie:
<Wp
=Wp
>Wp

Consistency

VS	Very soft
S	Soft
F	Firm
St	Stiff
VSt	Very stiff
H	Hard
Fb	Friable

Appendix B

Landslide Risk Matrix

Terminology for use in Assessing Risk to Property

These notes are provided to help you understand concepts and terms used in Landslide Risk Assessment and are based on the "Practice Note Guidelines for Landslide Risk Management 2007" published in *Australian Geomechanics* Vol 42, No 1, 2007.

Likelihood Terms

The qualitative likelihood terms have been related to a nominal design life of 50 years. The assessment of likelihood involves judgment based on the knowledge and experience of the assessor. Different assessors may make different judgments.

Approximate Annual Probability	Implied indicative Recurrence Interval	Description	Descriptor	Level
10^{-1}	10 years	The event is expected to occur over the design life	Almost Certain	A
10^{-2}	100 years	The event will probably occur under adverse conditions over the design life	Likely	B
10^{-3}	1000 years	The event could occur under adverse conditions over the design life	Possible	C
10^{-4}	10,000 years	The event might occur under very adverse conditions over the design life	Unlikely	D
10^{-5}	100,000 years	The event is conceivable but only under exceptional circumstances over the design life	Rare	E
10^{-6}	1,000,000 years	The event is inconceivable or fanciful for the design life	Barely Credible	F

Qualitative Measures of Consequence to Property

Indicative Cost of Damage	Description	Descriptor	Level
200%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequential damage.	Catastrophic	1
60%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequential damage	Major	2
20%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequential damage.	Medium	3
5%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works	Minor	4
0.5%	Little damage.	Insignificant	5

The assessment of consequences involves judgment based on the knowledge and experience of the assessor. The relative consequence terms are value judgments related to how the potential consequences may be perceived by those affected by the risk. Explicit descriptions of potential consequences will help the stakeholders understand the consequences and arrive at their judgment.

Qualitative Risk Analysis Matrix – Risk to Property

Likelihood		Consequences to Property				
	Approximate annual probability	1: Catastrophic	2: Major	3: Medium	4: Minor	5: Insignificant
A: Almost Certain	10^{-1}	VH	VH	VH	H	L
B: Likely	10^{-2}	VH	VH	H	M	L
C: Possible	10^{-3}	VH	H	M	M	VL
D: Unlikely	10^{-4}	H	M	L	L	VL
E: Rare	10^{-5}	M	L	L	VL	VL
F: Barely credible	10^{-6}	L	VL	VL	VL	VL

NOTES:

1. The risk associated with Insignificant consequences, however likely, is defined as Low or Very Low

2. The main purpose of a risk matrix is to help rank risks and set priorities and help the decision making process.

Response to Risk

In general, it is the responsibility of the client and/or regulatory and/or others who may be affected to decide whether to accept or treat the risk. The risk assessor and/or other advisers may assist by making risk comparisons, discussing treatment options, explaining the risk management process, advising how others have reacted to risk in similar situations and making recommendations. Attitudes to risk vary widely and risk evaluation often involves considering more than just property damage (eg environmental effects, public reaction, business confidence etc).

The following is a guide to typical responses to assessed risk.

Risk Level		Example Implications
VH	Very High	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than the value of the property.
H	High	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	Moderate	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	Low	Usually accepted by regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	Very Low	Acceptable. Manage by normal slope maintenance procedures

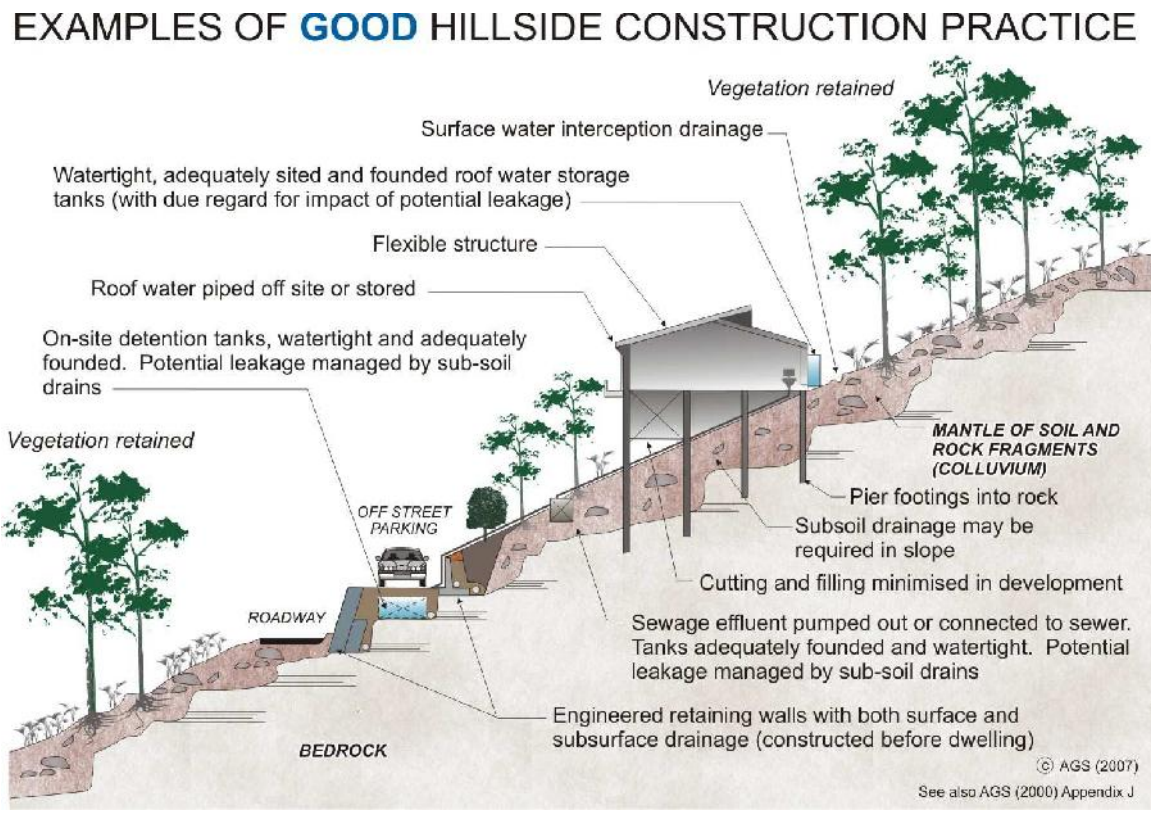
Appendix C

Guidelines to Hillside Construction

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

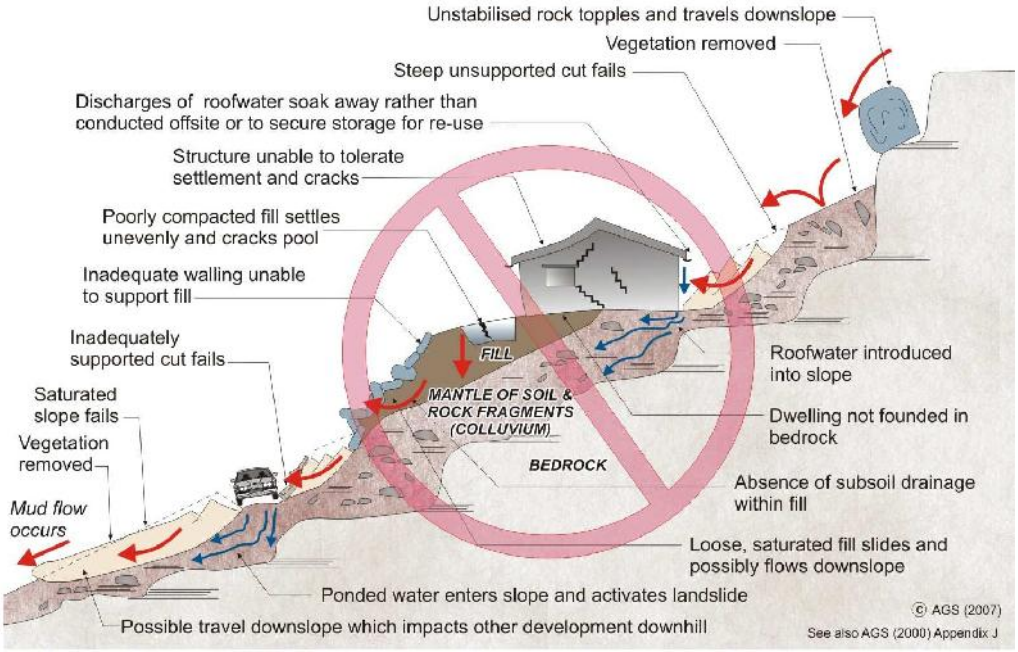
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

Appendix D – Soil Management Plan by *ES&D Consulting*

Prepared by: *ES&D Consulting*
Project No.: 8895C

Document dates: 21 July 2023

Report Title: Soil Management Plan

Site/details: 63 Millvale Road, Dromedary

Client Name: Channel Earthmoving

Document Control

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1.1 Introduction

The Brighton Council have issued a notice to cease the reuse “land filling” of soil at 63 Millvale Road, Dromedary TAS 7030 and instructed the following measures need to be in place for the activity.

Brighton Council has requested the following:
“Cease using the property for land filling and either:
1) remove all unapproved associated fill within 28 days from the date of this correspondence including remediation of the site; or
2) Submit a Development Application for the property to be used for “land filling” within 28 days from the date of this correspondence, including remediation of the site; or
a) Completed Application Form (attached).
b) Current Copy of Title including Folio Text and Folio Plan
c) Site Plan showing the extent of the fill to natural ground levels, contours, heights and distances.
d) An Environmental Management Plan, prepared by a suitably qualified person, addressing land stability together with the amount of fill (in tonnes) and type of fill deposited on the site.
e) A Natural Values Assessment, prepared by a suitably qualified person, considering the impact on threatened and priority vegetation identified in the area and what mitigation/remediation can be undertaken.
The report should address the Performance Criteria of the Natural Assets Code of the Tasmanian Planning Scheme- Brighton, required by clause C7.6.2:
P1.2 Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:

a) the design and location of buildings and works and any constraints such as topography or land hazards;
b) any particular requirements for the buildings and works;
c) any mitigation measures implemented to minimise the residual impacts on priority vegetation.
d) any on-site biodiversity offsets; and
e) any existing cleared areas on the site.

Advice:
The site is subject to a mapped priority vegetation overlay, with threatened species having been identified within close proximity.
f) A Landslip Hazard Report prepared by a suitably qualified person considering the Performance Criteria in Clause C15.6.1:
P1.1 Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to:

a) the type, form, scale and Intended duration of the development;
b) whether any Increase in the level of risk from a landslip requires any specific hazard reduction or protection measures;
c) any advice from a State Authority, regulated entity or a Council; and
d) the advice contained in a landslip hazard report.

P1.2 A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the site, on adjacent land or public infrastructure.
P1.3 If landslip reduction or protection measures are required beyond the boundary of the site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.”

ES&D Consulting has been commissioned to assess the site and activity in response to the Brighton Council's request. Soil is being utilised to level out the area on the southern side of the existing residential building, the material is and will be filled to a depth greater than 1m in depth and therefore, a Development Application will be needed for the activity. The proponent has indicated that they would still like to use the soil on site and continue future use. Therefore, the activity will be addressing request two from the Brighton Council.

ES&D Consulting has completed this Soil Reuse Management Plan pending approval from a relevant authority aligned with the request for the Brighton Council.

Material already used on site must be tested for potential contamination to remain on site and any future material must be tested for potential contamination prior to use on site with approval from a relevant authority. Soil must comply with *Information Bulletin 105 (IB105)* and, or National Environment Protection Measures (NEPM) to ensure there is no risk to the environment and human health.

1.2 Natural values assessment.

A desktop natural values assessment has been conducted utilising The List data and Natural Values Atlas (NVA) to determine the risk associated with the activity to the site and surrounding natural values.

The Brighton Council has flagged the activity as potentially impacting priority/threatened vegetation communities on the property. Upon conducting a desktop survey of the communities on the LISTMap, threatened vegetation communities are approximately 350m upgradient from the activity to the west/northwest, see **Error! Reference source not found.**. The site visit also indicated *Acacia mearnsii* (Black Wattle) was the primary vegetation species in the area of the activity, see identification below. Therefore, the activity will not affect threatened vegetation communities and no management constraints and or, the need for a Forest Practices Plan (FPP) will apply. The clearing of non-threatened vegetation communities will be less than 100t and 1ha annually and therefore, a FPP is not required.

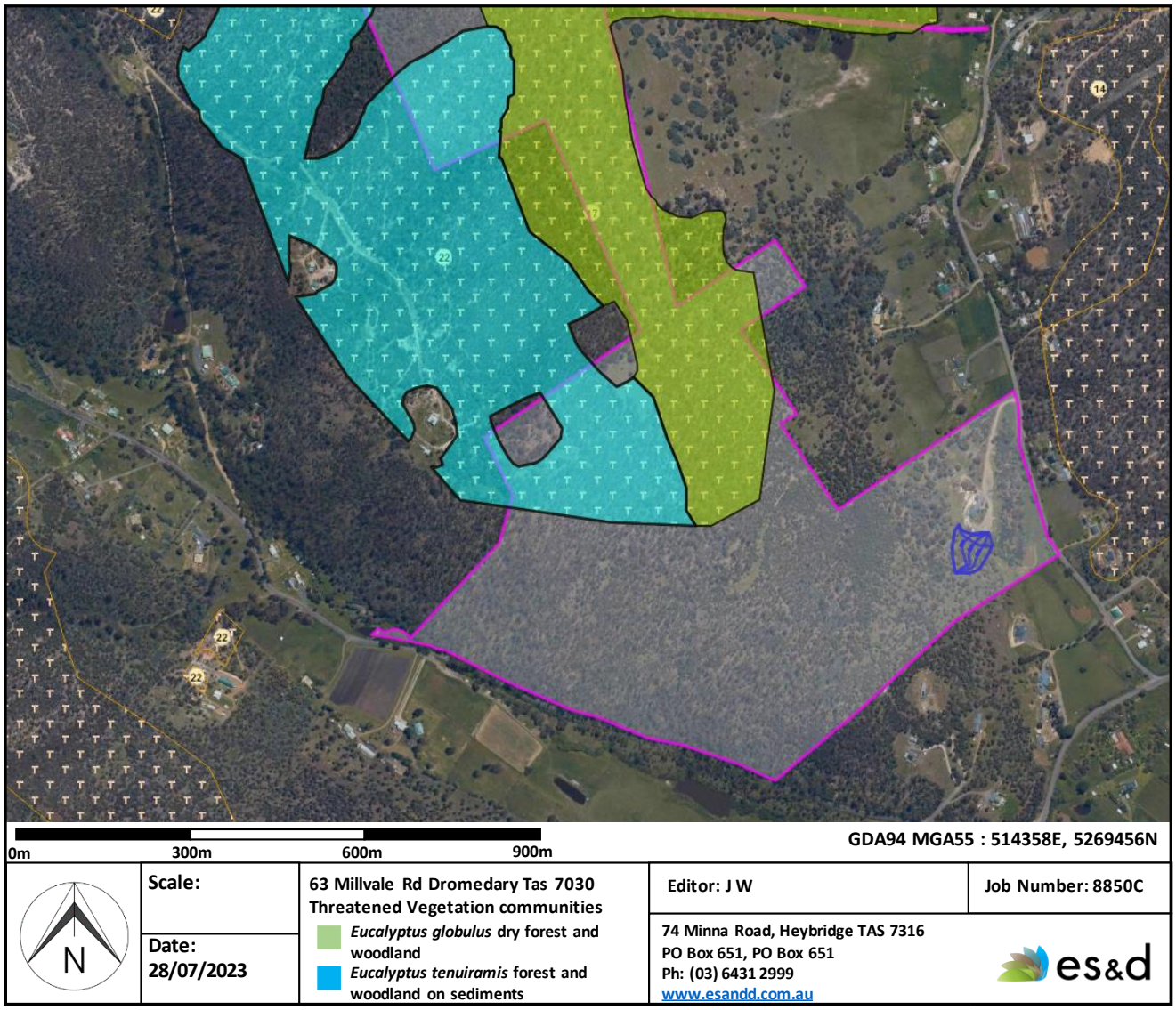

Figure 1 Threatened vegetation communities and development area

1.2.1 Vegetation identification

The dominant vegetation species within the area of the proposal to be cleared was an *acacia sp.,* more specifically *Acacia mearnsii* (Black Wattle). This species of wattle is commonly confused with the silver wattle; however, *A. mearnsii* has pairs of pinnules while the silver wattle only has one, see Figure 2. The vegetation in the area of the proposal is unlikely to be classified as a threatened vegetation community. A portion of the vegetation is on modified land according to TASVEG 4.0, the site visit also indicated that the vegetation in the development area is sparse.

Figure 2 *Acacia mearnsii* identifying features.

1.2.2 Desktop Threatened Flora and Fauna

A 500m buffer zone will apply to the property when considering effects on threatened flora and fauna species. A 1000m buffer zone will be applied for assessing risk associated with raptor nests.

There are two observed threatened flora species within 500m of the site, there are no observations of the species on the site according to the NVA and the LISTMap. The development area is considered low risk for impacting threatened species due to minimal observations in the area, and the location of the development.

Table 1 Observed threatened flora 500m buffer.

Species name	Common Name	Observation count
Lythrum salicaria	Purple Loosestrife	1
Pentachondra ericifolia	Fine Frillyheath	1

The NVA and TheLIST indicates there are four threatened fauna species observed within the 500m buffer zone. However, none of these have been observed on site. There is suitable habitat for these and other threatened fauna species on site due to the size of the vegetated area on site. The activity is generally located on the more sparsely vegetated area surrounding the southern side of the dwelling.

Table 2 Observed threatened fauna 500m buffer.

Species name	Common Name	Observation count
Dasyurus maculatus	Spotted-Tail Quoll	1
Dasyurus viverrinus	Eastern Quoll	4
Perameles gunnii	Eastern Barred Bandicoot	1
Sarcophilus harrisii	Tasmanian Devil	3

The following management measures/requirements and risk assessment apply for these species:

Dasyurus maculatus (Spotted-Tail Quoll):
The Spotted-Tail Quoll are broad ranging species that occur at low densities inhabiting a broad range of vegetation types (Threatened Species Section 2023). The area of cleared land associated with the activity is minor in comparison to the denser forest and woodlands on the property. The area of vegetation to be cleared is approximately 0.36Ha (~0.4%) of the total 92.27ha property which is primarily vegetated. A small portion of the vegetation to be cleared is on modified land (TASVEG 4.0). The clearing of the sparse area of vegetation is unlikely to have a detrimental impact to this species with such a large portion of habitable vegetation on the property situated away from the dwelling. However, the activity area must be managed to ensure no destructions of dens occur.

Dasyurus viverrinus (Eastern Quoll):
The Eastern quoll is widespread across Tasmania, with suitable vegetation present on the property. Females have range boundary of 35ha, and males have a range boundary of 44ha, however these boundaries can overlap (Threatened Species Section (2023)). The small area of cleared vegetation associated with this activity is unlikely to have a detrimental impact on this species, providing mitigation of den disturbance is required.

Perameles gunnii (Eastern Barred Bandicoot):
The Eastern Barred Bandicoot inhabits a range of vegetation types but prefers mosaic habitat with dense cover (including weeds) and is generally observed on agricultural land. The majority of the area of clearing is sparse and open with minimal dense low-lying vegetation (tussock, gorse, shrubs, etc). Although there is habitat for this species, the small portion of vegetation to be cleared is unlikely to have a detrimental impact on this species.

Sarcophilus harrisii (Tasmanian Devil):
The threatened species link describes the habit of the Tasmanian Devil as follows:
Habitat includes the following elements contained across an area of several square kilometres: denning habitat for daytime shelter (e.g. dense vegetation, hollow logs, burrows or caves); hunting habitat (open understorey mixed with patches of dense vegetation); breeding den habitat (areas of burrowable, well-drained soil or sheltered overhangs such as cliffs, rocky outcrops, knolls, caves and earth banks, free from risk of flooding; windrows and log piles may also be used).

Due to the size of the vegetated land (92.27ha), it is likely that the land has denning habitat. However, due to the activity being adjacent to the dwelling and modified land of that dwelling, it is unlikely the clearing of vegetation for the activity will have a detrimental impact on this species. The area being cleared must be managed for dens and denning habitat to prevent accidental destruction.

Table 3 Threatened Fauna range boundaries 500m buffer

Species name	Common Name
Litoria raniformis	Green And Gold Frog
Lathamus discolor	Swift Parrot
Dasyurus maculatus subsp. maculatus	Spotted-Tail Quoll
Prototroctes maraena	Australian Grayling
Antipodia chaostola	Chaostola Skipper
Pseudemoia pagenstecheri	Tussock Skink
Haliaeetus leucogaster	White-Bellied Sea-Eagle
Tyto novaehollandiae subsp. castanops	Masked Owl (Tasmanian)
Sarcophilus harrisii	Tasmanian Devil
Accipiter novaehollandiae	Grey Goshawk
Pardalotus quadragintus	Forty-Spotted Pardalote
Perameles gunnii	Eastern Barred Bandicoot
Aquila audax subsp. fleayi	Tasmanian Wedge-Tailed Eagle
Dasyurus viverrinus	Eastern Quoll

1.3 Site contamination

The property is relatively undeveloped with the construction of residential building beginning in 2010 with Google Earth indicating road base laid for the driveway building area. It is unlikely that any potentially contaminating activities have occurred within the development area (residential building and fill area, see landslide report for batters/fill area) other than the fill material, which is the subject of Brighton council's letter. The fill material will be analysed for potential contamination and either remain on site if deemed suitable with approval as required or be removed from the site and disposed of appropriately.

1.4 Sampling

QGIS was utilised to determine the volume of existing fill material placed on site to determine the minimum sample requirements for sampling based on the Australian standard, *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil (AS 4482.1)* and the NEPM utilising the VIC EPA guidelines for statistical analysis. The VIC EPA guidelines were used, as they reference PROUCL, a statistical analysis program for environmental data.

The area is calculated from 1x1m grids using the height difference from 2013 Digital elevation modelling when fill material was not present on the site, and, interpreted elevation points from the current fill area, see Figure 3. The total volume of placed fill was estimated to be 2,500m^3 which aligns with the estimated volume provided by the client.

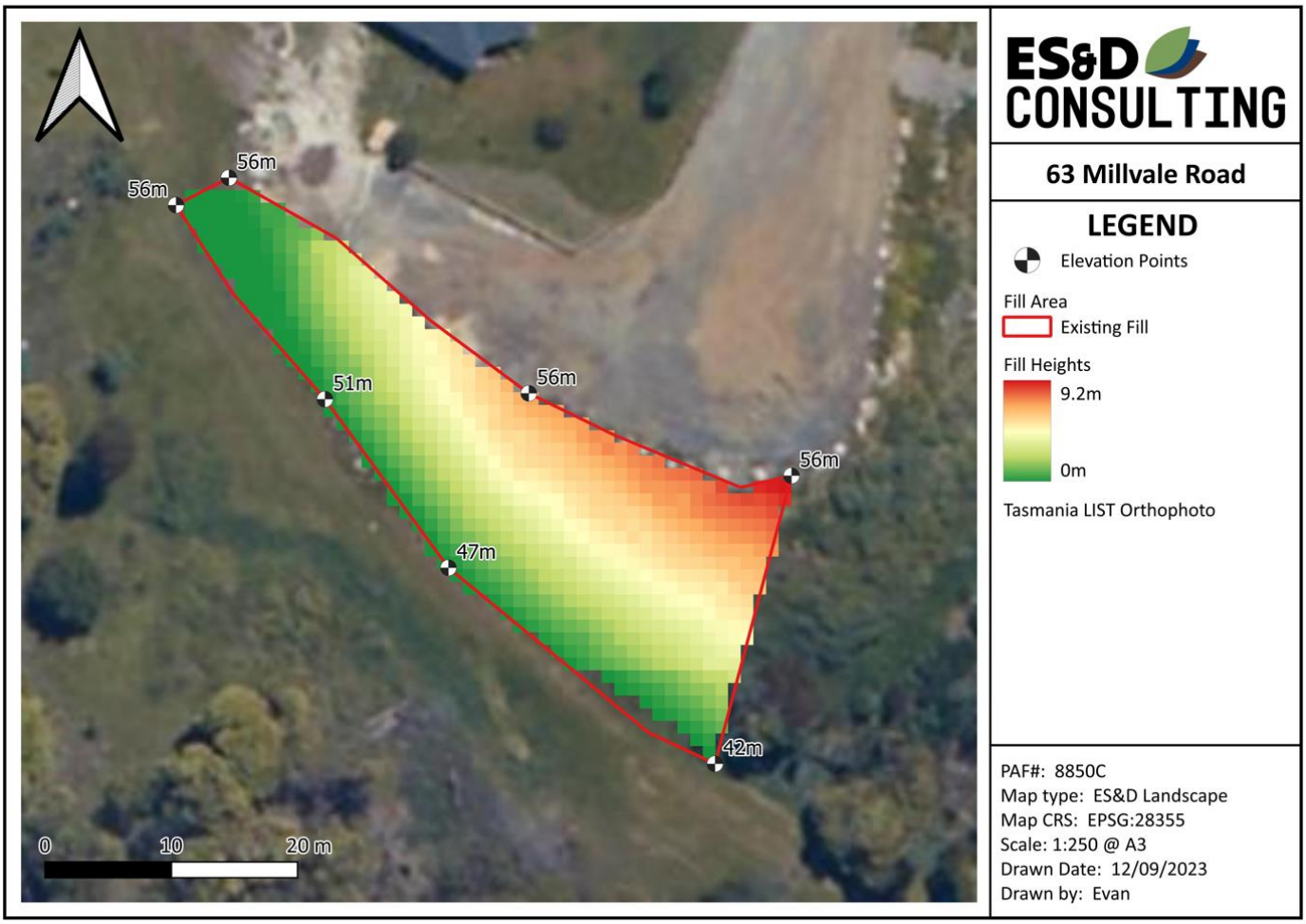

Figure 3 Volume Estimates of Existing Fill Using GIS

Jackson Whitbread, Environmental Consultant with ES&D sampled the material on the 14/09/2023. A total of 12 samples were conducted for statistical analysis for the classification of material. Soil samples were collected using a new pair of disposable gloves for each sample and immediately placed in ALS supplied analyte jars, individually labelled, placed in eskies with freezer packs and dispatched for overnight delivery to the laboratory with accompanying chain of custody document. Soil was analysed for heavy metals,

polynuclear aromatic hydrocarbons, total petroleum hydrocarbons, total recoverable hydrocarbons and BTEXN.

Samples were conducted to 0.3-0.5m at the top, middle and base of the slope, see Figure 4 for an example of sampling method.

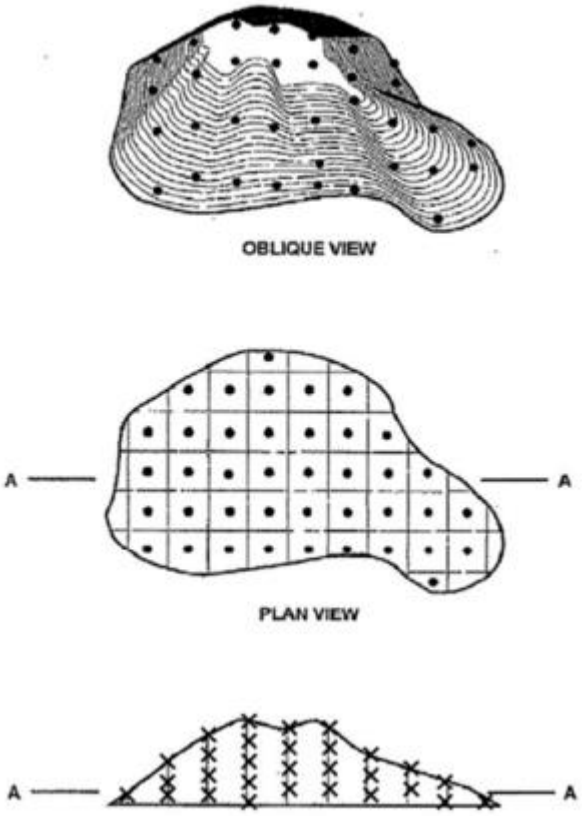

Figure 4 Sampling distribution method

1.5 Contamination Result Tables

Analytical results indicate some samples exceed the IB105 Level 1 Fill Material Limits, however, a statistical analysis in line with the NEPM guidelines will be conducted to determine classification based on a 95% UCL average. See below for further information.

Table 4 0.5m contamination analytical results against IB105

ALS	Sample ID														IB105	
EM2316669	Units	LOR	P1.1.1	P1.1	P1.2	P1.3	P1.4	P2.1	P2.2	P2.3	P3.1	P3.2	P4.1	P4.2	Level 1	Level 2
Depth																
Moisture Content	%	1	13.2	16.8	11.9	12.3	9.2	17.8	14.7	17.6	16.6	14.2	16	26		
Arsenic	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6	20	200
Cadmium	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3	40
Chromium	mg/kg	2	12	54	10	30	17	83	56	10	31	47	13	17	50	500
Copper	mg/kg	5	16	32	23	20	18	30	28	<5	24	33	29	<5	100	2000
Lead	mg/kg	5	13	<5	14	10	12	6	5	7	12	<5	8	12	300	1200
Nickel	mg/kg	2	24	82	34	40	32	76	63	10	35	86	20	4	60	600
Zinc	mg/kg	5	55	46	63	57	67	61	47	10	54	56	31	8	200	14,000
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	30
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.08	2
Polycyclic Aromatic Hydrocarbons (total)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	20	40
C6 - C10 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	65	650
>C10 - C16 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
>C16 - C34 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
>C34 - C40 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
>C10 - C40 Fraction (sum)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	1000	5,000
>C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	65	650
C6 - C9 Fraction	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
C10 - C14 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
C15 - C28 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
C29 - C36 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		
C10 - C36 Fraction (sum)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50		
Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1	5
Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	100
Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3	100
meta- & para-Xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ortho-Xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Total Xylenes	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	14	180
Sum of BTEX	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Naphthalene	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		

1.6 Statistical analysis of contamination results

A statistical analysis has been conducted for analytical results where some values exceed the relevant IB105 and NEPM limits. Therefore, a statistical analysis has been conducted for chromium and nickel and as some samples exceeded the IB105 fill material limits. This analysis is only to characterise the "filling material" where soil has been incorporated into the landscape. Samples that are less than the reporting limit (<LOR) will be valued at the reporting limit for the sake of the analysis. The statistical analysis has been conducted using ProUCL, an environmental statistical analysis program to generate a 95% $UCL_{average}$.

The NEPM indicates that data must comply with the following for the 95% $UCL_{average}$to be valid. This also applies to IB105 limits for concentrations to be valid.

1. The 95% upper confidence limit (UCL) of the arithmetic mean concentration of the contaminant is less than the relevant HIL value, See Table 5**.**
2. No individual sample concentration exceeds 250% of the HIL value.
3. The standard deviation of the sample concentrations does not exceed 50% of the HIL value.
4. A sufficient number of samples has been collected using a spatially representative sampling design (Schedule B2 provides advice on sampling requirements). **This has been addressed in the sampling plan.**

The following table addresses the above requirements (2-3).

Table 5 NEPM B7 statistical requirements.

Analyte	IB105 Level 1 limit	Max Value	250% Limit	SD	50% Limit
Chromium	50	83	125	23.49	25
Nickel	60	86	150	28.00	30

Table 5 indicates that none of the heavy metal analytes exceed the requirements for the 95% $UCL_{average}$to be valid. No heavy metal analytes samples exceed 250% of the corresponding limit and none of the samples standard deviation exceeds 50% of the corresponding limit.

A statistical analysis for the 95% $UCL_{average}$ has been produced for the above analytes to compare against the relevant guidelines. Chromium has a 95% $UCL_{average}$ of 43.84 mg/kg and nickel has a 95% $UCL_{average}$ of 56.68 mg/kg.

Chromium

General Statistics			
Total Number of Observations	12	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	10	Mean	31.67
Maximum	83	Median	23.5
SD	23.49	SD of logged Data	0.745
Coefficient of Variation	0.742	Skewness	1.041

Normal GOF Test			
Shapiro Wilk Test Statistic	0.859	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.805	Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.281	Data appear Normal at 1% Significance Level	
Data appear Normal at 1% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	43.84	95% Adjusted-CLT UCL (Chen-1995)	45
		95% Modified-t UCL (Johnson-1978)	44.18

Suggested UCL to Use			
95% Student's-t UCL	43.84		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Nickel

General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	4	Mean	42.17
Maximum	86	Median	34.5
SD	28	SD of logged Data	0.91
Coefficient of Variation	0.664	Skewness	0.434

Normal GOF Test		
Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.805	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.198	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.281	Data appear Normal at 1% Significance Level
Data appear Normal at 1% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	56.68	95% Adjusted-CLT UCL (Chen-1995)	56.55
		95% Modified-t UCL (Johnson-1978)	56.85

Suggested UCL to Use			
95% Student's-t UCL	56.68		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

1.7 Contamination result interpretation

Analytical and statistical results have been compared to *Information Bulletin 105* to determine classification of the material for reuse. The analytical results indicate that some sample locations exceed The Level 1 Fill Material limit for chromium and nickel and therefore, cannot be classified as Level 1 Fill Material without a statistical analysis to classify the Site with a 95% $UCL_{average}$**Error! Reference source not found.**. The statistical analysis determined that heavy metals (chromium and nickel) limits are below the Level 1 Fill Material limit.

1.8 Clean Fill requirements

1.8.1 Authority

The regulations for clean fill usage have been updated as of 29 March 2022. The *Environmental Management and Pollution Control (Waste Management) Regulations 2020* no longer includes Section18(2)(a), which means clean fill is no longer exempt from waste disposal regulations.

From 29 March 2022, land cannot be used for clean fill disposal unless:

(a) They have a relevant authority (such as a Permit, Environment Protection Notice, Environmental Licence or Environmental Approval) which authorises the disposal of waste on the land; or

(b) It is disposed of in accordance with an Approved Management Method (AMM) for clean fill.

The Director has given approval for an AMM for clean fill disposal under certain conditions.

If the fill volume exceeds 100 tonnes per year, the AMM does not apply. Therefore, as the current soil on site is estimated to be 4,500 tonnes, a permit will be necessary to continue using clean fill on the property. Under IB105, low-level contaminated soil (level 2) can be used as fill material if approved by the Director unless not classified as controlled waste under the *Environmental Management and Pollution Control Act 1994.*

1.8.2 Fill material management plan

As per Tasman Geotechnics landslide report and Walter Surveys estimates, the remaining fill required for the proposal is 15,000-17,200 m^3 at 2:1 batters.

The following steps are required for the use of fill material on the site.

- Approval must be granted by a relevant authority for the use of 15,000-17,200 m3 of soil on the site.
- Soil must be sampled and classified against *IB105* for transport and reuse. Soil must be classified as Level 1 fill material or, level 2 low level contaminated which is not classified as a controlled waste under the *Environmental Management and Pollution Control Act 1994* and approved by the Director for reuse. Soil must also not exceed health investigation levels (HILs) residential A limits and under the NEPM schedule B1.
- Sampling requirements must comply with the IB105, NEPM, AS4482.1 and AS4482.2 depending on the volume/area of soil to be sampled and the level of contamination expected from the site of origin. VIC EPA guidelines (IWRG702) methodology is particularly useful for classifying larger volumes of soil, i.e., >2500m^3 as it utilises a 95% UCL average as per the NEPM.
- The placement of the soil must comply with TASMAN Geotechnics report "LANDSLIDE RISK ASSESSMENT, PROPOSED WORKS, 63 MILLVALE ROAD, DROMEDARY" to ensure landslide risk is managed.
- Once filling has been completed, it is recommended the area is grassed at a minimum where possible for erosion control, this has also been addressed in TASMAN Geotechnics report.
- If any odour or discolouration of soil occurs that suggests potential contamination, further sampling is required to ensure that risk to the environment and human health is manage appropriately.

1.9 Conclusion

- Soil is statistically classified a Level 1 Fill Material under *IB105* with elevated chromium and nickel which is likely natural. Therefore, soil is suitable for use for the development with approval from a relevant authority (local council) and must follow requirements of the TASMAN Geotechnics report. All future soil must be classified as level 1 fill material as part of the approval, and/or, classified as level 2 contaminated soil and approved by the Director EPA for the reuse of soil under *IB105*. No acid sulphate soils (ASS) are to be brought onto the property without adequate treatment and validation sampling. ASS must comply with the *Tasmanian Acid Sulphate Management Guidelines*.

- Natural values of threatened vegetation communities are unlikely to be impacted due to the mapped communities present being ~350m upgradient of the development area. A denning survey is required prior to the clearance of non-threatened vegetation associated with the development prior to filling.

- The use of soil must comply with TASMAN Geotechnics Landslide assessment report and fill material management plan.

Appendices

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Appendix F – Earthworks Methodology by *Exceed Engineering*

Project:	*ES&D Consulting*,
Project No.	EE973
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EARTHWORKS METHODOLOGY

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EXCEED ENGINEERING

CLIENT: ES&D Consulting
PROJECT: 63 Millvale Road, Dromedary
JOB NO: EE973

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Contents

1 Introduction

This report has been prepared by Exceed Engineering to satisfy the Brighton Council application requirements for the proposed earthworks, to be carried out at 63 Millvale Road, Dromedary, TAS 7030.

1.1 Purpose

The purpose of this report is to provide supplementary information and drawings to the Landslide Risk Assessment of the site prepared by Tasman Geotechnics, Reference No. TG23219/1 – 01 report, dated 7 December 2023.

We understand that the proposed earthworks comprise extending the platform to the southwest to the east of the existing residence located within the front eastern portion of the site. The proposed earthworks involve placing a significant amount of fill to be carried out in accordance with recommendations in the Landslide Risk Assessment Report.

The report is carried out the address the following:

a) Prepare a comprehensive plan that clearly delineates both the unapproved works as well as the proposed works, including the relocation of subsoil drains;
b) Detail the pre-developed natural ground level and the proposed finished levels;
c) Details on how the batters will be stabilised.
d) Provide both a site plan and cross-section plan with suitable scale and appropriately dimensions; and
e) Follow the soil stabilisation recommendations outlined in the Landslide Risk Assessment report.

1.2 Pre-development site conditions

The site is a large 92ha and irregularly shaped block and developed with a dwelling and a shed within front eastern portion of the site.

The dwelling is located on a near-level cut-to-fill platform with slopes surrounding the platform falling moderately towards the east at angles of approximately 13° to 16°.

The proposed works aim to extend the fill platform to the southwest and east of the existing dwelling.

The fill is proposed to be placed to an elevation of about RL 56-57m (where the existing dwelling is located), giving a maximum vertical height of about 9m. The fill will be placed with a batter angle of 1V:2H (26.5°).

The approximate volume of the earthworks for the proposed fill platform is 18,000m^3.

1.3 Developed site conditions

The existing ground surface of the site was derived from 2013 LiDAR data sourced from Geoscience Australia. Based on the proposed works, it is inferred that the developed condition of the site would be as follows:

- The existing fill is to be extended approximately 20m to 25m within the eastern side of the dwelling.
- New fill is to be constructed to the south and southeast of the dwelling, with a maximum width of approximately 50m. This new fill platform will extend approximately 90m to the south of the existing fill platform.
- The fill material will be clean fill type 1 as defined in Section 3(1) of the *Environmental Management and Pollution Control Act 1994*. Clean fill type 1 means a mixture – (a) containing natural materials, such as soil, rock, crushed rock, gravel, clay or sand, that are in a raw, unaltered form and that have been excavated from an area of land; and (b) that has been tested and verified as clean fill by a suitably qualified environmental consultant.
- The use of any material other than Type 1 is not allowed. This includes fill containing building rubble or demolition waste.
- The fill will be constructed to have a similar, very gentle fall of about 2° towards the east, like the existing fill platform.
- After the crest of the proposed fill platform, the fill will have a sharp break in slope with an angle of 1V:2H (approximately 26.5°), to reach the existing ground surface to the east of the fill platform.
- The proposed fill is inferred to have a maximum depth of 9m at the highest point within the southern side of the existing dwelling.
- Considering the existing slope and recommended slope batter of 1V:2H for the fill platform, the fill batter is expected to reach the existing ground surface about 30m to 35m beyond the crest of the fill batter.
- It is inferred that the fill will be overlaid stormwater/wastewater trenches that are located within the southwestern side of the dwelling; these will need to be re-located to a new undeveloped area. A wastewater/stormwater assessment and design may be required for the proposed relocation.

All earthworks shall be carried out per plan and compliance long-sections in EE973-C103&C104.

All earthworks shall be carried out per recommendations in the Tasmanian Geotechnics report as outlined in Section 2 below.

2 Earthworks Recommendation

Per Tasman Geotechnics report, to ensure the proposed development does not change the risk profile above Very Low for the site, it is recommended that the following limitations be enforced:

- The fill should be constructed at a final batter angle no steeper than 1V:2H;
- Vegetation and topsoil should be stripped from the footprint of the proposed fill area prior to the placement of new fill. As the ground slope is >8°, it is recommended to bench the natural slope and key-in the fill;
- Fill should be spread in (nominally) 200mm thick layers and track rolled with a 20t (or larger) excavator (at least 6 passes);
- If the fill is proposed to be constructed above 60m AHD (elevation), the proposal must be reviewed by a Geotechnical Engineer.
- No habitable structure should be constructed on the site downslope of the filled are;
- Runoff must not be permitted to pool on or immediately upslope of the filled area;
- Cut-off drains should be used to divert surface runoff around the perimeter of the fill, i.e., during and after construction;
- A layer of coarse material (such as cobbles or gravel) wrapped in geofabric should be placed as the base of the fill to prevent build-up of groundwater pressure at the base of the fill;
- Where possible, vegetation should be maintained on the slopes to prevent erosion of surface soils. As a minimum, vegetation should comprise grass. Once the fill is placed to the final extents, any stockpiled topsoil should be used to revegetate the filled area;
- Maintenance of surface runoff, vegetation, retaining structures and other measures described above are the responsibility of the site owner;
- The existing wastewater disposal area must be relocated to a new area, which should be located at least 10m upslope of the proposed fill platform, or cross slope of the proposed fill platform; and
- Good hillside construction practices should be followed.