2018 Douglas Shire Council Planning Scheme Property Report

The following report has been automatically generated to provide a general indication of development related information applying to the premise.

For more information and to determine if the mapping layers are applicable, refer to the 2018 Douglas Shire Council Planning Scheme. This report is not intended to replace the need for carrying out a detailed assessment of Council and State controls or the need to seek your own professional advice on any town planning instrument, local law or other controls that may impact on the existing or intended use of the premise mentioned in this report. For further information please contact Council by phone: 07 4099 9444 or 1800 026 318 or email enquiries@douglas.qld.gov.au.

Visit Council's website to apply for an official property search or certificate, or contact the Department of Natural Resources, Mines and Energy to undertake a title search to ascertain how easements may affect a premise.

Property Information

Property Address	12 Murphy Street PORT DOUGLAS
Lot Plan	113PTD2094 (Freehold - 2023m^2)

Selected Property | Easements | Land Parcels

Douglas Shire Planning Scheme 2018 version 1.0

The table below provides a summary of the Zones and Overlays that apply to the selected property.

Zoning

Applicable Zone
Environmental Management

More Information
- View Section 6.2.4 Environmental Management Zone Code
- View Section 6.2.4 Environmental Management Zone Compliance table
- View Section 6.2.4 Environmental Management Zone Assessment table

Douglas Shire Planning Scheme 2018 version 1.0

The table below provides a summary of the Zones and Overlays that apply to the selected property.

Local Plans	**Applicable Precinct or Area** Port Douglas - Craiglie Precinct 1 - 1f Flagstaff Hill	**More Information** • View Section 7.2.4 Port Douglas/Craiglie Local Plan Code • View Section 7.2.4 Port Douglas/Craiglie Local Plan Compliance table
Bushfire Hazard	**Applicable Precinct or Area** Very High Potential Bushfire Intensity High Potential Bushfire Intensity	**More Information** • View Section 8.2.2 Bushfire Hazard Overlay Code • View Section 8.2.2 Bushfire Hazard Overlay Compliance table
Coastal Processes	**Applicable Precinct or Area** Erosion Prone Area	**More Information** • View Section 8.2.3 Coastal Environment Overlay Code • View Section 8.2.3 Coastal Environment Overlay Compliance table
Hillslopes	**Applicable Precinct or Area** Area Affected by Hillslopes	**More Information** • View Section 8.2.5 Hillslopes Overlay Code • View Section 8.2.5 Hillslopes Overlay Compliance table
Landscape Values	**Landscape Values** High landscape values	**More Information** • View Section 8.2.6 Landscape Values Overlay Code • View Section 8.2.6 Landscape Values Overlay Compliance table
Landslide	**Applicable Precinct or Area** Landslide Hazard (High & Medium Hazard Risk)	**More Information** • View Section 8.2.9 Potential Landslide Hazard Overlay Code • View Section 8.2.9 Potential Landslide Hazard Overlay Compliance table
Natural Areas	**Applicable Precinct or Area** MSES - Regulated Vegetation	**More Information** • View Section 8.2.7 Natural Areas Overlay Code • View Section 8.2.7 Natural Areas Overlay Compliance table
Transport Road Hierarchy	**Applicable Precinct or Area** Access Road	**More Information** • View Section 8.2.10 Transport Network Overlay Code • View Section 8.2.10 Transport Network Overlay Compliance table

Zoning

Applicable Zone

Environmental Management

More Information

- View Section 6.2.4 Environmental Management Zone Code
- View Section 6.2.4 Environmental Management Zone Compliance table
- View Section 6.2.4 Environmental Management Zone Assessment table

Selected Property

Land Parcels

Zoning

- Centre
- Community Facilities
- Conservation
- Environmental Management
- Industry
- Low Density Residential
- Low-medium Density Residential
- Medium Density Residential
- Recreation and Open Space
- Rural
- Rural Residential
- Special Purpose
- Tourism
- Tourist Accommodation

Local Plans

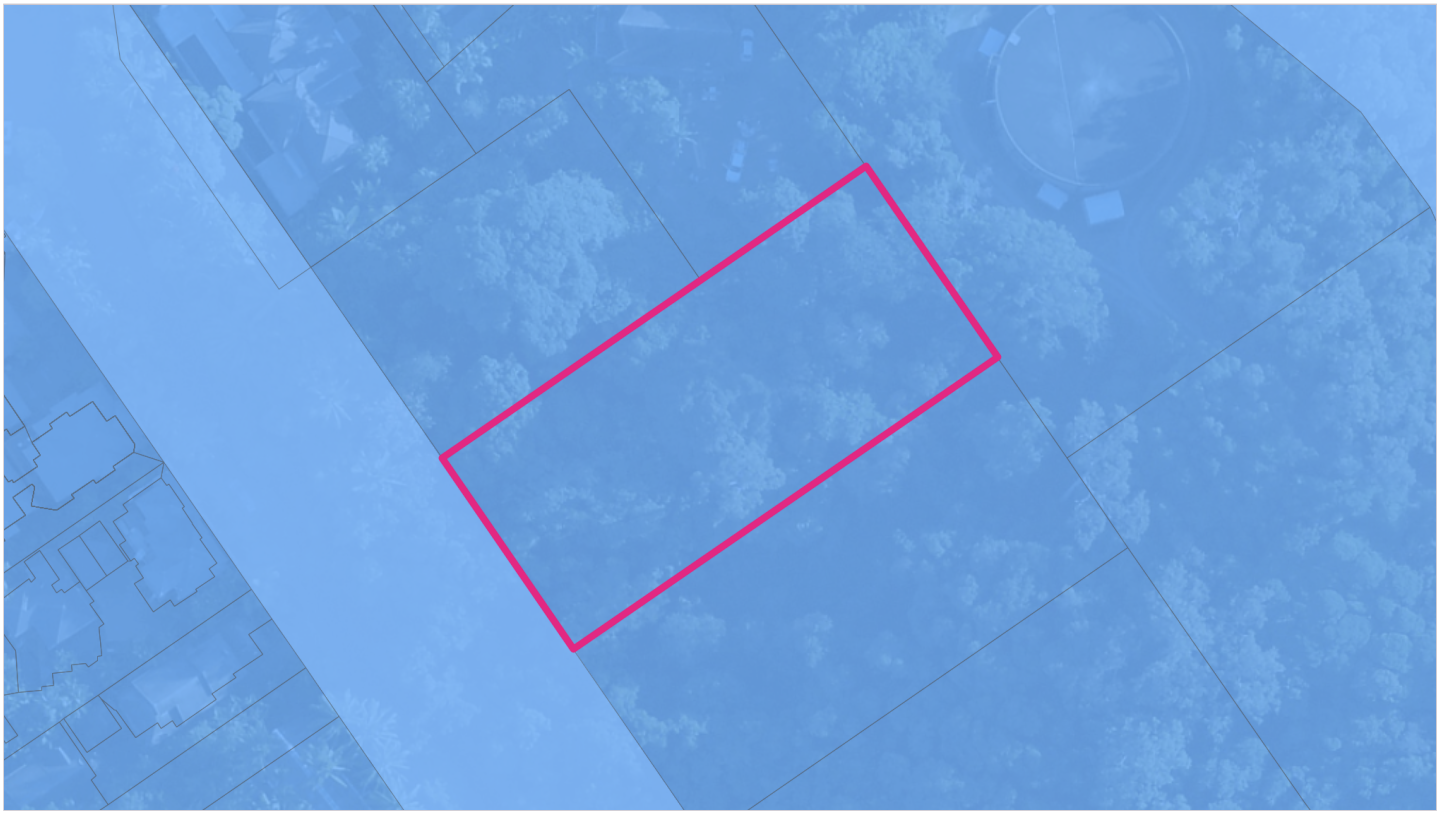
Applicable Precinct or Area

Port Douglas - Craiglie

Precinct 1 - 1f Flagstaff Hill

More Information

- View Section 7.2.4 Port Douglas/Craiglie Local Plan Code
- View Section 7.2.4 Port Douglas/Craiglie Local Plan Compliance table



Selected Property

Land Parcels

Transport Investigation Corridor

Transport Investigation Corridors

Major Road Connections

Major Road Connections

Major Road Connections (No Arrow)

Major Road Connections

Daintree River to Bloomfield

Daintree River to Bloomfield

Creb Track and Quaid Road

Creb Track

60 metre contour

60 metre contour

Local Plan Boundary

Local Plan Boundary

Local Plan Sub Precincts

1a Town Centre

1b Waterfront North

1c Waterfront South

1d Limited Development

1e Community and Recreation

1f Flagstaff Hill

Local Plan Precincts

Not Part of a Precinct

Precinct 1

Precinct 2

Precinct 3

Precinct 4

Precinct 5

Precinct 6

Precinct 7

Precinct 8

Precinct 9

Live Entertainment Precinct

Live Entertainment Precinct

Indicative Future Open Space

Indicative Future Open Space

Road Reserve Esplanade

Bushfire Hazard

Applicable Precinct or Area

Very High Potential Bushfire Intensity

High Potential Bushfire Intensity

More Information

- View Section 8.2.2 Bushfire Hazard Overlay Code
- View Section 8.2.2 Bushfire Hazard Overlay Compliance table

Selected Property

Land Parcels

Bushfire_Hazard

High Potential Bushfire Intensity

Medium Potential Bushfire Intensity

Potential Impact Buffer

Very High Potential Bushfire Intensity

all others

Coastal Processes

Applicable Precinct or Area

Erosion Prone Area

More Information

- View Section 8.2.3 Coastal Environment Overlay Code
- View Section 8.2.3 Coastal Environment Overlay Compliance table

Selected Property | Land Parcels | Coastal Management District | Erosion Prone Area

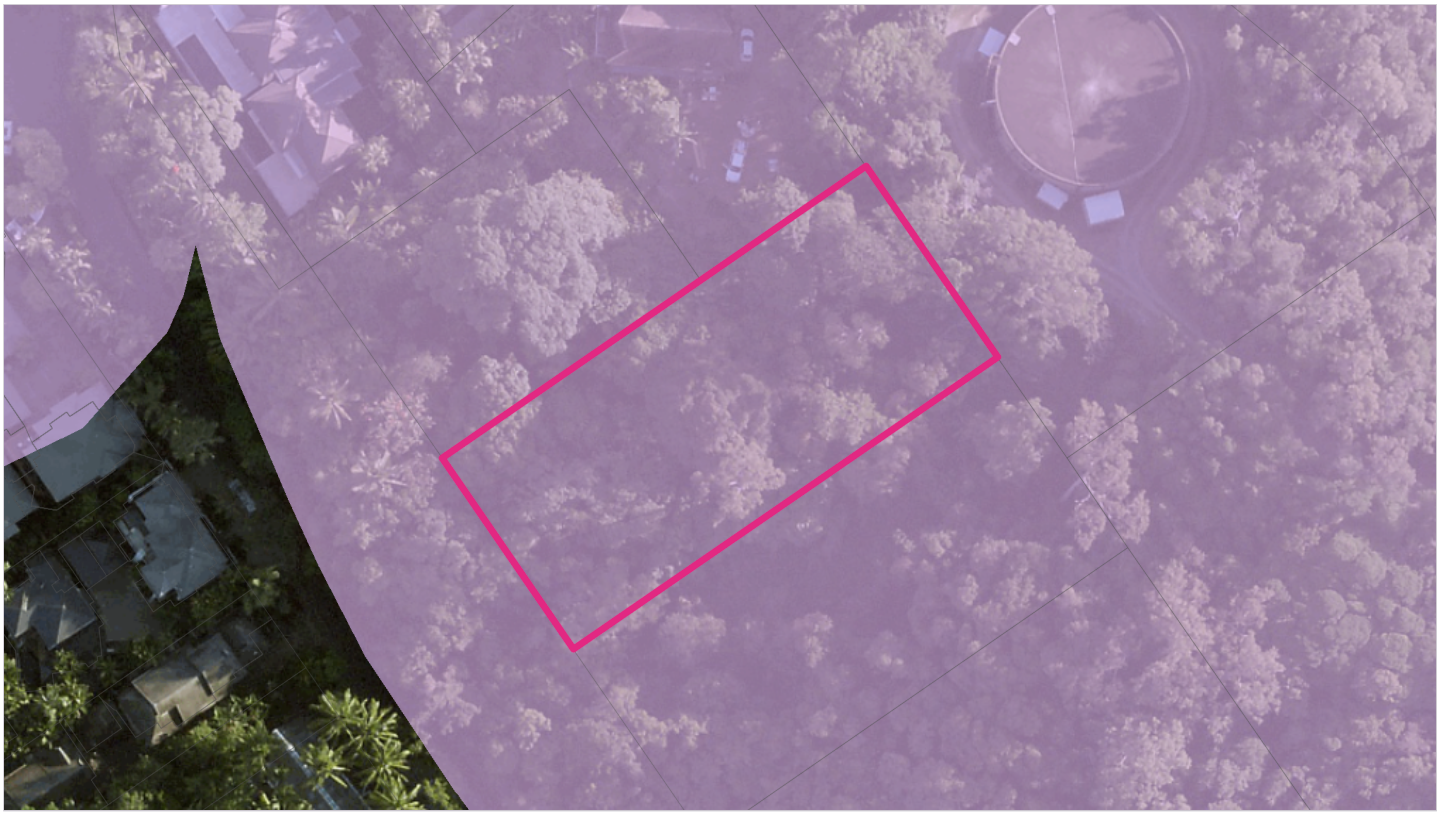
Hillslopes

Applicable Precinct or Area

Area Affected by Hillslopes

More Information

- View Section 8.2.5 Hillslopes Overlay Code
- View Section 8.2.5 Hillslopes Overlay Compliance table



Selected Property | Land Parcels | Area Affected by Hillslopes

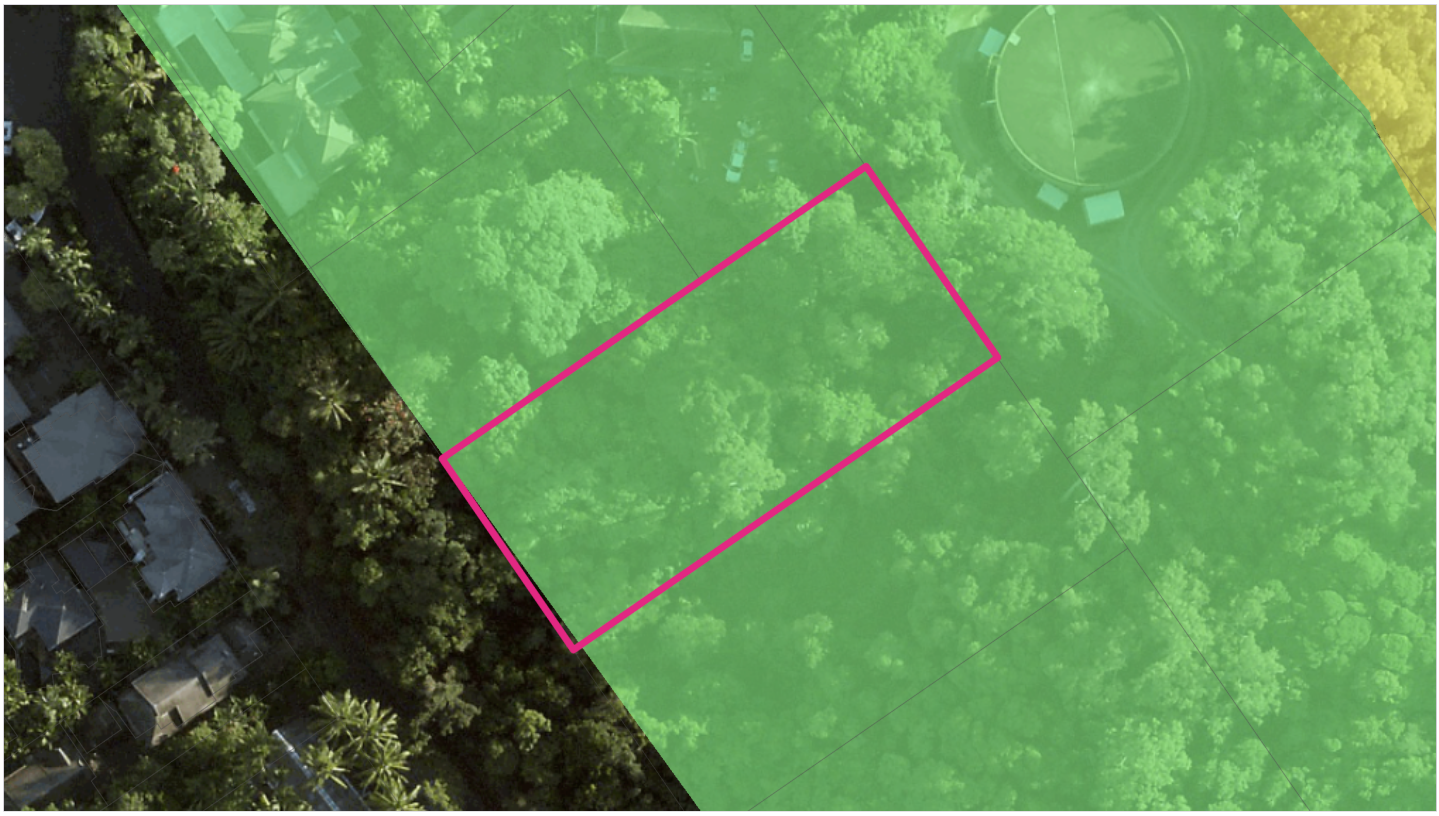
Landscape Values

Landscape Values

High landscape values

More Information

- View Section 8.2.6 Landscape Values Overlay Code
- View Section 8.2.6 Landscape Values Overlay Compliance table



Selected Property

Land Parcels

Scenic Buffer Area

Gateway

Lookout

Scenic route

Scenic route buffer

View corridor

all others

Landscape Values

Coastal scenery

High landscape values

Medium Landscape Value

all others

Landslide

Applicable Precinct or Area

Landslide Hazard (High & Medium Hazard Risk)

More Information

- View Section 8.2.9 Potential Landslide Hazard Overlay Code
- View Section 8.2.9 Potential Landslide Hazard Overlay Compliance table

Selected Property | Land Parcels | Potential Landslide Hazard

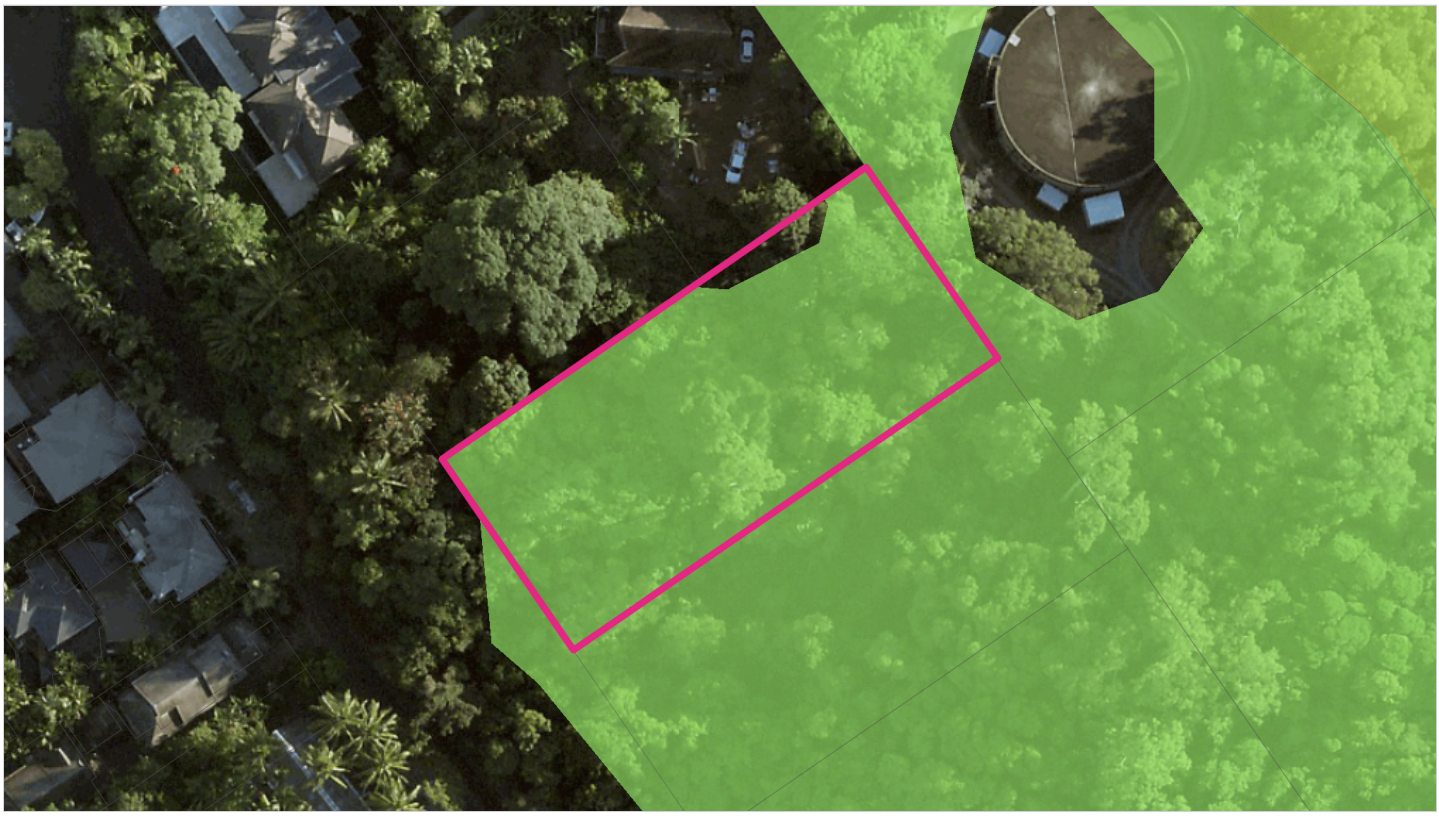
Natural Areas

Applicable Precinct or Area

MSES - Regulated Vegetation

More Information

- View Section 8.2.7 Natural Areas Overlay Code
- View Section 8.2.7 Natural Areas Overlay Compliance table



Selected Property	Land Parcels	MSES - Regulated Vegetation (Intersecting a Watercourse)
MSES - High Ecological Value Waters (Watercourse)	MSES - Wildlife Habitat	MSES - Regulated Vegetation
MSES - Protected Area	MSES - Marine Park	MSES - Legally Secured Offset Area
MSES - High Ecological Value Waters (Wetland)	MSES - High Ecological Significance Wetlands	

Transport Road Hierarcy

Applicable Precinct or Area

Access Road

More Information

- View Section 8.2.10 Transport Network Overlay Code
- View Section 8.2.10 Transport Network Overlay Compliance table

Selected Property

Land Parcels

Road Hierarchy

Access Road

Arterial Road

Collector Road

Industrial Road

Major Rural Road

Minor Rural Road

Sub Arterial Road

Unformed Road

all others

Major Transport Corridor Buffer Area

Disclaimer

This report is not a substitute for a Planning and Development Certificate and should not be relied upon where the reliance may result in loss, damage or injury. While every effort is taken to ensure the information in this report is accurate and up to date, Douglas Shire Council makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs that may occur as a result of the report being inaccurate or incomplete in any way or for any reason.

State Assessment and Referral Agency

Date: 21/02/2022

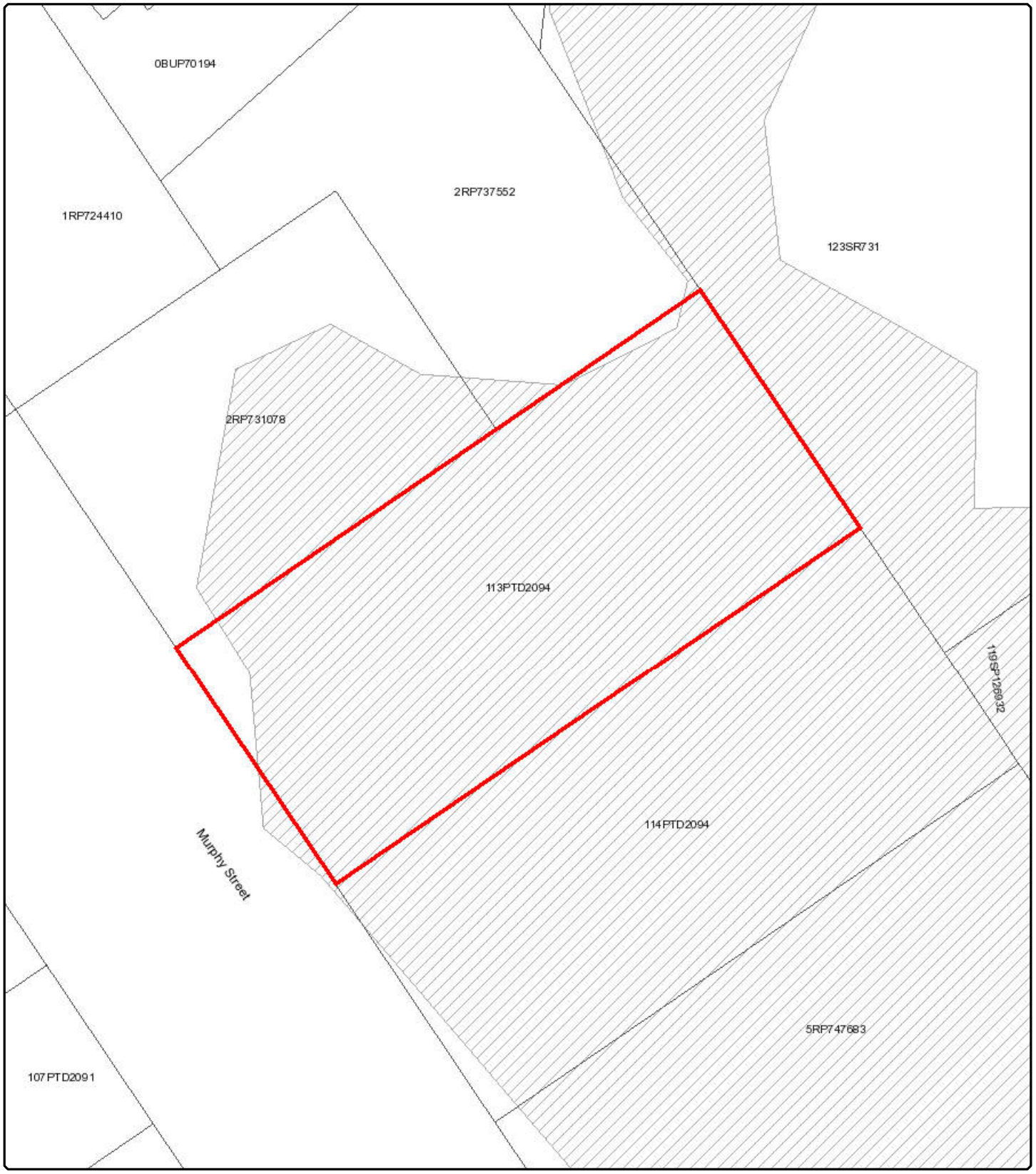
Queensland Government

Matters of Interest for all selected Lot Plans

Coastal area - erosion prone area
Regulated vegetation management map (Category A and B extract)

Matters of Interest by Lot Plan

Lot Plan: 113PTD2094 (Area: 2023 m^2)
Coastal area - erosion prone area
Regulated vegetation management map (Category A and B extract)



State Assessment and Referral Agency

Date: 21/02/2022

Queensland Government

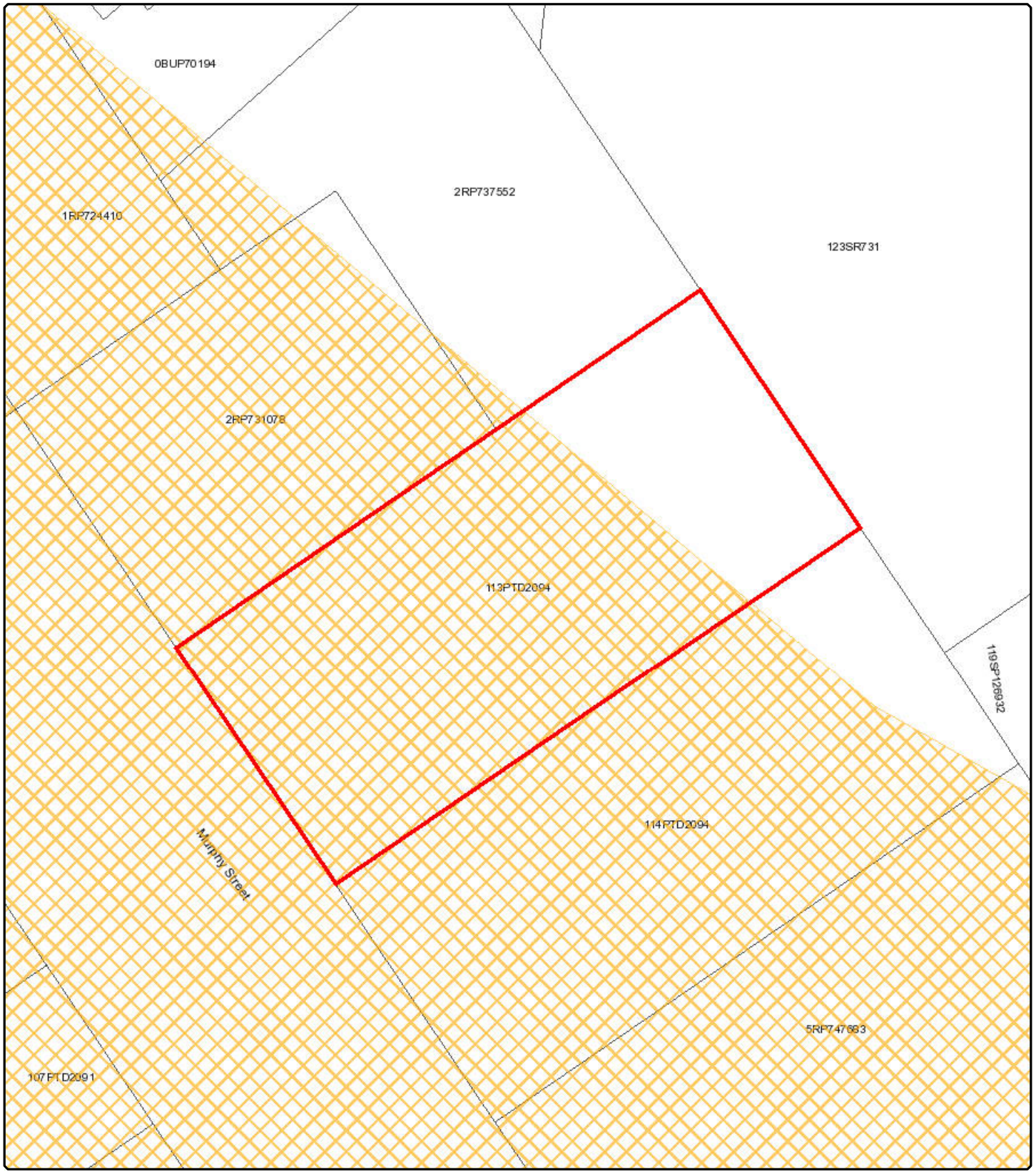
0 10 20 30 40

Metres

Legend

Regulated vegetation management map (Category A and B extract)

- Category A on the regulated vegetation management map
- Category B on the regulated vegetation management map



State Assessment and Referral Agency

Date: 21/02/2022

Queensland Government

Legend

Coastal area - erosion prone area

Coastal area - erosion prone area

0 10 20 30 40

Metres

Attachment 5

Photomontage

KELLY REASTON

kr

DEVELOPMENT & PROPERTY SERVICES

A PREDOMINANTLY OBSTRUCTED VIEWS OF THE SITE FROM THE PORT DOUGLAS TOWNSHIP

1 PRIMARY VISUAL IMPACT VIEWS ALONG DICKSON INLET REFER PHOTOMONTAGES

NOTE : ALL PHOTOS TAKEN WITH A 50MM LENS AND DISPLAY EXISTING VEGETATION ONLY (PROPOSED PLANTS NOT SHOWN).

MURPHY STREET RESIDENCE

PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

DEVELOPMENT APPLICATION
VISUAL IMPACT - VIEWPOINTS

DEVELOPMENT APPLICATION	
PROJECT NO.	MURPHY001
DRAWING NO.	01.4
REVISION NO.	01
DATE	2/6/22

HUNT DESIGN

MURPHY STREET RESIDENCE
PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

DEVELOPMENT APPLICATION
VISUAL IMPACT - VIEW 1 (50mm LENS)

DEVELOPMENT APPLICATION	
PROJECT NO.	MURPHY001
DRAWING NO.	01.5
REVISION NO.	01
DATE	2/6/22

HUNT DESIGN

MURPHY STREET RESIDENCE
PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

DEVELOPMENT APPLICATION
VISUAL IMPACT - VIEW 2 (50mm LENS)

DEVELOPMENT APPLICATION	
PROJECT NO.	MURPHY001
DRAWING NO.	01.6
REVISION NO.	01
DATE	2/6/22

HUNT DESIGN

Attachment 6

Ecological Report

KELLY REASTON

kr

DEVELOPMENT & PROPERTY SERVICES

Attachment 7

Landscaping Plans

KELLY REASTON

kr

DEVELOPMENT & PROPERTY SERVICES

MURPHY STREET RESIDENCE

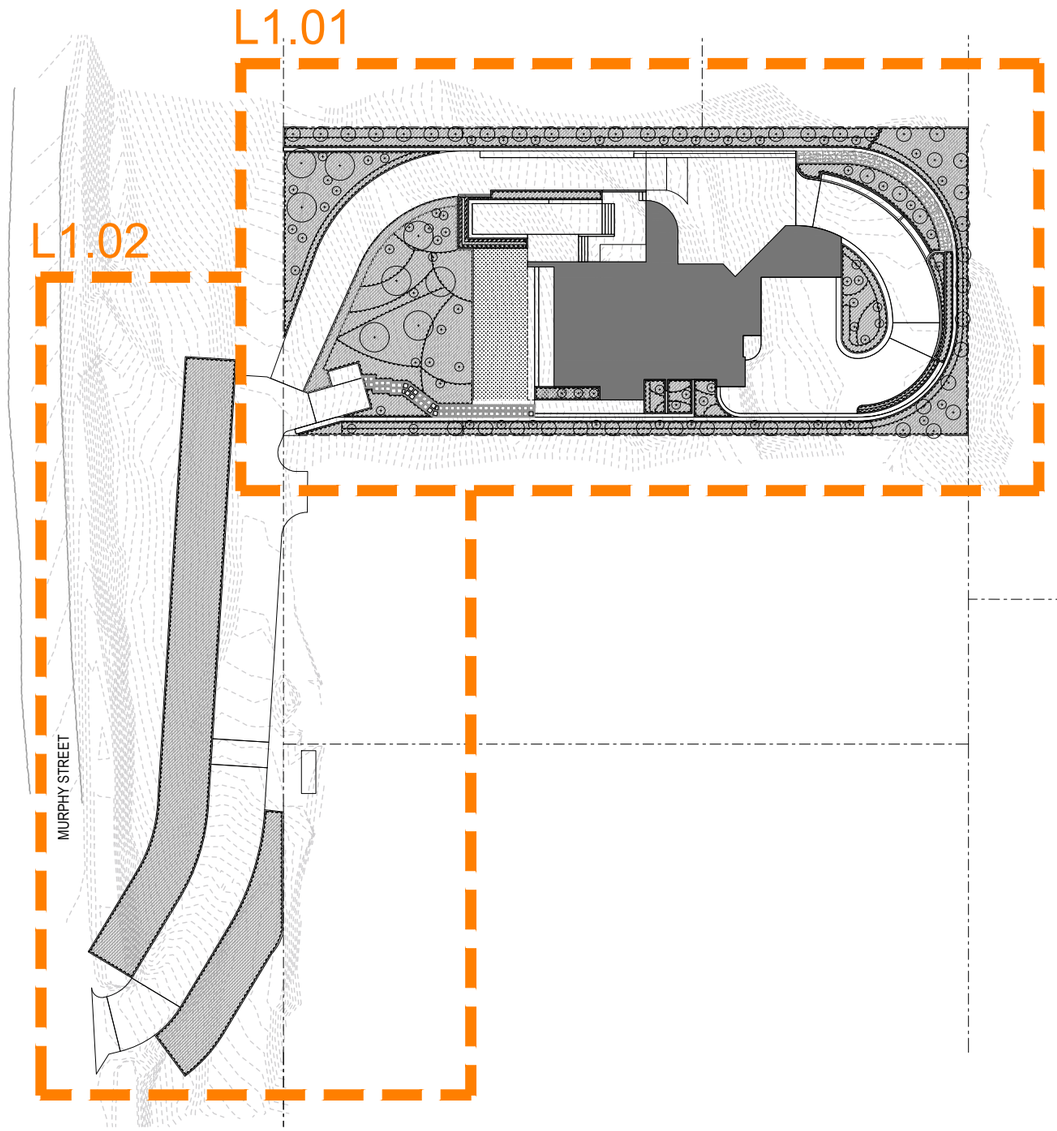
12 MURPHY STREET ON LOT 113 (PTD2094)

LANDSCAPE DOCUMENTATION

Issue: OPERATIONAL WORKS

Date: 03-06-2022

SHEET PLAN 1:300@A1



DRAWING SCHEDULE

DRAWING NUMBER	TITLE	REVISION
L0.01	COVER SHEET	02
L1.01	LANDSCAPE PLAN	02
L1.02	LANDSCAPE PLAN	02
L2.01	LANDSCAPE STANDARD DETAILS	02
PROJ. NO./STAGE/L3.01	LANDSCAPE SPECIFICATION	02

PLANT SCHEDULE

CODE	SPECIES	COMMON NAME	POTSIZE	QUANTITY
ACM HEM	ACMENA HEMILAPRA	LILLY PILLY	200mm	8
BAR ACU	BARRINGTONIA ACUTANGULAR	INDIAN OAK	200mm	5
SYZ FIB	SYZYGIUM FIBROSUM	FIBROUS SATINASH	25 Litre	8
SYZ AUS	SYZYGIUM AUSTRALE	BRUSH CHERRY	25 Litre	20
XAN CHR	XANTHOSTEMON CHRYSANTHUS	GOLDEN PENDA	25 Litre	5
PHY CUS	PHYLLANTHUS CUSCUTIFLORUS	PINK PHYLLANTHUS	200mm	32
CLE HYL	CLEISTANTHUS HYLANDII	BERNIE'S CLEISTANTHUS	140mm	14
LOM LON	LOMANDRA LONGIFOLIA	MAT RUSH	140mm	169
SYZ CAS	SYZYGIUM CASCADE	CASCADE LILLY-PILLY	140mm	17
GAR PSI	GARDENIA PSIDIOIDES	GLENNIE RIVER	140mm	32
CYR REN	CYRTOSTACHYS RENDA	LIPSTICK PALM	100 Litre	38
LIC RAM	LICUALA RAMSAYI	AUSTRALIAN FAN PALM	100 Litre	15
TEC HIL	TECOMANTHE HILLII	FRASER ISLAND CREEPER	140mm	15
GRA EXC	GRAPTOPHYLLUM EXCELSUM	SCARLET FUCHSIA	140mm	10
ALP CER	ALPINIA CAERULEA	NATIVE GINGER	140mm	35
ATR FIT	ATRACTOCARPUS FITZALANII	BROWN GARDENIA	100 Litre	3
HOY AUS	HOYA AUSTRALIS	WAXVINE	140mm	10
DEP TET	DEPLANCHEA TETRAPHYLLA	GOLDEN BOUQUET TREE	100 Litre	5
CUR CAP	CURCULIGO CAPITULATA	PALM GRASS	140mm	199
BRA ACE	BRACHYCHITON ACERIFOLIUS	ILLAWARRA FLAME TREE	100 Litre	5
ALP PUR	ALPINIA PURPURATA	RED GINGER	140mm	48
PHI SEL	PHILODENDRON SELLOUM	PHILODENDRON	140mm	5
VIO HED	VIOLA HEDERACEA	NATIVE VIOLET	140mm	12
BLE SIL	BLECHNUM SILVER LADY	DWARF TREE FERN	140mm	18
PHI XAN	PHILODENDRON XANADU	WINTERBOURN	140mm	17
CAL ZEB	CALATHEA ZEBRINA	ZEBRA PLANT	140mm	8
CAL HAG	CALATHEA HAGBERGII	CALATHEA	140mm	12
HEL CHA	HELICONIA CHARTACEA	SEXY PINK HELICONIA	140mm	6
GRE SPE	GREVILLEA SPECIES	GREVILLEA	140mm	5
BRO SPE	BROMELIAD SPECIES	RADICANS	140mm	8
GAR RAD	GARDENIA RADICANS	PROSTRATE GARDENIA	140mm	12
DIC SIL	DICHONDRA SILVER FALLS	SILVER PONYSFOOT	140mm	20
ZEP CAN	ZEPHYRANTHES CANDIDA	FAIRY LILY	140mm	30
DIA SIL	DIANELLA SILVER STREAK	NATIVE FLAX	140mm	20
ETL ELA	ETLINGERA ELATIOR	TORCH GINGER	140mm	20
COR CAN	CORDYLINE CANNIFOLIA	THE PALM LILY	140mm	24
CRI PED	CRINUM PEDUNCULATUM	SWAMP LILY	140mm	12
DIA CAE	DIANELLA CAERULEA	FLAX LILY	140mm	12

REVEGETATION SCHEDULE

CODE	SPECIES	COMMON NAME	POTSIZE	QUANTITY
A	LOMANDRA HYSTRIX	CREEK MAT RUSH	TUBE	42
A	LOMANDRA LONGIFOLIA	MAT RUSH	TUBE	42
A	GAHNIA ASPERA	ROUGH SAW EDGE	TUBE	42
A	GARDENIA PSIDIOIDES	GLENNIE RIVER	TUBE	42
A	HIBBERTIA BANKSII	GUINEA FLOWER	TUBE	42
A	ASPLENIUM NIDUS	BIRD'S NEST FERN	TUBE	42
	TOTAL - (21/MODULE)			252
B	ACACIA FLAVESCENS	RED WATTLE	TUBE	18
B	ANTIDESMA BUNIUS	CHINESE - LAUREL	TUBE	18
B	PAVETTA AUSTRALIENSIS	BUTTERFLY BUSH	TUBE	18
B	LEEA INDICA	BANDICOOT BERRY	TUBE	18
B	GRAPTOPHYLLUM EXCELSUM	SCARLET FUCHSIA	TUBE	18
B	GREVILLEA LONGISTYLA	LONG JOHN	TUBE	18
B	CLEISTANTHUS HYLANDII	BERNIE'S CLEISTANTHUS	TUBE	18
B	ALPINIA MODESTA	NARROW-LEAF GINGER	TUBE	18
	TOTAL - (12/MODULE)			144
C	ACACIA AULACOCARPA	HICKORY WATTLE	TUBE	3
C	ACACIA CRASSICARPA	NORTHERN WATTLE	TUBE	3
C	SYZYGIUM AUSTRALE	BRUSH CHERRY	TUBE	3
C	PHYLLANTHUS CUSCUTIFLORUS	PINK PHYLLANTHUS	TUBE	3
	TOTAL - (1/MODULE)			12

Based on 12 5x5m modules

The Contractor shall review the plant schedule to ensure that drawings and schedules concur. Where insufficient detail or discrepancies may exist on either the plans or the schedule, it is the Contractors responsibility to resolve immediately with the Landscape Architect and prior to providing Tender pricing, signing work contracts or commencement of works.

IMPORTANT NOTE

rev. no	description	date	drawn
01	PRELIMINARY	30/05/2022	DC
02	REVISED FOR APPROVAL	03/06/2022	SM

LANDPLAN
LANDSCAPE ARCHITECTURE
p 0439 005 294 | e simon@landplanla.com.au | PO Box 781 Bungalow 4870

drawn	approved	date
D.C.	S.M.	03/06/2022

scale: 1: 300 (AT A1 SIZE SHEET) 0

client: KIM CULLEN & NEIL BIDDLE

project: MURPHY STREET RESIDENCE

title: COVER SHEET

project number: 2112-055

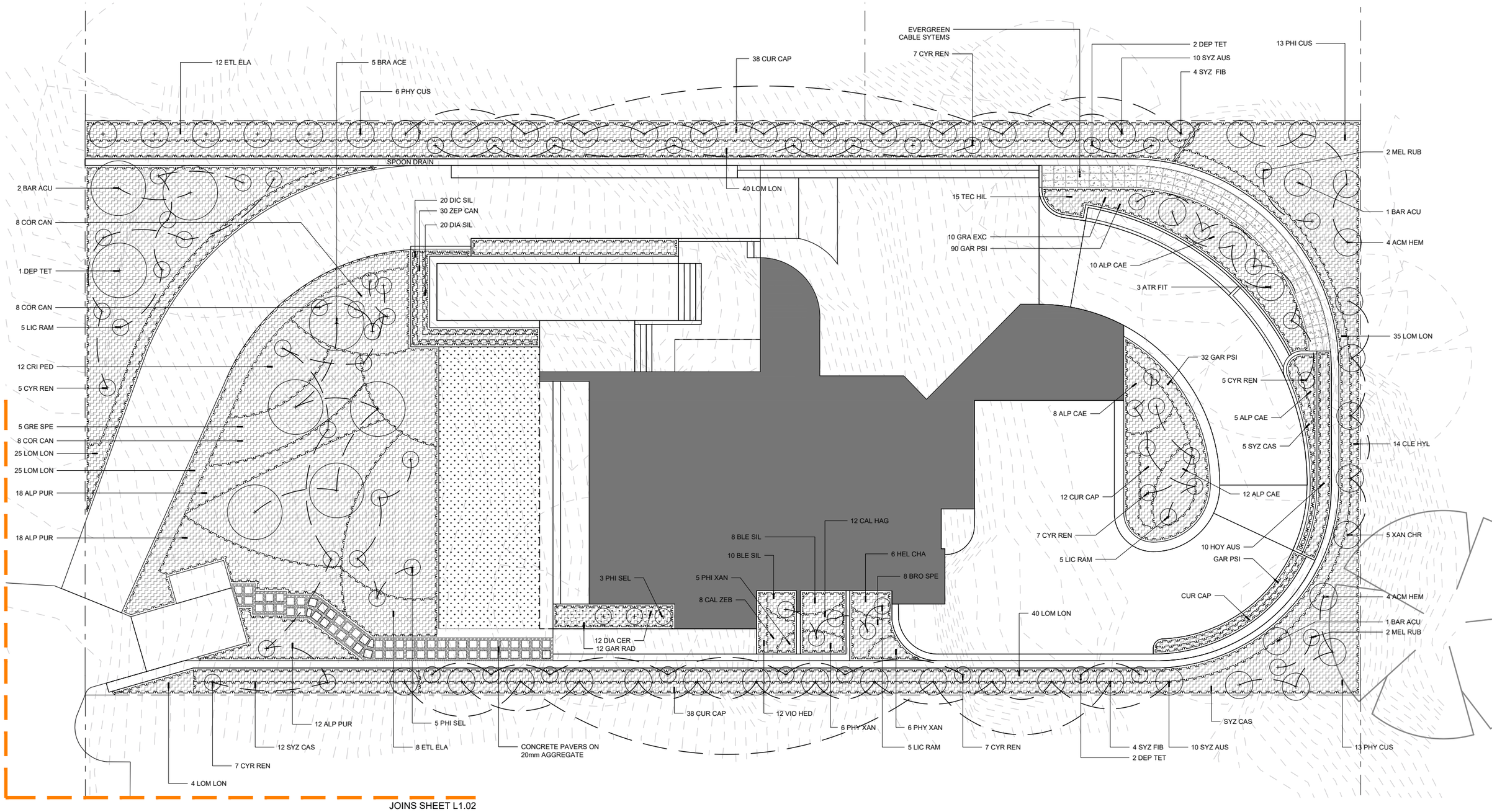
drawing number: L0.01

rev: 02

northpoint

LEGEND:

- PROPOSED TREE. REFER PLANT SCHEDULE
- PA1 — PLANTING AREA TYPE 1 (PA1) - GENERAL PLANTING AREAS AS SPECIFIED
- NEW TURF OVER TOPSOIL & CULTIVATED SUBGRADE AS SPECIFIED
- PT1 — PAVEMENT TYPE 1 (PT1) - CONCRETE PAVERS



JOINS SHEET L1.02

rev. no	description	date	drawn
01	PRELIMINARY	30/05/2022	DC
02	REVISED FOR APPROVAL	03/06/2022	SM

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drawn	approved	date
D.C.	S.M.	03/06/2022

scale: 1:100 (AT A1 SIZE SHEET) — 0

client: KIM CULLEN & NEIL BIDDLE
project: MURPHY STREET RESIDENCE
title: LANDSCAPE PLAN

project number: 2112-055
drawing number: L1.01
rev: 02

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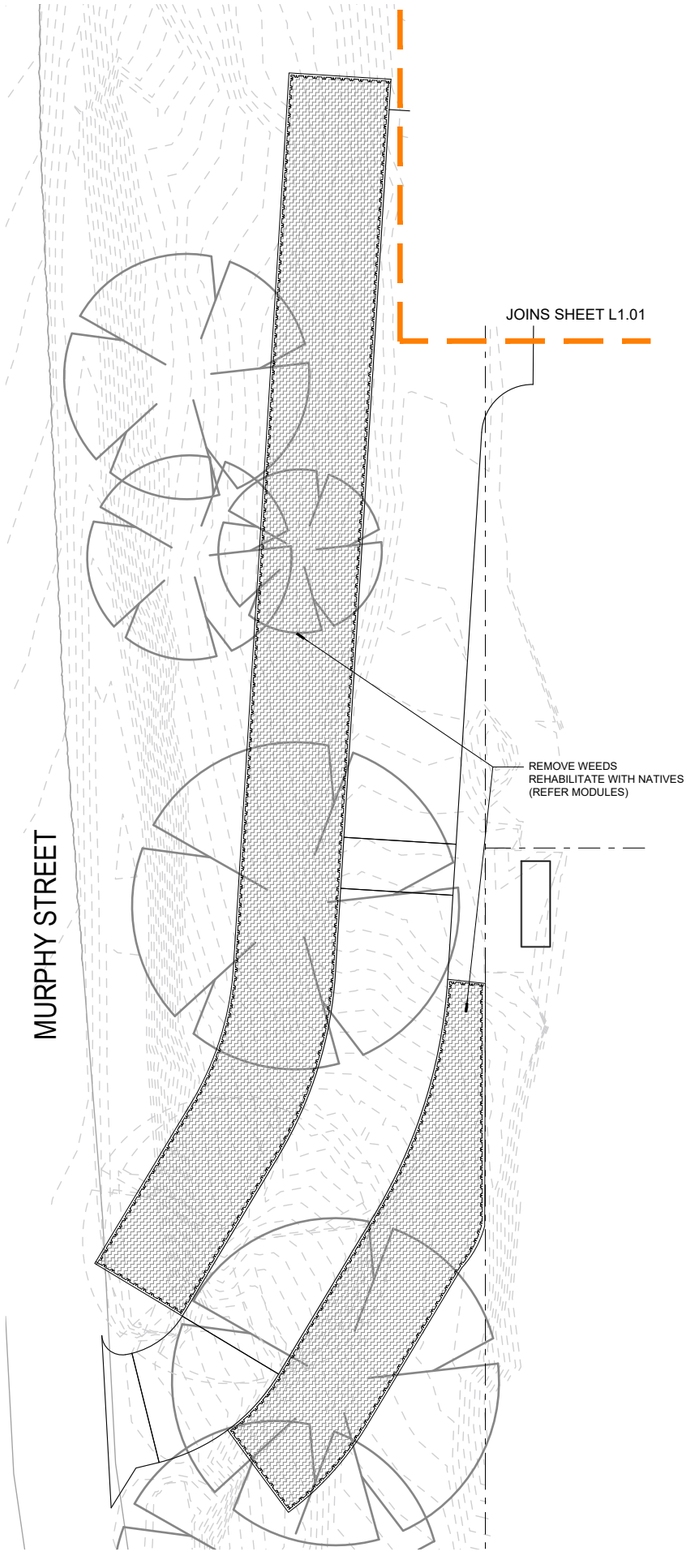

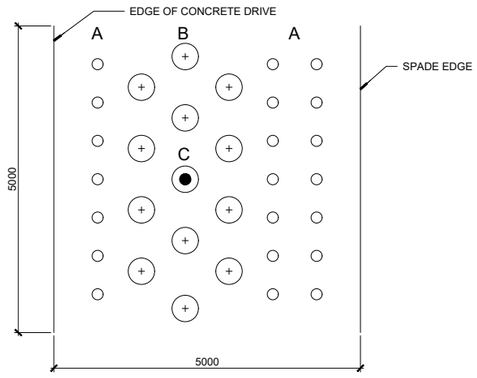

01 TYPICAL PLANTING MODULE
SCALE 1:50

rev. no	description	date	drawn
01	PRELIMINARY	30/05/2022	DC
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drawn	approved	date
D.C.	S.M.	03/06/2022

scale
1:150
(AT A1 SIZE SHEET)
0

client
KIM CULLEN & NEIL BIDDLE

project
MURPHY STREET RESIDENCE

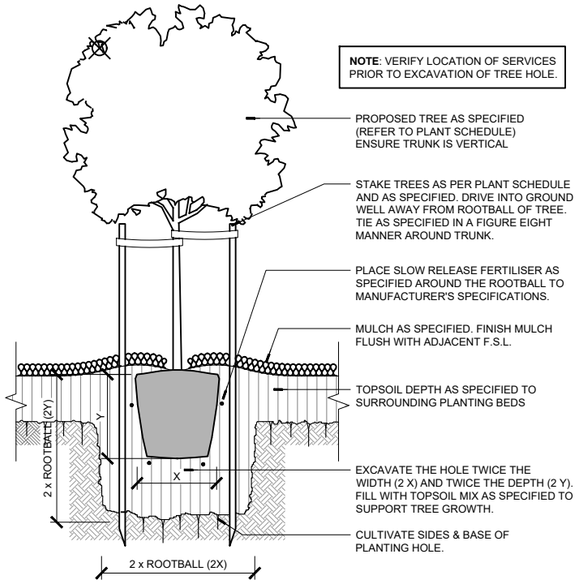
title
LANDSCAPE PLAN

project number
2112-055

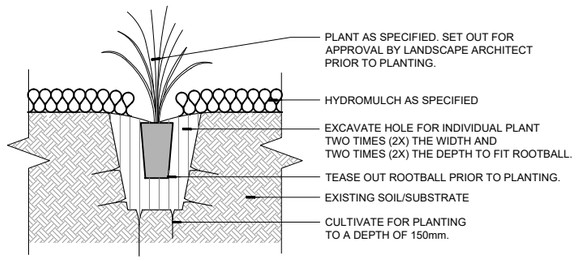
drawing number
L1.02

rev
02

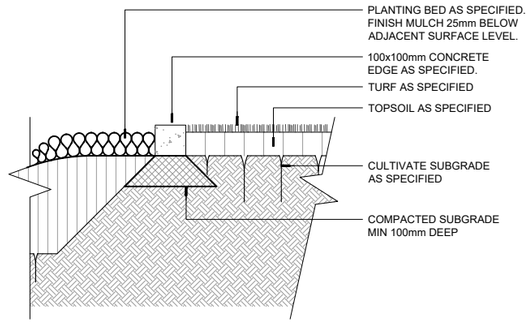
northpoint



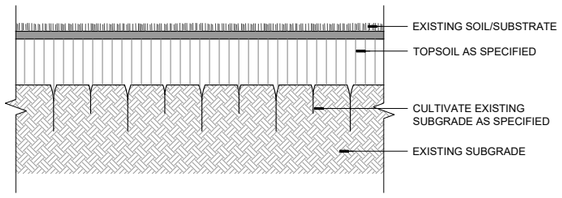
01 TREE PLANTING - IN GARDEN BEDS
SCALE 1:20



02 PA1 PLANTING - GENERAL PLANTING
SCALE 1:10



03 TYPICAL CONCRETE EDGE
SCALE 1:10



04 TURFED AREAS
SCALE 1:10

rev. no	description	date	drawn
01	PRELIMINARY	30/05/2022	DC
02	REVISED FOR APPROVAL	03/06/2022	SM

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drawn	approved	date
D.C.	S.M.	03/06/2022

scale: AS SHOWN (AT A1 SIZE SHEET) 0

client: KIM CULLEN & NEIL BIDDLE
project: MURPHY STREET RESIDENCE
title: LANDSCAPE STANDARD DETAILS

project number: 2112-055
drawing number: L2.01
rev: 02

northpoint

SPECIFICATIONS

SCOPE OF WORK

The work includes the organisation for and supply of all relevant labour, materials, plant and equipment as required to execute the works.

The scope of work includes but is not limited to the following:

- Trimming of areas to be landscaped;
- Removal of deleterious material;
- Cultivation;
- Supply and spreading of additives;
- Supply and installation of imported topsoil;
- Supply and installation of mulch;
- Planting; and
- Maintenance.

WORKS BY OTHERS

- All hard pavement
- Retaining walls
- All fencing types
- Subsoil drainage

EARTHWORKS

Earthworks shall involve the removal of existing compacted material, the cultivation of subsoil, the supply and mixing in of additives, the supply and spreading of topsoil and the fine grading of such soil and existing soil profiles to all landscaped areas to form the finished levels and profiles.

Finished surfaces shall finish flush with adjacent surfaces.

Preparation

Eradicate all weeds using environmentally acceptable methods, such as non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Maintain all areas in a weed free state for the duration of the contract and Plant Establishment periods.

Cultivation

Excavate and remove from site compacted fill resulting from the building works. Cultivate all planting and turf areas to a depth of 150mm and place 100g/m2 of Blood and Bone and 100g/m2 of Gypsum.

IMPORTED TOPSOIL (FOR PLANTING)

Import and spread premium topsoil mix . Soil shall be free of weeds, sticks, rocks and other deleterious matter. Imported topsoil is to comply with AS4419.

MULCH

Mulch to be spread evenly across all planting areas. Mulch to planting areas shall be approved rainforest mulch free of soil, stones, weeds, rubbish or any other deleterious materials. Spread mulch to garden bed areas to a depth of 75mm, to finish 20mm below adjacent surfaces. Keep mulch clear of plant stems. Spread mulch following planting and watering in. Avoid mixing of soil and mulch materials. Do not use recycled garden mulch. Mulch to comply with AS4454.

PLANTING AREAS

Finished soil depth to all garden areas shall be 300mm crowned towards centre of beds ensuring positive falls to drainage structures. Use 'Agriform' 10g fertilizer tablets (or approved equivalent) to base of all plant root balls at manufacturer's recommended rate.

PLANTS

Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage;
- Vigorous well-established stock free from pests and diseases, of good form consistent with the pot size, species or variety;
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Label at least one plant from each species in a batch with a durable, readable tag. Plant stock immediately after it is delivered to site. For all plant stock excavate a hole twice the diameter of the rootball and at least 200mm deeper than the rootball. Loosen compacted sides and base of holes to prevent confinement of root growth. Fill all holes to half deep with water in advance of planting, allowing time for water to soak away. After planting, fill hole with amended/imported soils.

STAKES AND TIES

All 45L stock and larger are to be staked and tied.

GRASS AREAS

Refer Civil Engineers Specifications.

TIMBER EDGE

To be located in ALL areas between turfed areas and planting beds. Supply and install in accordance with the details and the drawings.

Installation:

Set edging's flush with adjoining surfaces to define planting to turf or turf/reinforced turf junctions. Fix to pegs with galvanized nails, two per fixing. Drive pegs into the ground at 1500mm max centres on both sides of joints between boards, with peg tops 15mm below the top of the edging. Refer to details.

CONDUITS

The contractor is responsible for co-ordination with the building contractor to ensure that conduits under proposed paved or concreted areas have been installed. Conduits for irrigation purposes shall be 90mm PVC pipe - top min. 250mm below finished surface levels.

TURF AREAS

Spread 50mm layer of imported topsoil to all nominated turf areas.

Install an A-grade green couch that is weed free.

PLANTING ESTABLISHMENT

Establish and maintain the works for a period of thirteen (13) weeks from the Date of Practical Completion.

Establishment shall include the care of the contract areas by accepted horticultural practices, as well as rectifying any defects that become apparent in the works under normal 'use'. This shall include, but not be limited to, the following works:

- Repair and/or replace any defects due to failure and/or inferior quality materials and/or workmanship;
- Replace plants that have failed and/or have been damaged or died;
- Weed and pest control;
- Maintain all landscape areas in a neat and tidy condition at all times;
- Maintain fertilising and pruning as required;
- Check and adjust levels to attain those specified by addition or removal of mulch and/or topsoil.

All planted beds are to be weeded to maintain same in a grass and weed free environment. Carry out any other work that is specified or is necessary to establish the landscape works in a first class condition.

GARDEN EDGING

Location:

To be located in areas between grass/garden areas and PT1 as indicated on the drawings. Supply and install in accordance with the details and the drawings

Installation:

Set top of edge strip to be flush with the surface level of surrounding turf. Install 100mm x 100mm depth concrete edging strip as detailed.

IRRIGATION

The design, supply, and installation of a fully automatic irrigation system to provide coverage to all turf and planting areas specified. The system shall be capable of delivering an application rate of 32mm per week.

To avoid water wastage, ensure that the correct sprinkler nozzle is used for the particular application required, and also adjust sprinklers and solenoid valves as required to avoid overspray onto paths and roadways.

SYSTEM DESIGN SPECIFICATIONS

This is a general design specification and does not relate specifically to any particular site. The purpose of these specifications is to provide general guidelines and operating parameters by which an irrigation system can be installed which complies to relevant government, authorities, and industry standards.

Any irrigation layout drawings containing pipe work, valves, sprinkler outlets, wiring and controllers are diagrammatic and contractor is required to obtain all necessary information, including but not limited to; correct measurements, on site flow/ pressure test of water supply, and other necessary information to carry out complete installation of system.

Exact alignment of irrigation lines to be determined onsite and approved by landscape architect prior to commencement of works.

Any impact on existing trees to be minimized and avoided where possible.

All materials to be supplied and installed are to be of professional standard and compliant to any relevant Government standards.

Any fees, licenses or associated installation costs are the responsibility of the irrigation contractor.

Fully automatic irrigation system appropriate for specific site requirements;

Appropriately sized commercial controller in weatherproof enclosure if mounted externally;

Turf areas to be watered utilizing pop-up sprinklers:

- -Hunter Model I20 or similar for commercial installations;
- Garden areas to be watered utilizing pop-up sprinklers, garden shrub sprays on 15mm poly risers or drip irrigation dependent on customer's specifications;
- Solenoid valves to be appropriately sized for individual station flow rate requirements:
- -Hunter ICV solenoid valve or similar;
- Mainline and lateral pipework to be PVC Class 12 or poly pipe PN12.5;
- Dripline pipework to be low density poly pipe and associated fittings with stainless steel hose clamps;
- Solenoid valve wiring to be appropriately sized, according to distance between valve and controller, power losses through cable, and inrush amperage of valve;
- Solenoid valve control wire joints are to be waterproof connections
- -DBY or similar;
- Backflow prevention device with associated valves and filter assembly to comply with relevant government authorities and sized according to maximum flow rate of system

COMMISSIONING AND MAINTENANCE

Prior to commissioning of system the following works will have been carried out:

Operation of each individual solenoid valve from controller;

- Minimum 7 days of continuous automatic operation of entire system from controller;
- Programming of controller to allow for 32mm of precipitation during a 7 day period;
- Testing of rain sensor to ensure proper operation of same to over-ride controller during rain periods;
- Attach all contact details of contractor to door of controller for future reference;
- Provide a detailed irrigation schedule for controller programme, showing all relevant details;
- Provide personal and written operating instructions to nominated personnel on site;
- Provide a detailed as constructed drawing showing:
  1. Solenoid and gatevalve locations (including station number and irrigated area)
  2. Mainline location
  3. Backflow and other isolation valve locations
  4. Controller and rain sensor locations.

Maintenance Period

This period shall be 13 weeks in duration, during which period the contractor shall undertake the following:

Additional flushing of system as necessary to ensure correct sprinkler operation;

Repair of any pipework or fitting leaks and/or blockages;

Ensure correct overall operation of system, including valves, sprinklers and nozzles;

Ensure correct programming and operation of controller;

Adjust controller program as required for individual station watering to ensure over-watering and run-off does not occur.

On completion of the maintenance period, the final programming of the controller shall be recorded in the control box and in the instruction manual, and the appropriate personnel advised

of the irrigation scheduling. These personnel shall at this time relate any queries or questions they have regarding the installation or operation of the system to the irrigation contractor.

Defects Liability Period

The defects liability period for the irrigation system shall be 52 weeks from the date of practical completion.

rev. no	description	date	drawn
01	PRELIMINARY	30/05/2022	DC
02	REVISED FOR APPROVAL	03/06/2022	SM

LANDPLAN
LANDSCAPE ARCHITECTURE
p 0439 005 294 | e simon@landplanla.com.au | PO Box 781 Bungalow 4870

drawn	approved	date
D.C.	S.M.	03/06/2022

scale: N.T.S. (AT A1 SIZE SHEET) 0

client: KIM CULLEN & NEIL BIDDLE
project: MURPHY STREET RESIDENCE
title: LANDSCAPE SPECIFICATIONS

project number: 2112-055
drawing number: L3.01
rev: 02

northpoint

Attachment 8

Geotechnical Report

KELLY REASTON

kr

DEVELOPMENT & PROPERTY SERVICES

GEO | design

1 June 2022

GEO Ref: 22021AA-D-L02-v2
Client Ref: TBA

Neil Biddle and Kim Cullen
C/-
Gary Hunt
Hunt Design
PO Box 170
PORT DOUGLAS 4877

Transmission via email: *gary@huntdesign.com.au*

GEOTECHNICAL INVESTIGATION
12 MURPHY STREET (LOT 113 on PTD2094)
PORT DOUGLAS QLD 4877

Dear Gary,

Further to our draft retaining wall design sections and the subsequent typical sections and alignment of the proposed retaining walls developed by Hunt Design and further to our mark ups providing details of the proposed retention system (attached), we can offer the following comments:

1. The proposed retention systems are considered geotechnically feasible and would provide sufficient support to the proposed cut batters as part of the proposed development.

2. The designs allow that all retention works required as part of the development are contained wholly within the subject property. No soil nails or other elements will extend into adjacent properties.

3. The proposed retention works do not represent a complex engineering solution and adopts common design and construction techniques for these types of projects which are similar to other projects constructed in Port Douglas.

4. The design allows the use of conventional equipment which are considered appropriate for this site.

5. The retention systems have been developed for this site in accordance with accepted guidelines and specifications based on the slope, grade and adjacent site conditions, together with the intent of the proposed development design.

6. The works would allow support to batters as excavation proceeds, meaning adequate short-term stability for the batters, together with providing the necessary long term support for the final profiles

7. Following construction of the retention systems in accordance with our finalised design, the risk of instability, in accordance with the AGS 2007 guidelines, will be Low.

8. The retention system would not increase the landslide risk to adjacent properties from a temporary or permanent point of view.

9. It is proposed the works would be carried out under direction and supervision of GEO to confirm design and construction adequacy.

Further to the above points, given the current site conditions and batters along the northern boundary of the site, the requirement for a retaining wall or a retention system in this area would be recommended as part of any further residential development of the allotment. This would also be to reduce the risk of instability within these batters and any debris or overland flow from further upslope reaching the building area, as outlined in our letter 22021AA-D-L01-v1 dated 27 April 2022.

In closing, we consider that the proposed retention works provide a feasible solution to provide support to the existing and proposed slopes in the subject allotment without extending into or negatively impacting the adjacent allotment and structures.

We would be pleased to answer any questions that you may have regarding this matter.

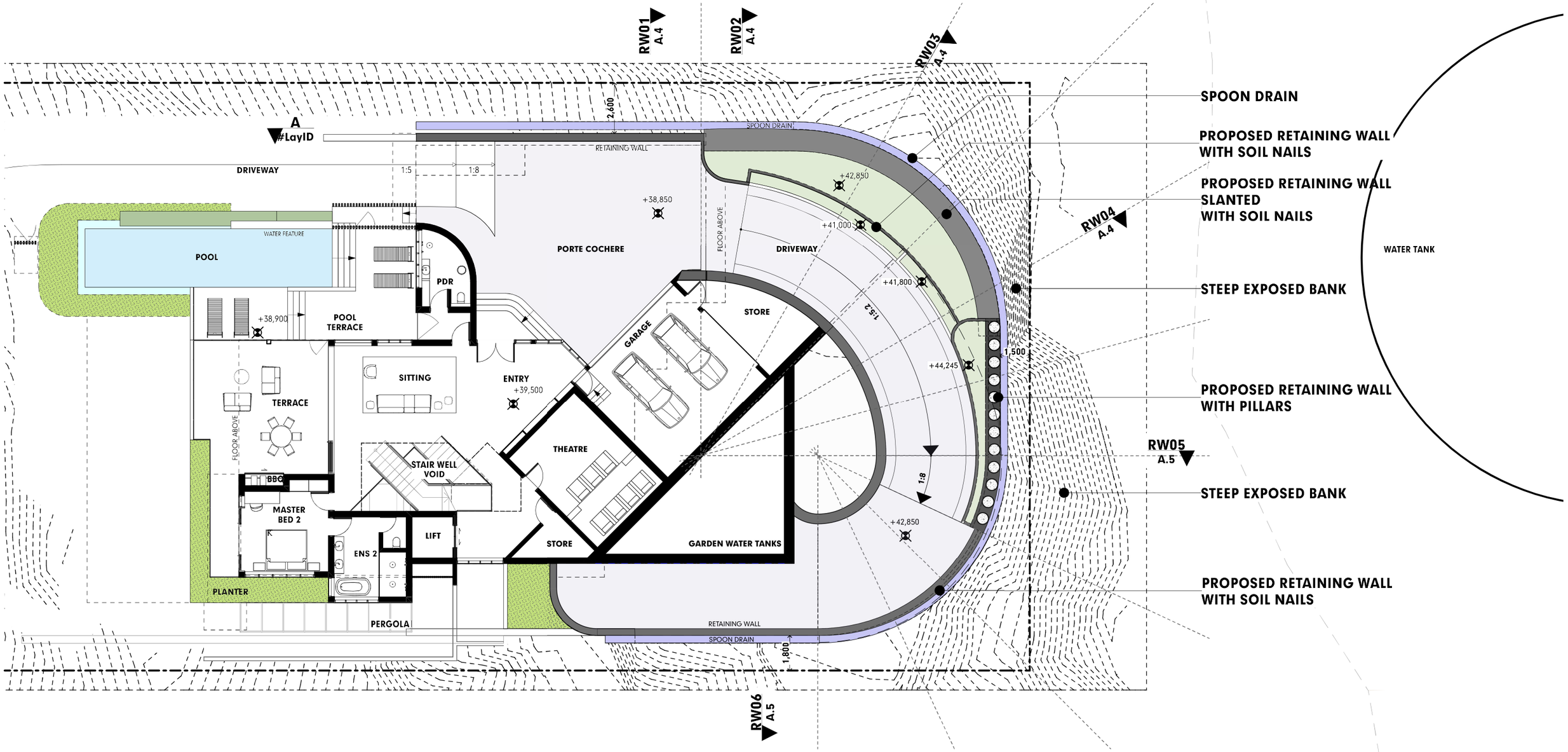
Yours sincerely,

Steve Ford

Principal Geotechnical Engineer
BSc (Geo) BSc Hons (Geo) MEngSc (Geotechnical)
RPEQ 25762

Attachments

1. Proposed Retention System



REAR RETAINING WALLS

REAR RETAINING WALL ANALYSIS

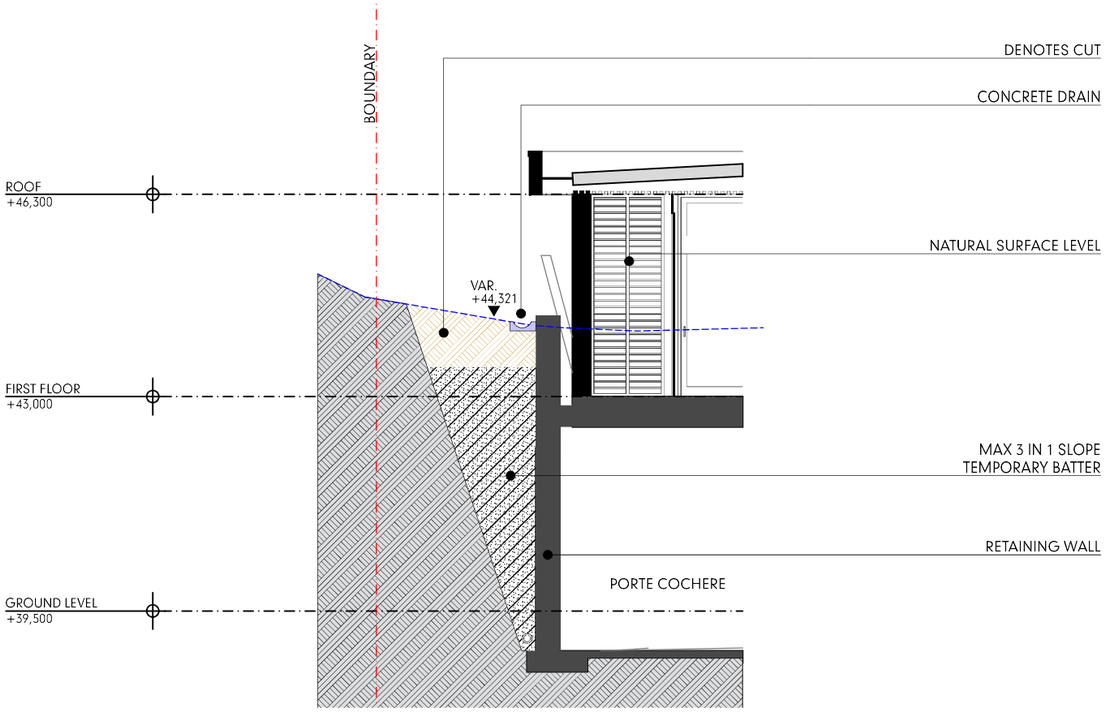
MURPHY STREET RESIDENCE

PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

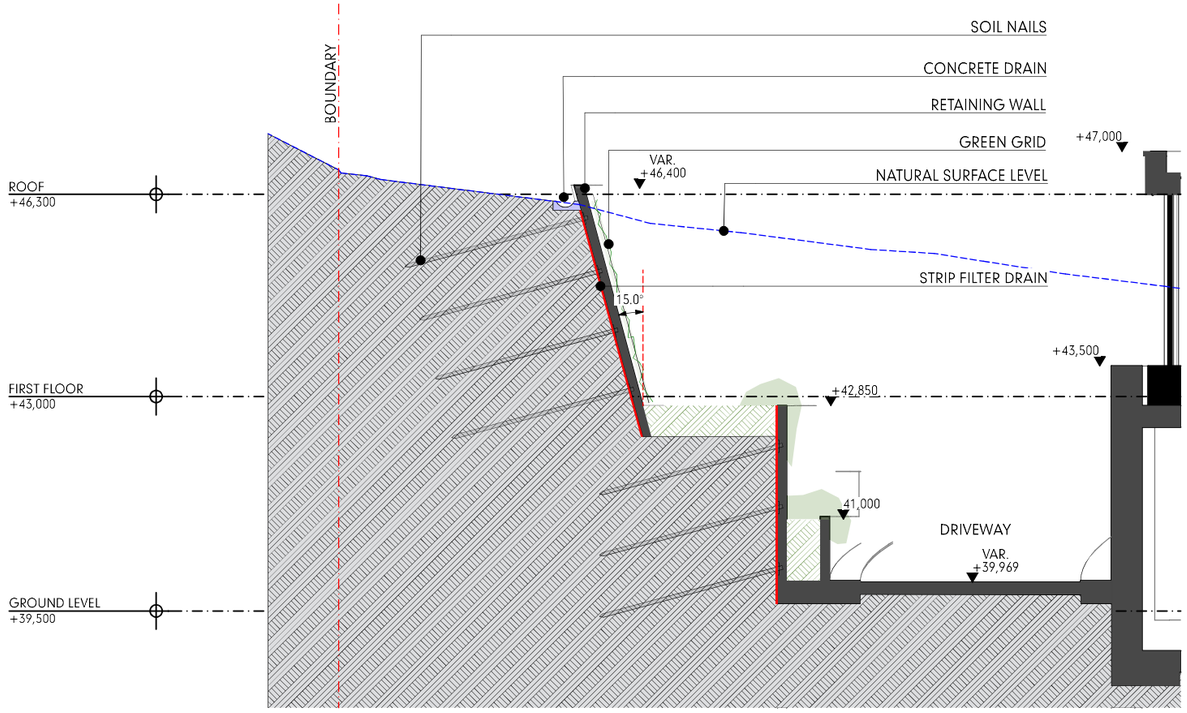
DEVELOPMENT APPLICATION
REAR RETAINING WALLS

DEVELOPMENT APPLICATION	
PROJECT NO.	MURPHY001
DRAWING NO.	A.3
REVISION NO.	01
DATE	20/5/22

HUNT DESIGN



SECTION RW01



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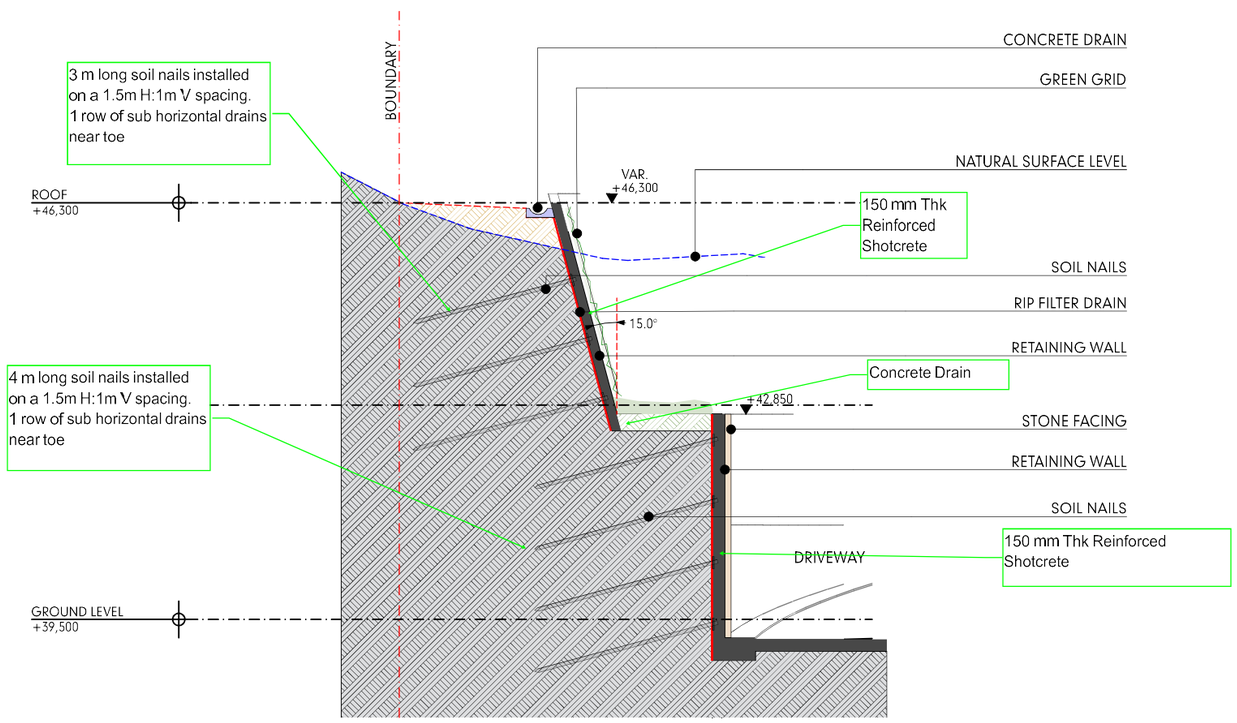
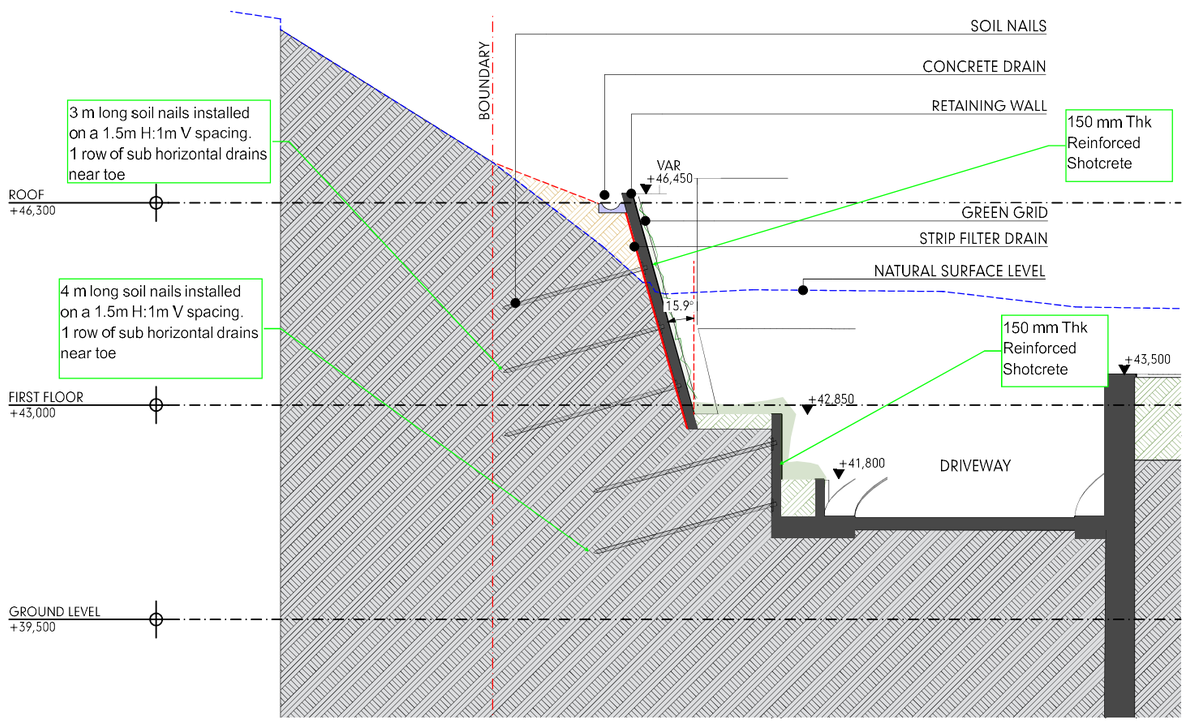


SECTION RW02



SECTION RW04

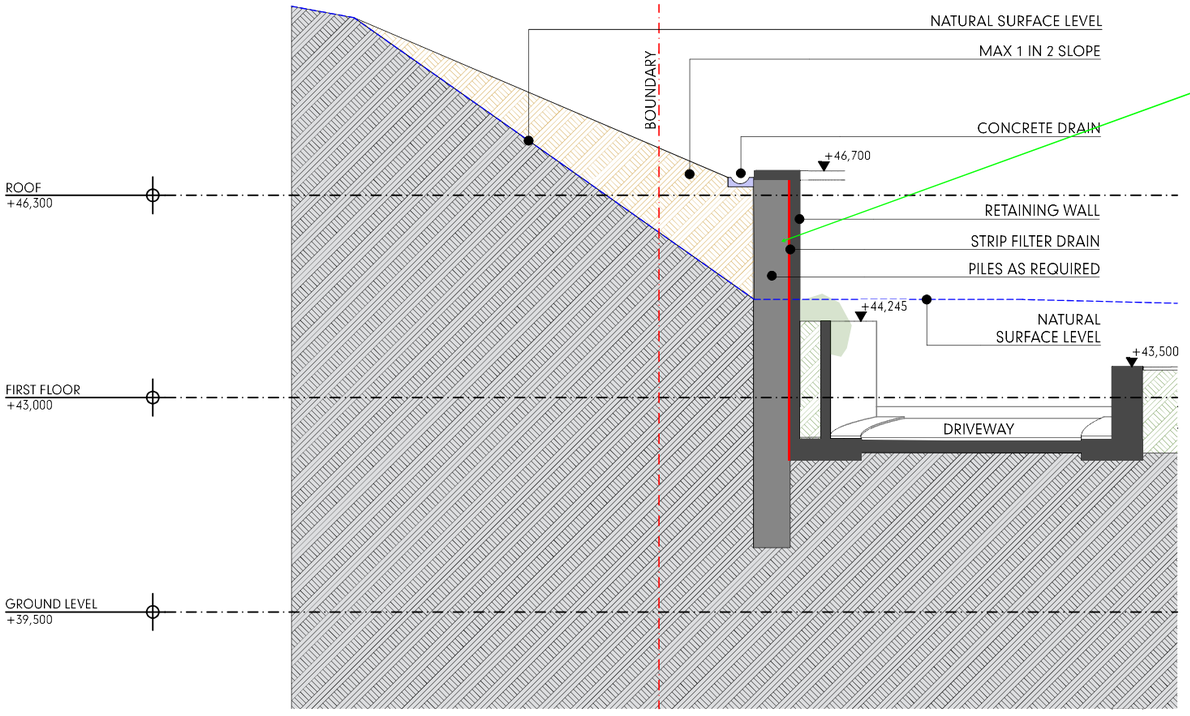
REAR RETAINING WALL ANALYSIS

MURPHY STREET RESIDENCE
PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

DEVELOPMENT APPLICATION
REAR RETAINING WALLS

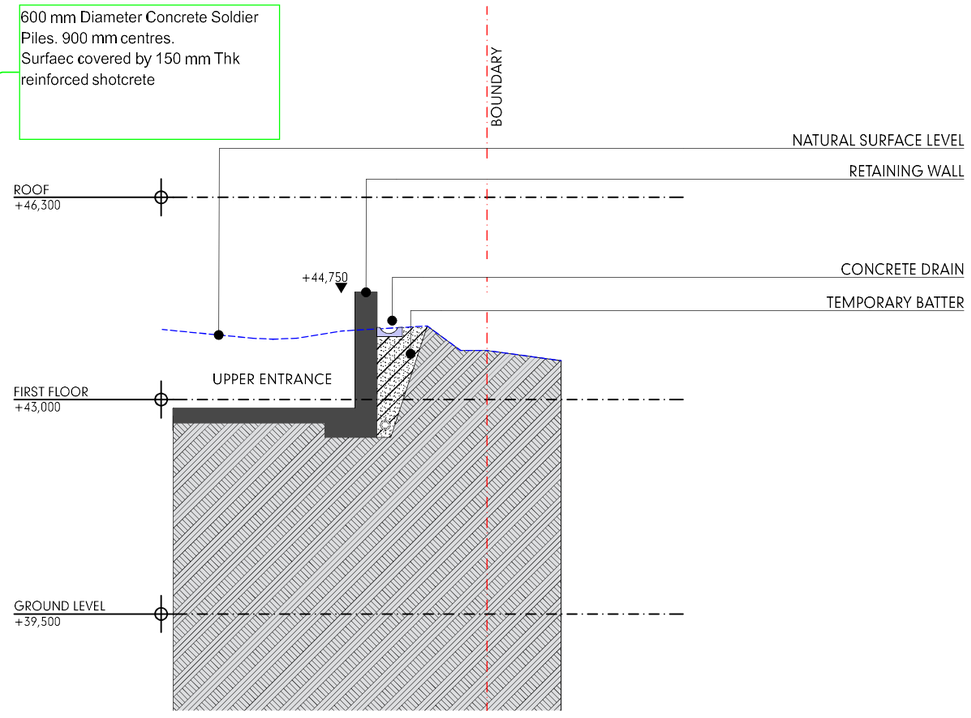
DEVELOPMENT APPLICATION
PROJECT NO. MURPHY001
DRAWING NO. A.4
REVISION NO. 01
DATE 20/5/22

HUNT DESIGN



SECTION RW05

600 mm Diameter Concrete Soldier Piles. 900 mm centres. Surfaec covered by 150 mm Thk reinforced shotcrete



SECTION RW06

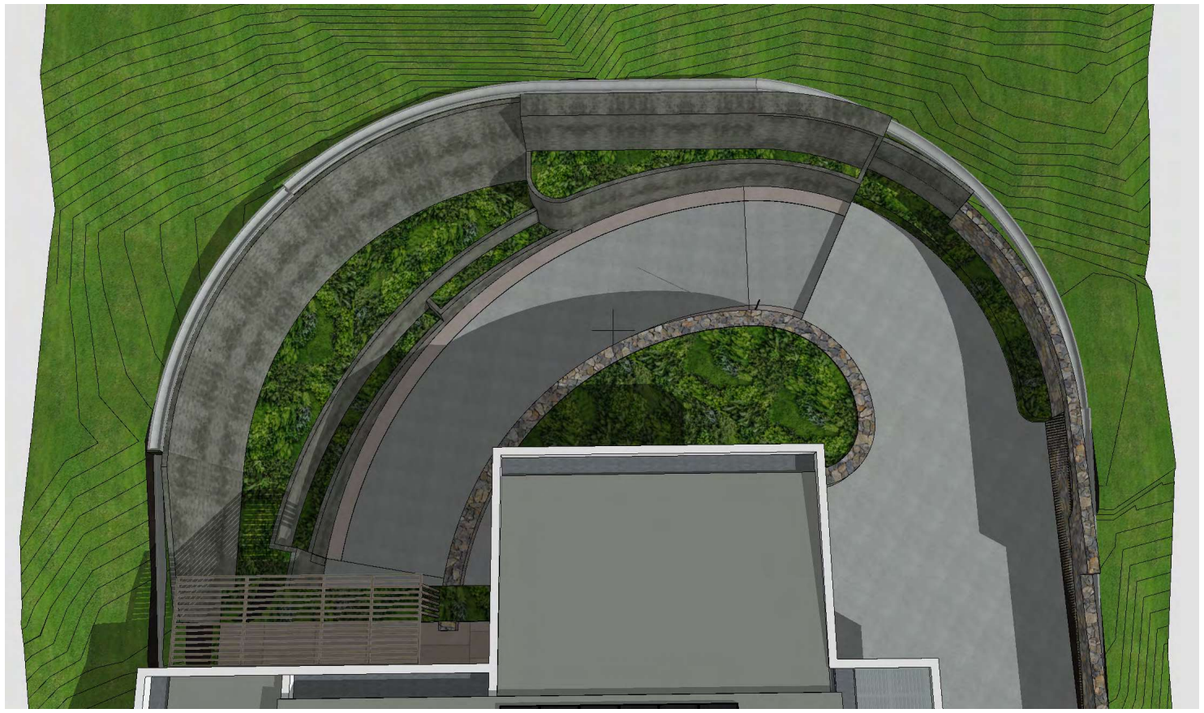
REAR RETAINING WALL ANALYSIS

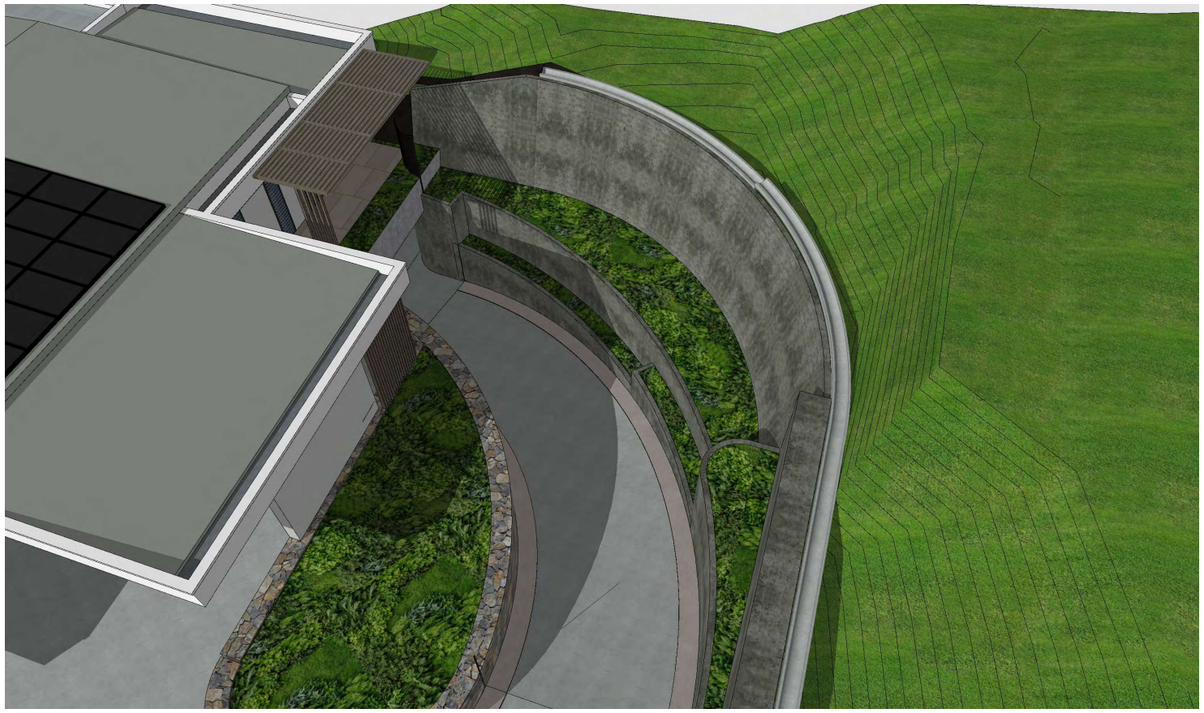
MURPHY STREET RESIDENCE
PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

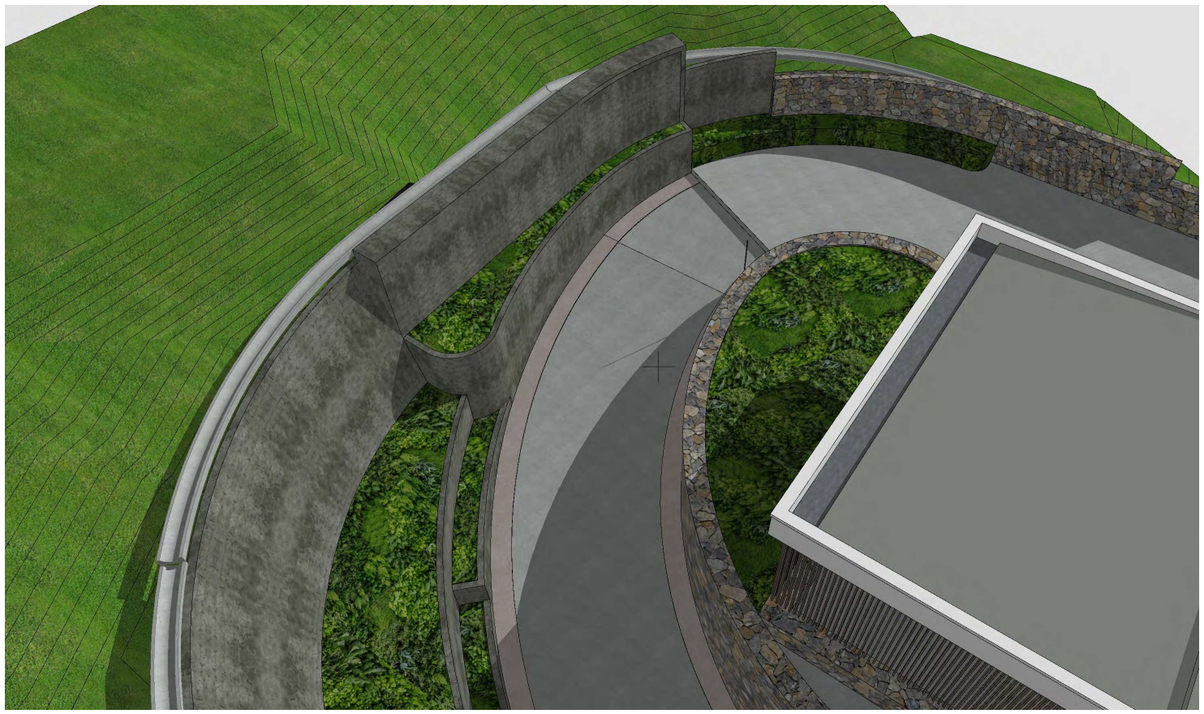
DEVELOPMENT APPLICATION
REAR RETAINING WALLS

DEVELOPMENT APPLICATION
PROJECT NO. MURPHY001
DRAWING NO. A.5
REVISION NO. 01
DATE 20/5/22

HUNT DESIGN







REAR RETAINING WALL ANALYSIS

MURPHY STREET RESIDENCE
PROPOSED NEW RESIDENCE AT No 12 MURPHY STREET
ON LOT 113 (PTD2094)
FOR : KIM CULLEN & NEIL BIDDLE

DEVELOPMENT APPLICATION
REAR RETAINING WALLS

DEVELOPMENT APPLICATION	
PROJECT NO.	MURPHY001
DRAWING NO.	A.6
REVISION NO.	01
DATE	20/5/22

HUNT DESIGN

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31 May 2022

EDGE Ref: 220150_Murphy St Northeastern Boundary letter rev01
Client Ref: TBA

Neil Biddle and Kim Cullen
c/- Gary Hunt
Hunt Design
PO Box 170
Port Douglas
4877

Structural and Civil Retention Advice – Northeastern Boundary
12 Murphy St (lot 113, PTD2094)
Port Douglas
QLD 4877

Dear Gary,

Further to our recent discussion regarding the Northeastern boundary, it is understood that structural advice is required to address the most suitable and practicable retention design approach (in collaboration with the geotechnical engineer) that will fulfill the permanent development arrangement and address the current erosion and surface slumping stemming from the above council lot.

It is evident onsite and also noted by the geotechnical engineer, that previous instability has occurred along the northeastern boundary which has caused lateral movement leading to unstable debris compiling onto lot 113. As outlined in the geotechnical report provided by GEO design, the current risk for instability to the Northeastern boundary has been deemed 'Moderate' in accordance with appropriate guidelines. As such, it has been recommended that a substantial retention solution be required to further reduce the overall landslide risk to within acceptable limits.

To form part of this advice, I refer both the retention scheme provided by the geotechnical engineer (GEO Design) SK-001 dated 07/05/22 rev00 and drawings A.3 to A.6 rev 01 dated 20/05/22 provided by the architect (Hunt Design). These retention solutions comprise of methods including soil nails and soldier pile walls. It is understood that these methods would be contained within lot113 boundaries.

From a structural design perspective, these retention methods described are believed to be of a workable solution and structurally adequate noting the deemed 'Moderate' landslide risk highlighted in the geotechnical report. It is of opinion these methods would be the safest and most practicable methods (both in the temporary and permanent case) providing robustness and fit for purpose arrangement also noting the intricacies of the land and current degraded embankment issues. The retention systems to the Northwest and Southeast boundaries would be of simpler construction and would be more traditional in nature (i.e. concrete/blockwork cantilevered wall) also contained within lot113.

From a civil design perspective, these retention methods proposed would provide arrangement to also address the current overland flow and erosion issues being deposited onto lot 113. A designed surface water system would be integral of both retention methods and would ensure surface flow is controlled and directed to an engineered stormwater catchment systems contained within the lot.

It is should be noted that an existing council rock retention system has been constructed to remediate surface slumping above the Northeastern boundary. It is highly recommended that the structural adequacy of this system should be clarified by council and that certification has been designed by a competent person using current Australian Standards. If deemed a non-engineered system, there is real risk that instability could occur resulting in landslip onto lot 113. Consideration should be given to further stabilize the batter below the existing concrete reservoir platform/rock retention to further mitigate the landslip risk as advised by the Geotechnical engineer. This work would assist in safer construction methodologies (short and long term) and would remediate the current erosion issue. It is of opinion this work could be carried out concurrently during the development of lot113 to find time and cost efficiencies for both landowners.

In summary, the proposed retention systems put forward in the above mentioned, are in opinion the most fit for purpose and robust solutions noting the intricate landscape and structural arrangement of the development. These solutions would allow for Safety in Design to be addressed appropriately for both temporary and permanent construction methodologies. In addition, overland flow can be addressed in controlled, engineered manner contained within lot113.

If any further clarification is required, please don't hesitate to contact the undersigned.

Yours faithfully,

Matthew Wallwork

Structural Manager
B.Eng(Hons) MIEAust CPEng NER RPEQ

Relevant Documentation:

Geotechnical Investigation Report – GEO Design – 12 Murphy St – Ref 22021AA-D-R01-v2
Geotechnical Engineering Letter – GEO Design – 12 Murphy St – Ref 22021AA-L01-v1
Northeastern Boundary Retention Systems Sketch – 12 Murphy St – SK001 07/05/22 rev00
Rear Retaining Wall Analysis sketches – Hunt Design – 12 Murphy St – Drawing A3 to A6 rev 01

Golder Associates Pty Ltd
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Fax (07) 4052 1546
http://www.golder.com

REPORT ON

GEOTECHNICAL INVESTIGATION
LOTS 1, 2, 113 AND 114
CNR OF MURPHY STREET AND ISLAND POINT ROAD
PORT DOUGLAS, NORTH QUEESLAND

Submitted to:

Property Resolutions Pty Ltd
C/- Gary Hunt & Partners Pty Ltd
PO Box 170
Port Douglas Queensland 4871

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May, 2001

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1.0 INTRODUCTION

Golder Associates has carried out a geotechnical investigation at 10-14 Murphy Street and 2 Island Point Road, Port Douglas. The investigation was carried out at the request of Garry Hunt & Partners Pty Ltd on behalf of PRP Pty Ltd and was authorised by a letter dated 14 February 2001.

The site has been investigated for a resort development by others in the late 1980's and early 1900's. It is understood that the currently proposed development will comprise ten villa buildings with associated access roads, swimming pools and basement car parking. The buildings will be of two to three levels and of reinforced concrete/masonry block construction.

The aims of the current investigation were as follows:-

- to confirm subsurface conditions in areas of the site not previously investigated for previously proposed developments;
- to confirm the stability of the slopes following proposed development;
- to comment on site preparation and earthworks procedures;
- to comment on the requirement for slope stabilisation/retention and to provide comments on stabilisation/retention options; and
- to comment on footing options and to provide geotechnical design parameters.

This report presents the results of the investigation together with the engineering comments outlined above.

2.0 METHOD OF INVESTIGATION

2.1 Review of Previous Investigations

The site has been investigated by Hollingsworth Dames and Moore in late 1980's and early 1900's for previously proposed development. Copies of investigation reports were reviewed. These reports includes the following:

- Preliminary Geotechnical Assessment of Slope Stability, dated 12 December 1988.
- Geotechnical Investigation, dated 31 January 1989.
- Drilling Investigation, dated 8 May 1989.

- Geotechnical Investigation, Island Point Resort, dated January 1992.

The previous investigations involved excavation of test pits to a maximum depth of 3.5 m, seismic refraction testing and drilling of a borehole to a depth of 17.14 m. Engineering comments were presented on site stability, basement excavation, ground support and footing design.

2.2 Current Fieldwork

Fieldwork for current investigation was carried out on 12 March, 2001 and involved the following:

- a walk over survey;
- drilling of six boreholes (BH1 to BH6) to a maximum depth of about 4.5 m;
- performance of a dynamic cone penetrometer tests at the location of each of the boreholes;

A senior geotechnical engineer from Golder Associates carried out the walkover survey, positioned the boreholes, logged the materials encountered, recovered samples and carried out the field tests. The approximate test locations including relevant test locations from previous investigations are shown on the Site Plan, Figure 1.

The results of the fieldwork are presented in Appendix A.

2.3 Laboratory Testing

Laboratory testing was carried out on four samples of the materials encountered in the boreholes. The testing consisted of grading and plasticity tests to confirm field classifications. The laboratory test results are summarised as follows:-

Borehole No.	BH1	BH3	BH5	BH6
Sample Depth (m)	2.6-2.7	4.1-4.2	2.1-2.2	2.3-2.4
Moisture Content (%)	12.8	22.4	15.0	14
Liquid Limit (%)	25	36	28	26
Plastic Limit (%)	20	25	18	18
Plasticity Index	5	11	10	8
Percentage Fines (%<75μm)	42	45	44	44
Sample Description	Silty Clayey SAND *	Silty SAND *	Clayey SAND	Clayey Silty SAND *

* Logged as extremely weathered sandstone rock in field

The laboratory test results are presented in Appendix B.

3.0 RESULTS OF INVESTIGATION

3.1 Surface Conditions

The site covers four allotments – Lot 1 on RP724410, Lot 2 on RP731078, Lot 113 and Lot 114 on PTD2094. All allotments are located on the uphill side of Murphy Street with Lot 1 bounded to Island Point Road on the north west. The site occupies an area with length of approximately 140 m along Murphy Street and width varying from about 26m in Lot 1 to about 70 m in Lot 113 and Lot 114. Access to the site was gained from a concrete driveway off Island Point Road and steps from the top of Lot 113. At the time of the fieldwork no vehicular access was available to Lot 2, Lot 113 and Lot 114.

Lot 1 was occupied by a two level restaurant/apartment building with a swimming pool and access driveways. The building steps down the slope towards Murphy Street. A concrete block wall about 2.4 m high forms the north east boundary.

Lot 2, Lot 113 and Lot 114 were essentially natural hill slope covered by vegetation consisting of small to large trees and some low-level shrubs in parts. A small shed was located in the lower area of Lot 2 and a steel sheeting fence runs along the north east boundary. Some down hill movement of the fence was apparent, which may have been caused by filling behind the fence. A platform with small run down building was located near the top of Lot 113. This part of the site slopes at approximately 10° to 25° to the south west. Some stockpiles of dead trees were located on the lower areas of Lot 113 and Lot 114. An abandoned well was located in the north east corner of Lot 114.

A cut batter ranging in height from 2 m to 5 m and sloping at about 50 ° to horizontal runs along Murphy Street below the site. The distance from the site boundary to the crest of the batter is about 10 m to 15 m. The batter is essentially covered by small trees and other vegetation.

A cut batter up to about 7 m high is present at the rear of the building on the top of Lot 113. A large platform with a concrete water tank about 25 m in diameter and 5 m in height is located above this batter.

No signs of large scale instability were apparent during the walkover survey although localised instability in the form of soil slumps was observed on the cut batter along Murphy Street and the fence movement was observed along the north east boundary in Lot 2.

3.2 Subsurface Conditions

Subsurface conditions encountered in the boreholes BH1 and BH3 to BH5 generally consisted of a layer sandy silt/clayey silt/silty clay/sandy clay to depths ranging from about 0.8 m to 2.2 m overlying extremely weathered rock to depths up to 4.5 m, the maximum depth investigated.

Subsurface conditions encountered in the boreholes BH2 and BH6 generally consisted of a layer of uncontrolled sandy silt fill, over sandy clayey silt/sandy silt to depths ranging from about 1.3 m to 1.8 m over extremely weathered rock to depths up to 4.5 m, the maximum depth investigated.

The extremely weathered rock breaks down to soil similar to the overlying residual soils in terms of particle size and colours. Thin layers of stronger rock (eg. chert) were encountered below a depth of 2 m in most of the boreholes drilled. Previous drilling information (BH1, Hollingsworth Report, dated 8 May 1989) indicated that similar weathered rock extends to a depth of about 11.5 m.

At the time of the current fieldwork, no groundwater was observed in the boreholes to the depths investigated.

4.0 STABILITY ANALYSIS

Stability analyses were carried out for Section A-A' as shown in Figure 1. Based on judgement and previous experience with similar materials, the following strength parameters were adopted for the stability analyses:

Material Type	Strength Parameters	
Residual Soils	c' = 3 kPa	ϕ' = 30°
Extremely Weathered Sandstone Rock	c' = 20 kPa	ϕ' = 30°

Analyses were initially performed for what were considered to be dry or "normal" conditions. Analyses were then performed for what were considered to be wet or "extreme" conditions. A pore water pressure co-efficient (R_u=0.1 - 0.2) was used to simulate seepage/water infiltration for "extreme" conditions.

The analyses were carried out using Bishop's simplified method for a potential circular failure using the proprietary computer software SLOPE/W. The results of the stability analyses are presented in Appendix C and summarised as follows:

Section A-A	Calculated Minimum Factor of Safety (FOS)	
	Dry Conditions	Wet Conditions
Without Ground Support	1.15	0.97
With Ground Support (eg. soil nails)	1.51	1.36

5.0 ENGINEERING COMMENTS

5.1 Proposed Development

It is understood that the proposed buildings will be a two to three level structures, stepping down the slope. Excavations ranging to 7 m deep are proposed for basement carparking for the upper level buildings and their associated driveways. No substantial filling is proposed in the building areas. Excavations are proposed to be supported by retaining walls and/or soil nails/rock dowels. Engineering comments regarding stability, cut and fill earthworks, retaining/support structures, footings and excavation conditions are presented in the following sections.

5.2 Stability

For the purposes of assessing stability we provide the following guidelines which are appropriate to the conditions at this site:

- A calculated factor of Safety (FOS) > 1.5 indicates the slope is likely to be stable;
- A calculated FOS from 1.1 – 1.5 indicates a marginally stable slope;
- A calculated FOS < 1.1 indicates the slope is likely to be unstable.

For this site we consider that marginal stability is acceptable for the "extreme" conditions modelled, and that stability should be achieved for the "normal" conditions modelled. The results of the stability analyses indicate that the proposed excavations without ground support is only marginally stable under "normal" conditions and not stable under "extreme" conditions. Hence, ground support will be required for the proposed basement excavations on the top of Lot 2, Lot 113 and Lot 114.

The proposed development will remove most of surface soils within building and driveway areas and hence remove the potential for instability in these soils.

It is considered that with the adoption of sound engineering practices relevant to hillside construction (ie. those to be addressed in the following sections), the overall slope following the proposed development should be stable. As is the case for all hillslope developments in the Port Douglas area, some minor instability should be expected. This instability is expected to be in the form of relatively minor slips and slumps on locally steep slopes or unsupported batters during prolonged periods of heavy rainfall, such as that which has previously occurred along the cut batter above Murphy Street.

5.3 Drainage

The stability of the site is highly dependent on the provision and maintenance of adequate drainage. Suggested drainage measures that should be implemented include:

- provision of concrete lined cut-off drains to intercept run-off on the uphill side of retaining walls/and unsupported batters greater than 1.5 m high.

- provision of subsurface drainage behind retaining walls.

In addition to the above all stormwater should be collected and discharged from the site via pipes or lined drains rather than be allowed to flow onto the ground. Side entry pits should be spaced at appropriate distances such that run-off along the access roads does not overflow from the roads.

5.4 Cut and Fill Earthworks

It is recommended that cut and fill earthworks on this site carried out under the technical supervision of Golder Associates. Areas of unsupported cuts and fills should be minimised. The height of permanently unsupported cut batters should be limited to about 1.5 m at 1V:1H or 3 m at 1V:1.5H, or 6 m at 1V:2H. Filling should be limited to about 1.5 m in thickness and be supported within and near the building areas and be limited to about 2 m at 1V:2H beyond the building areas. Where filling is proposed site preparation and earthworks procedures should comprise the following: -

(i) Strip and remove topsoil material, previously placed uncontrolled fill and soil containing significant amounts of organic materials;

(ii) Compact subgrade areas with a heavy roller to reveal soft or loose zones;

(iii) Soft materials that can not be improved by compaction should be removed and replaced with engineered fill;

(iv) Place fill in uniform horizontal layers not exceeding 200 mm loose thickness and compact to achieve a density ratio of at least 98% using Standard Compaction. Each layer should be keyed into natural ground

Compaction levels should be checked by field density testing during filling in accordance with AS3798-1996 – Guidelines on Earthworks for Commercial and Residential Development.

5.5 Retaining Structures

Retaining walls where they form part of the house or swimming pools can be designed using an earth pressure coefficient of 0.6, plus any surcharge loads imposed on the wall. Other stand alone retaining walls where they form a boundary or for landscape purposes can be designed using an earth pressure coefficient of 0.4, plus any surcharge load imposed on the walls. Footings for retaining walls should be founded at least 1.0 m into extremely weathered or less weathered rock. Footings for retaining walls founded at least 1.0 m into extremely weathered rock can be designed using allowable bearing pressures up to 300 kPa.

5.6 Footings

It is understood that most of the buildings will be supported on concrete piers or strip/pad footings. Strip/pad footings should be founded at least 0.5 m into extremely weathered or less weathered weathered rock and can be designed using allowable bearing pressures of up to 300kPa. Bored pier footings extended at least three times their diameter into weathered rock can be designed using an allowable end bearing pressure of 500kPa and an allowable side adhesion of up to 40kPa, neglecting the contribution of the upper 1.0 m of the shaft.

It is recommended that footing excavations be inspected by Golder Associates to confirm that founding conditions are consistent with those on which the design guidelines are based.

5.7 Excavation Conditions

Results of the investigation indicate that within the proposed excavation depths of up to 7.5 m, the materials are expected to be essentially very low strength extremely weathered rock with localised layers or zones of stronger rock. Based on our experience on similar projects in this area, it is considered that most of the proposed excavations at the site should be able to be achieved using large excavators (say 30 tonne). Heavy equipment, such as dozers with single tyne rippers or excavators with heavy impact breakers may be required if stronger zones of rock are encountered.

5.8 Ground Support Options

Given the depths of excavation proposed and the proximity of buildings and a water storage reservoir above the proposed excavations ground support will be required during construction. The following options are proposed.

- Soil Nail Option – This option will involve staged excavations and installation of soil nails. Conceptual sketches of this option are presented in Figure 2. This option is considered to be suitable providing permission to install soil nails into the adjacent property can be obtained (as is expected to be the case).

- Soldier Pile Option – If installation of soil nails is not possible, soldier piles can be installed to support excavations. Conceptual sketches are presented in Figure 3.

6.0 IMPORTANT INFORMATION

Your attention is drawn to the document - "Important Information About Your Geotechnical Engineering Report", which is included in Appendix D of this report. This document has been prepared by the ASFE *(Professional Firms Practicing in the Geosciences)*, of which Golder Associates is a member. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimise the risks associated with the groundworks for this project. The document is not intended to reduce the level of responsibility accepted by Golder Associates, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

We would be pleased to answer any questions about this important information from the reader of this report.

GOLDER ASSOCIATES PTY LTD

Kejing Chen
Senior Engineer

Malcolm Cook
North Queensland Manager

KC/MSC/klm
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APPENDIX A

RESULTS OF FIELDWORK

REPORT OF BOREHOLE: BH1

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill
LOGGED: KC DATE: 12/3/01
CHECKED: DKS DATE: 10/5/01

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP TEST (AS1289.6.3.2) Blows per 100 mm
HA	L	Groundwater Not Encountered	0.0	0.00				ML	Sandy SILT Low plasticity, dark grey	W		
				0.40								
			0.5	-0.40				ML	Sandy SILT Low plasticity, dark brown	M	F-St	
			1.0									
			1.5	1.50 -1.50	DS 1.40 - 1.50 m				Extremely Weathered SANDSTONE Fine to coarse grained, yellow/grey/orange, very low strength, (Remoulds to Silty Clayey SAND)			
	M		2.0									
			2.5		DS 2.60 - 2.70 m							No DCP Test (1.9m-3.1m)
			3.0									
			3.5	3.50 -3.50					Colour becomes grey/green			
	H		4.0		DS 4.20 - 4.30 m							No DCP Test (3.4m-4.3m)
			4.5	4.50 -4.50					BOREHOLE DISCONTINUED @ 4.5m			Refusal
			5.0									

DCP TEST (AS1289.6.3.2) Blows per 100 mm: 0 5 10 15 20 25

GAP3 GLB FULL PAGE S:\DATA\2GEO\01\01672012\2012BH.GPJ GAP3.GDT 10/05/2001 1:29:34 PM

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

REPORT OF BOREHOLE: BH2

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill
LOGGED: KC DATE: 12/3/01
CHECKED: DCS DATE: 10/5/01

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP TEST (AS1289.6.3.2) Blows per 100 mm
HA	L	Groundwater Not Encountered	0.0	0.00				ML	TOPSOIL:- Sandy SILT Low plasticity, dark brown	W	F	
				0.30								
				-0.30				ML	FILL:- Sandy SILT Low plasticity, red brown		St	
			0.5									
					DS 0.80 - 1.00 m							
			1.0									
				1.30								
				-1.30				ML	Sandy Clayey SILT Low plasticity, brown	M	VSt	
			1.5									
	M		2.0		DS 2.00 - 2.20 m							No DCP Test (1.9m-2.1m)
				2.50								
			2.5	-2.50					Extremely weathered SANDSTONE Medium to coarse grained, red brown mottled grey, very low strength, (Remoulds to Silty SAND)			
			3.0									
												No DCP Test (2.6m-4.1m)
			3.5									
	H				DS 3.80 - 4.00 m							
			4.0									
				4.50								
			4.5	-4.50					BOREHOLE DISCONTINUED @ 4.5m			
			5.0									

REPORT OF BOREHOLE: BH3

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill
LOGGED: KC DATE: 12/03/01
CHECKED: PLS DATE: 10/5/01

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY
HA	L	Groundwater Not Encountered	0.0	0.00				ML	TOPSOIL:- Sandy SILT Low plasticity, dark brown	W	F
				0.20 -0.20				ML	Sandy SILT Low plasticity, brown	M	F-St
			0.5	0.90							
	M		1.0	-0.90					Extremely Weathered SANDSTONE Fine to coarse grained, orange brown mottled, light grey, very low strength, (Remoulds to Silty SAND)		
			1.5		DS 1.40 - 1.60 m						
			2.0	2.00 -2.00					- Piece of Chert encountered @ 2.0m, became light grey		
			2.5								
			3.0								
	H		3.5								
			4.0		DS 4.10 - 4.20 m						
				4.40							
			4.5	-4.40					BOREHOLE DISCONTINUED @ 4.4m		
			5.0								

DCP TEST (AS1289.6.3.2)
Blows per 100 mm
0 5 10 15 20 25

No DCP Test (1.9m-4.0m)

30
40
Refusal

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP Form No. 9
RL 2

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REPORT OF BOREHOLE: BH4

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill
LOGGED: KC DATE: 12/3/01
CHECKED: PLS DATE: 10/5/01

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP TEST (AS1289.6.3.2) Blows per 100 mm
HA	L	Groundwater Not Encountered	0.0	0.00				CL	TOPSOIL:- Sandy Silty CLAY Low plasticity, dark grey	M	F	0 5 10 15 20 25
				0.30								
				-0.30				CL	Sandy Silty CLAY Low plasticity, dark brown			
			0.5									
				0.80								
				-0.80					Extremely Weathered SANDSTONE Fine to coarse grained, orange brown, very low strength (Remoulds to Silty SAND)			
			1.0									
			1.5		DS 1.50 - 1.70 m							
			2.0									No DCP Test (1.9m-2.8m)
	M-H		2.5									
					DS 2.90 - 3.00 m							30
			3.0									
			3.5									No DCP Test (2.9m-4.0m)
			4.0									
				4.40								Refusal
				-4.40					BOREHOLE DISCONTINUED @ 4.4m			
			4.5									
			5.0									

REPORT OF BOREHOLE: BH5

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill
LOGGED: KC DATE: 12/3/01
CHECKED: PKS DATE: 10/5/01

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP TEST (AS1289.6.3.2) Blows per 100 mm
HA	L	Groundwater Not Encountered	0.0	0.00				CL	TOPSOIL:- Silty CLAY Low plasticity, dark grey	W		
				0.30								
				-0.30				CL	Sandy Silty CLAY Low plasticity, dark brown		F	
			0.5									
			1.0									
				1.10								
				-1.10				SC	Clayey SAND Fine to coarse grained, brown	M		
			1.5								L	
			2.0									
				2.20	DS 2.10 - 2.20 m							
				-2.20					Extremely Weathered SANDSTONE Medium to coarse grained, orange brown/red brown, very low strength (Remoulds to Silty SAND)			
			2.5									
				2.60								
				-2.60					- Becoming Grey @ 2.6m			
	M		3.0									
			3.5		DS 3.50 - 3.60 m							No DCP Test (2.9m-4.3m)
				4.00								
			4.0	-4.00					Becoming yellow brown @ 4.0m			
	H											26
				4.50								30
			4.5	-4.50					BOREHOLE DISCONTINUED @ 4.5m			Refusal
			5.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP Form No. 9
RL 2

REPORT OF BOREHOLE: BH6

CLIENT: Property Resolutions Pty Ltd
PROJECT: "The Vue" Development
LOCATION: Port Douglas
JOB NO: 01672012

LOCATION: Refer to Site Plan
SURFACE RL: 0 m DATUM: AHD
INCLINATION: -90°

SHEET: 1 OF 1
DRILL RIG: Hand Drill 12/3/01
LOGGED: KC DATE:
CHECKED: PKS DATE: 10/5/01

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	DCP TEST (AS1289.6.3.2) Blows per 100 mm
HA	L	Groundwater Not Encountered	0.0	0.00				ML	TOPSOIL:- Sandy SILT Low plasticity, dark brown, with some roots	M	H	No DCP Test (0.0m-0.3m)
				0.30								
				-0.30				ML	FILL:- Sandy SILT Low plasticity, dark brown/red brown, trace of gravel		F	
			0.5		DS 0.80 - 0.90 m							
	M		1.0								St	
			1.5									
				1.80								
				-1.80				ML	Sandy SILT Low plasticity, dark brown			
			2.0									
				2.30								
	H			-2.30	DS 2.30 - 2.40 m				Extremely Weathered SANDSTONE Fine to coarse grained, red brown, very low strength (Remoulds to Clayey SAND)			
			2.5									
			3.0									
			3.5		DS 3.50 - 3.60 m							26
				3.60								Refusal
				-3.60					BOREHOLE DISCONTINUED @ 3.6m			
			4.0									
			4.5									
			5.0									

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS

DRILLING/EXCAVATION METHOD

AS	Auger Screwing	RD	Rotary blade or drag bit	HQ	Diamond Core - 63 mm
AV	Auger V-Bit	RT	Rotary Tricone bit	NMLC	Diamond Core - 52 mm
ATC	Auger TC-Bit	RAB	Rotary Air Blast	NQ	Diamond Core - 47 mm
HA	Hand Auger	RC	Reverse Circulation	BH	Tractor mounted backhoe
WB	Washbore or Bailer	PT	Push Tube	EX	Tracked hydraulic excavator
JET	Jetting	CT	Cable Tool Rig	EE	Existing Excavation

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration possible with little effort from the equipment used.

M **Medium resistance.** Excavation/possible at an acceptable rate with moderate effort from the equipment used.

H **High resistance** to penetration/excavation. Further penetration is possible at a slow rate and requires significant effort from the equipment.

R **Refusal or Practical Refusal.** No further progress possible without the risk of damage or unacceptable wear to the digging implement or machine.

These assessments are subjective and are dependent on many factors including the equipment power, weight, condition of excavation or drilling tools, and the experience of the operator.

WATER

▽	Water level at date shown	◁	Partial water loss
▷	Water inflow	◀	Complete water loss

GROUNDWATER NOT OBSERVED	The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.
GROUNDWATER NOT ENCOUNTERED	The borehole/test pit was dry soon after excavation, however groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-1993
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm seating
30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
DS	Disturbed sample
FP	Field permeability test over section noted
FV	Field vane shear test expressed as shear strength s_v
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket penetrometer test (expressed as instrument reading in kPa)
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres

Ranking of Visually Observable Contamination and Odour (for specific soil contamination assessment projects)

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery

$$= \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100\%$$

SCR = Solid Core Recovery

$$\frac{\sum \text{Length of cylindrical core recovered}}{\text{Length of core run}} \times 100$$

RQD = Rock Quality Designation

$$= \frac{\sum \text{Axial lengths of core} > 100\text{mm long}}{\text{Length of core run}} \times 100$$

ROCK STRENGTH TEST RESULTS

▼ Point Load Strength Index (Is_{50}) (Axial test - MPa)

◂ Point Load Strength Index (Is_{50}) (Diametral test - MPa)

● Uniaxial Compressive Strength (UCS) test result (MPa)

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METHOD OF SOIL DESCRIPTION
USED ON BOREHOLE AND TEST PIT REPORTS

GRAPHIC LOG - TYPICAL SYMBOLS FOR SOILS

Modified from BS5930 - 1981


FILL


GRAVEL (GP OR GW)


SAND (SP or SW)


SILT (ML or MH)


CLAY (CL or CI)


CLAY (CH)


Organic Soils (OL or OH or Pt)


COBBLES or BOULDERS

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay.

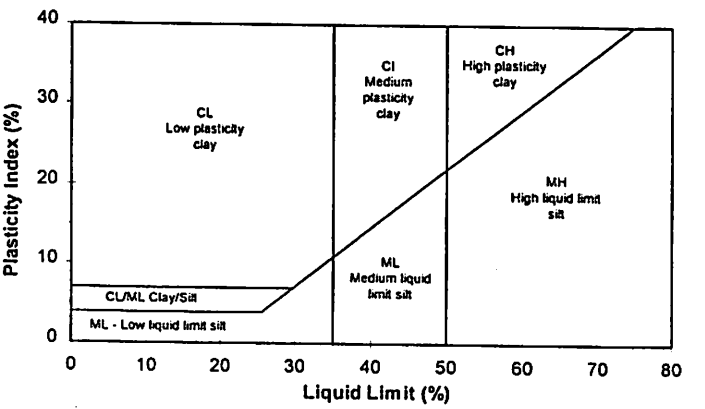
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726 - 1993, Appendix A. The material properties are assessed in the field by visual/tactile methods.

Particle Size

Major Division	Sub Division	Particle Size
BOULDERS		> 200 mm
COBBLES		60 to 200 mm
GRAVEL	Coarse	20 to 60 mm
	Medium	6.0 to 20 mm
	Fine	2.0 to 6.0 mm
SAND	Coarse	0.6 to 2.0 mm
	Medium	0.2 to 0.6 mm
	Fine	0.075 to 0.2 mm
SILT		0.002 to 0.075m
CLAY		< 0.002 mm

Plasticity Properties



MOISTURE CONDITION

AS1726 - 1993

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

CONSISTENCY AND DENSITY

AS1726 - 1993

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0 to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	above 200 kPa

Symbol	Term	Density Index %	SPT "N" *
VL	Very Loose	Less than 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Dense	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	above 85	Above 50

SPT correlations may be subject to corrections for overburden pressure and equipment type.

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.

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APPENDIX B

RESULTS OF LABORATORY TESTING

Particle Size Distribution & Consistency Limits Test Report

Client:	PROPERTY RESOLUTIONS PTY LTD	**Job No.**	01672012
Project:	PROPOSED DEVELOPMENT - "THE VUE"	**Date:**	13-Mar-2001
Location:	10-14 MURPHY ST & 2 ISLAND PT RD, PORT DOUGLAS	**Report No.**	NQ-01077

Lab Reference No.	**Sample Identification:**	**Sampling Method:**
01/144	BH1 2.6 - 2.7m	As Supplied To Laboratory

Laboratory Specimen Description: SC-SM Silty Clayey SAND, Fine to coarse grained, yellow brown

Particle Size Distribution AS1289.3.6.1

Sieve Size	% Passing	Specification
150 mm		
75 mm		
53mm		
37.5 mm		
26.5 mm		
19.0 mm		
13.2 mm		
9.5 mm		
6.7 mm		
4.75 mm		
2.36 mm		
1.18 mm		
600 um		
425 um		
300 um		
150 um		
75 um		

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	25	
Plastic Limit	%	AS1289 3.2.1	20	
Plasticity Index		AS1289 3.3.1	5	
Linear Shrinkage	%	AS1289 3.4.1	ND	
Moisture Content	%	AS1289 2.1.1	12.8	

Sample History: Air dried

Preparation Method: Dry sieved

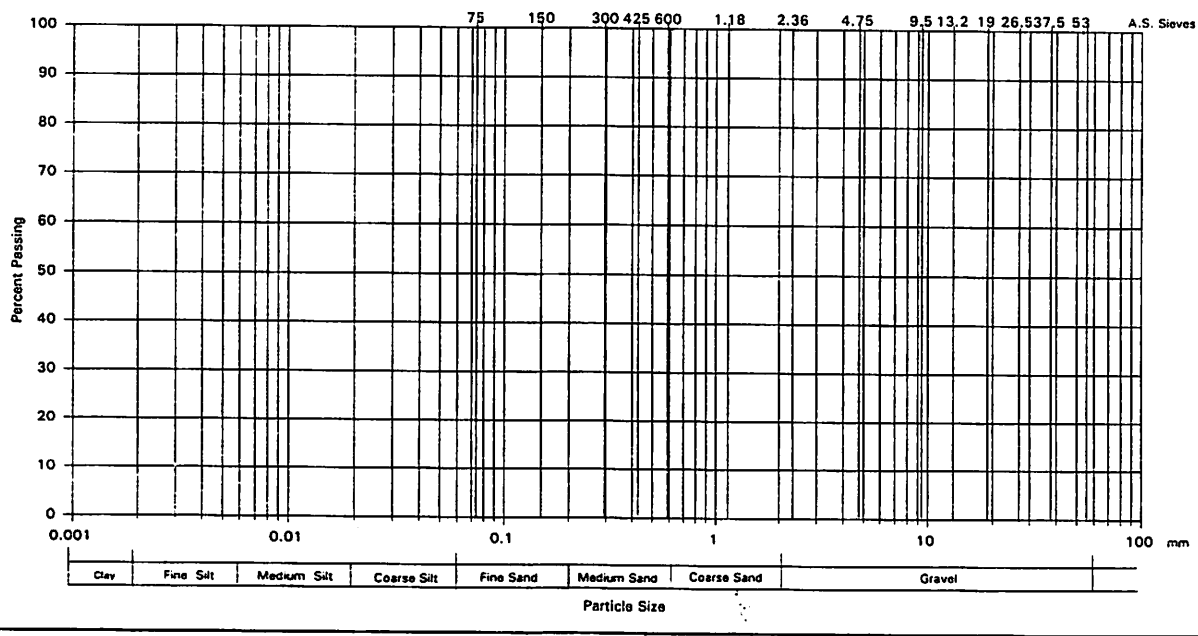
Notes

Percentage <0.075um = 42%

ND = not determined

NO = not obtainable

Particle Size Distribution



North Queensland Laboratory - Accreditation No. 3732 LABFORM23-03/00 S:\DATA\2GEO01\01672012\2012_077.WB1

15/3/01

Approved Signatory Date

Golder Associates Pty Ltd

Particle Size Distribution & Consistency Limits Test Report

Client:	PROPERTY RESOLUTIONS PTY LTD	**Job No.**	01672012
Project:	PROPOSED DEVELOPMENT - "THE VUE"	**Date:**	13-Mar-2001
Location:	10-14 MURPHY ST & 2 ISLAND PT RD, PORT DOUGLAS	**Report No.**	NQ-01078

Lab Reference No.	**Sample Identification:**	**Sampling Method:**
01/145	BH3 4.1 - 4.2m	As Supplied To Laboratory

Laboratory Specimen Description: SM Silty SAND, Fine to coarse grained, dark brown mottled orange brown

Particle Size Distribution AS1289.3.6.1

Sieve Size	% Passing	Specification
150 mm		
75 mm		
53mm		
37.5 mm		
26.5 mm		
19.0 mm		
13.2 mm		
9.5 mm		
6.7 mm		
4.75 mm		
2.36 mm		
1.18 mm		
600 um		
425 um		
300 um		
150 um		
75 um		

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	36	
Plastic Limit	%	AS1289 3.2.1	25	
Plasticity Index		AS1289 3.3.1	11	
Linear Shrinkage	%	AS1289 3.4.1	ND	
Moisture Content	%	AS1289 2.1.1	22.4	

Sample History: Air dried

Preparation Method: Dry sieved

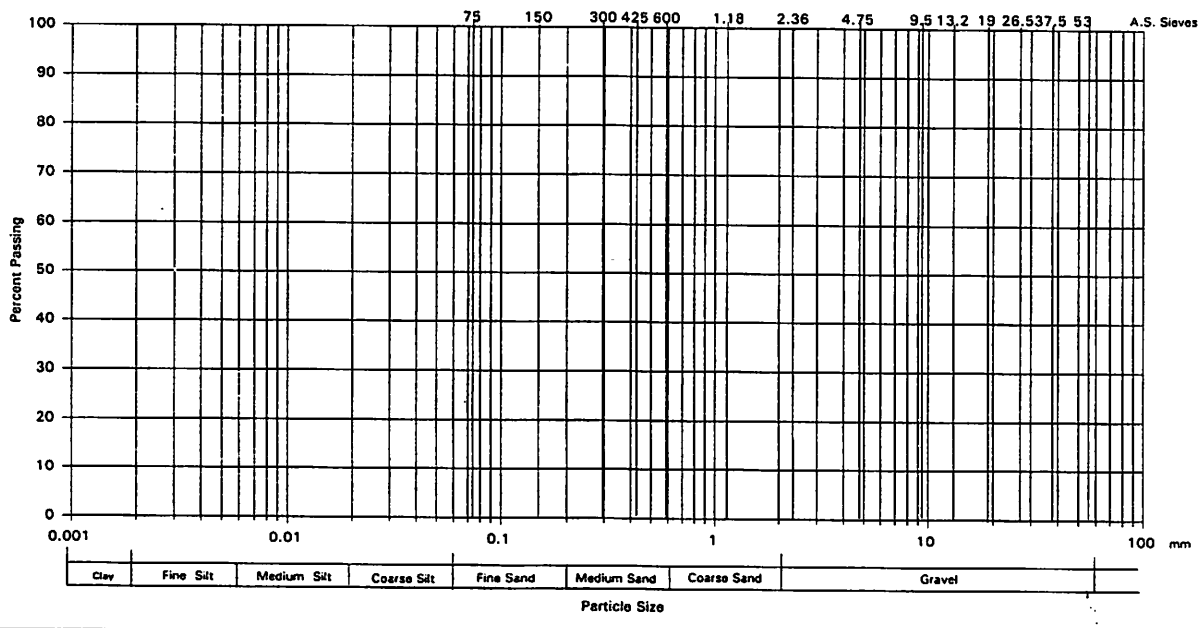
Notes

Percentage <0.075um = 45%

ND = not determined

NO = not obtainable

Particle Size Distribution



North Queensland Laboratory - Accreditation No. 3732 LABFORM23-03/00 S:\DATA\2GEO01\01672012\2012_078.WB1

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Approved Signatory 15/3/01 Date

Golder Associates Pty Ltd

Particle Size Distribution & Consistency Limits Test Report

Client:	PROPERTY RESOLUTIONS PTY LTD	**Job No.**	01672012
Project:	PROPOSED DEVELOPMENT - "THE VUE"	**Date:**	13-Mar-2001
Location:	10-14 MURPHY ST & 2 ISLAND PT RD, PORT DOUGLAS	**Report No.**	NQ-01079

Lab Reference No.	**Sample Identification:**	**Sampling Method:**
01/146	BH5 2.1 - 2.2m	As Supplied To Laboratory

Laboratory Specimen Description: SC Clayey SAND, Fine to coarse grained, orange brown mottled brown

Particle Size Distribution AS1289.3.6.1

Sieve Size	% Passing	Specification
150 mm		
75 mm		
53mm		
37.5 mm		
26.5 mm		
19.0 mm		
13.2 mm		
9.5 mm		
6.7 mm		
4.75 mm		
2.36 mm		
1.18 mm		
600 um		
425 um		
300 um		
150 um		
75 um		

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	28	
Plastic Limit	%	AS1289 3.2.1	18	
Plasticity Index		AS1289 3.3.1	10	
Linear Shrinkage	%	AS1289 3.4.1	ND	
Moisture Content	%	AS1289 2.1.1	15.0	

Sample History: Air dried

Preparation Method: Dry sieved

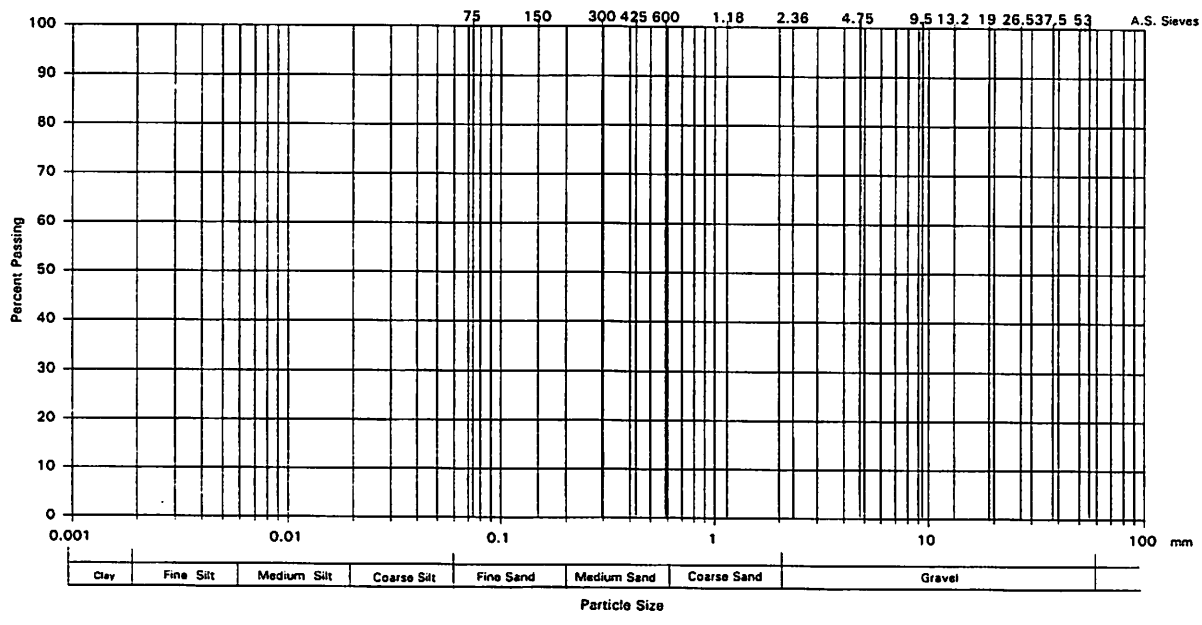
Notes

Percentage <0.075um = 44%

ND = not determined

NO = not obtainable

Particle Size Distribution



Approved Signatory 15/3/01 Date

Golder Associates Pty Ltd

Particle Size Distribution & Consistency Limits Test Report

Client:	PROPERTY RESOLUTIONS PTY LTD	**Job No.**	01672012
Project:	PROPOSED DEVELOPMENT - "THE VUE"	**Date:**	13-Mar-2001
Location:	10-14 MURPHY ST & 2 ISLAND PT RD, PORT DOUGLAS	**Report No.**	NQ-01080

Lab Reference No.	**Sample Identification:**	**Sampling Method:**
01/147	BH6 2.3 - 2.4m	As Supplied To Laboratory

Laboratory Specimen Description: SC Clayey SAND, Fine to coarse grained, red brown, with trace fine gravel

Particle Size Distribution AS1289.3.6.1

Sieve Size	% Passing	Specification
150 mm		
75 mm		
53mm		
37.5 mm		
26.5 mm		
19.0 mm		
13.2 mm		
9.5 mm		
6.7 mm		
4.75 mm		
2.36 mm		
1.18 mm		
600 um		
425 um		
300 um		
150 um		
75 um		

Consistency Limits and Moisture Content

Test		Method	Result	Spec.
Liquid Limit	%	AS1289 3.1.2	26	
Plastic Limit	%	AS1289 3.2.1	18	
Plasticity Index		AS1289 3.3.1	8	
Linear Shrinkage	%	AS1289 3.4.1	ND	
Moisture Content	%	AS1289 2.1.1	14.0	

Sample History: Air dried

Preparation Method: Dry sieved

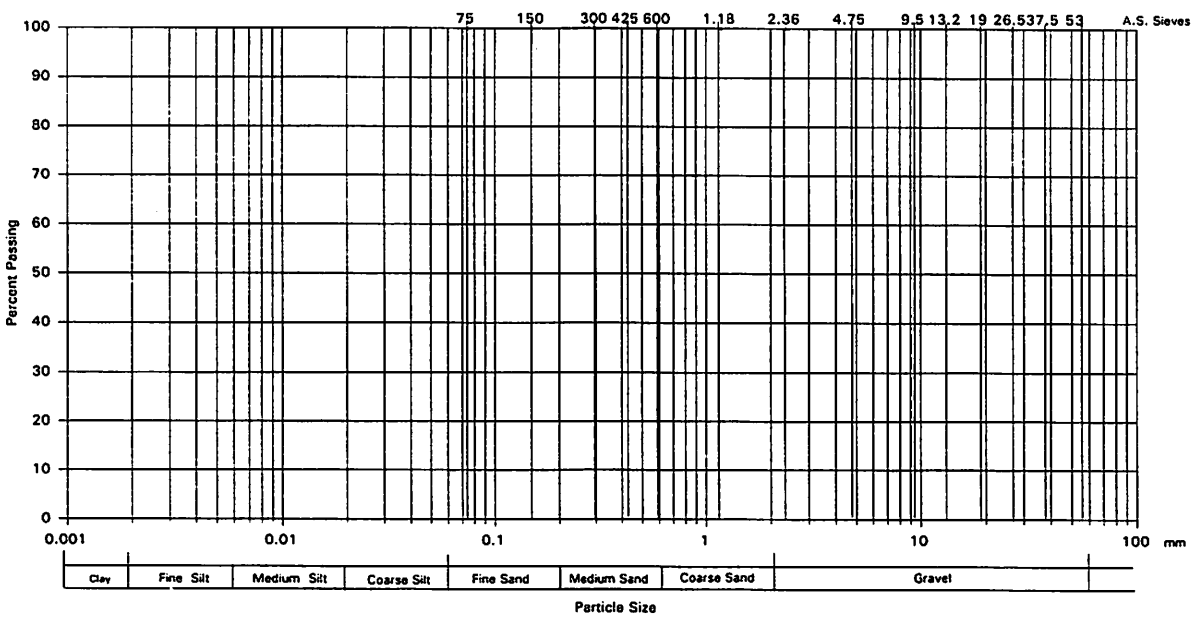
Notes

Percentage <0.075um = 44%

ND = not determined

NO = not obtainable

Particle Size Distribution



North Queensland Laboratory - Accreditation No. 3732 LABFORM23-03/00 S:\DATA\2GEO01\01672012\2012_080.WB1

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15/3/01

Approved Signatory Date

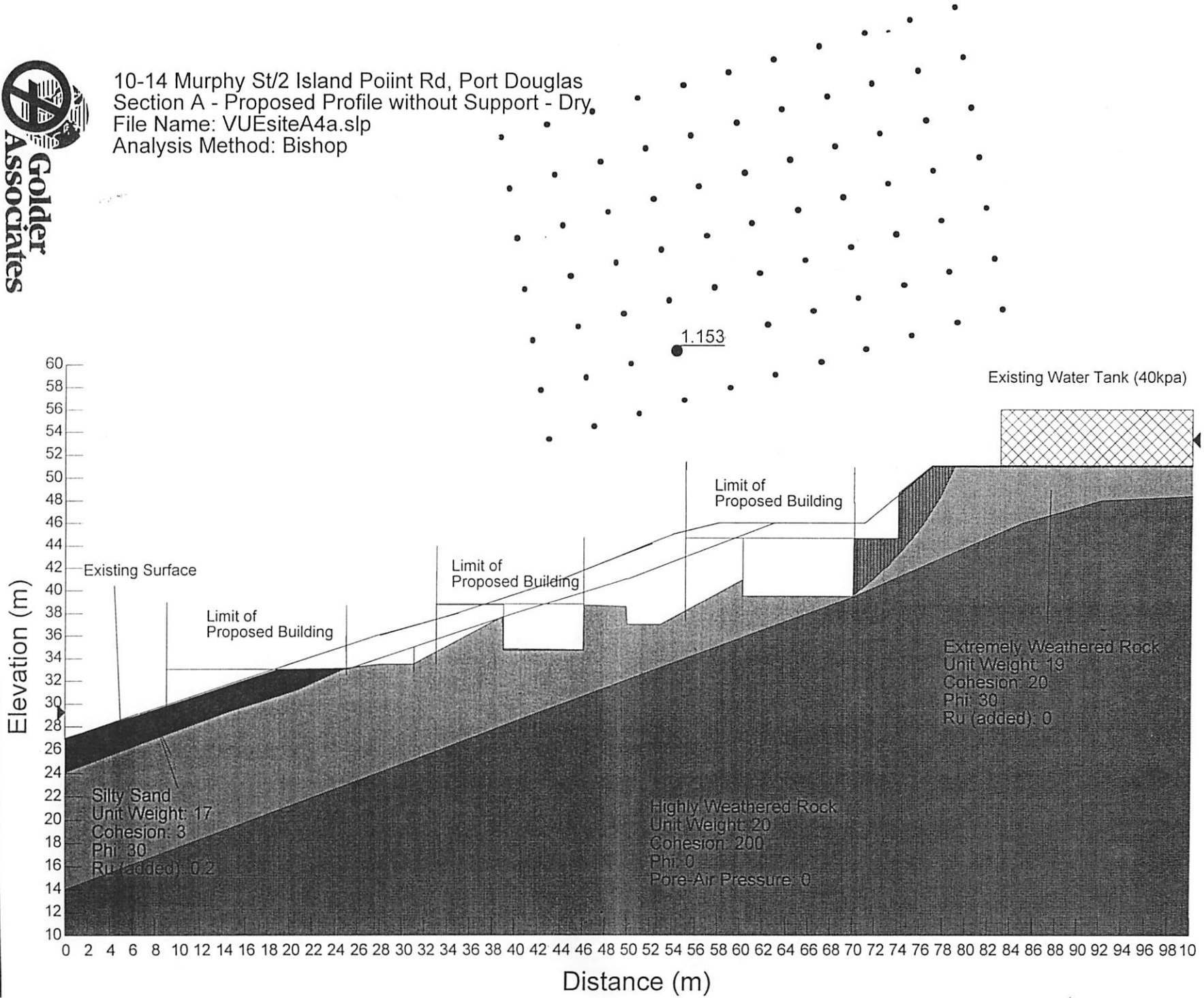
Golder Associates Pty Ltd

APPENDIX C

RESULTS OF STABILITY ANALYSIS

Golder Associates

10-14 Murphy St/2 Island Poiint Rd, Port Douglas
Section A - Proposed Profile without Support - Dry
File Name: VUEsiteA4a.slp
Analysis Method: Bishop



Project No.:	01672012	Computed In:	SLOPE/W Ver 4
Computed By:	KC	Checked By:	
Date:	09.05.01	Date:	10/5/01

RESULTS OF STABILITY ANALYSIS

GEOTECHNICAL INVESTIGATION - "THE VUE" DEVELOPMENT

CNR OF MURPHY ST & ISLAND POINT ROAD, PORT DOUGLAS

Project No.:	01672012	Computed In:	SLOPE/W Ver 4
Computed By:	KC	Checked By:	HCS
Date:	09.05.01	Date:	10/5/01

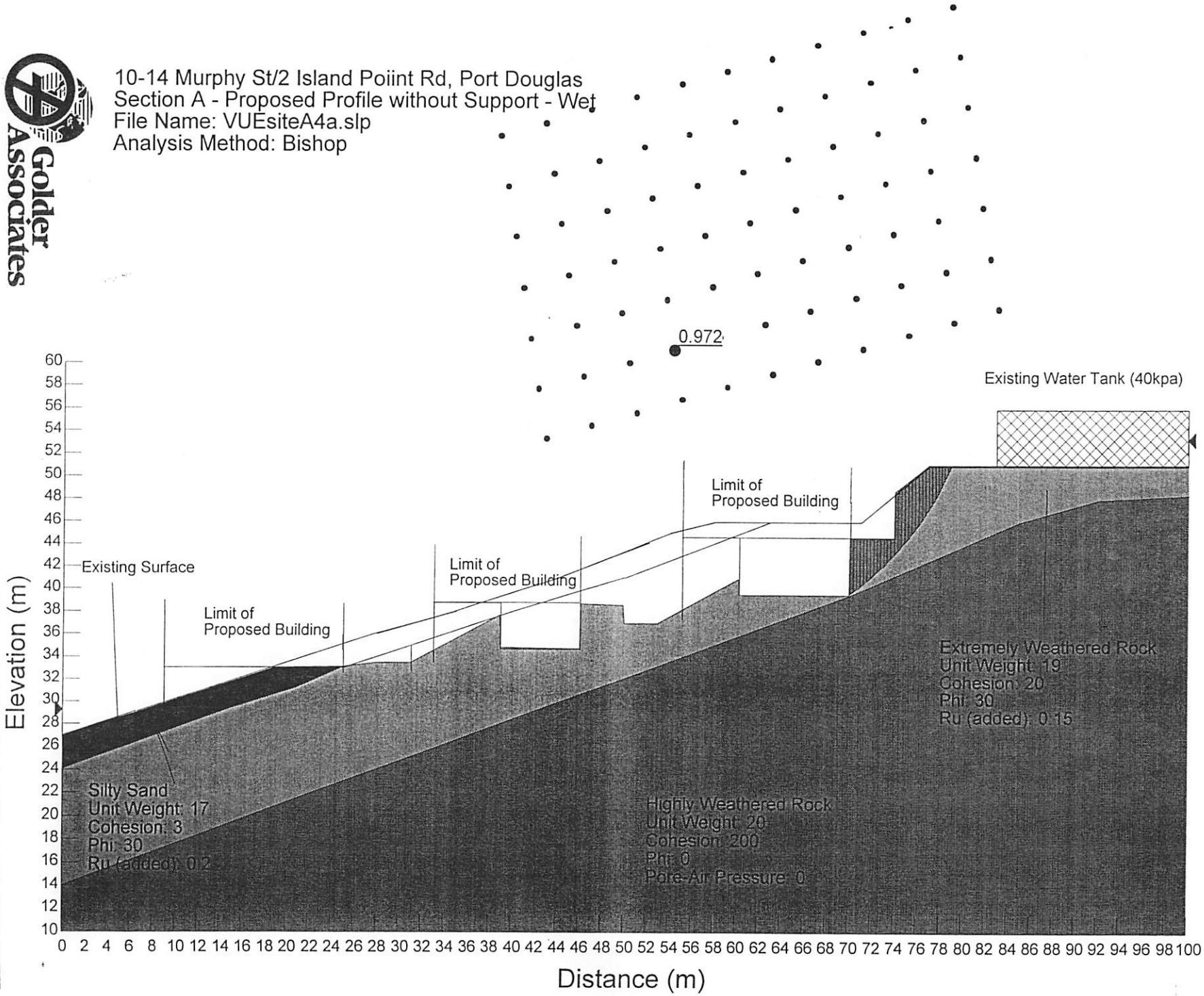
RESULTS OF STABILITY ANALYSIS

GEOTECHNICAL INVESTIGATION - "THE VUE" DEVELOPMENT

CNR OF MURPHY ST & ISLAND POINT ROAD, PORT DOUGLAS

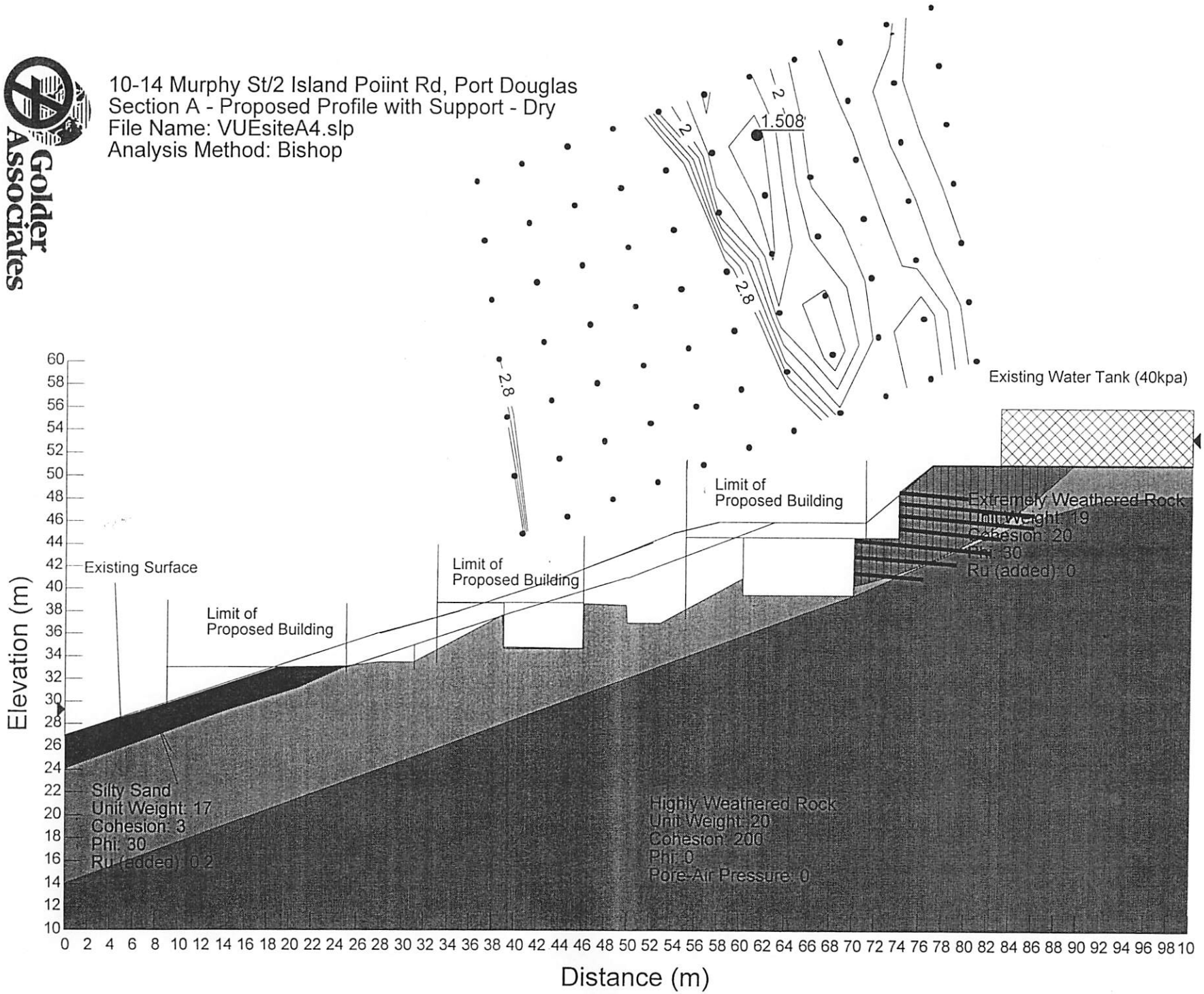
Golder Associates

10-14 Murphy St/2 Island Poiint Rd, Port Douglas
Section A - Proposed Profile without Support - Wet
File Name: VUEsiteA4a.slp
Analysis Method: Bishop



Golder Associates

10-14 Murphy St/2 Island Poiint Rd, Port Douglas
Section A - Proposed Profile with Support - Dry
File Name: VUEsiteA4.slp
Analysis Method: Bishop



Project No.:	01672012	Computed In:	SLOPE/W Ver 4
Computed By:	KC	Checked By:	RJS
Date:	09.05.01	Date:	10/5/01

RESULTS OF STABILITY ANALYSIS

GEOTECHNICAL INVESTIGATION - "THE VUE" DEVELOPMENT

CNR OF MURPHY ST & ISLAND POINT ROAD, PORT DOUGLAS

Project No.: 0167201 2	Computed In: SLOPE/W Ver 4	RESULTS OF STABILITY ANALYSIS	
Computed By: KC	Checked By: OLG	Date: 10/5/01	GEOTECHNICAL INVESTIGATION -"THE VUE" DEVELOPMENT
Date: 09.05.01			CNR OF MURPHY ST & ISLAND POINT ROAD, PORT DOUGLAS

Golder Associates

10-14 Murphy St/2 Island Point Rd, Port Douglas
Section A - Proposed Profile with Support - Wet
File Name: VUEsiteA4.slp
Analysis Method: Bishop

Elevation (m)

Distance (m)

Existing Surface

Limit of Proposed Building

Limit of Proposed Building

Limit of Proposed Building

Existing Water Tank (40kpa)

Silty Sand
Unit Weight: 17
Cohesion: 3
Phi: 30
Ru (added): 0.2

Highly Weathered Rock
Unit Weight: 20
Cohesion: 200
Phi: 0
Pore Air Pressure: 0

Extremely Weathered Rock
Unit Weight: 19
Cohesion: 20
Phi: 30
Ru (added): 0.15

2.8
2
1.6
1.360

APPENDIX D

"IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT"

Attachment 9

Comparable Development Murphy Street

KELLY REASTON

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DEVELOPMENT & PROPERTY SERVICES