8 February 2023



Chief Executive Officer Douglas Shire Council 64-66 Front Street MOSSMAN QLD 4873

Attn: Ms. Rebecca Taranto (Assessing Officer)

Via email: <u>enquiries@douglas.qld.gov.au;</u> <u>rebecca.taranto@douglas.qld.gov.au</u>

RE: RESPONSE TO INFORMATION REQUEST A MATERIAL CHANGE OF USE (DWELLING HOUSE) 34 MURPHY STREET, PORT DOUGLAS, MORE FORMALLY DESCRIBED AS LOT 126 ON SP144708

COUNCIL REF: MCUI 2022_5127/1 (Doc ID: 1121398)

Aspire Town Planning and Project Services act on behalf of Vermillion 21 Pty Ltd (Tte) (the 'Applicant') in relation to the above described matter.

On behalf of the Applicant, please accept this correspondence as the Applicant's full response to the above referenced Request for Information pursuant to s13.2(a) of the Development Assessment Rules v1.3.

Information Request Item 1: Site Plan

Provide a site plan that shows:

- a. The location of the sewer pipe within Easement A and the setback distance (to the building eave and separately to the building footing) of the proposed Dwelling House from the sewer pipe;
- b. The proposed connection to Council's reticulated water and sewer infrastructure, and any required infrastructure to achieve sufficient water pressure; and
- c. The 6m setback distance to the all property boundaries.

PO BOX 1040, MOSSMAN QLD 4873 M. 0418826560 E. <u>admin@aspireqld.com</u> W. <u>www.aspireqld.com</u> ABN. 79 851 193 691

Applicant Response to Information Request Item I

The Proposal Plan has been amended to show the location of the existing sewer main which runs parallel to the site north-western boundary. The alignment has been derived from Council's As Constructed Plans. It is shown on the Amended Proposal Plan that the corner of the building is located 1.723m, and the roof corner is 0.48m from the edge of the easement. This allows sufficient area for maintenance access if required.

The Amended Proposal Plan indicates the location of the proposed water meter in the lower western corner of the site. The Applicant has been in discussions with Mr. Peter White of Council, and it is understood that a separate application to Council will be required for a water connection which will be constructed by the Council Water Team. Until such time as a connection is extended to the property it is not possible to understand the water pressure at the site. It is acknowledged that a private booster may be required to achieve appropriate water pressure and it is suggested that this requirement is placed as a condition of approval.

The Amended Proposal Plan illustrates the 6m setback line from all boundaries. Justification for the proposed reduced boundary setbacks is included within the original Development Application.

Refer to Attachment A: Amended Proposal Plans.

Information Request Item 2: Stormwater Drainage Plan

Provide a site-specific stormwater drainage plan that demonstrates that post development stormwater received by the site and how this is directed to a lawful point of discharge without creating an unacceptable risk internally and externally to the site. The assessment should also consider upstream catchment and flows, and the impact of the development on the adjacent slope stabilisation works on Murphy Street and the receiving stormwater pit located to the south- east of the allotment.

Where there is an impact on flows to the Adjacent Murphy Street stabilisation work, then provide a report, undertaken by a suitably qualified and experienced geotechnical Engineer (RPEQ) and must be in accordance with the AGS Guidelines, regarding these impacts.

Applicant Response to Information Request Item 2

CMG Consulting Engineers has been engaged to develop a plan to manage the capture and discharge of stormwater across the site.

Please also note that as a result of the drainage review the roof pitch has been reduced and changed to fall to the rear of the building. It is expected that this will improve the visual impact of the development and does not impact any further on the building height restrictions.

Refer to Attachment B: Stormwater Management, Retaining Wall and Vehicle Circulation Plan.

Information Request Item 3: Site Stability

The geotechnical report for this land dated 2013 prepared by Golder Associates identifies stability issues. Advise where and how the proposed structural elements of the new development address these instability issues and achieve a low or very low risk of instability in accordance with AGS guidelines. Assessment must also include the batter below the driveway in the Murphy Street reserve.

The report must be undertaken by a suitably qualified and experienced geotechnical Engineer (RPEQ) and must be in accordance with the AGS Guidelines. The Applicant must demonstrate that geotechnical risks during and post development remain in the low or very low risk categories for the site and adjacent properties.

Applicant Response to Information Request Item 3

GEO Design has been engaged to undertake a Geotechnical Assessment of the site. It is noted that the proposed development is assessed as Low Risk.

Refer to Attachment C: Geotechnical Assessment.

Information Request Item 4: Retaining Walls

Provide details for each retaining structure which is sited adjacent and parallel to the site boundaries. These details must include:

- a. The specific means of supporting or retaining to be used and where relevant a geotechnical design detail; Doc ID: 1121398 MCUC 2022_5127/1 Page 3 of 3
- b. Elevations and sections for each retaining structure; and
- c. Proposed drainage solutions.

Applicant Response to Information Request Item 4

CMG Consulting Engineers has been engaged to develop a Site Retaining Wall Plan including Site Drainage.

Refer to Attachment B: Stormwater Management, Retaining Wall and Vehicle Circulation Plan.

Information Request Item 5: Landscape Plan

Submit a Landscaping Plan and visual elevations of the landscaping external from the site. The species of plants selected for landscaping should provide screening qualities and have regard to the stability of the site and surrounding properties. Provide combined advice from a Geotechnical Engineer and Landscape Architect confirming the suitability of the proposed landscaping.

Applicant Response to Information Request Item 5

Hortulus Australia Pty Ltd has been engaged to develop a site and development specific Landscape Plan.

Please note that the Landscape Plan was prepared prior to the Geotechnical Assessment and further detailed design. Since the Landscaping Plan was originally prepared, a portion of the retaining wall (outside the first floor living area) has been moved off the boundary. The landscape drawings still show that portion of the retaining wall on the boundary, but essentially the planting concept/scheme is not affected overall.

Refer to Attachment D: Proposed Landscape Plan.

Information Request Item 6: Access Driveway

Confirm the geotechnical stability of the existing driveway access from the sealed road pavement of Murphy Street to the garage. Provide a plan that demonstrates swept path movements for vehicles exiting the garage ensuring vehicle movements are contained within the lot. The plan should also show elevations at the top of the driveway can continue to provide access to Lot 131 on PTD2094.

Applicant Response to Information Request Item 6

Refer to Attachment B: Stormwater Management, Retaining Wall and Vehicle Circulation Plan and Attachment C: Geotechnical Assessment. This plan demonstrate vehicle swept paths driving in forward motion into the site and reversing out of the site onto Murphy Street and existing Murphy Street on the wider transport network in forward gear. The design is supported under the Geotechnical Assessment.

Information Request Item 7: External Finishes

Provide a plan for external finishes and colours for all buildings and structure. Please note the Environmental Zone code seeks non-reflective finishes and colours that blend with the natural colours of the surrounding environment.

Applicant Response to Information Request Item 7

The Applicant intends to select finishes and colours that are non-reflective and that blend with the natural colours of the surrounding environment, however the Applicant is deliberating on this selection. It is submitted that this is a minor matter that could be addressed through a condition of approval which requires the Applicant to submit such details to Council for endorsement prior to the issue of a Development Permit for Building Works.

Conclusion

Thank you for your time and consideration of this Response to Information Request. We respectfully request that Council progress the assessment and decision of the Development Application.

If you have any further questions or issues please do not hesitate to contact the undersigned.

Regards,

Daniel Favier Senior Town Planner ASPIRE Town Planning and Project Services

ATTACHMENT A

Amended Proposal Plan

Prepared by Danny Vos Architect



34 MURPHY STREET, PORT DOUGLAS QLD



34 MURPHY STREET, PORT DOUGLAS QLD



















P R O P O S E D D W E L L I N G Vermilion21 Pty Ltd, ATF the McNelhaus Superannuation Fund 34 MURPHY STREET, PORT DOUGLAS QLD

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8/02/2023

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34 MURPHY STREET, PORT DOUGLAS QLD



ATTACHMENT B

Stormwater Management, Retaining Wall Plan and Vehicle Circulation Plan

Prepared by CMG Consulting Engineers





ATTACHMENT C

Geotechnical Assessment

Prepared by GEO Design



REPORT

Geotechnical Assessment

Proposed New Residence 34 Murphy Street Port Douglas QLD 4877



22098AA-D-R01-v1 Vermilion21 Pty Ltd 7 February 2023

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1.0 Introduction

GEO Design has carried out a geotechnical investigation for a proposed new residence located at 34 Murphy Street, Port Douglas. The investigation was carried out at the request of Roger McBain on behalf of Vermilion21 Pty Ltd.

Based on the provided building plans, it is understood that the proposed development comprises the construction of up to a three level residence with associated driveway, swimming pool and landscaped areas. It is further understood that the proposed building will be partly founded on prepared building platforms and partly over formed batters and the natural slope.

Given the above, the aims of the geotechnical investigation were as follows:

- Review the results of previous investigations at the site.
- Comment on temporary and permanent cut/fill batters and stabilisation options as required.
- Comment on retaining wall design and geotechnical design parameters.
- Comment on suitable footings and geotechnical design parameters.
- Comment on slope stability issues at the subject allotments and provide comments in regards to the development's adherence to the State Planning Policy 1/03-Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Landslides only).
- Provide updated stability analyses and comments on the landslide risk associated with the proposed development and any impacts on the adjacent stabilised batters along Murphy Street.
- Comment on earthworks including recommended cut and fill batters, procedures and site preparation.

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

2.0 Fieldwork

The fieldwork for the current investigation comprised the following:

- A walkover assessment, carried out by an experienced Engineering Geologist.
- Mapping of exposed batters at the site.
- Excavation of three test holes (TP01 to TP03) to depths of between about 1.1 to 2.4 m.

Fieldwork was carried out by an experienced field technician under the direction of a geotechnical engineer. The location of all testing is presented in Appendix A. The results of the fieldwork are presented in Appendix B. Site photographs are presented below in Figure 2.

2.1 Surface Conditions

The site is located at 34 Murphy Street, Port Douglas. The site is located to the north of Murphy Street and is bound to the north by a residential development, to the west by a gully and drainage path, and to the east by an undeveloped portion of the Owen Street easement. A concrete driveway extends along the southern boundary of the allotment which in turn is bound by a cut batter that extends down to Murphy Street.

The cut batter along Murphy Street is generally covered by thick vegetation in the area adjacent to the existing concrete driveway. The batter extends further to the east and increases in height with slope stability works carried out in the area to the south and southeast of the proposed residence.

The surface of the site generally slopes towards the southwest up to about 25° to 30° with locally steeper sections. A small rock wall is located in the central portion of the allotment. At the time of fieldwork, the site was generally covered by trees and various vegetation.

Some evidence of previous earthworks were observed at the site.



No signs of significant instability were noted in the walkover survey.

Figure 1: Site Location



Figure 2: Site Photographs

2.2 Subsurface Conditions

The subsurface conditions observed within the existing batters and excavated test pits (TP01 to TP03) generally comprised Firm to Stiff/Loose to Medium Dense Clay's/Sands to a depth of about 0.3 m to 0.9 m, over Very Stiff to Hard Silty CLAY to a depth of about 0.9 m to 2.3 m, over weathered greywacke rock of the Hodgkinson Formation. A layer of filling was observed between about 0.3 m to 0.9 m in TP01.

At the time of fieldwork groundwater was not observed at the site.

The subsurface conditions observed as part of the current investigation agree with the results of the previous investigation at this site.



Figure 3: Summary of TP01 to TP02 Results



Figure 4: Summary of TP03 Results

3.0 Stability

3.1 General

Based on the results of the investigation and experience with similar sites in this area of Port Douglas, it is considered the geotechnical model for this site generally comprises some minor filling and natural clayey colluvium overlying weathered rocks of the Hodgkinson Formation.

Given the above geotechnical model, together with the results of the fieldwork, stability analyses were carried out for the existing profile of the allotment. Based on the plans provided, it is understood that the proposed structures are likely to be mostly founded over the existing slope or prepared batters. Some sections of the building may be founded on prepared building platforms.

To simulate building loads on the slopes a distributed load of 20 kPa was adopted in the proposed building portions of the site.

The adopted loading is considered conservative from a stability analyses point of view but allows an evaluation of the stability of the site for planning and design approval. Further details of recommended batter slopes and heights, together with appropriate footing types are outlined in the following sections.

A summary of the results of the stability analyses carried out for the site is presented in the following section.

3.2 Stability Analysis

Stability analyses were carried out for a typical completed profile as provided in the design plans and as shown in Appendix A. The profile was based on site measurements and the plans provided. The profile excluded minor elements not considered to affect the overall stability of the site following the proposed extension works. Based on the materials observed at the site and commonly used parameters, the following effective (drained) strength parameters were adopted for the stability analyses.

Matarial Tyme	Strength Parameters		
Material Type	c'	φ'	
Firm to Stiff Silty CLAY/Fill – Loose to Medium Dense Clayey SAND	5 kPa	28°	
Very Stiff to Hard Silty CLAY	6 kPa	30°	
Weathered Rock	15 kPa	35°	

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. The "extreme" conditions considered near saturation of the materials with a pore water pressure co-efficient (R_u) of between 0.1-0.2 adopted for the material properties to simulate seepage/water infiltration.

The analyses were carried out for a potential circular failure using the proprietary software SLIDE 2. The results of the stability analyses are presented in Appendix C and summarised in the following table.

•					
Calculated Factor of Safety (FOS)					
Dry Conditions Extreme Conditions					
1.503	1.338				

Table 2: Summary of Stability Analyses Results

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 > 1.5 indicates the profile is likely to be stable.
- A calculated factor of safety from 1.0 1.5 indicates a marginally stable profile.
- A calculated factor of safety < 1.0 indicates the profile is likely to be unstable.

In general terms the factor of safety is calculated by dividing the forces resisting instability (i.e. the strength of the soil/rock or the strength of discontinuities within the soil/rock) by the forces driving instability (i.e. the weight of the soil/rock, plus groundwater/seepage, plus surcharges/loads on the slope). A calculated factor of safety of 1.0 indicates the forces are balanced, whereas a calculated factor of safety vill likely occur.

For this site we consider that a calculated factor of safety >1.3 should be achieved for the wet or "extreme" conditions modelled, and that a calculated factor of safety >1.5 should be achieved for the dry or "normal" conditions modelled.

The results of the stability analyses indicate that the FOS for stability at the site are >1.5 under the dry conditions modelled and >1.3 under the wet conditions modelled for both the local and global instability cases. As such, it is considered that the overall site should be stable if the measures outlined in the following sections are adopted.

Analyses for small scale slumping at this site is not possible and is dependent upon slight profile variations and the cover of soil materials, angle and orientation of the discontinuities and the influences of trees and water flow. It is considered that small scale slumping within unsupported batters and in the steep sections of natural slopes should be expected. It is considered that this instability should be in the form of relatively small slumps or erosion failures and occur during or following prolonged rainfall events. This type of instability is common in this area of Port Douglas.

3.3 Landslide Risk

As part of the investigation, a landslide risk assessment was carried out for the area of the proposed development in general accordance with the guidelines of the Landslide Risk Management Concepts and Guidelines published by the Australian Geomechanics Society in March 2000. Risk assessment in accordance with the New South Wales Road Traffic Authority (RTA) Guide to Slope Risk Analysis, Version 3.1, and the Queensland Department of Transport and Main Roads (DTMR) Batter Slope Risk Element procedures were also carried out. These guides are based on the approach suggested in the Landslide Risk Management Concepts and Guidelines and to those outlined in the Australian Geoguide LR7 (Landslide Risk).

The landslide risk assessment generally involves the evaluation of slopes enabling the identification of potential hazards ("a condition with the potential for causing an undesirable consequence", for example, rockfall or slump type failure) and analyses the identified hazards with respect to likelihood and consequences using prescribed risk matrices. The risk matrices use a number of estimated conditional probabilities to calculate an Assessed Risk Level (ARL) rating for individual slopes.

The risk assessment procedure generally uses estimated conditional probabilities designed to characterise a sequence of events which must occur for slope instability to result in a fatality or injury to the community, damage to structures or buildings, and/or economical costs that may be associated with the effects of instability.

The principal conditional probabilities used in the risk assessment include the following:

- Temporal Probability (T)
- Vulnerability (V)
- Likelihood of instability (L)

In general, the risk assessments use T and V to estimate a Consequence rating (C) for loss of life or economic loss as a result of instability. The rating C is combined with L to derive the ARL rating.

The RTA system has five separate ARL categories, namely ARL1 to ARL5, with ARL1 being the highest risk rating and ARL5 being the lowest risk rating. It is generally understood that all slopes with a risk rating of ARL1 or ARL2 are given the highest priority and should have risk reduction measures implemented within the short term (<3 years). ARL3 sites generally undergo regular monitoring with risk reduction measures carried out if the assessed risk levels are considered to increase. Sites assessed as ARL4 and ARL5 are periodically inspected for any significant site changes.

In terms of the Guidelines for Landslide Risk Management outlined in Australian Geomechanics, Volume 42, No. 1 March 2007 (AGS 2007) the risk to property is defined as Very Low to Very High. In general terms risks of very low to low are tolerable for regulatory bodies in relation to developments while higher risks are generally unacceptable without detailed investigation and implementation of risk reduction strategies to enable the reduction of risk to an acceptable level. The risk system matrix outlined in AGS 2007 is presented in Appendix D.

A full description of the risk analyses procedures are presented in the RTA and AGS 2007 documents. For further information the reader is directed to these documents.

The landslide risk assessment carried out as part of this investigation was based on the constructed development including the satisfactory implementation of the engineering and slope stability measures outlined in the following sections. The risk assessment considered the results of the stability analyses (outlined in the previous section), the walkover survey, site observations and based on experience in this area of Port Douglas.

The hazards evaluated as part of the risk analysis were based on the proposed development with the adoption of the construction recommendations and measures included within this report.

The hazards considered comprised the following:

- Instability within constructed batters or natural slopes resulting in downward migration of <2 m³ of soil debris or rocks impacting the residence and associated structures or surrounding structures.
- Instability within constructed batters or natural slopes resulting in downward migration of >2 m³ of soil debris or rocks impacting the residence and associated structures or surrounding structures.
- Instability within the existing Murphy Street batter resulting in downward migration of <2 m³ of soil debris or rocks impacting the road, existing stabilisation works or other structures.

4. Instability within the existing Murphy Street batter resulting in downward migration of >2 m³ of soil debris or rocks impacting the road, existing stabilisation works or other structures.

Based on the above, the following AGS 2007 and RTA risk classifications have been assessed for the proposed development:

Hazard	AGS 2007 Risk Rating	ARL Risk Rating
1	Low	ARL4
2	Low	ARL5
3	Low	ARL4
4	Low	ARL4

т	able	3:	Risk	Classification	s
	anc	•••	IN SIX	classification	,

Low to Very Low risks are generally considered acceptable to regulators for development approval in accordance with the relevant guides. As such, no further risk reduction measures are warranted at the site to allow the proposed residence.

In addition to the above, to maintain long term stability at the site, the measures recommended in the following sections should be implemented as a minimum.

Notwithstanding the above, it is known that the existing gully located along the western boundary of the site provided a channel for debris runout following instability in the upper portions of the gully. The debris runout resulted in the deposition of soil, mud and other debris into residences along Murphy Street.

On this basis, it is recommended that no permanent structures or additional infrastructure is placed in an around the drainage easement.

4.0 Engineering Comments

4.1 General

Based on the plans provided, the proposed development comprises the construction of up to a three level residential building partly founded on prepared building platforms and partly over formed batters or natural slopes.

Engineering comments relating to site preparation and earthworks procedures, excavation conditions, foundation options, slope stabilisation comments and retaining walls are presented in the following sections.

4.2 Cut and Fill Earthworks

It is envisaged that some minor further cut and fill earthworks will be required as part of the proposed development.

Where required, all new unsupported batters should be constructed in accordance with the guidelines outlined in the following table.

Batter Type	Maximum Height (m)	Maximum Batter Face		
Fill	1.5	1V:2H		
Cut	2.5	1V:1H		

Table 4: Unsupported Batter Construction Guidelines

Unsupported fill batters should not be constructed over slopes >15°. If proposed, fill batters higher or steeper than the above guidelines, or where proposed over slopes >15°, should be supported by engineered retaining walls.

Temporary cut batters can be formed at 3V:1H up to a maximum height of 3 m. Temporary cut batters should not be formed during the wet season months and be in place for a maximum 3 weeks if unsupported.

Where required, site preparation and earthworks procedures should involve the following:

- Strip and remove existing debris/materials, topsoil and soil containing significant amounts of
 organic materials.
- Strip and remove all cobble and boulders >150 mm in diameter from the surface.
- Compact the subgrade with a heavy roller to reveal soft or loose materials. Soft or loose
 material that cannot be improved by compaction should be removed and replaced with
 engineered fill.
- Place fill where required in uniform horizontal layers not exceeding 200 mm loose thickness and compact to achieve a relative dry density ratio of at least 95% using Standard Compaction. Each layer of filling should be keyed into natural ground. Filling should be placed at least 1 m beyond the design profile and then trimmed to the design profile.

If required, imported fill materials should have a Plasticity Index less than 20 and a soaked CBR value of >15%.

It is recommended that all earthworks procedures be carried out in accordance with AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments" and local authority requirements. It is recommended that the earthworks contractor be familiar with site conditions.

The existing fill observed at the site should be considered as uncontrolled and be removed as part of the site preparation.

4.3 Excavation Conditions

Excavations at the site in the proposed building areas are likely to encounter clayey soils and weathered rock. Excavation of the soils and upper extremely weathered rock would be readily achievable for a conventional small (>8T) excavator. Excavation to depth into the weathered rock will likely require the use of a large (>20T) excavator. An impact breaker or ripper may be required to loosen harder zones of rock.

4.4 Drainage

Drainage measures that should be implemented include:

- Provision of lined drains at the crest of any proposed new fill batters.
- Provision of lined drains and kerbing or similar along the margin of the driveway/car parking areas.
- Provision of subsurface drainage behind retaining walls and lined drains above the crest of any retaining walls over 1.5 m in height.

All stormwater should be collected and discharged from the site via pipes into designated drainage paths and not be allowed to flow on to the ground or around footings or structures. Where this is not possible, stormwater should be directed into flow spreaders or energy dissipaters to prevent concentrated flows.

4.5 Retaining Structures

Retaining walls could be founded on high level or bored pier footings. High level footings (strip/pad or slab on ground) should be founded on the weathered rock. High level footings for the retaining walls founded in this manner could be designed with an allowable bearing pressure of 100 kPa.

Bored pier footings for retaining walls should be extended at least three times their diameter into the weathered rock. Bored pier footings founded in this manner can be designed using an allowable end bearing pressure of 350 kPa and an allowable shaft adhesion of up to 60 kPa, neglecting the contribution of the upper 1 m of the shaft.

It is recommended that all new retaining walls be designed using the following at rest (K_0), active (K_a) and passive (K_p) earth pressure coefficients.

Material Description	Ko	Ka	Kp
Firm-St CLAY's/Fill & VSt to H Silty CLAY	0.45	0.3	3.0
Weathered Rock	0.1	0.25	5.0

Table 5: Summary of Earth Pressure Coefficients

All retaining walls should include any surcharge loads imposed on the walls.

All retaining walls should be designed by a Structural Engineer.

4.6 Footings

4.6.1 Bored Pier Footings

Portions of buildings and structures located within 2 m of the crest of all batters/slopes and/or over natural slopes and formed batters should be founded on bored piers. Bored pier footings should extend at last three times their diameter into the weathered rock at depth, or a minimum of 3 m below natural ground level. Bored pier footings founded in this manner can be designed with an allowable end bearing pressure of 350 kPa and a shaft adhesion of 60 kPa. Shaft adhesion for the upper 1 m of the shaft should be neglected.

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

4.6.2 High Level Footings

It is considered that, if proposed, areas of the proposed structures to be constructed on prepared building platforms prepared in accordance with Section 4.2 above, and located at least 2 m from the crest of any batter or the natural slope, can be founded on high level footings such as pad, strip or beams for slab on ground footings. High level pad, strip or beams for slab on ground footings should be founded on the weathered rock. Pad, strip or beams for slab on ground footings founded in this manner can be designed using an allowable bearing pressure of 100 kPa.

For the purposes of AS2870-2011, high level footings could be designed in accordance with a Class S site following site preparation and development as outlined above.

4.6.3 Stability of Murphy Street Batter

Based on the plans provided and an inspection of the Murphy Street batter where the slope stabilisation works were carried out, together with the stability analyses and our experience with the Murphy Street slope remediation works, it is considered that the proposed development will not negatively impact the batter or increase the risk of instability along the batter along Murphy Street. Furthermore, the proposed subject residence will not impact or impede installed stabilisation elements within the Murphy Street batter installed in the area of the Owen Street easement and subject property.

5.0 Limitations

GEO Design has prepared this report for the use of Vermilion21 Pty Ltd for design purposes in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than Vermilion21 Pty Ltd and their other consultants. It may not contain sufficient information for purposes of other parties or for other uses.

Your attention is drawn to the document - "Important Information About Your Geotechnical Engineering Report". This document has been prepared by the ASFE (Professional Firms Practicing in the Geosciences). 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 ground works for this project. The document is not intended to reduce the level of responsibility accepted by GEO Design Pty Ltd, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

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

Regards,

Steve Ford Principal Geotechnical Engineer BSc (Geo) BSc (Geo) Hons MEngSc (Geotechnical) MIMinEng (Geomechanics) RPEQ 25762

Appendix A Site Plan & Provided Plans



Client: VERMILION21	GEOTECHNICAL INVESTIGATION	
Drawn: DLH	34 MURPHY STREET, PORT DOUGLAS	
Scale: NTS	FIGURE 1 SITE PLAN	
Ref No: 22098AA-D-FIGURE1-V1		















Appendix B Results of Fieldwork

Appendix C Stability Analysis

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	R
FILL		18	Mahr- Coulomb	5	28	None	0
CLAY		19	Mahr- Coulomb	6	30	None	0
Weathered Rock		22	Mohr- Coulomb	15	35	None	0

	Client:	Vermilion21 F
design	Drawn:	SRF
ucsign	Scale:	NTS

Client:	Vermilion21 Pty Ltd	Geotechnical Assessment
Drawn:	SRF	34 Murphy Street, Port Douglas
Scale:	NTS	
Project No:	22098AA-D	DRY CONDITIONS

22098AA-D – Result of Stability Analysis

6 February 2023

Appendix D AGS 2007 Risk Matrix

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)					
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%	
A - ALMOST CERTAIN	10 ⁻¹	VH	VH	VH	Н	M or L (5)	
B - LIKELY	10 ⁻²	VH	VH	Н	М	L	
C - POSSIBLE	10 ⁻³	VH	Н	М	М	VL	
D - UNLIKELY	10 ⁻⁴	Н	М	L	L	VL	
E - RARE	10 ⁻⁵	М	L	L	VL	VL	
F - BARELY CREDIBLE	10 ⁻⁶	L	VL	VL	VL	VL	

Notes: (5) For cell A5, may be subdivided such as that a consequence of less than 0.1% is Low risk

(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
νн	VERY HIGH RISK	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 the value of the property.
н	HIGH RISK	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.
м	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce risk to Low. Treatment options to reduce to Low should be implemented as soon as practical.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.
Note: (7)	The implications for a particular situation	an are to be determined by all parties to the rick assessment and may depend on the nature of the property at rick:

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

ATTACHMENT D

Landscape Plan

Prepared by Hortulus Australia Pty Ltd

EXISTING CONCRETE STORMWATER DRAIN AND PIT.

500mm HIGH PROPOSED NATURAL STONE WALL TO SUPPORT EXISTING DRAIN.

MIXED NATIVE SCREENING TREES.

PEBBLES SUFACE.

NATIVE SCREENING PALMS WITH MIXED NATIVE SHRUBS AND FERNS.

EXISTING SCHEFFLERA ACTINOPHYLLA WITH MIXED PLANTING.

EXISTING COCOS NUCIFERA WITH MIXED PLANTING.

RENDERED MASONRY SCREENING WALL. REFER 3D SCREENSHOTS.

EXISTING CONCRETE DRIVEWAY ACCESS.

EXISTING VEGATATION ON MURPHY STREET TO REMAIN.

EXISTING CORYMBIA TESSELLARIS FROM EDGE OF ROADWAY.

VERMILION21 PTY LTD RESIDENCE	SCALE: 1:100@A1	HORTULUS AUST
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LANDSCAPE CONCEPT PLAN	1 -	E: design@hortulus.co

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PLANT SCHEDULE

Code	Botanical Name	Common name	Qty.	Pot Size	Туре	
TREES &	PALMS					
AF	Atractocarpus fitzalanni	Brown gardenia	9	400mm	Т	
СМ	Cerbera manghas	Native beach frangipani	1	100ltr	Т	
CN	Cocos nucifera	Coconut palm	1	Existing	Р	
СТ	Corymbia tessellaris	Morton bay ash tree	1	Existing	Т	
НW	Hydriastele wendlandiana	Elegant swamp palm	16	300mm	Р	
MR	Melicope rubra	Dwarf ulysses tree	3	300mm	Т	
MM	Micromelum minutum	Lime berry	11	300mm	Т	
PC	Phaleria clerodendron	Native daphne	6	300mm	Т	
РM	Ptycosperma macartheri	Macarther palm	5	400mm	Р	
SA	Syzygium australe 'Straight & Narrow'	Straight & Narrow lilly pilly	24	300mm	Т	
SH	Schefflera actinophylla	Umbrella tree	1	Existing	Т	
SW	Syzygium wilsonii	Powder puff lilly pilly	4	200mm	Т	
ХС	Xanthostemon chrysanthus 'Fairhill Gold'	Dwarf golden penda	14	400mm	Т	
SHRUBS,	GRASSES, GROUNDCOVERS & CLIMBERS					
AN	Asplenium nidis	Bird's nest fern	3	200mm	F	Τ
BC	Blechnum cartilagineum	Gristle fern	19	140mm	S	С
BS	Bowenia spectabilis	Zamia fern	3	200mm	S	
СС	Casuarina glauca 'Cousin It'	Cousin it plant	23	200mm	S	
СР	Crinum pedunculatum	Native swamp lily	13	140mm	S	
DA	Dianella atraxis	Blue flax lily	39	140mm	S	
EP	Epipremnum pinnatum	Native monstera	3	200mm	S	
GP	Gardenia psidiodes 'Glennie River'	Glennie river gardenia	35	140mm	GC	
GS	Gardenia scabrella	Cape york gardenia	65	140mm	S	
HC	Hypolytrum compactum	Rainforest sedge	33	140mm	S	С
LL	Lomandra hystrix	Mat rush	76	100mm	S	
LV	Lomandra hystrix 'Lucky stripe'	Variegated mat rush	94	140mm	S	
MC	Molineria capitulate	Weevil lily	70	140mm	S	
ТА	Tapeinochilos ananassae	Native backscratcher ginger	3	200mm	S	
XV	Xanthostemon verticillatus	Bloomfeild penda	50	200mm	S	1

KEY TO SYMBOLS

A LIN ALL	XANTHOSTEMON VERTICI
	CASUARINA GLAUCA 'COU
	GARDENIA SCABRELLA
A	TAPEINOCHILOS ANANASS
K	ASPLENIUM NIDIS
K	BOWENIA SPECTABILIS
R	CRINUM PEDUNCULATUM
	EPIPREMNUM PINNATUM
	MOLINERIA CAPITULATE
	LOMANDRA HYSTRIX 'LUC
	GARDENIA PSIDIODES 'GLI
(+ + +) (+ ~+ (BLECHNUM CARTILAGINE
	DIANELLA ATRAXIS LOMANDRA HYSTRIX

H x W 8x4 6x4 12x4 12x6 8x1.5 10x6 5x3 6x4 8x3 6x2 6x6 5x6 6x5 1x1 0.7x0.5 1x1 0.7x0.5 1x1 0.3x1 1x1 0.3x1 1x1 0.3x0.3 1x1 1x1

CILLATUS

USIN IT'

SAE

CKY STRIPE'

LENNIE RIVER'

UM UM

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SITE PLANTING PLAN	2 -	E: design@hortulus.c

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LANDSCAPE SPECIFICATIONS:

1. EXCAVATION

ALL GARDEN AREAS ARE TO BE STRIPPED OF UNWANTED PLANTS. BUILDING MATERIAL AND OTHER MATTER.

a. EXCAVATE-ALL PAVED AREAS TO A DEPTH OF 200mm BELOW FINISHED LEVEL ALL LAWN AREAS TO A DEPTH OF 100mm BELOW FINISHED LEVEL ALL GARDEN BED AREAS TO A DEPTH OF 250mm BELOW FINISHED LEVEL

2. SOIL PREPARATION

DUE TO THE SITE SLOPE THE GARDEN AREAS WILL HAVE COMPOST/GARDEN BED SOIL ADDED AT PLANTING. EXISTING SITE SOIL TO HAVE GYPSUM ADDED AT 1KG/M2 BEFORE BEING RAKED READY FOR PLANTING. TEST SOIL FOR PH LEVEL AND TREAT ACCORDINGLY TO PROVIDE A PH LEVEL OF 5.5 -6.5.

3. TOP SOIL

IMPORT 5 WAY ORGANIC GARDEN SOIL BLEND TO FILL ALL RETAINING WALLS AND GARDEN BEDS. ENSURE MIN. 250mm LAYER SOIL IS IMPORTED TO ALL PLANTED AREAS.

4. MULCH

MULCH ALL GARDEN AREAS TO A DEPTH OF 75mm OF AGED ORGANIC MATTER AS SHOWN ON LANDSCAPE PLAN. PLANTING/MULCHED AREA TO BE COVERED IN WIRE OR PLASTIC MESH ON ALL SLOPED AREA TO PROTECT THE SLOPE FROM EROSION AND YELLOW FOOTED SCRUB FOWL DAMAGE.

5. FERTILISING

FERTILISE USING A PELLETISED ORGANIC FERTILIZER, AT A RATE OF 500g/m².

6. PLANT MATERIAL

TO BE VIGOROUS, WELL-ESTABLISHED OF GOOD FORM AND NOT ROOT BOUND.

7. PLANTING

BEFORE PLANTING, THOROUGHLY WATER PLANTS AND PLANTING AREAS. WATER AGAIN IMMEDIATELY AFTER PLANTING.

8. DRAINAGE

ALL FINISHED SOIL LEVELS WILL DRAIN AWAY FROM **BUILDINGS AND BE DIRECTED TO APPROPRIATE PITS &** DRAINS BY BUILDER. ALL PITS AND PIPE TO BE SUPPLIED AND INSTALLED TO CORRECT LEVELS BY BUILDER.

9. RETAINING WALLS

PLEASE NOTE - FOOTING SIZES WILL VARY DEPENDING ON HEIGHT OF WALLS:

POUR 400-500mm WIDE, 450-650mm DEEP 25MPA CONCRETE FOOTINGS WITH 2 LAYERS 12mm TRENCH MESH, Y12 STARTER BARS TO BE INSERTED AT 400 CENTRES. LAY 190 WIDE REINFORCED CEMENT BLOCK WALLS. IN ALL FOOTINGS, EXTENDING BARS THROUGH WALL CAVITIES TO TOP OF WALLS. FILL WALL CAVITIES WITH 20MPA CONCRETE. APPLY 2 COATS 'GRIPSET' BITUMEN-BASED MEMBRANE TO ALL BURIED SURFACES OF WALL, COVERING 150mm OF FOOTINGS ALSO.

10.IRRIGATION

TO BE A FULLY AUTOMATIC SYSTEM, USING SHRUB HEAD SPRAYS. APPROPRIATE BACKFLOW AND FILTRATION TO BE ALLOWED FOR ACCORDING TO LOCAL COUNCIL LAWS.

11.EXISTING VEGETATION

REFER TO PLANT SCHEDULE AND PLANTING PLAN FOR PLANT SIZE AND POSITION. THE SITE HAS BEEN CLEARED OF VEGETATION SINCE A 2013 TREE SURVEY AND THEREFORE NO TREES PRESENT WITH A TRUNK DIAMETER OF 500mm OR MORE. A LARGE COCONUT PALM. APPROXIMATELY 10m TALL EXISTS ON THE SOUTHWESTERN BOUNDARY.

THE MURPHY STREET ROAD VERGE IS CURRENTLY VEGETATED AND WILL REMAIN WITH THE EXISTING VEGETATION. WITHIN THIS AREA IS A LARGE MORTON BAY ASH TREE (REFER PLANTING PLAN) WITH A TRUNK DIAMETER OF 550mm. A HEIGHT OF 12m AND CANOPY SPREAD OF 8m. THIS TREE WILL REMAIN.

12.BUSH FIRE PLANTING

SPECIES SELECTED FOR THIS PROJECT ARE ALL NATIVE AND THE MAJORITY ARE SELECT RAINFOREST SPECIES THAT ARE MORE FIRE RESISTANT THAN THOSE OF DRY NATIVE FORESTS.

13.PEBBLE

PEBBLE AREAS AND PATHWAYS AS SHOWN ON PLANTING PLAN, SHALL BE A LOCAL 40mm ROUNDED RIVER GRAVEL. LAID TO A DEPTH OF 100mm ON TOP OF BIDDUM GEOTEXTILE.

14. STEP STONES

STEP STONE OUTSIDE SHOWER TO BE AN ORGANIC BLUE STONE STEPPER WITH PEBBLE SURROUNDS. A SMALL ROCK RETAINING WALL, LESS THAN 500MM HIGH MAYBE REQUIRED ALONG THE EXISTING CONCRETE DRAIN.

15. MAINTENANCE

THE MAINTENANCE SHOULD BE CONTROLLED AND MONITORED BY THE LANDSCAPE FIRM CONTRACTED TO OVERSEE ALL WORKS AND UPKEEP IN ACCORDANCE WITH AN APPROVED LANDSCAPE MANUAL.

KEY TO SYMBOLS

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- **EXISTING COCOS NUCIFERA**
 - HYDRIASTELE WENDLANDIANA
 - PTYCOSPERMA MACARTHERI
 - SEXISTING TREES
 - MELICOPE RUBRA
 - PHALERIA CLERODENDRON
 - CERBERA MANGHAS
 - ATRACTOCARPUS FITZALANNI
 - MICROMELUM MINUTUM

CORYMBIA TESSELLARIS

- EXISTING SCHEFFLERA ACTINOPHYLLA
- XANTHOSTEMON CHRYSANTHUS 'FAIRHILL GOLD'
- SYZYGIUM AUSTRALE 'STRAIGHT & NARROW'
- SYZYGIUM WILSONII
- XANTHOSTEMON VERTICILLATUS CASUARINA GLAUCA 'COUSIN IT' GARDENIA SCABRELLA **TAPEINOCHILOS ANANASSAE** ASPLENIUM NIDIS **BOWENIA SPECTABILIS** CRINUM PEDUNCULATUM EPIPREMNUM PINNATUM MOLINERIA CAPITULATE LOMANDRA HYSTRIX 'LUCKY STRIPE'
- GARDENIA PSIDIODES 'GLENNIE RIVER'
- BLECHNUM CARTILAGINEUM HYPOLYTRUM COMPACTUM
- DIANELLA ATRAXIS LOMANDRA HYSTRIX

PLANTS SHOULD BE PLACED SO THAT THE TOP OF THE ROOTBALL IS AT THE SAME LEVEL AS THE FINISHED SOIL LEVEL AND THAT THE SOIL OR MULCH SHOULD NOT COVER THE PLANTS STEM

LANDSCAPE SURFACE PERMEABILITY 25% NON-PERMEABLE (188.50m²) 75% PERMEABLE (570.50m²) TOTAL LANDSCAPE AREA (759.00m²)

PLANT SCHEDULE

Code	Botanical Name	Common name	Qty.	Pot Size	Туре	Н×W
TREES &	PALMS		ł			•
AF	Atractocarpus fitzalanni	Brown gardenia	9	400mm	Т	8x4
CM	Cerbera manghas	Native beach frangipani	1	100ltr	Т	6x4
CN	Cocos nucifera	Coconut palm	1	Existing	Р	12x4
СТ	Corymbia tessellaris	Morton bay ash tree	1	Existing	Т	12x6
HW	Hydriastele wendlandiana	Elegant swamp palm	16	300mm	Р	8x1.5
MR	Melicope rubra	Dwarf ulysses tree	3	300mm	Т	10x6
MM	Micromelum minutum	Lime berry	11	300mm	Т	5x3
PC	Phaleria clerodendron	Native daphne	6	300mm	Т	6x4
PM	Ptycosperma macartheri	Macarther palm	5	400mm	Р	8x3
SA	Syzygium australe 'Straight & Narrow'	Straight & Narrow lilly pilly	24	300mm	Т	6x2
SH	Schefflera actinophylla	Umbrella tree	1	Existing	Т	6x6
SW	Syzygium wilsonii	Powder puff lilly pilly	4	200mm	Т	5x6
ХС	Xanthostemon chrysanthus 'Fairhill Gold'	Dwarf golden penda	14	400mm	Т	6x5
SHRUBS,	GRASSES, GROUNDCOVERS & CLIMBERS					
AN	Asplenium nidis	Bird's nest fern	3	200mm	F	1x1
BC	Blechnum cartilagineum	Gristle fern	19	140mm	S	0.7x0.5
BS	Bowenia spectabilis	Zamia fern	3	200mm	S	1x1
СС	Casuarina glauca 'Cousin It'	Cousin it plant	23	200mm	S	0.3x1
СР	Crinum pedunculatum	Native swamp lily	13	140mm	S	1x1
DA	Dianella atraxis	Blue flax lily	39	140mm	S	1x1
EP	Epipremnum pinnatum	Native monstera	3	200mm	S	5x2
GP	Gardenia psidiodes 'Glennie River'	Glennie river gardenia	35	140mm	GC	0.5x1
GS	Gardenia scabrella	Cape york gardenia	65	140mm	S	2x1
HC	Hypolytrum compactum	Rainforest sedge	33	140mm	S	0.3x0.3
LL	Lomandra hystrix	Mat rush	76	100mm	S	1x1
LV	Lomandra hystrix 'Lucky stripe'	Variegated mat rush	94	140mm	S	1x1
MC	Molineria capitulate	Weevil lily	70	140mm	S	1x1
TA	Tapeinochilos ananassae	Native backscratcher ginger	3	200mm	S	2x1
XV	Xanthostemon verticillatus	Bloomfeild penda	50	200mm	S	2x1

C = Climber **G** = Ginger **SE** = Sedge **F** = Fern **P** = Palm **T** = Tree **GC** = Groundcover **S** = Shrub

ALL TREES TO BE HEALTHY, WELL-GROWN SPECIMENS FREE OF PEST & DISEASE. TREE ROOT BALL TO BE WATERED THE DAY PRIOR TO PLANTING.

SOIL BERM FORMING A WATERING SAUCER AROUND IMMEDIATE CROWN OF PLANT TO HOLD AT LEAST 5~10% OF ROOTBALL SIZE OF WATER.

TREES TO BE PLACED TOP ENSURE TOP OF THE ROOTBALL IS AT THE SAME LEVEL AS FINISHED SOIL LEVEL. SOIL OR MULCH SHOULD NOT COVER THE PLANTS TRUNK TO AVOID COLLAR ROT.

RE-CONDITION SOIL TO 300mm DEEP WITH COMPOSTED WEED-FREE GARDEN SOIL

STAKE TREES WITH 3 CHISEL POINTED HARDWOOD STAKES 2.4m X 50 X 50mm DRIVEN 800mm INTO GROUND TO OUTSIDE OF ROOT BALL. TIE TREES IMMEDIATELY AFTER PLANTING WITH HESSIAN.

40mm LAYER OF FINE COMPOSTED MULCH.

APPLY DYNAMIC LIFE FERTILISER WATER STORING CRYSTALS (AT MANUFATURER'S **RECOMMENDED RATES) INTO SOIL** SURROUNDING TREE.

NOTES:

GARDEN BED TO BE WELL DRAINED WITH DRAINAGE AS PER DRAWING. BEFORE PLANTING, THOROUGHLY WATER TREES TO BE TRANSPLANTED. AFTER PLANTING WATER IS TO BE CONCENTRATED WITH DIPPERS PLACED DIRECTLY ON TOP OF ROOT BALL. AFTER PLANTING IT IS ESSENTIAL MOISTURE LEVELS OF ROOTBALL ARE REGULARLY CHECKED TO ENSURE ROOTBALL DOES NOT DRY OUT.

NOTES:

- ERADICATE WEEDS BY SPRAYING WITH GLYPHOSATE OR REMOVING BY HAND.
- LOOSELY BREAK UP SOIL WITH A FORK AND COMBINE WITH A 75mm DEPTH OF ORGANIC MATTER.
- 3. DIG A HOLE TWICE THE WIDTH AND ONE AND A HALF THE DEPTH OF THE POT SIZE. 4. FILL THE HOLE WITH WATER BEFORE PLANTING AND ALLOW TO DRAIN THOROUGHLY.
- PLACE THE PLANT IN THE HOLE & BACKFILL WITH FRESH TOPSOIL.
- SPREAD WITH A 40MM LAYER OF FINE COMPOSTED MULCH AND WATER DEEPLY AFTER PLANTING.
- IF PLANTING IS TALLER THAT 1M, SUPPORT PLANT WITH 750mm LONG X 25 X 25 HARDWOOD STAKE TIED WITH JUTE WEBBING TIES. GARDEN BEDS TO BE WELL DRAINED WITH GEO-FABRIC SOCKED AGRICULTURAL DRAINS WITH SCREENINGS SURROUNDING CONNECTED TO SILT PIT PRIOR TO STORMWATER SYSTEM.
- CUDUD DI ANITINIC DETAIL 2

SHRUB PLANT	ING DETAIL	
SI	ECTION NTS	

VERMILION21 PTY LTD RESIDENCE

SITE ADDRESS: 34 Murphy Street | Port Douglas QLD

DRAWING TITLE

LANDSCAPE PLAN FOR TOWN PLANNING APPROVAL

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ROOF LEVEL (FFL +42.300)

1ST FLOOR (FFL +39.200)

GROUND FLOOR (FFL +36.300)

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REAR ELEVATION AT BOUNDARY - SCHEMATIC VEGETATION 1:100

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SCHEMATIC ELEVATION	5 -	E: design@hortulus.c

PLANTING HEIGHT LINE AT 10 YEARS GROWTH.

| PLANTING HEIGHT LINE AT 5 YEARS GROWTH.

| PLANTING HEIGHT LINE AT PROJECT COMPLETION.

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