PUBLIC NOTIFICATION

Rockhampton Regional Council

Approval Sought: Material Change of Use

Proposed Development: Dwelling House

Where: Lot 99 Isabella Street, Stanwell

Lot Description: Lot 99 on S9416

Application Reference: D/16-2025

Make a submission from:

14 April 2025 to 8 May 2025

You may make a submission to Rockhampton Regional Council

PO BOX 1860, Rockhampton QLD 4700
Email: enquiries@rrc.qld.gov.au
Phone: 07 4932 9000 or 1300 22 55 77

Click here to view the 'Guide to public notification of development and change applications'

For more information on planning requirements within the Rockhampton Region feel free to visit www.rrc.qld.gov.au

capricornsurveygroupcq
SURVEYING & PLANNING SOLUTIONS

18 February 2025 Our Ref: 9559

The Chief Executive Officer
Rockhampton Regional Council
PO Box 1860
Rockhampton QLD 4700

Attention: Kathy McDonald

Dear Sir,

RE: Development Application for
Material Change of Use for Dwelling House
Lot 99 on S9416
Lot 99 Isabella Street, Stanwell

This application is for the Development Permit for a Material Change of Use (Dwelling House) over Lot 99 on S9416, at Lot 99 Isabella Street, Stanwell - made by C and C Roberts.

Please find attached following supporting documentation:

- Planning Report and Code Assessment
- DA Form 1
- Site Plan 9559-01-MCU Issue A
- Building Plans
- Smartmap
- Title
- Subject Plan S9416
- Bushfire Attack Level Assessment
- Slope Stability Assessment
- Waste Water Design

Our client will arrange payment of the $1239 application fee upon lodgement. We seek your approval to this proposal.

If you have any queries with regards to the above, please do not hesitate to contact this office.

Yours Sincerely,

Madison Day

SITE CONTEXT AND PROPOSAL

The subject property is a 2.327 hectare parcel of vacant rural land, located on the northern border of the Stanwell Township at the end of the bitumen seal of Isabella Street. The lot is predominantly situated over the southerly and easterly aspects of a steep hilly ridgeline, averaging between 30-40% slope. The easterly slope transitions to a gentler fall toward the Isabella Street frontage (around 10-15% average).

A new lowset 15m x 8m dwelling is to be sited in the north-eastern corner of the land. A 20m x 10m slab will be provided and the dwelling will sit atop on 600mm stumps. The land will be benched to provide a flat area for the proposed building pad.

The dwelling will contain three bedrooms, two bathrooms, European style laundry and open plan kitchen/living and dining area that opens out to a covered deck. Front entry to the dwelling is located on the eastern façade facing Isabella Street and enters via the open plan living area.

Area breakdowns (approximately only)
Internal – 98m²
Deck – 22m²
Porch – 2m²
Slab – 200m²
Site Coverage – under 1%

Building Heights
The building will not exceed 6m above finished ground level.

Relevant Setbacks

- Northern boundary (side) – 10m to slab
- Southern boundary (Isabella Street) – 20m to slab

The dwelling house does not comply with the minimum setback to the side property boundary.

Despite this, the new dwelling will achieve appropriate separation from the neighbouring dwelling on the northern lot (Lot 98 on S9416), being offset in different positions. The neighbouring dwelling is sited atop the hill ridgeline toward the rear of the lot whereas the proposed dwelling is to be sited toward the front of the land, the dwellings are more than 150m away from one another.

The setbacks remain consistent with the rural residential character of the locality. The dwelling on the lot to the south (Lot 7 on S9416) is only some 12m from its common boundary shared with the subject property.

SERVICES/INFRASTRUCTURE

Access

The existing access point, gate and informal track will be re-used. The track will be formalised to an all-weather suitable finish. It loops into the site to maintain an appropriate crossfall. See below Google Streetview image from 2020 showing the site access.

Google Streetview Imagery – December 2020

Water

Council infrastructure records indicate there is no reticulated supply to Stanwell. The dwelling will be supplied with rainwater tanks to meet or exceed the minimum required capacity of 20,000L in accordance with Table 8.2.4.3.3 of the Bushfire Hazard Overlay Code. There is existing bore on the land which can be used for an additional non-potable supply.

Sewer

Council infrastructure records indicate there is no reticulated sewer to Stanwell. See attached waste water design report for sanitary drainage details.

Electricity

The dwelling can be connected to grid electricity else provided with on-site supply.

Telecommunications

The dwelling will be connected to telecommunications whether via fixed line or satellite.

Stormwater

All roof water will dissipate to the ground.

ZONING

The land is zoned as rural however sits just north of the Stanwell township zone. The area is characterised by small to moderate sized holdings used in a rural residential lifestyle capacity.

OVERLAYS

Biodiversity - Vegetation

The dwelling is sited within an MSES area, which is a high value regrowth mapped area (Category C) if mixed woodland communities. The house site contains scattered trees and generally cleared ground cover/understorey which is characteristic of managed or modified rural residential land uses. This area has the sparsest vegetation coverage across the site, despite other areas being mapped as non-remnant. It is also the most conveniently located space relative to the existing access and informal track. We believe the siting chosen is the most appropriate to minimise residual impacts.

The Bushfire Attack Level (BAL) assessment recommends a 20m setback from the south-west (nearest hazardous vegetation which sits upslope of the house site) to achieve a BAL score of 12.5. The area of land within this setback is consistent with the modified rural residential land characteristic as described above with low canopy coverage and low to no grass cover. Canopy trees can be retained within the BAL setback/asset protection zone (APZ) where within its outer zone and ensuring tree canopies do not overlap and the understorey is improved with low-fuel and non-combustible features such as maintained lawns, pathways etc.

Bushfire Hazard

The dwelling is located within the buffer zone. To achieve a BAL score of 12.5, a minimum setback of 20m has been recommended as per the attached BAL assessment.

Steep Land

The land sits in an area of the property on average 10 to 15% slope. A slope stability assessment has been undertaken to support this development as attached.

RURAL ZONE CODE

<table>
<tr><th>Performance Outcomes</th><th>Acceptable Solutions</th><th>Proposed Compliance</th></tr>
<tr><td colspan="3">Built Form</td></tr>
<tr><td>PO1 Development does not adversely impact on the rural character of the locality, having regard to the scale and visibility of buildings.</td><td>AO1.1 The height of new buildings and structures does not exceed two (2) storeys and ten (10) metres above ground level, excluding silos, windmills and similar structures ancillary to rural uses.

Note—Building heights on the airport obstacle limitation surface map OM-2A prevail over building heights detailed in the zone codes.</td><td>The dwelling is single level on ~600mm stumps. It will be less than 6m above finished ground level.</td></tr>
<tr><td colspan="3">PO2 is not applicable, the proposal does not include aquaculture.</td></tr>
<tr><td colspan="3">Dwelling House and Dwelling Unit</td></tr>
<tr><td>PO3 Development does not compromise the continued operation of an intensive animal industry, extractive industry, or a similar potential use on neighbouring rural land.</td><td>AO3.1 Development:
(a) is set back a minimum of twenty (20) metres from all site boundaries; and
(b) is separated from an existing or approved:
(i) intensive animal industry by a minimum of 1,000 metres; and
(ii) extractive industry operation as follows:
<table><tr><th>Operation</th><th>Separation distance</th></tr><tr><td>Extractive industry operation involving blasting</td><td>1,000 metres</td></tr><tr><td>A hard rock extractive industry</td><td>500 metres</td></tr><tr><td>A sand and gravel extractive industry</td><td>200 metres</td></tr><tr><td>A designated haul route</td><td>100 metres</td></tr></table>AND

AO3.2 Where a secondary dwelling is proposed, that dwelling:
(a) is contained within the same lot; and
(b) is no more than eighty (80) square metres gross floor area.</td><td>The dwelling house does not comply with the minimum setback to the side property boundary.

Despite this, the new dwelling will achieve appropriate separation from the neighbouring dwelling on the northern lot (Lot 98 on S9416), being offset in different positions. The neighbouring dwelling is sited atop the hill ridgeline toward the rear of the lot whereas the proposed dwelling is to be sited toward the front of the land, the dwellings are more than 150m away from one another.

The setbacks remain consistent with the rural residential character of the locality. The dwelling on the lot to the south (Lot 7 on S9416) is only some 12m from its common boundary shared with the subject property.</td></tr>
<tr><td>PO4 Dwellings have adequate access to services to ensure the safety and well-being of residents and the water supply is adequate for the current and future needs of the development.</td><td>AO4.1 A dwelling:
(a) has a legal access to a constructed road; and
(b) where within a water supply area has a legal connection to Council's reticulated water supply.

Editor's note—A constructed road can</td><td>The existing access point, gate and track will be reutilised and upgraded as appropriate.

On-site water supply will be provided by way of rainwater tanks. An inground septic system will be provided in accordance with the</td></tr>
</table>

	be sealed, graded or gravel. Editor's note—Where development is located outside of the water supply area refer to the requirements under the Plumbing Code of Australia.	wastewater design report attached. We expect electricity to be provided by on-site supply and telecommunications provided via satellite.
PO5 – PO11 are not applicable the proposed land use is a dwelling house		
Effects of Development		
PO12 Outdoor lighting maintains the amenity of any adjoining residential zoned premises and does not adversely impact the safety of vehicles or pedestrians on the adjoining streets as a result of light emissions, either directly or by reflection.	**AO12.1** Outdoor lighting is designed, installed and maintained in accordance with the parameters and requirements of the Australian Standard AS 4282 — Control of the obtrusive effects of outdoor lighting, as updated from time to time.	Any outdoor lighting shall be as per normal residential standards.
General		
PO14 Development that does not involve rural uses: (a) is located on the least productive parts of a site and not on land identified on the agricultural land classification (ALC) overlay maps; (b) does not restrict the ongoing safe and efficient use of nearby rural uses; and (c) is adequately separated or buffered where it is likely to be sensitive to the operational characteristics associated with rural uses, rural industries or extractive industries. Editor's note—Agricultural land classified as Class A or Class B is shown on the agricultural land classification overlay map OM-13. Editor's note—Applicants should have regard to the State Planning Policy - State Interest Guideline - Agriculture.	No acceptable outcome is nominated.	The dwelling is separated from nearby rural uses and activities at appropriate distances.
PO15 Uses that require isolation from urban areas are accommodated only where: (a) they cannot be more appropriately located in an industrial or other relevant zone; (b) they can be adequately separated from sensitive land use(s) (whether or not in the rural zone); and (c) potential impacts can be appropriately managed. Editor's note—Applicants seeking approval for intensive animal industries are to refer to State Planning Policy –		N/A

State Interest Guideline – Agriculture and consult with the relevant state government department prior to the lodgement of a development application. Council may require a study that, amongst other matters, identifies how the development is in accordance with Environmental Protection (Air) Policy 2008 or Environmental Protection (Noise) Policy 2008.		
PO16 Ecological values, habitat corridors and soil and water quality are protected, having regard to: (a) maximisation of vegetation retention and protection of vegetation from the impacts of development; (b) avoidance of potential for erosion and minimisation of earthworks; (c) retention and protection of natural drainage lines and hydrological regimes; and (d) avoidance of leeching by nutrients, pesticides or other contaminants, or potential for salinity.	No acceptable outcome is nominated.	The dwelling is sited within an MSES area, which is a high value regrowth mapped area (Category C). The house site contains scattered trees and generally cleared ground cover/understorey which is characteristic of managed or modified rural residential land uses. The slopes of the hill remain vegetated in a more naturally occurring state. The Bushfire Attack Level (BAL) assessment recommends a 20m setback from the south-west (nearest hazardous vegetation upslope of the house site) to achieve a BAL score of 12.5. The area of land within this setback is consistent with the modified rural residential land characteristic as described above with low canopy coverage. Canopy trees can be retained within the BAL setback/asset protection zone (APZ) where within its outer zone and ensuring tree canopies do not overlap and the understorey is improved with low-fuel and non-combustible features such as maintained lawns, pathways etc.
PO17 – PO38 are not applicable to this proposal.		

BIODIVERSITY OVERLAY CODE

Performance Outcomes	Acceptable Solutions	Proposed Solutions
Matters of State Environmental Significance		
PO1 Development is located, designed and operated to retain and protect significant natural assets, habitat and values to the greatest extent possible. Where this is not possible, impacts are minimised by: a) retaining native vegetation; b) allowing for the regeneration of native vegetation to the area, or rehabilitating with locally endemic plants in non-vegetated areas of the site; c) landscaping with locally native plants; d) locating and designing public access to avoid disturbance of ecological values; e) ensuring alterations to natural landforms, hydrology and drainage patterns do not significantly affect ecological values; and f) incorporating measures that avoid the disruption of threatened wildlife and their habitat by allowing for their safe movement through the site. Note—In areas where environmental values have been mapped but are no longer present a report certified by an appropriately qualified person that the development site does not contain any matters of environmental significance will be required. Note—An environmental offset is provided for any permanent, irreversible loss or reduction in matters of local (high) environmental significance caused by the development. An environmental offset is carried out as per the requirements of the Queensland Government's Environmental Offsets Policy, as amended from time to time.	No acceptable outcome is nominated.	The dwelling is sited within an MSES area, which is a high value regrowth mapped area (Category C). Clearing within this mapped area to establish the building pad, surrounding earthworks and asset protection zone is unavoidable however is being minimised as best as practicably possible through siting in historically modified/disturbed areas where the canopy cover is low and the understorey has been reduced to grasslands or cleared earth. The dwelling could be sited within the non-remnant area on the property however this would place the dwelling closer to the neighbouring house to the south, which could create privacy and amenity issues. Clearing is only required for establishing infrastructure. The existing canopy coverage that falls within the firebreak of the proposed dwelling (as recommended in the BAL assessment) is within tolerable levels such that they may be retained on site. The development does not cause connectivity issues with vegetation through adjacent sites and the surrounding environment. The dwelling is a low impact development that can co-exist with the natural environment and allow conservation to continue and be enhanced.
PO2 Development ensures native vegetation is retained, regenerated and rehabilitated in such a way as to:	No acceptable outcome is nominated.	The area where the dwelling house is to be sited is within an existing modified area with low canopy coverage and understorey consisting of low grasslands to bare ground.

a) ensure protection of areas of vegetation within biodiversity corridors and wildlife habitats; b) maintain vegetation that is in patches of greatest size and smallest possible edge-to-area ratio; c) maximise the linkages between vegetation located on the subject site; d) maximise linkages between vegetation located on adjacent properties within the biodiversity network; e) allow the dispersal or movement through biodiversity corridors; and f) protect riparian vegetation in and adjacent to watercourses.		Vegetation connectivity is retained through adjacent properties and the surrounding environment. The largest expanses of woodland vegetation are maintained.
Matters of Local Environmental Significance		
PO3 Development minimises impacts on biodiversity values by ensuring they are retained to the greatest extent possible. Editor's note—minimising the impacts on biodiversity values can be achieved by: a) retaining native vegetation; b) allowing for the regeneration of native vegetation; c) landscaping with native local plants; d) locating and designing public access (for example roads, bushfire separation areas etcetera) to avoid disturbance of ecological values; e) accommodating the safe movement of wildlife through the site; and f) limiting alterations to natural landforms and avoiding disturbance to natural waterways and drainage paths.	No acceptable outcome is nominated.	As per response to PO1
Biodiversity Corridors and Wildlife Habitats		
PO4 Development maintains unimpeded movement of terrestrial and aquatic fauna that are associated with or are likely to use the biodiversity corridor as part of their normal life cycle by: a) ensuring development, including roads, pedestrian access and in-stream structures, do not create barriers to the movement of fauna (including fish passage)	No acceptable outcome is nominated.	No fencing is proposed thus movement of terrestrial fauna across the site should remain unimpeded. Only selective clearing is required to establish the infrastructure, surrounding works and proposed firebreak and is within an existing modified area. This clearing does not impact the site's role in providing habitat and

along or within biodiversity corridors; b) providing effective wildlife movement infrastructure in accordance with best practice and directing fauna to locations where wildlife movement infrastructure has been provided to enable fauna to safely negotiate a development area; and c) separating fauna from potential hazards through the use of appropriate fencing. Note—In areas where environmental values have been mapped but are no longer present a report certified by an appropriately qualified person that the development site does not contain any matters of environmental significance will be required. Editor's note—Biodiversity corridors have been mapped based on a minimum width of 500 metres.		roosting opportunities for birdlife and other fauna.
PO5 Development: a) retains and protects areas of wildlife habitat that support a critical life stage ecological process such as feeding, breeding or roosting for identified species; and b) incorporates measures as part of siting and design to protect and retain identified ecological values and underlying ecosystem processes within or adjacent to the development site.	**AO5.1** Development retains and protects native fauna feeding areas, nesting, breeding and roosting sites within the identified wildlife habitats. Editor's note—Development applications lodged with Council must identify all species listed that are present within or adjoining premises and habitats that may be affected by the proposal. In particular applications are to identify and describe how the development protects or enhances wildlife habitat at any critical life stage ecological processes within or adjacent to the development area. This should be reflected in an ecological assessment report prepared in accordance with the SC6.8 — Ecological assessment planning scheme policy.	Clearing will not impact native fauna used for habitat purposes.
Wetlands and Waterways		
PO6 Development has no adverse impacts on: a) native vegetation; b) habitat; c) ecological functions; d) water quality; and e) nature conservation values. Editor's note—Waterway buffers (aside from MSES-Waterways) have been mapped based on the following minimum widths:	No acceptable outcome is nominated.	N/A

a) fifty (50) metres buffer (twenty-five (25) metres either side of the waterway) for stream orders 1 and 2; b) 100 metres (fifty (50) metres either side of the waterway) for stream orders 3 and 4; c) 200 metres for stream order 5 and above, except for the Fitzroy River; and d) for the Fitzroy River: 350 metres buffer (175 metres either side of the waterway) upstream of the Fitzroy River Barrage, and 450 metres (225 metres either side of the waterway) downstream of the Fitzroy River Barrage. Editor's note—Wetland buffers have a minimum width of: a) fifty (50) metres buffer (twenty-five (25) metres either side of the waterway) in urban areas; and b) 200 metres buffer (100 metres either side of the waterway) in non-urban areas. Editor's note—Vegetation clearing undertaken as a consequence of development occurs in compliance with the *Vegetation Management Act 1999* and *Nature Conservation Act 1992*.		
PO7 Development does not cause land degradation near a waterway or wetland, including: a) mass movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and b) loss or modification of chemical, physical or biological properties or functions of soil.	**AO7.1** Excavation and filling is not undertaken in waterways or wetlands.	N/A
Hydrology		
PO8 Development: a) enhances or maintains the existing groundwater hydrological regime of all areas of environmental significance; and b) ensures that the water table and hydrostatic pressure in the area of environmental significance is returning to its natural state.	No acceptable outcome is nominated.	The development will have no impact on the integrity of the groundwater table.
Non-Native Pest Management		
PO9 Development avoids the introduction of non-native pest species (plant or animal) that pose a risk to ecological integrity.	**AO9.1** Development does not introduce non-native pest species.	The land use will not introduce non-native pest species to the site. The owner is aware of their obligations to clear or remove declared pest species.

Ongoing Management, Construction and Operation		
PO10 During construction and operation of development, ongoing management, monitoring and maintenance is undertaken to ensure impacts on environmentally significant areas, biodiversity values and ecological processes, including water quality and hydrology, are avoided or minimised. Editor's note—Construction and operation related to a development are carried out in accordance with an operational management plan where appropriate. This plan can form an amendment to an existing approved management plan for the site.	No acceptable outcome is nominated.	Erosion and sediment control, stormwater and environmental management will be implemented on site during construction and where necessary for permanent support in the post development scenario.
PO11 Development adjoining a national park or other land in a protected area estate: a) maintains and where appropriate, improves access to a protected area estate; and b) maintains a buffer to a protected area estate in accordance with minimum best practice standards and includes characteristics to avoid development impacts. Editor's note—Protected area estate includes the following classes, as defined in the *Nature Conservation Act 1992*: a) national park (scientific); b) national parks; c) national parks (Aboriginal land); d) national parks (Torres Strait Islander); e) national parks (Cape York Peninsula Aboriginal land); f) national parks (recovery); g) conservation parks; h) resource reserves; i) nature refuges; j) coordinated conservation area; k) wilderness areas; l) World Heritage management areas; and m) international agreement areas.	No acceptable outcome is nominated.	The site does not adjoin a national park or protected area.
PO12 Management arrangements facilitate the effective conservation and protection of matters of national, state or local environmental significance, ecological processes and biodiversity values.	**AO12.1** Areas supporting matters of national, state or local significance features, biodiversity values or ecological processes are: a) transferred into public ownership where the land is required for public access or for some other public purpose consistent with its ecological, open	Not applicable. No covenants are required.

	space or recreation functions, including: (i) access for maintenance; (ii) linking core and remnant habitat areas; (iii) protecting water quality and ecological processes; and (iv) other public benefit; or b) incorporated within private open space and included within a voluntary statutory covenant that is registered under the *Land Title Act 1994*. Editor's note—Matters of national, state or local environmental significance include all areas shown on all biodiversity overlay maps.	
Rehabilitation		
PO13 Areas degraded as a result of development are rehabilitated by the proponent as near as is practical to the naturally occurring suite of native plant species and ecological communities. Editor's note—A rehabilitation plan supported by expert ecological advice prepared in accordance with SC6.8 — Ecological assessment planning scheme policy as well as reference to SC6.12 — Landscape design and street trees planning scheme policy will assist in demonstrating achievement of this performance outcome.	No acceptable outcome is nominated.	No rehabilitation should be required. The proposed selective clearing maintains the overall environmental integrity of the site.
PO14 is not applicable, the proposal does not involve reconfiguring a lot		

BUSHFIRE HAZARD OVERLAY CODE

Performance Outcomes	Acceptable Solutions	Proposed Solutions
Access		
PO1 Development ensures that the location, siting, and design of development and associated driveways and access routes: a) avoid potential for entrapment during a bushfire; b) facilitate safe and efficient emergency services to access and egress the site during a bushfire; and c) enables safe evacuation of the site during a bushfire for site occupants.	**AO1.1** AO1.1.1 Where the development is located in an urban area, the development: a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; b) has a maximum single access driveway length of sixty (60) metres from the street to the development; and	The existing access point, gate and informal internal track will be utilised and upgraded as appropriate. This provides the dwelling direct access to the sealed portion of Isabella Street. The access loops into the site parallel to the slope to minimise the crossfall on the proposed driveway.

	c) access driveways have a maximum gradient of 12.5 per cent. OR AO1.1.2 Where the development is located in a non-urban area, the development: a) has direct access to a constructed, all-weather, public road capable of carrying emergency service vehicles; b) is separated from hazardous vegetation by a public road or fire trail with a minimum width of four (4) metres and at least six (6) metres clear of vegetation, with a minimum of 4.8 metres vertical clearance and a maximum gradient of 12.5 per cent; and c) has: (i) a maximum single access driveway length of sixty (60) metres from the street to the development; or (ii) access driveways that are greater than sixty (60) metres from the street to the dwelling provide a turning circle with a minimum radius of eight (8) metres every sixty (60) metres.	
Water Supply for Fire Fighting Purposes		
PO2 Development provides adequate and accessible water supply for fire fighting purposes which is safely located and freely accessible for fire fighting.	**AO2.1** AO2.1.1 In a reticulated water supply area fire hydrants in: a) residential areas are above ground single outlet fire hydrants and provided at not less than eighty (80) metre intervals and at each street intersection; and Editor's note—To remove any doubt, these intervals also apply to common access ways within a common private title. a) commercial and industrial areas are above or below ground fire	Rainwater tanks meeting or exceeding 20,000L capacity will be provided to the dwelling for domestic and firefighting supply.

	hydrants and provided at not less than ninety (90) metre intervals and at each street intersection. Above ground fire hydrants are to be fitted with dual valve outlets in these areas. Editor's note—Fire hydrants are designed and installed in accordance with Australian Standard 2419.1 Fire hydrant installations – system design, installation and commissioning, unless specified by the relevant water entity. OR AO2.1.2 Where a reticulated water supply is not available or the development is not within eighty (80) metres of a hydrant, a water tank is provided within ten (10) metres of the building or structure, and the water tank has: a) a take-off connection from the building to the tank which is at a level that provides on-site water storage of not less than the water requirement outlined in Table 8.2.4.3.3; b) a hardstand area allowing heavy rigid fire appliance access within six (6) metres of a tank; and c) fire brigade tank fittings consisting of: (i) for above ground tanks, (A) fifty (50) millimetre ball valve and male camlock coupling; and (B) above ground water pipe fittings that are metal; or (ii) for underground tanks, an access hole of 200 millimetre diameter (minimum) to allow access for suction lines. Note—Plastic tanks are not recommended, however if they are fully submerged with above ground access points they are acceptable. Note—Where water tanks are required, swimming pools, creeks and dams should not be used as a substitute for a dedicated static supply as these sources of water are not reliable during drought conditions.	

PO3 is not applicable, the proposal does not include an activity that involves the use of hazardous materials		
Development within the high and very high bushfire hazard areas		
PO4 The development is compatible with the level of risk associated with the bushfire hazard.	**AO4.1** The development has a Bushfire Attack Level of less than 12.5. Editor's note—The Bushfire Attack Level is calculated in accordance with the methodology described in the Australian Standard AS 3959 — Construction of buildings in bushfire prone areas.	The dwelling is located within the buffer zone. To achieve a BAL score of 12.5, a minimum setback of 20m has been recommended as per the attached BAL assessment.
Land Use		
PO5 Essential community infrastructure and community facilities are highly vulnerable development are located, designed and sited to: a) protect the safety of people during a bushfire; b) not increase the exposure of people to the risk from a bushfire event; c) minimise the risk to vulnerable populations; and d) ensure essential community infrastructure can function effectively during and immediately after bushfire events.	**AO5.1** The following uses are not located in high or very high bushfire hazard areas: a) childcare centre; b) detention facility; c) educational establishment; d) emergency services; e) hospital; f) industrial use involving manufacture or storage of hazardous materials; g) multiple dwelling; h) outstation; i) relocatable home park; j) residential care facility; k) retirement facility; l) rooming accommodation; m) shopping centre; n) short-term accommodation; o) telecommunications facility; p) tourist park; q) tourist attraction; r) transport depot; and s) utility installation.	The proposal is not for essential community infrastructure or facilities.
PO6 – PO12 are not applicable, the proposal does not involve reconfiguring a lot		

DA Form 1 – Development application details

Approved form (version 1.6 effective 2 August 2024) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details.*

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	C and C Roberts
Contact name *(only applicable for companies)*	c/- Capricorn Survey Group (CQ) Pty Ltd
Postal address *(P.O. Box or street address)*	PO Box 1391
Suburb	Rockhampton
State	QLD
Postcode	4700
Country	Australia
Contact number	(07) 4927 5199
Email address *(non-mandatory)*	reception@csgcq.com.au
Mobile number *(non-mandatory)*	0407 581 850
Fax number *(non-mandatory)*	n/a
Applicant's reference number(s) *(if applicable)*	9559

1.1) Home-based business
☐ Personal details to remain private in accordance with section 264(6) of *Planning Act 2016*

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☐ Yes – the written consent of the owner(s) is attached to this development application ☒ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (a*ll lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
		99	Isabella Street	Stanwell
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4702	99	S9416	RRC
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
c)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☒ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☐ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:	
Name of port authority for tidal area *(if applicable)*	

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*	
Name of airport:	
☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☒ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☒ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

Dwelling House

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development
☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application
☒ Not required
6.4) Is the application for State facilitated development?
☐ Yes - Has a notice of declaration been given by the Minister?
☒ No

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☒ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*
Dwelling House	Dwelling House	1	120m² under roof including deck

8.2) Does the proposed use involve the use of existing buildings on the premises?
☐ Yes
☒ No

8.3) Does the proposed development relate to temporary accepted development under the Planning Regulation?	
☐ Yes – provide details below or include details in a schedule to this development application	
☒ No	
Provide a general description of the temporary accepted development	Specify the stated period dates under the Planning Regulation

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10)*	☐ Dividing land into parts by agreement *(complete 11)*
☐ Boundary realignment *(complete 12)*	☐ Creating or changing an easement giving access to a lot from a constructed road *(complete 13)*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)
12.2) What is the reason for the boundary realignment?			

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?		
☐ Road work	☐ Stormwater	☐ Water infrastructure
☐ Drainage work	☐ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
☐ Yes – specify number of new lots:	
☐ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*

$

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

RRC

16) Has the local government agreed to apply a superseded planning scheme for this development application?

☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☒ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the *Planning Act 2016*:**

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☐ Environmentally relevant activities (ERA) *(only if the ERA has not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☐ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Heritage places – Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure-related referrals – designated premises
☐ Infrastructure-related referrals – state transport infrastructure
☐ Infrastructure-related referrals – State transport corridor and future State transport corridor
☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure-related referrals – near a state-controlled road intersection
☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
☐ Koala habitat in SEQ region – key resource areas
☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
☐ Ports – Brisbane core port land – hazardous chemical facility
☐ Ports – Brisbane core port land – taking or interfering with water
☐ Ports – Brisbane core port land – referable dams
☐ Ports – Brisbane core port land – fisheries
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*
☐ SEQ development area
☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
☐ SEQ northern inter-urban break – tourist activity or sport and recreation activity

☐ SEQ northern inter-urban break – community activity
☐ SEQ northern inter-urban break – indoor recreation
☐ SEQ northern inter-urban break – urban activity
☐ SEQ northern inter-urban break – combined use
☐ Tidal works or works in a coastal management district
☐ Reconfiguring a lot in a coastal management district or for a canal
☐ Erosion prone area in a coastal management district
☐ Urban design
☐ Water-related development – taking or interfering with water
☐ Water-related development – removing quarry material *(from a watercourse or lake)*
☐ Water-related development – referable dams
☐ Water-related development –levees *(category 3 levees only)*
☐ Wetland protection area

Matters requiring referral to the **local government:**

☐ Airport land
☐ Environmentally relevant activities (ERA) (*only if the ERA has been devolved to local government)*
☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**

☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:

- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**

☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**

☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*
☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**

☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**

☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**

☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**

☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☐ Yes – referral response(s) received and listed below are attached to this development application
☐ No

Referral requirement	Referral agency	Date of referral response

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable).*

PART 6 – INFORMATION REQUEST

19) Information request under the DA Rules

☒ I agree to receive an information request if determined necessary for this development application

☐ I do not agree to accept an information request for this development application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties*
- *Part 3 under Chapter 1 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules or*
- *Part 2under Chapter 2 of the DA Rules will still apply if the application is for state facilitated development*

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? *(e.g. a preliminary approval)*

☐ Yes – provide details below or include details in a schedule to this development application

☒ No

List of approval/development application references	Reference number	Date	Assessment manager
☐ Approval ☐ Development application			
☐ Approval ☐ Development application			

21) Has the portable long service leave levy been paid? *(only applicable to development applications involving building work or operational work)*

☐ Yes – a copy of the receipted QLeave form is attached to this development application

☐ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid

☒ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

☐ Yes – show cause or enforcement notice is attached

☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below

☒ No

***Note**: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

☐ Yes – *Form 536: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application

☒ No

***Note**: See www.business.qld.gov.au for further information about hazardous chemical notifications.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☐ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☒ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☐ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☒ No

***Note**: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.*

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

***Note**: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.desi.qld.gov.au for further information.*

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the *Water Act 2000***?

☐ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☒ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au for further information.*

*DA templates are available from planning.statedevelopment.qld.gov.au**.** If the development application involves:*

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

23.7) Does this application involve **waterway barrier works?**

☐ Yes – the relevant template is completed and attached to this development application

☒ No

DA templates are available from planning.statedevelopment.qld.gov.au. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants?**

☐ Yes – an associated *resource* allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

***Note**: See guidance materials at www.daf.qld.gov.au for further information.*

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au and www.business.qld.gov.au for further information.*

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Environment, Science and Innovation at www.desi.qld.gov.au for further information.*

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application

☒ No

***Note**: See guidance materials at www.resources.qld.gov.au for further information.*

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for further information.*

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

☐ Yes – details of the heritage place are provided in the table below

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for information requirements regarding development of Queensland heritage places.*

For a heritage place that has cultural heritage significance as a local heritage place and a Queensland heritage place, provisions are in place under the Planning Act 2016 that limit a local categorising instrument from including an assessment benchmark about the effect or impact of, development on the stated cultural heritage significance of that place. See guidance materials at www.planning.statedevelopment.qldgov.au for information regarding assessment of Queensland heritage places.

Name of the heritage place:		Place ID:	

Decision under section 62 of the *Transport Infrastructure Act 1994*

23.14) Does this development application involve new or changed access to a state-controlled road?

☐ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)

☒ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.15) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered

☒ No

***Note**: See guidance materials at www.planning.statedevelopment.qld.gov.au for further information.*

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued *(see 21)*	☐ Yes ☒ Not applicable

25) Applicant declaration
☒ By making this development application, I declare that all information in this development application is true and correct ☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001* ***Note**: It is unlawful to intentionally provide false or misleading information.*
Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website. Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where: • such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or • required by other legislation (including the *Right to Information Act 2009*); or • otherwise required by law. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

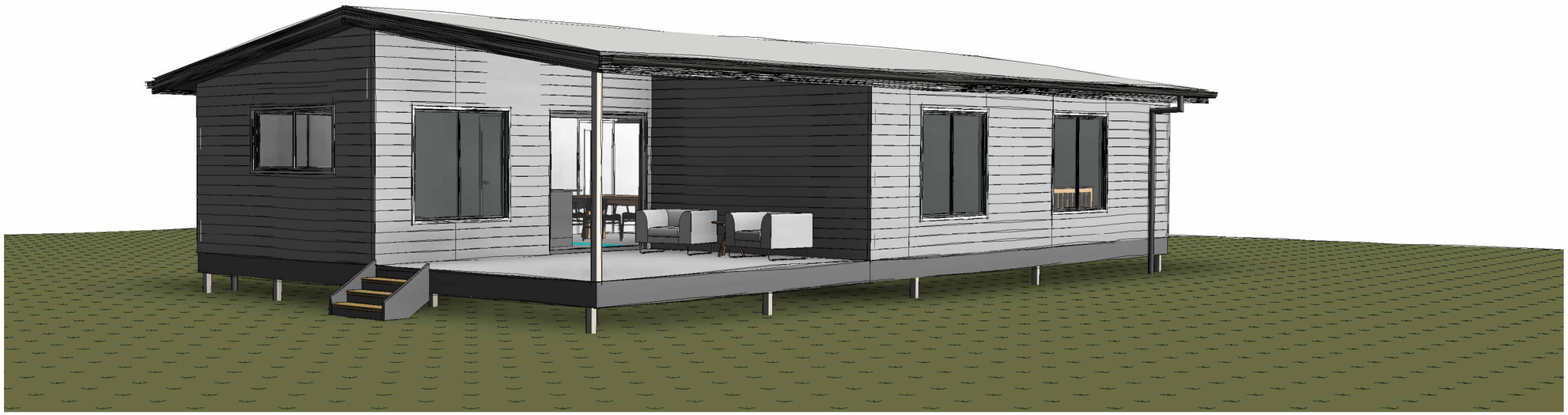
Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

99 ISABELLA STREET

STANWELL



Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

DAN WHIDDETT
GUNYA MODULAR DESIGNS
PHONE: 0417751183

CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **COVER PAGE**
SHEET NO: **0.0**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

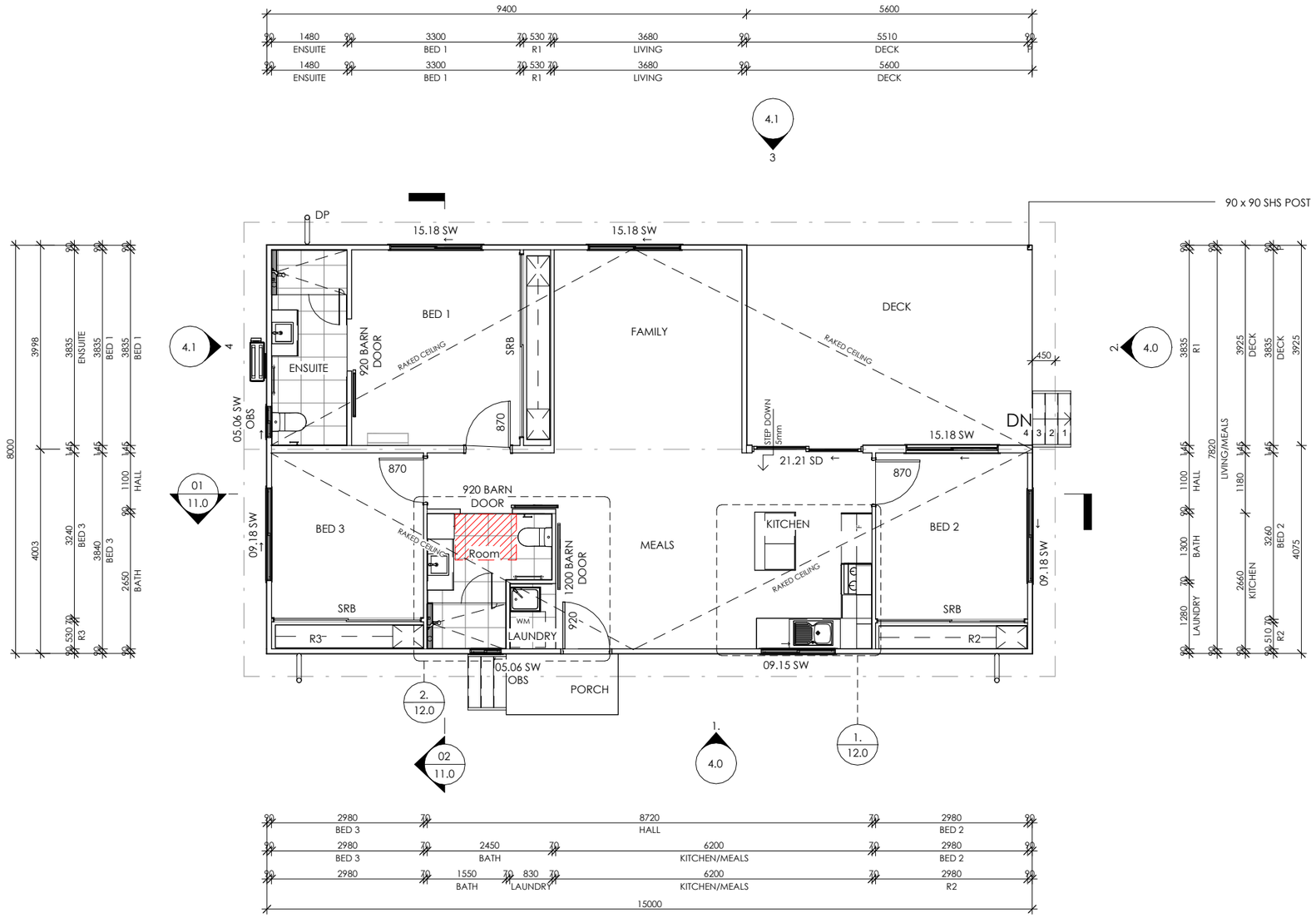
WD1

SCALE 1:100 @A3

m 1 0 1 2 3 4 5

DOOR SCHEDULE			
Family and Type	Height	Width	Comments
EXTERNAL SLIDING DOOR: 2121 SD	2110	2170	DECK
Internal Timber Door - Single: 870	2040	870	BED 2
ROBE DOORS: ROBE	2100	3600	R1
Barn_Door: 920 barn door	2100	920	ENSUITE
Internal Timber Door - Single: 870	2040	870	BED 3
Barn_Door: 920 barn door	2100	920	BATH
Internal Timber Door - Single: 870	2040	870	BED 2
ROBE DOORS: ROBE	2100	2900	R3
ROBE DOORS: ROBE	2100	2900	BED 2
Entry Door - Single: 920	2040	920	ENTRY DOOR
Barn_Door1: barn door 2	2100	1500	LAUNDRY

Window Schedule	
Family and Type	Comments
A&L Sliding - Standard: SW 0506 OBS	ENSUITE
A&L Sliding - Standard: SW 1518	BED 1
A&L Sliding - Standard: SW 0918	BED 3
A&L Sliding - Standard: SW 1518	BED 2
A&L Sliding - Standard: SW 1518	FAMILY
A&L Sliding - Standard: SW 0915	KITCHEN
A&L Sliding - Standard: SW 0506 OBS	BATH
A&L Sliding - Standard: SW 0918	BED 2



PROPERTY TITLE :	LOT	Revison	Description	Date	By	CLIENT SIGNATURE : _____ DATE : DATE	CLIENT SIGNATURE : _____ DATE : DATE
WIND RATING :	N	WD1	ISSUE CHECKING	20.12.2024	RM	CLIENT NAME: COLIN AND CHRISTINE ROBERTS	SHEET: GROUND FLOOR PLAN
SOIL TYPE :	?				RM	DESIGN:	SHEET NO: 3.0
SITE AREA :	0 m²				RM	COUNCIL/SHIRE:	PROJECT ADDRESS: 99 ISABELLA STREET STANWELL
						DRAWN BY: RM DATE: 20.12.2024	PROJECT STAGE: WORKING DRAWINGS
							PROJECT No: GM026

WD1

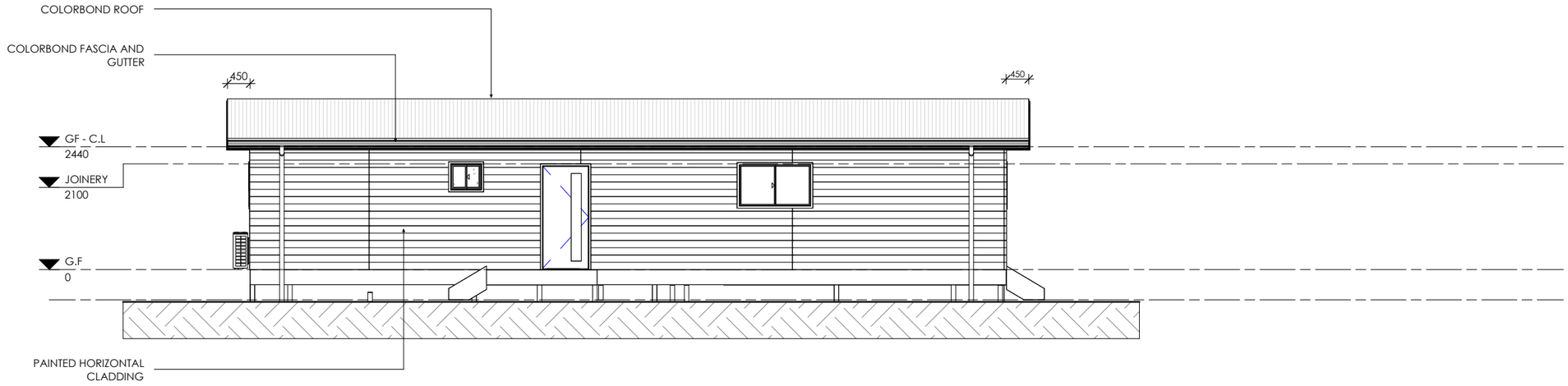
SCALE 1: 100 @A3

DAN WHIDDETT

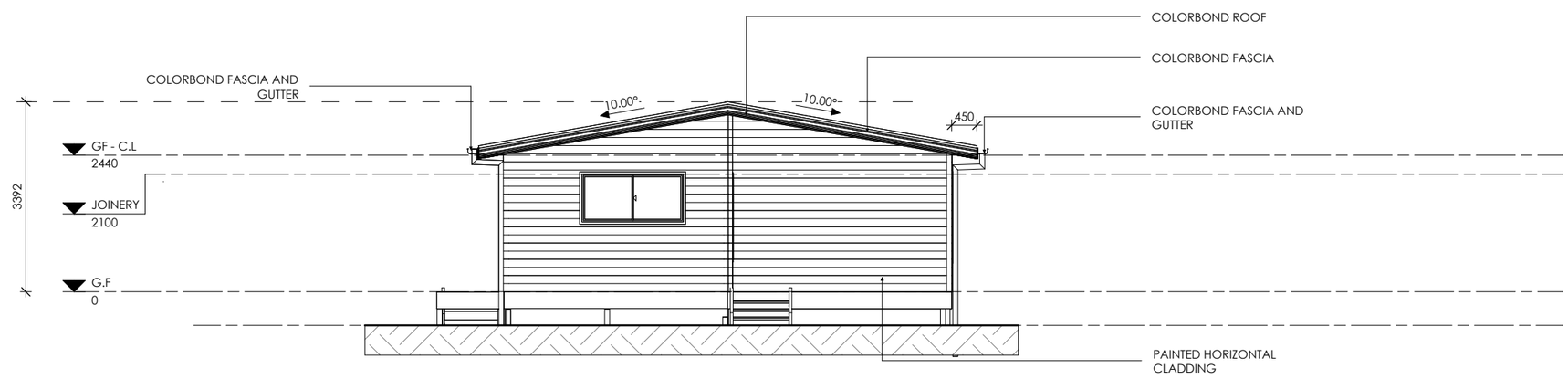
GUNYA MODULAR DESIGNS

PHONE: 0417751183

NOTE:
FLOOR LEVEL 600mm TO UNDERSIDE OF JOISTS



1. FRONT. ELEVATION
1 : 100



2. RIGHT. ELEVATION
1 : 100

PROPERTY TITLE :	LOT	Revison	Description	Date	By
WIND RATING :	N	WD1	ISSUE CHECKING	20.12.2024	RM
SOIL TYPE :	?				RM
SITE AREA :	0 m²				RM

DAN WHIDDETT
PHONE: 0417751183

GUNYA MODULAR DESIGNS

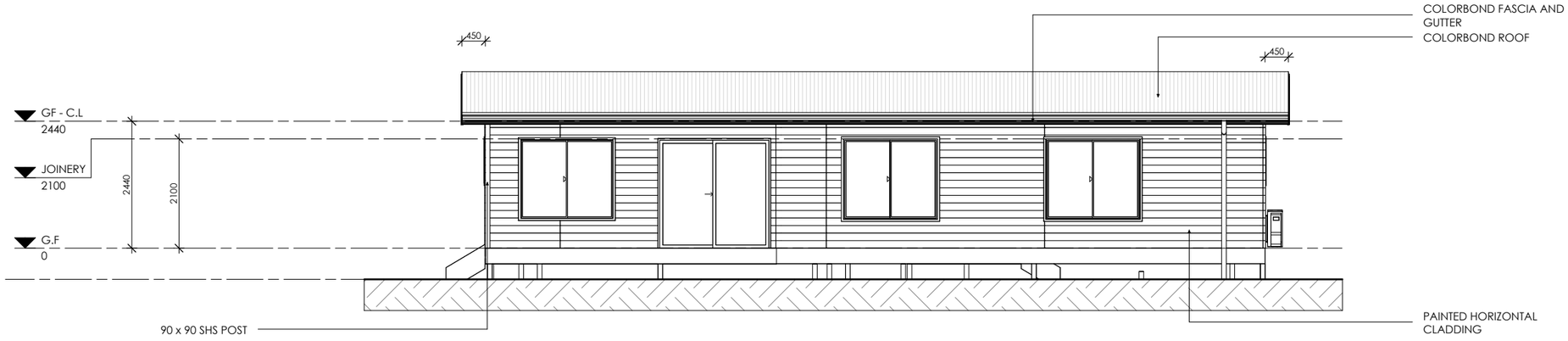
CLIENT SIGNATURE : _____ DATE : DATE
CLIENT NAME: COLIN AND CHRISTINE ROBERTS
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: RM | DATE: 20.12.2024

CLIENT SIGNATURE : _____ DATE : DATE
SHEET: ELEVATIONS
SHEET NO: 4.0
PROJECT ADDRESS: 99 ISABELLA STREET STANWELL
PROJECT STAGE: WORKING DRAWINGS
PROJECT No: GM026

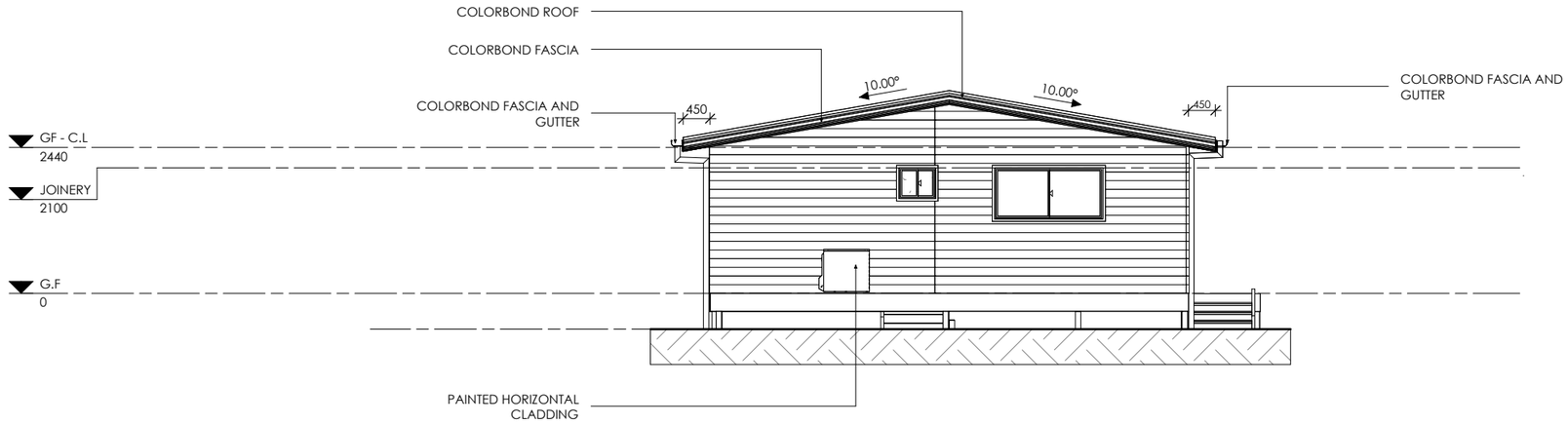
WD1

SCALE 1: 100 @A3

NOTE:
FLOOR LEVEL 600mm TO UNDERSIDE OF JOISTS



3 REAR ELEVATION
1 : 100



4 LEFT ELEVATION
1 : 100

m 0 1 2 3 4 5

C:\Users\Robynne\hhdesign.com.au\HarperHouse Design - CURRENT JOB FILES\Gunya Modular Design\GUNYA #20240221 - 99 ISABELLA ST STANWELL\DRAWINGS\99 ISABELLA ST.rvt
12/20/2024 12:39:36 PM

PROPERTY TITLE :	LOT
WIND RATING :	N
SOIL TYPE :	?
SITE AREA :	0 m²

Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

DAN WHIDDETT
GUNYA MODULAR DESIGNS
PHONE: 0417751183

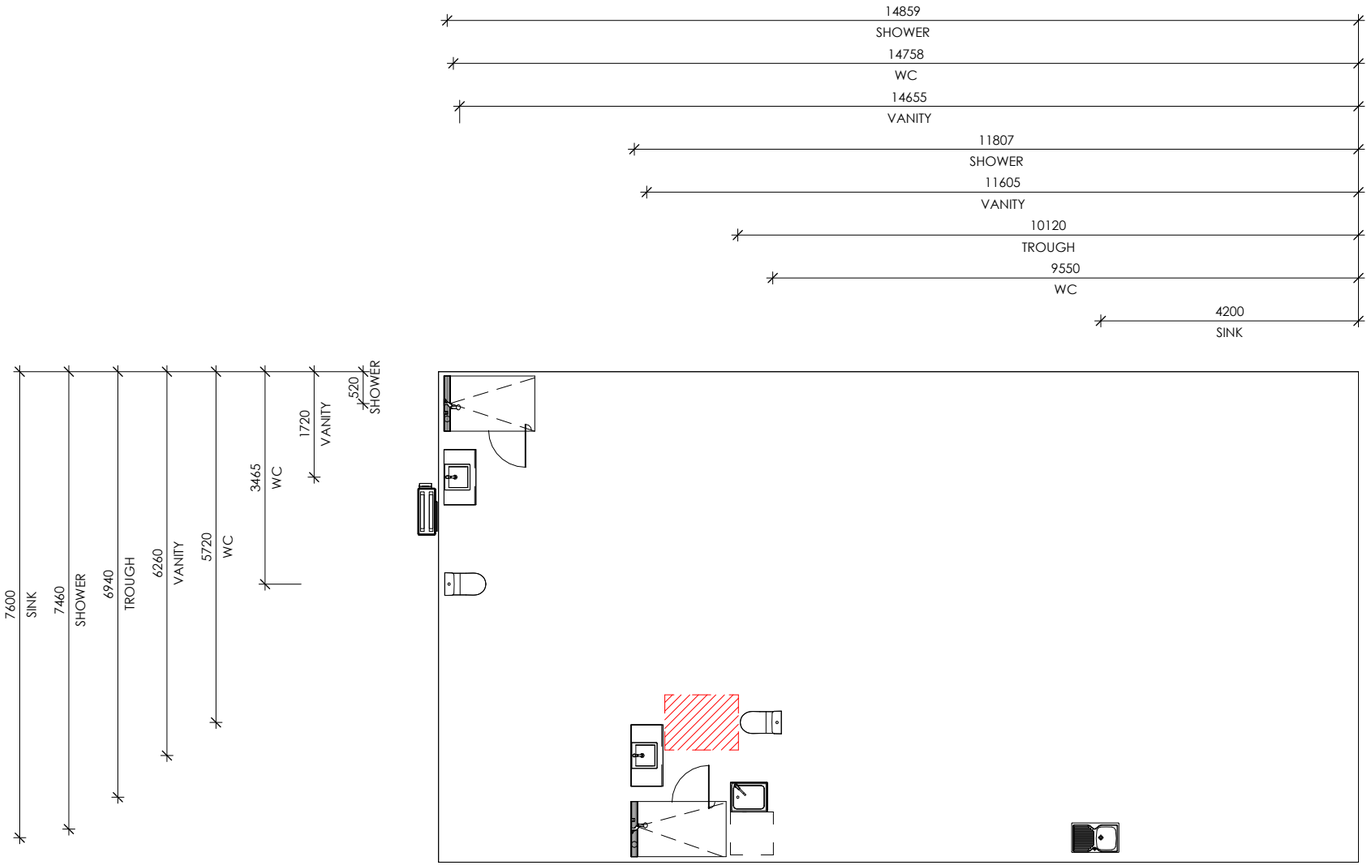
CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **ELEVATIONS**
SHEET NO: **4.1**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

WD1

SCALE 1: 100 @A3

KEYNOTE LEGEND



PORCH & ALFRESCO SLABS

PORCH AND ALFRESCO SLABS POURED AS PART OF LANDSCAPING WORKS.

SLABS

SLAB & FOOTINGS AS PER ENGINEER'S DESIGN & SPECIFICATION.

SLABS & FOOTINGS

CONCRETE SLAB & FOOTINGS TO STRUCTURAL ENGINEERS DETAILS, INCLUDE TERMITE PROTECTION TO COMPLY WITH AS 3660.1

PROPERTY TITLE :	LOT	Revison	Description	Date / By
WIND RATING :	N	WD1	ISSUE CHECKING	20.12.2024 RM
SOIL TYPE :	?			
SITE AREA :	0 m²			

DAN WHIDDETT
GUNYA MODULAR DESIGNS
PHONE: 0417751183

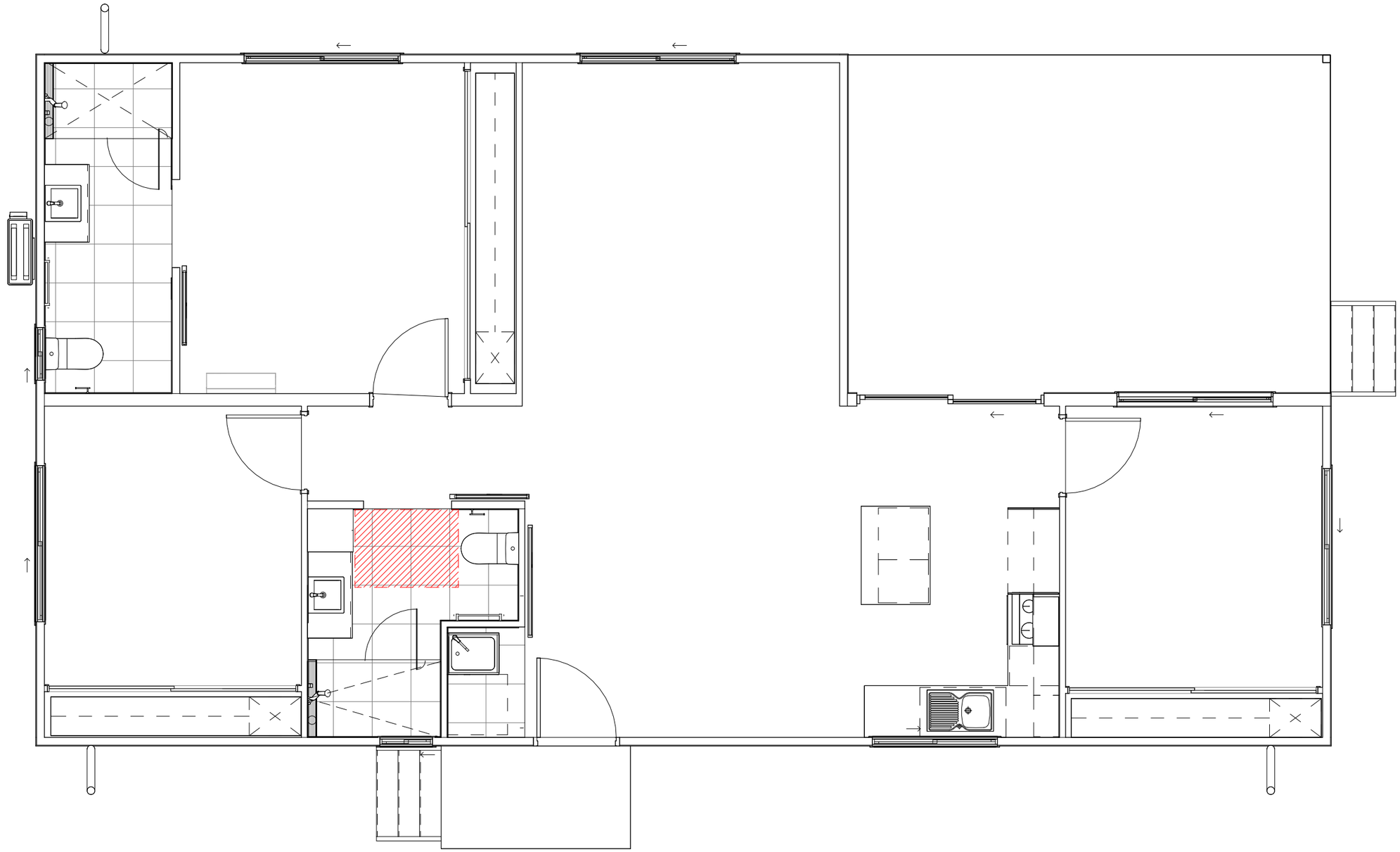
CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **PENETRATIONS PLAN**
SHEET NO: **6.0**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

WD1

SCALE 1: 100 @A3

m 1 0 1 2 3 4 5



GENERNAL NOTES

80% OF ALL INTERNAL AND EXTERNAL LIGHT FITTINGS ARE TO BE ENERGY EFFICIENT.

LIGHT SWITCHES TO BE 1000mm ABOVE F.F.L.

AIR CONDITIONING OUTLETS AND RETURN AIR GRILL (IF APPLICABLE) TO BE CONFIRMED ONSITE BY AIR CONDITIONING SPECIALIST.

AIR CONDITIONING OUTLETS AND RETURN AIR GRILL (IF APPLICABLE) TO BE CONFIRMED ONSITE BY AIR CONDITIONING SPECIALIST.

0 1 2 3 4 5 m

C:\Users\Robynne\hhdesign.com.au\HarperHouse Design - CURRENT JOB FILES\Gunya Modular Design\GUYNA#20240221 - 99 ISABELLA ST STANWELL\DRAWINGS\99 ISABELLA ST.rvt

12/20/2024 12:39:37 PM

PROPERTY TITLE :	LOT
WIND RATING :	N
SOIL TYPE :	?
SITE AREA :	0 m²

Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

DAN WHIDDETT

GUNYA MODULAR DESIGNS

PHONE: 0417751183

CLIENT SIGNATURE : _____ DATE : **DATE**

CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**

DESIGN:

COUNCIL/SHIRE:

DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**

SHEET: **ELECTRICAL PLAN**

SHEET NO: **9.0**

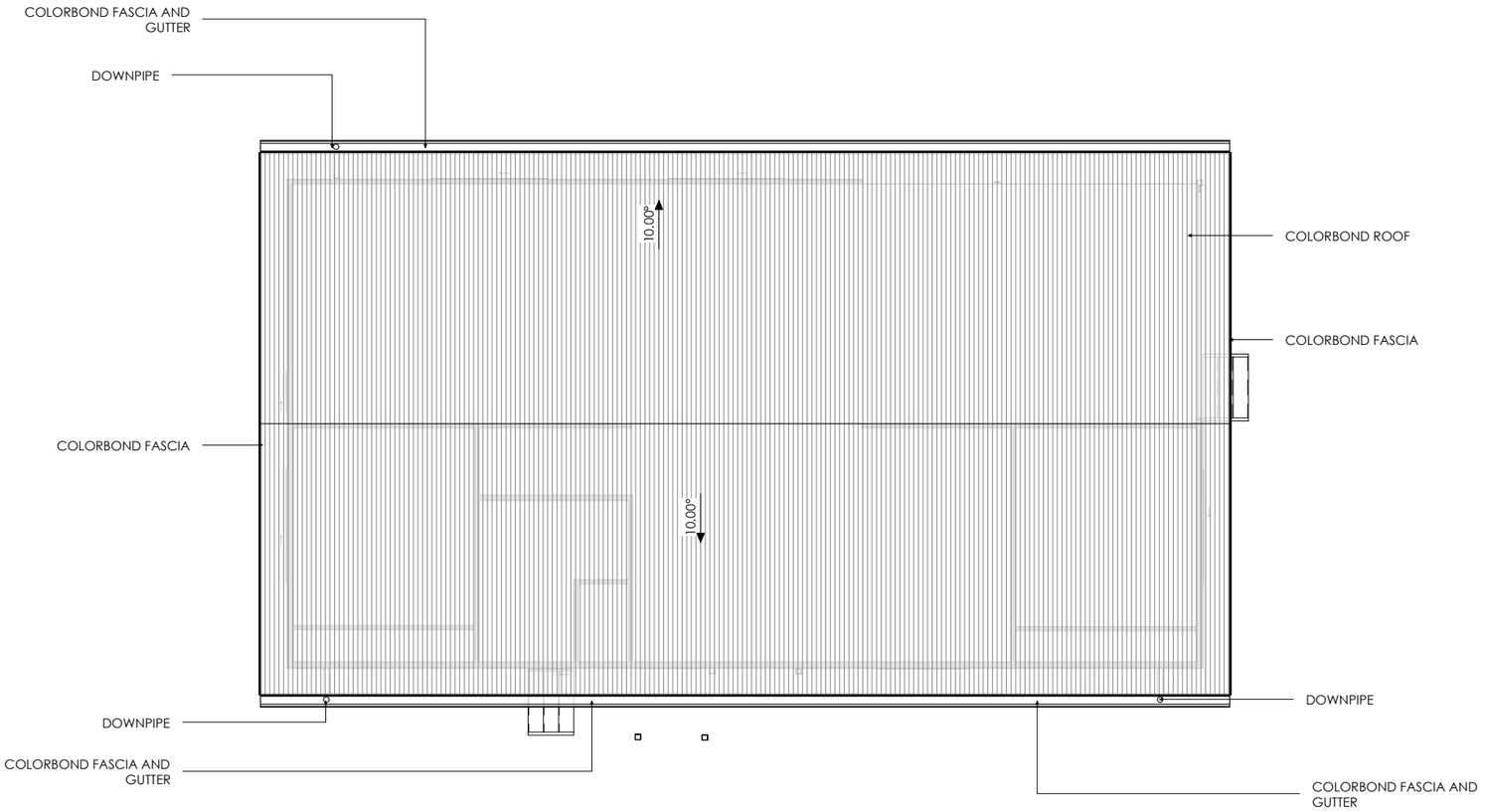
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**

PROJECT STAGE: **WORKING DRAWINGS**

PROJECT No: **GM026**

WD1

SCALE 1: 100 @A3



0 1 2 3 4 5 m

SCALE 1:100 @A3

C:\Users\Robynne\Vhtdesign.com.au\HarperHouse Design - CURRENT JOB FILES\Gunya Modular Design\GUYNA#20240021 - 99 ISABELLA ST STANWELL\DRAWINGS\99 ISABELLA ST.rvt

12/20/2024 12:39:37 PM

PROPERTY TITLE :	LOT
WIND RATING :	N
SOIL TYPE :	?
SITE AREA :	0 m²

Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM

DAN WHIDDETT
GUNYA MODULAR DESIGNS
PHONE: 0417751183

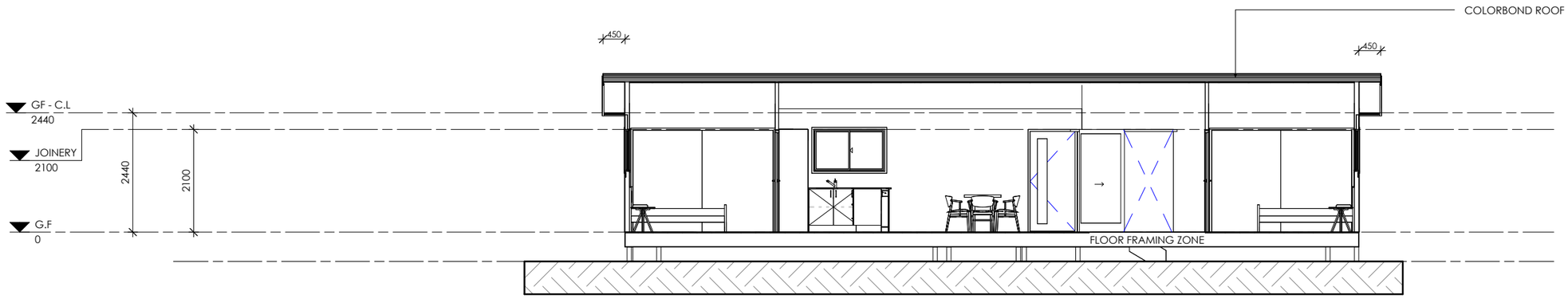
CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **ROOF PLAN**
SHEET NO: **10.0** **WD1**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

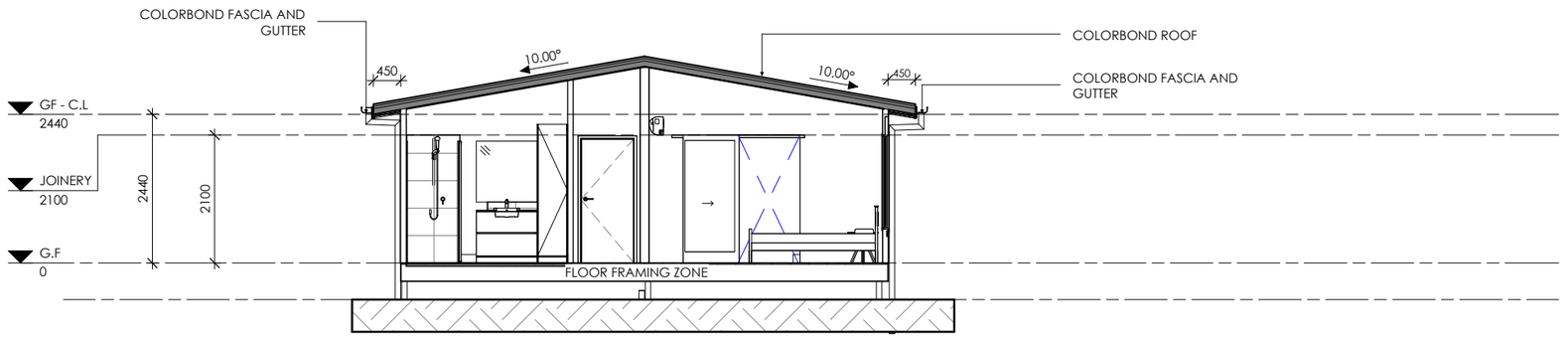
KEYNOTE LEGEND

CB	COLORBOND ROOF
FF(Z)	FLOOR FRAMING ZONE
G(01)	COLORBOND FASCIA AND GUTTER

NOTE:
FLOOR LEVEL 600mm TO UNDERSIDE OF JOISTS



01 SECTION A
1 : 100



02 SECTION B
1 : 100

1 0 1 2 3 4 5 m

SCALE 1: 100 @A3

Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

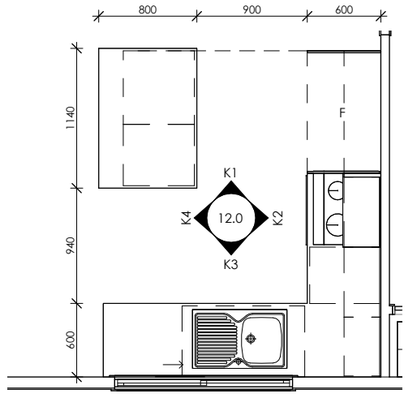
DAN WHIDDETT
PHONE: 0417751183

GUNYA MODULAR DESIGNS

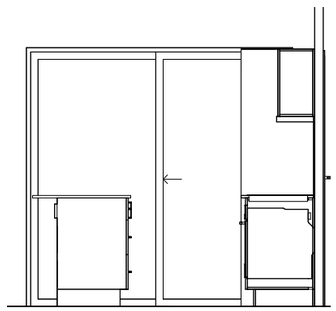
CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **SECTIONS**
SHEET NO: **11.0**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

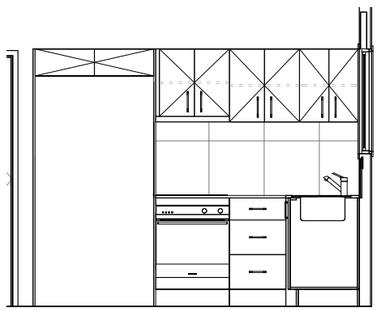
WD1



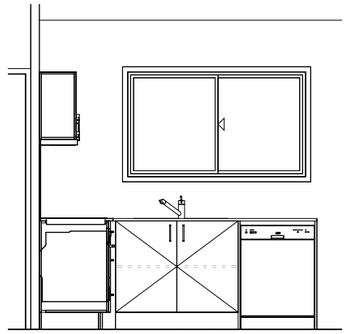
KITCHEN
1 : 50



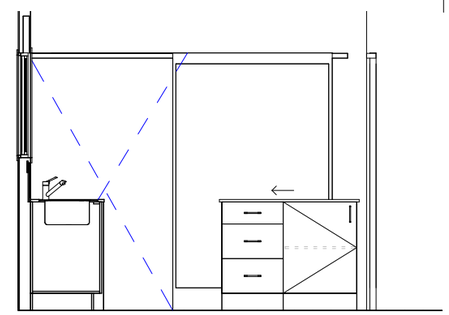
K1.
1 : 50



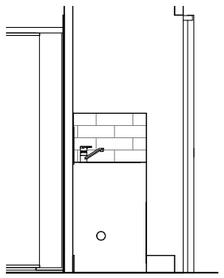
K2.
1 : 50



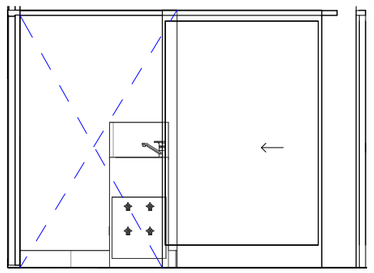
K3
1 : 50



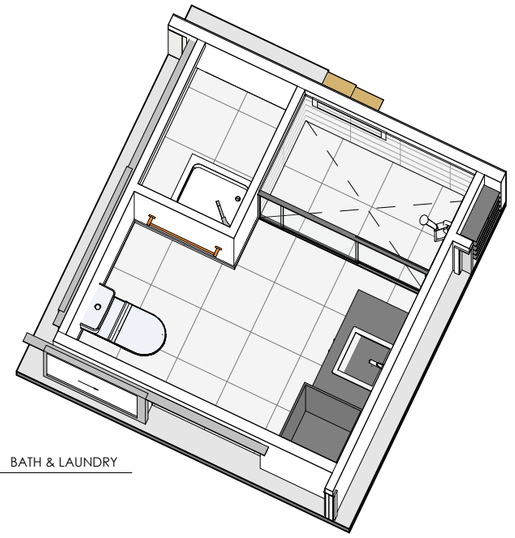
K4
1 : 50



L1
1 : 50

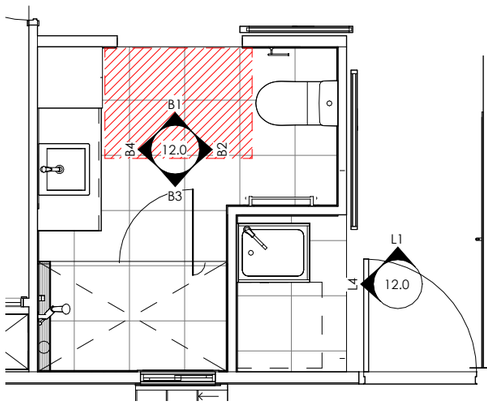


L4
1 : 50

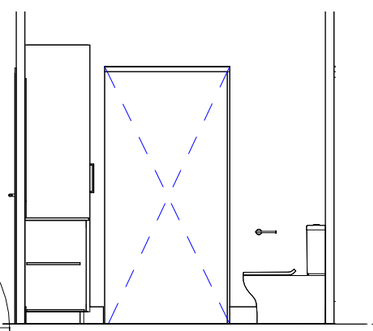


1 BATH & LAUNDRY

2 KITCHEN

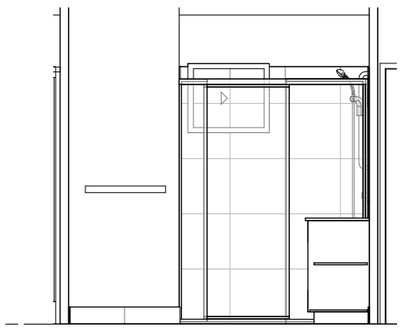


BATHROOM/LAUNDRY
1 : 50

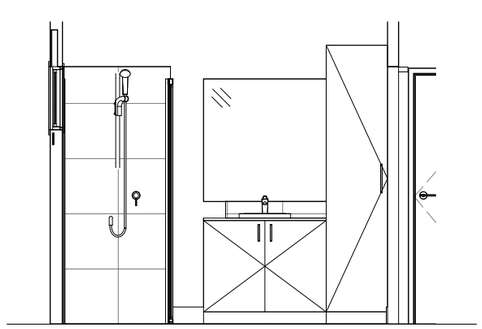


B1
1 : 50

B2
1 : 50



B3
1 : 50



B4
1 : 50

Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

DAN WHIDDETT
PHONE: 0417751183

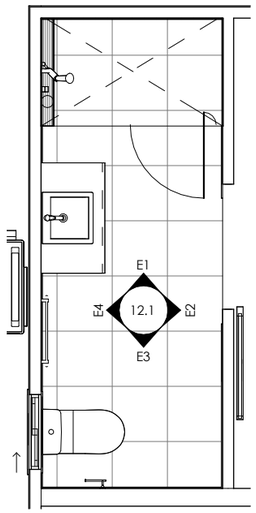
GUNYA MODULAR DESIGNS

CLIENT SIGNATURE : _____ DATE : **DATE**
CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: **RM** | DATE: **20.12.2024**

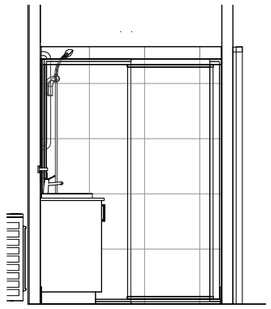
CLIENT SIGNATURE : _____ DATE : **DATE**
SHEET: **INTERNALS -**
SHEET NO: **12.0**
PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**
PROJECT STAGE: **WORKING DRAWINGS**
PROJECT No: **GM026**

WD1

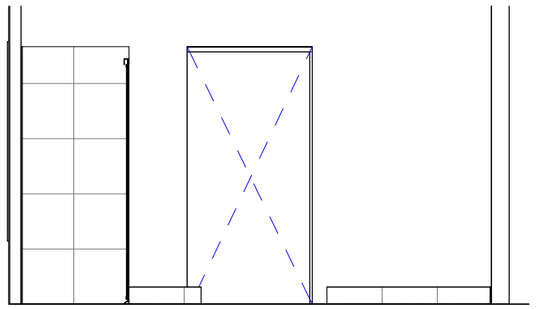
SCALE 1: 100 @A3



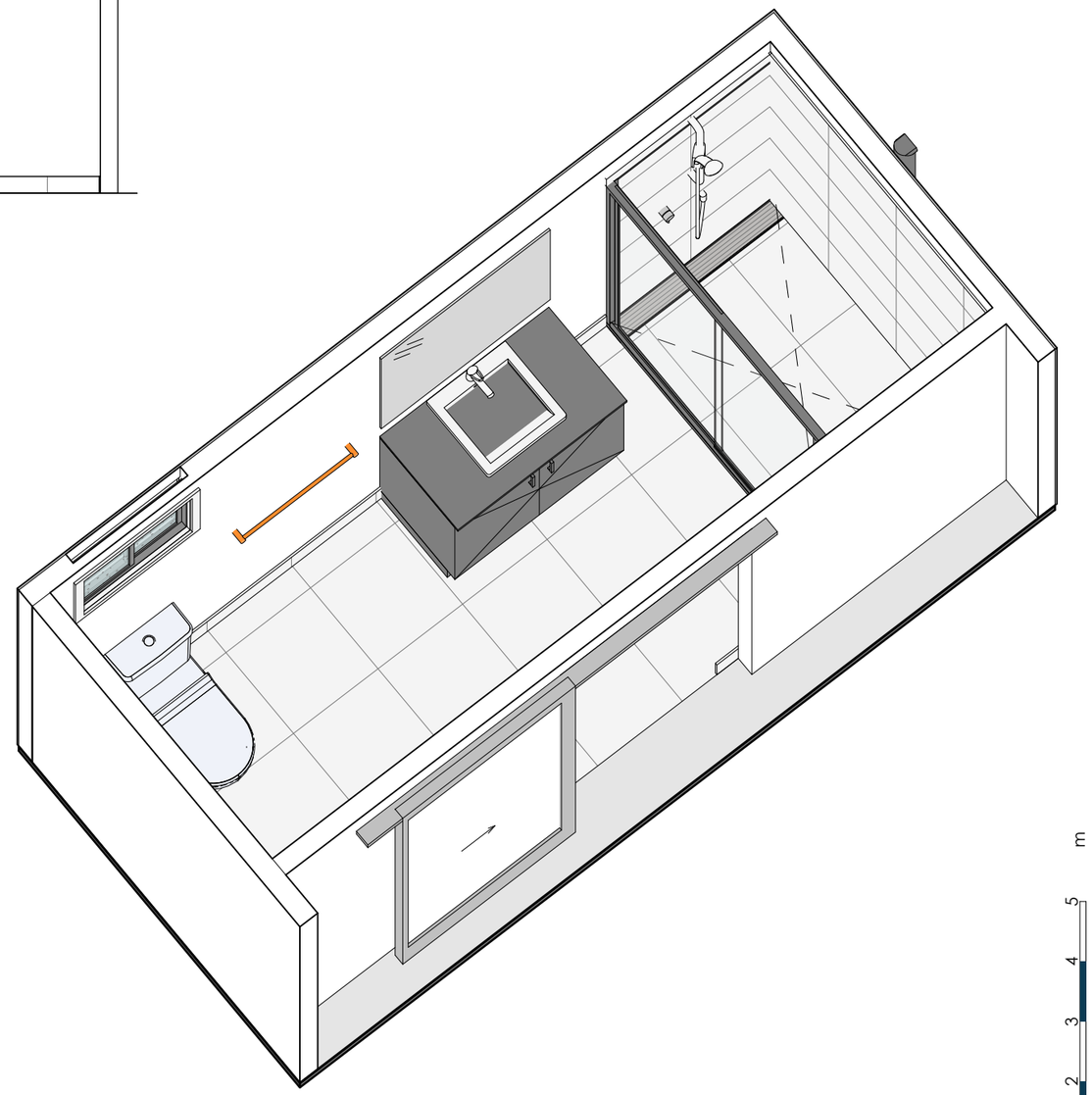
ENSUITE
1 : 50

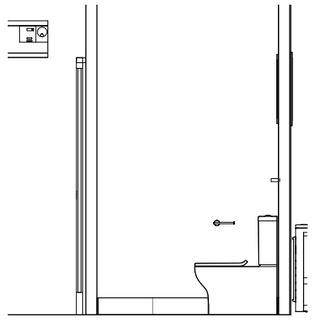


ENS' 01
1 : 50

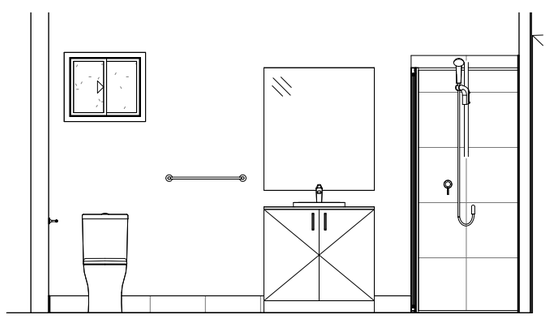


ENS' 02
1 : 50





ENS' 03
1 : 50



ENS' 04
1 : 50

1 0 1 2 3 4 5 m

SCALE 1:100 @A3

C:\Users\Robynne\Vhtdesign.com.au\HarperHouse Design - CURRENT JOB FILES\Gunya Modular Design\GUYNA#20240021 - 99 ISABELLA ST STANWELL\DRAWINGS\99 ISABELLA ST.rvt

12/20/2024 12:39:39 PM

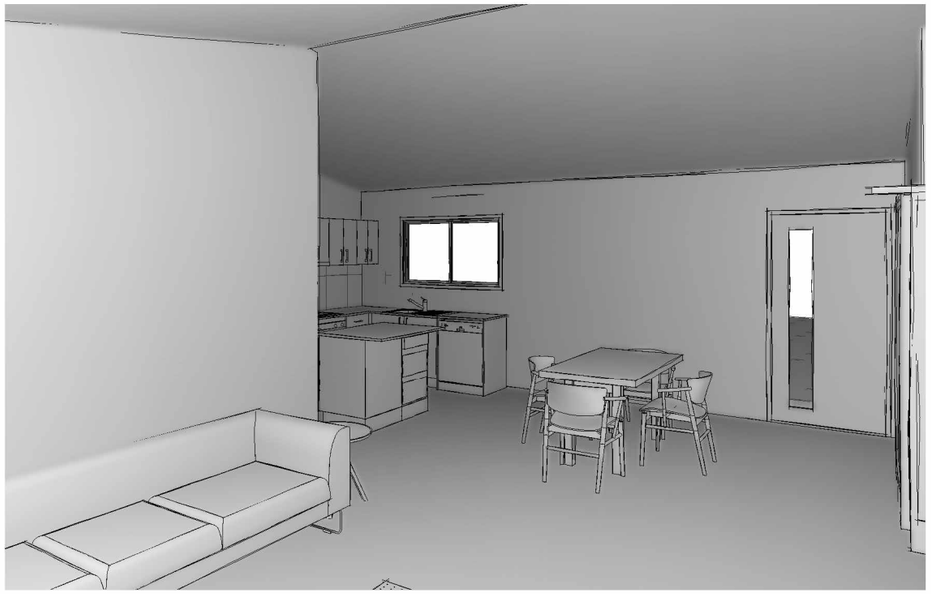
PROPERTY TITLE :	LOT
WIND RATING :	N
SOIL TYPE :	?
SITE AREA :	0 m²

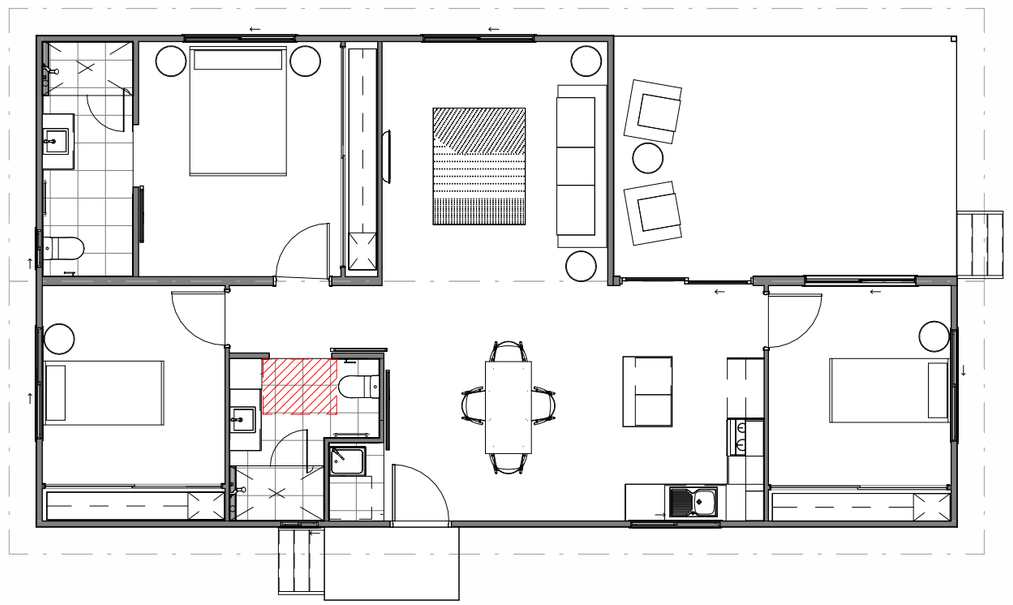
Revison	Description	Date	By
WD1	ISSUE CHECKING	20.12.2024	RM
			RM
			RM

DAN WHIDDETT
GUNYA MODULAR DESIGNS
PHONE: 0417751183

CLIENT SIGNATURE : _____ DATE : DATE
CLIENT NAME: COLIN AND CHRISTINE ROBERTS
DESIGN:
COUNCIL/SHIRE:
DRAWN BY: RM | DATE: 20.12.2024

CLIENT SIGNATURE : _____ DATE : DATE
SHEET: INTERNALS - 12.1
SHEET NO: WD1
PROJECT ADDRESS: 99 ISABELLA STREET STANWELL
PROJECT STAGE: WORKING DRAWINGS
PROJECT No: GM026





PROPERTY TITLE :	LOT	**Revison**	**Description**	**Date**	**By**
WIND RATING :	N	WD1	ISSUE CHECKING	20.12.2024	RM
SOIL TYPE :	?				RM
SITE AREA :	0 m²				RM

DAN WHIDDETT

GUNYA MODULAR DESIGNS

PHONE: 0417751183

CLIENT SIGNATURE : _____ DATE : **DATE**

CLIENT NAME: **COLIN AND CHRISTINE ROBERTS**

DESIGN:

COUNCIL/SHIRE:

DRAWN BY: **RM** | DATE: **20.12.2024**

CLIENT SIGNATURE : _____ DATE : **DATE**

SHEET: **FLOOR PLAN**

SHEET NO: **M 3.0**

PROJECT ADDRESS: **99 ISABELLA STREET STANWELL**

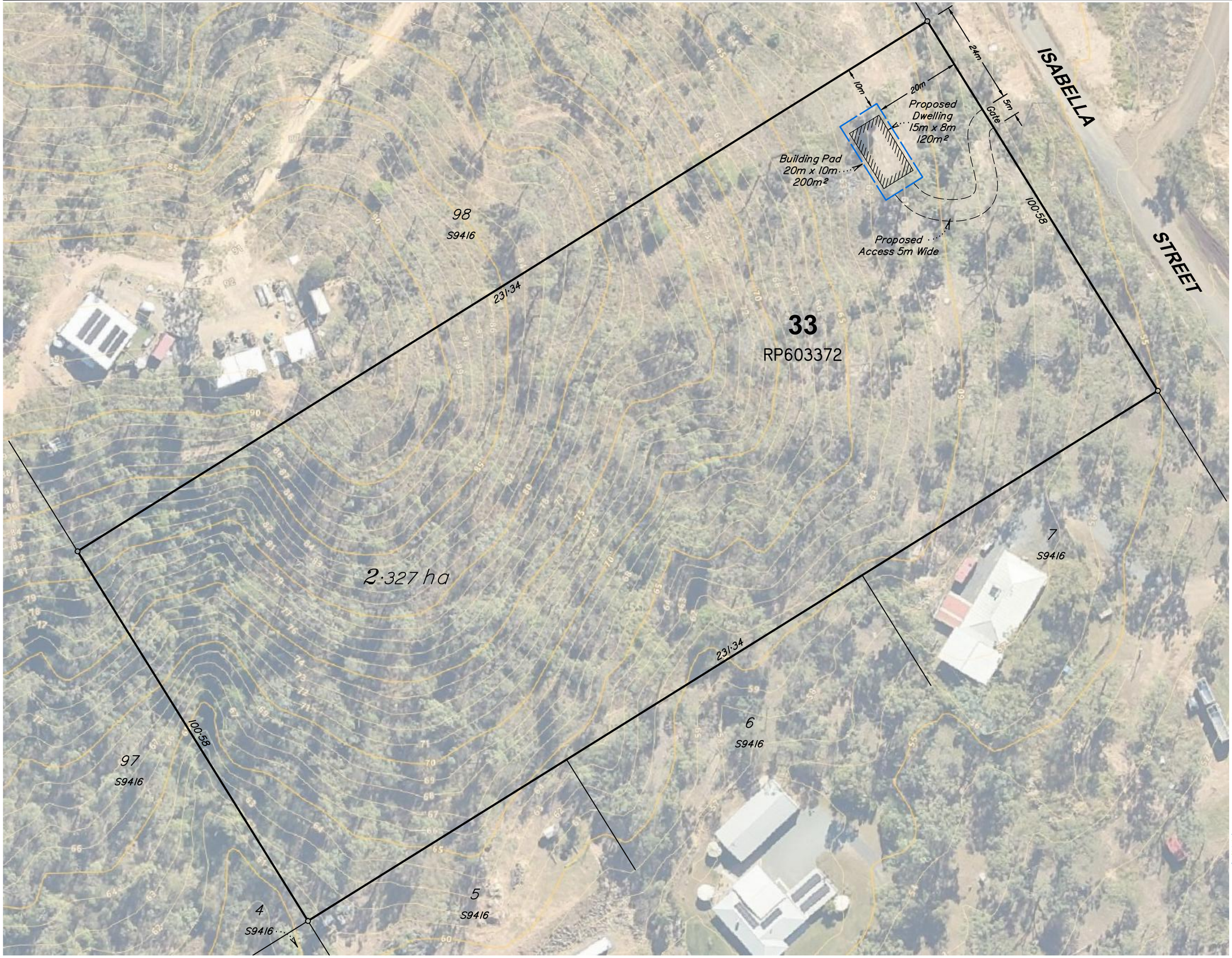
PROJECT STAGE: **MARKETING**

PROJECT No: **GM026**

WD1

SCALE 1: 100 @A3

1 0 1 2 3 4 5 m



IMPORTANT NOTE

This plan was prepared to accompany an application to Rockhampton Regional Council and should not be used for any other purpose.

The dimensions and areas shown hereon are subject to field survey and also to the requirements of council and any other authority which may have requirements under any relevant legislation.

In particular, no reliance should be placed on the information on this plan for any financial dealings involving the land.

This note is an integral part of this plan.

client

C. & C. Roberts

project

99 Isabella Street, Stanwell

plan of

Material Change of Use

Proposed Dwelling House (With QLD Globe Underlay)

rpd

Lot 99 on S9416

lga

Rockhampton Regional Council

issue	date	details	authorised
A	11-02-2025	Initial Issue	RJKF
-	-	-	-

created

capricornsurveygroupcq
SURVEYING & PLANNING SOLUTIONS
07 4927 5199 | reception@cgcq.com.au | 132 Victoria Parade, Rockhampton QLD 4700

scale: **1:800 @ A3**

datum: **AHD 1m Cont (LiDAR)**

sheet no.: **1 of 1**

cad file: **9559-01-MCU-A**

plan no.: **9559-01-MCU**

issue: **A**

BAL - Bushfire Attack Level Assessment

99 Isabella Street Stanwell

Lot 99 on S9416

Rockhampton Regional Council, Qld

Prepared by:

Wollemi Eco-Logical
PO BOX 123
WAMURAN QLD 4512

Prepared for:

John Roberts

Project Reference: **24532**

Version / Date: **15 December 2024**

Author: **Scott Edwards**

Proviso

This report has been prepared for the sole use of John Roberts for the purposes for which it is provided. No part of this report, its attachments or appendices may be reproduced or distributed to third parties, not connected with the delivery of the purpose, by or on behalf of the client, without the express written consent of Wollemi Eco-Logical.

Introduction

Wollemi Eco-Logical has been engaged to undertake a Bushfire Attack Level (BAL) assessment, consistent with the Australian Standard – *Construction of Buildings in Bushfire Prone Areas* (AS3959:2018), for the construction of a residential dwelling on the subject site.

This assessment is based on the classification of potentially hazardous vegetation, slope and separation distances to the proposed development, and informs the required construction standards to be applied.

Subject Site

The subject site is located at 99 Isabella Street Stanwell and is formally described as Lot 99 on S9416. The subject site covers an area of 23,270sqm, and is represented in **Figure 1.**

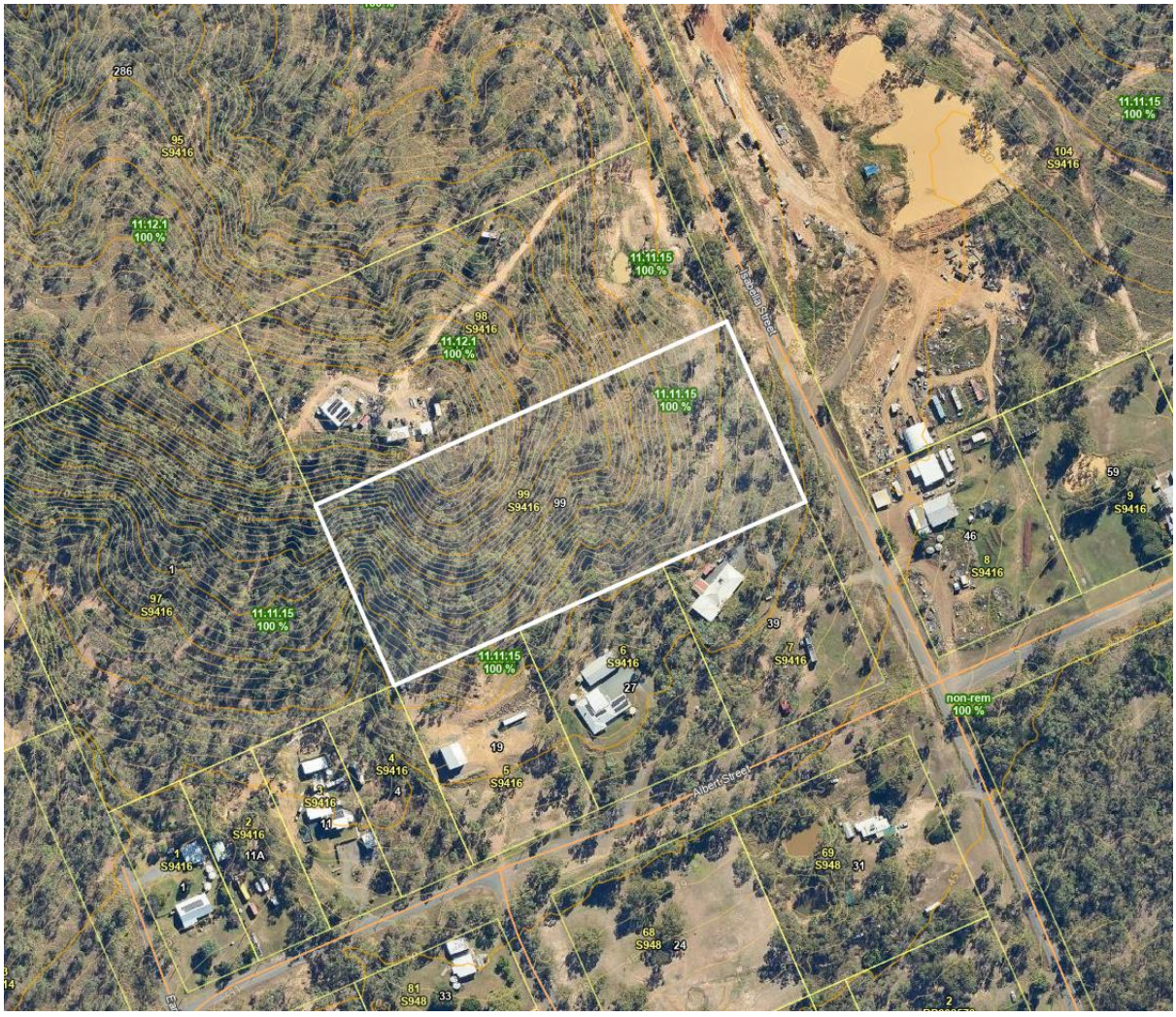


Figure 1: Subject Site

Proposed Development

It is understood a residential dwelling is proposed to be constructed on the subject site. The proposed development layout is provided in **Figure 2**, and is located in the northeast corner of the site.

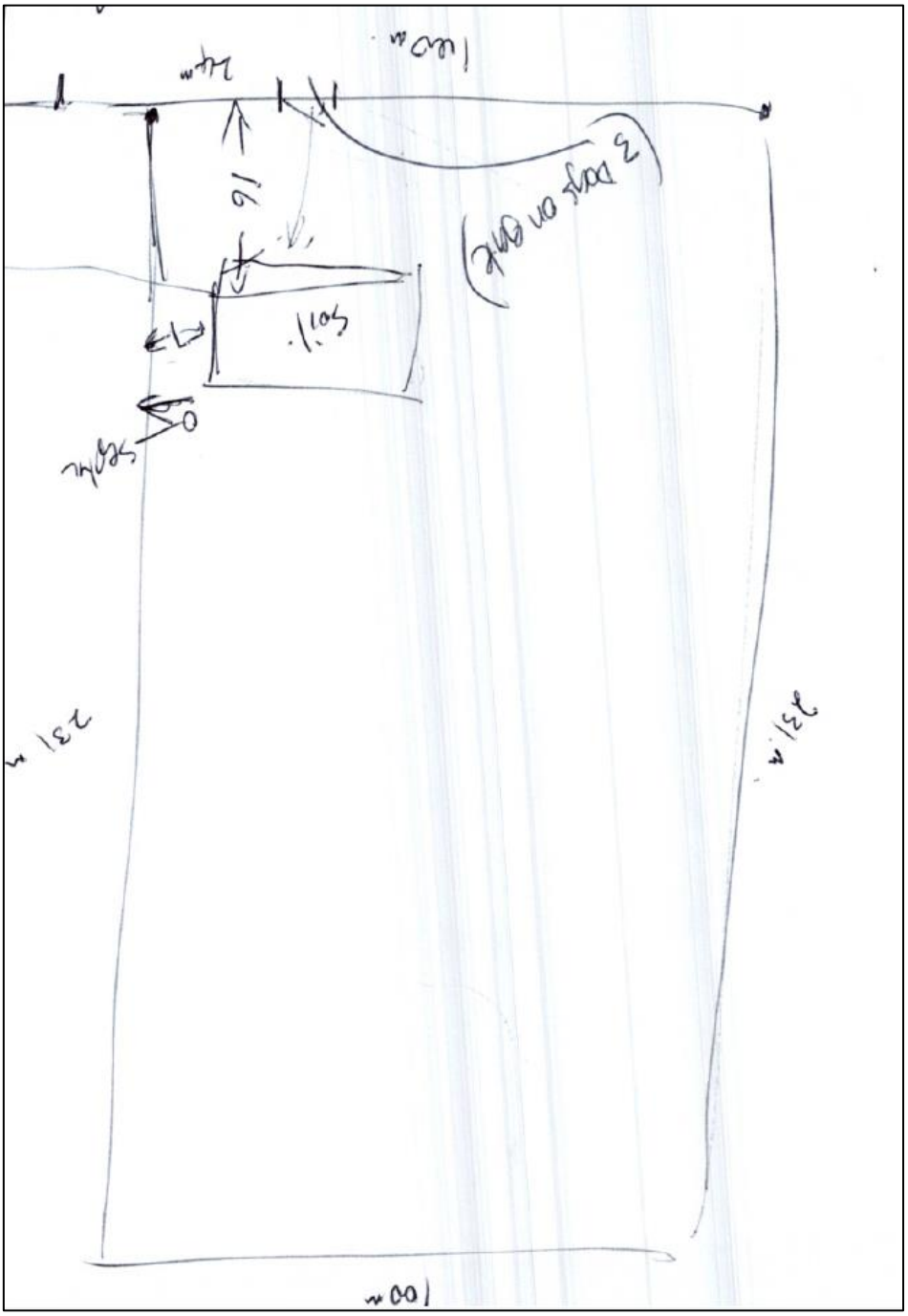


Figure 2: Proposed Development

Current Bushfire Hazard Mapping

A review of State Bushfire Hazard Overlay Mapping, as maintained by the Department of State Development, Infrastructure, Local Government & Planning (DSDILGP), revealed the site is within a potential bushfire hazard area (**Figure 3**).

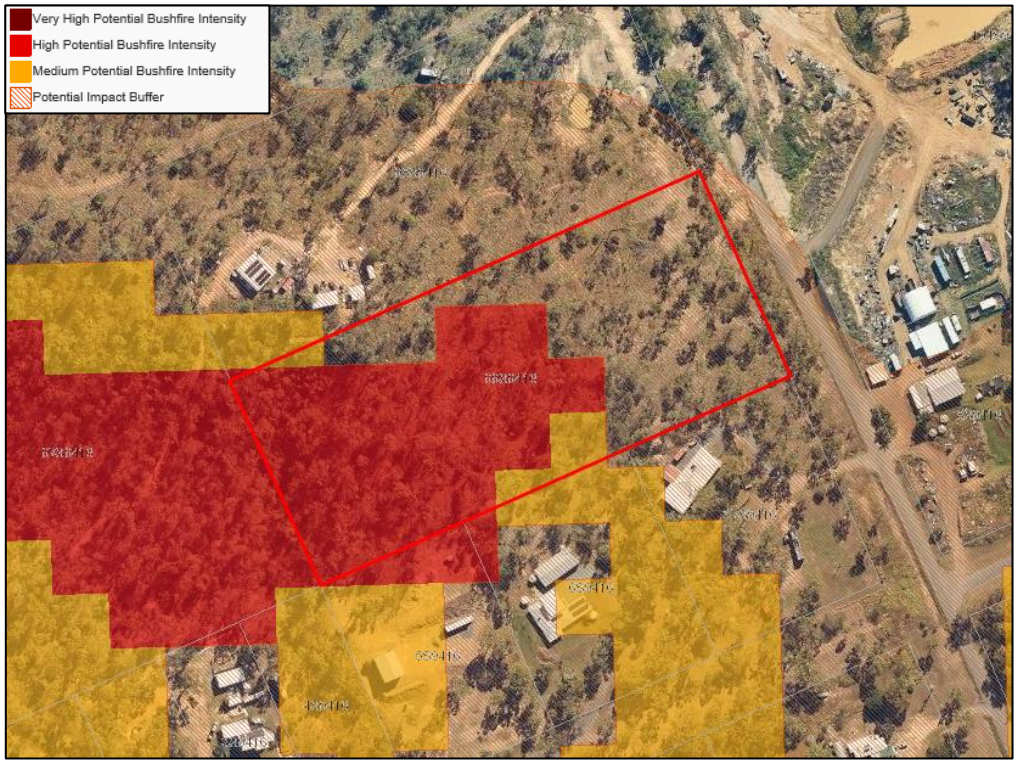


Figure 3: Bushfire Hazard Overlay Mapping

Potentially Hazardous Vegetation

As represented in **Figure 1,** assessable vegetation within 100m of the proposed development is limited to that from the southwest. This vegetation consists of a fragmented Eucalypt woodland community.

The site and all other directions to the northwest through east to south, contain scattered trees associated with predominantly managed or modified rural residential land uses, with no other assessable vegetation observed within 100m. Subsequently, vegetation creating a potential Bushfire Hazard to the proposed development is limited to that from the southwest, and this vegetation forms the basis of the following BAL determination.

Bushfire Attack Level Assessment

The Building Code of Australia (BCA) requires all Class 1-3 and Class 10a buildings associated with a dwelling, to be constructed in accordance with the Australian Standard 3959 (2018) - *Construction of buildings in bushfire-prone areas* (AS3959:2018). This standard provides minimum construction standards for new dwellings in designated Bushfire Prone Areas.

The construction standards are intended to improve the performance of buildings subjected to burning debris, radiant heat or flame contact. The AS3959:2018 methodology prescribes Bushfire Attack Levels (BAL's) to the facades of proposed buildings to which corresponding construction safety standards are applied. AS3959:2018 defines Bushfire Attack Levels as:

> *'A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per*

metre squared, which is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.'

In accordance with the Australian Standard – *Construction of Buildings in Bushfire-prone Areas* (AS 3959, 2018), an assessment of the required construction standards for the proposed development has been undertaken based on the potential Bushfire Hazard to the southwest (**Table 1**).

This assessment has been based on the following assumptions:

- A Fire Danger Index (FDI) of 40 (AS3959:2018);
- Proposed development will be located in the layout as represented in **Figure 2**.
- Adjacent assessable vegetation community to the southwest has been classified as Woodland as per the AS3959:2018;
- Slope under potentially hazardous vegetation is upslope relative to the proposed development location.
- Setback of the proposed development to potentially hazardous vegetation are understood to be maintained at >20m in all directions.

Table 1 - Determination of Site BAL – Potentially Hazardous Vegetation to the Southwest

Vegetation Classification	Bushfire Attack Levels (BALs) – FDI 40 (AS3959- 2018)				
	BAL – FZ	BAL – 40	BAL – 29	BAL – 19	BAL – 12.5
	Distance (m) of the site from the predominant vegetation class				
	All Upslopes and Flat Land				
B. Woodland	<6	6-<9	9- <13	13-<19	19<100

Result

In accordance with AS3959:2018, the required Bushfire Attack Level for the proposed development on the subject site has been determined. Based on this assessment, the proposed development is potentially subject to a Bushfire Attack Level (BAL) of 12.5, and **BAL-12.5** Construction Standards should be applied. Refer to Sections 3 & 5 in the Australian Standard – Construction of Buildings in Bushfire-prone Areas (AS3959:2018).

The nominated construction standards should be reviewed by an experienced consultant/designer at the time of detailed building design. Should the proposed site layout or vegetation setbacks identified above change, this may alter the determination of the required BAL.

N.B. It is important to note that this report is not to be considered approval to undertake vegetation clearing to achieve the above identified BAL ratings. Vegetation clearing will require approval from Council prior to being undertaken, unless existing approvals or exemptions are applicable.

Important Note:

It should be noted that this Bushfire Attack Level Assessment (BAL) has been determined based on site conditions at the time of writing, the identified setbacks being achieved, and utilising current best-practice assessment methodologies as detailed. These methodologies are not able to factor in and predict catastrophic bushfire events. Bushfires are intrinsically unpredictable, and no guarantee is able to be provided or should be assumed that the area will not be affected by bushfire at some time.

Bushfires are an intrinsic part of Australia's environment, are often unpredictable, and have potentially extremely serious consequences. Regardless of the results of this assessment, owners should be aware of the unpredictability of Bushfire in the landscape, and the need to be bushfire aware and prepared for extreme events.

All Queenslanders should be familiar with the official Bushfire Warnings system and have a completed Bushfire Survival Plan. Print ready guides for preparing a Bushfire Survival Plan and to assist in the interpretation of the official Bushfire Warnings system are available for download from the Rural Fire Service Queensland website – https://ruralfire.qld.gov.au/bushfires/.

There are three formal Bushfire Warning levels:

Advice

Monitor conditions and review your bushfire survival plan.

Watch and act

Conditions are changing. Start taking action and follow your bushfire survival plan.

Emergency Warnings

You are in danger. Act on your bushfire survival plan now.

CQ SOIL TESTING

AS1547 Wastewater Design

SITE ADDRESS:	Lot 2 (SP141828) 99 Isabella Street, Stanwell
Prepared for:	J Roberts
Job Number:	CQ26768
Issue Date:	22/11/2024

Certified System OHS ISO 45001 SAI GLOBAL
Certified System Environment ISO 14001 SAI GLOBAL
Certified System Quality ISO 9001 SAI GLOBAL

SUMMARY OF RECOMMENDATIONS

Treatment
All-Waste Septic Tank (3000 litre minimum)
With serviceable filter

Disposal Mechanism
One (1) Evapotranspiration/Absorption Bed
2.0 metres x 18.5 metres – Total Area 37 sqm

CQ SOIL TESTING technical excellence

ABN 87 656 845 448
QBCC License 15 305 465

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Client & Document Information

Client:	J Roberts
Project:	Lot 2 (SP141828)
	99 Isabella Street, Stanwell
Investigation Type:	**Wastewater Investigation**
Job Number:	CQ26768
Date of Issue:	22/11/2024

Contact Information

CQ SOIL TESTING
ABN 87 656 845 448

PO Box 9654
PARK AVENUE QLD 4701

Telephone: (07) 4936 1163
Facsimile: (07) 4936 1162

Email: info@cqsoiltesting.com.au

Document Control

Version	Concept By	Design Drawings	Design Review	Issue Approved By	Date
A	James Rider	C Tindoc	S Walton	S Walton	22/11/2024

1. INTRODUCTION

The purpose of this report is to evaluate and define a suitable on-site sewerage treatment and disposal system for household effluents in accordance with Australian Standard 1547 "On-site domestic-wastewater management". The Queensland Plumbing and Wastewater Code has been used for reference purposes during the compiling of this report.

The field investigation was carried out on the 15th November 2024. This report relates exclusively to the proposed dwelling at the site identified on Page 1 of this report. This document has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

2. SITE DESCRIPTION AND SUPPLIED INFORMATION

2.1 Allotment and Effluent Disposal Site

- ***The landholder was interviewed. All information included in this report relating to the dwelling size, water source, fixtures etc have been provided by the landholder or the landholders representative.***

- ***The landholder shall read and understand all aspects of this design. CQ Soil Testing may carry out amendments to this design if requested, additional fees shall apply.***

- ***The landholder is to liaise with neighbouring properties regarding the presence of discrete/unregistered bores that may exist/be proposed on adjacent allotments prior to system installation.***

- The site is a rural allotment located at 99 Isabella Street, Stanwell (an unsealed road).
- The slope configuration in relation to surface drainage is linear planar.
- The proposed effluent disposal area falls toward the southeast and is considered to have fair drainage.
- The soil surface condition was dry at the time of testing.
- There was no evidence of cracking of the surface during the investigation.
- There were no visible boulders on the surface of the allotment.
- There were no rock outcrops evident.
- There was no watercourse, bore, well, or dam evident within 50 m of the proposed disposal area at the time of this investigation.
- The proposed effluent disposal area is exposed to sun and wind.
- The proposed disposal site is an existing grassed area.
- Surface water will drain toward the southeast.
- Surface water drainage from adjoining allotments may traverse this site.
- The weather conditions prior to testing were periods of moist conditions.
- The site is not a known flood area.

2.1 Dwelling and Fixtures

- The dwelling type is single storey - 2 bedroom.
  (3 equivalent persons – AS 1547:2012 Appendix J)
- The water source is tank and bore supply.
  (150 litre/person/day – AS 1547:2012 Appendix H)
- Standard water reducing fixtures ***are to be*** used throughout the dwelling.
- A spa bath ***is not*** proposed to be installed.
- A food waste disposal unit ***is not*** proposed to be installed.

3. SOIL PROFILE

The borelogs carried out at the site (refer attached Site Plan for localities) indicate that the soil profile typically consists of silty clay. Soil logs are detailed in this report.

Groundwater was not encountered during the field investigation.
Weathered rock was not encountered during the field investigation.

Table 1 - Determination of Soil Category

Soil Category BH2	Soil Texture	Structure	Indicative Permeability	Indicative Drainage Class
5 (00-1500 mm)	Light Clay	Strongly Structured	0.12 – 0.5 m/day	Poorly Drained

Table 2 – Permeability test results and conclusions

Test No.	Soil Permeability	Test hole depth	Recommended Design Loading Rate
PT 1	0.31	500 mm	
Average	**0.31**		**8 (mm/day)**

Permeability testing aids in the design of an "On-site domestic–wastewater management system". CQ Soil Testing carries out a permeability testing in accordance with Appendix 4.1F of the Australian Standard 1547.

Whilst every effort has been made to ensure that the borelogs carried out at the subject allotment are indicative of the soil profile over the site any discrepancy between the profile detailed in the borelogs and that observed during construction shall be referred to CQ Soil Testing for immediate attention.

4. INVESTIGATION DETAILS

The investigation carried out at the site included machine augured boreholes up to 1500 mm depth and a series of permeability test pits (see Appendix 4). These test pits are located in the proposed effluent disposal area as shown on the attached site report. The Queensland Plumbing and Wastewater Code and AS 1547 suggests that the use of a primary-treated effluent disposal system will be satisfactory provided:

- Sufficient permeable surface soil overlying rock is present over the disposal area, not less than 1.2 metres depth.
- A suitable soil category material (as per AS 1547) and minimum required depth is encountered.
- A minimum set-back distance of 50m is obtained.
- Acceptable permeability rates are obtained.

All the above requirements have been met, therefore it is concluded that the use of a primary-treated effluent septic system is acceptable.

5. FINDINGS AND RECOMMENDATIONS

- All work must be carried out by a licensed plumber or drainer.
- All pipework shall be installed in accordance with AS3500.2.2, National Plumbing and Drainage, Part 2.2, Sanitary Plumbing and Drainage.
- The Design Loading Rate of 8 mm/day has been adopted.
- A 100% reserve effluent disposal area can be obtained on this allotment and shall be kept clear of development for possible future expansion.

5.1. Treatment

- Septic Tank – 3000 Litre minimum to be installed.
- The local authority may require the installation of a grease trap.
- The septic tank shall be de-sludged and pumped out at a maximum interval of 5 years.
- A Septic Tank Filter shall be installed between the septic tank and the disposal area. Regular maintenance of the filter shall be undertaken, normally 3 monthly.

5.2. Disposal

- For the purpose of calculating evaporation, the long term average monthly pan evaporation and rainfall figures from the Bureau of Meteorology weather station at Rockhampton have been adopted. Water Balance and design calculations are appended.
- All wastewater shall be disposed of by Evapotranspiration/Absorption.
- The land application facility shall be by evapotranspiration-absorption bed/s with a total minimum area of **37 sqm**.
- A diversion mound shall be constructed above/around the disposal area to divert overland water flows.
- Effluent shall be distributed evenly throughout the bed/s via the use of a distribution chamber or equivalent system.
- The beds shall be 2.0 m in width and 18.5 m in length. One (1) are required.
- The beds shall be installed level and across the natural contour of the land.
- The finished surface shall shed water.
- Detailed design drawings are attached to this report.
- The disposal area has been calculated on a daily all-waste flow rate of 450 litres/day, (2 bedroom/3 people each using 150 litres per day) and a design load rate of 8 mm/day. This flow rate will accommodate all-waste flows from the proposed two bedroom residence using Standard Water-Reducing Devices, which include using a dual flush 6/3 litre water closet (maximum), shower flow restrictors, aerated faucets and a water conserving washing machine.
- The disposal area should be located in the vicinity of BH1, BH2 & BH3 and as per attached site plan.
- All set-back distances as required by the local authority shall be met.
- Stormwater run-off including roofwater from buildings shall be diverted around and away from the disposal area. Imported fill may be required should there be insufficient soil available for the design of the disposal system.

5.3. Setback Distances

Table 3 - Setback distances for subsurface land application area for greywater treatment plant or an on-site sewage treatment plant (QLD Plumbing & Wastewater Code Version 1:2019)

Feature	Horizontal separation distance ①		
	Up slope	Down slope	Level
Property boundaries, pedestrian paths, walkways, recreation areas, retaining wall, and footings for buildings and other structures.	2	4	2
Inground swimming pools	6	6	6
Inground potable water *tank* not exposed to primary effluent	6	6	6
Inground potable water *tank* exposed to primary effluent	15	15	15

① Distances are given in metres and are measured from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature

Table 4- Setback distances for on-site sewage facilities and greywater use facilities – Protection of surface water and groundwater (QLD Plumbing & Wastewater Code Version 1:2019)

Feature	Separation distance ①		
For onsite – see Table 2.1 in AS 1546.3	**Advanced Secondary**	**Secondary**	**Primary**
For *greywater* – see Table 2.1 in AS 1546.4	**Level 1 and Level 2**	**Level 3**	**Untreated**
Top of bank of permanent water course	10	30	50
Top of bank of intermittent water course			
Top of bank of a lake, bay, or estuary			
Open stormwater drainage channel or drain			
Bore or a dam			
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

① Distances are given in metres and are measured from the edge of the irrigated wetted area to any point of the feature
② Note: Primary effluent typically has a (BOD^5) (Biochemical Oxygen Demand) of between 120 – 240 mg/L and Total Suspended Solids of between 65 – 180 mg/L.

5.4. Vegetation and signage

- Water tolerant vegetation shall be planted to maximize evapotranspiration and shall be carefully chosen. See vegetation specified in AS 1547:2012 "Disposal Systems for Effluent from Domestic Premises (Appendix C)". CQ Soil Testing recommends consultation with local nurseries for selection/density of plantings.
- At least two signs stating "Recycled water – Do Not Drink" are to be erected on boundaries.

- The presence of buried pipes shall:

  (a) Be indicated e.g. using underground marking tape to AS/NZS 2648.1; OR
  (b) Be indicated by signage. Signs shall be prominently displayed with the words:

  "Sewage effluent pipework installed below. DO NOT DIG."

5.5. Greywater

Surface irrigation of greywater directly (without treatment) from the dwelling's washing machine is permissible. CQ Soil Testing recommends the surface irrigation of greywater. The washing machine shall be connected to a flexible hose with the hose distributing greywater to the landholder's garden/lawn. Provide an air admittance valve and suspend drainage (per AS/NZS 3500) to a rigid, fixed position external to building and reduce to a flexible hose fitting (minimum diam. 32 mm). Greywater should be used with care and used responsibly - Avoid:

- *Ponding of water.*
- *Run-off to neighbouring properties.*
- *Causing an odour.*

When using greywater:

- Choose laundry detergents with low phosphorus, sodium and nitrogen content.
- Take care not to keep watering the same spot - it can affect soil and can cause plants to die.
- Be careful when using on native plants and do not use on edible parts of vegetables or fruits.
- Make sure it does not enter swimming pools or flow into neighbouring properties.
- Avoid ponding, bad smells or damage to plants by restricting use or moving the outlet.
- Keep away from children's play areas and the footings of buildings.

6. CERTIFICATION

The local authority may request that an inspection and certification is to be undertaken on the installation of the system when nearing completion. CQ Testing is qualified to undertake this task and issue the appropriate Form 8 **(additional fees apply)**. If certification is required, the installer must:

- Contact CQ Soil Testing prior to "burying" the system to arrange an inspection.
- Must photograph the entire installation process and supply to CQ Soil Testing.
- Supply to CQ Soil Testing a Form 8 signed by the licensed installer.

Yours faithfully

SCOTT WALTON
Laboratory Manager

Soil Logs

BOREHOLE 1		
Depth (m)	**Visual Class'n Symbol**	**Visual Description of Material**
0.0 1.5	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST. ***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Soil Logs

BOREHOLE 2		
Depth (m)	**Visual Class'n Symbol**	**Visual Description of Material**
0.0 1.5	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST. ***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Soil Logs

BOREHOLE 3

Depth (m)	Visual Class'n Symbol	Visual Description of Material
0.0	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST.
1.5		***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Photographs

Figure 1 Disposal Area

Figure 2 Disposal Area

APPENDIX 1 - NOTES

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.
2. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware however, that exploration is limited by time available and economic restraints. In some cases, soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.
3. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.
4. This report may not be reproduced except in full, and only then with the permission of the entity trading as CQ Soil Testing. The information and site sketch shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.
5. All information contained within this report is the intellectual property of the entity trading as CQ Soil testing. All information contained with can only be used for the express purposes of the commissioned scope of works.
6. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show approximate location of field tests only.
7. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted at that person assuming the responsibility for the long-term performance of the system.
8. The following documents are available from various sources and shall be read and adhered to in relation to this site:

   AS/NZS 1547:2012 - On-site domestic wastewater management
   https://www.standards.org.au/standards-catalogue/sa-snz/waterandwasteservices/ws-013
   AS/NZS 1546.1 - On-site domestic wastewater treatment units - Septic tanks
   http://www.standards.com.au/
   AS/NZS 1546.2 - On-site domestic wastewater treatment units - Waterless composting toilets
   http://www.standards.com.au/
   AS/NZS 1546.3 - On-site domestic wastewater treatment units -Aerated wastewater treatment systems
   http://www.standards.com.au/
   Queensland Plumbing and Wastewater Code
   https://www.hpw.qld.gov.au/__data/assets/pdf_file/0019/3943/queenslandplumbingandwastewatercode_26march2019.pdf
   Standard Sewerage Law
   http://www.legislation.qld.gov.au/LEGISLTN/SLS/1998/98SL099.pdf

Periodically during the course of your trench, ETA bed or irrigation areas life span it will most likely require maintenance such as deep scarification to promote the uptake, and transmission of effluent. This can also be achieved via deeper drilling, rotary hoe or excavator tines.

The Land Application Area designed by CQ Soil Testing is in accordance with the relevant Australian Standards to provide the most economical solution. Generally, this initial installation will be sufficient to successfully handle the load from the dwelling and/or building. Occasionally, however, all of the effluent is not absorbed or transpired due to reasons such as:

- diversion drains are not effective and stormwater enters the Land Application area.
- plants used for the aid of transpiration have not reached maturity resulting in less than optimum transpiration.
- water conservation is not being practiced within the household or building.
- soils can vary significantly over short distances resulting in significant variations in absorption characteristics.

APPENDIX 2 MAINTAINING YOUR SEPTIC SYSTEM

The following tips will help you to save money, reduce pollution and conserve resources:

Remove accumulated sludge from the tank:

- Generally, septic tanks require periodic cleaning or pumping out of accumulated solids every 4 years. If solids are allowed to build up in the tank to a point where they pass to the effluent treatment stage they can cause problems.
- Household pipes may become filled with sewage and the subsoil soil trench system could soon become clogged with solids. This may cause the effluent to come to the surface, pool and cause unpleasant smells. This can constitute a risk to public health, particularly to children playing in the vicinity.

Minimise or manage the volume of water entering the system to improve the lifespan and operation of the absorption trench:

- Regularly check plumbing fixtures for leaking taps or toilets cisterns. Have them repaired. Ensure water from roof downpipes does not enter the system and roof water is diverted away from the effluent disposal area.
- Install water saving devices such as shower heads that minimise water use and dual flush toilet cisterns.
- If the terrain slopes down to your absorption trench ensure that surface water is diverted around the soakage area by installing a stormwater diversion trench.
- Spread large washing loads over several days to minimise the impact on your septic tank system. Plan your water usage so that large flows to the system in a short time are avoided, for example, operate the dishwasher and washing machine at separate times.

Ensure the system can be readily accessed for maintenance:

If you own a house built prior to March 1995 and your tank is difficult to access for maintenance, you may consider installing an approved access shaft to minimise future maintenance difficulties.
Do not construct driveways, buildings or paved areas over the septic and soakage system as this may result in damage to the system and access problems when the tank requires pumping out at a later date.

Use household detergents and bleaches sensibly:

The normal use of household detergents and bleaches is considered satisfactory. If in doubt about any household product suitability, consult the product manufacturer.

Don't use the system for the disposal of chemicals:

Don't dispose of medicines or strong chemicals such as pesticides and paints into the septic system. This can cause the septic tank to malfunction and may pollute groundwater.

Protect the septic tank and disposal area from damage:

If the tank and disposal area are exposed to vehicle traffic use a barrier or other means to prevent vehicles driving over the tank and soakage as this could cause damage and result in costly repairs.

Prevent mosquito breeding:

Ensure that all vents associated with the system are fitted with mosquito proof mesh and access openings are correctly sealed.

After a number of years of use, some soakage systems may fail and require replacement. The first signs of this can be soggy patches on the surface in the area where the soakage trenches are located. This can be accompanied by strong odours and blocked pipes. This can constitute a health risk and advice should be sought from a registered plumber to confirm the cause. If the trench requires replacement or the system needs to be altered in any way, the local council Environmental Health Officer should be consulted. A malfunctioning effluent disposal system can constitute a risk to public health and in some cases result in action being taken by the relevant authority.

Note: Odours may occur on initial use of the system. If this becomes a problem consult your local council or the Department of Health.

Table 3 – Water Balance Calculations

EVAPO-TRANSPIRATION ABSORPTION

SITE DATA			***DESIGN DATA*** (AS1547:2000)			***DESIGN FLOWS*** (AS1547:2000)		
Soil Category:	5		Retension Rate:	0.5		No. Bedrooms:	2	
Soil Texture:	Light Clay		Evapotranspiration Factor:	0.75		Flow Rate per Person:	150 ltr/day	(A4.2D)
Soil Structure:	Strong		Design Loading Rate:	8 mm/day	(T4.2A2)	No. of persons:	3	(T4.3A1)
Measured Permeability:	0.31	m/day	Indicative Permeability:	0.12-0.5 mm/day	(T4.2A2)	Black Water Factor:	1.00	
						Daly Flow Rate (Total):	450.0 ltr/day	

http://www.bom.gov.au/climate/averages/tables/cw_039123_All.shtml

AREA CALCULATION

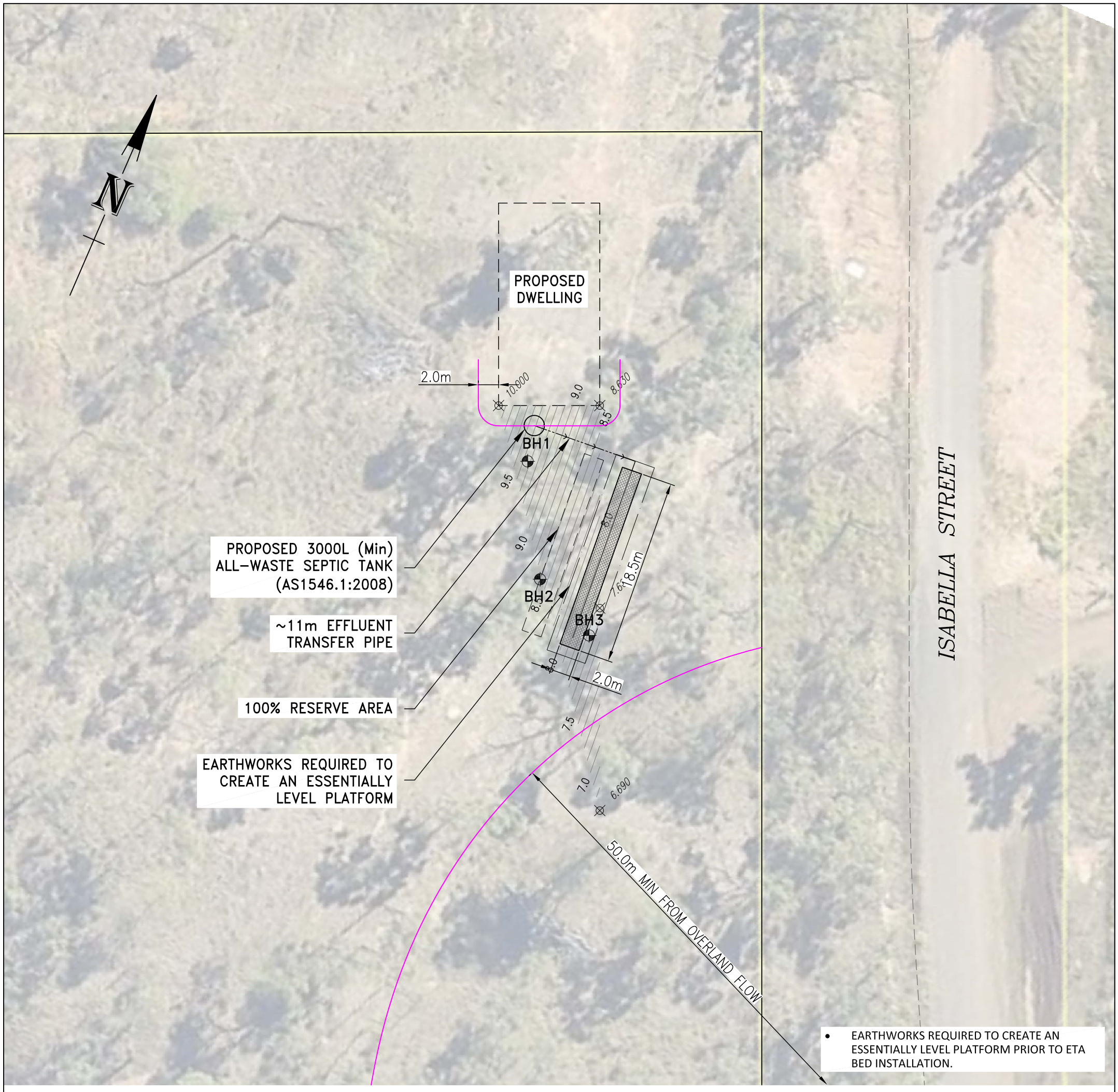
	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Sum	Ave
Days	31	28	31	30	31	30	31	31	30	31	30	31		
Mean rainfall (mm)	129.8	144	104.7	43	45.3	37.8	31.8	27.1	24.5	49.5	66.3	104.3	808.1	67.3
Retained Rainfall (mm)	64.9	72.0	52.4	21.5	22.7	18.9	15.9	13.6	12.3	24.8	33.2	52.2	404.1	33.7
Pan Evaporation	198.4	165.2	167.4	135.0	105.4	90.0	96.1	108.5	129.0	167.4	180.0	195.3	1737.7	144.8
Mean daily evaporation (mm)	7.4	6.7	6.2	5.3	4.1	3.5	3.6	4.4	5.8	6.8	7.6	7.7	69.1	5.8
Evapotranspiration (mm)	229.4	187.6	192.2	159.0	127.1	105.0	111.6	136.4	174.0	210.8	228.0	238.7	2099.8	175.0
DLR per month (mm)	248.0	224.0	248.0	240.0	248.0	240.0	248.0	248.0	240.0	248.0	240.0	248.0	2920.0	243.3
Disposal Rate per month (ltr)	412.5	339.6	387.9	377.5	352.5	326.1	343.7	370.9	401.8	434.1	434.9	434.6	4615.8	384.6
Effluent per month (ltr)	13950.0	12600.0	13950.0	13500.0	13950.0	13500.0	13950.0	13950.0	13500.0	13950.0	13500.0	13950.0	164250.0	13687.5
Area (sq.m)	33.8	37.1	36.0	35.8	39.6	41.4	40.6	37.6	33.6	32.1	31.0	32.1		35.9

STORAGE CHECK

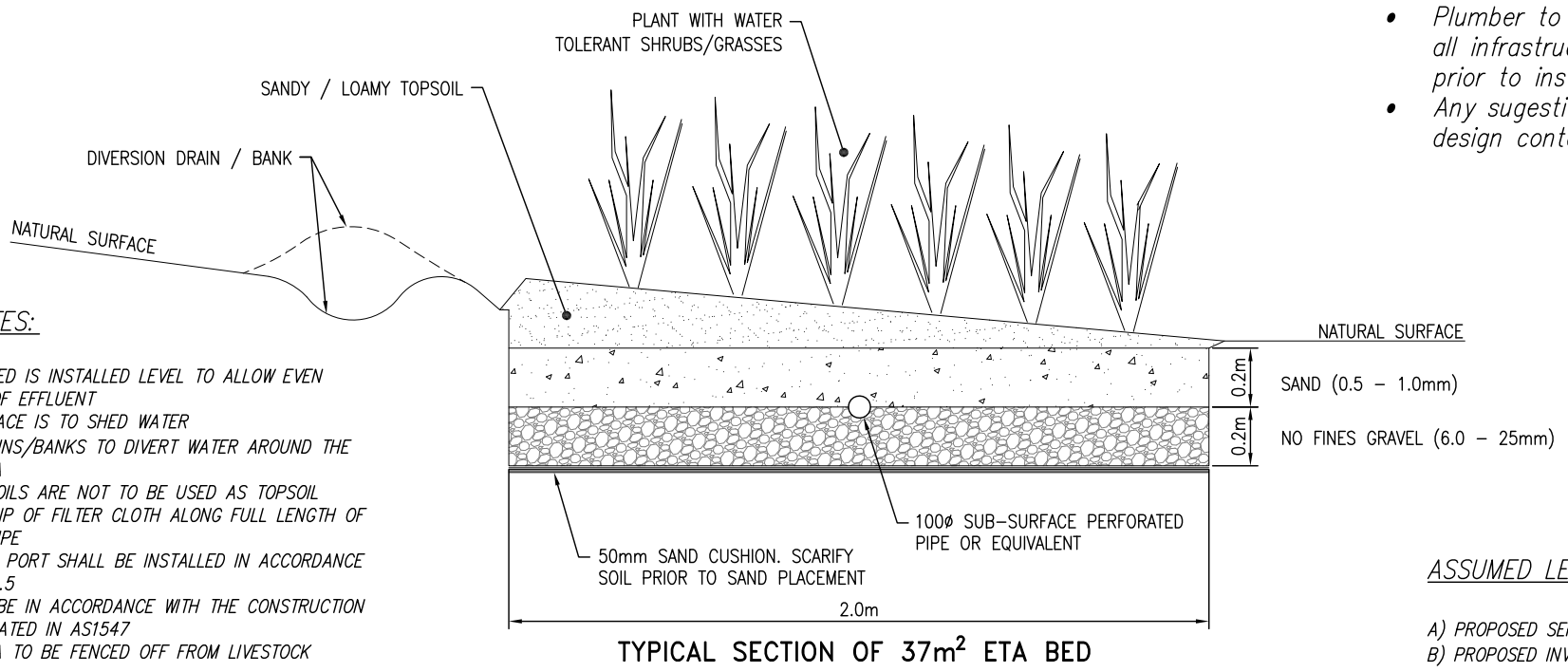
		Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Area (sq.m)	37												
Application Rate (mm)		377.0	340.5	377.0	364.9	377.0	364.9	377.0	377.0	364.9	377.0	364.9	377.0
Disposal Rate (mm)		412.5	339.6	387.9	377.5	352.5	326.1	343.7	370.9	401.8	434.1	434.9	434.6
Excess Effluent (mm)		-35.5	0.9	-10.8	-12.6	24.6	38.8	33.3	6.2	-36.9	-57.0	-70.0	-57.5
Stored Effluent Increase (mm)		-118.2	3.1	-36.1	-42.1	81.9	129.2	111.1	20.6	-123.0	-190.1	-233.3	-191.7
Effluent Depth for month (mm)		0.0	0.0	3.1	0.0	0.0	81.9	211.1	322.2	342.8	219.9	29.8	0.0
Effluent Depth Total (mm)	0	0.0	3.1	0.0	0.0	81.9	211.1	322.2	342.8	219.9	29.8	0.0	0.0

Depth of Gravel	200	mm	
Depth of Sand	200	mm	
Depth of Storage Area	400	mm	
Freeboard	50	mm	
Permitted Depth of Effluent	350	mm	

Area of ETA Bed	37	
Bed Dimensions		
No. of Beds	1	
Bed Length	18.5	m
Bed Width	2	m



- EARTHWORKS REQUIRED TO CREATE AN ESSENTIALLY LEVEL PLATFORM PRIOR TO ETA BED INSTALLATION.



TYPICAL SECTION OF 37m² ETA BED

- *Plumber to confirm suitability of all infrastructure with landholder prior to installation.*
- *Any sugestions to change the design contact CQ Soil Testing.*

SEWERAGE NOTES:

- *ENSURE THE BED IS INSTALLED LEVEL TO ALLOW EVEN DISTRIBUTION OF EFFLUENT*
- *FINISHED SURFACE IS TO SHED WATER*
- *DIVERSION DRAINS/BANKS TO DIVERT WATER AROUND THE DISPOSAL AREA*
- *CLAY BASED SOILS ARE NOT TO BE USED AS TOPSOIL*
- *0.3m WIDE STRIP OF FILTER CLOTH ALONG FULL LENGTH OF PERFORATED PIPE*
- *AN INSPECTION PORT SHALL BE INSTALLED IN ACCORDANCE WITH AS1547_4.5*
- *ALL WORK TO BE IN ACCORDANCE WITH THE CONSTRUCTION TECHNIQUES STATED IN AS1547*
- *DISPOSAL AREA TO BE FENCED OFF FROM LIVESTOCK*

ASSUMED LEVELS:

A) PROPOSED SEPTIC TANK INVERT ≈ 9.100
B) PROPOSED INVERT OF HEADER LINE ≈ 7.600

CQ SOIL TESTING
Servicing all of Central Queensland

QBCC - 15 305 465 ABN - 87 656 845 448

Phone: (07) 4936 1163
Email: info@cqsoiltesting.com.au
Website: www.cqsoiltesting.com.au

Project:
LOT 99 ISABELLA STREET
STANWELL, QLD

For:
J ROBERTS

Title: EFFLUENT DISPOSAL DESIGN

Scale:	1:400 (A3)	*Date:*	NOV '24
Sheet:	1 of 1	*Drawn:*	C.T.
Job No:	CQ26768	*Rev:*	A

CQ SOIL TESTING

AS2870 Site Classification

SITE ADDRESS:	Lot 99 (S9416) 99 Isabella Street, Stanwell
Prepared for:	J Roberts
Job Number:	CQ26768
Issue Date:	22/11/2024

ABN 87 656 845 448
QBCC License 15 305 465

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Client & Document Information

Client:	J Roberts
Project:	Lot 99 (S9416)
	99 Isabella Street, Stanwell
Investigation Type:	**Site Classification**
Job Number:	CQ26768
Date of Issue:	22/11/2024

Contact Information

CQ SOIL TESTING
ABN 87 656 845 448

PO Box 9654
PARK AVENUE QLD 4701

Telephone: (07) 4936 1163
Facsimile: (07) 4936 1162

Email: info@cqsoiltesting.com.au

Document Control

Version	Date	Author	Design Drawings	Reviewer	Reviewer Initials
A	22/11/2024	J Rider	C Tindoc	Scott Walton	SWW

QBCC Subsidence Policy

In accordance with the QBCC "Queensland Building and Construction Commission" the contractor must supply the site classifier with the information in Table 1. The contractor, or the contractor representative (CR), may require the site classifier (SC) gather all or part of this information and the SC must satisfy themselves that all of the "relevant" information has been considered.

If all of the information listed below is not supplied by the contractor or the contractor does not wish the SC to recover said information (at cost) the contractor may be in breach of the no fault provisions of the QBCC's Policy for Rectification of Building Work and may be held responsible for subsidence or settlement of a building.

Table 1

Element	Supplied/ Considered	Remarks
Property description and site address	✓	Supplied by CR
Plan and/or survey	✓	Supplied by CR
Contour of the site	✗	Nil supplied
Location of trees, vegetation etc identified	✓	Considered by SC
Location and identification of potential overland flow	✓	Considered by SC
The footprint of proposed building and platform levels	✓	Supplied by CR
Location of proposed or existing cut and fill	✗	Nil supplied
Appropriate land searches	✗	Nil supplied

The following (Table 2) is a summary of the information required under the QBCC relating specifically to the SC. Information supplied in this summary is to be read in conjunction with the entire report attached. All relevant data used to ascertain the classification is documented in the report.

Table 2

Element	Remarks
Total number of excavations	2
Minimum of two excavations in building footprint	✓
Soil samples recovered	Undisturbed
Laboratory test performed	Shrink/Swell
Predicted Surface Movement	21 - 30 mm
Expected movement potential for "P" sites in the absence of uncontrolled fill and soft soil	NA

1.0 Introduction

The purpose of this report is to classify the subject allotment in accordance with Australian Standard 2870 Residential Slabs and Footings". From this classification a footing system can be recommended by an experienced/qualified engineer (designer) to suit the proposed structure. This design shall provide adequate performance of the footings under the soil conditions determined at the site.

This site investigation has been carried out by an experienced/qualified soils technician and in accordance with *AS 2870.* CQ Soil Testing is licensed with Building Services Australia to "Classify Sites".

This report relates exclusively to the proposed new dwelling at the address stated on page one of this report and has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

2.0 Site Description

The subject site is a rural type allotment which fronts a sealed road.

The construction site is sparsely grassed and there are large trees located within and adjacent to the proposed dwelling footprint (see attached photographs). The construction site falls to the east and is considered to be well drained. Surface water will drain toward the east. Surface water from the adjoining allotments may traverse the site. A site sketch is attached to this report.

There is no evidence of fill having been placed onto the proposed construction site.

3.0 Soil Profile

Boreholes carried out at the site (refer attached site sketch for approximate localities) indicate a soil profile of silty clay which is underlain by weathered rock (see detailed logs). Tungsten carbide drill bit refusal was encountered at both locations. Laboratory testing was carried out on typical soil sample/s to assess the potential of the underlying soils to exhibit shrink/swell characteristics and any underlying moisture conditions. Details of the laboratory test results are contained in Section 4.

- Groundwater was not encountered during the site investigation.
- Weathered rock was encountered during the site investigation.

It is possible that the soil profile may vary across the site from those shown in the bore logs which were used for this site classification. CQ Soil Testing are required to be notified if different conditions are encountered during construction. No allowance has been made for any substantial earthworks on the site or importing building platform material. ***The classification provided is based on the borehole, which has the highest characteristic surface movement.***

4.0 SITE CLASSIFICATION AND TARGET STRATA

Based on the findings of the site investigation and subsequent laboratory testing, the predicted surface movement for this site is between 21 - 30 mm:

CLASS "M"
(Moderately Reactive)

in accordance with Australian Standard 2870, Residential Slabs and Footings. The above classification has not allowed for the possibility of differential surface movement as a result of differing soil types throughout the site or as a result of construction activities. It is the responsibility of the engineer to allow for this possibility in the footing design.

An indicative bearing capacity of greater than 100 kPa was encountered beyond 0.1 m. Any fill placed over the existing ground shall be piered through into the existing suitable material. Further note that the placement of reactive material as fill, or cutting of the site may change the site's classification.

Where trees exist/ed CQ Soil Testing recommends an experienced arborist be commissioned to quantify the existing size, location, predicted maximum height and type of all relevant trees to aid in the design process. It is the responsibility of the designing engineer to apply the principals of AS2870-2011 Appendix H "Guide to Design of Footings for Trees". The classification herein excludes the effect of trees on the site.

It is noteworthy that soil samples recovered from this site may be tested further to aid in the preparation of a database of Central Queensland soils currently being compiled by CQ Soil Testing. The aim of this database is to further understand the types of soils in the region and their mechanical properties.

If you should have any queries regarding this report, please do not hesitate to contact the undersigned at your convenience.

Yours faithfully

SCOTT WALTON
Laboratory Manager

Site/Soil Characteristics and Classification

A. Classification by characteristic surface movement as per AS2870-2011

Site Classification Symbols	Y's Range Value	Generalised Description (Guide Only)
'S'	0 – 20 mm	Slightly reactive clay sites which may experience only slight ground movement due to moisture changes
'M'	21 – 40 mm	Moderately reactive clay or silt sites which may experience moderate ground movement due to moisture changes
'H1'	41 – 60 mm	Highly reactive clay sites which may experience high ground movement due to moisture changes
'H2'	61 – 75 mm	Highly reactive clay sites which may experience very high ground movement due to moisture changes
'E'	>75 mm	Extremely reactive clay sites which may experience extreme ground movement due to moisture changes
'P'	N/A	Problem sites which generally have soils associated with uncontrolled fill, abnormal moisture conditions (trees), soft or collapsing soils, landslip etc...

B. Laboratory Test Results

Borehole Location	1	**Borehole Location**		**Borehole Location**	
Depth Range of Sample (m)	0.0–0.3	Depth Range of Sample (m)		Depth Range of Sample (m)	
Natural MC %	14.2	Natural MC %		Natural MC %	
% Passing 75 um Sieve	ND	% Passing 75 um Sieve		% Passing 75 um Sieve	
Liquid Limit %	ND	Liquid Limit %		Liquid Limit %	
Plastic Index %	ND	Plastic Index %		Plastic Index %	
Linear Shrinkage %	ND	Linear Shrinkage %		Linear Shrinkage %	
Shrink Swell Index	1.4	Shrink Swell Index		Shrink Swell Index	
Pocket Penetrometer kPa	ND	Pocket Penetrometer kPa		Pocket Penetrometer kPa	

C. Permeability Test Results AS1547-2012

Test Hole Number	Depth Of Test Hole	Range Tested	Permeability M/Day
NA	500 mm	250 – 500 mm	NA

Soil Logs

BOREHOLE 1		
Depth (m)	**Visual Class'n Symbol**	**Visual Description of Material**
0.0 0.4	CI	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, brown, D, VST.
0.4 0.5	GC/XW	Clayey Sandy GRAVEL, fine to coarse grained, low plasticity fines, brown, D, VD. **Weathered rock**

Tungsten carbide drill bit refusal at 0.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

DCP TEST RESULTS		
Depth (mm)	**Blows per 100 mm**	**Indicative kPa**
100	2	70
200	4	160
300	8	200
400	11	250
500	>15	>300
600		
700		
800		
900		
1000		
1100		
1200		
1300		
1400		
1500		
1600		
1700		
1800		
1900		
2000		
2100		
2200		
2300		
2400		
2500		
2600		
2700		
2800		
2900		
3000		
3100		
3200		
3300		
3400		
3500		
3600		
3700		
3800		
3900		
4000		

Soil Logs

BOREHOLE 2		
Depth (m)	**Visual Class'n Symbol**	**Visual Description of Material**
0.0 0.3	CI	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, brown, D, VST.
0.3 0.5	GC/XW	Clayey Sandy GRAVEL, fine to coarse grained, low plasticity fines, brown, D, VD. **Weathered rock**

Tungsten carbide drill bit refusal at 0.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

DCP TEST RESULTS		
Depth (mm)	**Blows per 100 mm**	**Indicative kPa**
100	2	70
200	6	180
300	5	160
400	10	250
500	>15	>300
600		
700		
800		
900		
1000		
1100		
1200		
1300		
1400		
1500		
1600		
1700		
1800		
1900		
2000		
2100		
2200		
2300		
2400		
2500		
2600		
2700		
2800		
2900		
3000		
3100		
3200		
3300		
3400		
3500		
3600		
3700		
3800		
3900		
4000		

Photographs

Image 1 – Proposed construction site

Image 2 – Proposed construction site

Limitations

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.

2. The recommendations herein may identify a target soil stratum into which the footings should be founded. The target stratum has been located by the depth in mm of the target stratum's upper horizon boundary below the existing ground surface level at the time of the site investigation. Any cutting or filling works and any surface erosion or deposits subsequent to the site investigation, will alter the measured location of the stratum relative to the surface. Where required, the author should be notified in such cases to confirm the location of the target stratum.

3. The description of the soil given in Section 3.0 of this report is intended as a brief overview of the soil's primary constituents. For a detailed classification of the soil, the reader should refer to the Soil Profile Reports and/or Borehole Reports.

4. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware however, that exploration is limited by time available and economic restraints. In some cases soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.

5. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.

6. This report may not be reproduced except in full, and only then with the permission of the entity trading as CQ Soil Testing. The information and site sketch shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.

7. All information contained within this report is the intellectual property of the entity trading as CQ Soil Testing. All information contained with can only be used for the express purposes of the commissioned scope of works.

8. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show approximate location of field tests only.

9. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted at that person assuming the responsibility for the long-term performance of the footing system.

10. The recommendations contained in this report have not taken into consideration the long term effects of any previous, current or potential subsurface work by mining companies or potential slope instability problems. At the time of writing this report neither our client (nor his agent) nor the local authority had made the author aware that these problems may be affecting this allotment. If a mining subsidence or slope stability assessment is required for this allotment, the recommendations of a suitably qualified geotechnical engineer should be sought.

11. Removal of trees from a site before an investigation can cause significant swelling of the soil over large areas. The removal of large trees from a construction site during development is rarely picked up during the investigation phase and is generally outside the scope of AS2870. Sites affected by large trees are often classified "P". If, during the footing excavation, it is noticed that there are soils with varying moisture contents or evidence of large trees having been removed CQ Soil Testing should be notified immediately.

12. The following documents are available from the CSIRO and QBCC and shall be read and adhered to in relation to this site:

    - Builder's Guide to Preventing Damage to Dwellings- Part 1 Site Investigation and Preparation http://www.publish.csiro.au/nid/22/pid/3621.htm
    - Builder's Guide to Preventing Damage to Dwellings- Part 2 Sound Construction Methods http://www.publish.csiro.au/nid/22/pid/3661.htm
    - QBCC Subsidence Fact Sheet https://www.qbcc.qld.gov.au/sites/default/files/Homeowner%27s%20Guide%20to%20Subsidence.pdf

Contours derived by others.
Contour plans and any associated drawings supplied by CQ Soil Testing are solely for the purpose of satisfying the QBCC's subsidence policy. Use or distribution of these drawings for any other purpose is not recommended and entirely at the users risk. CQ Soil Testing are not licensed surveyors and these drawings are not survey plans.
Services shown are indicative only and are to be confirmed onsite prior to construction.

NOT FOR CONSTRUCTION

SERVICES LEGEND:

E	Electricity Pit	T	Telecom Turret	—T—	U/G Telecom Line
S	Storm water pit	T	Telecom Pit	—W—	U/G Water Line
H	Fire Hydrant	G	Gully Pit	—SW—	U/G Stormwater Line
K	Kerb Adapter	S	Sewer Manhole	—OHP—	Overhead Power
W	Water Meter	—S—	Sewerage Line	HC	Sewer House Connection
	Street Light	—E—	U/G Power Line		Stormwater Gully Pit

SITE LEGEND & NOTES:

10.000	RL 10.000 is assumed as datum level (ie Not AHD)
9.2	Existing Contour
9.820	Denotes Surveyed RL

Field Technician: R.J. Date: 15.11.2024

CQ SOIL TESTING
Servicing all of Central Queensland

QBCC - 15 305 465 ABN - 87 656 845 448

Phone: (07) 4936 1163
Email: info@cqsoiltesting.com.au
Website: www.cqsoiltesting.com.au

Project:
LOT 99 ISABELLA STREET
STANWELL, QLD

For:
J ROBERTS

Title: CONTOUR & SITE PLAN	
Scale: 1:500 (A3)	Date: NOV '24
Sheet: 1 of 1	Drawn: C.T.
Job No: CQ26768	Rev: A

and Road Secants.

Line	Bearing.	Dist.
24-24a	32°2'	166.9
33-33a	96°	152.3
34-34a	89°57'	156.1
13-13a	13°5	212.2
13a-13b	328°7	150
34-34a	89°57	156.1

Por. Nº	Date of First opening to sale	Farm Nº	Selector.	Band D. passed on	Remarks.
95		~~A.F. 2511~~	Thomas W. ~~Jos. Dinsdale~~ F.H.G.F.S.	21.2.11	1380 Z 17 5887 PL
104		~~A.F. 2510~~	~~Jos. Dinsdale~~ F.H.G.F.S.	2	1353 6899 P.L.
~~104~~		~~P.P.S. 7194~~	~~E. Beck~~	19.3.39	L. 34. 665
~~95~~		~~P.P.S. 7246~~	~~Albert F. Toon.~~ F.H.F.	12.8.30	~~L. 32. 1531~~
~~104~~		~~P.P.S. 7194~~	Thomas E. & Alice M. Molloy ~~James Goodman~~		
~~104~~		~~P.P.S. 7184~~	~~Robert H. James~~		
~~104~~		~~P.P.S. 7194~~	~~Clarence L.L.B. & Muriel B. DeLandelles~~		

F. ~~104 P.P.S. 7194~~ Ernest G. & Muriel C. Sutherland

~~104 P.P.S. 7194~~ Eric J. Major

~~104 P.P.S. 7194~~ Keith F. Nielsen

See ... 4 May 1911 Page 1605
Lots 7 & 9 ... Portions 95 & 104
Open for Selection 7 June '11 as A.F.

See Nom. 28th Apl. 26 Page 1320
Lot 9 Portion 95
Open for Selection 1st June 26 as P.L.P.P.S.

SURVEY OFFICE
04156 # 8-MAR 1911
QUEENSLAND.

Date of transmission of plans &c. 26th Feby 1911
Examined by G.C. 13.3.11 Charted by ... 13.3.11
Voucher Nº 4158 Passed for payment 9.3.11
Sales Register Vol. 7 Fol. 405 13.3.11

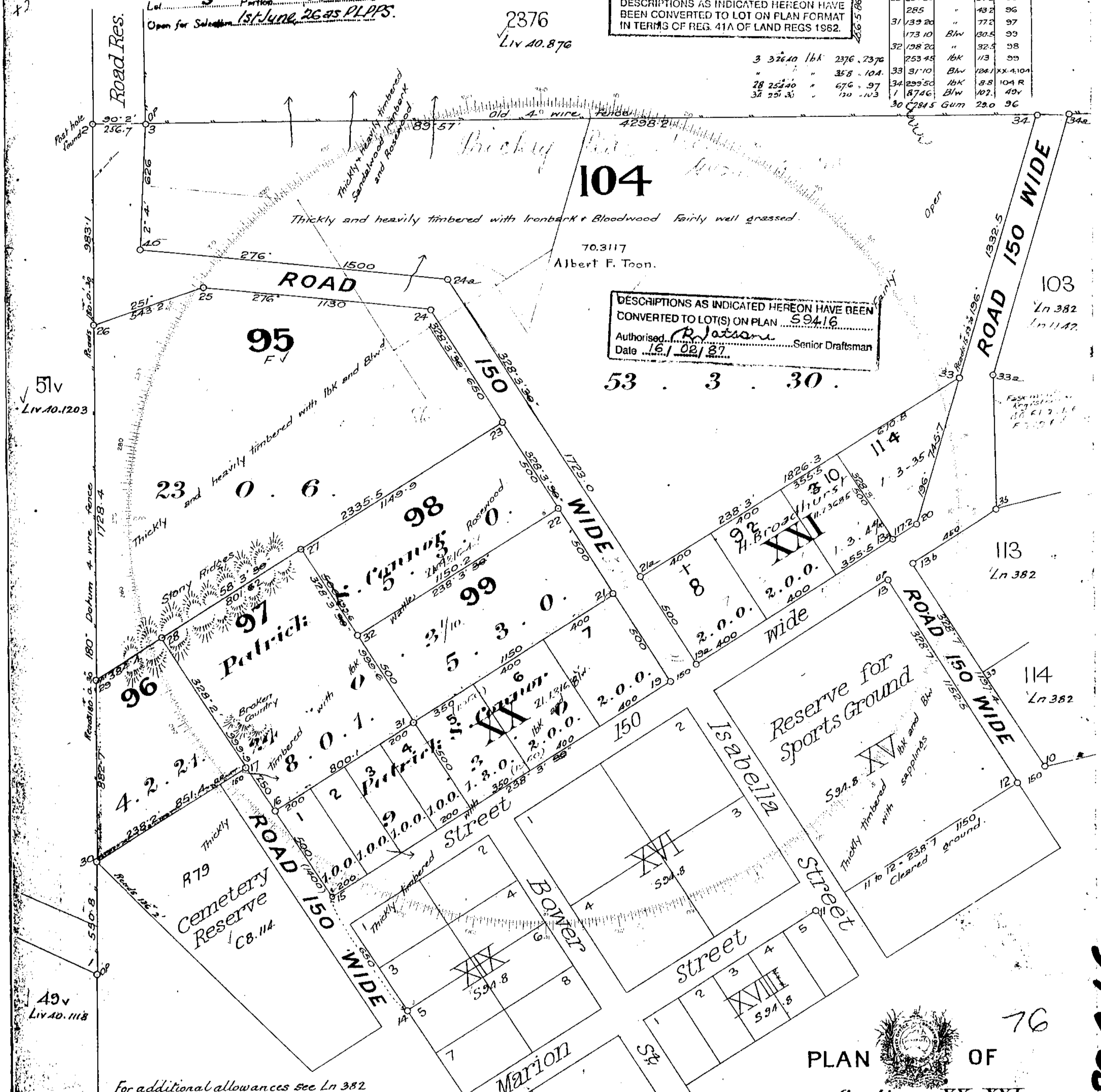
Scale 4 Chains to an Inch.

See Nom. 4th Oct. 28 Page 1188
Lot 3 Portion 104
Open for Selection 6th Nov 28 as P.P.S.

15	58°20	Blw	133.9	XXI
16	273°	Ibk	90.7	" 97
17	172°50	"	30.8	96
19	158°50	"	109.8	XX 7
19a	208°25	"	21.3	" 1
21	38°50	"	33.8	" 7
21a	148°30	"	87.9	99
22	356°40	"	88.6	"
	82°20	"	56.9	98
23	105°20	Rosewd	17.3	95
	352°	Blw	107.4	98
24	222°5	"	115	95 R
24a		Post		104 "
25	279°50	Ibk	93.2	95 "
26	316°40	Dogwd	34.7	"
27	358°20	Ibk	89.6	97
	304.5	"	94.8	98
28	332°20	"	29.7	96
29	234°30	"	24.2	95
	285	"	43.2	96
31	139°20	"	77.2	97
	173°10	Blw	130.5	99
32	198°20	"	32.5	98
	253°45	Ibk	113	99
33	31°10	Blw	124.1	XX.4.104
34	299°50	Ibk	8.8	104 R
1	87°46	Blw	107.	49v
30	284°5	Gum	29.0	96

3	326°40	Ibk	2376 . 2376	
"	"	"	358 . 104	
28	252°40	"	676 . 97	
34	251°30	"	120 . 103	

DESCRIPTIONS AS INDICATED HEREON HAVE BEEN CONVERTED TO LOT ON PLAN FORMAT IN TERMS OF REG. 41A OF LAND REGS 1962. 26.5.86



For additional allowances see Ln 382

(Fitzroy Shire)

I hereby certify that I, in person, made and on the 26.1.1911 completed the survey represented by this plan, on which are written the bearings and lengths of the lines surveyed by me, and that the survey has been executed in accordance with the existing regulations of the Surveyor-General's Department.

W. Henry Flowers
Auth. Surveyor.

To U.S. 10.4.11

TM

Meridian Observations
(This form can also be adapted to stellar observations.)

Reasons	Station	Date	Lat.	Long.	Bearing of R.O.	Apparent posn of Sun	Readings on R.O.	Time	H. Corr. Sun	Observed Altitude	Observed Z. Distance	Meridian

Meridian of 57a
Design with papers 10.2.12/6.05

NOTE.- Observing stations are shown by a triangle in red.

Charted on Stanwell Fair Plan.

76

PLAN OF

Sections XX, XXI
Town of Stanwell
and
Portion Nº 95 to 99 & 104
Parish of Stanwell
County of Livingstone
Land Agents District of Rockhampton
Cat. S.94.16.

S94/16

Current Title Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**51183894**	**Search Date:**	18/02/2025 10:12
Date Title Created:	20/05/2019	**Request No:**	50921805
Previous Title:	30134071		

ESTATE AND LAND

Estate in Fee Simple

LOT 99 CROWN PLAN S9416
Local Government: ROCKHAMPTON

REGISTERED OWNER

Dealing No: 721742107 06/06/2022

CHRISTINA ROBERTS
COLIN JOHN ROBERTS JOINT TENANTS

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 30134071 (POR 99)

ADMINISTRATIVE ADVICES

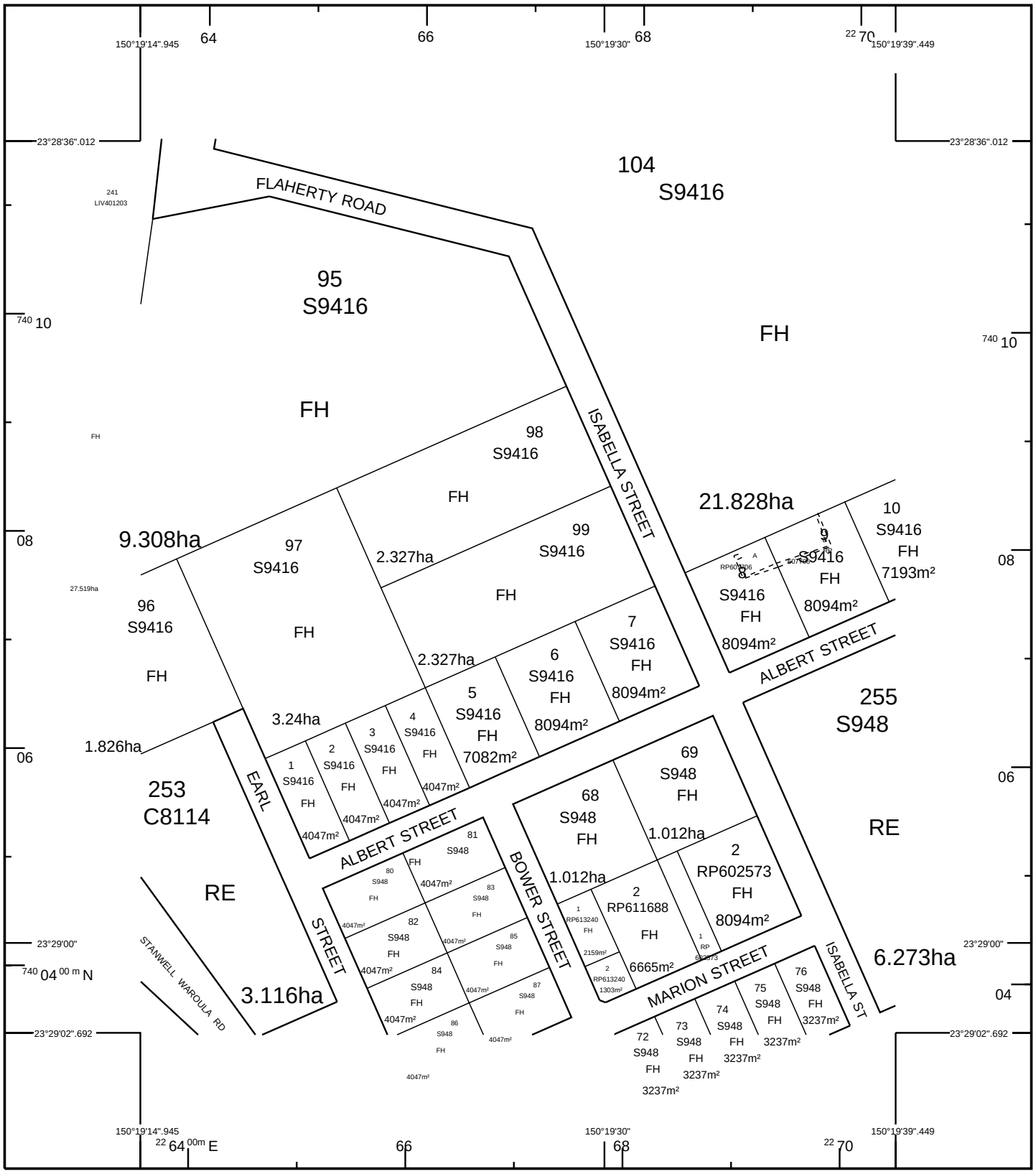
NIL

UNREGISTERED DEALINGS

NIL

** End of Current Title Search **

Requested by: D-ENQ GLOBALX

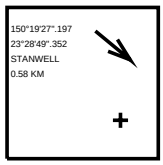


STANDARD MAP NUMBER
8951-23234

0 100 200 300 400 500 m

HORIZONTAL DATUM:GDA94 ZONE:56 SCALE 1 : 5000

MAP WINDOW POSITION & NEAREST LOCATION



SUBJECT PARCEL DESCRIPTION

DCDB

Lot/Plan	99/S9416
Area/Volume	2.327ha
Tenure	FREEHOLD
Local Government	ROCKHAMPTON REGIONAL
Locality	STANWELL
Segment/Parcel	31951/5

CLIENT SERVICE STANDARDS

PRINTED 18/02/2025

DCDB 17/02/2025

Users of the information recorded in this document (the Information) accept all responsibility and risk associated with the use of the Information and should seek independent professional advice in relation to dealings with property.

Despite Department of Resources best efforts, RESOURCES makes no representations or warranties in relation to the Information, and, to the extent permitted by law, exclude or limit all warranties relating to correctness, accuracy, reliability, completeness or currency and all liability for any direct, indirect and consequential costs, losses, damages and expenses incurred in any way (including but not limited to that arising from negligence) in connection with any use of or reliance on the Information

For further information on SmartMap products visit https://www.qld.gov.au/housing/buying-owning-home/property-land-valuations/smartmaps

GDA

SmartMap

An External Product of SmartMap Information Services

Based upon an extraction from the Digital Cadastral Data Base

Queensland Government

Rockhampton Office
232 Bolsover St, Rockhampton
Gracemere Office
1 Ranger St, Gracemere
Mount Morgan Office
32 Hall St, Mount Morgan

4 March 2025

Our reference: D/16-2025
Enquiries to: Kathy McDonald
Telephone: 07 4936 8099

C and C Roberts
C/- Capricorn Survey Group (CQ) Pty Ltd
PO Box 1391
ROCKHAMPTON QLD 4700

Dear Sir/Madam

INFORMATION REQUEST – DEVELOPMENT APPLICATION D/16-2025 FOR A MATERIAL CHANGE OF USE FOR A DWELLING HOUSE – SITUATED AT LOT 99 ISABELLA STREET, STANWELL – DESCRIBED AS LOT 99 ON S9416

Council refers to your application received by Council on 18 February 2025.

Council officers have undertaken a detailed assessment of the development application and require you to provide further information to address the following issues:

1.0 The proposed Dwelling House is subject to Steep Land 20-25%, please provide an assessment against the Steep Land Overlay Code and supply a detailed Slope Stability Assessment Report by a registered (RPEQ) Engineer, experienced in the geotechnical aspects of Landslide Risk Management. The Site Classification Report submitted has not demonstrated to Council's satisfaction that the subject site when developed will not be subject to the problems associated with slope stability as a result of the development.

2.0 Applicant is requested to update the submitted Wastewater Design report. The submitted Wastewater Design report is based on a 2-bedroom dwelling, however, the proposal is for 3-bedroom dwelling.

Under section 13 of the Development Assessment Rules, the Applicant has three (3) options available in response to this information request. The Applicant must give the Assessment Manager:

1. all of the information requested; or
2. part of the information requested, together with a notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application; or
3. a notice:
    i. stating the Applicant does not intend to supply any of the information requested; and
    ii. requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

Response to this further information request should be forwarded to:

General.Enquiries@rrc.qld.gov.au or;
Development Assessment Section
Rockhampton Regional Council
PO Box 1860
ROCKHAMPTON QLD 4700

A response needs to be received within a period of three (3) months from the date of this letter, In accordance with section 68 (1) of the *Planning Act 2016* and sections 12 and 13 of the Development Assessment Rules. Please forward your response to this information request to Council at your earliest convenience, in order for the assessment of your application to progress further.

Should you have any queries regarding the above information request, please contact the undersigned on 07 4936 8099.

Yours faithfully

Kathy McDonald
Principal Planning Officer
Planning and Regulatory Services

Information Request Response Form
(to be returned to the Assessment Manager with the response)

I _____ choose to respond to the Assessment Manager's Information Request:

- ☐ in full;

  OR

- ☐ in part, with this notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application;

  OR

- ☐ stating that I do not intend to supply any of the information requested; and requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

A copy of the response to the Assessment Manager's information request has been provided to all Referral Agencies nominated on the Confirmation Notice.

I understand the requirements of this Information Request as listed above.

Signed : _____ Date : _____

Position : _____

capricornsurveygroupcq
SURVEYING & PLANNING SOLUTIONS

28 March 2025

Our Ref: 9559
Your Ref: D/16-2025

The Chief Executive Officer
Rockhampton Regional Council
PO Box 1860
Rockhampton QLD 4700

Attention: Kathy McDonald

Dear Sir,

RE: Information Request Response
D/16-2025 Material Change of Use for Dwelling House
99 Isabella Street, Stanwell

With regards to Council's information request dated 4th March 2025, we provide the following response:

Item 1 Please refer to the attached landslide hazard assessment and below code assessment.

STEEP LAND OVERLAY CODE

Performance Outcomes	Acceptable Solutions	Proposed Solutions
All development		
PO1 Development incorporates design measures for the development (including ancillary buildings, structures and swimming pools) to ensure: a) the long-term stability of the site considering the full nature and end use of the development; b) site stability during all phases of construction and development; c) people and property are protected from a potential landslide event; and d) adjoining properties are not impacted by a potential landslide event.	No acceptable outcome is nominated. Editor's note—The preparation of a site specific geotechnical assessment or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this acceptable outcome.	Refer to the attached slope stability assessment for the recommendations for construction.

PO2 Vegetation clearing on site does not increase the risk of a landslide event occurring.	No acceptable outcome is nominated. Editor's note—The preparation of a site specific geotechnical assessment report or landslide risk assessment in accordance with SC6.11 — Geotechnical report planning scheme policy can assist in demonstrating compliance with this acceptable outcome.	Mature trees with established root systems will be retained on site (where not necessary to be cleared within the building footprint). This will assist in maintaining land stability.
PO3 Development involving the manufacture or storage of hazardous materials in bulk is not at risk from a landslide event.	**AO3.1** The manufacture or storage of hazardous materials in bulk does not occur within the steep land overlay area.	N/A
PO4 Emergency services and community uses are able to function effectively during and immediately after landslide events.	No acceptable outcome is nominated.	N/A

Item 2 Please refer to the attached updated wastewater design report.

We trust this information is sufficient and Council can proceed with the decision assessment.

If you have any queries with regards to this matter, please do not hesitate to call this office.

Yours Sincerely,

Madison Day

Information Request Response Form
(to be returned to the Assessment Manager with the response)

I _____ choose to respond to the Assessment Manager's Information Request:

☒ in full;

OR

☐ in part, with this notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application;

OR

☐ stating that I do not intend to supply any of the information requested; and requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

A copy of the response to the Assessment Manager's information request has been provided to all Referral Agencies nominated on the Confirmation Notice.

I understand the requirements of this Information Request as listed above.

Signed :  Date : 28/03/2025

Position : Capricorn Survey Group (CQ) Pty Ltd - applicants representative

CQ SOIL TESTING

AS1547 Wastewater Design

SITE ADDRESS:	Lot 2 (SP141828) 99 Isabella Street, Stanwell
Prepared for:	J Roberts
Job Number:	CQ26768 – REV B
Issue Date:	27/03/2025

Certified System OHS ISO 45001 SAI GLOBAL
Certified System Environment ISO 14001 SAI GLOBAL
Certified System Quality ISO 9001 SAI GLOBAL

SUMMARY OF RECOMMENDATIONS

Treatment
All-Waste Septic Tank (3000 litre minimum)
With serviceable filter

Disposal Mechanism
Two (2) Evapotranspiration/Absorption Bed
2.0 metres x 15.5 metres – Total Area 62 sqm

CQ SOIL TESTING technical excellence

ABN 87 656 845 448
QBCC License 15 305 465

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Client & Document Information

Client:	J Roberts
Project:	Lot 2 (SP141828)
	99 Isabella Street, Stanwell
Investigation Type:	**Wastewater Investigation**
Job Number:	CQ26768 – REV B
Date of Issue:	27/03/2025

Contact Information

CQ SOIL TESTING
ABN 87 656 845 448

PO Box 9654
PARK AVENUE QLD 4701

Telephone: (07) 4936 1163
Facsimile: (07) 4936 1162

Email: info@cqsoiltesting.com.au

Document Control

Version	Concept By	Design Drawings	Design Review	Issue Approved By	Date
A	James Rider	C Tindoc	S Walton	S Walton	22/11/2024
B	James Rider	C Tindoc	S Walton	S Walton	27/03/2025

1. INTRODUCTION

The purpose of this report is to evaluate and define a suitable on-site sewerage treatment and disposal system for household effluents in accordance with Australian Standard 1547 "On-site domestic-wastewater management". The Queensland Plumbing and Wastewater Code has been used for reference purposes during the compiling of this report.

The field investigation was carried out on the 15th November 2024. This report relates exclusively to the proposed dwelling at the site identified on Page 1 of this report. This document has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

2. SITE DESCRIPTION AND SUPPLIED INFORMATION

2.1 Allotment and Effluent Disposal Site

- ***The landholder was interviewed. All information included in this report relating to the dwelling size, water source, fixtures etc have been provided by the landholder or the landholders representative.***

- ***The landholder shall read and understand all aspects of this design. CQ Soil Testing may carry out amendments to this design if requested, additional fees shall apply.***

- ***The landholder is to liaise with neighbouring properties regarding the presence of discrete/unregistered bores that may exist/be proposed on adjacent allotments prior to system installation.***

- The site is a rural allotment located at 99 Isabella Street, Stanwell (an unsealed road).
- The slope configuration in relation to surface drainage is linear planar.
- The proposed effluent disposal area falls toward the southeast and is considered to have fair drainage.
- The soil surface condition was dry at the time of testing.
- There was no evidence of cracking of the surface during the investigation.
- There were no visible boulders on the surface of the allotment.
- There were no rock outcrops evident.
- There was no watercourse, bore, well, or dam evident within 50 m of the proposed disposal area at the time of this investigation.
- The proposed effluent disposal area is exposed to sun and wind.
- The proposed disposal site is an existing grassed area.
- Surface water will drain toward the southeast.
- Surface water drainage from adjoining allotments may traverse this site.
- The weather conditions prior to testing were periods of moist conditions.
- The site is not a known flood area.

2.1 Dwelling and Fixtures

- The dwelling type is single storey - 3 bedroom.
  (5 equivalent persons – AS 1547:2012 Appendix J)
- The water source is tank and bore supply.
  (150 litre/person/day – AS 1547:2012 Appendix H)
- Standard water reducing fixtures ***are to be*** used throughout the dwelling.
- A spa bath ***is not*** proposed to be installed.
- A food waste disposal unit ***is not*** proposed to be installed.

3. SOIL PROFILE

The borelogs carried out at the site (refer attached Site Plan for localities) indicate that the soil profile typically consists of silty clay. Soil logs are detailed in this report.

Groundwater was not encountered during the field investigation.
Weathered rock was not encountered during the field investigation.

Table 1 - Determination of Soil Category

Soil Category BH2	Soil Texture	Structure	Indicative Permeability	Indicative Drainage Class
5 (00-1500 mm)	Light Clay	Strongly Structured	0.12 – 0.5 m/day	Poorly Drained

Table 2 – Permeability test results and conclusions

Test No.	Soil Permeability	Test hole depth	Recommended Design Loading Rate
PT 1	0.31	500 mm	
Average	**0.31**		**8 (mm/day)**

Permeability testing aids in the design of an "On-site domestic–wastewater management system". CQ Soil Testing carries out a permeability testing in accordance with Appendix 4.1F of the Australian Standard 1547.

Whilst every effort has been made to ensure that the borelogs carried out at the subject allotment are indicative of the soil profile over the site any discrepancy between the profile detailed in the borelogs and that observed during construction shall be referred to CQ Soil Testing for immediate attention.

4. INVESTIGATION DETAILS

The investigation carried out at the site included machine augured boreholes up to 1500 mm depth and a series of permeability test pits (see Appendix 4). These test pits are located in the proposed effluent disposal area as shown on the attached site report. The Queensland Plumbing and Wastewater Code and AS 1547 suggests that the use of a primary-treated effluent disposal system will be satisfactory provided:

- Sufficient permeable surface soil overlying rock is present over the disposal area, not less than 1.2 metres depth.
- A suitable soil category material (as per AS 1547) and minimum required depth is encountered.
- A minimum set-back distance of 50m is obtained.
- Acceptable permeability rates are obtained.

All the above requirements have been met, therefore it is concluded that the use of a primary-treated effluent septic system is acceptable.

5. FINDINGS AND RECOMMENDATIONS

- All work must be carried out by a licensed plumber or drainer.
- All pipework shall be installed in accordance with AS3500.2.2, National Plumbing and Drainage, Part 2.2, Sanitary Plumbing and Drainage.
- The Design Loading Rate of 8 mm/day has been adopted.
- A 100% reserve effluent disposal area can be obtained on this allotment and shall be kept clear of development for possible future expansion.

5.1. Treatment

- Septic Tank – 3000 Litre minimum to be installed.
- The local authority may require the installation of a grease trap.
- The septic tank shall be de-sludged and pumped out at a maximum interval of 5 years.
- A Septic Tank Filter shall be installed between the septic tank and the disposal area. Regular maintenance of the filter shall be undertaken, normally 3 monthly.

5.2. Disposal

- For the purpose of calculating evaporation, the long term average monthly pan evaporation and rainfall figures from the Bureau of Meteorology weather station at Rockhampton have been adopted. Water Balance and design calculations are appended.
- All wastewater shall be disposed of by Evapotranspiration/Absorption.
- The land application facility shall be by evapotranspiration-absorption bed/s with a total minimum area of **62 sqm**.
- A diversion mound shall be constructed above/around the disposal area to divert overland water flows.
- Effluent shall be distributed evenly throughout the bed/s via the use of a distribution chamber or equivalent system.
- The beds shall be 2.0 m in width and 15.5 m in length. Two (2) are required.
- The beds shall be installed level and across the natural contour of the land.
- The finished surface shall shed water.
- Detailed design drawings are attached to this report.
- The disposal area has been calculated on a daily all-waste flow rate of 750 litres/day, (3 bedroom/5 people each using 150 litres per day) and a design load rate of 8 mm/day. This flow rate will accommodate all-waste flows from the proposed three bedroom residence using Standard Water-Reducing Devices, which include using a dual flush 6/3 litre water closet (maximum), shower flow restrictors, aerated faucets and a water conserving washing machine.
- The disposal area should be located in the vicinity of BH1, BH2 & BH3 and as per attached site plan.
- All set-back distances as required by the local authority shall be met.
- Stormwater run-off including roofwater from buildings shall be diverted around and away from the disposal area. Imported fill may be required should there be insufficient soil available for the design of the disposal system.

5.3. Setback Distances

Table 3 - Setback distances for subsurface land application area for greywater treatment plant or an on-site sewage treatment plant (QLD Plumbing & Wastewater Code Version 1:2019)

Feature	Horizontal separation distance ①		
	Up slope	Down slope	Level
Property boundaries, pedestrian paths, walkways, recreation areas, retaining wall, and footings for buildings and other structures.	2	4	2
Inground swimming pools	6	6	6
Inground potable water *tank* not exposed to primary effluent	6	6	6
Inground potable water *tank* exposed to primary effluent	15	15	15

① Distances are given in metres and are measured from the edge of trench/bed excavation or subsurface irrigation distribution pipework to the nearest point of the feature

Table 4- Setback distances for on-site sewage facilities and greywater use facilities – Protection of surface water and groundwater (QLD Plumbing & Wastewater Code Version 1:2019)

Feature	Separation distance ①		
For onsite – see Table 2.1 in AS 1546.3	**Advanced Secondary**	**Secondary**	**Primary**
For *greywater* – see Table 2.1 in AS 1546.4	**Level 1 and Level 2**	**Level 3**	**Untreated**
Top of bank of permanent water course	10	30	50
Top of bank of intermittent water course			
Top of bank of a lake, bay, or estuary			
Open stormwater drainage channel or drain			
Bore or a dam			
Unsaturated soil depth to a permanent water table (vertically)	0.3	0.6	1.2

① Distances are given in metres and are measured from the edge of the irrigated wetted area to any point of the feature
② Note: Primary effluent typically has a (BOD^5) (Biochemical Oxygen Demand) of between 120 – 240 mg/L and Total Suspended Solids of between 65 – 180 mg/L.

5.4. Vegetation and signage

- Water tolerant vegetation shall be planted to maximize evapotranspiration and shall be carefully chosen. See vegetation specified in AS 1547:2012 "Disposal Systems for Effluent from Domestic Premises (Appendix C)". CQ Soil Testing recommends consultation with local nurseries for selection/density of plantings.
- At least two signs stating "Recycled water – Do Not Drink" are to be erected on boundaries.

- The presence of buried pipes shall:

  (a) Be indicated e.g. using underground marking tape to AS/NZS 2648.1; OR
  (b) Be indicated by signage. Signs shall be prominently displayed with the words:

  "Sewage effluent pipework installed below. DO NOT DIG."

5.5. Greywater

Surface irrigation of greywater directly (without treatment) from the dwelling's washing machine is permissible. CQ Soil Testing recommends the surface irrigation of greywater. The washing machine shall be connected to a flexible hose with the hose distributing greywater to the landholder's garden/lawn. Provide an air admittance valve and suspend drainage (per AS/NZS 3500) to a rigid, fixed position external to building and reduce to a flexible hose fitting (minimum diam. 32 mm). Greywater should be used with care and used responsibly - Avoid:

- *Ponding of water.*
- *Run-off to neighbouring properties.*
- *Causing an odour.*

When using greywater:

- Choose laundry detergents with low phosphorus, sodium and nitrogen content.
- Take care not to keep watering the same spot - it can affect soil and can cause plants to die.
- Be careful when using on native plants and do not use on edible parts of vegetables or fruits.
- Make sure it does not enter swimming pools or flow into neighbouring properties.
- Avoid ponding, bad smells or damage to plants by restricting use or moving the outlet.
- Keep away from children's play areas and the footings of buildings.

6. CERTIFICATION

The local authority may request that an inspection and certification is to be undertaken on the installation of the system when nearing completion. CQ Testing is qualified to undertake this task and issue the appropriate Form 8 **(additional fees apply)**. If certification is required, the installer must:

- Contact CQ Soil Testing prior to "burying" the system to arrange an inspection.
- Must photograph the entire installation process and supply to CQ Soil Testing.
- Supply to CQ Soil Testing a Form 8 signed by the licensed installer.

Yours faithfully

SCOTT WALTON
Laboratory Manager

Soil Logs

BOREHOLE 1		
Depth (m)	**Visual Class'n Symbol**	**Visual Description of Material**
0.0 1.5	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST. ***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Soil Logs

BOREHOLE 2

Depth (m)	Visual Class'n Symbol	Visual Description of Material
0.0	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST.
1.5		***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Soil Logs

BOREHOLE 3

Depth (m)	Visual Class'n Symbol	Visual Description of Material
0.0	Cl	Silty CLAY, medium plasticity, trace fine to coarse grained sand & gravel, light brown w/depth, D, VST.
1.5		***CAT 5 Light Clay – moderately structured***

Borehole terminated at 1.5 m

MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY
D – Dry	VS – Very Soft	VL – Very Loose
M – Moist	S – Soft	L – Loose
W – Wet	F – Firm	MD – Med Dense
	ST – Stiff	D – Dense
	V/ST – Very Stiff	VD – Very Dense
	H – Hard	

Allowable Bearing Pressure calculated using the guidelines in "Determination of Allowable Bearing Pressure under Small Structures" by MI Stockwell (NZ Engineering June 1997)

DCP test results are to be used as a guide only to relative density and consistency of soils. Changes in moisture contents or the presence of coarse grained material can greatly influence the outcome of this test.

Photographs

Figure 1 Disposal Area

Figure 2 Disposal Area

APPENDIX 1 - NOTES

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.
2. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware however, that exploration is limited by time available and economic restraints. In some cases, soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.
3. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.
4. This report may not be reproduced except in full, and only then with the permission of the entity trading as CQ Soil Testing. The information and site sketch shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.
5. All information contained within this report is the intellectual property of the entity trading as CQ Soil testing. All information contained with can only be used for the express purposes of the commissioned scope of works.
6. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show approximate location of field tests only.
7. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted at that person assuming the responsibility for the long-term performance of the system.
8. The following documents are available from various sources and shall be read and adhered to in relation to this site:

   AS/NZS 1547:2012 - On-site domestic wastewater management
   https://www.standards.org.au/standards-catalogue/sa-snz/waterandwasteservices/ws-013
   AS/NZS 1546.1 - On-site domestic wastewater treatment units - Septic tanks
   http://www.standards.com.au/
   AS/NZS 1546.2 - On-site domestic wastewater treatment units - Waterless composting toilets
   http://www.standards.com.au/
   AS/NZS 1546.3 - On-site domestic wastewater treatment units -Aerated wastewater treatment systems
   http://www.standards.com.au/
   Queensland Plumbing and Wastewater Code
   https://www.hpw.qld.gov.au/__data/assets/pdf_file/0019/3943/queenslandplumbingandwastewatercode_26march2019.pdf
   Standard Sewerage Law
   http://www.legislation.qld.gov.au/LEGISLTN/SLS/1998/98SL099.pdf

Periodically during the course of your trench, ETA bed or irrigation areas life span it will most likely require maintenance such as deep scarification to promote the uptake, and transmission of effluent. This can also be achieved via deeper drilling, rotary hoe or excavator tines.

The Land Application Area designed by CQ Soil Testing is in accordance with the relevant Australian Standards to provide the most economical solution. Generally, this initial installation will be sufficient to successfully handle the load from the dwelling and/or building. Occasionally, however, all of the effluent is not absorbed or transpired due to reasons such as:

- diversion drains are not effective and stormwater enters the Land Application area.
- plants used for the aid of transpiration have not reached maturity resulting in less than optimum transpiration.
- water conservation is not being practiced within the household or building.
- soils can vary significantly over short distances resulting in significant variations in absorption characteristics.

APPENDIX 2 MAINTAINING YOUR SEPTIC SYSTEM

The following tips will help you to save money, reduce pollution and conserve resources:

Remove accumulated sludge from the tank:

- Generally, septic tanks require periodic cleaning or pumping out of accumulated solids every 4 years. If solids are allowed to build up in the tank to a point where they pass to the effluent treatment stage they can cause problems.
- Household pipes may become filled with sewage and the subsoil soil trench system could soon become clogged with solids. This may cause the effluent to come to the surface, pool and cause unpleasant smells. This can constitute a risk to public health, particularly to children playing in the vicinity.

Minimise or manage the volume of water entering the system to improve the lifespan and operation of the absorption trench:

- Regularly check plumbing fixtures for leaking taps or toilets cisterns. Have them repaired. Ensure water from roof downpipes does not enter the system and roof water is diverted away from the effluent disposal area.
- Install water saving devices such as shower heads that minimise water use and dual flush toilet cisterns.
- If the terrain slopes down to your absorption trench ensure that surface water is diverted around the soakage area by installing a stormwater diversion trench.
- Spread large washing loads over several days to minimise the impact on your septic tank system. Plan your water usage so that large flows to the system in a short time are avoided, for example, operate the dishwasher and washing machine at separate times.

Ensure the system can be readily accessed for maintenance:

If you own a house built prior to March 1995 and your tank is difficult to access for maintenance, you may consider installing an approved access shaft to minimise future maintenance difficulties.
Do not construct driveways, buildings or paved areas over the septic and soakage system as this may result in damage to the system and access problems when the tank requires pumping out at a later date.

Use household detergents and bleaches sensibly:

The normal use of household detergents and bleaches is considered satisfactory. If in doubt about any household product suitability, consult the product manufacturer.

Don't use the system for the disposal of chemicals:

Don't dispose of medicines or strong chemicals such as pesticides and paints into the septic system. This can cause the septic tank to malfunction and may pollute groundwater.

Protect the septic tank and disposal area from damage:

If the tank and disposal area are exposed to vehicle traffic use a barrier or other means to prevent vehicles driving over the tank and soakage as this could cause damage and result in costly repairs.

Prevent mosquito breeding:

Ensure that all vents associated with the system are fitted with mosquito proof mesh and access openings are correctly sealed.

After a number of years of use, some soakage systems may fail and require replacement. The first signs of this can be soggy patches on the surface in the area where the soakage trenches are located. This can be accompanied by strong odours and blocked pipes. This can constitute a health risk and advice should be sought from a registered plumber to confirm the cause. If the trench requires replacement or the system needs to be altered in any way, the local council Environmental Health Officer should be consulted. A malfunctioning effluent disposal system can constitute a risk to public health and in some cases result in action being taken by the relevant authority.

Note: Odours may occur on initial use of the system. If this becomes a problem consult your local council or the Department of Health.

Table 3 – Water Balance Calculations

EVAPO-TRANSPIRATION ABSORPTION

SITE DATA			*DESIGN DATA* (AS1547:2000)			*DESIGN FLOWS* (AS1547:2000)		
Soil Category:	5		Retension Rate:	0.5		No. Bedrooms:	3	
Soil Texture:	Light Clay		Evapotranspiration Factor:	0.75		Flow Rate per Person:	150 ltr/day	(A4.2D)
Soil Structure:	Strong		Design Loading Rate:	8 mm/day	(T4.2A2)	No. of persons:	5	(T4.3A1)
Measured Permeability:	0.31	m/day	Indicative Permeability:	0.12-0.5 mm/day	(T4.2A2)	Black Water Factor:	1.00	
						Daly Flow Rate (Total):	750.0 ltr/day	

http://www.bom.gov.au/climate/averages/tables/cw_039123_All.shtml

AREA CALCULATION

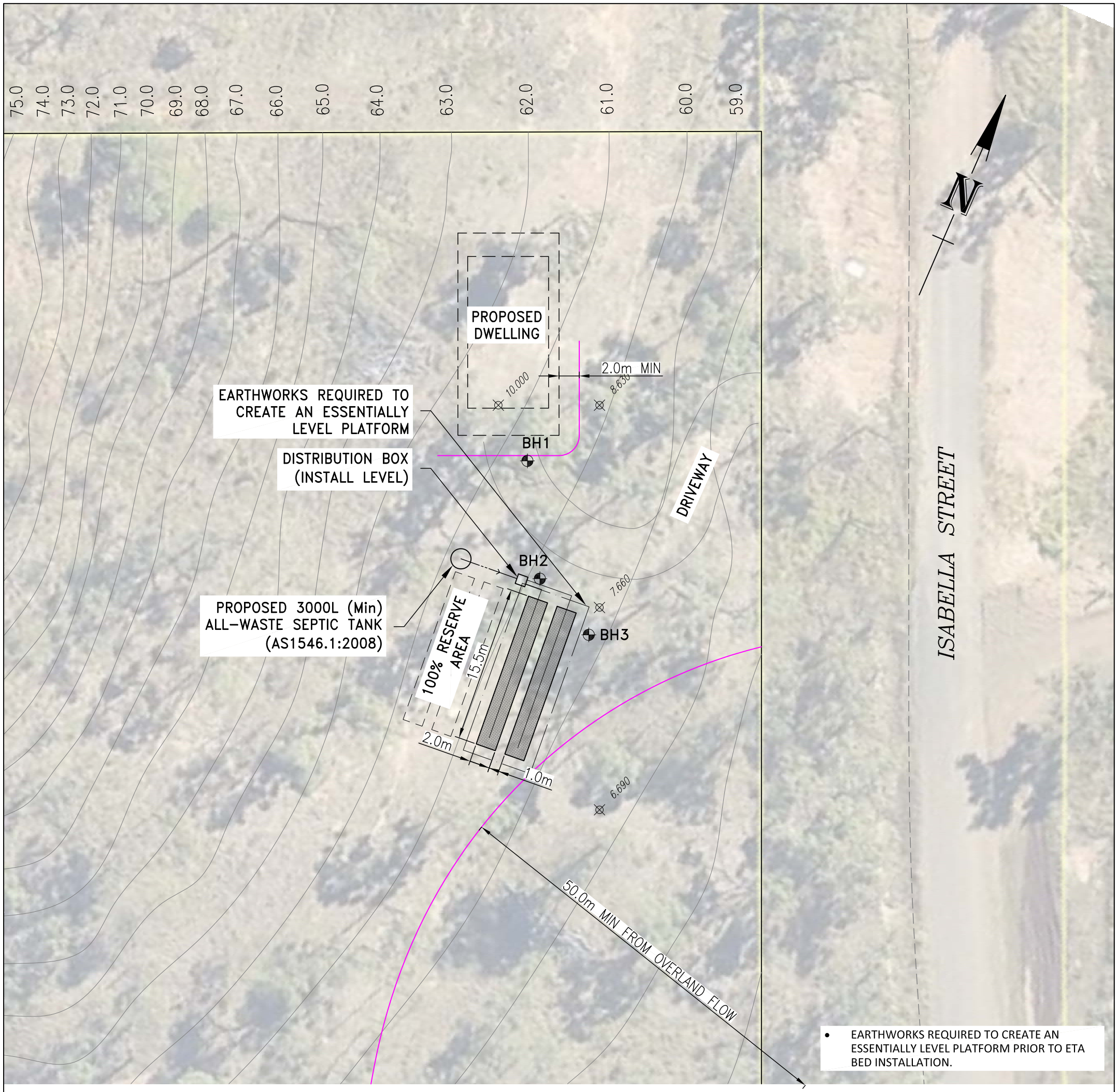
	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Sum	Ave
Days	31	28	31	30	31	30	31	31	30	31	30	31		
Mean rainfall (mm)	129.8	144	104.7	43	45.3	37.8	31.8	27.1	24.5	49.5	66.3	104.3	808.1	67.3
Retained Rainfall (mm)	64.9	72.0	52.4	21.5	22.7	18.9	15.9	13.6	12.3	24.8	33.2	52.2	404.1	33.7
Pan Evaporation	198.4	165.2	167.4	135.0	105.4	90.0	96.1	108.5	129.0	167.4	180.0	195.3	1737.7	144.8
Mean daily evaporation (mm)	7.4	6.7	6.2	5.3	4.1	3.5	3.6	4.4	5.8	6.8	7.6	7.7	69.1	5.8
Evapotranspiration (mm)	229.4	187.6	192.2	159.0	127.1	105.0	111.6	136.4	174.0	210.8	228.0	238.7	2099.8	175.0
DLR per month (mm)	248.0	224.0	248.0	240.0	248.0	240.0	248.0	248.0	240.0	248.0	240.0	248.0	2920.0	243.3
Disposal Rate per month (ltr)	412.5	339.6	387.9	377.5	352.5	326.1	343.7	370.9	401.8	434.1	434.9	434.6	4615.8	384.6
Effluent per month (ltr)	23250.0	21000.0	23250.0	22500.0	23250.0	22500.0	23250.0	23250.0	22500.0	23250.0	22500.0	23250.0	273750.0	22812.5
Area (sq.m)	56.4	61.8	59.9	59.6	66.0	69.0	67.6	62.7	56.0	53.6	51.7	53.5		59.8

STORAGE CHECK

		Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Area (sq.m)	62												
Application Rate (mm)		375.0	338.7	375.0	362.9	375.0	362.9	375.0	375.0	362.9	375.0	362.9	375.0
Disposal Rate (mm)		412.5	339.6	387.9	377.5	352.5	326.1	343.7	370.9	401.8	434.1	434.9	434.6
Excess Effluent (mm)		-37.5	-0.9	-12.9	-14.6	22.6	36.8	31.3	4.1	-38.8	-59.1	-71.9	-59.6
Stored Effluent Increase (mm)		-125.0	-3.0	-42.8	-48.7	75.2	122.7	104.3	13.8	-129.5	-196.8	-239.8	-198.5
Effluent Depth for month (mm)		0.0	0.0	0.0	0.0	0.0	75.2	197.8	302.2	316.0	186.5	0.0	0.0
Effluent Depth Total (mm)	0	0.0	0.0	0.0	0.0	75.2	197.8	302.2	316.0	186.5	0.0	0.0	0.0

Depth of Gravel	200	mm	
Depth of Sand	200	mm	
Depth of Storage Area	400	mm	
Freeboard	50	mm	
Permitted Depth of Effluent	350	mm	

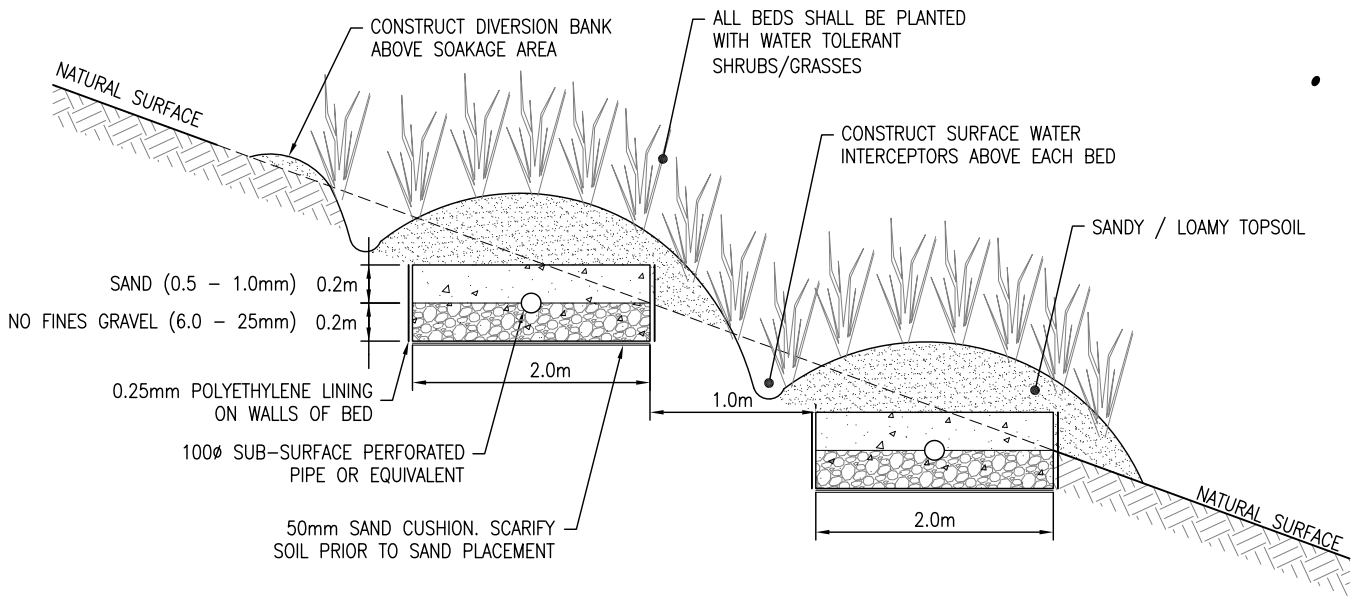
Area of ETA Bed	62	
Bed Dimensions		
No. of Beds	2	
Bed Length	15.5	m
Bed Width	2	m



- EARTHWORKS REQUIRED TO CREATE AN ESSENTIALLY LEVEL PLATFORM PRIOR TO ETA BED INSTALLATION.

SEWERAGE NOTES:

- *ENSURE THE BED IS INSTALLED LEVEL TO ALLOW EVEN DISTRIBUTION OF EFFLUENT*
- *FINISHED SURFACE IS TO SHED WATER*
- *DIVERSION DRAINS/BANKS TO DIVERT WATER AROUND THE DISPOSAL AREA*
- *CLAY BASED SOILS ARE NOT TO BE USED AS TOPSOIL*
- *0.3m WIDE STRIP OF FILTER CLOTH ALONG FULL LENGTH OF PERFORATED PIPE*
- *AN INSPECTION PORT SHALL BE INSTALLED IN ACCORDANCE WITH AS1547_4.5*
- *ALL WORK TO BE IN ACCORDANCE WITH THE CONSTRUCTION TECHNIQUES STATED IN AS1547*
- *DISPOSAL AREA TO BE FENCED OFF FROM LIVESTOCK*



TYPICAL SECTION OF 31m² ETA BED (TOTAL AREA 62m²)

- *Plumber to confirm suitability of all infrastructure with landholder prior to installation.*
- *Any sugestions to change the design contact CQ Soil Testing.*

ASSUMED LEVELS:

A) PROPOSED SEPTIC TANK INVERT ≈ 61.70
B) PROPOSED INVERT OF HEADER LINE ≈ 59.80

CQ SOIL TESTING
Servicing all of Central Queensland

QBCC - 15 305 465 ABN - 87 656 845 448

Phone: (07) 4936 1163
Email: info@cqsoiltesting.com.au
Website: www.cqsoiltesting.com.au

Project:
LOT 99 ISABELLA STREET
STANWELL, QLD

For:
J ROBERTS

Title: EFFLUENT DISPOSAL DESIGN	
Scale: 1:400 (A3)	*Date:* MAR '25
Sheet: 1 of 1	*Drawn:* C.T.
Job No: CQ26768	*Rev:* B

CQ SOIL TESTING

Landslide Susceptibility Assessment

SITE ADDRESS:	**Proposed New Dwelling** Lot 99 Plan S9416 99 Isabella Street, Stanwell
Prepared for:	J Roberts
Job Number:	CQ27737
Issue Date:	27/03/2025

CQ SOIL TESTING technical excellence

ABN 87 656 845 448
QBCC License 15 305 465

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Client & Document Information

Client:	J Roberts
Project:	Lot 99 Plan S9416 99 Isabella Street, Stanwell
Investigation Type:	**Landslide Susceptibility Assessment and Geotechnical Comments**
Job Number:	CQ27737
Date of Issue:	27/03/2025

Contact Information

CQ SOIL TESTING ABN 87 656 845 448 PO Box 9654 PARK AVENUE QLD 4701	Telephone: (07) 4936 1163 Facsimile: (07) 4936 1162 Email: info@cqsoiltesting.com.au

Document Control

Version	Date	Author	Design Drawings	Reviewer	Reviewer Initials
A	27/03/2025	C Burke	NA	Scott Walton	SWW
		Ryan Kemp			

Table of Contents

QBCC SUBSIDENCE POLICY

In accordance with the QBCC "Queensland Building and Construction Commission" the contractor must supply the site classifier with the information in Table 1. The contractor, or the contractor representative (CR), may require the site classifier (SC) gather all or part of this information and the SC must satisfy themselves that all of the "relevant" information has been considered.

If all of the information listed below is not supplied by the contractor or the contractor does not wish the SC to recover said information (at cost) the contractor may be in breach of the no fault provisions of the QBCC's Policy for Rectification of Building Work and may be held responsible for subsidence or settlement of a building.

Table 1: Supplied Information

Element	Supplied/ Considered	Remarks
Property description and site address	✓	Supplied by CR
Plan and/or survey	✓	Supplied by CR
Contour of the site	✓	Supplied by SC
Location of trees, vegetation etc identified	✓	Considered by SC
Location and identification of potential overland flow	✓	Identified by SC
The footprint of proposed building and platform levels	✓	Supplied by CR
Location of proposed or existing cut and fill	✗	Nil Supplied
Appropriate land searches	✗	Nil Supplied

The following (Table 2) is a summary of the information required under the QBCC relating specifically to the SC. Information supplied in this summary is to be read in conjunction with the entire report attached. All relevant data used to ascertain the classification is documented in the report.

Table 2: Information Summary

Element	Remarks
Total number of excavations	3
Minimum of two excavations in building footprint	✓
Soil samples recovered	Undisturbed
Laboratory test performed	Shrink/Swell
Predicted Surface Movement in the absence of the effect of trees	21 - 30 mm
Expected movement potential for "P" sites in the absence of uncontrolled fill	NA

INTRODUCTION

This report outlines the results of the landslide susceptibility assessment and geotechnical investigation undertaken by CQ Soil Testing for the proposed residential dwelling to be constructed at 99 Isabella Street, Stanwell.

It is understood that the project will involve the construction of a residential building in the northeastern corner of the lot facing Isabella Street.

The provided documentation does not include specific details such as the proposed earthworks, type of building type, or loading conditions for the proposed structure. However, for the purposes of this report, it is assumed that cut to fill earthworks will be limited to 1 metre depth/height to level the building pad, and that the loading conditions are consistent with those of a standard residential dwelling, with foundation pressures not exceeding 100 kPa.

This report outlines the results of the fieldwork, laboratory testing, analysis and interpretive reporting on the following items:

- Summary of subsurface conditions and the adopted ground model.
- Foundation soil reactivity in accordance with AS2870 (Site Classification).
- Landslide Susceptibility Analysis.
- Earthworks and site preparation.
- Retaining wall design parameters.
- Allowable bearing pressures for high level footings.
- Ultimate base bearing and ultimate skin friction for the design of piles.

This report must be kept in its entirety. It relates exclusively to the proposed new dwelling at the address stated on page one of this report and has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

SITE DESCRIPTION

The site is located at 99 Isabella Street, Stanwell on Lot 99 Plan S9416 is located on the south western side of Isabella Street, as shown on the attached cadastral mapping.

At the time of the investigation, the site was found to be vacant, featuring vegetation that included a sparse grass ground cover and scattered trees.

Review of the attached contour map and detailed survey plan, along with hillside shading data sourced from GeoResGlobe, indicates that the proposed residential development is situated on the lower slope which descends down towards to east. The average calculated natural surface slope in the area of the proposed dwelling is less than 10 degrees.

During the walkover, the site was visually inspected to assess the general topography for signs of previous landslide instability. No indications of previous landslides or slips were observed on this suggesting that there has been no recent soil creep or landslides in the upper soil mantle. No signs of instability were identified on the GeoResGlobe Hillside shading map.

Based on the review of regional surface geology presented on the Queensland Government website GeoResGlobe, the proposed development area and southern portion of the site is underlain by Late Permian aged Dinner Creek Conglomerate (Pd) comprising of 'Conglomerate, lithic sandstone and carbonaceous mudstone'. In the northwest portion of the site, is the Native Cat Andesite (Rvn) which comprising of 'Andesite, andesitic tuff, trachyandesite, andesitic to rhyolitic breccia, minor rhyolite'.

To improve the understanding and appreciation of the site conditions and features, this report is accompanied by photographs of the site taken during the fieldwork, site sketch and GeoResGlobe mapping and reports.

FIELDWORK

The fieldwork scope was undertaken on 22 November 2024 and 16 March 2025 and included three boreholes (nominated Boreholes 1 to 3) at the approximate locations indicated on the attached drawing. The boreholes were drilled using a 4WD utility-mounted rig equipped with 100mm diameter solid-flight augers. Borehole logs and test location plan are attached.

In summary, the subsurface conditions encountered comprised of a surficial 0.1-metre layer of topsoil underlain by residual very stiff silty clay, very dense clayey/sandy/silty gravel and dense gravely silty sand continuing between depth of 0.45 to 1.4 metres underlain by weathered rock. The very dense clayey/sandy/silty gravel above the rock was characterised as extremely weathered sandstone.

All boreholes encountered auger refusal (i.e. unable to penetrate any further) at the termination depths due to the strength of the weathered rock. The weathered rock encountered at refusal depth was assessed to have low strength or stronger characteristics.

It should be noted that the strength of the rock could potentially increase significantly below the borehole refusal depths. As the excavations were unable to penetrate beyond the refusal depths, it is recommended to consider the possibility of encountering stronger rock formations at greater depths.

No groundwater was encountered during drilling of the boreholes. Groundwater levels can be affected by a variety of factors, including seasonal changes, precipitation, and local geology.

As the site is located within a natural drainage path, groundwater can be expected to rise significantly during the wet season, and/or after heavy and prolonged rainfall, with the potential for groundwater at times to be near the surface.

It is important to note that the soil profile across the site may potentially differ from what is indicated in the bore logs. Therefore, in the event of encountering different conditions during construction, it is imperative to notify CQ Soil Testing.

LABORATORY TEST RESULTS

The laboratory testing undertaken on selected representative soil samples in accordance with AS1289-Methods of Testing for Engineering Purposes is aimed at determining the typical soil characteristics required for the engineering assessment. The results of the laboratory tests are attached to this report.

GEOTECHNICAL COMMENTS

The geotechnical comments presented in this report are derived from factual information obtained during the fieldwork, along with the application of best practices, local expertise, and relevant published literature.

SITE CLASSIFICATION

In strict accordance with AS2870:2011, the site would be classified as Class M, and as a result the foundation system needs to be designed by following appropriate engineering principles.

It is recommended that all load-bearing elements of the footing system be supported into the underlying residual soils or weathered rock.

To provide an indication of potential shrink swell ground movements due to normal seasonal moisture variations that could be experienced at this site, a shrink-swell index (Iss) value of 2% was inferred (based on the laboratory testing and previous experience in the area). Based on the inferred shrink-swell value and empirical methods described in Section 2.3 of AS2870, the calculated surface movement (ys) in response to normal seasonal soil suction could potentially be up to 30 mm consistent with a Class M site classification.

Shrink swell ground movements due to the influence of trees (including trees that have been recently removed) or garden beds planted near the building footings could potentially be up to an additional 10 mm.

Settlement of fill will be in addition to ground movements due to normal seasonal moisture variations.

The introduction of new fill will influence potential shrink swell ground movements, and the site will need to be reclassified if cut to fill earthworks are undertaken as part of this development.

Proper site maintenance is crucial for the long-term performance of any building's foundation system. As such, the guidelines outlined in the attached CSIRO publication "Foundation Maintenance and Footing Performance: A Homeowners Guide" should be followed to ensure the site remains in optimal condition.

LANDSLIDE RISK ASSESSMENT

Rockhampton Regional Council has developed a Planning Scheme mapping tool and require a landslide hazard assessment before obtaining building approval. Consequently, this triggers the need for a landslide susceptibility assessment as per regulatory requirements.

The results of the attached Landslide Susceptibility Analysis (refer attached), including the relative susceptibility and correlated susceptibility rating, are summarised in Table 3 below. The following are assumed to achieve the reported Correlated Susceptibility Rating:

- Natural site slope angles between 5 and 15 degrees (across the site).
- Slope shape is planar.
- Residual soils between 1 metre and 3 metres thick.
- Fill up to 1 metre is possible.
- Cuts up to 1 metre are possible
- Slope of cut less than 30 degrees (to the horizontal).
- Slope support has been is categorised as unsupported, representing the highest risk.
- Located on the lower slope.
- No evidence of instability.
- Wastewater is disposed onsite via surface methods
- Rainwater is collected in rainwater tanks with overflows.

***Table 3**: Results of AGS Qualitative Risk Assessment*

Relative Susceptibility	Correlated Susceptibility Rating
0.6	Low

Based on the relative susceptibility and correlated susceptibility rating, the site would be assessed as having a 'Low' landslide risk rating.

Retaining structures would need to be designed and certified by a qualified structural engineer (not anticipated), with a minimum of 1.5 global stability factor of safety, to maintain the correlated susceptibility rating to 'Low.'

The attached geomechanics hillside practices should be adopted for the dwelling.

EARTHWORKS

Any new fill that will support structural loads should be placed and compacted under full time supervision and testing in accordance with AS3798–2007 Guidelines on Earthworks for Commercial and Residential Developments. These guidelines recommend:

- Remove grass and vegetation.
- Remove uncontrolled fill (none encountered within the boreholes).
- Subgrade preparation.
- Test rolling after subgrade preparation using specific plant and load conditions such as a static 12 Tonne smooth steel wheeled roller, a pneumatic-tired plant that weighs at least 20 tonnes and has a ground pressure not less than 450 kPa per tyre, or a highway truck with a rear axle loaded to not less than 8 tonnes, with tyres inflated to 550 kPa.
- Soft areas identified will need to be removed and replaced with select material, subject to site-specific conditions.
- Structural fill should be placed in near horizontal layers, with a maximum loose thickness of 300mm (uncompacted) and then compacted to a minimum of 98% DDR for general fill and 100% DDR in the upper 0.5m beneath slabs and pavements. Moisture variation should not exceed ±2% of the OMC.
- Maximum particle size should be limited to two-thirds of the compacted layer thickness or 125 mm (whichever is greater).
- If the structural fill abuts slopes steeper than 8H:1V, it is recommended to cut benches into the slope equal to the height of the fill layer before filling.

If fill is placed in an uncontrolled manner, it is recommended to design structures to be fully supported by the underlying natural soils. Furthermore, uncontrolled fill can lead to ground surface settlement, potentially affecting other areas of the site, including sheds, yard furniture, retaining walls and buildings.

RETAINING WALLS

Recommended retaining wall design parameters for the materials encountered during the investigation are provided in Table 4: Retaining Wall Parameters. These parameters are unfactored and drained (of pore pressures), and have been inferred based on the information available.

Table 4: Retaining Wall Parameters

Material	Unit Weight (kN/m^3)	Friction Angle (Ø')	Drained Cohesion (c')
Very stiff silty clay	19	26	2
Very dense clayey/sandy/silty gravel Dense gravely silty sand	20	35	0
Weathered rock	22	38	5

To ensure the safety and stability of retaining walls, it is recommended that they are designed and certified by a qualified structural engineer and built in accordance with the minimum requirements outlined in AS4678 - Earth Retaining Structures.

It is recommended that global stability analysis be undertaken on all retaining structures to ensure that suitable global stability FoS are reached.

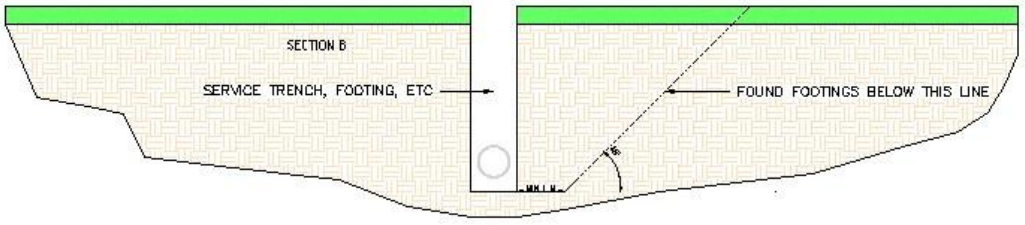
It is recommended that passive pressures be ignored in areas where disturbance may occur (ie. future trenching or earthworks processes).

FOUNDATIONS

High-level footings can be designed using an allowable bearing pressure of 100 kPa in residual very stiff silty clay, very dense clayey/sandy/silty gravel and dense gravely silty sand soils, and 500 kPa in the weathered rock. Elastic settlements under such applied loading are predicted to be less than 0.5% of the footing width.

If footings are positioned near an underground service or other structure, it is recommended to extend the footing at least 0.3 m below an imaginary line projected at a 45-degree angle from the lowest point of the service/obstruction. Figure 1 provides a visual representation for reference.

Figure 1:



The design of vertically loaded bored piles that are founded at least two pile diameters into the designated strata can adopted the ultimate values in Table 5: Deep Level Footings – Ultimate Geotechnical Parameters.

The upper metre of the pile skin friction should be ignored in the design. For example, the pile should be designed assuming a 1 metre length of pile is sticking out of the ground, cantilevering this upper metre of pile. This precaution is necessary due to the potential separation between the pile and the ground due to soil shrinkage during drying.

Table 5: Deep Level Footings – Ultimate Geotechnical Parameters

Soil Type	Skin Friction (kPa)	End Bearing (kPa)
Stiff silty clay	30	Not recommended
Dense gravels and sand	10	Not recommended
Weathered rock	50	1800

To ensure the proper performance of piles, it is recommended to have them designed and certified by a qualified structural engineer and constructed according to the minimum requirements specified in AS2159 - Piling Design and Installation.

Settlements of piles that are loaded in a manner like the one described above are not expected to exceed approximately 1% of the diameter of the pile.

Most equipment, including excavators with auger attachments, should be able to excavate bored pile excavations in the residual soils. The underlying rock is likely to require larger machinery with specialised rock auger attachments.

To ensure that footings are properly constructed and perform as expected over their design life, it is recommended that a suitably qualified geotechnical engineer inspects and certifies them for bearing capacity during construction

If you should have any queries regarding this report, please do not hesitate to contact the undersigned at your convenience.

Yours faithfully

Ryan Kemp
Geotechnical Consultant – RPEQ (19386), CPEng, NER, MEIAust

Scott Walton
Laboratory Manager

LABORATORY FINDINGS

A. Classification by characteristic surface movement as per AS2780-2011

Site Classification Symbols	Y's Range Value	Generalized Description (Guide Only)
'S'	0 – 20 mm	Slightly reactive clay sites which may experience only slight ground movement due to moisture changes
'M'	21 – 40 mm	Moderately reactive clay or silt sites which may experience moderate ground movement due to moisture changes
'H1'	41 – 60 mm	Highly reactive clay sites which may experience high ground movement due to moisture changes
'H2'	61 – 75 mm	Highly reactive clay sites which may experience very high ground movement due to moisture changes
'E'	>75 mm	Extremely reactive clay sites which may experience extreme ground movement due to moisture changes
'P'	N/A	Problem sites which generally have soils associated with uncontrolled fill, abnormal moisture conditions (trees), soft or collapsing soils, landslip etc...

B. Laboratory Test Results

Borehole Location	1	Borehole Location		Borehole Location	
Depth Range of Sample (m)	0.0-0.3	Depth Range of Sample (m)		Depth Range of Sample (m)	
Natural MC %	14.2	Natural MC %		Natural MC %	
% Passing 75 um Sieve	ND	% Passing 75 um Sieve		% Passing 75 um Sieve	
Liquid Limit %	ND	Liquid Limit %		Liquid Limit %	
Plastic Index %	ND	Plastic Index %		Plastic Index %	
Linear Shrinkage %	ND	Linear Shrinkage %		Linear Shrinkage %	
Shrink Swell Index	1.4	Shrink Swell Index		Shrink Swell Index	
Pocket Penetrometer kPa	ND	Pocket Penetrometer kPa		Pocket Penetrometer kPa	

C. Permeability Test Results AS1547-2000

Test Hole Number	Depth Of Test Hole	Range Tested	Permeability M/Day
NA	500 mm	250 – 500 mm	NA

APPENDIX A – Borehole Logs

CQ SOIL TESTING

CQ Soil Testing

32 Alexandra Street, North Rockhampton QLD 4701

Phone: (07) 4936 1163

Geotechnical Log - Borehole

BH1

Easting	**: 226694.27**	**Location**	**: 99 Isabella Street, Stanwell QLD**	**Job Number**	**: CQ27737**
Northing	**: -2599241.26**	**Logged By**	**: M Walton**	**Client**	**: John Roberts**
Total Depth	**: 0.5 m**	**Date**	**: 22/11/2024**	**Project**	**: Geotechnical Investigation - Slope Stability**

Drilling Method	Water	DCP Blows (0 5 10 15 20)	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Samples	Testing
		2, 4, 8, 11, 15		Natural		CI	Natural Silty CLAY CI: medium plasticity, trace fine to coarse sized gravel, trace fine to coarse grained sand, brown, dry, very stiff.		
			0.4	Natural		GC	Natural Clayey sandy GRAVEL GC: fine to coarse sized, low plasticity clay, brown, dry, very dense.		
			0.45	Rock		GC/XW	Rock WEATHERED ROCK: , brown, dry.		
							BH1 refusal at 0.5m (Weathered Rock)		

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger:V-Bit
AD/T	Solid flight auger:TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy(No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard(Refusal)

WATER

- Water Level on Date
- Water inflow
- Water outflow

FIELD TESTS

SPT	- Standard Penetration Test
PP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photo Ionisation Detector
VS	- Vane Shear; P=Peak, R=residual (unconnected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube "undisturbed"

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- plastic limit
LL	- liquid limit
W	- Moisture content

SOIL CONSISTENCY

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

RELATIVE DENSITY

VL	- Very loose
L	- Loose
MD	- Medium dense
D	- Dense
VD	- Very dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

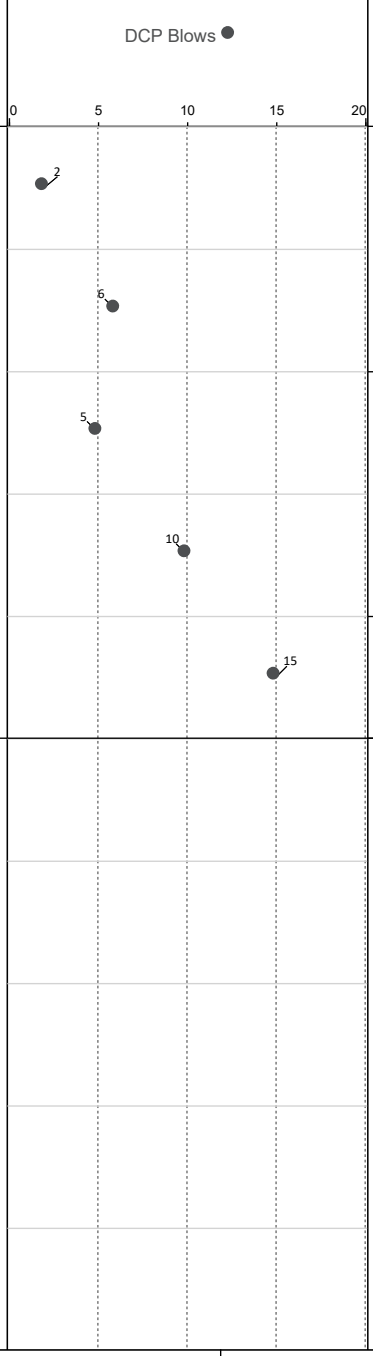
CQ Soil Testing

CQ Soil Testing
32 Alexandra Street, North Rockhampton QLD 4701
Phone: (07) 4936 1163

Geotechnical Log - Borehole

BH2

Easting	: 226694.27	**Location**	: 99 Isabella Street, Stanwell QLD	**Job Number**	: CQ27737
Northing	: -2599241.26	**Logged By**	: M Walton	**Client**	: John Roberts
Total Depth	: 0.5 m	**Date**	: 22/11/2024	**Project**	: Geotechnical Investigation - Slope Stability



Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Samples	Testing
	Natural		CI	Natural Silty CLAY CI: medium plasticity, trace fine to coarse sized gravel, trace fine to coarse grained sand, brown, dry, very stiff.		
0.3	Natural		GC	Natural Clayey sandy GRAVEL GC: fine to coarse sized, low plasticity clay, brown, dry, very dense.		
0.4	Rock		GC/XW	Rock WEATHERED ROCK: , brown, dry.		
				BH2 refusal at 0.5m (Weathered Rock)		

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger:V-Bit
AD/T	Solid flight auger:TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy(No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard(Refusal)

WATER

- Water Level on Date
- Water inflow
- Water outflow

FIELD TESTS

SPT	- Standard Penetration Test
PP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photo Ionisation Detector
VS	- Vane Shear; P=Peak, R=residual (unconnected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube "undisturbed"

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- plastic limit
LL	- liquid limit
W	- Moisture content

SOIL CONSISTENCY

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

RELATIVE DENSITY

VL	- Very loose
L	- Loose
MD	- Medium dense
D	- Dense
VD	- Very dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CQ Soil Testing

CQ SOIL TESTING

CQ Soil Testing

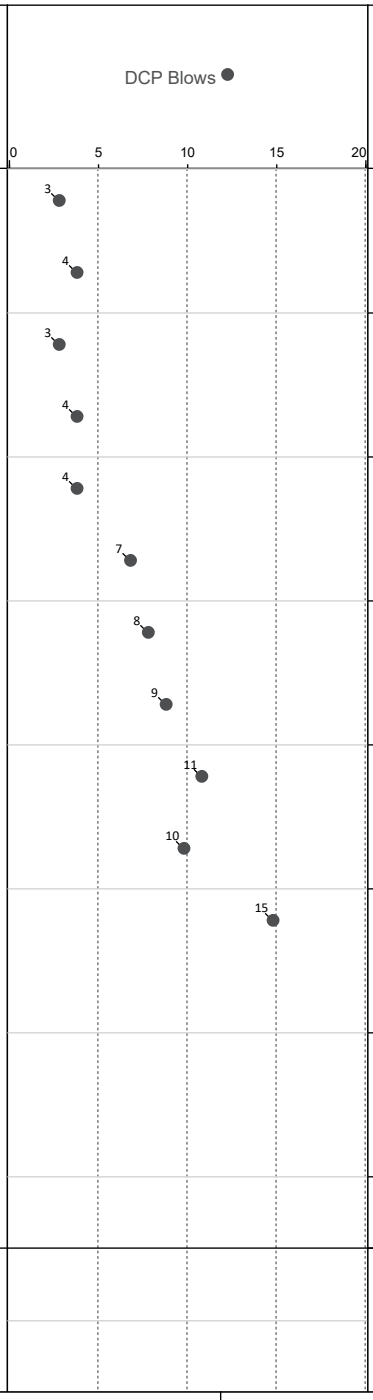
32 Alexandra Street, North Rockhampton QLD 4701

Phone: (07) 4936 1163

Geotechnical Log - Borehole

BH3

Easting	: 226694.27	**Location**	: 99 Isabella Street, Stanwell QLD	**Job Number**	: CQ27737
Northing	: -2599241.26	**Logged By**	: M Walton	**Client**	: John Roberts
Total Depth	: 1.5 m	**Date**	: 16/03/2025	**Project**	: Geotechnical Investigation - Slope Stability



Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description
	Natural		CI	Natural Silty CLAY CI: medium plasticity, trace fine to coarse sized gravel, trace fine to coarse grained sand, brown, dry, very stiff.
0.6	Natural		GM	Natural Silty sandy GRAVEL GM: fine to coarse sized, fine to coarse grained sand, light brown, dry, very dense.
1	Natural		SM	Natural Gravelly silty SAND SM: fine to coarse grained, fine to coarse sized gravel, white, dry, dense.
1.4	Rock		SM/XW	Rock GRAVELLY SILTY SAND (SM/XW): , white, dry.
				BH3 refusal at 1.5m (Weathered Rock)

Drilling Method | **Water** | **Samples** | **Testing**

METHOD

EX	Excavator bucket
R	Ripper
HA	Hand auger
PT	Push tube
SON	Sonic drilling
AH	Air hammer
PS	Percussion sampler
AS	Short spiral auger
AD/V	Solid flight auger:V-Bit
AD/T	Solid flight auger:TC-Bit
HFA	Hollow flight auger
WB	Washbore drilling
RR	Rock roller

PENETRATION

VE	Very Easy(No Resistance)
E	Easy
F	Firm
H	Hard
VH	Very Hard(Refusal)

WATER

- Water Level on Date
- Water inflow
- Water outflow

FIELD TESTS

SPT	- Standard Penetration Test
PP	- Hand/Pocket Penetrometer
DCP	- Dynamic Cone Penetrometer
PSP	- Perth Sand Penetrometer
MC	- Moisture Content
PBT	- Plate Bearing Test
IMP	- Borehole Impression Test
PID	- Photo Ionisation Detector
VS	- Vane Shear; P=Peak, R=residual (unconnected kPa)

SAMPLES

B	- Bulk disturbed sample
D	- Disturbed sample
ES	- Environmental sample
U	- Thin wall tube "undisturbed"

MOISTURE

D	- Dry
M	- Moist
W	- Wet
PL	- plastic limit
LL	- liquid limit
W	- Moisture content

SOIL CONSISTENCY

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

RELATIVE DENSITY

VL	- Very loose
L	- Loose
MD	- Medium dense
D	- Dense
VD	- Very dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

CQ Soil Testing

APPENDIX B – Site Photographs

Site Photo

Site Photo

CQ SOIL TESTING

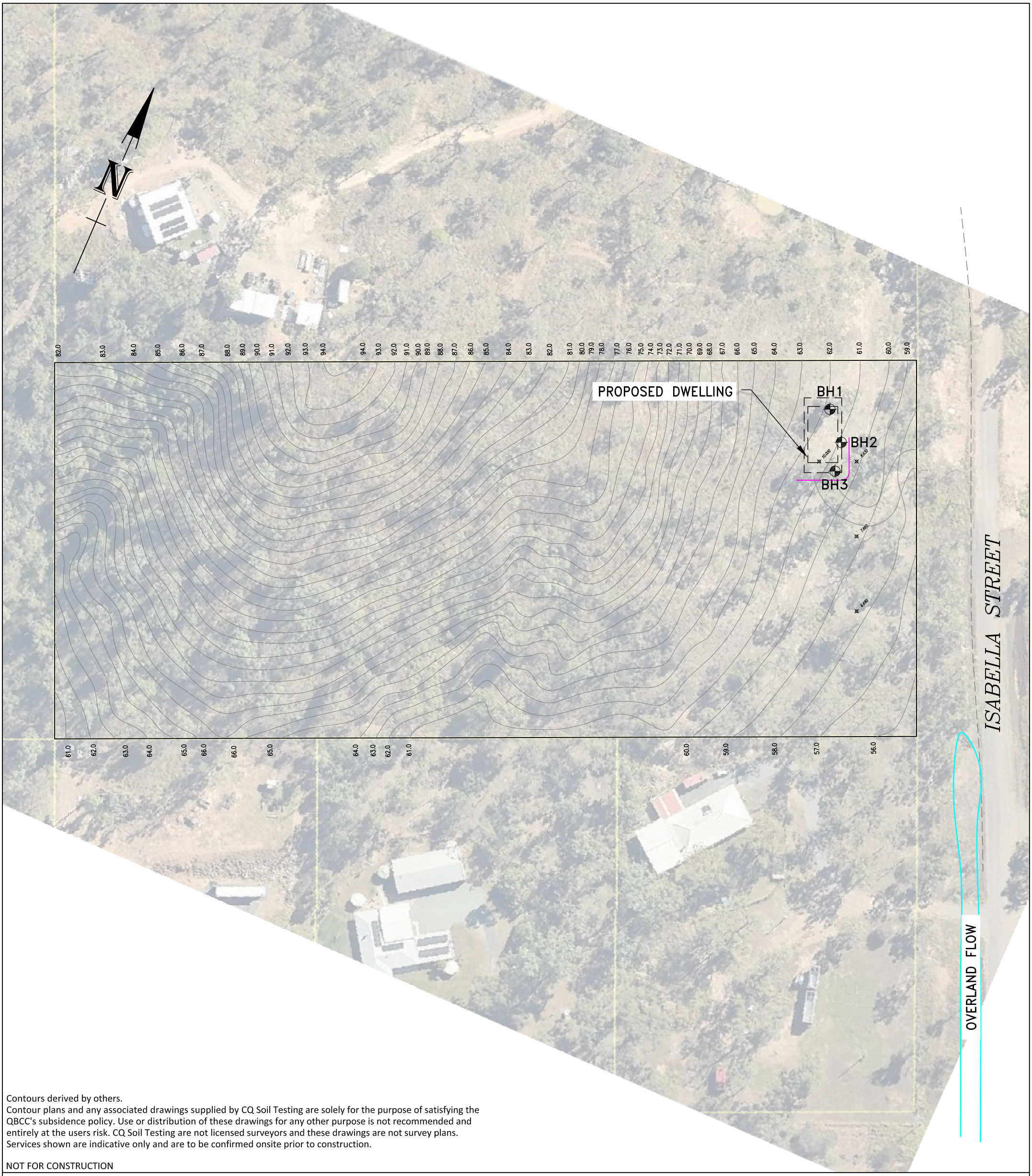
(07) 4936 1163

32 Alexandra Street, North Rockhampton QLD 4701

info@cqsoiltesting.com.au

Photo description	Site Photographs		
Client	John Roberts		
Location	99 Isabella Street, Stanwell QLD		
Project name	Geotechnical Investigation - Slope Stability		
Project No	CQ27737	**Scale**	Not to Scale
BH No	Site Photos	**BH Depth**	

APPENDIX C – Site Plan



Contours derived by others.
Contour plans and any associated drawings supplied by CQ Soil Testing are solely for the purpose of satisfying the QBCC's subsidence policy. Use or distribution of these drawings for any other purpose is not recommended and entirely at the users risk. CQ Soil Testing are not licensed surveyors and these drawings are not survey plans.
Services shown are indicative only and are to be confirmed onsite prior to construction.

NOT FOR CONSTRUCTION

SERVICES LEGEND:

E — Electricity Pit	T — Telecom Turret	—T—	U/G Telecom Line
S — Storm water pit	T — Telecom Pit	—W—	U/G Water Line
H — Fire Hydrant	G — Gully Pit	—SW—	U/G Stormwater Line
K — Kerb Adapter	S — Sewer Manhole	—OHP—	Overhead Power
W — Water Meter	—S— Sewerage Line	HC	Sewer House Connection
Street Light	—E— U/G Power Line		Stormwater Gully Pit

SITE LEGEND & NOTES:

- 10.000 — RL 10.000 is assumed as datum level (ie Not AHD)
- 9.2 — Existing Contour
- 9.820 — Denotes Surveyed RL

Field Technician: R.J. Date: 15.11.2024

CQ SOIL TESTING
Servicing all of Central Queensland

QBCC - 15 305 465 ABN - 87 656 845 448

Phone: (07) 4936 1163
Email: info@cqsoiltesting.com.au
Website: www.cqsoiltesting.com.au

Project:
LOT 99 ISABELLA STREET
STANWELL, QLD

For:
J ROBERTS

Title: CONTOUR & SITE PLAN	
Scale: 1:1000 (A3)	Date: MAR '25
Sheet: 1 of 1	Drawn: C.T.
Job No: CQ26768	Rev: A

APPENDIX D - Attachments

99 Isabella Street, Stanwell

Spatial reference

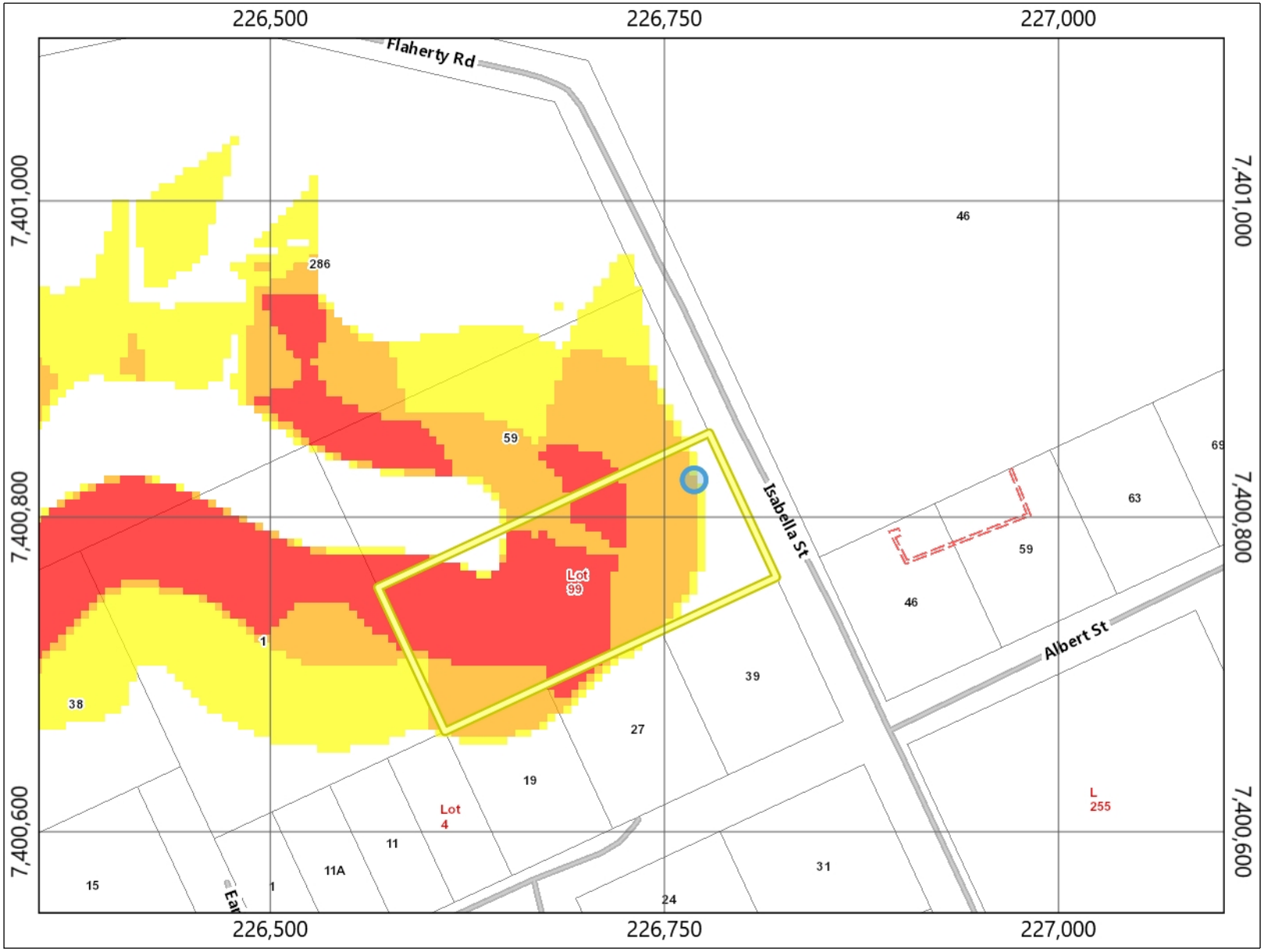
GDA2020_MGA_Zone_56

A4 Page scale at 1: 3,741.63

Printed from RRPS on 25/03/25

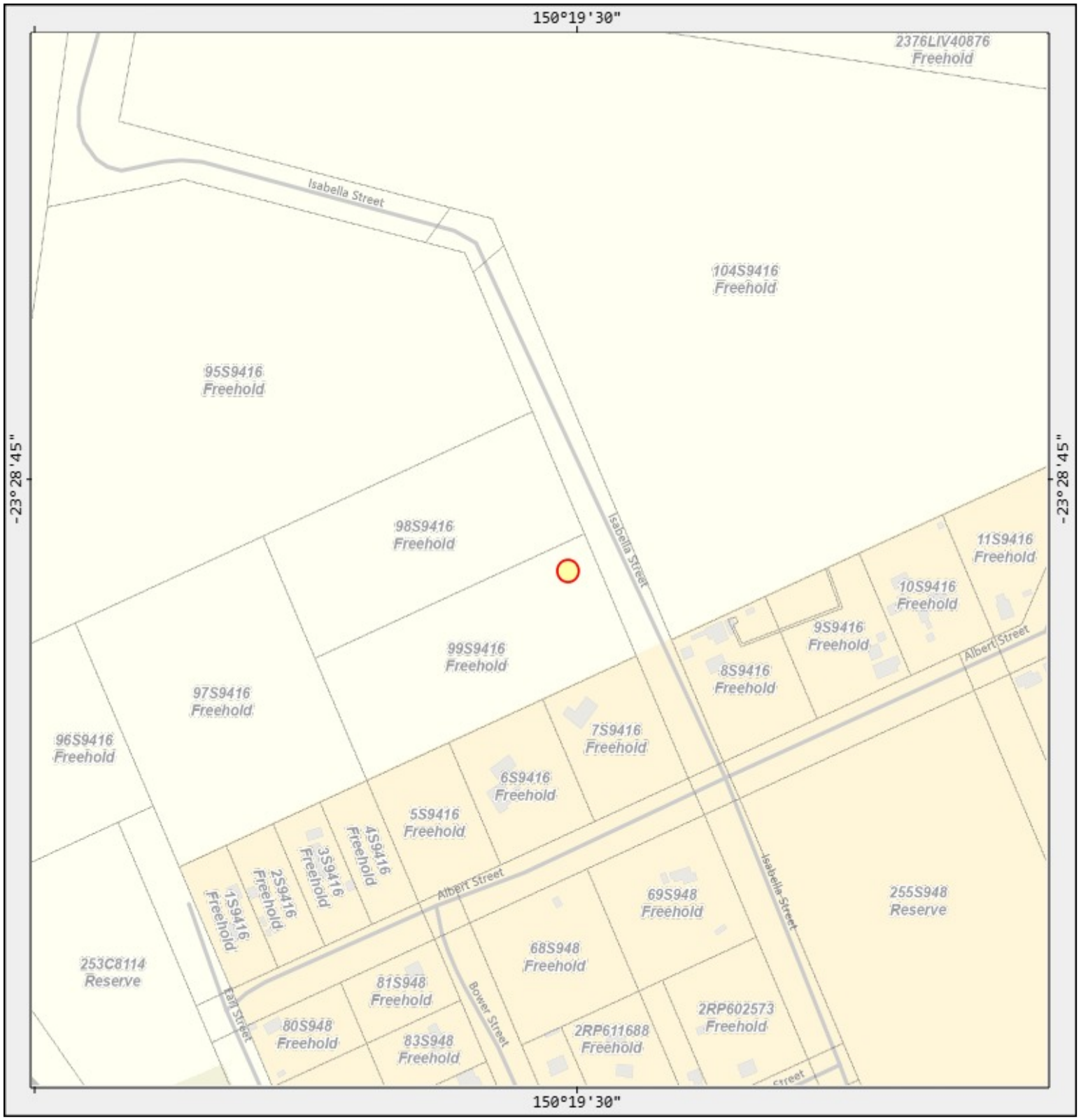
Legend

Slope %
- 15-20%
- 20-25%
- 25%+



GDA 2020

Rockhampton Regional Council



A product of
GeoResGlobe

Legend

Cadastre (DCDB) parcel

Places: My Places(1)

Proposed Dwelling - 99 Isabella Street, Stanwell

N

0 100 metres

Scale: 1:4365

Printed at: A4

Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government

Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

PDF report

Lot:	99
Plan:	S9416
Lot plan:	99S9416
Area (sq m):	23270
Tenure:	Freehold
Segment parcel:	31951005
Parcel indicator:	
Local government:	Rockhampton Regional
Locality:	Stanwell
Accuracy:	B&D ENTRY CONTROLLED - 0.1M
Surveyed:	Y
Smart Map:	https://apps.information.qld.gov.au/data/v2/Cadastre/SmartMap?lot=99&plan=S9416
st_area(shape):	0.000002057
st_perimeter(shape):	0.0063157039
Layer:	Cadastre (DCDB) parcel

Created On: 25/03/2025, 1:56:50 am Created By: Guest

Queensland Government

A product of
GeoResGlobe

Legend

Cadastre (DCDB) parcel

Places: My Places(1)

Proposed Dwelling - 99 Isabella Street, Stanwell

N

0 100 metres

Scale: 1:4365

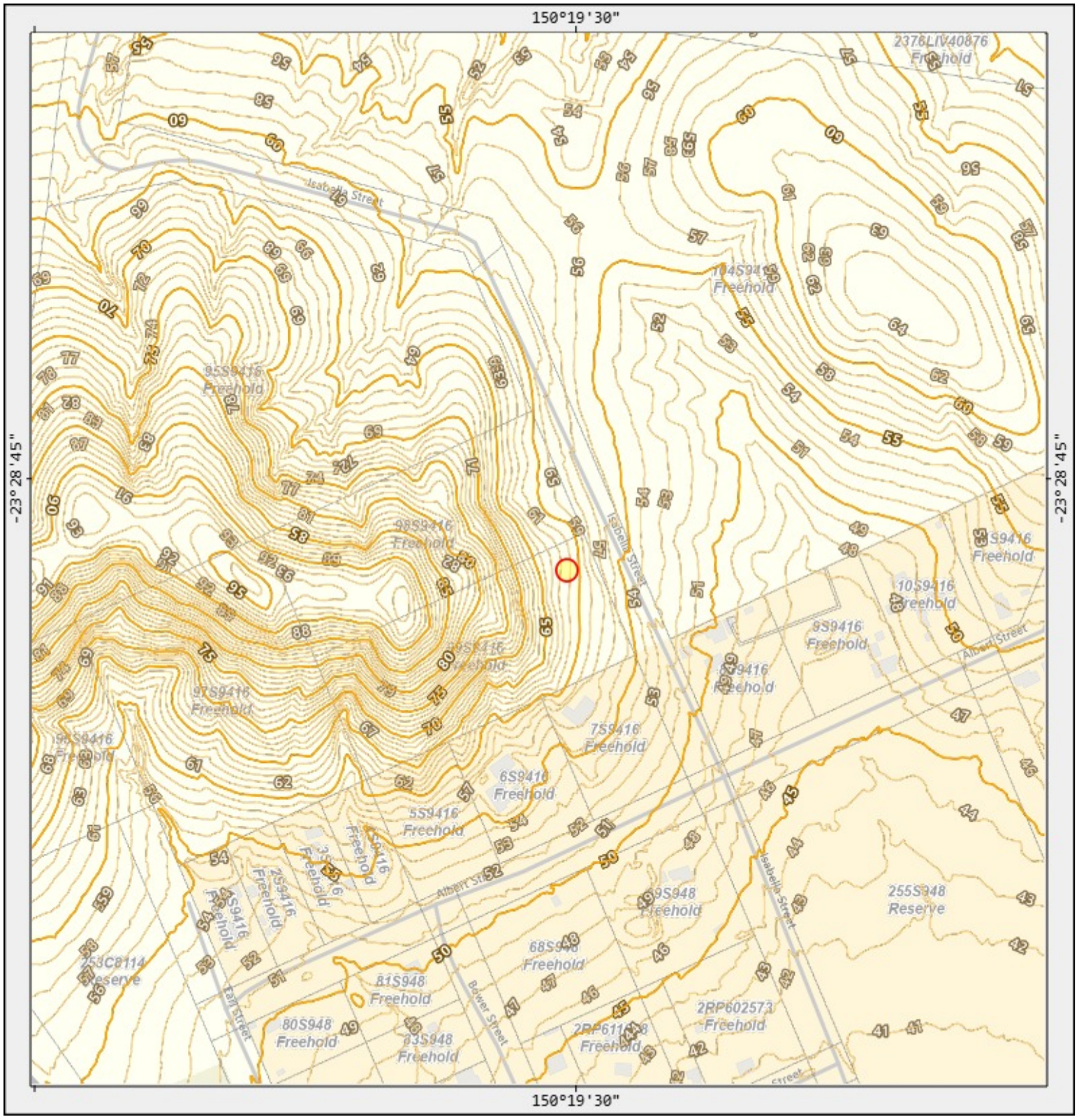
Printed at: A4

Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government
Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development



A product of
GeoResGlobe

Legend

Contour LiDAR 1m

- Index Contour
- Intermediate Contour
- Cadastre (DCDB) parcel

Places: My Places(1)

- Proposed Dwelling - 99 Isabella Street, Stanwell

N

0 100 metres

Scale: 1:4365

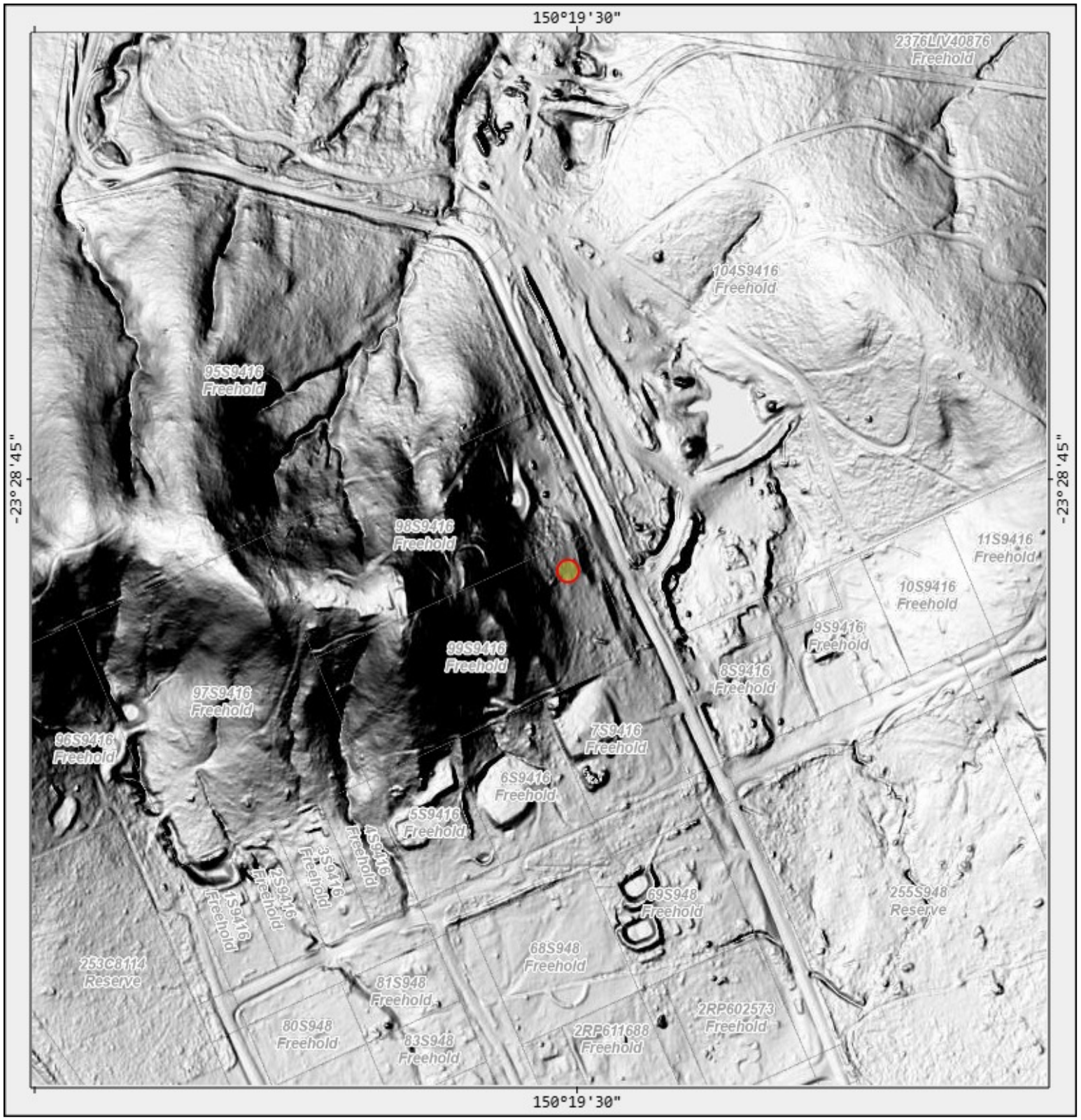
Printed at: A4

Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government
Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development



A product of
GeoResGlobe

Legend

Cadastre (DCDB) parcel

Places: My Places(1)

Proposed Dwelling - 99 Isabella Street, Stanwell

N

0 100 metres

Scale: 1:4365

Printed at: A4

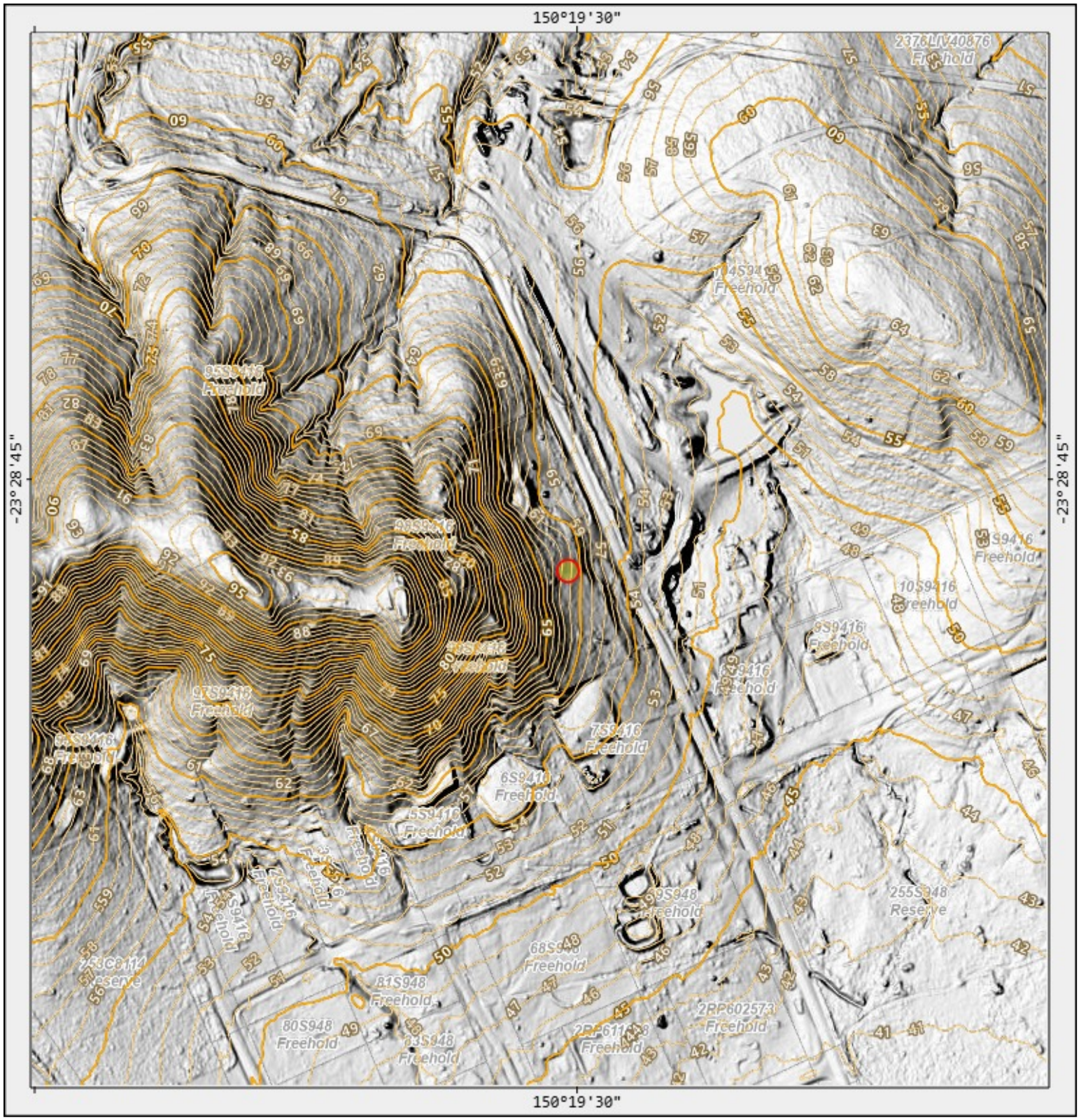
Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government

Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development



A product of
GeoResGlobe

Legend

Contour LiDAR 1m

- Index Contour
- Intermediate Contour
- Cadastre (DCDB) parcel

Places: My Places(1)

- Proposed Dwelling - 99 Isabella Street, Stanwell

N

0 100 metres

Scale: 1:4365

Printed at: A4

Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government

Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

A product of
GeoResGlobe

Legend located on next page

N

0 100 metres

Scale: 1:4365

Printed at: A4

Print date: 25/3/2025

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit https://georesglobe.information.qld.gov.au/help-info/Contact-us.html

Queensland Government
Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

Legend

Detailed surface geology

- Dalma Basalt (Kvd)
- Dinner Creek Conglomerate (Pd)
- Native Cat Andesite (Rvn)
- Cadastre (DCDB) parcel

Places: My Places(1)

- Proposed Dwelling - 99 Isabella Street, Stanwell

Attribution

PDF report

Rock unit key (Surface):	415
Rock unit name:	Dinner Creek Conglomerate
Map symbol:	Pd
Lithological summary:	Conglomerate, lithic sandstone and carbonaceous mudstone
Dominant rock:	ARENITE-RUDITE
Rock type:	STRATIFIED UNIT (INCLUDING VOLCANIC AND METAMORPHIC)
Age:	LATE PERMIAN
Legend:	Dinner Creek Conglomerate (Pd)
Legend sequence:	3080
Rock unit key (Solid):	415
Layer:	Detailed surface geology

Created On: 25/03/2025, 2:00:42 am Created By: Guest

PDF report

Rock unit key (Surface):	1054
Rock unit name:	Native Cat Andesite
Map symbol:	Rvn
Lithological summary:	Andesite, andesitic tuff, trachyandesite, andesitic to rhyolitic breccia, minor rhyolite
Dominant rock:	MAFITES (LAVAS, CLASTICS & HIGH-LEVEL INTRUSIVES)
Rock type:	STRATIFIED UNIT (INCLUDING VOLCANIC AND METAMORPHIC)
Age:	MIDDLE TRIASSIC - LATE TRIASSIC
Legend:	Native Cat Andesite (Rvn)
Legend sequence:	1680
Rock unit key (Solid):	1054
Layer:	Detailed surface geology

Created On: 25/03/2025, 2:01:06 am Created By: Guest

Queensland Government

WATER, DRAINAGE & SURFACE PROTECTION

One way or another, water usually plays a critical part in initiating a landslide (GeoGuide LR2). For this reason, it is a key factor to be controlled on sites with more than a low landslide risk (GeoGuide LR7).

Groundwater and Groundwater Flow

The ground is permeable and water flows through it as illustrated in Figure 1. When rain falls on the ground, some of it runs along the surface ("surface water run-off") and some soaks in, becoming groundwater. Groundwater seeps downwards along any path it can find until it meets the water table: the local level below which the ground is saturated. If it reaches the water table, groundwater either comes to a halt in what is effectively underground storage, or it continues to flow downwards, often towards a spring where it can seep out and become surface water again. Above the water table the ground is said to be "partially saturated", because it contains both water and air. Suctions can develop in the partially saturated zone which have the effect of holding the ground together and reducing the risk of a landslide. Vegetation and trees in particular draw large quantities of water out of the ground on a daily basis from the partially saturated zone. This lowers the water table and increases suctions, both of which reduce the likelihood of a landslide occurring.

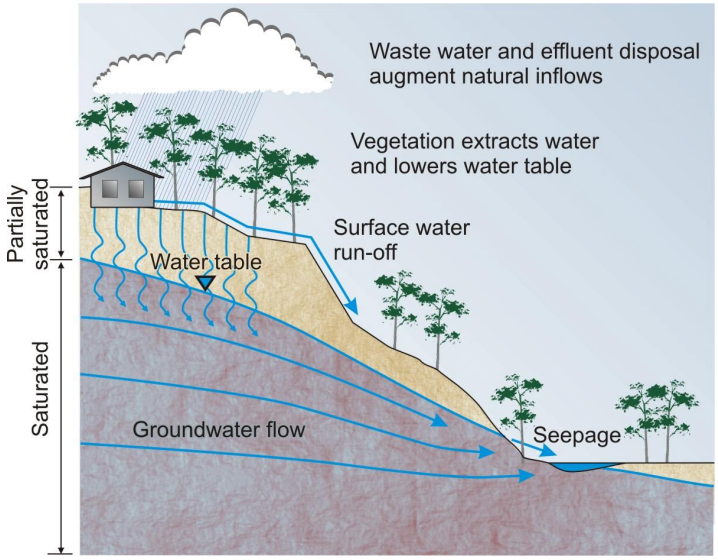


Figure 1 - Groundwater flow

Groundwater Flow and Landslides

The landslide risk in a hillside can be affected by increase in soak-away drainage or the construction of retaining walls which inhibit groundwater flow. The groundwater is likely to rise after heavy rain, but it can also rise when human interference upsets the delicate natural balance. Activities such as felling trees and earthworks can lead to:

- a reduction in the beneficial suctions in the partially saturated zone above the water table.
- increased static water pressures below the water table,
- increased hydraulic pressures due to groundwater flow,
- loss of strength, or softening, of clay rich strata,
- loss of natural cementing in some strata,
- transportation of soil particles.

Any of these effects, or a combination of them, can lead to landslides like those illustrated in GeoGuides LR2, LR3 and LR4.

Limiting the Effect of Water

Site clearance and construction must be carefully considered if changes in groundwater conditions are to be limited. GeoGuide LR8 considers good and poor development practices. Not surprisingly much of the advice relates to sensible treatment of water and is not repeated here. Adoption of appropriate techniques should make it possible to either maintain the current ground water table, or even cause it to drop, by limiting inflow to the ground.

If drainage measures and surface protection are relied on to keep the risk of a landslide to a tolerable level, it is important that they are inspected routinely and maintained (GeoGuide LR11).

The following techniques may be considered to limit the destabilising effects of rising groundwater due to development and are illustrated in Figure 2.

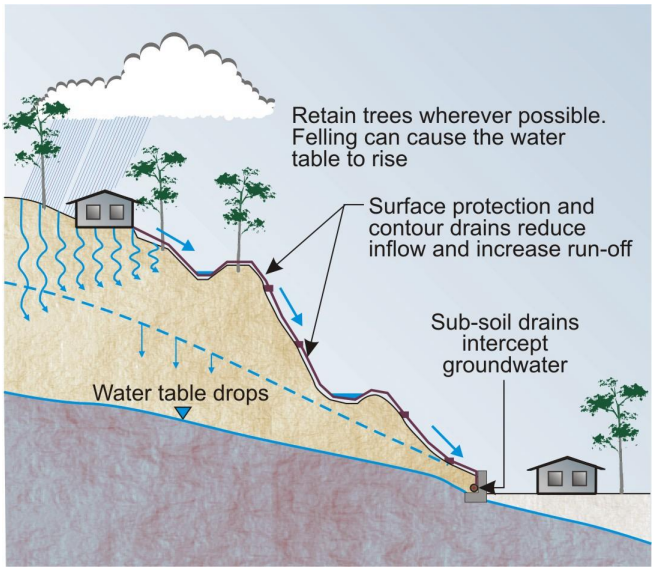


Figure 2 - Techniques used to control groundwater flow

Surface water drains (dish drains, or table drains) - are often used to prevent scour and limit inflow to a slope. Other than in rock, they are relatively ineffective unless they have an impermeable lining. You should clear them regularly, and as required, and not less than once a year. If you live in an area with seasonal rainfall, it is best to do this near the end of the dry season. If you notice that soil or rock debris is falling from the slope above, determine the source and take appropriate action. This may mean you have to seek advice from a geotechnical practitioner.

Surface protection - is sometimes used in addition to surface water drainage to prevent scour and minimise water inflow to a slope. You should inspect concrete, shotcrete or stone pitching for cracking and other signs of deterioration at least once a year. Make sure that weepholes are free of obstructions and able to drain. If the protection is deteriorating, you should seek advice from a geotechnical practitioner.

Sub-soil drains - are often constructed behind retaining walls and on hillsides to intercept groundwater. Their function is to remove water from the ground through an appropriate outlet. It is important that subsoil drains are designed to complement other measures being used. They should be laid in a sand, or gravel, bed and protected with a graded stone or geotextile filter to reduce the chance of clogging. Sub-soil drains should always be laid to a fall of at least 1 vertical on 100 horizontal. Ideally the high end should be brought to the surface, so it can be flushed with water from time to time as part of routine maintenance procedures.

Deep, underground drains - are usually only used in extreme circumstances, where the landslide risk is assessed as not being tolerable and other stabilisation measures are considered to be impractical. They work by permanently lowering the water table in a slope. They are not often used in domestic scale developments, but if you have any on your site be aware that professional maintenance is essential. If they are not maintained and stop working, the water table will rise and a landslide may even occur during normal weather conditions. Both an increase or a reduction in the normal flow from deep drains could indicate a problem if it appears to be unrelated to recent rainfall. If changes of this sort are observed, you should have the drains and your site checked by a geotechnical practitioner.

Documentation - design drawings and specifications for geotechnical measures intended to minimise landslide risk can be of great assistance to a geotechnical specialist, or structural engineer, called in to inspect and report on them. Copies of available documentation should be retained and passed to the new owner when the property is sold (GeoGuide LR11). You should also request details of an appropriate maintenance program for drainage works from the designer and keep that information with other relevant documentation and maintenance records.

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

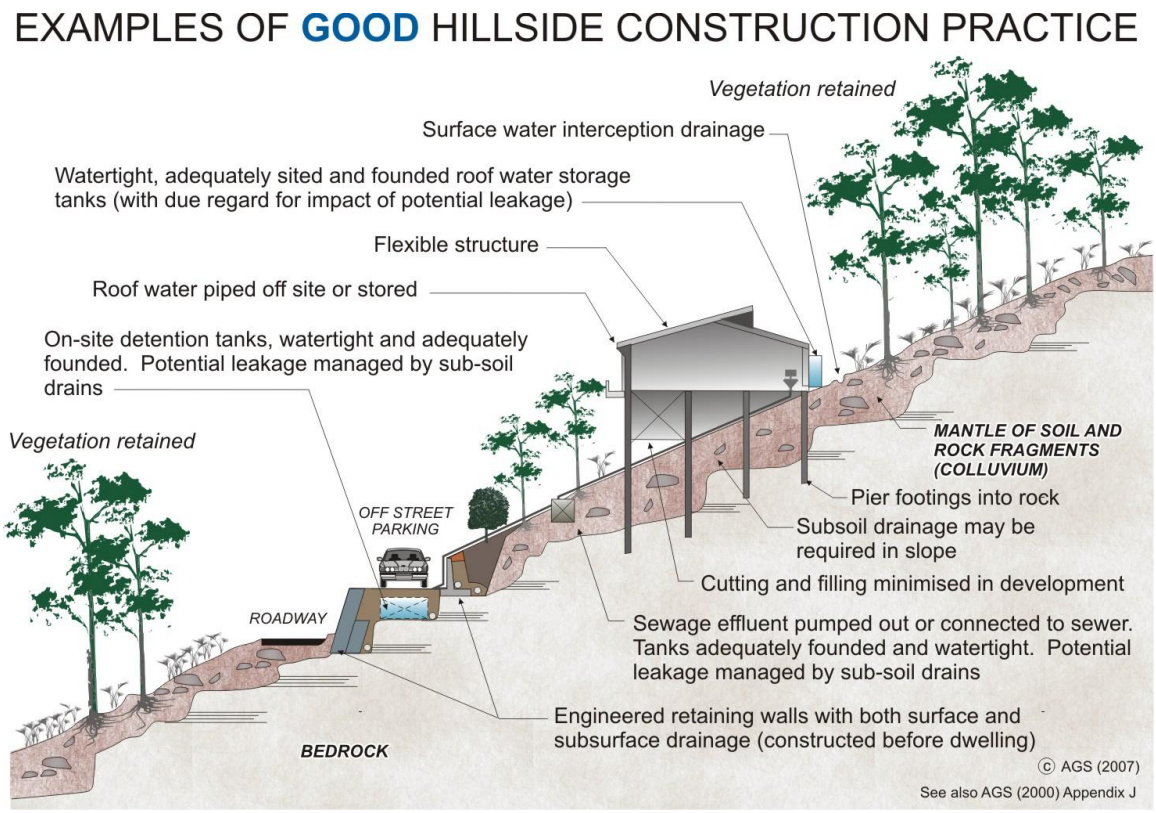
- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR8 - Hillside Construction
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

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

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

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



WHY ARE THESE PRACTICES GOOD?

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

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

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

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

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

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

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

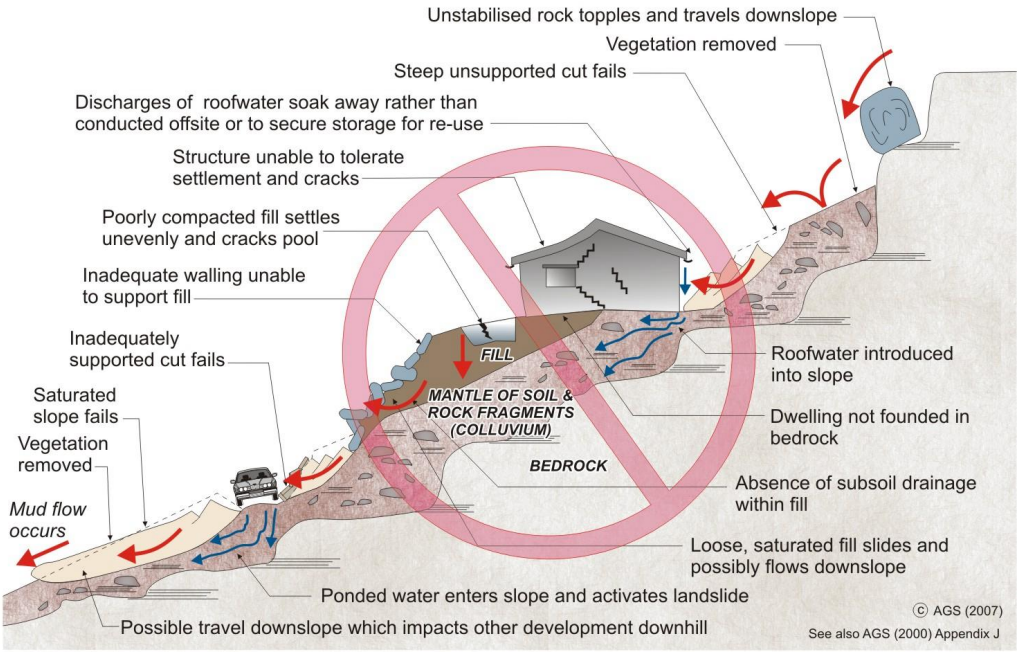
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing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

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

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

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

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

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

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

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

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

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

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

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

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

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

AUSTRALIAN GEOGUIDE LR9 (EFFLUENT DISPOSAL)

EFFLUENT AND SURFACE WATER DISPOSAL

EFFLUENT AND WASTEWATER

All households generate effluent and wastewater. The disposal of these products and their impact on the environment are key considerations in the planning of safe and sustainable communities. Cities and townships generally have reticulated water, sewer and stormwater systems, which are designed to deliver water and dispose of effluent and wastewater with minimal impact on the environment. However, many smaller communities and metropolitan fringe suburbs throughout Australia are un-sewered. Some of these are located in hillside or coastal settings where landslides present a hazard.

Processes by which wastewater can affect slope stability

As explained in GeoGuides LR3 and LR5, groundwater variations have a significant impact on slope stability. Inappropriate disposal of effluent and wastewater may result in the ground becoming saturated. The result is equivalent to a localised rise of the groundwater table and may have the potential to cause a landslide (GeoGuides LR2, LR5 and LR8).

On-site effluent disposal

In un-sewered areas disposal of effluent must be achieved through suitable methods. These methods usually involve containment within the boundaries of the site ("on-site disposal"). State environment protection agencies and local government authorities can usually provide advice on suitable disposal systems for your area. Such systems may include:

- *Septic systems,* which involve a storage/digestion tank for solids, with disposal of the liquid effluent via absorption trenches and beds, leach drains, or soak wells. Such systems are best suited to areas not prone to landslides.
- *Aerobic treatment units* which incorporate an individual household treatment plant to aid breakdown of the waste into a higher quality effluent. Such effluent is further treated and disposed of by surface or sub-surface irrigation, sub-soil dripper, or shallow leach drain system.
- *Nutrient retentive leaching systems* which utilise septic tanks to process the solid and liquid wastes in conjunction with discharge of the effluent through sand filters, media filters, mound systems and nutrient retentive leaching systems, which strip the effluent of nutrients.

Toilet (and sometimes kitchen) waste is known as *black water.* Other, less contaminated, wastewater streams from showers, baths and laundries are known as *grey water*. *Grey water re-use systems* allow a household to conserve water from bathrooms, kitchens and laundries, for re-use on gardens and lawns.

Recommendations for effluent disposal

In areas prone to landslide hazard, it is recommended that whatever effluent disposal system is employed, it should be designed by a qualified professional, familiar with how such a system can impact on the local environment. Local council, and in some instances state environment protection agency, approval is usually required as well. Many local authorities require a site assessment report, which covers all relevant issues. If approved, the report's recommendations must be incorporated in the system design. Reduction in the volume of effluent is beneficial so composting toilets and highly rated (i.e. low consumption) water appliances are recommended. It should be noted that in some state and local government jurisdictions there are restrictions on the alternative measures that can be applied. Consideration should be given to applying treated wastewater to land at low rates and over as large an area as possible. Further guidance can be found in Australian Standard AS/NZS 1547:2000 On-site domestic wastewater management.

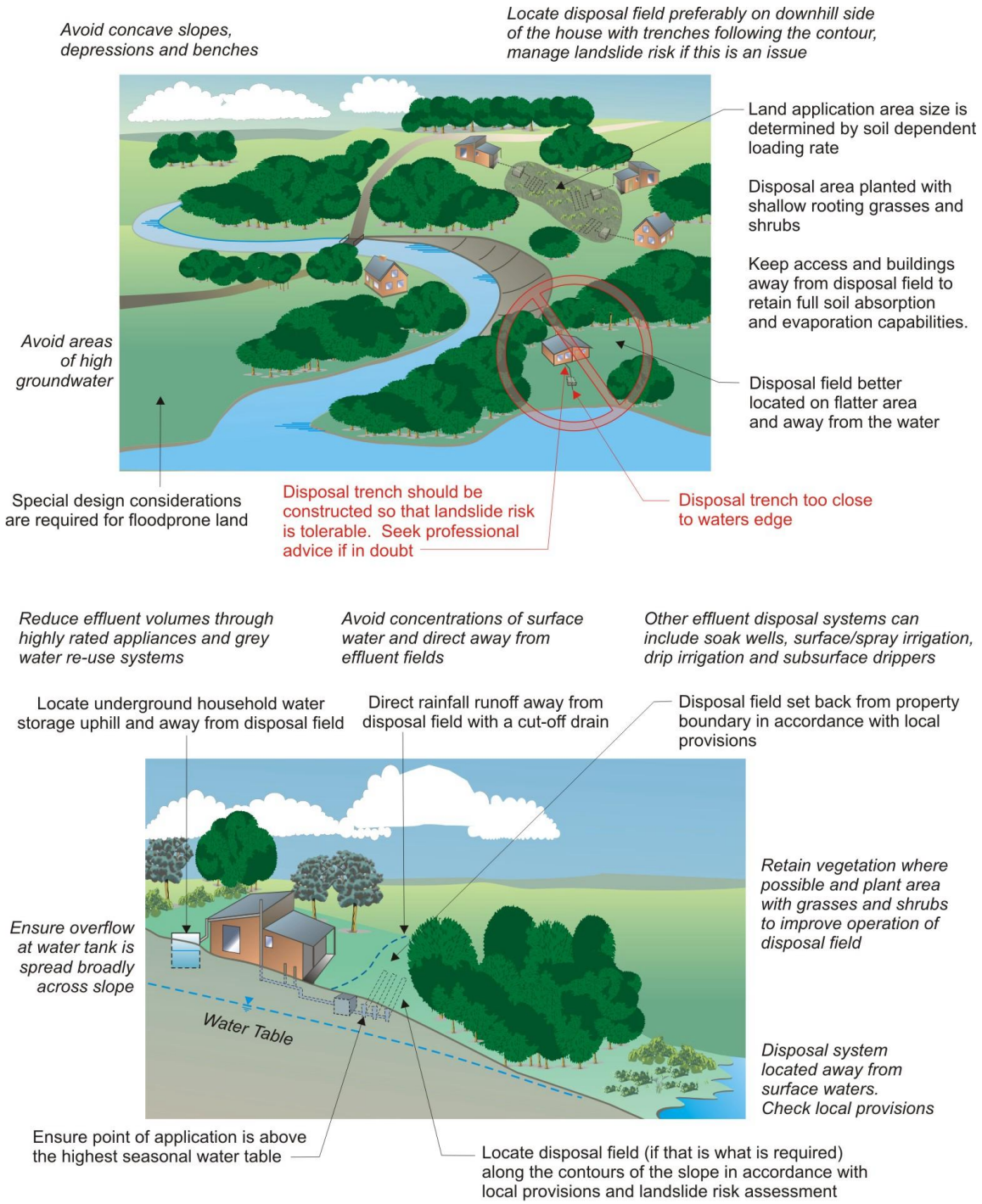
Effluent disposal fields should be sited with due consideration to the overall landscape and the individual characteristics of the property. Some guidance is provided. In particular, effluent fields should be located downslope of the building, away from stormwater, or *grey water*, discharge areas and where there is minimal potential for downstream pollution. Set backs and buffer distances vary from state to state and local requirements should be adhered to. All systems require regular maintenance and inspection. Efficient operation of the system must be a priority for property owners/occupiers to ensure safe and sustainable communities. Responsibility for maintenance rests with owners.

SURFACE WATER DRAINAGE

Attention to on-site surface water management is also important. Runoff from developments, including buildings, decks, access tracks and hardstand areas should be collected and discharged away from the development and other effluent disposal fields. Particular care must be given to the design of overflows on water tanks, as this is often overlooked. Discharge from any development should be spread out as much as possible, unless it can be directed to an existing natural water course. Ponding of water on hillsides and the concentration of water flows on slopes must be avoided.

It is recommended that a specific drainage plan and strategy should be developed in conjunction with the effluent disposal system for sites with a high potential for slope instability. Maintenance of the surface water drainage system is as important as maintenance of the effluent disposal system and again the responsibility rests with owners.

AUSTRALIAN GEOGUIDE LR9 (EFFLUENT DISPOSAL)



Note: Adapted from EPA Vic. Publication 451 (March 1996) "Code of Practice - Septic Tanks", which was sourced from Vic. Department of Planning and Loddon-Campaspe Regional Planning Authority.

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

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR8 - Hillside Construction
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

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

8 APPENDICES

Appendix A - Landslide susceptibility analysis form

LANDSLIDE SUSCEPTIBILITY ANALYSIS **Analysis No.** 1703

Location: **Site No.**

1 Natural Surface Slope

Site		Level	Factor
	Less than 5 degrees	L	0.1
x	Between 5 and 15 degrees	M	0.5
	Between 15 and 30 degrees	M	0.8
	Between 30 and 45 degrees	H	1.2
	More than 45 degrees	M	0.8

2 Slope Shape

Site		Level	Factor
	Crest or ridge	L	0.7
x	Planar / Convex	M	0.9
	Rough / Irregular	H	1.2
	Concave	H	1.5

3 Site Geology

Site		Level	Factor
	Volcanic Extrusive rock	H	1.1
x	Sedimentary rock	M	1
	Low grade metamorphic rock	M	1
	High grade metamorphic rock	L	0.9
	Volcanic Intrusive rock	M	1

4 Soils

Site		Level	Factor
	Rock at surface	VL	0.1
	Residual soil < 1m deep	L	0.5
x	Residual soil 1-3m deep	M	0.9
	Residual soil > 3m deep	H	1.5
	Colluvial soil < 1m deep	H	1.5
	Colluvial soil 1-3m deep	VH	2
	Colluvial soil > 3m deep	VH	4

5 Fill height

Site		Level	Factor
	None	L	1
x	Less than 1m	M	1.1
	Between 1 and 3m	M	1.3
	Between 3 and 6m	H	1.7
	More than 6m	VH	2.5

6 Evidence of groundwater

Site		Level	Factor
x	None apparent	L	0.7
	Minor moistness	M	0.9
	Generally wet	H	1.5
	Surface springs	VH	3

7 Cut height

Site		Level	Factor
	None	L	1
x	Less than 1m	M	1.1
	Between 1 and 3m	M	1.3
	Between 3 and 6m	H	1.7
	More than 6m	VH	2.5

8 Slope of cut face

Site		Level	Factor
x	Less than 30 degrees	L	0.5
	Between 30 and 45 degrees	M	1
	Between 45 and 60 degrees	H	1.5
	More than 60 degrees	VH	3

9 Material in cutting

Site		Level	Factor
	High strength rock	L	0.5
	Medium strength rock	L	1
x	Low strength rock	M	1.2
	Very low strength rock and soil	H	1.5
	Soil	VH	2

10 Cut slope support

Site		Level	Factor
	Concrete wall	L	0.5
	Crib wall	M	0.9
	Gabion wall	M	1
	Rockwall	H	1.5
x	Unsupported	H	2

11 Concentration of surface water

Site		Level	Factor
	Ridge	L	0.7
	Crest	L	0.8
	Upper slope	M	0.9
	Mid slope	H	1.2
x	Lower slope	VH	1.5

12 Wastewater Disposal

Site		Level	Factor
	Fully sewered	L	1
x	Onsite disposal - Surface	L	1.2
	Onsite disposal - Soak/Trenches	M	1.5

13 Stormwater Disposal

Site		Level	Factor
	All stormwater piped into road draina	L	0.7
x	Rain water tank with overflows	L	1
	Stormwater discharge on site	M	1.5

14 Evidence of instability

Site		Level	Factor
x	No sign of instability	L	0.8
	Soil Creep	H	1.2
	Minor irregularity	VH	2
	Major irregularity	VH	5
	Active instability	VH	10

Summary

			Factor
1	Natural surface slope		0.5
2	Slope shape		0.9
3	Site geology		1
4	Soils		0.9
5	Fill height		1.1
6	Evidence of groundwater		0.7
7	Cut height		1.1
8	Slope of cut face		0.5
9	Material in cut		1.2
10	Cut slope support		2
11	Concentration of surface water		1.5
12	Wastewater disposal		1.2
13	Stormwater disposal		1
14	Evidence of instability		0.8
Relative Susceptibility (1x2x3x4x5x6x7x8x9x10x11x12x13x14			0.593

0.6

Appendix B - Correlation between relative susceptibility and susceptibility rating

Relative Susceptibility	Susceptibility Rating
Less than 0.2	Very Low
0.2 - 0.6	Low
0.6 - 2.0	Moderate
2.0 - 6.0	High
Greater than 6.0	Very High

APPENDIX E - LIMITATIONS

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.

2. The recommendations herein may identify a target soil stratum into which the footings should be founded. The target stratum has been located by the depth in mm of the target stratum's upper horizon boundary below the existing ground surface level at the time of the site investigation. Any cutting or filling works and any surface erosion or deposits subsequent to the site investigation, will alter the measured location of the stratum relative to the surface. Where required, the author should be notified in such cases to confirm the location of the target stratum.

3. The description of the soil given in Section 3.0 of this report is intended as a brief overview of the soil's primary constituents. For a detailed classification of the soil, the reader should refer to the Soil Profile Reports and/or Borehole Reports.

4. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware, however, that exploration is limited by time available and economic restraints. In some cases, soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.

5. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.

6. This report may not be reproduced except in full, and only then with the permission of the entity trading as CQ Soil Testing. The information and site sketch shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.

7. All information contained within this report is the intellectual property of the entity trading as CQ Soil Testing. All information contained within can only be used for the express purposes of the commissioned scope of works.

8. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show the approximate location of field tests only.

9. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted by that person assuming the responsibility for the long-term performance of the footing system.

10. The recommendations contained in this report have not taken into consideration the long-term effects of any previous, current, or potential subsurface work by mining companies or potential slope instability problems. At the time of writing this report neither our client (nor his agent) nor the local authority had made the author aware that these problems may be affecting this allotment. If a mining subsidence or slope stability assessment is required for this allotment, the recommendations of a suitably qualified geotechnical engineer should be sought.

11. Removal of trees from a site before an investigation can cause significant swelling of the soil over large areas. The removal of large trees from a construction site during development is rarely picked up during the investigation phase and is generally outside the scope of AS2870. Sites affected by large trees are often classified "P". If, during the footing excavation, it is noticed that there are soils with varying moisture contents or evidence of large trees having been removed CQ Soil Testing should be notified immediately.

12. The following documents are available from the CSIRO and QBCC and shall be read and adhered to in relation to this site:

    - Builder's Guide to Preventing Damage to Dwellings- Part 1 Site Investigation and Preparation http://www.publish.csiro.au/nid/22/pid/3621.html
    - Builder's Guide to Preventing Damage to Dwellings- Part 2 Sound Construction Methods http://www.publish.csiro.au/nid/22/pid/3661.html
    - QBCC Subsidence Fact Sheet https://www.qbcc.qld.gov.au/sites/default/files/Homeowner%27s%20Guide%20to%20Subsidence.pdf

CQ SOIL TESTING technical excellence
Member of the Surbana Jurong Group

ABN 87 656 845 448
QBCC License 15 305 465

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Explanatory Notes of Abbreviations and Terms

Used on Borehole and Excavation Logs

General

Information obtained from site investigations is recorded on log sheets. The "Engineering Log – Borehole or Non Cored Borehole" presents data from drilling operations where a core barrel has not been used to recover material, and information is based on a combination of regular sampling and in-situ testing. The material penetrated in non-core drilling is commonly soil but may include rock. The "Engineering Log – Cored Borehole" presents data from drilling operations where a core barrel has been used to recover material – commonly rock. The "Engineering Log - Excavation" presents data obtained on the subsurface profile from observations of excavations, either natural or man-made. It may contain a scaled, graphical presentation of the typical excavation profile. Refusal of the excavation plant is noted should it occur.

As far as is practicable, the data contained on the log sheets is factual. Some interpretation is inevitable in the assessment of material boundaries in areas of partial sampling, the location of areas of core loss, description and classification of material, estimation of strength and identification of drilling induced fractures. Material description and classification is generally based on AS1726-2017.

Drilling Method

Code	Description
ADT	Auger drilling with TC-bit
ADV	Auger drilling V-bit
AS	Auger screwing
AT	Air track
CA	Casing advancer
CC	Concrete core
CTR	Cable tool rig
DB	Wash bore drag bit
HA	Hand auger
HAND	Hand methods
HF	Hollow flight auger
HMLC	Diamond core 62mm diameter
HQ	Wire line core barrel 64mm diameter
HQ3	Wire line core barrel 62mm diameter
NDD	Non destructive drilling
NMLC	Diamond core 52mm diameter
NQ	Wire line core barrel 47mm diameter
NQ3	Wire line core barrel 45mm diameter
PT	Continuous push tube
PQ	Wire line core barrel 85mm diameter
RAB	Rotary air blast
RC	Reverse circulation
RD	Rotary blade or drag bit
RR	Rock roller
RT	Rotary tricone bit
SD	Sonic drilling
TBX	Tube-X
VC	Vibro-core drilling
WB	Wash bore drilling

Drilling Penetration

Ease of penetration in non-core drilling

VE	Very easy
E	Easy
F	Firm
H	Hard
VH	Very hard

Support and Casing

Code	Description	Code	Description
C	Casing	Hw	114.3 mm
M	Mud	NW	88.9 mm
W	Water	PVC	150 mm

Core Run

Core lifts are identified by a line and depth with core loss per run as a percentage. Core loss is shown in the core run unless otherwise indicated.

Defect Spacing

The average distance between defects is measured parallel to the core axis in mm and may be expressed as a range or average.

Angle / Orientation

Angle from horizontal and orientation to magnetic north.

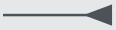
For inclined cored boreholes the Alpha and Beta angles are presented for orientated core. Alpha (α) is measured relative to the core axis, whilst Beta (β) is measured clockwise from the reference line looking down the core axis in the direction of drilling.

Excavation Method

N	Natural exposure
X	Existing excavation
BB	Tractor mounted backhoe bucket
EX	Hydraulic excavator
EH	Hydraulic excavator with hammer
B	Bulldozer blade
R	Ripper

Water / Drilling Fluid

The drilling fluid used is identified and loss of return to the surface is estimated as a percentage, generally of each core lift.

Symbol	Description
	Water inflow
	Water outflow
	Water level: during drilling or immediately after completion of drilling
	Groundwater level with date observed prior to introduction of fluids or after standpipe construction
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.
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.

Colour

The colour of a soil or rock is described in a moist/wet condition using simple terms, such as black, white, grey, red, brown, orange, yellow green or blue. These are modified as necessary by 'pale', 'dark' or 'mottled'. Borderline colours are described as a combination of these colours (e.g. orange-brown). Where a soil or rock consists of a primary colour with a secondary mottling it is described as (primary colour) mottled (first colour) and (secondary colour).

Description of Soil

i. Soil name (BLOCK LETTERS)

ii. Plasticity or particle size of soil

iii. Colour

iv. Secondary soil components names & estimated proportions, including their plasticity / particle characteristics, colour

v. Minor soil components name, estimated proportions, including their plasticity / particle characteristics, colour

vi. Other minor soil components

vii. Moisture condition

viii. Consistency / density

ix. Structure of soil, geological origin

x. Additional observations

Particle Size

Term		Grain Size
Clay		< 2 µm
Silt		2 – 75 µm
Sand	Fine	0.075 – 0.21 mm
	Medium	0.21 – 0.6 mm
	Coarse	0.6 – 2.36 mm
Gravel	Fine	2.36 – 6.7 mm
	Medium	6.7 – 19 mm
	Coarse	19 – 63 mm
Cobbles		63 – 200 mm
Boulders		> 200 mm

Fine Grained and Coarse Grained Soils

Term	Description
Fine Grained Soil (cohesive)	More than 35% of the material less than 63 mm is smaller than 0.075 mm (silts and clays)
Coarse Grained Soil	More than 65% of the material less than 63 mm is larger than 0.075 mm (sands, gravels and cobbles)

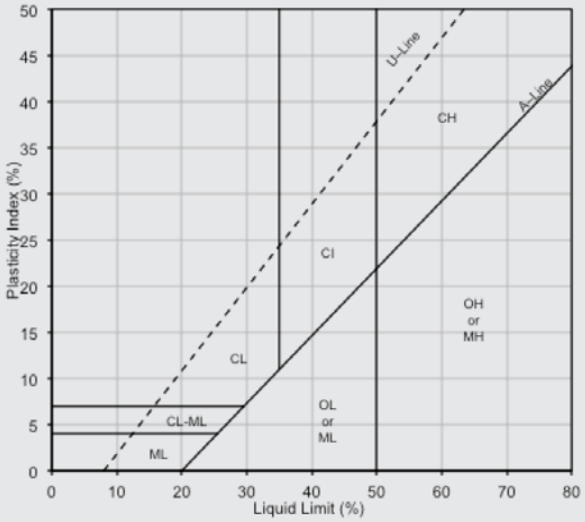
Descriptive Terms for Secondary and Minor Components

Designation of Components	In coarse grained soils				In fine grained soils	
	% Fines	Terminology	% Accessory coarse fraction	Terminology	% Sand / Gravel	Terminology
Minor	≤5	trace	≤15	trace	≤15	trace
	>5, ≤12	with	>15, ≤30	with	>15, ≤30	with
Secondary	>12	prefix	>30	prefix	>30	prefix

Plasticity – Fine Grained Soils

Liquid Limit (LL) %	Description
≤ 35	Low plasticity (L)
>35 to ≤ 50	Medium plasticity (I)
> 50	High plasticity (H)

Plasticity Chart– Fine Grained Soils



Consistency Terms – Fine Grained Soils

Term	Undrained shear strength (kPa)	Indicative SPT (N) Blow Count	Field Guide to Consistency
Very Soft (VS)	<12	0 – 2	Easily penetrated several centimetres by fist, exudes between fingers when squeezed in fist
Soft (S)	12 – 25	2 – 4	Easily penetrated several centimetres by thumb, easily moulded by light finger pressure
Firm (F)	25 – 50	4 – 8	Can be penetrated several centimetres by thumb with moderate effort, and moulded between the fingers by strong pressure
Stiff (St)	50 – 100	8 – 15	Readily indented by thumb but penetrated only with difficultly. Cannot be moulded by fingers
Very Stiff (VSt)	100 – 200	15 –30	Readily indented by thumb nail, still very tough
Hard (H)	>200	>30	Indented with difficulty by thumb nail, brittle
Friable (Fr)	-		Can be easily crumbled or broken into small pieces

Density Terms – Coarse Grained Soils

Term	Density Index (%)	SPT (N) Blow Count
Very Loose (VL)	< 15	0 – 4
Loose (L)	15 – 35	4 – 10
Medium Dense (MD)	35 – 65	10 – 30
Dense (D)	65 – 85	30 – 50
Very Dense (VD)	> 85	>50

Particle Characteristics – Coarse Grained Soils

Term	Description
Well Graded	Having good representation of all particle sizes
Poorly graded	With one or more intermediate size poorly represented
Gap graded	With one or more intermediate sizes absent
Uniform	Essentially of one size

Angularity – Coarse Grained Soils

	Rounded
	Sub-rounded
	Angular
	Sub-angular

Origin of Soil

Fill	Formed by humans
Aeolian	Formed by wind
Alluvial	Formed by streams and rivers
Colluvial	Formed on slopes (talus)
Estuarine	Formed in marine environments
Lacustrine	Formed in lakes
Residual	Formed by weathering insitu

Soil Moisture

	Term	Code	Description
Coarse Grained	Dry	D	Looks and feels dry and free running
	Moist	M	Soil feels cool, darkened in colour, soils tend to stick together, soil grains do not run freely through fingers and no visible free water
	Wet	W	Soil feels cool, darkened in colour, soils tend to stick together, free water on remoulding
Fine Grained	Moist, Less than Plastic Limit	W < PL	Hard and friable or powdery, moisture content well below Plastic Limit
	Moist, Near Plastic Limit	W ≈ PL	Soil feels cool, darkened in colour, can be moulded, near Plastic Limit
	Moist, Wet of Plastic Limit	W > PL	Soil feels cool, dark, usually weakened, free water, moisture content well above Plastic Limit
	Wet, Near Liquid Limit	W ≈ LL	Soil exudes easily
	Wet, Wet of Liquid Limit	W > LL	Soil behaves as a liquid

Boundary Classifications

Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well graded gravel-sand mixture with clay binder.

Graphic Symbols

	Asphalt		MH
	CH		ML
	CI		OH
	CL		OL
	Concrete		PT
	Fill		SC
	GC		SM
	GM		SP
	GP		SW
	GW		

Soil Classification

Soils are described in general accordance with AS1726-2017 as shown below.

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 63 mm and basing fractions on estimated mass)						GROUP SYMBOL	PRIMARY NAME
COARSE GRAINED SOILS More than 65% of the material is less than 63 mm and is larger than 0.075 mm	A particle size of 0.075 is about the smallest size distinguishable to the naked eye	GRAVELS More than half of coarse fraction is larger than 2.36 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes, not enough fines to bind coarse grains, no dry strength; ≤ 5% fines		GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing, not enough fines to bind coarse grains, no dry strength; ≤ 5% fines		GP	GRAVEL
			GRAVELS w/ FINES (Appreciable amount of fines)	'Dirty' materials with excess of non-plastic fines, none to medium dry strength; ≥ 12% silty fines		GM	SILTY GRAVEL
				'Dirty' materials with excess of plastic fines, medium to high dry strength; ≥ 12% clayey fines		GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.36 mm	CLEAN SANDS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes, not enough fines to bind coarse grains, no dry strength; ≤ 5% fines		SW	SAND
				Predominantly one size or a range of sizes with more intermediate sizes missing, not enough fines to bind coarse grains, no dry strength; ≤ 5% fines		SP	SAND
			SANDS w/ FINES (Appreciable amount of fines)	'Dirty' materials with excess of non-plastic fines, none to medium dry strength; ≥ 12% silty fines		SM	SILTY SAND
				'Dirty' materials with excess of plastic fines, medium to high dry strength; ≥ 12% clayey fines		SC	CLAYEY SAND
FINE GRAINED SOILS More than 35% of the material less than 63 mm is less than 0.075 mm		IDENTIFICATION PROCEDURES ON FRACTIONS < 0.075 mm					
		SILTS AND CLAYS Liquid Limit < 50%	DRY STRENGTH	DILATANCY	TOUGHNESS	GROUP SYMBOL	PRIMARY NAME
			None to low	Slow to rapid	Low	ML	SILT
			Medium to high	≥ 12% clayey fines	Medium	CL, CI	CLAY
			Low to medium	Slow	Low	OL	ORGANIC SILT
		SILTS AND CLAYS Liquid Limit > 50%	Low to medium	None to slow	Low to medium	MH	SILT
			High to very high	None	High	CH	CLAY
			Medium to high	None to very slow	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS: readily identified by colour, odour, spongy feel and frequently fibrous texture						PT	PEAT

Description of Rock

i. Rock name (BLOCK LETTERS)
ii. Grain size and mineralogy
iii. Colour
iv. Fabric and texture
v. Features, inclusions, minor components, moisture content and durability
vi. Strength
vii. Weathering and/or alteration
viii. Rock mass properties – discontinuities and structure of rock
ix. Interpreted stratigraphic unit
x. Additional observations including geological structure

Simple rock names are used to provide a reasonable engineering description, rather than a precise geological classification. The rock name is chosen by considering the nature and shape of the grains or crystals, the texture and fabric of the rock material, the geological structure and setting, and information from the geological map of the area. Further guidance on the naming of rocks can be found in AS1726-2017, Tables 15, 16, 17 and 18. Typical rock types are described below, though subject to site specific variations.

Rock Type	Description	Example of Rock Name
Sedimentary	Formed by deposited beds of sediments, have grains that are cemented together and often rounded. Significant porosity	COMMON: Conglomerate, Breccia, Sandstone, Mudstone, Siltstone, Claystone ≥90% CARBONATE: Limestone, Dolomite, Calcirudite, Calcarenite, Calcisiltite, Calcilutite PYROCLASTIC: Agglomerate, Volcanic Breccia, Tuff
Igneous	Formed from molten rock and have a crystalline texture. Typically massive and low porosity. Rock types are from coarse to fine grained.	HIGH QUARTZ CONTENT: Granite, Microgranite, Rhyolite MODERATE QUARTZ CONTENT: Diorite, Microdiorite, Andesite LOW QUARTZ CONTENT: Gabbro, Dolerite, Basalt
Metamorphic	Formed when rocks are subject to heat and/or pressure and have typically have directional fabric. Typically have low porosity and crystalline structure. Rock types are from coarse to fine grained	FOLIATED: Gneiss, Schist, Phyllite, Slate NON-FOLIATED: Marble, Quartzite, Serpentinite, Hornfels
Duricrust	Formed as part of a weathering profile and show evidence of being cemented in situ. Cementation is typically irregular and exhibits replacement textures.	Ferricrete (Iron oxides and hydroxides) Silicrete (Silica) Calcrete (Calcium carbonate) Gypcrete (Gypsum)

Note: ( ) denotes dominant cementing mineralogy

Grain Size

Terms describing dominate grain size in sedimentary rocks.

Term	Grain size
Coarse	Mainly 0.6 mm to 2 mm
Medium	Mainly 0.2 mm to 0.6 mm
Fine	Mainly 0.06mm (just visible) to 0.2 mm

Terms describing dominate grain size in igneous and metamorphic rocks

Term	Grain size
Coarse	Mainly greater than 2 mm
Medium	0.06 mm to 2 mm
Fine	Mainly less than 0.06 mm (just visible) to 0.2mm

Texture and Fabric

Sedimentary rocks

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

Igneous rocks

Term	Definition
Amorphous	Indicates that the rock has no obvious crystalline structure
Crystalline	A regular molecular structure, showing crystal structure and symmetry.
Cryptocrystalline	The texture comprises crystals that are too small to recognise under an ordinary microscope. Indistinctly crystalline.
Porphyritic	Indicates the presence of phenocrysts (relatively large crystals in a fine grained ground mass) in igneous rocks.
Flow banded	Indicates visible flow lines in volcanic rocks and some intrusive rocks
Glassy	Entirely glass like. No crystalline units and without crystalline structure.
Vesicular	A texture of volcanic rocks that indicates the presence of vesicles (small gas bubbles). Where the vesicles are filled with a mineral substance they are termed Amygdales and the texture is Amygdaloidal.

Metamorphic

Term	Definition
Foliation	The parallel arrangement of minerals due to metamorphic process, which shall be defined by the terms in weak, moderate and strongly foliated.
Porphyroblastic	A texture indicating the presence of porphyroblasts (larger crystals formed by recrystallization during metamorphism, such as garnet or staurolite in a mica schist).
Cleavage	A type of foliation developed in fine grained metamorphic rocks such as slates.

Bedding and Fabric Development

Type	Definition
Massive	No obvious development of bedding – rock appears homogeneous
Poorly Developed	Bedding is barely obvious as faint mineralogical layering or grain size banding, but bedding planes are poorly defined.
Well Developed	Bedding is apparent in outcrops or drill core as distinct layers or lines marked by mineralogical or grain size layering.
Very Well Developed	Bedding is often marked by a distinct colour banding as well as by mineralogical or grain size layering.
Indistinct fabric	There is little effect on strength properties
Distinct Fabric	The rock may break more easily parallel to the fabric

Rock Strength

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

Rock strength is assessed by laboratory Uniaxial Compressive Strength (UCS) testing and/or Point Load Strength Index (PLT) testing to obtain the $Is_{(50)}$ the strength table implies a 20 times correlation between $Is_{(50)}$ and UCS used for classification. Note however, multiplier may range from 4 (e.g. some carbonated and low strength rocks) to 40 (e.g. some igneous rocks and/or some high strength rocks). A site specific correlation based on testing, previous investigation or literature may be used where available. These terms refer to the strength of the rock material and not to the strength of the rock mass which may be considered weaker due to the effect of rock defects.

Visual Log

A diagrammatic plot of defects showing type, spacing and orientation in relation to the core axis.

- Defects open in situ or clay sealed
- Defects closed in-situ
- Drill induced fractures or handling breaks
- Infilled seam

Rock Weathering and or Alteration Classification

Term (Code)		Definition	
Residual soil (RS)		Soil developed on extremely weathered rock. The rock mass structure and substance fabric are no longer evident but the soil has not been significantly transported.	
Extremely weathered (EW) Extremely altered (XA)		Rock is weathered to such an extent that it has 'soil' properties, i.e, it either disintegrates or can be remoulded in water, but the texture of original rock is still evident.	
Highly weathered (HW) Highly Altered (HA)	Distinctly weathered (DW)*	Whole rock material is discoloured usually by extent that iron staining or bleaching and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original rock substance is no longer recognisable	*Where is it not practical to distinguish between 'HW' and MW'. Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores
Moderately weathered (MW) Moderately Altered (MA)	Distinctly Altered (DA)	Whole rock material is discoloured usually by staining that original colour of the fresh rock is no longer recognisable	
Slightly weathered (SW) Slightly altered (SA)		Rock is slightly discoloured but shows little or no change of strength from fresh rock	
Fresh rock (F)		Rock shows no sign of decomposition or staining.	

Rock Core Recovery

TCR = Total Core Recovery (%)

$$\frac{\text{Length of Core Recovered}}{\text{Length of Core run}} \times 100$$

SCR = Solid Core Recovery (%)

$$\frac{\text{Sum Length of Cylindrical Core Recovered}}{\text{Length of Core run}} \times 100$$

RQD = Rock Quality Designation (%)

$$\frac{\text{Sum Length of Sound Core Pieces} > 100\text{mm in length}}{\text{Length of Core run}} \times 100$$

Types of Discontinuities

Term	Code	Description
Parting	Pt	A defect parallel or sub-parallel to a layered arrangement of mineral grains or micro-fractures, which has caused planar anisotropy in the rock substance.
Joint	Jt	A defect across which the rock substance has little tensile strength, but that is not related to textural or depositional features within the rock substance.
Sheared Zone	SZ	A zone with roughly parallel planar boundaries of rock substance consisting of closely spaced joints with smooth slickensided surfaces often curved. The joints divide the rock mass into unit blocks usually of lenticular or wedge shape.
Crushed Zone	CZ	A zone or seam with roughly parallel planar boundaries of rock substance composed of disoriented, usually angular, fragments of the host rock substance
Seam	Se	A zone or seam with roughly parallel boundaries, infilled by soil (IS) or decomposed rock (DS)
Fault	F	A fracture (defect) in rock along which there has been an observable amount of displacement.
Vein	Ve	A zone of minerals intruded into a joint or fissures.

Type of Structures

Term	Code	Description
Bedding	Bg	A layered arrangement of minerals parallel to the surface of deposition which has caused planar anisotropy in the rock substance.
Cleavage	C	An alignment of fine grained minerals caused by deformation.
Schistosity	SH	A layered arrangement of minerals to each other
Foliation	Fo	A planar alignment of minerals caused by deformation.
Void	Vo	A completely empty space
Dyke	DK	Sheet-like bodies of igneous rock that cut across sedimentary bedding or foliations in rocks. They may be single or multiple in nature
Sill	Sl	A sill is an intrusion of magma that spreads underground between the layers of another kind of rock
Contact	Cn	A contact between intrusive and stratigraphic units.
Boundary	Bd	A distinct boundary between two stratigraphic units

Note: Drill breaks (DB) and handling breaks (HB) are not included as natural discontinuity.

Discontinuity Spacing

Spacing (mm)	Description
>6000	Extremely Widely Spaced
2000 - 6000	Very Widely Spaced
600 - 2000	Widely Spaced
200 - 600	Medium Spaced
60 - 200	Closely Spaced
20 - 60	Very Closely Spaced
<20	Extremely Closely Spaced

Discontinuity Planarity

Code	Description
Cu	Curved – A defect with a gradual change in orientation
Ir	Irregular – A defect with many sharp changes in orientation
Pl	Planar – Defect forms a continuous plane without variation in orientation
St	Stepped – A defect with distinct sharp steps or step
Un	Undulose – A defect with undulations
Vu	Vuggy – An open void with crystallisation
Wv	Wavy – A wavy defect surface

Discontinuity Roughness

Abbreviation	Description
Ro	Rough – Many small surface irregularities generally related to the grain size of the parent rock
Sm	Smooth – Few or no surface irregularities related to the grain size of the parent rock
Po	Polished – Planes have a distinct sheen or a smoothness
Sl	Slickensided – Planes have a polished, grooved or striated surface consistent with differential movement of the parent rocs along the plane
VR	Very rough – many large surface irregularities, amplitude generally more than 1mm

Infill Material

Code	Name	Code	Name
Ca	Calcite	Gp	Gypsum
Ch	Chlorite	Mn	Manganese
Cl	Clay	MS	Secondary mineral
Co	Coal	Py	Pyrite
Fe	Limonite / Ironstone	Um	Unidentified mineral
Fe Cl	Iron oxide clay	Qz	Quartz
Fl	Feldspar	X	Carbonaceous

Discontinuity Observation

Term	Code	Description
Clean	CN	No visible coating or infill
Stain	SN	No visible coating or infill but surfaces are discoloured by mineral staining
Veneer <1 mm	VNR	A visible coating or soil or mineral substance but usually unable to be measured. If discontinuous over the plane, patchy veneer.
Coating >1 mm to <10 mm	CT	A visible coating or infilling of soil or mineral substance. Describe composition and thickness.
Filling (Filled) >10 mm	FLD	A visible filling of soil or mineral substance. Describe composition and thickness.

Samples and Field Tests

Code	Description
B	Bulk disturbed sample
BLK	Block sample
C	Core sample
DS	Small disturbed sample
ES	Soil sample for environmental testing
EW	Water sample for environmental testing
FP	Pressuremeter
G	Gas sample
H	Hydraulic fracturing
HP	Hand penetrometer test
I	Impression device
$Is_{(50)}$	Point Load Index
K	Permeability
LB	Large bulk disturbed sample
N	Standard penetration test result (N* denotes SPT sample recovery)
O	Core orientation
P	Piston sample
PID	Photoionisation detector reading in ppm
R	Hammer bouncing / refusal
SPT	Standard Penetration Test
U	Undisturbed push in sample
UCS	Uniaxial Compressive Strength
U50	Undisturbed tube sample (50 mm diameter)
U75	Undisturbed tube sample (75 mm diameter)
VS	Vane shear test
● (A)	Axial Test
○ (D)	Diametral Test
□	Irregular Lump test

Laboratory Tests

Code	Description
ACM	Asbestos Containing Material
CD	Consolidated Drained
CU	Consolidated Undrained
LL	Liquid Limit
LS	Linear Shrinkage
MC	Moisture Content
MDD	Maximum Dry Density
OMC	Optimum Moisture Content
PBT	Plate Bearing Test
PI	Plasticity Index
PL	Plastic Limit
PSD	Particle Size Distribution
ρ_b	Bulk Density
ρ_p	Particle Density
ρ_d	Dry Density
UU	Undrained Unconsolidated

Backfill / Standpipe Detail

Symbol	Description	Symbol	Description
	Cement seal		Filter pack: sand filter
	Grout backfill		Filter pack: gravel filter
	Blank pipe		Bentonite seal
	Slotted pipe		Cutting – excavated material backfill
	Surface Completion: Monument Above Ground		Surface Completion: Gatic Ground Monument

Completion Details

Type	Description
Collapse	Exploratory hole collapsed before reaching planned depth
Equipment Failure	Boring or excavator equipment operational failure
Flooding	Flooding of excavation
Machine Limit	Limit of machine capability reached
Obstruction	Obstruction preventing further advancement
Possible services	Indication of possible services below
Services present	Services encountered during exploratory hole
Squeezing	Hole squeezing boring equipment
Target Depth	Depth reached as planned
Target Depth Instrumentation Installed	Depth reached as planned instrumentation installed
Target Depth Standpipe Installed	Depth reached as planned open standpipe constructed
Material Refusal	Material preventing further advancement

Confirmation Notice

PLANNING ACT 2016, PART 1 OF THE DEVELOPMENT ASSESSMENT RULES

Application number:	**D/16-2025**	*For further information regarding this notice, please contact:*	Kathy McDonald
Date application properly made**:**	**19 February 2025**	Phone:	07 4936 8099

1. APPLICANT DETAILS

Name:	**C and C Roberts**
Postal address:	**C/- Capricorn Survey Group (CQ) Pty Ltd** **PO Box 1391** **ROCKHAMPTON QLD 4700**
Contact number:	(07) 4927 5199 Email: reception@csgcq.com.au

2. PROPERTY DESCRIPTION

Street address:	Lot 99 Isabella Street, Stanwell
Real property description:	Lot 99 on S9416

3. OWNER DETAILS

Name:	C Roberts and C J Roberts
Postal address:	67 Archer St ROCKHAMPTON CITY QLD 4700

4. DEVELOPMENT APPROVAL SOUGHT

Development Permit for a Material Change of Use for a Dwelling House

5. APPLICATION TYPE

	Development Permit	Preliminary Approval
Development assessable under the planning scheme, a temporary local planning instrument, a master plan or a preliminary approval which includes a variation approval	☒	☐

6. REFERRAL AGENCIES	**NIL**

Based on the information accompanying the lodged application, in accordance with the *Planning Regulation 2017,* referral to the following Referral Agencies is required.

7. IMPACT ASSESSMENT

Will Impact Assessment be required?	**YES**
The whole of the application must be publicly notified under the provisions of Part 4 of the Development Assessment Rules by:	

- Publishing a notice at least once in a newspaper circulating generally in the locality of the premises which are the subject of the application; and
- Placing a notice on the premises which are the subject of the application. The notice must remain on the premises for the period of time up to and including the stated day; and
- Giving a notice to all owners of any lots adjoining the premises which are the subject of the application.

8. PUBLIC NOTIFICATION DETAILS

The application requires public notification which must be undertaken in accordance with Section 53 of the *Planning Act 2016* and Part 4 of the Development Assessment Rules.

9. SUPERSEDED PLANNING SCHEME

Is the application to be assessed under a Superseded Planning Scheme?	**NO**

You are further advised that the truth and accuracy of the information provided in the application form and accompanying information is relied on when assessing and deciding this application. If you find an INACCURACY in any of the information provided above or have a query or seek clarification about any of these details, please contact Council's Development Assessment Unit.

10. ASSESSMENT MANAGER

Name:	**Kathy McDonald** **PRINCIPAL PLANNING OFFICER**	Signature:		Date:	8 April 2025

Notice of intention to commence public notification

Section 17.2 of the Development Assessment Rules

D/16-2025	[*application reference number*]
C. and C. Roberts	[*applicant name*]
C/- Capricorn Survey Group (CQ) Pty Ltd – PO Box 1391, Rockhampton QLD 4700 reception@csgcq.com.au	[*contact address/email address*]
(07) 4927 5199	[*contact number*]
8 April 2025	[*notice date*]
Kathy McDonald	[*assessment manager's name*]
Rockhampton Regional Council PO Box 1860, Rockhampton QLD 4700	[*assessment manager's address*]

RE: Application for:

[details of proposed development]

Development Permit for a Material Change of Use for a Dwelling House

[*street address*]

Lot 99 Isabella Street, Stanwell

[*real property description*]

Lot 99 on S9416

Dear

[*sir/madam/name*]

Kathy

In accordance with section 17.2 of the Development Assessment Rules, I intend to start the public notification required under section 17.1 on:

[*insert intended date of commencement*

14th April 2025

At this time, I can advise that I intend to: [provide details below if known]

☒ Publish a notice in:

[*insert name of the newspaper*] **CQ Today**
on
[*intended date for publishing*] **12th April 2025**

and

☒ Place notice on the premises in the way prescribed under the Development Assessment Rules

[*intended date notice to be erected*] **11th April 2025**

and

☒ Notify the owners of all lots adjoining the premises the subject of the application

[*intended date owners to be notified*] **9th April 2025**

If you wish to discuss this matter further, please contact me on the above telephone number.

Yours sincerely

[*applicant name, signature and date*] **Madison Day**  **8th April 2025**