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- Clothes hoist supplied & installed by Builder.
- Letterbox by Others.

✕ Control Joint

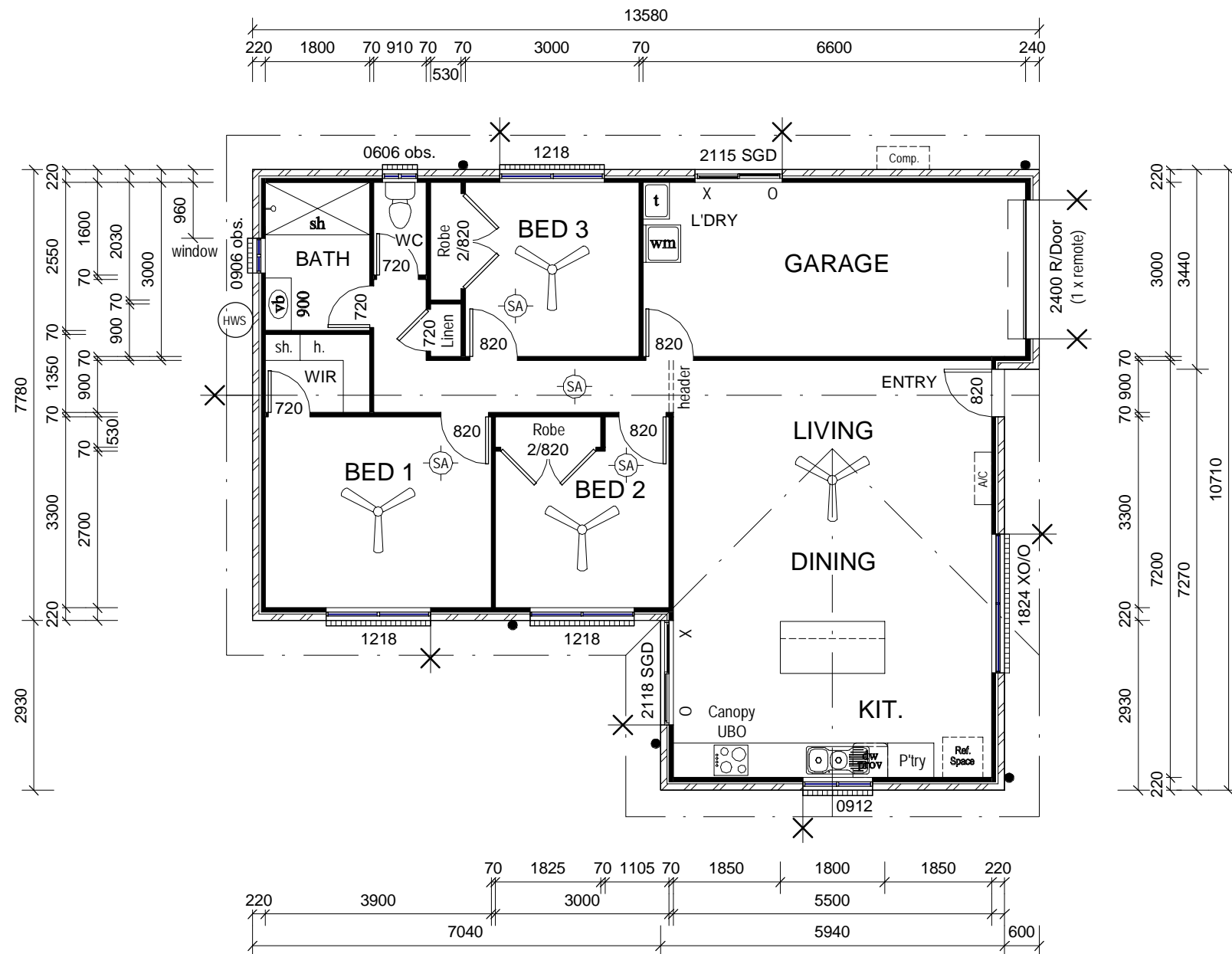
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/49-2021

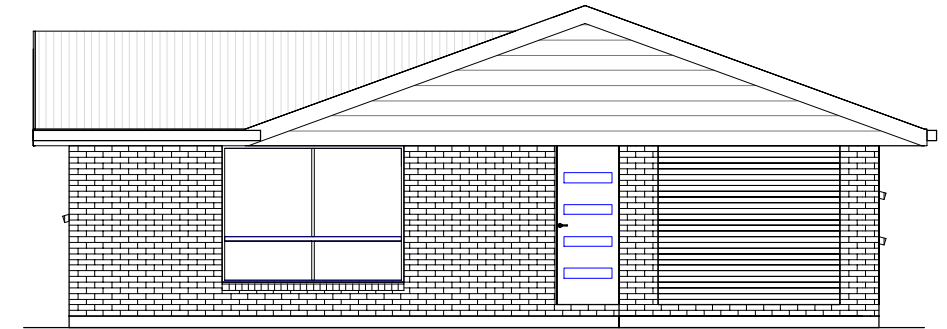
Dated: 5 May 2021



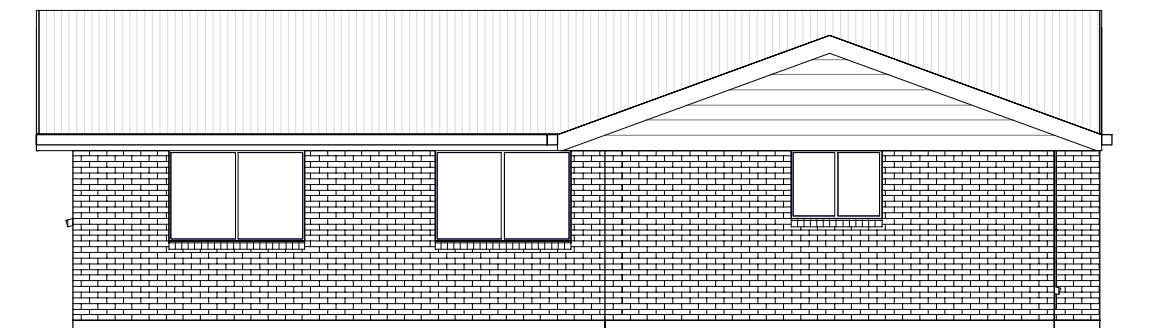
ELEVATION LEGEND

C1 FLOOR PLAN / ELEVATIONS

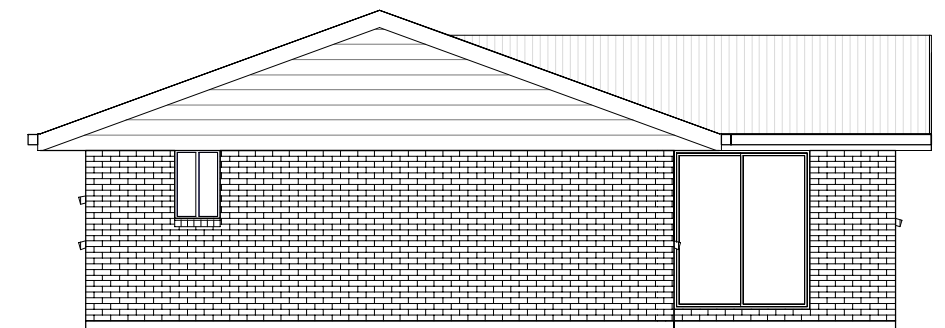
Front gable is a 600 box gable. Side and rear gables are 450 box gables.
All overhangs are 600 from the brickwork (unless noted above).
Metal roofing at 20° pitch.
230mm Smooth Plank to box gables (unless noted above).



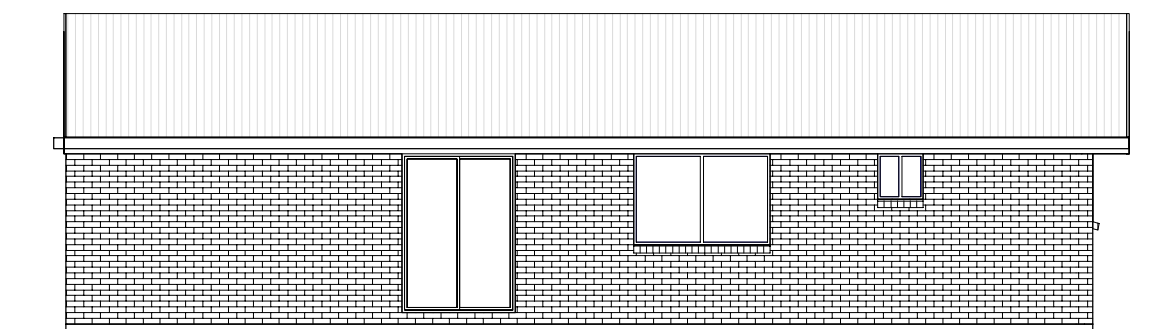
1 ELEVATION 1



2 ELEVATION 2



3 ELEVATION 3



4 ELEVATION 4

LOT NUMBER: 1
REGISTERED PLAN NUMBER: SP175972
COUNTY: LIVINGSTONE
AREA: 1000 m²

FOR CUT/FILL, CONTOUR
& PIERING DETAILS SEE
ENGINEERS DESIGN

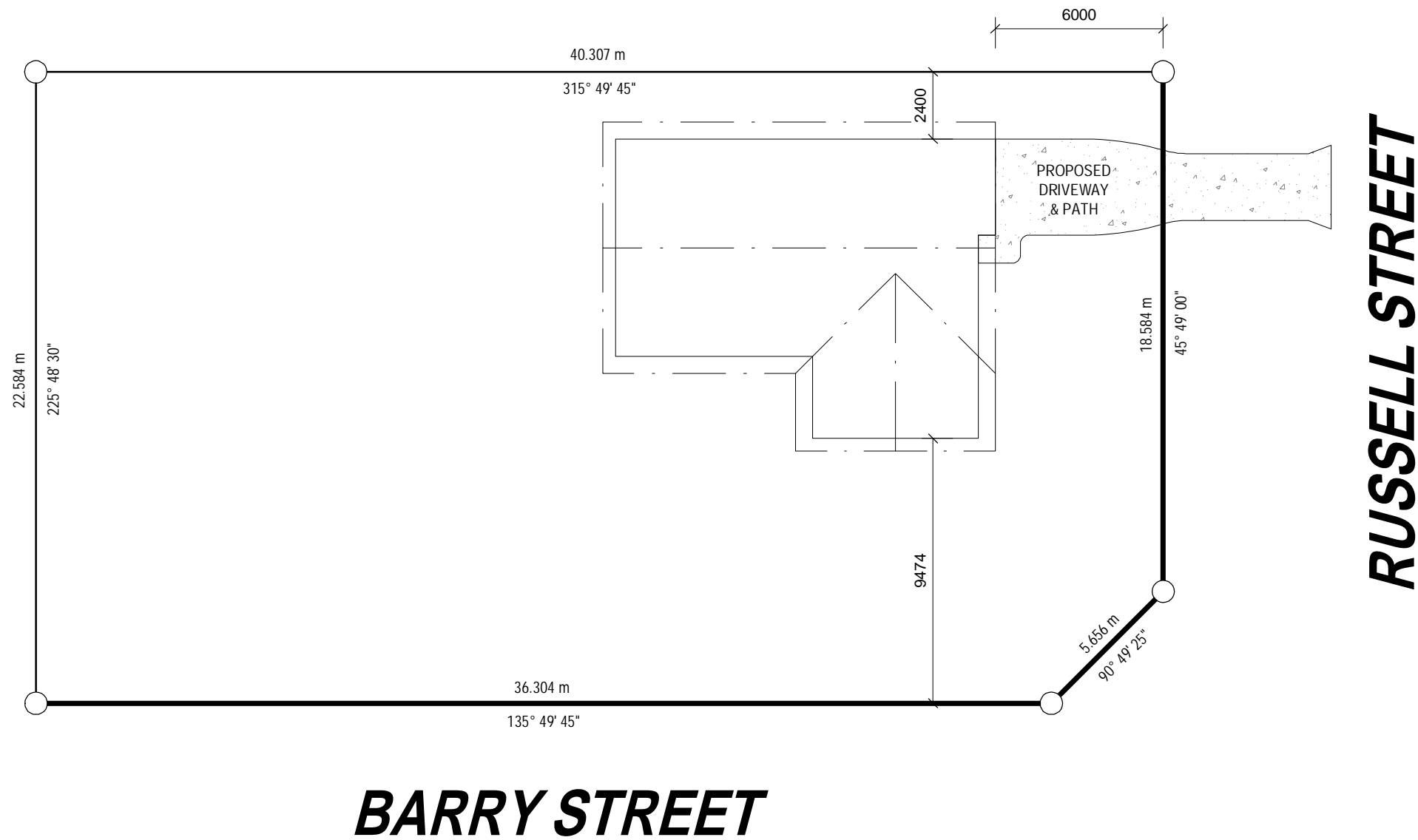
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C1
SITE PLAN

CONCRETE	TYPE	AREA (m ²)
MAIN	STD.	120.5
DRIVEWAY & PATH	EXP. AGG.	36.1

17 Russell Street, Gracemere Flood Hazard Assessment

Project Name: 17 Russell Street Flood Hazard Assessment

Project Number: 21-003

Project Address: 17 Russel Street, Gracemere QLD 4702 (Lot 1 on SP175972)

Client: Affordable Quality Homes

Client Contact: Red Lorroway (Affordable Quality Homes)

Dated: 13/04/21

Rev: 1

Revision	Revision	Issue Date
Original Issue	0	10/03/21
Revision 1	1	13/04/21

1.0 Introduction

The scope of this document is to address the relevant provisions of the Rockhampton Region Planning Scheme 2015 with regards to the Fitzroy River Flood Overlay for 17 Russel Street, Gracemere.

17 Russel Street, as shown below, is currently an empty block that is to be developed with a single story residential house.

The subject site is located in the flood hazard zone as defined by the Rockhampton Region Planning Scheme 2015 hazard overlays.



Figure 1 - Site Location

2.0 Flood Hazard Assessment

The proposed structure to be located at 17 Russell Street is to be a single-story residential house and connecting driveway. Due to its location, it triggers the need for a flood hazard assessment.

The location of the house on the block has been chosen to not retard the flow of flood waters, meaning that in a flood event water will be free to flow around the structures without causing nuisance, turbulence or redirecting flows outside of the site.

The house has been designed as a waffle pod construction meaning the floor level will be 325mm higher than the surrounding surface level with impervious clay placed around the structure.

It is seen that in a flood event, the proposed building site could be effectively managed with regards to achieving the acceptable outcomes set out in Appendix A by simply ensuring water can flow unimpeded around the building through the existing overland flow paths, which would in turn mean existing flood risks are not made worse by alteration to the flow characteristics of the site. Further, insignificant increase in impervious area is seen to have resulted from the structures, hence the post-development case for the site will show very minimal impact on the peak discharge and stormwater quality.

Summarising, the structures covered by this report would not create any actionable nuisance to the surrounding properties.

3.0 Existing Site Conditions

The proposed site is situated within the Creek Catchment Flood, Planning Area 2.



Figure 2 - Proposed General Arrangement

Figure 3 is an extract from the report “Gracemere Catchments Flood Study , Rockhampton Regional Council” which was completed by Aurecon in 2013. This report shows that the peak depth in a 100 Year ARI is 0.0m to 0.5m. However anecdotal evidence from council suggests that this is closer between 0.0m to 0.3m.

As the block in question is at the upper reaches of flooded area it is expected the depth to be closer to the 0.0 end of the scale. Due to the nature of construction with a waffle pod, the finished floor level will be around the predicted maximum height. The pod size has been increased to achieve 0.5m FFL from the existing surface as required by council. A copy of the proposed slab and footing system can be found in Appendix A.

From the same report it was shown that the velocity of the water flowing through either side of the site during a 100 Year ARI event is a medium to low hazard category, however by the same logic as above it is reasonable to assume velocity will be negligible.

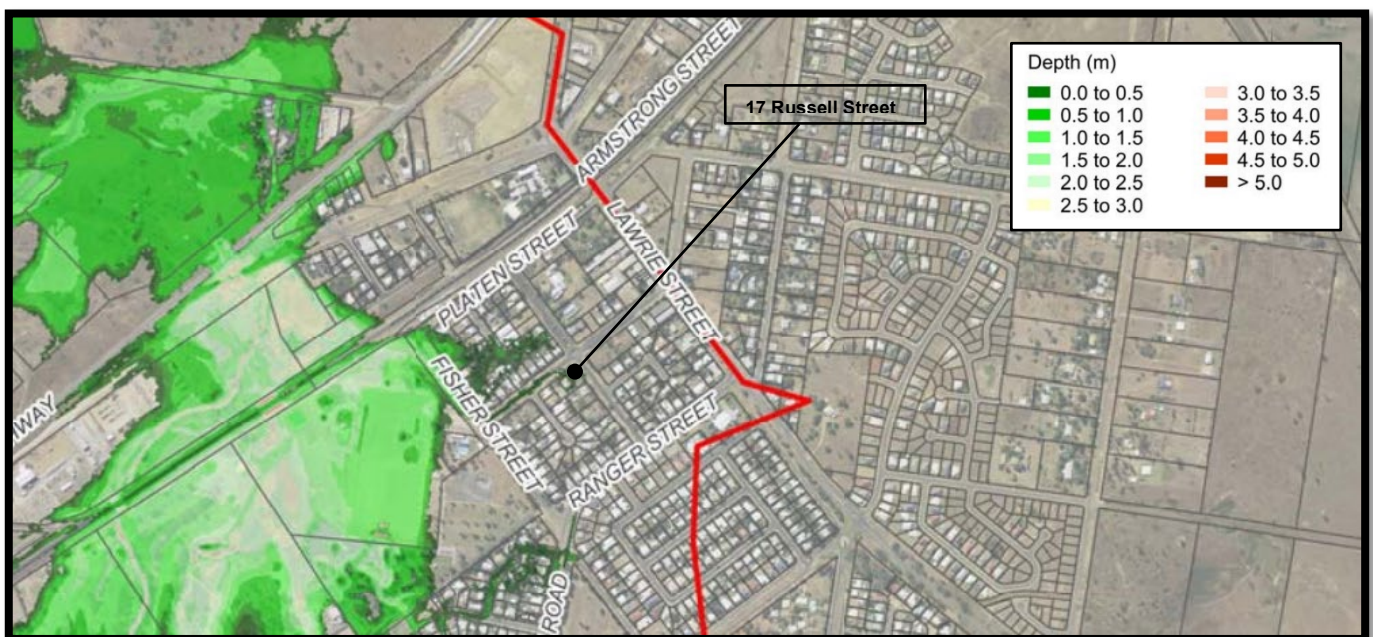


Figure 3 - Flood Depth Mapping (Aurecon, 2013)

It is seen that the proposal is acceptable based on the following:

1. Resilience to the existing flood event affects will be provided in accordance with the RRC Planning Scheme outcomes towards a defined flood event. This is achievable as the proposed structure will be constructed above the flood level and outside of flow paths with impervious clay being used around the outside of the slab to prevent the ingress of water.
2. Local flood heights will not increase as a result of the development. This is due to the fact that there will be no material change to existing hydraulic parameters and no loss of storage.
3. As there will be no tangible change to depth or velocity, there will be no increase to the sites Flood Hazard Category and therefore no risk to persons, infrastructure or property.
4. There are no proposed earthworks aside from minor levelling of ground under the structure.
5. Sufficient notice period of 12+ hours is expected to be the case for a 100 Year ARI event, and we know this wouldn't change in the future due to the location on the fringe of the flood catchment. Given the structure is above the flood level the management required after notice include:
 1. Removal of loose material and potential debris.
 2. Relocation of all equipment out of flow paths

4.0 Conclusion

There appears to be no great engineering infrastructure difficulties with the proposed changes to the aforementioned property. It is seen that the proposal will not affect flooding, either on the property or upstream/downstream in any way and conforms to the acceptable outcomes as set out by the RRC planning scheme.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Scott Thomas'.

Scott Thomas

Manager – B. Eng (Civil/Structural) RPEQ 16203

APPENDIX A – FOOTING DESIGN & DOCUMENTATION

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PO BOX 8284, Red Hill, 470.
Ph: 08 9361 100
Fax: 08 9361 100
GPOC # 80579 ACN 063 90 404

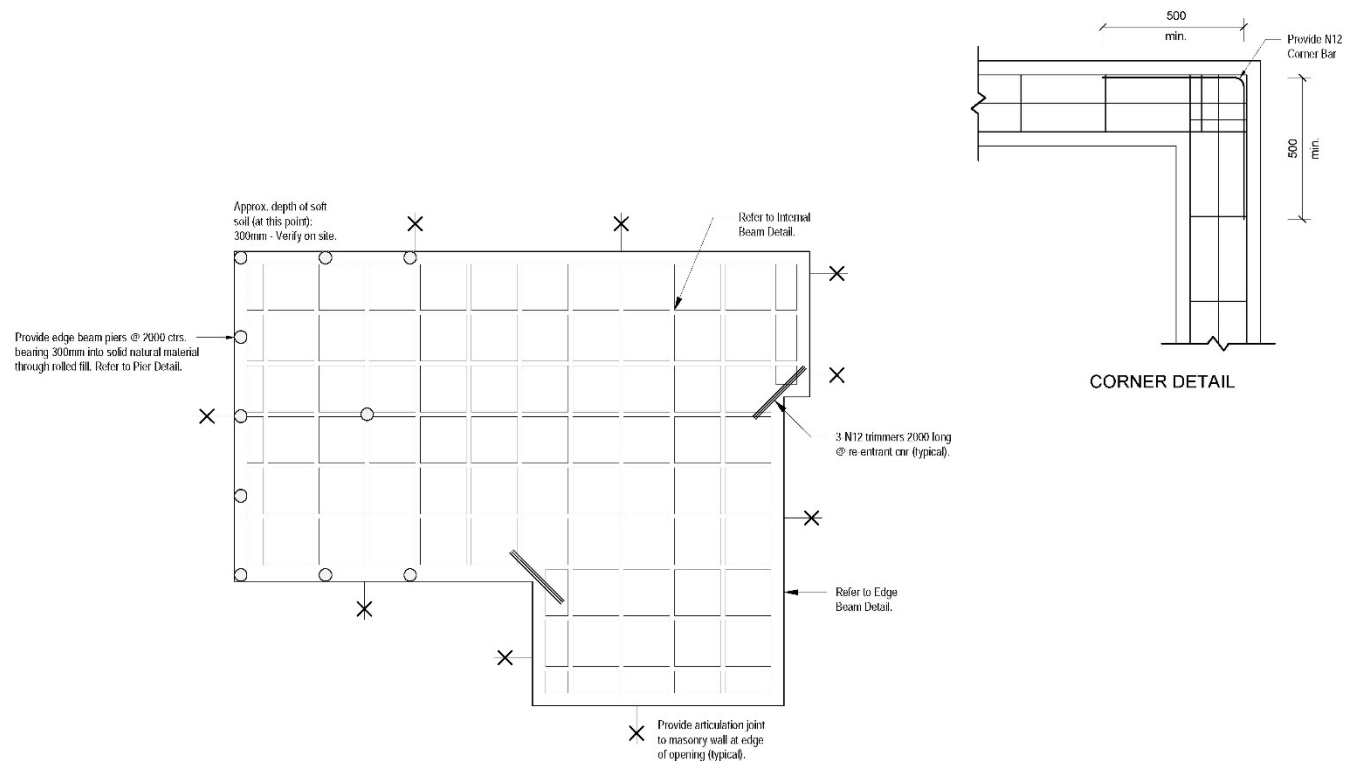
by **SCOTT KILPATRICK**

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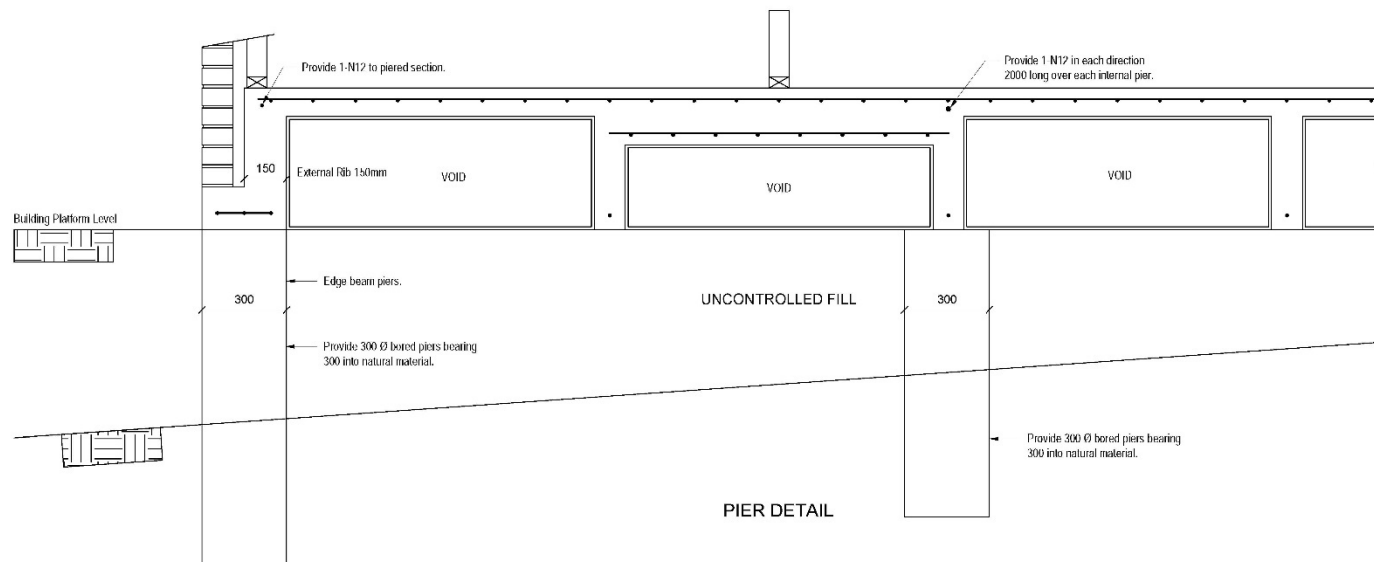
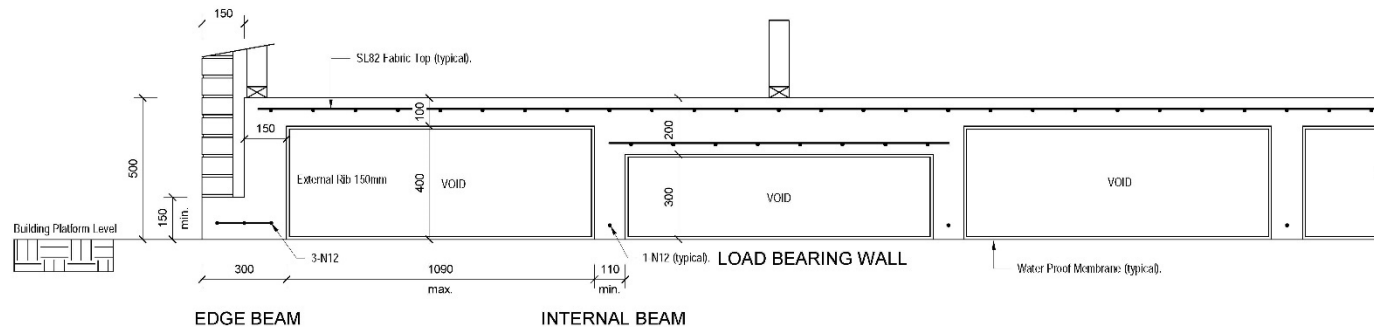
PROJECT: REBECCA DE BOER
ADDRESS: #17 (Lot 1) RUSSELL STREET,
GRACEMERE

SHEET: 13
DATE: 18.12.20
SCALE: 1:100
DRAWN: RL
DWG No: AQHR - 621
CHECKED: SK

Rev.	Description:	Date:



C1
SLAB LAYOUT



C1
FOOTING DETAILS A



PO BOX 8264, Red Hill, 470.
Ph: 08 9266 1000
Fax: 08 9266 1000
GPOC = 80879 ACN 062 90 404

by **SCOTT KILPATRICK**

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PROJECT: REBECCA DE BOER
ADDRESS: #17 (Lot 1) RUSSELL STREET,
GRACEMERE

SHEET: 15
DATE: 18.12.20
SCALE: 1:100
DRAWN: RL
DWG No: AQHR-621
CHECKED: SK

Rev:	Description:	Date:

SITE EARTHWORKS

SE 1

Before placing any fill, all organic material and top soil are to be removed and the area proof rolled to identify any low strength areas. If necessary, low strength material is to be excavated to obtain a uniform strength base prior to placing of fill material.

SE 2

Filling under slab shall be approved material compacted to a density not less than 95% standard density in accordance with AS1289. Fill should extend at least 1000mm outside building line.

SE 3

The base of footings and edge beams may be stepped or may be sloped not more than 1:10.

SE 4

Ensure that water does not pond around the building. On cut and fill sites, grade ground away from the building a minimum of 1 in 20 slope for 1.0m. On level sites the minimum height of slab above finished external levels shall be 225mm. This may be reduced locally to 50mm near paved areas that slope away from the building.

SE 5

Where depth of fill below slabs exceeds 600mm, the fill shall be deemed to be uncontrolled unless site density testing is carried out.

SE 6

The details shown on this drawing assume controlled, compacted fill. Refer to Engineer for changes to construction requirements to allow for uncontrolled fill below slab or edge beams. Piers will be provided through uncontrolled fill bearing 300 mm into suitable natural material.

TERMITE PROTECTION

T 1

In areas of potential termite risk, foundations shall be treated in accordance with AS3660.1 1995. Provide for termite protection as required at slab joints. Owner and Council to be advised of maintenance requirements.

BRICKWORK / MASONRY

B 1

Where practical, articulated masonry should be used in accordance with the recommendations given in Technical Note TN61 published by the Cement and Concrete Association (Australia).

B 2

Provide articulation joints at abrupt changes in construction such as large openings or internal corners and generally within 4 metres of external corners.

B 3

Isolate extensions from the original structure to allow differential movement.

CONCRETE

C 1

Concrete 28 day design strength to be $f'c = 20MPa$ for footings $f'c = 25MPa$ for slabs with a maximum slump of 80mm, 20mm max. aggregate size.

C 2

Trench mesh shall be lapped by the width of the mesh at 1 and L junctions. Trench mesh shall be spliced where necessary by a lap of 500mm. R12 corner bars shall be provided around the outside of corners. Slab fabric shall be lapped by the 2 outermost wires plus 25mm.

C 3

Clear cover to reinforcement shall be 50mm to unprotected ground, 30mm to membrane and 30mm to internal surfaces.

C 4

Workmanship and materials shall be in accordance with AS2070-1996 and AS3600.

C 5

Concrete shall be cured (kept continuously wet) for a minimum of 7 days after placement or an approved curing compound applied.

C 6

Slab design does not allow for shrinkage crack control. Refer to Engineer. Tiled floor areas shall be bedded in flexible material to allow for shrinkage. Large or irregular areas to be laid with expansion joints.

C 7

Footings may be stepped or thickened to maintain design strength around penetrations.

SITE DRAINAGE

SD 1

Allotments containing reactive sites shall be provided with an adequate system of drainage designed to discharge to suitable points.

SD 2

The drainage shall be designed and constructed to avoid any possibility of water ponding against or near the house.

SD 3

Porous bedding and backfill in plumbing/drainage trenches external to the building shall be isolated from draining towards footings in reactive sites by suitably installed clay isolating plugs or other approved means.

PLUMBING / DRAINAGE

PD 1

Penetrations of the slab & beams should be avoided, but where necessary shall be sleeved to allow for movement with 10mm thick closed cell polyethylene or similar material.

PD 2

Connection to stormwater drains and waste drains shall include flexible connections on reactive sites, in compliance with Plumbing and Drainage regulations.

PD 3

Septic tanks and associated soakage areas should be located to minimise their effects on the foundation.

RECOMMENDED SITE MANAGEMENT TECHNIQUES

It is important to realise that engineering design on reactive clays is a compromise solution between costs and building performance. Engineering design aims at accommodating differential movements caused by extreme seasonal moisture changes and does not allow for uncontrolled localised moisture changes which are controllable by adequate site management techniques. It is virtually impossible to design an economic foundation that will totally prevent differential movement. It is therefore expected that some degree of non-structural aesthetic cracking and movement will occur. Slight cracking (crack width less than 5mm) usually have no structural influence on the function of the wall. Rectification of movement problems to be designed by a registered Engineer experienced with reactive site conditions for reactive sites. The following Owner/Tenant recommendations are suggested as a means of minimising differential movement problems with the finished construction.

SM 1

Loading plumbing and blocked drains should be promptly attended to. Garden watering should be carefully controlled to prevent excessive moisture variations around the building. Moistured aimed at producing a uniform ground moisture content year round are beneficial.

SM 2

Trees and large shrubs, when planted close to the building can cause significant moisture changes under the construction in times of drought. Problems from this cause can be significantly reduced by planting trees some distance away from buildings. 75% of the mature tree height is a recommended minimum, however recommended distance varies depending on site conditions and tree species.

SM 3

In times of drought, water demand of trees can be substantially reduced by extensive pruning. Alternatively provision of adequate water will reduce the degree of building damage that trees cause. Watering is probably best achieved by providing bore holes or trenches between the tree and the building. Care should be taken not to destabilise the building by excavating trenches too close to the building. Filling any trenches with compacted granular material is recommended.

C1 CONSTRUCTION NOTES

APPENDIX B – DEVELOPMENT OUTCOMES

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Fitzroy River – H1 or H2 or North Rockhampton flood management area or Creek catchment planning area 2

Not required due to being planning area 1 only

Table 8.2.8.3.1 Development outcomes for assessable development and requirements for accepted development (part)

Performance outcomes	Acceptable outcomes
Development in Fitzroy River flood areas – H1 (low hazard area) or H2 (medium hazard area) or North Rockhampton flood management area or Creek catchment flood - planning area 2 Editor's note—Refer to overlay maps OM-8A and OM-8C	
PO1 Development (including extensions) for non-residential purposes is able to provide a safe refuge for people and for the storage of goods during times of flood inundation.	AO1.1 For non-residential development, at least thirty (30) per cent of the <u>gross floor area</u> of all new buildings and structures is located a minimum of 500 millimetres above the defined flood level. Editor's note—Areas less than those nominated above may be supported where accompanied by a flood impact report in accordance with SC6.10— Flood hazard planning scheme policy . AND AO1.2 A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties.
PO2 Development is located to minimise susceptibility to and potential impacts of flooding.	AO2.1 For residential uses the finished floor levels of all habitable rooms shall be constructed a minimum of 500 millimetres above the defined flood level. AND AO2.2 A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties. Editor's note—Report to be prepared in accordance with SC6.10—Flood hazard planning scheme policy .
PO3 Development avoids the release of hazardous materials into floodwaters.	AO3.1 All hazardous materials and hazardous manufacturing equipment and hazardous containers are located and stored a minimum of 500 millimetres above the defined flood level.

Editor's note—Refer to the [Work Health and Safety Act 2011](#) and associated regulation, the [Environmental Protection Act 1994](#) and the relevant building assessment provisions under the [Building Act 1975](#) for requirements related to the manufacture and storage of hazardous substances.

Fitzroy River – H3-H4 or H5-H6 or Creek catchment flood planning area 1

Table 8.2.8.3.1 Development outcomes for assessable development and requirements for accepted development (part)

Performance outcomes	Acceptable outcomes
Development in Fitzroy River flood areas – H3-H4 (high hazard areas) or H5-H6 (extreme hazard areas) or Creek catchment flood - planning area 1	
Editor's note—Refer to overlay maps OM-8A and OM-8C	
<p>PO4 Development does not involve the further intensification of land uses and does not increase the risk to people and property.</p> <p>Editor's Note—Flood hazard risk assessment can be undertaken in accordance with SC6.10 — Flood hazard planning scheme policy.</p>	<p>AO4.1 AO4.1.1 Development does not involve new buildings or structures.</p> <p>OR</p> <p>AO4.1.2 Where involving the replacement or alteration to an existing non-residential building or structure:</p> <ol style="list-style-type: none"> there is no increase in the existing or previous buildings' <u>gross floor area</u>; and the finished floor level of any replacement or alteration to an existing building is constructed a minimum of 500 millimetres above the defined flood level. <p>OR</p> <p>AO4.1.3 Where involving the replacement or alteration to an existing caretaker's accommodation, <u>dwelling house</u> or <u>dwelling unit</u>:</p> <ol style="list-style-type: none"> there is no increase in the number of dwellings; there is no increase in the existing or previous buildings' <u>gross floor area</u>; and the finished floor level of all habitable rooms shall be constructed a minimum of 500 millimetres above the defined flood level.

	<p>AND</p> <p>AO4.1.4</p> <p>Where located in the rural zone, the <u>total floor area</u> of class 10a buildings and structures on the <u>site</u> do not exceed a total of fifty (50) square metres, and are set back a minimum of twenty (20) metres from all <u>site</u> boundaries.</p> <p>Proposed does involve a new structure/ building.</p>
<p>PO5</p> <p>Development avoids the release of hazardous materials into floodwaters..</p>	<p>AO5.1</p> <p>Materials manufactured, used or stored on <u>site</u> are not hazardous in nature.</p> <p>No hazardous materials will be manufactured, used or stored on site.</p>

Fitzroy River – all hazard areas, North Rockhampton flood management area or Creek catchment – all planning areas

Table 8.2.8.3.2 Development outcomes for assessable development

Performance outcomes	Acceptable outcomes
Development in Fitzroy River flood area – all hazard areas, North Rockhampton flood management area or Creek catchment flood – all planning areas	
Editor's note—Refer to overlay maps OM-8A and OM-8C	
<p>PO8</p> <p>Development is located to minimise susceptibility to and potential impacts of flooding.</p>	<p>No acceptable outcome is nominated.</p> <p>Development has been located to minimise susceptibility to and potential impacts of flooding.</p>
<p>PO9</p> <p>Underground car parks are designed to prevent the intrusion of floodwaters.</p>	<p>AO9.1</p> <p>Development with underground car parking is designed to prevent the intrusion of floodwaters by the incorporation of a bund or similar barrier a minimum of 500 millimetres above the defined flood level.</p> <p>No underground carparks.</p>
<p>PO10</p> <p>Development:</p> <ol style="list-style-type: none"> 1. does not result in any reduction of onsite flood storage capacity; or 2. does not result in any change to depth, duration or velocity of floodwaters within the premises; and 3. does not change flood characteristics outside the premises, including but not limited to causing: 	<p>No acceptable outcome is nominated.</p> <ol style="list-style-type: none"> 1. Development does not result in a reduction of onsite flood storage; 2. Development does not result in a change to depth, duration or velocity of floodwater within the premises, and; 3. Does not change flood characteristics outside the premises, including but not limited to causing ;

<ol style="list-style-type: none"> 1. loss of flood storage; or 2. loss of or changes to flow paths; or 3. acceleration or retardation of flows; or 4. any reduction in flood warning times elsewhere on the <u>floodplain</u>. <p>Editor's note—<u>Council</u> may require the applicant to submit a <u>site</u>-based flood study that investigates the impact of the development on the <u>floodplain</u> and demonstrates compliance with the relevant performance outcome.</p>	<ol style="list-style-type: none"> 1. Loss of flood storage, 2. Loss of or changes to flow paths, 3. Acceleration or retardation of flows, and; 4. Any reduction of flood warning times.
<p>PO11 Essential community infrastructure and community facilities are protected from, and able to function effectively during and immediately after, a defined flood event.</p>	<p>AO11.1 A use for a purpose listed in Table 8.2.8.3.3:</p> <ol style="list-style-type: none"> 1. is not located within the flood hazard area; and has at least one (1) flood free access road. <p>Development is not essential community infrastructure, community facilities or public asset.</p>
<p>PO12 Development provides safe and trafficable access to the local evacuation centres and evacuation services and have regard to:</p> <ol style="list-style-type: none"> 1. evacuation time; 2. number of persons affected; 3. types of vehicles necessary for evacuation purposes; 4. the distance to flood free land; and <p>the evacuation route.</p>	<p>AO12.1 Trafficable access to and from the development complies with the Capricorn Municipal Guidelines.</p> <p>Trafficable access will be provided with regards to the requirements of the Capricorn Municipal Development Guidelines.</p> <p>AND</p> <p>AO12.2 Trafficable access to and from the development within the creek catchment planning areas are in accordance with the Queensland Urban Drainage Manual.</p> <p>Trafficable access will be provided with regards to the requirements of the Queensland Urban Drainage Manual..</p> <p>Note—Trafficable access for <u>emergency services</u> or community related uses is obtained from at least one (1) route (minor collector or higher) for <u>emergency services</u> purposes. The development is to ensure that safe access, to the road network between the development <u>site</u> and the closest centre zone, is provided.</p> <p>Editor's note—Trafficable access requirements for creek catchment planning areas has not been identified and reference has been made to the provisions under the Queensland Urban Drainage Manual. This is due to the short period that property may be isolated.</p>

Fitzroy River – H3-H4 or H5-H6, North Rockhampton flood management area or Creek catchment – planning area 1

Table 8.2.8.3.2 Development outcomes for assessable development

Performance outcomes	Acceptable outcomes
Development in Fitzroy River flood areas – H3-H4 (high hazard areas) or H5-H6 (extreme hazard areas), North Rockhampton flood management area or Creek catchment flood – planning area 1 Editor's note—Refer to overlay maps OM-8A and OM-8C	
PO13 Development that involves temporary or moveable residential structures (for example caravan parks and camping grounds) are not located with the Fitzroy River high and extreme hazard areas, North Rockhampton flood management area and Creek catchment planning area 1.	No acceptable outcome is nominated. The development is not temporary or moveable.

Operational work

Table 8.2.8.3.2 Development outcomes for assessable development (part)

Performance outcomes	Acceptable outcomes
Operational work	
PO17 Development does not materially impede the flow of floodwaters through the <u>site</u> or worsen flood flows external to the <u>site</u> .	AO17.1 Development does not involve: <ul style="list-style-type: none"> a) filling with a height greater than 100 millimetres; or b) block or solid walls or fences; or c) garden beds or other structures with a height more than 100 millimetres; or d) the planting of dense shrub hedges. <p>Development does not impede the flow of floodwaters through the site or worsen flood flows external to the site – refer Report 21-003.</p>