

# Proposed Caravan Park including Workers Accommodation, Office, and ancillary facilities.

Lot 352 (9155) Pinjarra-Williams Road, Quindanning

Prepared for Brighthouse Consultants

#### DOCUMENT CONTROL

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## Executive Summary

Planned Focus has been engaged by Brighthouse Consultants for the landowner, to gain Development Approval for a Caravan Park including Workers Accommodation, Office, and ancillary facilities at Lot 352 (9155) Pinjarra-Williams, Quindanning.

The Caravan Park will include the following:

- Caravan bays and camping ground,
- Holiday cabins for tourists, with some for dual use for Workers Accommodation,
- Wellness Centre (Office), and
- Various ancillary facilities including Reception / Office, and Café.

This report demonstrates how the proposed development is suited to the subject land and meets the objectives of the Rural zone and the development standards specified by the Shire of Williams Town Planning Scheme No. 2, along with consideration against the broader planning framework.

The proposed Caravan Park has been carefully located on the subject land to minimise visual impacts from the Pinjarra-Williams Road, and in consideration of views from St Boniface Anglican Church and the Quindanning Hotel that are recognised features of the town.

The proposed Caravan Park is considered compatible with the rural character of the area and provides an appropriate scale of development within the Rural zone adjacent to the Quindanning Townsite.

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## 1 Introduction

The landowner seeks to develop a Caravan Park including Workers Accommodation, Office, and ancillary facilities at Lot 352 (9155) Pinjarra-Williams Road, Quindanning.

## 2 Site context

The subject land is located on the northern fringe of the Quindanning Townsite, generally on the north-eastern intersection of Pinjarra-Williams Road and Church Road.

This is an undeveloped rural lot, with significant road frontage to the Pinjarra-Williams Road along its western boundary. The property is currently used for broadacre agricultural purposes.

The site is serviced by power.

The subject site is adjacent to the St Boniface Anglican Church which is on the Shire of Williams Municipal Heritage Inventory and nearby to the Quindanning Hotel which is on the State Register of Heritage Places.

Quindanning is a small regional town comprising the Church, the Hotel, and a small number of homes, surrounded by farming properties. Quindanning is positioned between Pinjarra and Williams.

### 2.1 Title details

The site is legally described as Lot 352 on Deposited Plan 250660, held on Certificate of Title Volume 2752, Folio 589 and is 60.905ha in size. A copy of the Certificate of Title is provided in Appendix 1.

### 2.2 Previous Approval

The Shire of Williams Council previously determined to support development of the subject land for a Caravan Park development in 2015. Although this approval was ultimately granted, it was not acted upon so has now expired.

The previous approval was for 48 designated caravan sites, 36 caravan/camping sites, 10 transportable holiday cabins/chalets, 1 caretaker's dwelling, reception building and ancillary development including a communal building and amenities.

This prior approval involved a different site layout to that proposed now, where the development was positioned closer to the main town, more directly north east of St Boniface Anglican Church. For comparison, this is shown as an underlay for information purposes only on the development plans.

## 3 Proposed development

Approval is sought for a Caravan Park as detailed in the attached plan set provided in Appendices 2 and 3.

The development will comprise the following:

- 100 caravan bays plus 7 drive through caravan bays.
- 12 camping sites.

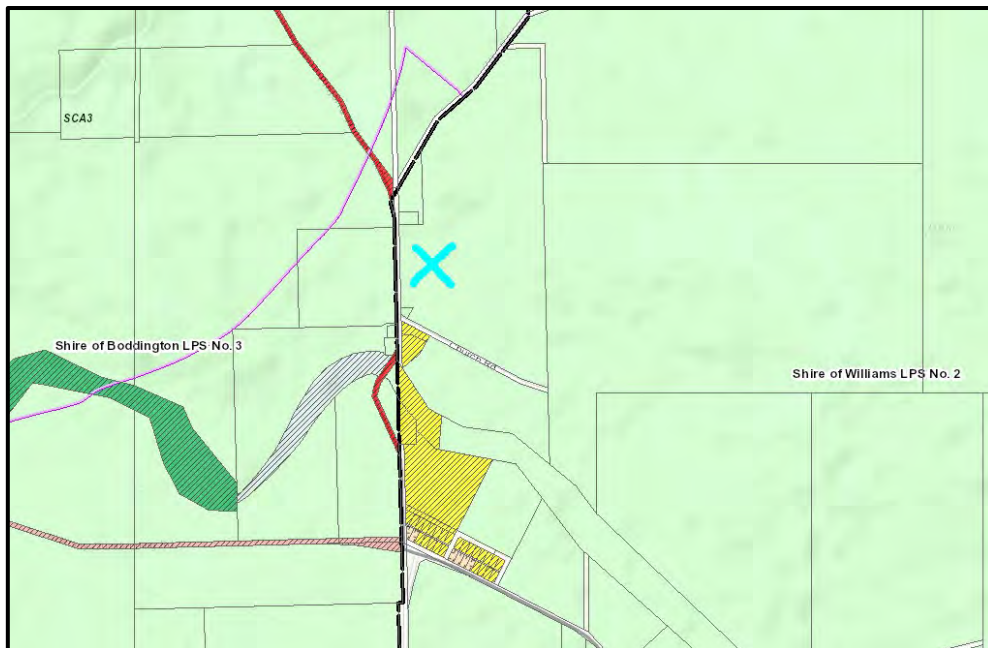
- An overflow area with 35 sites, restricted to self-contained RV's and caravans only.
- 6 holiday cabins plus potential for a further 4 to be added in the future, noting all 10 have been considered as part of the overall development, including in the wastewater calculations.
- 12 duplex holiday cabins nominated as Workforce Accommodation but with ability to also be used as holiday cabins, depending on demand.
- Wellness centre (Office). This space is mainly intended for guests to use for low-key activities, for example self-guided yoga, meditation, and arts and crafts. No permanent staff are proposed, but if there was demand, the operator may make the facility available to healthy-lifestyle practitioners for a fee. The nature of the space is considered to curtail this use.
- Ancillary facilities including:
  - Reception / office building which includes a café and laundry to service guest accommodation linen.
 

It is noted that the Café may cater to passing and local trade, however it is predominantly for Caravan Park guests providing hot and cold drinks, snacks, and light meals. Although the Workers Accommodation is self-catering, this provides a further option for Workers as well.
  - Managers residence (Caretakers Dwelling).
  - Park maintenance workshop / shed.
  - Camp kitchen for park guests.
  - Ablutions block,
  - Swimming pool, playground, multi-use court, and a small amphitheatre.
- Along with parking for the camping grounds and the cabins the proposed development also includes 28 car bays for café patron parking, 11 overflow parking bays and 10 caravan park visitor parking bays.
- Indicative landscaping is shown on the site plan. Local endemic species will be used for landscaping across the site. There is intention to provide planting around the development to filter views from Pinjarra Williams Road. The proponent accepts a condition to provide a detailed landscape plan prior to commencement.
- This is a large site comprising 60.9ha. Approximately 15ha will be designated for the Caravan Park development. At this stage, the balance of the site will continue to be used for pasture, with a firebreak maintained around the caravan park development area.
- The subject land has immediate access to power; however, Quindanning does not have a reticulated water or sewer system.
- A small part in the north of the site is identified as Bush Fire Prone by the Department of Fire and Emergency Services, and this is discussed in more detail below.
- Systems for standalone potable water and wastewater treatment are proposed to service the development. These are discussed in more detail later in this report.
- The provided plan set depicts most details of the development, noting the proponent accepts a condition to provide development details of the Wellness Centre later, prior to commencement of construction of this aspect.

### 3.1 Town Planning Scheme No. 2 (TPS2)

The subject land is within the Rural Zone under the Shire of Williams Town Planning Scheme No.2 (TPS2).

Figure 1 identifies the subject land with a teal coloured cross. It is noted that the western side of the Pinjarra – Williams Road and the southern side of Zilko Road which abuts the northern side of the subject land, forms the boundary between the Shire of Boddington and the Shire of Williams.



**Figure 1 – TPS2 extract**

TPS2 does not set out any objectives for the Rural zone. Although Clause 4.7 (3) of the Scheme sets out provisions relating to the Rural zone, these provisions only discuss subdivision requirements. Given this, Clause 67 (2) of the *Planning & Development (Local Planning Schemes) Regulations 2015* sets out the key matters to be given regard, and these are evaluated later in this report.

In terms of how best to describe this proposal, TPS2 sets out some use class definitions that describe elements of this development, however overall, the development is most accurately described as a Caravan Park which is not specifically mentioned in the Zoning Table or definitions of TPS2.

The Deemed Provision definition of a Caravan Park states:

*means premises that are a caravan park as defined in the Caravan Parks and Camping Grounds Act 1995 section 5 (1).*

This is considered most encompassing given the following rationale:

- “Holiday Cabins or Chalet”, “Farm Stay”, “Caretaker’s Dwelling”, “Office” and “Restaurant” are ‘AA’ uses within the Rural zone.

- “Holiday Cabins or Chalet” under TPS2 means:

*buildings on one lot used or intended for use for holiday purposes, and none of which is occupied by the same tenant for a continuous period of more than four months.*

This is included within this development however the development is broader than this given the predominant land use is caravans and camping sites, with holiday cabins arguably ancillary, or in addition to, if not a typical part of a modern Caravan Park.

- Likewise, is “Caretakers Dwelling”. A manager’s residence is required to operate the Caravan Park, it is not considered a standalone use in context of this proposal.
- “Workers Accommodation” is now recognised within the WA Planning Framework, including by the WAPC Planning Position Statement – Workforce Accommodation. It is defined in the Model Scheme text as:

*means premises, which may include modular or relocatable buildings, used -*

*(a) primarily for the accommodation of workers engaged in construction, resource, agricultural or other industries on a temporary basis; and*

*(b) for any associated catering, sporting and recreation facilities for the occupants and authorised visitors.*

The reason to specifically recognise this within the application is that Workers may need to occupy the cabins for longer than 4 months as per the Holiday Cabin definition under TPS2, or 3 months under the *WA Caravan and Camping Grounds Regulations 1997* that ultimately apply as well to the operation of a Caravan Park.

- In relation to the wellness centre, under TPS2, this will most likely only operate as ancillary and as part of the Caravan Park, but to keep options open, this has also been included as Office. “Office” is considered appropriate given “Consulting Rooms” specifies and limits this to qualified medical practitioners. The wellness centre may include medical practitioners however this is not presently the intention.
- “Residential Building”, “Motel” and “Hotel” are also defined in TPS2 however these are not considered to accurately describe the proposal, and all are X prohibited in the Rural Zone.

On this basis, largely that there are no other definitions that readily apply, it is considered that the proposed development and its combination of land uses are most accurately described overall as “Caravan Park including Workers Accommodation, Office and ancillary facilities”. This is on basis that all the other elements described are ancillary, a part of but secondary to the main use as Caravan Park.

Given this, Clause 4.3.2 of the TPS2 states:

*If the use of the land for a particular purpose is not specifically mentioned in the Zoning Table and cannot reasonably be determined as falling within the interpretation of one of the use categories, the Council may:*

*(a) determine that the use is not consistent with the objectives and purposes of the particular zone and is therefore not permitted, or*



- (b) determine by absolute majority that the proposed use may be consistent with the objectives and purpose of the zone and thereafter follow the advertising procedures of Clause 2.6 in considering an application for planning consent.*

For the reasons set out following, this is considered suitable to apply in this instance.

It is noted that in 2015, the Shire of Williams Council determined this for the previous application. That by absolute majority the proposed use was consistent with the objectives and purpose of the zone, and following advertising, was granted approval.

It is also noted that although the Model Scheme Text provisions define Tourist Development, its definition does not fit for this development because it excludes Caravan Park.

## 3.2 Planning Considerations

The following sets out commentary against the relevant planning considerations, generally as applied under Clause 67(2):

### 3.2.1 Car parking

Clause 5.1 of the Scheme sets out parking requirements:

- (1) the minimum dimension of any parking space required under the provisions of the Scheme, shall be 2.5m x 5.5m, excluding all access drives.*
- (2) the carparking layout on any lot within the proposed town centre commercial area shall be designed in conjunction with layouts on adjoining lots so that the total area may ultimately function as an integrated carparking and access area.*
- (3) where the landowner can demonstrate to the satisfaction of the Council that there is not the demand for the number of parking spaces specified in the Scheme, landscaping may be provided in lieu of carparking spaces not constructed; providing that the Council may at any time require that the additional parking spaces be provided.*

Clause 2.5 includes matters that Council shall consider. In respect of car parking the following needs to be addressed:

- (i) the means of access to each space and the adequacy of any manoeuvring area.*
- (ii) the location of the spaces on the site and their effect on the amenity of adjoining development, including the potential effect if spaces should later be roofed or covered.*
- (iii) the adequacy of any proposed screening or planting.*
- (iv) the location of proposed footpaths and the effect on road safety.*
- (v) any requirements considered necessary regarding the sealing and drainage of parking spaces and accessways.*

The proposed development includes sufficient car bays to support the proposed development, including those ancillary uses such as café and wellness centre. If these prove inadequate, there is ample space within the subject land to expand the parking available.

### 3.2.2 Access

Clause 5.3 of TPS2 states that access to lots shall be in general accordance with the following guidelines:

- (1) vehicular access to any lot shall not be within 9m of a road intersection.*
- (2) provision shall be made for all service vehicles to load and unload clear of any right-of-way where practicable.*
- (3) each lot has a right of access at one point per street frontage, with additional points of access at the discretion of the Council.*
- (4) the maximum width of any access crossover shall be 3.6m for residential and other uses, provided that the Council may at its discretion increase the width.*

The development proposes convenient and legible vehicle access to and from Pinjarra-Williams Road. This is where there is already an existing access.

As depicted in the following Figures 2 and 3 taken from Google Earth Street view, this stretch of Pinjarra-Williams Road is straight with good sightlines and there is already a drainage culvert installed over a wide crossing that caters to existing agricultural traffic.

This arrangement is considered suited to caravan access noting the applicant intends to all weather seal the main entry crossover, the main parking (caravan visitor parking area) and the entry road from the crossover to 10m on the caravan park side of the boom gates. The balance of the internal roads (driveways) will be constructed as all weather, compacted gravel roads.



**Figure 2 – Google Street view looking south**



**Figure 3 – Google Street view looking north, including St Boniface Church**

### 3.2.3 Setbacks

Although TPS2 does not include specific setbacks for the Rural zone, the proposed development is well setback from boundaries, including a minimum 30m to the car park and 63.5m to the buildings from the Pinjarra-Williams Road. This is also assisted by the proposed landscape buffer within the subject land around the caravan park, accommodation, and amenities.

It is considered that the proposed development is designed in a manner that will not constrain the continued use of surrounding land for ongoing agricultural use (e.g., broad acre grazing and cropping).

At this point, the owners do not propose to operate any agricultural or other activities on the balance land, retaining the balance land as pasture, with a mowed firebreak around the entire perimeter of the caravan park. Were a level of agriculture to occur on the subject land, there is sufficient setbacks available to accommodate a low level of activity without impinging on the caravan park or amenity of occupants.

The development is also positioned away from the St Boniface Church, a far greater distance and offset than was set out in the previously approved application.

### 3.2.4 Landscaping

Clause 5.2 Landscaping states:

- (1) the Council may require the provision of any amount of landscaping that it considers reasonable and desirable in the circumstances.*
- (2) as a guide to the Council and landowner, landscaping may include natural bushland, swimming pools and areas under covered ways; laundries, drying yards, and garbage collection spaces shall not be included.*
- (3) access driveways between street alignment and setback line, may be included in the landscaping requirement but otherwise carparking areas and driveways shall not be included.*
- (4) the Council may restrict the use of concrete, gravel, pebble and similar hard materials and require planting of lawns, trees or shrubs in lieu thereof.*

Local endemic species will be used for perimeter landscaping (shown on the site plan) to screen the development from surrounding land uses. Additional strategic landscaping will be planted in the area proposed as the 'rural landscape buffer'.

### 3.3 Separation distances between industrial and sensitive land uses

Environmental Protection Authority Guidelines outline 'Separation distances between Industrial and Sensitive land uses. It does not specify a buffer between extensive agriculture and sensitive land uses such as caravan parks.

The guidelines recommend buffers between some types of rural uses and any 'sensitive' land uses such as animal feedlots, hay processing plants, livestock saleyard / holding yard, extensive piggeries, and poultry farms.

Council has previously determined that the development of a caravan park would need to have regard for buffers in this location. The applicant proposes to setback the development envelope over 60 metres from Pinjarra Williams Road, much further again to the caravans and cabins, to allow a 'rural landscape buffer' to the accommodation component of the development.

The applicant has indicated the rural buffer will include planting 'to add to the character and charm of the proposed accommodation facility' which also provides additional physical as well as visual buffer separation to other land.

### 3.4 Servicing

Both water and waste water servicing are an essential component of the Caravan Park's operations.

Advice has been sought from professional engineers and treatment plant suppliers, based on peak occupancy of the caravan park and Health WA guidelines on personal water requirements and wastewater discharge rates.

Given the considerable costs involved, the proponent preference is for this facet to advance to detailed design post Development Approval. The proponent appreciates the development cannot commence until an approved solution is determined for both water and wastewater.

This said, it is apparent that there is a considerable water supply already available on the subject land, from groundwater and also from the large storage dam that exists.

#### 3.4.1 Wastewater

The development plans depict a sewerage treatment system south of the entry parking area. Structerre have undertaken a Site & Soil investigation, and a copy of this report is attached at Appendix 4.

This report demonstrates the site is suitable for the proposal, with a secondary level treatment system with a land application area recommended. The site is large and the Structerre report indicates the soil is suitable for such a system. Given the costs involved, preference is to finalise these details once there is certainty of a Development Approval in place.

#### 4.3.2 Water

The preferred option for water supply is to access nearby reticulated potable water. Preliminary advice has been sought from the Water Corporation who confirmed Lot 352 meets all criterion for a 'service by agreement', however the proponent cannot make a final decision, including about expenditure comparison to alternatives, until Development Approval is granted.



If reticulated water cannot be sourced then water tanks located near to the cabins and communal buildings can be utilised, although there is also option (subject to approval), to use an approved Reverse Osmosis system with adequate storage to cater for peak demand.

### 3.5 Heritage – State Registered and Municipal Heritage Inventory Listed Places

The plans prepared in support of the proposal ensure that a suitable distance is maintained between the existing heritage listed Quindanning Hotel and the St Boniface Anglican Church on the corner of Pinjarra-Williams Road and Church Road.

The land naturally slopes downwards from the north east to the south west, with the lowest levels near the Pinjarra Williams Road and Church Road intersection. The development will be visible from Pinjarra Williams Road and Church Road, which has potential to negatively impact on the rural character of the area and rural visual amenity.

This was identified as a significant issue as part of the previous development application due to the proximity of the land to the Quindanning Hotel which is a registered heritage site by the Heritage Council of WA, and the St Boniface Anglican Church which is listed on the Shire’s Municipal Inventory.

Several amendments have been made to the current proposal to minimise the potential for visual impact on adjoining heritage places.

Amendments have included sensitively siting the proposed development outside of major sightlines of the St Boniface Anglican Church and setting the development back a much greater distance than was originally proposed in the 2015 development approval.

The proposed development can also be further mitigated by quality landscaping which can provide an effective screen and minimise the visual impact of the development. The development is sensitively sited and designed, including in relation to St Boniface Church, which is unlikely to compromise the integrity of the heritage building within its broader rural setting.

### 3.6 Bushfire considerations

As shown in Figure 4, a small part of the site is identified as Bush Fire Prone. This area relates to vegetation in the northern part of the subject land. There is also Bush Fire Prone land south.

Clause 78D of the Deemed Provisions state that if land is within a declared Bush Fire Prone area, a Bushfire Attack Level Assessment (BAL) by a qualified person and Development Approval (in certain circumstances) is required. This includes for habitable buildings.

State Planning Policy (SPP) 3.7 Guidelines then states an exemption, for circumstances where the site is not within 100m of bushfire prone vegetation, and/or the site is of a significant size that the building envelope of the development is not within 100m of bushfire prone vegetation.



**Figure 4 – DFES Bushfire Prone land**

At 60ha, and given a separation evident across open paddocks, this development is considered exempt from a BAL Assessment and Development Approval on basis of being Bush Fire Prone. It is noted that fire and emergency requirements under the Building Regulations will continue to apply.

### 3.7 Workforce Accommodation

12 duplex cabins are proposed to cater for workers, as well as tourists, depending on demand. In practice, the operation of this aspect of the park is considered no different to a Caravan Park, given the cabins are self-contained, and the guests will also have access to the park facilities.

The proponent accepts a condition which limits “workers accommodation” to these 12 cabins, ideally worded to the effect of “except with the prior written consent of the Shire”. Although the Caravan Park is primarily for tourists, if there was opportunity to cater short term to any bigger projects that arose in the region, the park would like ability to temporarily meet this workforce demand as well.

### 3.8 Wellness Centre

As indicated, this is not a standalone use but an ancillary facility within the Caravan Park aimed at guest use only, with no staff. It is however another facility that could also be made available upon request to other members of the community, for example visiting practitioners for temporary or occasional use.

The proponent accepts a condition which would regulate this aspect of the park. For example “except with the prior written consent of the Shire, the wellness centre is limited to guest use”.

This option is considered something that could be beneficial to the small Quindanning community and surrounds, however it is not intended to be large scale or to replace existing services and facilities.

### 3.9 Other considerations

The Scheme includes a range of matters Council shall consider in respect of any application for development including:

- (d) *any detrimental circumstances that could originate from the proposed use, including noise, vibration, smell, light, traffic generation, potential safety or health hazard, electrical interference, unsightly appearance, fumes, smoke, dust, oil, wastewater or other waste products.*
- (e) *the character of the proposed development in relation to the development on the adjoining land in the locality and the intended future amenity of the area and any matters specified in Part 4 of the Scheme.*

Separate to the Scheme, regard is also given to the *Planning and Development Act* and associated *Regulations*. Clause 67 of the *Planning and Development (Local Planning Schemes) Regulations 2015* which sets out matters the Local Government is to have due regard to, and which are relevant to the development proposed.

In this context, relevant matters relate to the compatibility of the development to its setting, the amenity of the locality including environmental impacts of the development and the suitability of the land about environmental and human health risk. In this regard, the following comments are made:

- Although the Scheme does not contain specific objectives relating to the Rural zone, the Shire has previously considered the proposed development of a Caravan Park with Holiday cabins/chalets to meet the objectives of the Rural zone, and compatible in this location. It is

contended that whilst this is a larger development, it is better positioned and designed, and will make a positive contribution to Quindanning and the Shire.

- While the proposed development increases the number of caravan bays and includes additional land uses such as workforce accommodation and wellness centre, these land uses are considered complimentary in nature and considered to have minimal additional visual or amenity impacts. Despite the necessity to define the proposal to meet the Planning Scheme definitions, all other facets of the Caravan Park are considered incidental or a part of the primary land use, Caravan Park.
- There is considered a synergy between tourism uses in the location with the proposed development supplementing the existing hotel accommodation (Quindanning Hotel) for the benefit of a different price point in the travelling public and motor vehicle-based tourism in the region.
- The sensitive siting of the proposed Caravan Park and consideration of view corridors are proposed to minimise any visual impact on the prevailing rural character in the immediate locality.
- From the images shown in figures 2 and 3, it is apparent that with the setbacks, the landscaping, as well as the benching of the cabin / camping sites proposed, the development will step into the landscape view. The earthworks proposed follow the contours of the site and mean the development remains low in the landscape, stepping up the site.
- This updated siting and design is not considered to compromise the heritage significance of St Boniface Anglican Church or the Quindanning Hotel.
- The proposed development can readily provide sufficient on-site vehicle access and car parking.
- In terms of addressing environmental amenity and impacts, the proposed development can only proceed with a viable and environmentally responsible solution to the management of wastewater, and potable water. In the absence of mains sewerage, the proposed management and disposal of wastewater will be carefully planned to meet if not exceed likely demand.

## 4 Conclusion

This report has illustrated how the proposed development satisfies all relevant provisions of TPS2, including setbacks, car parking and landscaping along with being considered compatible with the rural character of the locality.

It is contended that the Caravan Park development is highly beneficial, unlikely to have any negative impacts on the natural environmental or visual landscape character of the immediate locality.

In light of the above information and justifications we respectfully request Council's favourable consideration and approval of the proposed Caravan Park development on a portion of Lot 352 Pinjarra-Williams Road, Quindanning.

## Appendices



## Appendix 1- Certificate of Title

WESTERN



AUSTRALIA

TITLE NUMBER

Volume Folio

**2752 589**

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

*BGRoberts*  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 352 ON DEPOSITED PLAN 250660

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

BYRON AUGUSTUS COWCHER OF RMB 522, WILLIAMS

(T L429009 ) REGISTERED 16/9/2010

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. THE LAND THE SUBJECT OF THIS CERTIFICATE OF TITLE EXCLUDES ALL PORTIONS OF THE LOT DESCRIBED ABOVE EXCEPT THAT PORTION SHOWN IN THE SKETCH OF THE SUPERSEDED PAPER VERSION OF THIS TITLE. SEE VOLUME 1406 FOLIO 987
2. L429010 MORTGAGE TO RURAL BANK LTD REGISTERED 16/9/2010.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

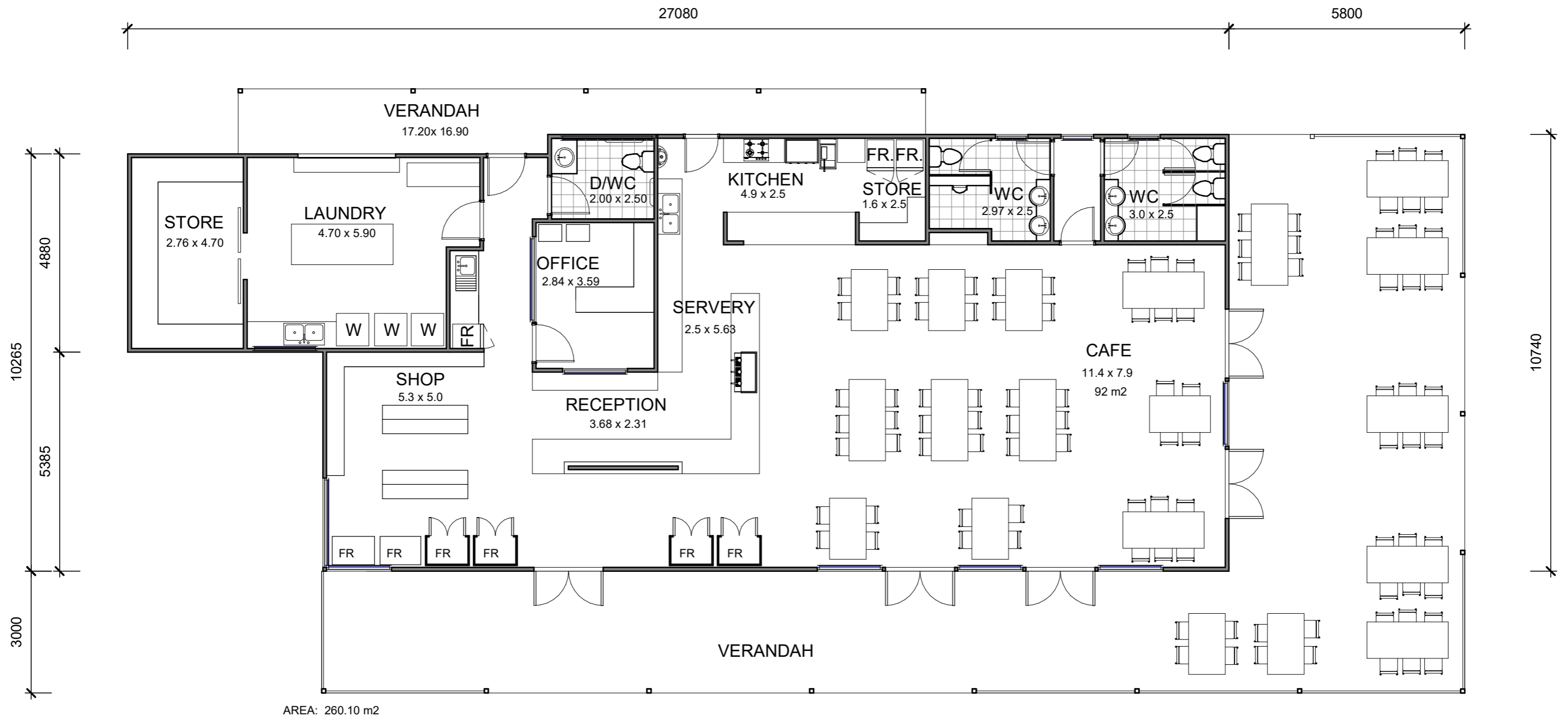
The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1406-987 (352/DP250660)  
PREVIOUS TITLE: 1406-987  
PROPERTY STREET ADDRESS: 9155 PINJARRA-WILLIAMS RD, WILLIAMS.  
LOCAL GOVERNMENT AUTHORITY: SHIRE OF WILLIAMS

## Appendix 2 – Site plan



## Appendix 3 – Development plans



AREA: 260.10 m2

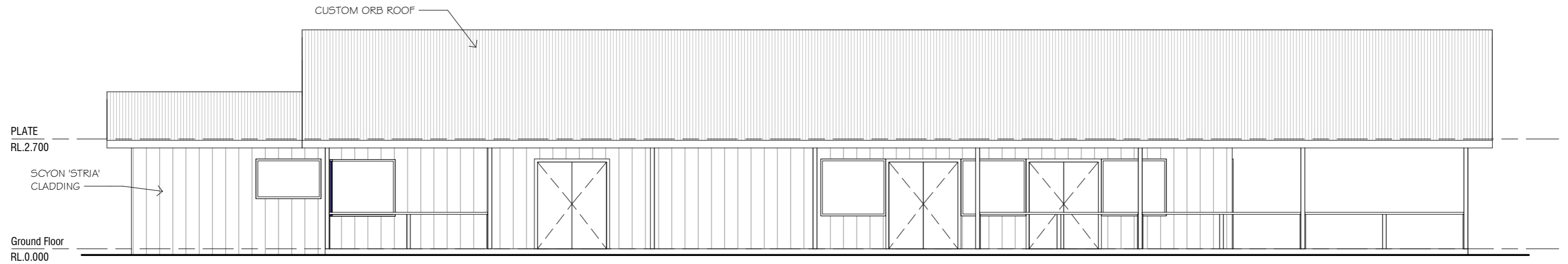
**1 FLOOR PLAN**  
1 : 100



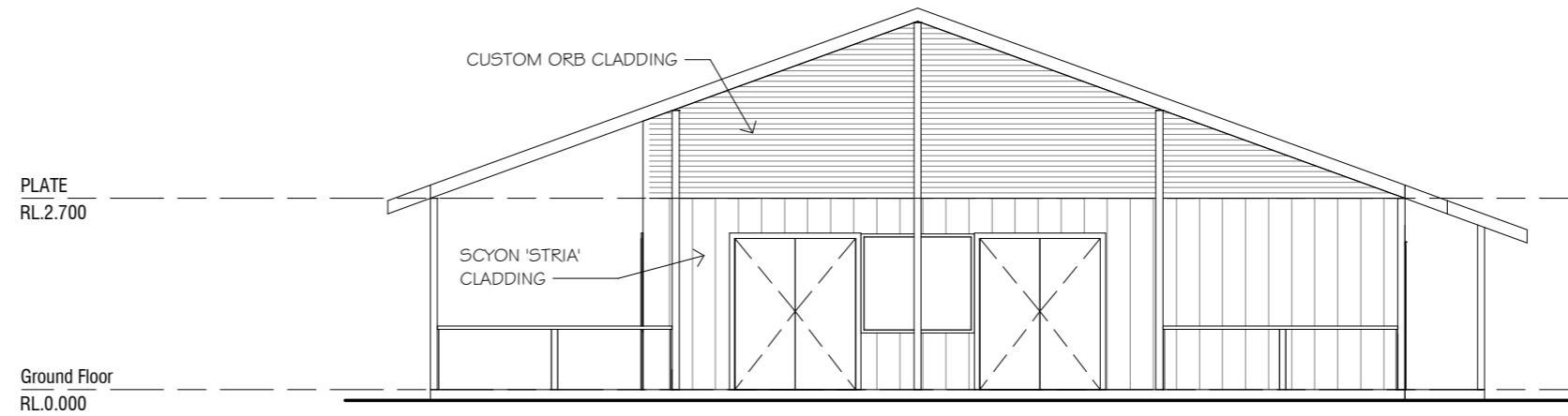
ADDRESS / POST:  
 BRIGHTHOUSE CONSULTANTS  
 P.O. BOX 1185 MANDURAH WA 6210  
 TEL: 0418915532  
 E-MAIL: consultant@brighthouse.com.au  
 www.brighthouse.com.au

RECEPTION BUILDING  
 QUINDANNING TOURIST PARK  
 WILLIAMS LOCATION 352  
 PINJARRA - WILLIAMS ROAD, QUINDANNING  
 FOR QUINDANNING TOURIST PARK

GROUND LEVEL PLAN		SK1
Project number	6725	R101
Date	30/08/23	
Drawn by	E.V./ A.T.	Scale 1 : 100
Checked by	P.B.	



**1** Elevation 1  
1 : 100



**2** Elevation 2  
1 : 100

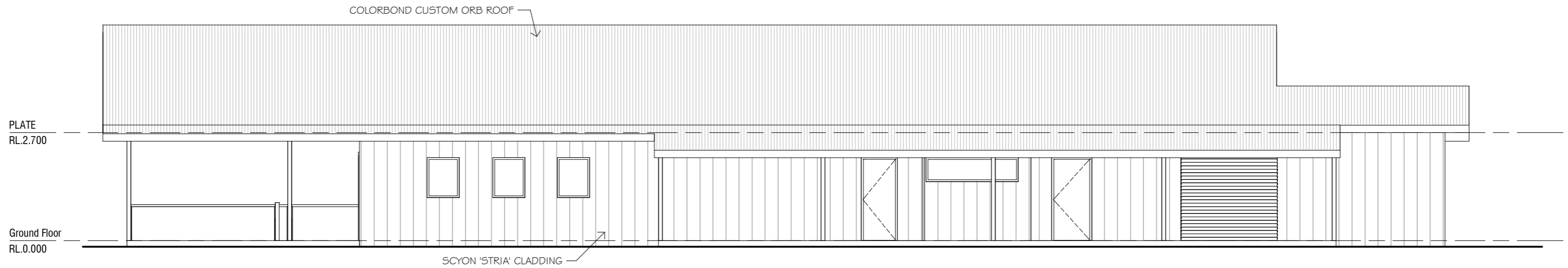


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BRIGHOUSE CONSULTANTS  
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E-MAIL: consultant@brighthouse.com.au  
www.brighthouse.com.au

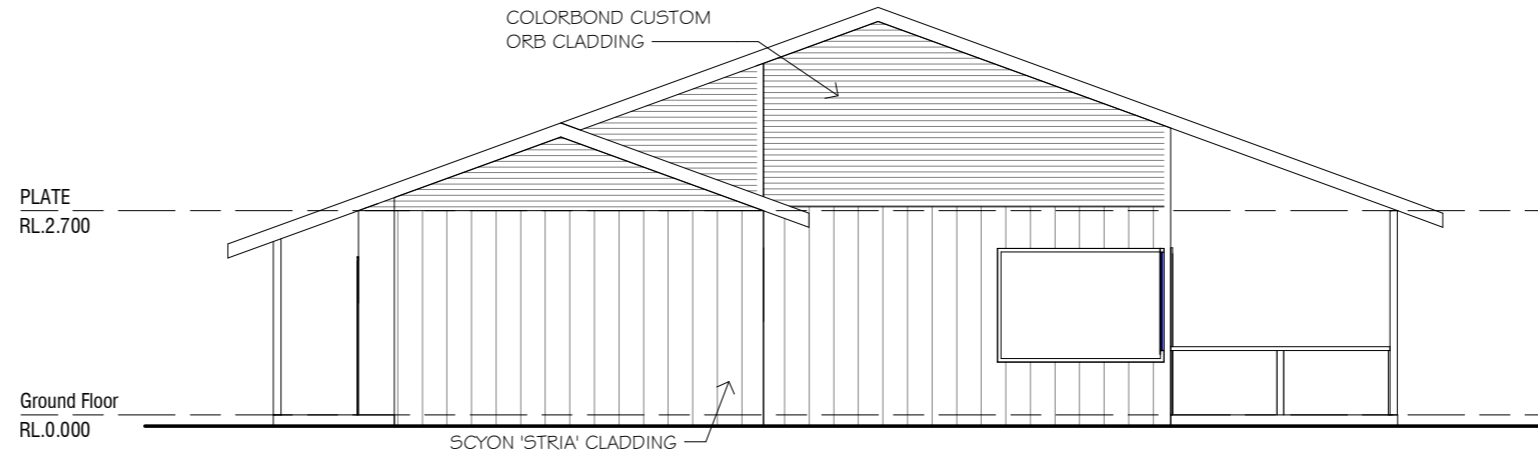
RECEPTION BUILDING  
QUINDANNING TOURIST PARK  
WILLIAMS LOCATION 352  
PINJARRA - WILLIAMS ROAD, QUINDANNING  
FOR QUINDANNING TOURIST PARK

ELEVATIONS 1 AND 2		SK1
Project number	6725	R201
Date	30/08/23	
Drawn by	A.T.	Scale 1 : 100
Checked by	P.B.	





**1** Elevation 3  
1 : 100



**2** Elevation 4  
1 : 100



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RECEPTION BUILDING  
QUINDANNING TOURIST PARK  
WILLIAMS LOCATION 352  
PINJARRA - WILLIAMS ROAD, QUINDANNING  
FOR QUINDANNING TOURIST PARK

ELEVATIONS 3 AND 4		SK1
Project number	6725	R202
Date	30/08/23	
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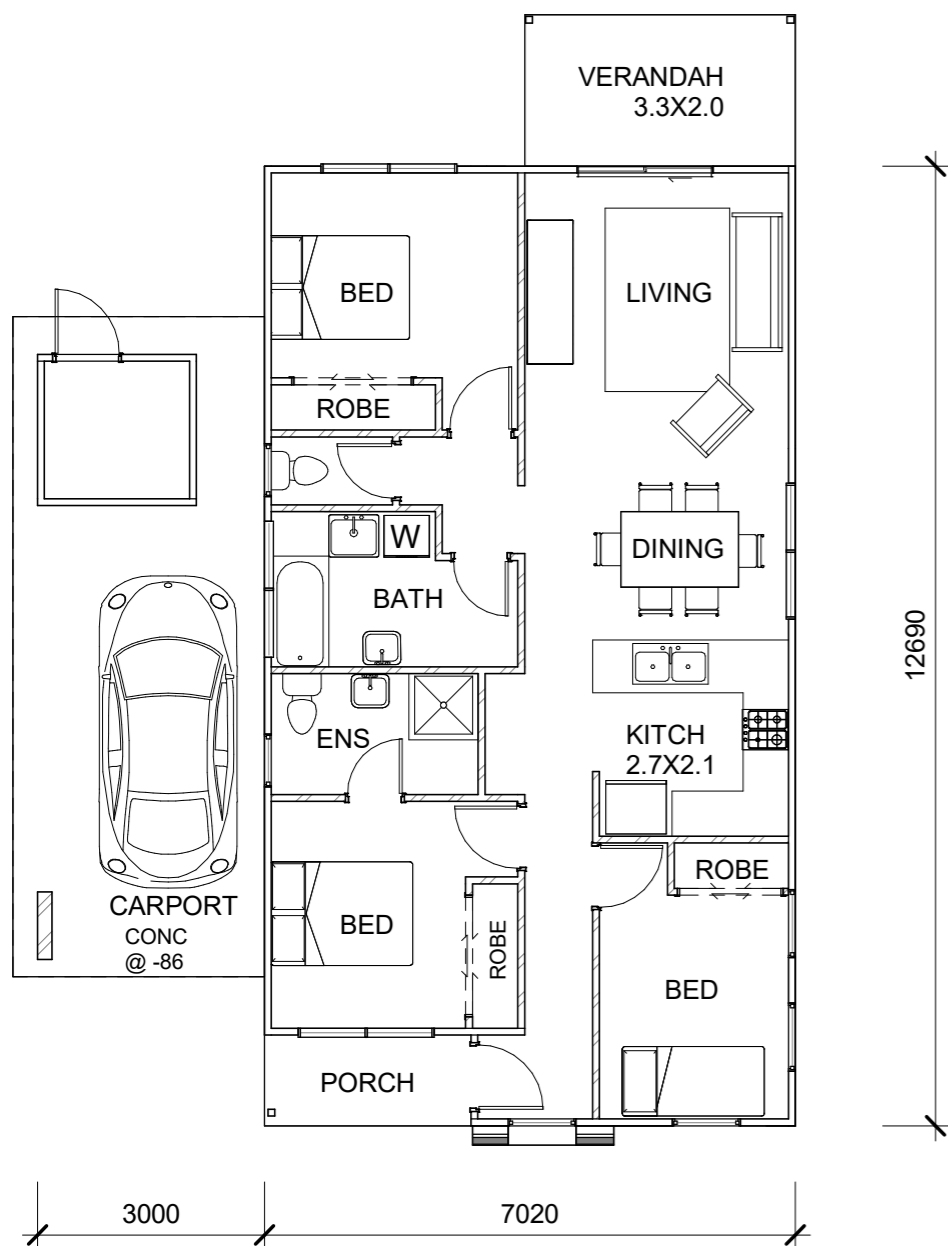
RECEPTION BUILDING

QUINDANNING TOURIST PARK  
 WILLIAMS LOCATION 352  
 PINJARRA - WILLIAMS ROAD, QUINDANNING  
 FOR QUINDANNING TOURIST PARK

3D VIEWS

SK1

Project number	6725	R901
Date	30/08/23	
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Checked by	P.B.	Scale

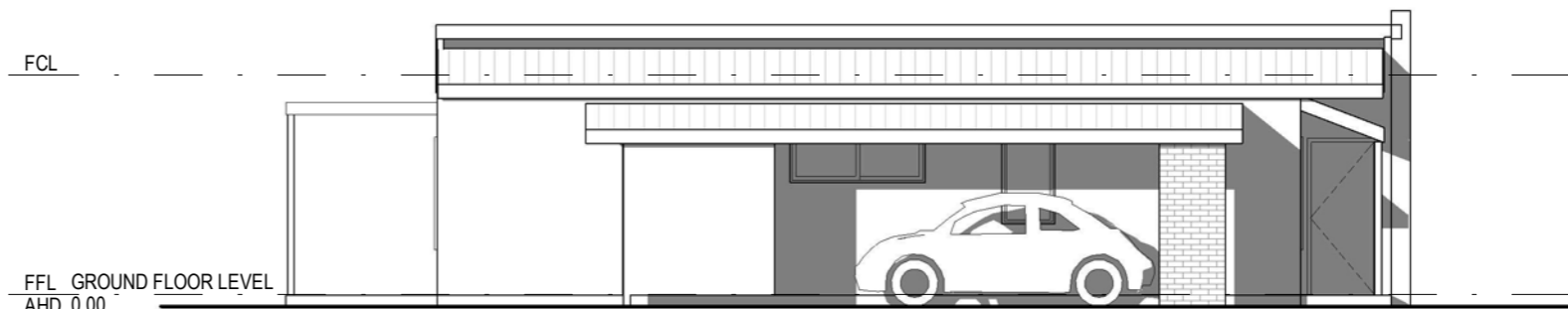


**FLOOR PLAN**

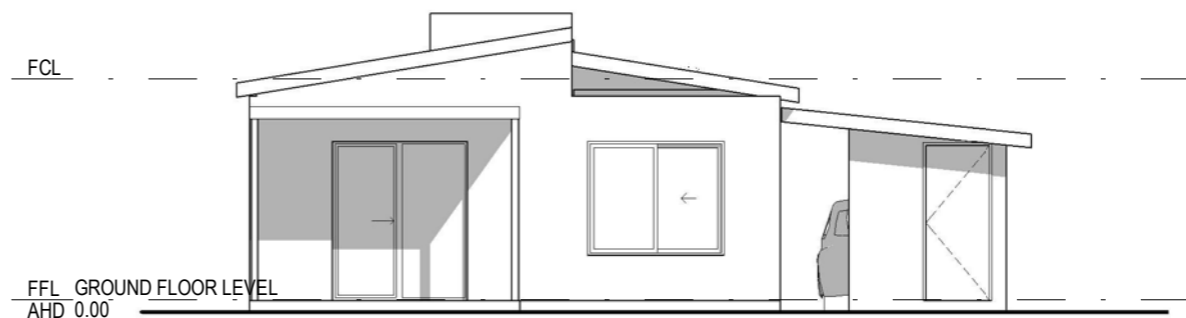
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**HABITABLE AREA: 82,33 sqm**



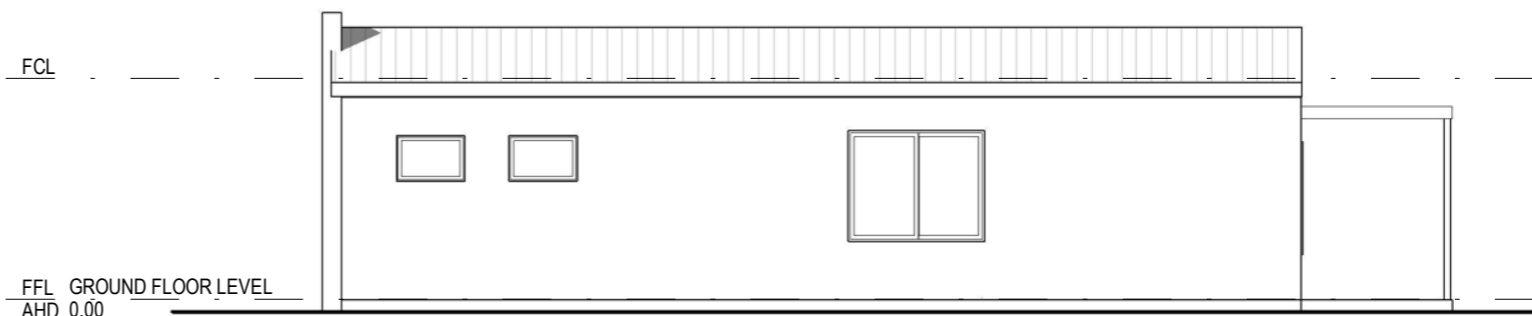
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**ELEVATION 2**



**ELEVATION 3**



**ELEVATION 4**

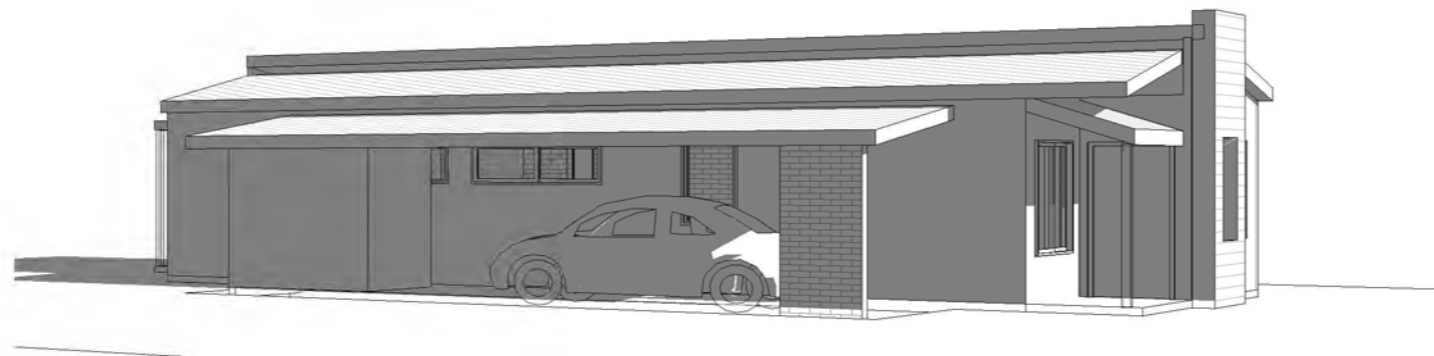
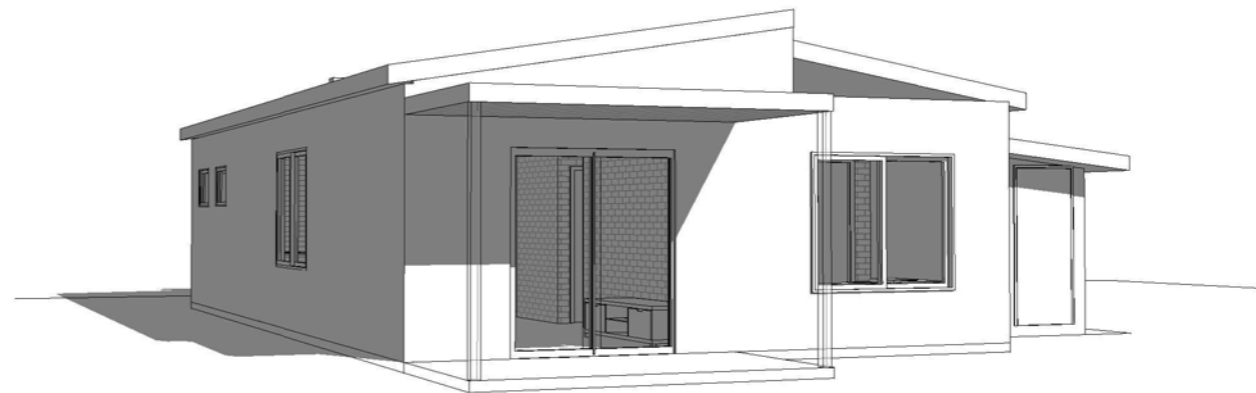
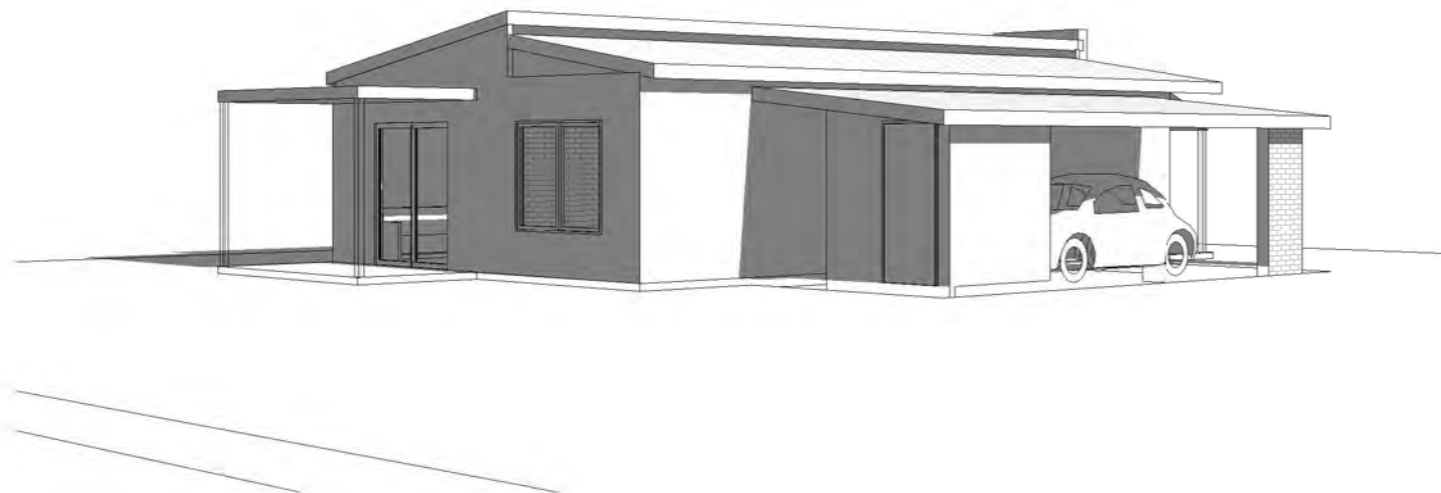
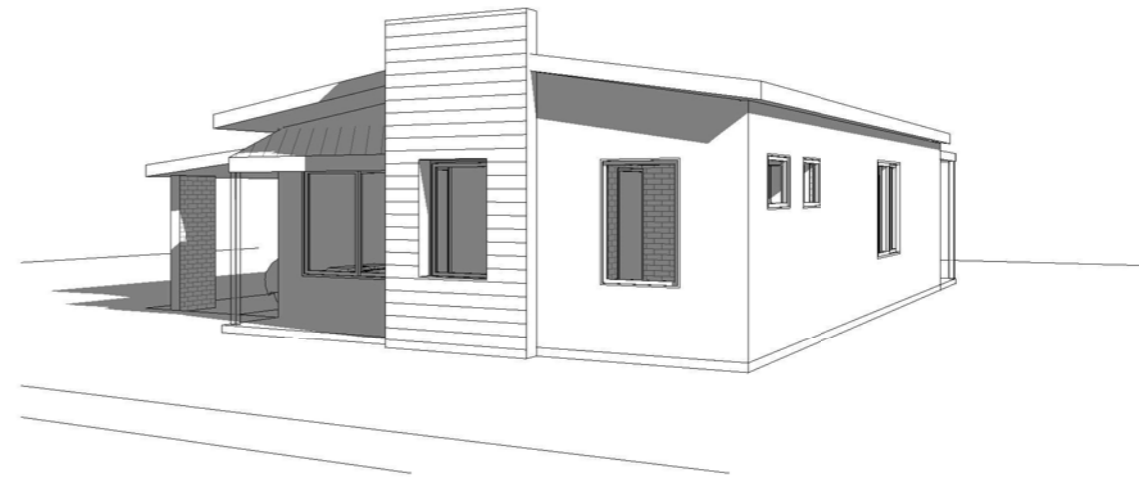


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QUINDANNING TOURIST PARK  
 WILLIAMS LOCATION 352  
 PINJARRA - WILLIAMS ROAD, QUINDANNING

**MANAGER'S HOUSE - 3 BED**

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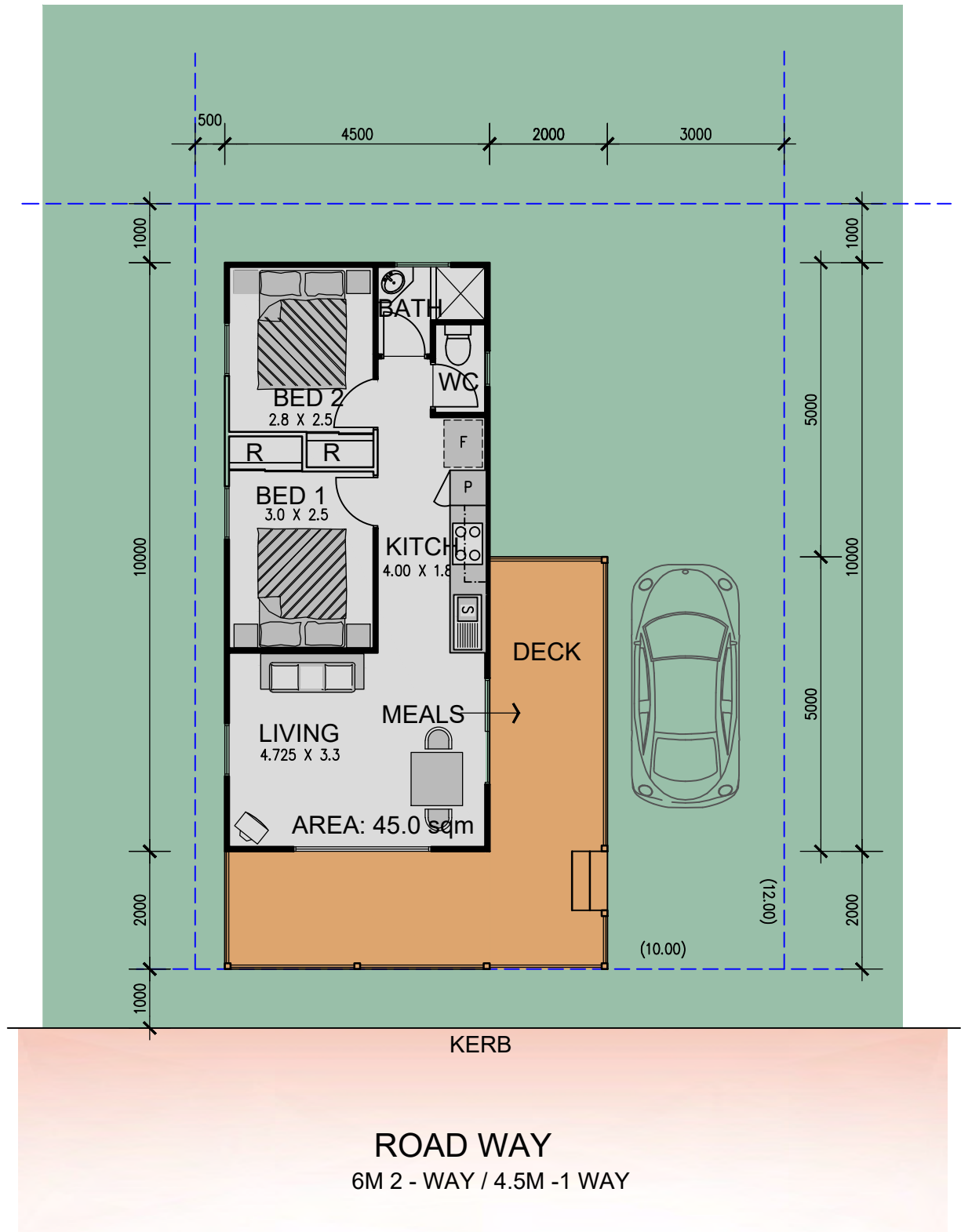
QUINDANNING TOURIST PARK  
 WILLIAMS LOCATION 352  
 PINJARRA - WILLIAMS ROAD, QUINDANNING

MANAGER'S HOUSE - 3 BED

Project number	6725	MH901
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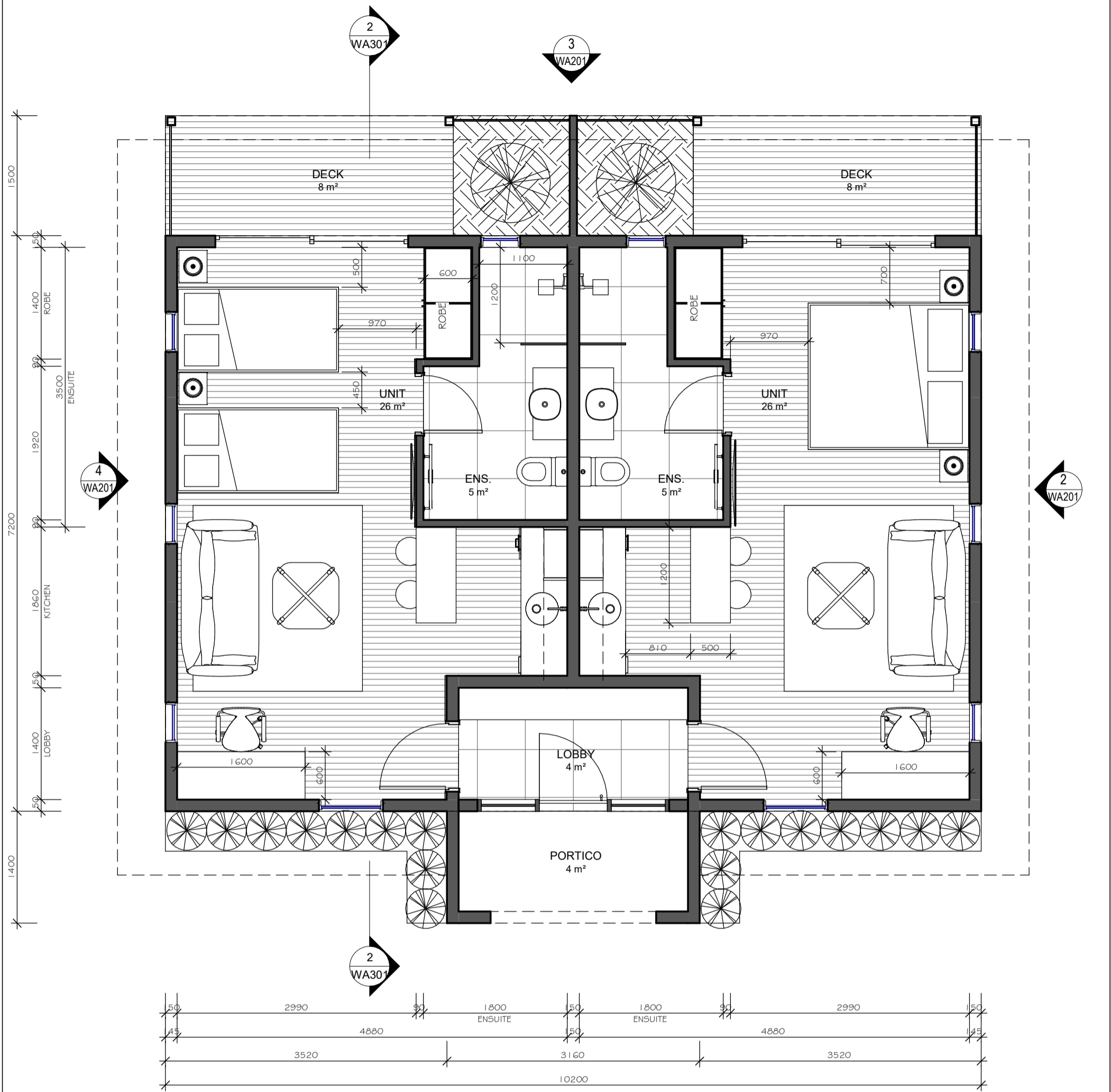
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10 X 4.5 - 2 BED SELF CONTAINED SINGLE WIDE CABIN  
2.0 WIDE DECK TO FRONTAGE AND / OR SIDE

SCALE: 1:200 @ A4	
DRAWN BY: IBD.	CHECKED BY: P.B.
JOB NO: 6758	DWG NO: 3 REV NO: A
PREVIOUS ISSUE: -/-	ISSUE DATE: 09/02/24



**1 FLOOR PLAN - UNIT PAIR**  
 WA201 SCALE: 1:50

**UNIT AREAS (MEASURED INSIDE EXT. WALLS)**

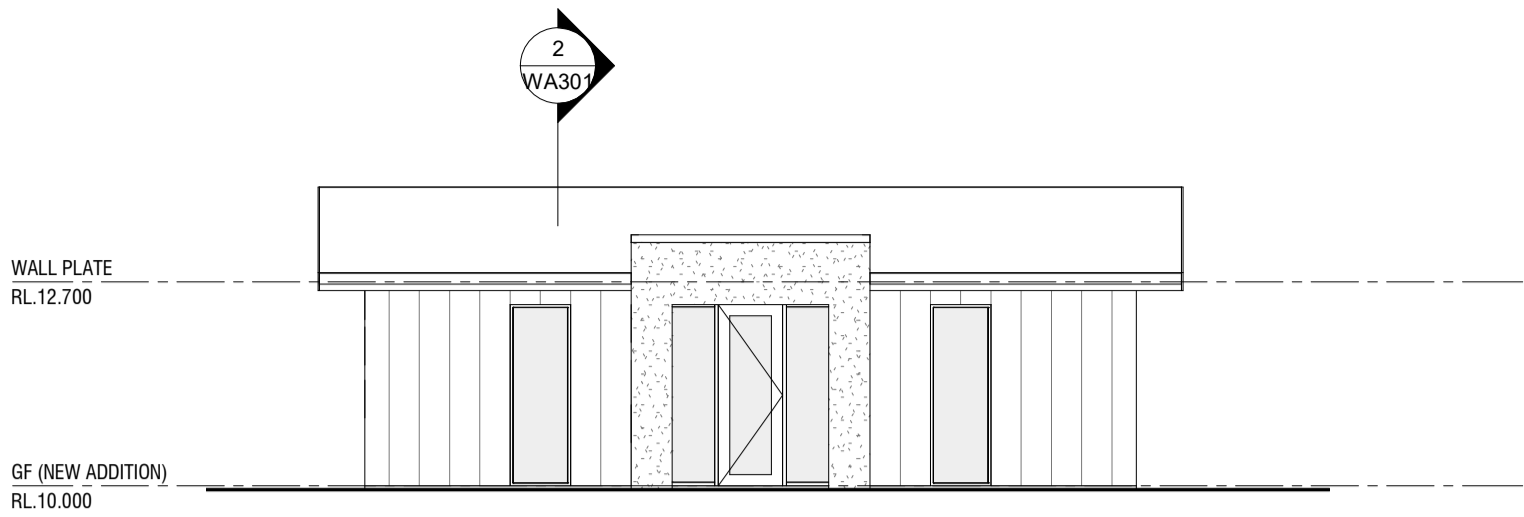
ROOM NAME	AREA
UNIT	26 m <sup>2</sup>
DECK	8 m <sup>2</sup>
ENS.	5 m <sup>2</sup>
LOBBY	4 m <sup>2</sup>
PORTICO	4 m <sup>2</sup>
TOTAL	47 m <sup>2</sup>

EXTERNAL AREA **73.44m<sup>2</sup>**

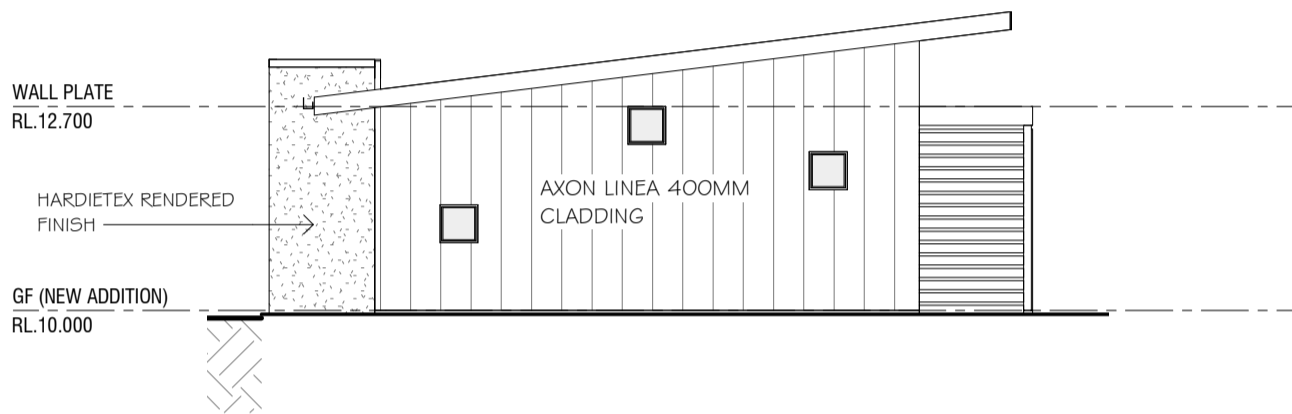


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QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA - WILLIAMS ROAD QUINDANNING		<b>WA101</b>
FLOOR PLAN		
Issue Date	30/08/23	Rev. A
Drawn By	TM	Scale As indicated
Checked by	P.B.	



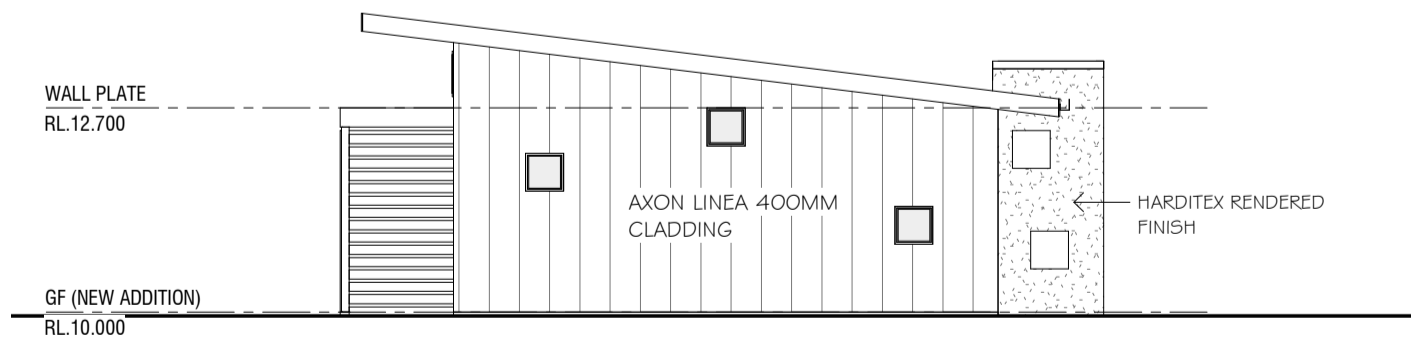
**1** ELEVATION - UNIT PAIR  
WA102 SCALE: 1:100



**2** ELEVATION - UNIT PAIR  
WA102 SCALE: 1:100



**3** ELEVATION - UNIT PAIR  
WA102 SCALE: 1:100

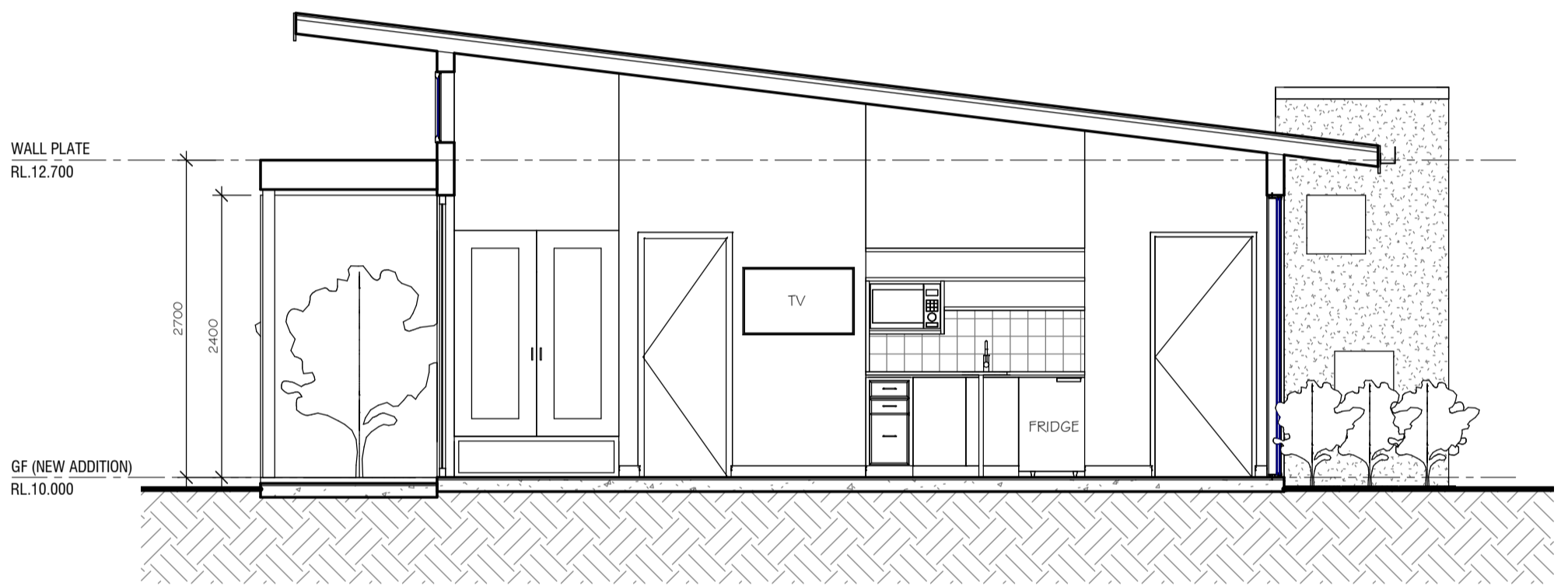


**4** ELEVATION - UNIT PAIR  
WA102 SCALE: 1:100

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QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA - WILLIAMS ROAD QUINDANNING		
ELEVATIONS		<b>WA201</b>
Issue Date	30/08/23	
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**2** TYPICAL SECTION  
 WA102 SCALE: 1:50

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QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA - WILLIAMS ROAD QUINDANNING			
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Issue Date	30/08/23	Rev.	A
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Checked by	PB		





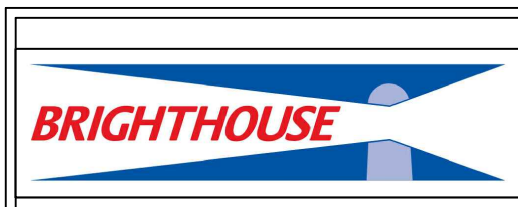
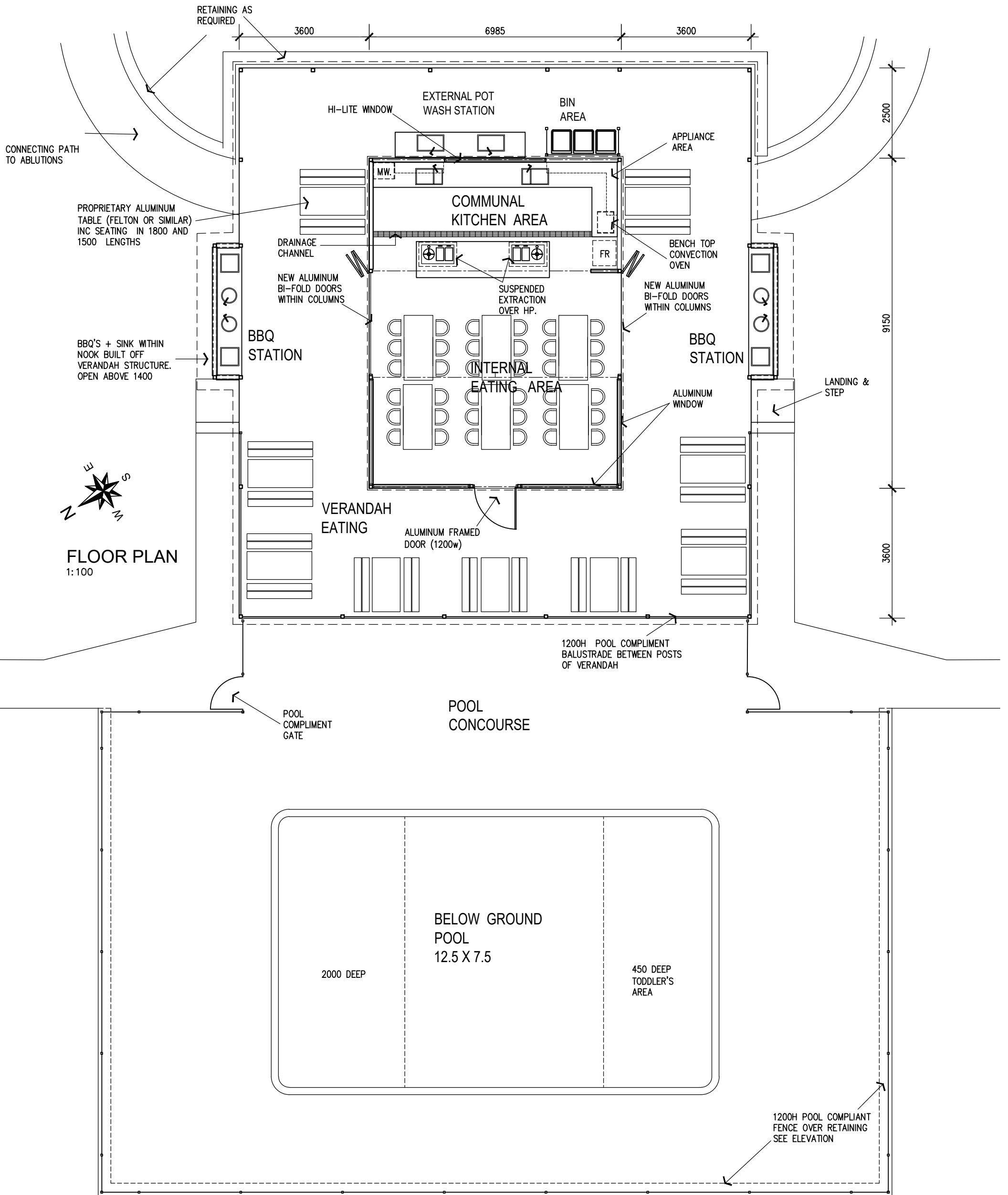
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 WILLIAMS LOCATION 352  
 PINJARRA - WILLIAMS ROAD QUINDANNING

3Ds		<b>WA901</b>	
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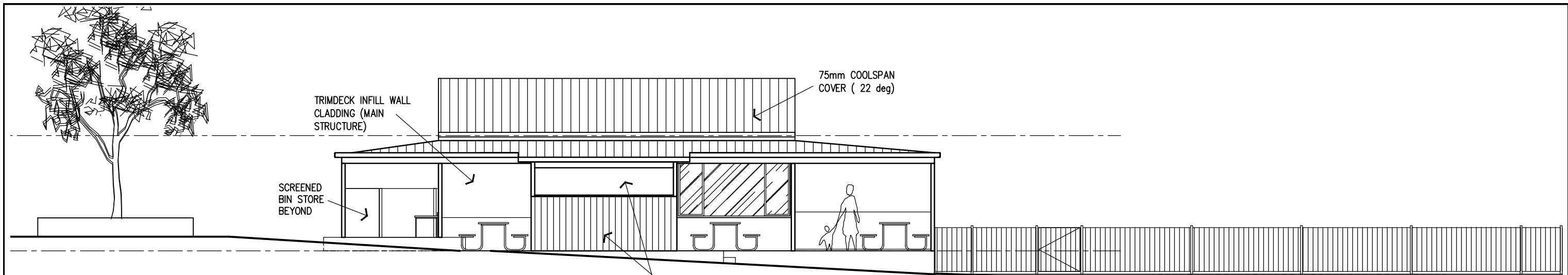


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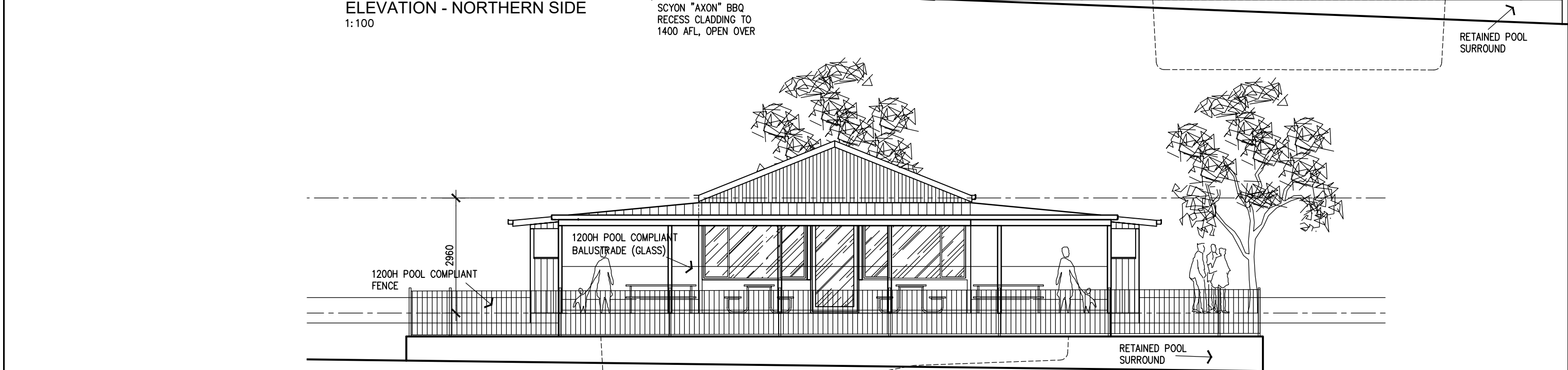
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QUINDANNING TOURIST PARK  
 WILLIAMS LOC 352 - PINJARRA / WILLIAMS RD  
 QUINDANNING

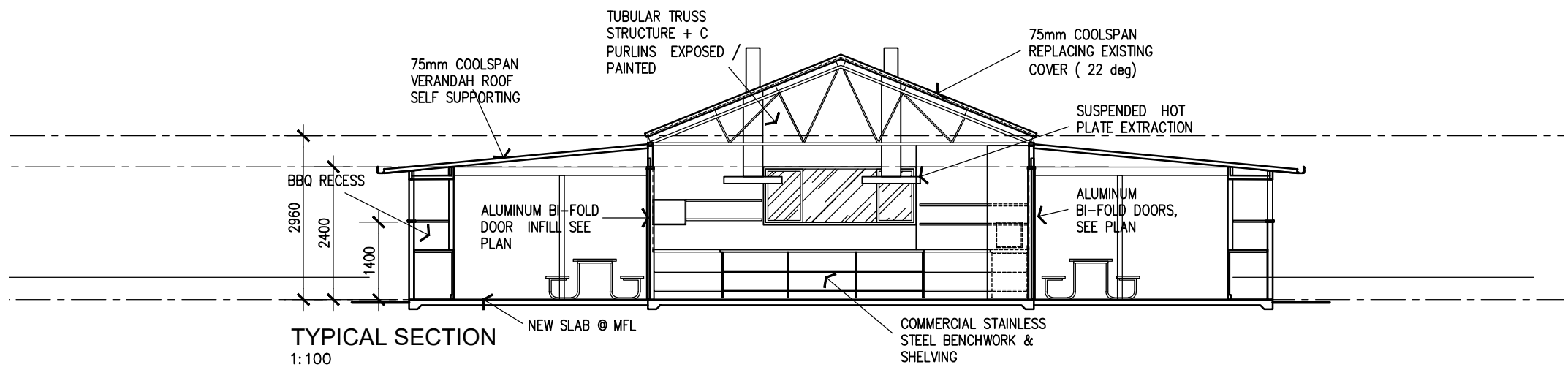
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JOB No	TYP	REV	
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IBD	1:100	A102	
PREV ISSUE:	AT A3 PAPER SIZE	ISSUE DATE:	
	06.09.23	1 of 2 SHEETS	




ELEVATION - NORTHERN SIDE  
1:100



ELEVATION - WESTERN SIDE  
1:100

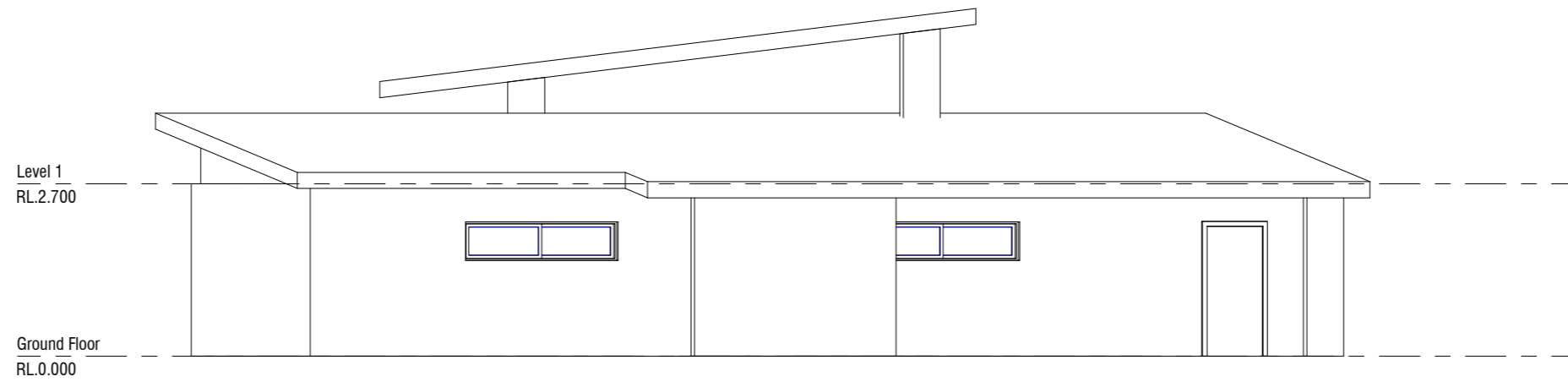


TYPICAL SECTION  
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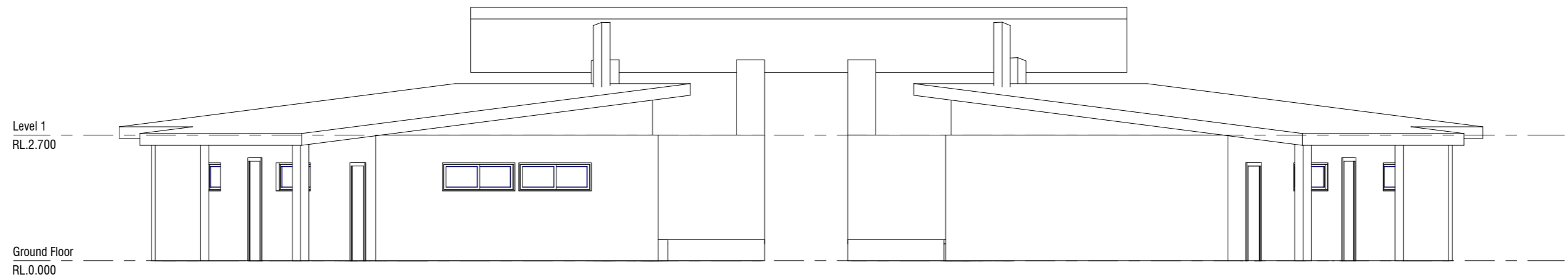
	ADDRESS / POST: BRIGHTHOUSE CONSULTANTS P.O. BOX 1185 MANDURAH WA 6210 TEL: 0418915532 E-MAIL: consultant@brighthouse.com.au www.brighthouse.com.au	CAMP KITCHEN AND POOL AREA  QUINDANNING TOURIST PARK WILLIAMS LOC 352 - PINJARRA / WILLIAMS RD QUINDANNING	DWG No: 6706 JOB No: TYP SCALE: 1:100 AT A3 PAPER SIZE ISSUE DATE: 06.09.23	A REV SHEET No: A102 2 of 2 SHEETS
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	QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA-WILLIAMS RD QUINDANNING QUINDANNING TOURIST PARK		JOB No TYP REV	SCALE: TYP REV	SHEET No: REV	
			DRAWN BY: IBD	SCALE: 1:100 @ A3	SHEET No: <b>A-01</b>	
		PREVIOUS ISSUE: -	ISSUE DATE: 06/09/23	1 of 1 SHEETS		



1 East  
1 : 100



2 North  
1 : 100



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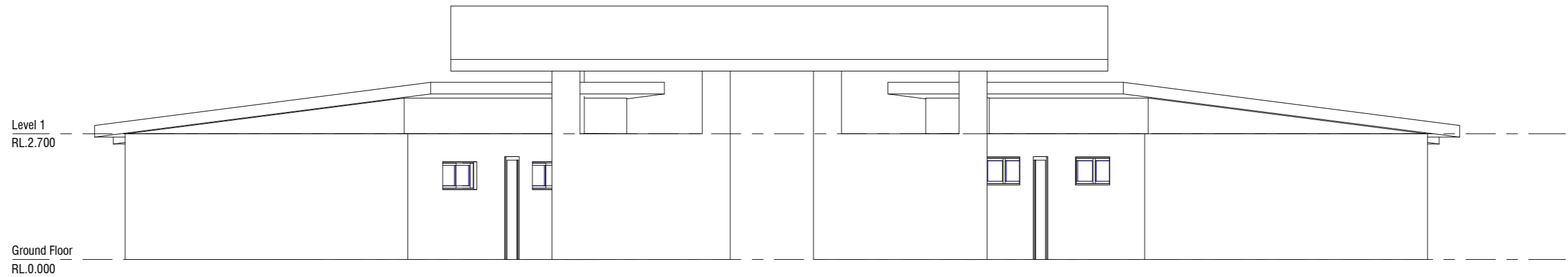
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WILLIAMS LOCATION 352  
PINJARRA - WILLIAMS ROAD, QUINDANNING  
for the SHIRE OF WILLIAMS

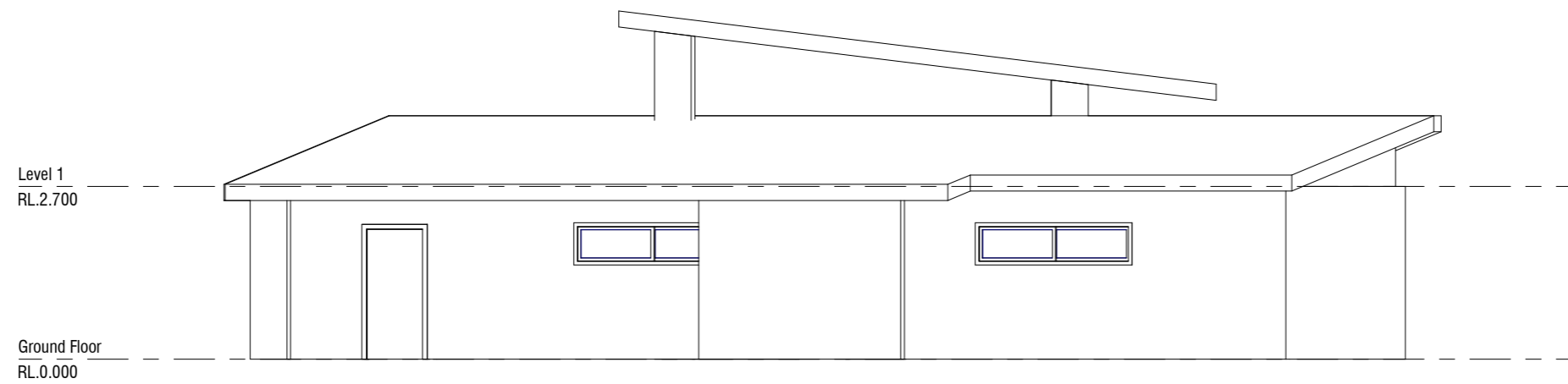
ELEVATIONS 01

SK1

Project number	6725	ABL201
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2 West  
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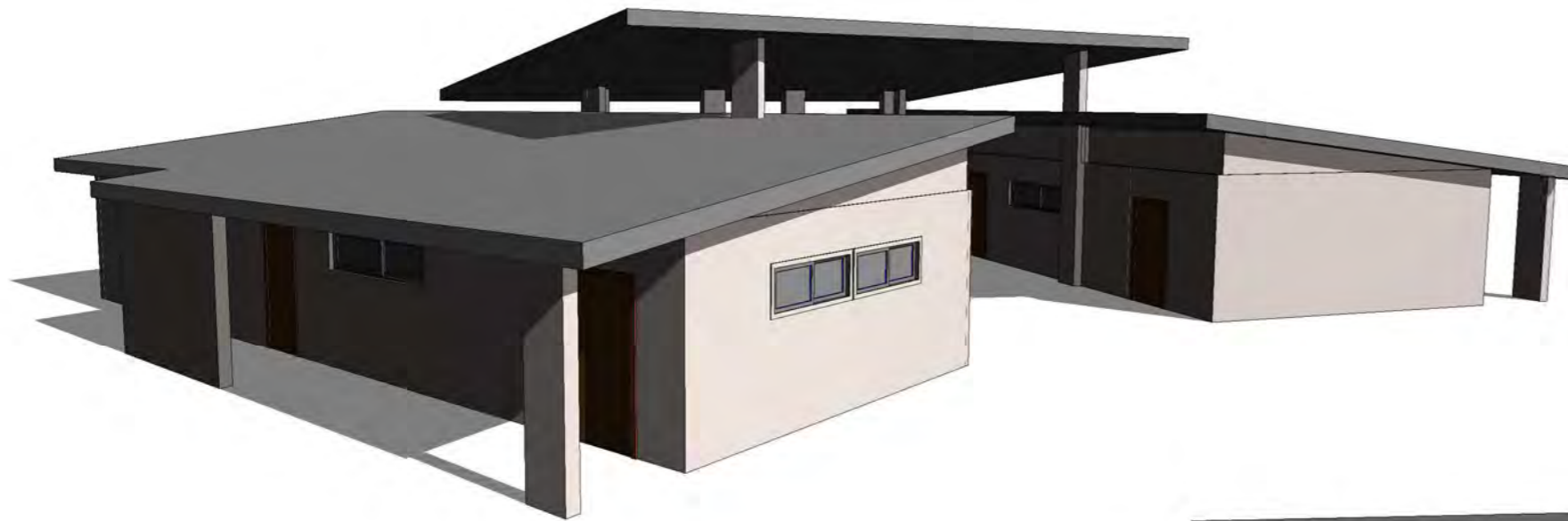


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ELEVATIONS 02		SK1
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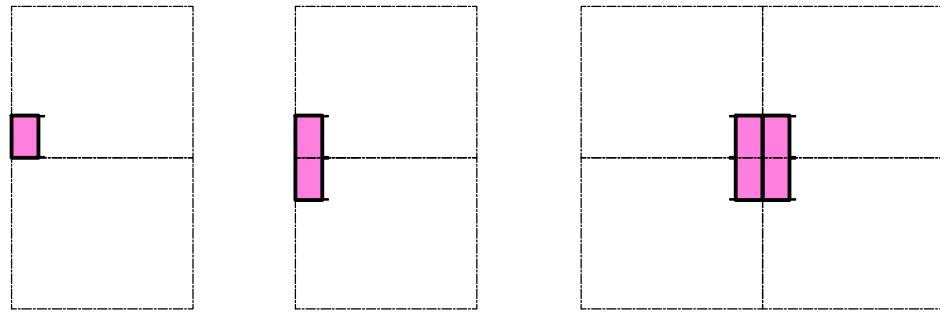
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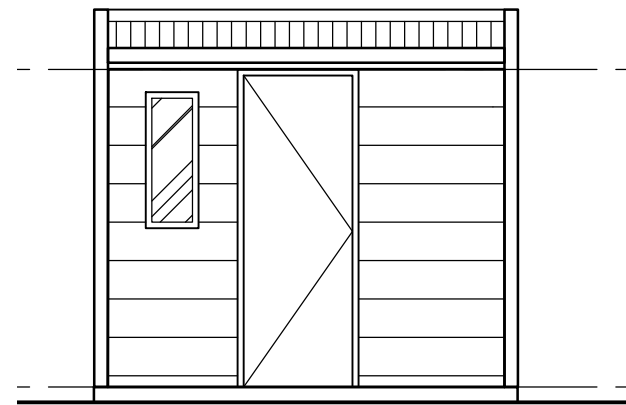
**3D VIEWS**

SK1

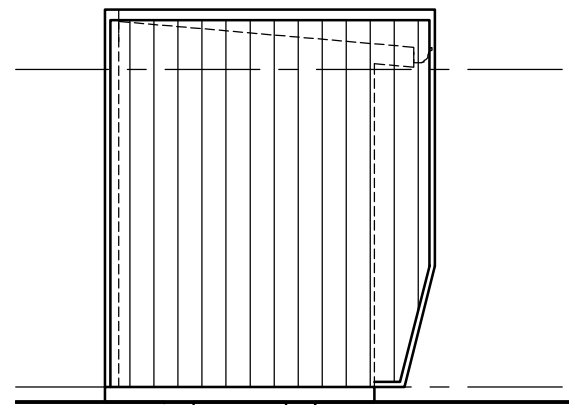
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		Scale



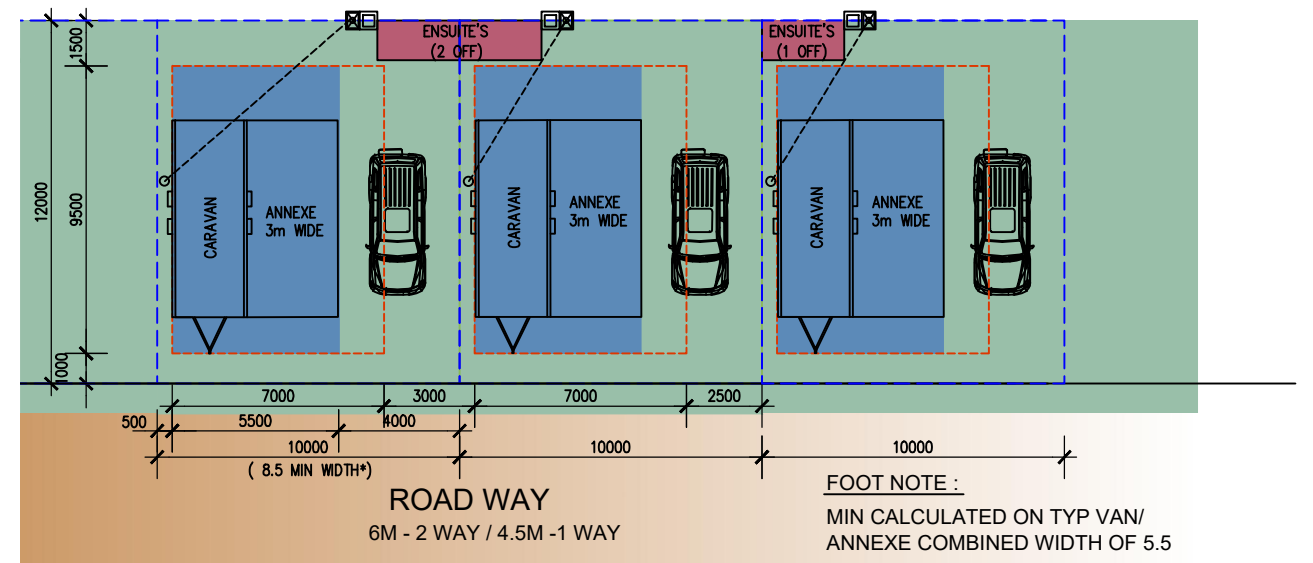
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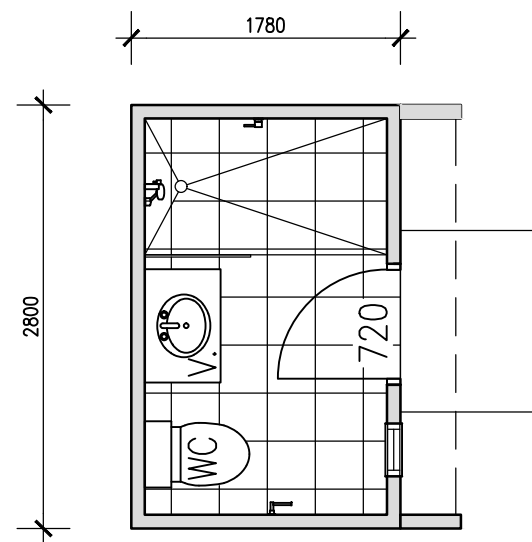
FRONT ELEVATION  
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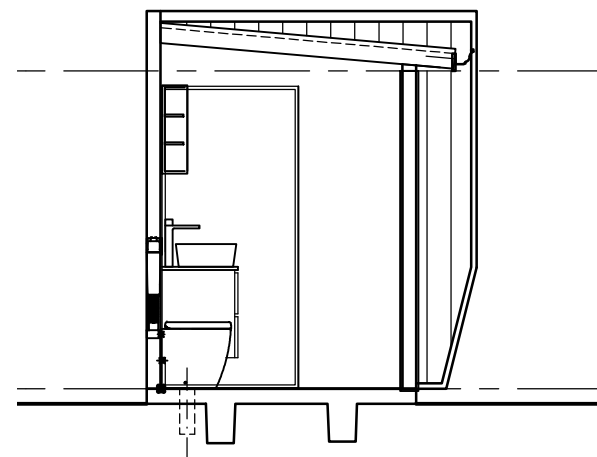
END ELEVATION  
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TYPICAL CONFIGURATION - QUINDANNING



FLOOR PLAN  
1:50



TYP SECTION  
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	TYP ENSUITE / ENSUITE LAYOUT QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA-WILLIAMS RD QUINDANNING CLIENT - QUINDANNING HOLIDAY PARK	DRAWN BY: IBD SCALE: AS SHOWN SHEET No: PREVIOUS ISSUE: - ISSUE DATE: 08/09/23 <b>ENS-01</b> 1 of 1 SHEETS

## Appendix 4- Structerre Site & Soil Evaluation



# Site & Soil Evaluation Report

## Site and Soil Evaluation for Onsite Sewage Management

### Lot 352 Pinjarra-Williams Road, Quindanning

Prepared for: Shire of Williams  
Prepared by: Structerre Consulting  
Telephone: (08) 92054500  
Email: [wageotecheng@structerre.com.au](mailto:wageotecheng@structerre.com.au)  
Ref No: D327588 / J446707-Rev0

**Date: 14.02.2024**

### Document History

Issue No (version)	Original prepared by	Issued to (description /section revised)	Date	Reviewed by	Field Assessment Date	Approved by	Approval Date
Rev0	FS	Approval	12.02.2024	MC	18.01.2024	MC	

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# 1. Introduction

## 1.1 The Consultant

The field investigation and report have been undertaken and overseen by the following suitably experienced staff.

### **Geotechnical Technician – Tony Broadway**

Over 10 years field experience at Structerre Consulting working across a wide range of site and soil conditions.

### **Civil Engineer – Farhad Silwanagh**

Civil and Geotechnical Engineer

Over 10 years' experience in civil and geotechnical engineering at Structerre Consulting. Experience includes the design consultation for various sized waste water treatment applications to include; single residence, mixed use commercial developments.

### **Geotech Division Manager – Mel Castle**

Mel Castle has been involved in civil construction inspection and testing for in excess of 35 years. Experienced in earthworks construction monitoring – residential & commercial, site supervision – earthworks, field and laboratory testing & inspection in construction materials including soils, aggregates, concrete, brick and block, rocks and pavements.

## 1.2 Report Summary

Structerre Consulting (Structerre) has been engaged to undertake a Site-and-Soil Evaluation (SSE) for a Tourist Park development of an approximately 609,052m<sup>2</sup> at Lot 352 Pinjarra-Williams Road, Quindanning.

This report details an onsite sewage management system and is to accompany an application to install an Onsite Sewage System and submitted to the Shire of Williams. This document provides information about the site and soil conditions. It also provides a detailed SSE for a 609,052m<sup>2</sup> Lot and includes a conceptual design for a suitable onsite sewage management system, including recommendations for monitoring and management requirements. As sufficient land area is available for effluent disposal, the recommendations of these findings are:

- To the proposed development of Tourist Park Development within Existing Lot 352 Pinjarra-Williams Road, Quindanning, provide secondary level treatment by a suitable Department of Health (DoH) approved treatment system and the effluent applied to Land Application Area (LAA) via secondary treated irrigation disposal system.
- All manufactured products selected as part of future detailed design shall be listed on the Department of Health approved products.

## 2. Site and Development Description

The site is located at the corner of Church Road and Pinjarra-Williams Road. Pinjarra-Williams Road lies to the West of the site with Church Road to the South.

The site generally flat and at the time of the field investigation, the site was vacant and covered in vegetation with small to medium sized trees.

**Table 1: Description of development**

Development Characteristic	Description
Site Address	Lot 352 Pinjarra-Williams Road, Quindanning
Owner/Developer	Quindanning Tourist Park
Postal Address	Lot 352 Pinjarra-Williams Road, Quindanning
Contact/Mob	Glenn Harris / 0428 912 371
Local Government	Shire of Williams
Zoning	No R Code
Proposal & Lot sizes	1 lot Development – 609,052m <sup>2</sup>
Water Supply	Water Mains
Anticipated Wastewater Load	Proposed Tourist Park development with a daily hydraulic load of (40,190 L/Day to AS1547) (282 x Short Stay Guests @ 140L/day) (8 Permanent Staff @ 70L/day) (1 x Resident @ 150L/day)
Availability of Sewer	The area is currently unsewered and unlikely to be serviced by reticulated sewerage within the next 10-20 years due to low development density in the area and high cost associated with any extension.

## 3. Site and Soil Assessment

### 3.1 Site Assessment

Structerre Consulting undertook the site investigation on 18.01.2024.

The assessment of the suitability of this site to retain on-site sewage and the recommendations in this report are based on on-site investigations and desktop study of available geological and topographic published sources relevant to the lot.

On-site investigation of the site including visual inspection, borehole sampling, percolation testing and soil identification. The desktop study involved the review of publically available publications from various government agencies relating to the geological setting, water table monitoring and topography of the site.

Based on the results of the site and soil assessment, the overall land capability of the site for onsite wastewater disposal is constrained, however the proposed sewage system is able to be designed and installed to satisfactorily meet the requirements of AS 1547 and the Health Regulations 1974 (treatment of Sewage and Disposal of Effluent and Liquid Waste).

## **SITE KEY FEATURES**

Table 2 summarises the key features of the site in relation to effluent management proposed for the site.

### **NOTE:**

- The site is not in a sewage sensitive area as per PlanWA online mapping.
- There are no Private bores within property.
- The site is not inside a public drinking water source area as per Public drinking water source areas (PDWSA) online mapping.
- The site is not located in Floodplains as per online mapping.
- A water course is located at the northern boundary within Lot 352 as per WC mapping.
- The risk of effluent transport offsite is low.



**Figure 1: Locality Plan**





**Table 2: Site characteristics and mitigation measures**

<b>Feature</b>	<b>Description</b>	<b>Level of Constraint</b>	<b>Mitigation Measures</b>
<b>Climate</b>	Annual rainfall to December 2023 –523.8mm Annual rainfall to 15 <sup>th</sup> January 2024 –17mm  Station (Marradong) No. 9575 Average annual pan evaporation is 1,600mm (derived from BOM Annual Average PAN Evaporation Map).	Low	NN
<b>Exposure</b>	Isolated trees are located to the East of the lot, the site is considered to have high exposure to sun and wind.	Low	NN
<b>Vegetation</b>	Open grassland, no hydrophillic vegetation in the proposed effluent management area or surrounds.	Low	NN
<b>Landform &amp; Drainage</b>	No visible signs of water ponding at time of assessment.	Low	NN
<b>Slope</b>	The lot slopes from East to West with a slope of less than 10%.	Low	NN
<b>Fill</b>	No signs of imported fill material observed at time of assessment.	Low	NN
<b>Surface Gravel and Rock Outcrops</b>	No surface gravel or rock outcrops observed.	Low	NN
<b>Erosion Potential</b>	No evidence of sheet or rill erosion; No evidence of landslip and landslip potential is low due to the small slope of site.	Low	NN
<b>Vertical Separation From Groundwater</b>	Groundwater/Perched water was NOT encountered in BH1 – BH10 during drilling up to 2.5m below the existing ground level.  The Perth Groundwater Atlas (Waters & Rivers Commission) has no available information for the groundwater levels for this site.  The Landgate website indicates the ground surface level at this site was approximately 210-265m Australian Height Datum (AHD) falling from East to West.	Low	Ensure minimum 0.6m separation between maximum groundwater level and discharge point of sewage system with use of fill material for the LAA.
<b>Public Drinking Water Source Areas &amp; Sewage Sensitive Areas</b>	The site is NOT located in a sewage sensitive area.  The site is NOT located in a public drinking water source area as per public drinking source areas	Low	Ensure minimum 0.6m separation between maximum groundwater level and discharge point of sewage

			system with use of fill material for the LAA.
<b>Surface Waters and Separation From Water Resources</b>	A natural water course is located within Lot 352 at the Northern Boundary.	Low	Minimum 100m clearance from edge/riparian of water course.
<b>Rainfall Run-on and Seepage</b>	No evidence of stormwater run-on to the proposed LAA observed.	Low	LAA to be positioned on the upslope of the subject lot.
<b>Flood Potential</b>	The lot is not located within the floodplains.	Low	NN
<b>Horizontal Setback Distances</b>	All relevant setback distances to the LAA are achievable for proposed lots.	Low	NN
<b>Available Land Application Area (LAA)</b>	Considering all the constraints and buffers, the site has ample suitable land for a LAA for secondary treated effluent disposal. The proposed effluent management area is as nominated in Figure 2.	Low	NN

\*NN: not needed

\*\*LAA: Land Application Area

### 3.2 Soil Assessment

A geotechnical site investigation was conducted across 10 locations within the existing lot, as shown in Figure 3. A soil retrieval probe was used to sample the soil by bore holes up to 2.5m in depth. Constant Head permeability testing was carried out at BH4 & BH5 location. This was sufficient to adequately characterise the soils expected throughout the area of interest. Soil profile descriptions for each bore hole are provided in the appendix. The site geotechnical assessment and percolation test results are consistent with Soil Permeability Category 4: Clay loams – High/moderate structured as per AS1547-2012. Table 3 below provides an assessment of the characteristics of nearest borehole to the proposed LAA. All supporting logs and documentation can be found in the appendix of this report.

**Table 3: Soil Assessment**

<b>Feature</b>	<b>Assessment</b>	<b>Level of Constraint</b>	<b>Mitigation Measures</b>
<b>Profile Depths</b>	0-100mm Topsoil. 100-2500mm: Sandy CLAY Fine to medium grained, medium plasticity, red/brown	High	Provide secondary treatment to systems with large daily hydraulic loads.
<b>Depth to Water Table</b>	Groundwater/Perched water was NOT encountered in BH1 – BH10 during drilling up to 2.5m below the existing ground level. The Perth Groundwater Atlas (Waters & Rivers Commission) has no available information for the groundwater levels for this site. The Landgate website indicates the ground surface level at this site was approximately 210-265m Australian Height Datum (AHD) falling from East to West.	Low	Ensure minimum 0.6m separation between maximum groundwater level and discharge point of sewage system with use of fill material for the LAA.
<b>Particle Size distribution</b>	90% passing 75mm	Low	NN
<b>Soil Colour</b>	Red/Brown soil.	Low	NN
<b>Soil Permeability &amp; Design Loading Rates</b>	Soil Permeability Category 4: Clay loams – High/moderate structured as per AS1547-2012 Mean Permeability of 0.8 m/day using the Constant head method. Refer to Table 4 for Permeability of BH4 & BH5.	Moderate	Installation of secondary treatment system with irrigation disposal type effluent disposal system.

**Table 4: Permeability Test Results**

<b>Test Location</b>	<b>Testing Depth</b>	<b>Soil Type</b>	<b>Permeability</b>
BH4	0 – 0.6m	Sandy CLAY	0.6m/day
BH5	0 – 0.6m	Sandy CLAY	0.9m/day

**OVERALL LAND CAPABILITY OF THE SITE**

Based on the results of the site and soil assessment tabled above and provided in the appendices, the overall land capability of the proposed onsite sewage system is constrained. However, the proposed onsite sewage system is able to be designed and installed to satisfactory meet the requirements of AS 1547 and the Health (treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974.

## 4. Wastewater Management System

Refer to the DOH website for the list of approved products: <http://www.health.wa.gov.au/>. The property owner has the responsibility for the final selection of the treatment system and will include the details in the application to install an onsite sewage system for Local Government approval.

### 4.1 Treatment System

Provide a secondary treated effluent with nutrient removal and irrigation disposal, with a minimum required effluent quality of:

- Biochemical Oxygen Demand (BOD)  $\leq$  20 mg/L
- Total Suspended Solids (TSS)  $\leq$  30 mg/L
- Escherichia (E) coli  $\leq$  10 cfu/100 mL

### 4.2 Land Application System

A range of Land Application systems have been considered and assessed based on their suitability to the site and soil conditions. We recommend the installation of a drip irrigation disposal system for proposed Tourist Park development on Lot 352.

#### ***Description of the drip irrigation disposal system***

Provide and install irrigation disposal system as approved by the Department of Health for the application.

#### ***Sizing the irrigation disposal system***

Sized, according for disposal of the calculated daily hydraulic load, the soil classification and quality of effluent being disposed.

Data to be used in the sizing of irrigation disposal system:

- Estimated Daily Hydraulic Load
  - 282 x Short Stay Guests @ 140 L/day =39,480 L/day
  - 8 Permanent Staff @ 70 L/day =560 L/day
  - 1 x Residence @ 150 L/day =150 L/day
  - Totalling 40,190 L/day Hydraulic Load to AS1547-2012
- Soil Classification – Category 4: Clay loams – High/moderate structured as per AS1547-2012

Area of Irrigation System as per Government Sewage Policy 2019

Secondary treatment for Soil category 4 – Clay loams = 0.286 as per Table 2 of GSP 2019

= Hydraulic Loading x Secondary Treated Conversion Factor (0.286)

=40190 x 0.286

= 11,495 m<sup>2</sup>

### **Alternatively:**

The required total length of leach drain required is calculated on the approved filtrative area (m<sup>2</sup>/m) of the selected leach drain.

- Approved Flat Bed Leach Drain with a filtrative area 2.4m<sup>2</sup>/m.

Length of Leach Drain = L/day / DLR / IA (2.4m<sup>2</sup>/m)

L/Day = 5060 (daily hydraulic load)

DLR = 30

IA = Infiltration area for approved leach drain section

$$= 40190 / 30 / 2.4$$

$$= 558.2\text{m}$$

Minimum 560m provided 28 x 20m Flatbed Leach Drains.

The property owner/developer has the responsibility for the final selection of the secondary treatment system and will include the details of it in the Onsite sewage system Approval to Install application form for Local Government approval.

Note: Application for the new effluent system is to be sized in accordance with current governing regulations.

The property owner/developer has the responsibility for the final selection of the secondary treatment system and will include the details of it in the Onsite sewage system Approval to Install application form for Local Government approval.

### ***Siting and configuration of the proposed disposal system***

The irrigation system shall be located in a designated area to enhance evapotranspiration and its amenity and shall:

- Not be used for purposes that compromise the effectiveness of the system or access for future maintenance purposes.
- Be used only for effluent application.
- Have boundaries clearly delineated by appropriate vegetation or other type of border.
- Have no run-off or seepage of effluent beyond the designated area.

### ***Buffer distances***

Setback buffer distances from effluent land application areas and treatment systems are required to help prevent human contact, maintain public amenity and protect sensitive environments. The relevant buffer distances for this site are:

- The disposal system should maintain minimum horizontal setbacks of:
  - 100m from high water mark of a reservoir or any bore used for public drinking, reservoir, waterways, significant wetlands and not within a waterway foreshore area or wetland buffer (the separation distance is to be measured from of riparian or wetland vegetation).

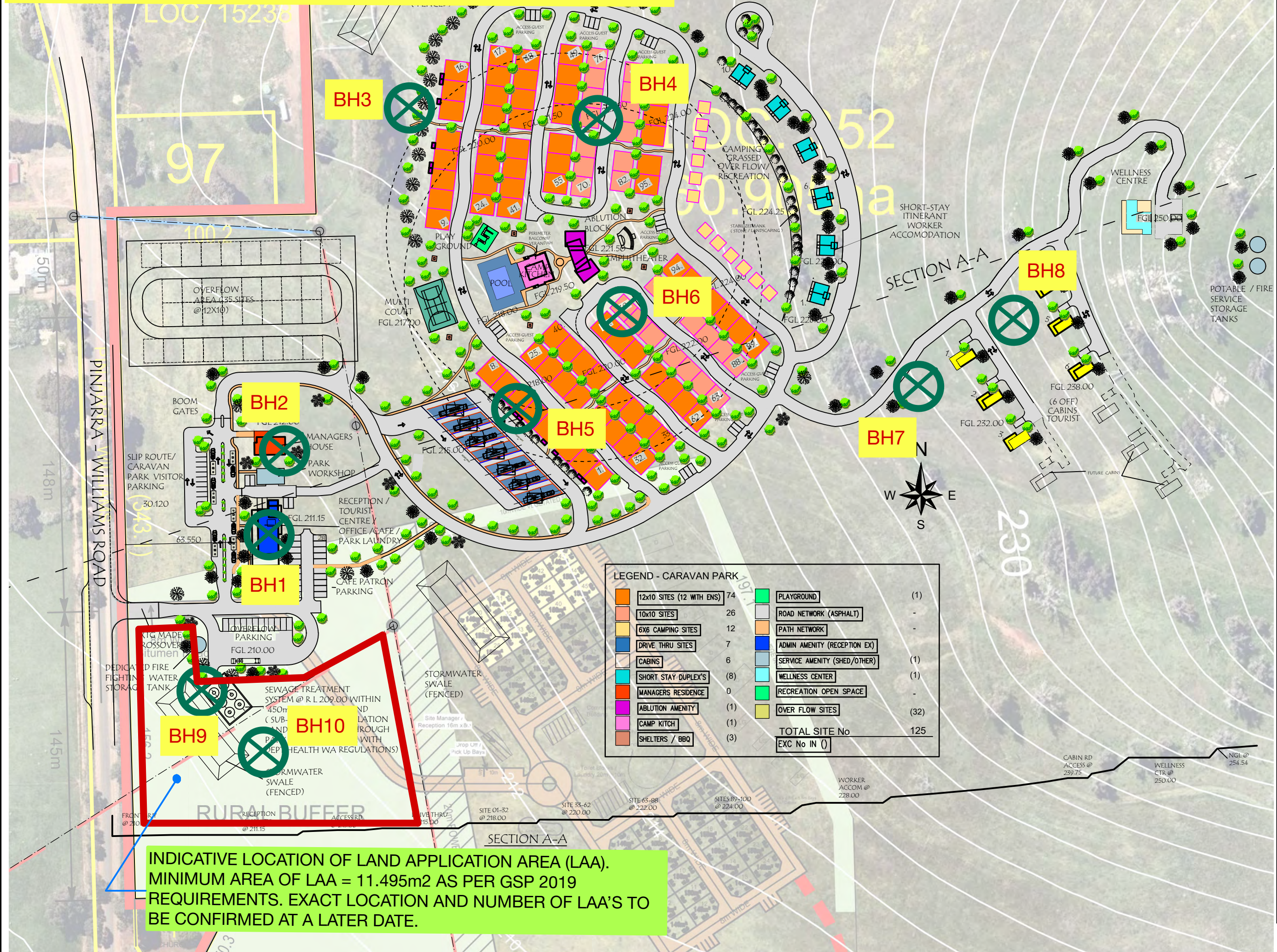
- 30m from potable private bore intended for consumption
- 1.8m downslope from property boundaries (may be dependent on local authority guidelines)
- 1.2m from driveways and paved surfaces
- 6.0m from any stormwater drainage systems
- 1.8m from building footings
- The distance between the base of the disposal system (i.e. trench bottom, bed base) and the groundwater table should not be less than 1.5m (for secondary treatment systems).
- On completion of the proposed disposal area, appropriate landscaping should be undertaken (i.e. planting of shallow rooted grasses / shrubs).

### ***Installation of the drip irrigation disposal system***

Installation of the drip irrigation disposal system must be carried out by a suitably qualified and licensed plumber or drainer experienced with onsite sewage disposal systems. Figure 2 shows the preliminary siting of the proposed wastewater disposal system in line with the required setbacks. This plan may differ based on the final number of occupants per building, dwelling location and any other intended developments on site.



**FIGURE 2: PROPOSED EFFLUENT DISPOSAL SYSTEM**



**INDICATIVE LOCATION OF LAND APPLICATION AREA (LAA).  
 MINIMUM AREA OF LAA = 11.495m2 AS PER GSP 2019  
 REQUIREMENTS. EXACT LOCATION AND NUMBER OF LAA'S TO  
 BE CONFIRMED AT A LATER DATE.**

DWG No: 6725 - SK - 13		REV: A-01	1 of 1 SHEETS
JOB No: 6725 - SK - 13	SCALE: 1:1750 @ A3	ISSUE DATE: 31/08/23	
DRAWN BY: IBD		PREPARED BY: 29/08/23	
<b>SITE PLAN</b> QUINDANNING TOURIST PARK WILLIAMS LOCATION 352 PINJARRA-WILLIAMS RD QUINDANNING CLIENT - QUINDANNING HOLIDAY PARK			
ADDRESS / POST: BRIGHTHOUSE CONSULTANTS P.O. BOX 1185 MANDURAH WA 6210 TEL: 0418915532 E-MAIL: consultant@brighthouse.com.au www.brighthouse.com.au			
PREPARED BY BRIGHTHOUSE CONSULTANTS - MANDURAH - WESTERN AUSTRALIA - TEL 0418 915 532 E-MAIL: CONSULTANT@BRIGHTHOUSE.COM.AU			



## 5. Stormwater Management

The Land Application areas for the proposed Lot is located on the low side of the Lot, therefore Stormwater run-off will need to be diverted away from the LAA. It is expected that run-off from the developed site will be managed and maintained within the Lot.

Stormwater works to be designed to the Shire of Williams requirements and approvals, with proposed criteria of 1 in 20-year ARI 5 minute duration event (subject to council approval) for proposed the proposed stage 1 development.

Note: Design of the stormwater drainage done by others.

## 6. Monitoring, Operation and Maintenance

Maintenance is to be carried out in accordance with the manufacturers instructions and to AS/NZS 1547-2012 Section 6, Appendix T & U. The treatment system will only function adequately if appropriately and regularly maintained.

To ensure the treatment system functions adequately, residents must:

- Scrape dishes and remove fats and solids before washing.
- Not dispose solids, sanitary napkins and other hygiene products in the system.
- Not use a food waste disposal unit.
- Use household cleaning products that are suitable for septic tanks.
- Keep as much fat and oil out of the system as possible.
- Conserve water (AAA rated fixtures and appliances are recommended).

To maintain adequate performance of the system, residents must ensure:

- Septic tanks and biosolids settling vessels undergo regular pump-out by licensed waste contractors to remove accumulated sediment.
- No structures and/or paths are constructed over the LAA, vehicles avoid access to the LAA to prevent damage.
- ATUs to undergo maintenance servicing by a provider approved by the Department of Health at minimum three-monthly intervals.

## 7. Conclusions

As a result of our investigations we conclude that a sustainable onsite sewage management system can be installed to meet the needs of the proposed Tourist Park Development at Lot 352 Pinjarra-Williams Road, Quindanning. Specifically, we recommend the following:

- The site is not in a sewage sensitive area as per PlanWA online mapping.
- Installation of Secondary Treated Effluent system, by a suitable DOH-approved treatment system of volume required for final calculated daily hydraulic load.
- LAA for the effluent disposal system for the proposed Tourist Park can be set at existing ground level and maintain minimum 0.6m clearance from drip irrigation discharge point to the maximum recorded groundwater level.
- The Soil Category for this lot is classified as Category 4: Clay loams – High/moderate structured as per AS1547-2012 with drip irrigation disposal for secondary treatment of the effluent wastewater and minimum LAA area of 5,264m<sup>2</sup>.
- Positioning of LAA to be minimum 100m from adjacent waterways at all times.
- At the time of site inspection on 18.01.2024 groundwater was encountered at 1.5m below surface level.

## 8. References

*Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*

Government of Western Australia (2019). *Government Sewerage Policy*.

Standards Australia/Standards New Zealand (2012). AS/NZS 1547:2012 *On-site domestic-wastewater management*.

Standards Australia/Standards New Zealand (2014). AS/NZS 1289:2014 *Methods of testing soils for engineering purposes Definitions and general requirements*.

Government of Western Australia, Department of Planning, Lands and Heritage. *PlanWA*  
<https://espatial.dplh.wa.gov.au/PlanWA/Index.html?viewer=PlanWA>

Government of Western Australia, Department of Water and Environmental Regulation.  
*Western Australia floodplain mapping*  
<https://dow.maps.arcgis.com/apps/webappviewer/index.html?id=9817b8d31c224846abb68a75478e9cf0>

Government of Western Australia, Department of Water and Environmental Regulation.  
*Water Information Reporting* <http://wir.water.wa.gov.au/Pages/Water-Information-Reporting.aspx>

Government of Western Australia, Department of Water and Environmental Regulation.  
*Public drinking water source area mapping tool* <https://www.water.wa.gov.au/maps-and-data/maps/public-drinking-water-source-area-mapping-tool>

Government of Western Australia, Department of Water and Environmental Regulation.  
*Perth groundwater map* <https://www.water.wa.gov.au/maps-and-data/maps/perth-groundwater-atlas>

Water Corporation WA. *ESInet* <https://esinet.watercorporation.com.au/>

Government of Western Australia, Department of Industry and Resources. *Geology and landforms of the Perth region.*

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*GeoVIEW.WA* <https://geoview.dmp.wa.gov.au/geoview/?Viewer=GeoView>

Government of Western Australia, Department of Water. *Lower Serpentine Hydrological Studies – Conceptual Model Report*  
[https://www.water.wa.gov.au/\\_data/assets/pdf\\_file/0020/3656/101835.pdf](https://www.water.wa.gov.au/_data/assets/pdf_file/0020/3656/101835.pdf)

### Appendix A: Soil profiles



**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

Test No.  
**BH01**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459756  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344138

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St								
2											
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

**Test No.**  
**BH02**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459742  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344172

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St - VSt								
2										D to M	
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84







**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

<b>Test No.</b> <b>BH03</b>
--------------------------------

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459914  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344309

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St								
2											
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

**Test No.**  
**BH04**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459945

**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344390

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St - VSt							D to M	
2		Terminated at 1.90 m									
3											

**Remarks**

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

**Test No.**  
**BH05**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459896  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344170

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			Vst								
2											
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84



**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

Test No.  
**BH06**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 460036  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344760

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St								
2											
		Terminated at 2.50 m								D to M	
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

Test No. <b>BH07</b>
-------------------------

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 460065  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344099

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St							D to M	
		Terminated at 1.50 m									
2											
3											

**Remarks**

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84







**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

Test No. <b>BH08</b>
-------------------------

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 460141  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344101

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St - VSt								
2										D to M	
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

**Test No.**  
**BH09**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459712  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344013

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St								
2											
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84





**Project** Quindanning Tourist Park - Lot 352 Pinjarra-Williams Road, Quindanning

**Client** Quindanning Tourist Park

Test No.  
**BH10**

**Project No.** D327588    **Logged By** Tony Broadway    **Machine** Soil Retrieval Probe    **Easting** 459780  
**Job No.** J446708    **Date** 18/01/2024    **Hole Dia.** 65mm    **Northing** 6344122

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm				Samples		Moisture	Water Level
				5	10	15	20	Depth	Type		
		Topsoil:									
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown (Colluvium)	S - F								
1			St								
2											
		Terminated at 2.50 m									
3											

**Remarks**

1. Termination reason: Target depth
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84

## Appendix B: Boreholes site photos

### Borehole 9



### Borehole 10





**Appendix C: Site photos**



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