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Consulting Structural & Civil Engineers

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Building 6, 62/195 Wellington Road Clayton, VIC 3168

**CIVIL ENGINEERING DEVELOPMENT APPLICATION REPORT**

**RESPONSE TO SARA RFI**

SARA reference no: 2602-50776 SRA

Council reference no: CA 2025_5878/1

# PROPOSED RESORT DEVELOPMENT

## 18 OASIS DRIVE, WONGA BEACH, QUEENSLAND


Date: 15th June 2026

Project No: 21342

**Clive Steele Partners Pty Ltd**

Director: Ian K. Flanders, B.E. Civil (Hons), F.I.E. Aust.
Associate: Chris Vinecombe, B.E. Civil (Hons), B.Sc, M.I.E. Aust.
Associate: Selam Desta, B.E. Civil (Hons), M.I.E. Aust.

A.C.N 005 363 735
A.B.N 92 627 427 761

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## DOCUMENT CONTROL REGISTER

**DISCIPLINE: Civil Engineering**

| Date | Issue | Comments/Revisions |
|---|---|---|
| 15/06/2026 | Preliminary | |
| | | |
| | | |

**RESPONSE TO SARA R.F.I.**

Response to the State Assessment and Referral Agency's request for information.

***1. Associated Earthworks***

The earthworks plan is attached. See drawing C02 in appendix A

The philosophy behind the treatment of the site was to preserve as much open space as possible, and touch the earth lightly. We have tried to minimise the earthworks, keeping the carparking and circulation road as low as possible above the flood level. As the site is relatively flat, there is little cutting required to maintain this RL.

Approximately 21 of the villas require some fill to bring the parking above the flood / storm surge level. The northern end of the site requires up to 650 mm of fill, with an average closer to 450 mm. The south-eastern portion of the site requires little fill, as does the central building.

The largest excavations on the site are for the two detention basins. These are relatively shallow, with a maximum cut depth of approximately 750 mm.

There is very little cut required for the project. Approximately six of the villas, and two very small sections of two others, require cutting the ground by an average of 75-300 mm, with a maximum cut of approximately 400 mm.

Two short sections of the circulation road require cutting the site. The average cut on the circulation road is approximately 100 mm, a very nominal depth.

A number of villas, and large sections of the central building and circulation road do not require any cut or fill.

The buildings are to be supported on driven piles generally, requiring very little earthworks as there are relatively shallow footings and pile caps.

Most site won material can be used as fill under the buildings and circulation road, other than the topsoil, which would be stockpiled for re-use in the garden areas under the villas.

Overall, there is a requirement for some imported fill, preferably sand similar to the natural material on site.

***2. Water Quality***

- ***Maintains or enhances environmental values of receiving waters:***

The site is self contained with regards to stormwater management. We are not changing the conditions for stormwater run-off into the existing Shire drainage channel to the west and south of the site. Almost no water from the existing site enters this drainage channel. The site will become largely self-contained, and generally falls away from this drainage channel, very gently towards the north-east.

Most of the site remains as a vegetated site. The current site is largely open grasses. This will be enhanced with selected planting and significant trees, slowing run-off and increasing ground rainwater retention.

Further, most hard surfaces, ie. nearly all carparks and the circulation route, are under green roofs, so do not add to unmanaged run-off.

The green roof areas, as well as two new shallow detention basins, along with the existing lake / dam, provide adequate detention for the stormwater. This will result is flow rates remaining largely unchanged from the current conditions on the site.

Run-off from much of the site currently runs into the dam in the middle of the site, then flows through a naturally formed creek / channel, which joins the Shire's artificial channel before ultimately running out into the ocean. The water quality will remain unchanged, if not improved, through the filtering and two stage detention system on site.

- ***Achieves the water quality objectives of Queensland waters:***

The quality of the stormwater is maintained through a multi-layered earth filtering system and detention ponds. All of the roofs in the development are green roofs, with 600 mm (nominally) of soil, underlain with geotextile filter fabric and a drainage mat. All roofs run into the detention ponds, then into the lake in the middle of the site. Consequently, all stormwater is effectively filtered before running into the detention ponds, which in themselves further improve water quality through retaining most sediments in the water.

The flow rates into the creek and ocean are managed through controlled release of the water from the green roofs, acting as detention basins, as well as the two new detention ponds and the existing central pond.

Further, all of the circulation driveway and most of the carparking is under the green roofs, so there is little run-off from the vehicle circulation areas. The majority of the site remains vegetated, and will be planted with significant vegetation, improving the water quality.

- ***Avoids the release of prescribed water contaminants to tidal waters:***

There is very significant water filtration and water treatment proposed for the development.

All villas and the central facility have a full, packaged treatment plant which includes tertiary treatment. These units are on plinths, so in the event of a cyclonic storm surge, the system remains operational as the control systems are approximately 7.2 m above sea level, as is the power supply for these systems. This provides resilience for the whole development.

This treated water is to be used for watering the gardens in the Undercroft areas, the hanging gardens under the roof, as well as the green roofs during the dry season when the supply and demand are at their greatest. A very small proportion of this tertiary treated water would end up in the ocean, and it is filtered through the ground or the detention ponds before entering the ocean.

Some rain water will be captured for re-use in toilet flushing, garden watering and topping up the swimming pools. All storage tank overflows run to the detention ponds before entering the ocean.

The onsite Wastewater Treatment systems and calculations are outlined in the attached document. See Appendix B – by PCE

***3. Public Passenger transport – private bus set-down:***

There is no need to upgrade Oasis Drive as the traffic volumes are commensurate with an Access Street (FNQROC Development Manual ), and this road currently complies with that requirement.
It has a 6.5 m pavement width, with a footpath on one side of the roadway.

The Traffic Impact Assessment Report is attached in Appendix D.
Adopted rates are similar or higher equivalent Resort Developments in the Douglas Shire, and are corroborated by a number of Queensland Government documents. The number of vehicle movements for servicing the facility have been amended now we have FTE numbers. We have also provided a range of figures based on average use and peak use.

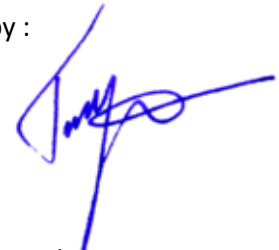
The only vehicles to utilise the Level 1 circulation ring will be service & maintenance vehicles, and will generally be electric Golf Buggies – small vehicles operating at low speeds.
These require little circulation for turnaround, and the width of the walkway, at over 6 m. wide, is more than adequate. Buggy parking bays are shown at the most northern and southern sides of the Central building. This results in safe pedestrian movements at first floor reception level as there is no large vehicular traffic running through the facility.

Rigid 14.5 m buses are catered for on both levels in the Central building. The primary drop-off or collection point is beside the main reception on level 1. A dedicated bus park is provided for at this level. See drawing TC02. There is another bus park for a 14.5 m rigid bus at the Undercroft (ground) level. See drawing TC01. This is directly under the reception foyer, with two stairs and a lifts linking the levels.

Circulation is adequate at both levels. See the attached drawing TC01 & TC02 in appendix C. Both of these allow for smaller vehicle movement past a parked bus.

There is a dedicated loading bay at Undercroft level, adequate for a medium rigid truck. This is off the main circulation route, beside a dedicated service elevator.
Any mini-buses parked long term on the site would be parked under the central building in the eastern building, away from the larger vehicle circulation paths, next to the foyer lifts and stairs. See the site plan C01.
Taxis and similar vehicles can utilise the carparks at the reception level. The volume of these is likely to be small, and the length of stay very limited, due to the location of the resort.

Response prepared by :



Tim Hall B.E.Civil B.Arch.
MIEAust. CPEng. RPEQ15280
Principal Architect & Design Engineer
Clive Steele Partners Pty. Ltd.

## APPENDICES

**Appendix A - Drawings C01 – Site Plan & Stormwater & C02 - Earthworks**

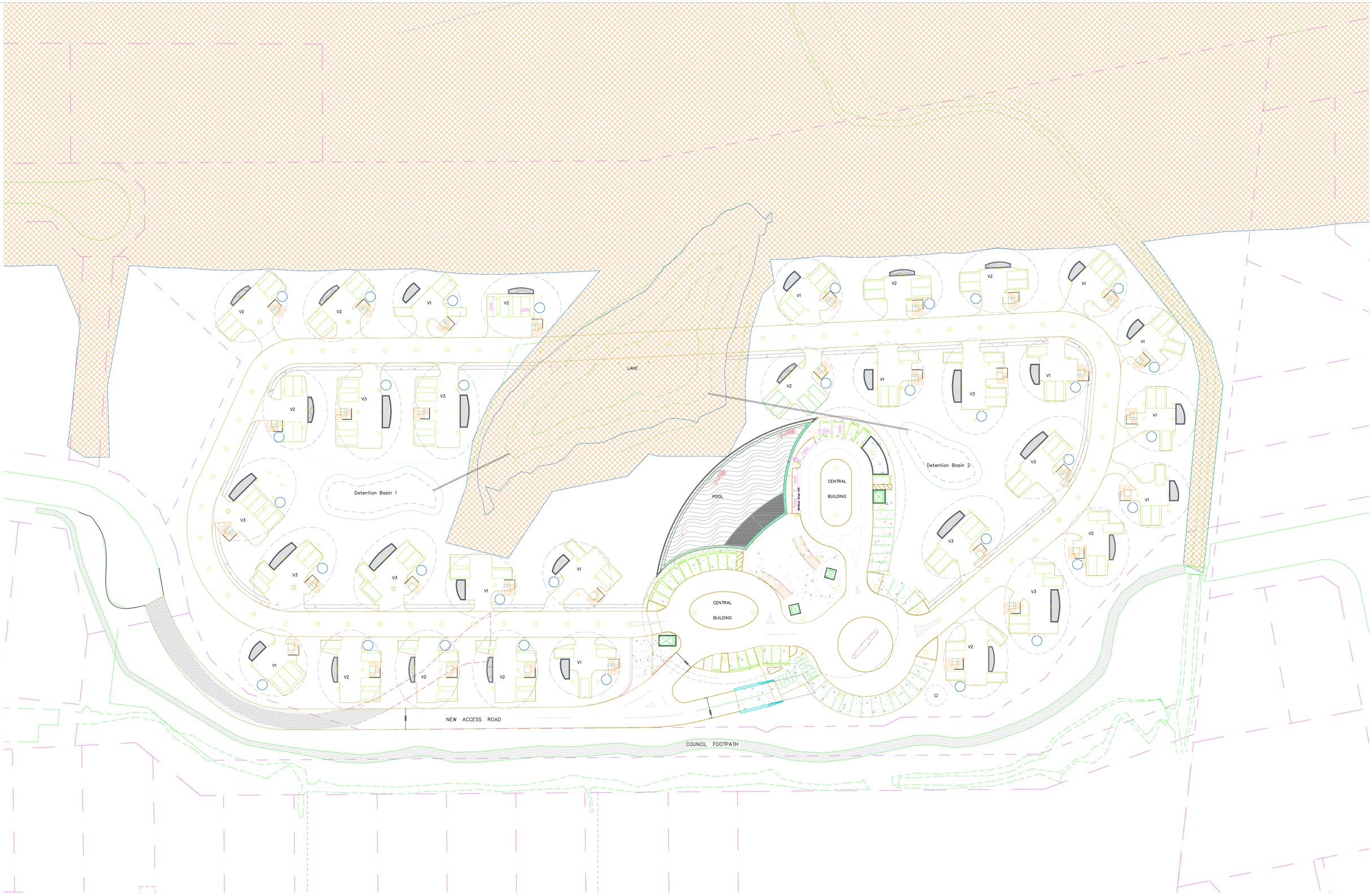
**Appendix B - Onsite Wastewater Treatment**

**Appendix C - Turning circles for 14.5 m Rigid Bus**

**Appendix D - Traffic Impact Assessment Water Supply**

# Appendix A

# Earthworks






| No: | Amendment: | Date: |
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Project:
WONGA RESORT
WONGA BEACH, QUEENSLAND

Title:
VEHICLE CIRCULATION & PARKING
STRORMWATER MANAGEMENT

| | |
|---|---|
| Scale: | 1:500 @ A1 |
| Date: | Apr.2026 |
| CAD File: | 21342 – Overall Plan_Undercroft |
| Drawn: | th |
| Checked: | |

Job No: 21342
Drawing: C01
Revision: C

N

LAKE

Detention Basin 1

Detention Basin 2

CENTRAL BUILDING

POOL

CENTRAL BUILDING

NEW ACCESS ROAD

COUNCIL FOOTPATH

Surveyed 2024
Revised 2026

LEGEND:

Cut for detention ponds.
Max. depth 750 mm.

Site cut. Ave. depth noted.

Site fill. Ave. depth noted.
site won or imported granular fill.



| No: | Amendment: | Date: |
|---|---|---|
| A | Issued for information | June '26 |

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Project:
WONGA RESORT
WONGA BEACH, QUEENSLAND

Title:
SITE EARTHWORKS
CUT & FILL

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| Scale: | 1: 500 @ A1 |
| Date: | Jun.2026 |
| CAD File: | 21342 – Overall Plan_Undercroft |
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| Checked: | |

Job No: 21342
Drawing: C02
Revision: A

# Appendix B

## Onsite Wastewater Treatment

File: 5306L1/8
Ref: 20260516L2

16 May 2026

**INFORMATION REQUEST**

**DOUGLAS SHIRE COUNCIL**
REFERENCE NO: CA 2025_5878/1 (DOC ID 1341375)

Application Number: CA 2025_5878/1

Property Details
Street Address: 18 Oasis Drive Wonga Beach
Real Property Description: Lot 2 on SP259953
Local Government Area: Douglas Shire Council

**Hydraulic Services: Information Request: Item No 27 – Onsite Wastewater Treatment**

This reports details the onsite wastewater treatment water plant for the proposed development.

## 1. PURPOSE OF REPORT

This report has been prepared by a suitably qualified professional to:

- Quantify on-site wastewater **loads** (wet and dry seasons) based on 200 L/person/day**.**
- Define what is the Taylex wastewater treatment systems**,** their safety and performance.
- Quantify the treated water absorbed on site by all landscaped areas and roof-top green gardens.
- Quantify the treated water discharged to the on-site lake (hold pond) per season and per annum.
- Demonstrate that the land and systems can safely cater for full occupancy (90% wet season, 100% dry season).

## 2. DESIGN BASIS AND KEY INPUTS

### 2.1 Population and loading rate

- Unique site population: 511 persons
- Sewage loading rate (AS standard): 200 L/person/day

Daily wastewater at 100% occupancy:
$Q_{\text{daily,100\%}} = 511 \times 200 = 102.2$ kL/day

### 2.2 Seasonal occupancy

- Wet season: 5 months ≈ 152 days, 90% occupancy
- Dry season: 7 months ≈ 213 days, 100% occupancy

Wet season daily wastewater:
$Q_{\text{daily,wet}} = 0.9 \times 102.2 \approx 92$ kL/day

Dry season daily wastewater:
$Q_{\text{daily,dry}} = 102.2$ kL/day

### 2.3 Toilet flushing water (extracted)

From the earlier water-balance work. Refer to response to question 26

- Toilet flushing volume (full occupancy):

$Q_{\text{toilets}} = 11{,}188$ kL/year

This is part of the total wastewater treated and reused.

### 2.4 Landscaped and garden areas

From the civil/hydraulic drawings

- Roof-top green gardens + walkway bridge gardens: $A_{\text{roof+walk}} = 3{,}081$ m$^2$
- Apartment garden areas: $A_{\text{apt}} = 523$ m$^2$
- Facility building garden areas: $A_{\text{fac}} = 704$ m$^2$
- Deep soil gardens: $A_{\text{deep}} = 19{,}577$ m$^2$

Define:
$A_{\text{shallow}} = A_{\text{roof+walk}} + A_{\text{apt}} + A_{\text{fac}} = 4{,}308$ m$^2$
$A_{\text{total}} = A_{\text{shallow}} + A_{\text{deep}} = 23{,}885$ m$^2$

### 2.5 Irrigation depths

Adopted average irrigation depths:

- Wet season: $d_{\text{wet}} = 2$ mm/day $= 0.002$ m/day
- Dry season: $d_{\text{dry}} = 4$ mm/day $= 0.004$ m/day

These are typical for tropical resort landscaping with efficient irrigation.

## 3. TAYLEX WASTEWATER TREATMENT SYSTEMS

### 3.1 System configuration

- Each apartment building and the facility building is provided with an above-ground Taylex Advanced Secondary Wastewater Treatment System (AWTS).

- All internal wastewater streams (toilets, showers, baths, kitchen, laundry) are directed to the Taylex units.

- The final chambers of all Taylex units are interconnected via an underground pipe network, forming a shared tank-farm.

- Treated effluent is pumped to the landscape irrigation network and, when surplus exists, to the on-site lake via a controlled outlet.

### 3.2 Process description

Each Taylex AWTS typically comprises:

- **Primary chamber:** Settles solids and floatables; initial anaerobic breakdown of organics.

- **Aeration chamber:** Forced aeration supports aerobic bacteria that reduce BOD, COD and suspended solids.

- **Clarification chamber:** Separates treated effluent from biological solids; sludge is periodically removed.

- **Disinfection / polishing:** UV or chlorination to achieve a high level of pathogen reduction suitable for non-potable reuse.

- **Reuse storage:** Treated effluent is stored in a balance tank and pumped to irrigation zones.

### 3.3 Safety and effluent quality

- Taylex systems are designed to produce Class B or Class A effluent (depending on configuration), suitable for landscape irrigation**.**

- Above-ground tanks are UV-stabilised and structurally robust under tropical sunlight.

- All non-potable pipework is colour-coded and hydraulically isolated from the potable water network.

- Disinfection ensures low pathogen lev**els**, making the reuse of treated water for gardens and landscaping safe and compliant**.**

## 3.4 3.4 Interconnected tank-farm benefits

- Shared storage capacity: all final chambers act as one large reservoir.
- Equalisation: inflows from different buildings are balanced across the network.
- Controlled release: surplus treated water is discharged to the on-site lake at managed flow rates, avoiding uncontrolled overflow.
- Operational resilience: redundancy and buffering during wet-season peaks.

## 3.5 Total wastewater flows (wet and dry seasons)

### 3.5.1 Wet season (90% occupancy)

Duration: 152 days - $Q_{\text{wet,total}} = 92 \times 152 \approx 13{,}984$ kL
Average daily treated flow (wet): $q_{\text{wet,total}} \approx 92$ kL/day

### 3.5.2 Dry season (100% occupancy)

Duration: 213 days: $Q_{\text{dry,total}} = 102.2 \times 213 \approx 21{,}769$ kL
Average daily treated flow (dry): $q_{\text{dry,total}} = 102.2$ kL/day

### 3.5.3 Annual total - $Q_{\text{annual,total}} = 13{,}984 + 21{,}769 \approx 35{,}753$ kL/year

This includes **toilet flushing (≈11,188 kL/year)** plus all other internal wastewater (showers, baths, kitchen, laundry).

## 3.6 Treated water absorbed by gardens and green roofs

### 3.6.1 Wet season irrigation demand

Shallow landscaping (roof + walkways + apartments + facility)
$Q_{\text{wet,shallow}} = A_{\text{shallow}} \times d_{\text{wet}} \times 152$
$Q_{\text{wet,shallow}} = 4{,}308 \times 0.002 \times 152 \approx 1{,}310$ kL

Average daily absorption (wet, shallow):
$q_{\text{wet,shallow}} = \frac{1{,}310}{152} \approx 8.6$ kL/day

### 3.6.2 Deep soil gardens

$Q_{\text{wet,deep}} = A_{\text{deep}} \times d_{\text{wet}} \times 152$
$Q_{\text{wet,deep}} = 19{,}577 \times 0.002 \times 152 \approx 5{,}951$ kL
Average daily absorption (wet, deep): $q_{\text{wet,deep}} = \frac{5{,}951}{152} \approx 39.1$ kL/day

### 3.6.3 Total wet season absorption

$Q_{\text{wet,irr,total}} = 1{,}310 + 5{,}951 \approx 7{,}261$ kL
Average daily absorption (wet, all landscaping):
$q_{\text{wet,irr,total}} = \frac{7{,}261}{152} \approx 47.7$ kL/day

### 3.6.4 Dry season irrigation demand

Shallow landscaping: $Q_{\text{dry,shallow}} = A_{\text{shallow}} \times d_{\text{dry}} \times 213$

$Q_{\text{dry,shallow}} = 4{,}308 \times 0.004 \times 213 \approx 3{,}670$ kL

Average daily absorption (dry, shallow): $q_{\text{dry,shallow}} = \frac{3{,}670}{213} \approx 17.2$ kL/day

### 3.6.5 Deep soil gardens

$Q_{\text{dry,deep}} = A_{\text{deep}} \times d_{\text{dry}} \times 213$

$Q_{\text{dry,deep}} = 19{,}577 \times 0.004 \times 213 \approx 16{,}680$ kL

Average daily absorption (dry, deep): $q_{\text{dry,deep}} = \frac{16{,}680}{213} \approx 78.3$ kL/day

### 3.6.6 Total dry season absorption

$Q_{\text{dry,irr,total}} = 3{,}670 + 16{,}680 \approx 20{,}350$ kL

Average daily absorption (dry, all landscaping): $q_{\text{dry,irr,total}} = \frac{20{,}350}{213} \approx 95.5$ kL/day

### 3.6.7 Annual absorption summary

Shallow landscaping (roof + walkways + apartments + facility):
$Q_{\text{shallow,annual}} \approx 1{,}310 + 3{,}670 = 4{,}980$ kL/year

Deep soil gardens: $Q_{\text{deep,annual}} \approx 5{,}951 + 16{,}680 = 22{,}631$ kL/year

Total landscaping absorption: $Q_{\text{irr,annual,total}} \approx 27{,}611$ kL/year

This is the total recycled water used on site for gardening and landscaping.

## 4. SURPLUS TREATED WATER TO ON-SITE LAKE (HOLD POND)

### 4.1 Wet season surplus

$Q_{\text{wet,surplus}} = Q_{\text{wet,total}} - Q_{\text{wet,irr,total}}$

$Q_{\text{wet,surplus}} = 13{,}984 - 7{,}261 \approx 6{,}723$ kL

Average daily surplus to lake (wet): $q_{\text{wet,surplus}} = \frac{6{,}723}{152} \approx 44$ kL/day

### 4.2 Dry season surplus

$Q_{\text{dry,surplus}} = Q_{\text{dry,total}} - Q_{\text{dry,irr,total}}$

$Q_{\text{dry,surplus}} = 21{,}769 - 20{,}350 \approx 1{,}419$ kL

Average daily surplus to lake (dry): $q_{\text{dry,surplus}} = \frac{1{,}419}{213} \approx 7$ kL/day

### 4.3 Annual surplus to lake

$Q_{\text{annual,surplus}} = 6{,}723 + 1{,}419 \approx 8{,}142$ kL/year

**Overview Summary**

- Treated water used and absorbed on site (landscaping): **≈** 27,600 kL/year
- Treated water discharged to on-site lake: **≈** 8,100 kL/year

## 5. BENEFITS TO INFRASTRUCTURE AND ENVIRONMENT

- **Reduced potable water demand:** All internal wastewater (including toilet flushing, showers, baths, kitchen and laundry) is recycled for irrigation, significantly reducing reliance on Council potable supply for landscaping.

- **Controlled discharge:** The interconnected Taylex tank-farm and on-site lake ensure that surplus treated water is discharged in a controlled, low-rate manner**,** avoiding peak loads on any single disposal element.

- **Environmental protection:**
  - Treated effluent is disinfected and suitable for non-potable reuse.
  - Deep soil gardens provide additional polishing and infiltration**,** improving environmental outcomes.
  - The on-site lake acts as a buffer and habitat feature**,** not a primary disposal field.

- **Infrastructure resilience:**
  - Above-ground Taylex units are UV-resistant and easily accessible for maintenance.
  - The modular system allows staged operation and future adjustment if occupancy patterns change.
  - The design comfortably accommodates 90% wet-season and 100% dry-season occupancy**.**

## 6. PLANNING RESPONSE SUMMARY

1. The development generates approximately 35,800 kL/year of treated wastewater at the Australian Standard loading rate of 200 L/person/day.

2. Of this, approximately 27,600 kL/year **is** beneficially reused on site for roof-top green gardens, walkway gardens, apartment and facility gardens, and deep soil landscaping.

3. Approximately 8,100 kL/year of surplus treated water is safely discharged to the on-site lake**,** at average rates of ~44 kL/day in the wet season and **~**7 kL/day in the dry season**.**

4. The Taylex systems provide safe, disinfected effluent, and the combination of landscaping absorption and lake buffering ensures that the land and infrastructure can comfortably cater for full occupancy in both wet and dry seasons.

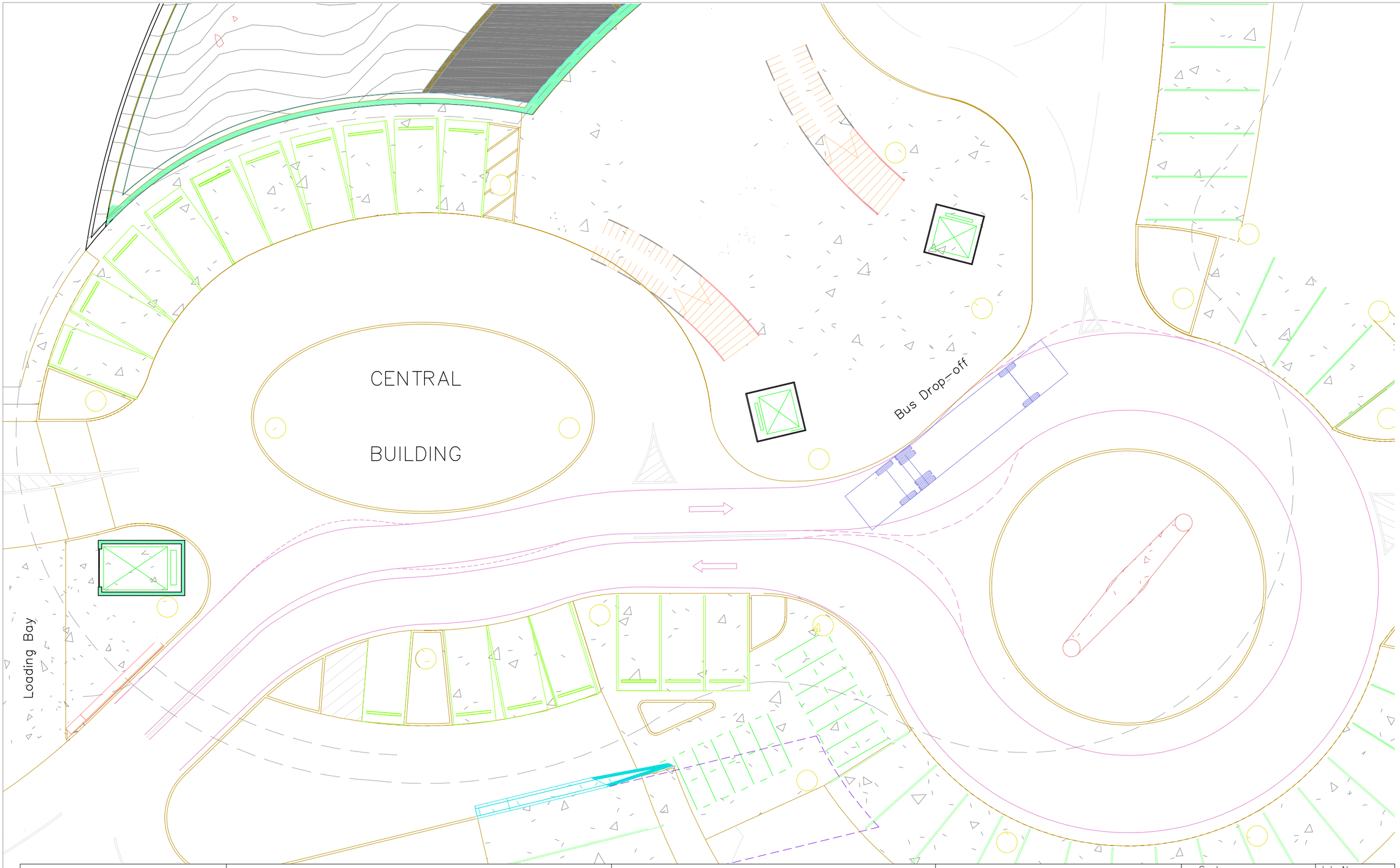
We trust the above address the matters raised in item 27 of the requested information,

Yours faithfully
**Proactive Consulting Engineers Pty Ltd**

Gino Fabris
Director
Practising Registered Professional Engineer of Queensland
REPQ: No  06041

# Appendix C

## Turning Circle Diagrams – 14.5 m Rigid Bus



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Project:
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Wonga Beach QLD 4873

Title:
Bus Turning Circles
14.5 m Rigid Bus
Undercroft Level

Scale:
Date: Mar.'26
CAD File:
Drawn: th
Checked:

Job No: 21342
Drawing: TC01
Revision: B

CONFERENCE CENTRE

RECEPTION

INTERPRETIVE CENTRE

car & mini-bus parking

buggy parking

bollards

bus park



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Building 6, 62/195 Wellington Rd
Clayton Vic. 3168 Australia

Project:
Wonga Resort
Wonga Beach QLD 4873

Title:
Bus Turning Circles
14.5 m Rigid Bus
Level 1 Reception

Scale: 1:200 @ A3
Date: Mar.'26
CAD File: Civil Eng._Level 1
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Job No: 21342
Drawing: TC02
Revision: _

# Appendix D

## Traffic Impact Assessment

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# Wonga Resort

## Traffic Impact Assessment

## Oasis Drive, Wonga Beach, Queensland

Prepared for: 101 Ives Avenue Pty. Ltd.
Location: Oasis Drive, Wonga Beach QLD
Date: June 2026

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# Wonga Resort

# Traffic Impact Assessment

# Oasis Drive, Wonga Beach, Queensland

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## 1. Introduction

This preliminary traffic engineering assessment considers the likely transport and traffic impacts associated with the proposed tourist resort development at the end of Oasis Drive, Wonga Beach, Queensland.

The assessment has been prepared based on the following proposed development characteristics:

- 66 resort apartments in 33 villas
- Maximum guest capacity of 210 guests
- Conference centre
- Restaurant and bar facilities
- Day Spa and Gymnasium
- Resort shop
- Indigenous Interpretive Centre
- Staff and servicing operations
- Bus access for conference and tourism groups
- Delivery and waste collection vehicles
- Dedicated on-site guest and staff parking
- Dedicated on-site bus drop-off and turning area
- Dedicated delivery truck parking and servicing bay

The development site is at the end of Oasis Drive, Wonga Beach, with vehicular access via Oasis Drive connecting to Wonga Beach Road and the broader Mossman–Daintree road network.

## 2. Site Location and Context

The subject land is located at the southern end of Oasis Drive in Wonga Beach within the Douglas Shire local government area. Relevant planning references indicate substantial land holdings and ongoing development activity in the Oasis Drive precinct.

Wonga Beach is a low-density coastal settlement approximately:

- 16 km north of Mossman
- 35–40 km north of Port Douglas
- Connected primarily via Mossman-Daintree Road

The locality currently experiences relatively low traffic volumes typical of small coastal communities. The Douglas Shire economy is strongly tourism-based, with more than 426,000 overnight visitors annually across the region.

# 3. Existing Road Network

## 3.1 Oasis Drive

Oasis Drive is a sealed local access road serving residential and undeveloped land parcels. Existing traffic volumes are currently low and generally comprise:

- Two-way local traffic operation
- Low operating speeds
- Residential traffic generation
- Minimal heavy vehicle activity

## 3.2 Regional Access

Traffic generated by the resort would distribute through the following network:

- Wonga Beach Road ( an Urban Collector Road )
- Mossman–Daintree Road
- Captain Cook Highway connections via Mossman

Road access to the local road network is via one existing state-controlled road intersection at the Mossman-Daintree Road / Wonga Beach Road intersection. This intersection is improved by a channelised right turn lane (CHR(S)) and a basic left turn treatment (BAL).

Public transport availability is limited, with infrequent regional bus services.

Consequently, the majority of resort-related travel is expected to occur via:

- Private vehicles
- Rental vehicles
- Organised tourist coaches
- Shuttle buses
- Airport transfer services

The broader regional network currently accommodates significant tourism traffic associated with the Douglas Shire and Far North Queensland tourism industry and is considered capable of accommodating additional resort-related traffic volumes.

# 4. Development Characteristics

## 4.1 Resort Population

**Maximum Occupancy**

| Component | Number |
|---|---|
| Resort guests | 210 |
| Conference Guests – ( 160 max. ) ….from other accommodation = | 50 * |
| Restaurant / Bar Guests – ( 240 max. ) ……. external guests = | 120 * |
| Bar & restaurant staff | 26 |
| Retail staff | 1 |
| Interpretive Centre | 2 |
| Gymnasium/Day Spa Staff | 12 |
| Servicing & Housekeeping staff | 33 |
| Tourist Coach Access | Yes |
| Delivery Vehicles | Yes |
| Waste Collection Vehicles | Yes |
| **Total persons on site** | **454** |

Total staffing capacity is estimated at approximately 74 persons.

The maximum theoretical on-site population is therefore approximately **454 persons**.

However, this level of occupancy would only occur during major holiday periods, conference events and peak tourism seasons.

* These figures are extremely conservative.

## 4.2. Realistic Occupancy Assumptions

Tourist resorts in regional Queensland typically operate below theoretical maximum capacity for much of the year.

For traffic assessment purposes, the following realistic occupancy assumptions are considered appropriate:

| Season | Assumed Occupancy |
|---|---|
| Low season | 45–55% |
| Average annual occupancy | 60–70% |
| Peak holiday periods | 85–95% |
| Conference peak events | 75–90% |

For assessment purposes, an average operational occupancy of approximately **70%** has been adopted.

This results in an average daily guest population of approximately:

$$454 \times 0.70 \approx 318$$

Approximately 320 guests on a typical operational day.

# 5. Traffic Generation Assessment

## 5.1 Resort Guest Vehicle Generation

Tourist resorts generally generate fewer vehicle movements per guest than conventional residential development because:

- Guests commonly travel together
- Visitors remain on-site for extended periods
- Shared transport usage is common
- Airport shuttle services are frequently utilised
- Conference attendees often arrive collectively by bus or charter transport
- Daily commuter travel is lower

Typical regional resort traffic generation rates are as follows:

- 4 vehicle trips per apartment per day under average occupancy conditions *

This produces estimated resort guest traffic generation of:

$$66\ x\ 4\ x\ (\ 0.6 - 0.95) = 160 - 250$$

Approximately 160 to 250 guest-related vehicle movements daily. ( 190 vpd is a realistic average )

## 5.2 Staff Traffic Generation

Assuming:

- Shift-based operations
- Some shared transport
- Multiple staffing periods throughout the day

Estimated staff-generated traffic:

- Approximately 120–180 vehicle movements daily

## 5.3 Conference Centre Traffic

Conference traffic characteristics differ from normal resort traffic because attendees commonly:

- Stay onsite
- Arrive collectively
- Use airport transfer coaches
- Use charter buses

Consequently, conference activity is not expected to proportionally increase private vehicle demand.

Typical conference-related transport may include:

| Vehicle Type | Estimated Activity |
|---|---|
| Large coaches | 2–6 per day during events |
| Mini-buses/shuttles | 4–8 per day |
| Taxi/rideshare movements | Moderate |
| Additional private vehicles | Limited |

Coach movements will produce short-duration peak operational activity but relatively low overall road loading.

### 5.4 Service and Delivery Vehicles

The resort will require routine commercial servicing including:

- Food and beverage deliveries
- Linen services
- Maintenance contractors
- Waste collection
- Courier vehicles

Estimated heavy/service vehicle activity:

| Vehicle Type | Estimated Frequency |
|---|---|
| Medium rigid trucks | 3–8 per day |
| Waste collection trucks | 1–2 per day |
| Couriers/light commercial | 5–15 per day |

Heavy vehicle impacts are therefore expected to remain relatively minor.

### 5.5 Anticipated Vehicles per day

| Source | Estimated Daily Vehicle Movements | Estimated average vpd |
|---|---|---|
| Guest vehicles | 160–250 | 190 |
| Staff vehicles | 120–160 | 140 |
| Restaurant/bar visitors | 30–60 | 40 |
| Deliveries/service vehicles | 18–30 | 24 |
| Waste collection | 2–4 | 2 |
| Tour buses/shuttles | 6–14 | 12 |
| Total estimated daily movements | 336–518 | 408 |

This equates to approximately:

- **120–260 inbound trips/day**
- **120–260 outbound trips/day**

These traffic volumes are considered low to moderate within the context of regional tourist developments.

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## 6. Parking and Internal Circulation

### 6.1 Vehicle Parking

A significant mitigating factor associated with the proposed development is the provision of adequate on-site infrastructure for vehicles and servicing operations.

The proposal includes:

- Sufficient on-site parking for guests and their guests
- Dedicated staff parking areas
- On-site bus drop-off and manoeuvring facilities

- Dedicated delivery and service vehicle loading bay
- Internal circulation areas for coaches and service vehicles

The provision of these facilities substantially removes all of the following:

- On-street parking
- Bus queuing on Oasis Drive
- Delivery vehicle obstruction of public roads
- Overflow parking impacts on neighbouring residential properties

The inclusion of dedicated internal bus and truck facilities represents an important positive design outcome from a traffic engineering perspective.

### 6.2 Villa Carparks

The carparks and circulation at ground level for the resort have been redesigned by a Civil Engineer in this office. They now comply with ***AS1890.1-2004 Parking facilities Part 1: Off-street Car Parking***

These changes are now shown on both the Engineering drawing C01 as well as the updated Architectural drawings.

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## 7. Bus Traffic Impacts

### 7.1 Conference Centre Operations

The conference centre significantly influences the transport characteristics of the development.

Conference-related transport activity is expected to include:

- Full-size coaches
- Mini-buses
- Airport transfer buses
- Tour coaches
- Charter transport vehicles

Importantly, many conference attendees are expected to stay on-site within the resort accommodation. This reduces the need for large numbers of daily commuter trips that would otherwise occur if conference patrons travelled separately from off-site accommodation.

This integrated accommodation model is considered beneficial from a traffic generation perspective.

### 7.2 Coach Access and Operations

The inclusion of a dedicated on-site bus drop-off and turning area substantially improves operational efficiency and safety outcomes.

The on-site bus facilities will:

- Remove any need for buses to stop on Oasis Drive
- Reduce traffic interruption to local residents
- Allow safe passenger loading and unloading
- Improve manoeuvring safety for large vehicles

While bus traffic will increase compared with existing conditions, the proposed internal bus handling arrangements are expected to significantly mitigate local traffic impacts.

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## 8. Heavy Vehicle and Service Traffic

The inclusion of a dedicated delivery truck parking and loading bay is a significant operational advantage.

This arrangement will:

- Prevent delivery vehicles from parking on Oasis Drive
- Improve safety for pedestrians and cyclists
- Allow servicing activities to occur fully within the site boundary

Accordingly, servicing impacts on the surrounding road network are expected to be manageable.

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## 9. Peak Traffic Periods

Peak traffic activity is expected during:

**Morning Peak**

- Staff arrivals
- Guest departures
- Tour bus departures
- Delivery vehicle arrivals

**Afternoon/Evening Peak**

- Guest arrivals
- Restaurant and bar traffic
- Conference arrivals
- Airport transfer activity

**Weekly Peaks**

- Friday and Sunday resort turnover
- Conference changeover periods

Estimated peak hour traffic generation:

50 to 75 vehicle movements per peak hour

This traffic volume is considered modest within engineering road capacity standards.

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## 10. Safety Considerations

Key traffic engineering issues that have been considered include:.

- Increased pedestrian activity – There is an existing path to the western side of the property connecting into the rest of Wonga Beach.
  Internal pedestrian circulation is at first floor level, with the only vehicles being gold buggy sized electric service vehicles. Cars and trucks are prevented from entering this upper level except in the event of an emergency or major maintenance issues.
- Coach turning movements – Catered for within the main building. See the attached turning circle diagrams TC01 & TC02.
- Tourist driver unfamiliarity – This is in a low speed environment with good sightlines and a very straight forward road network with only one turn after leaving the Mossman-Daintree road. Good signage makes this simple and safe.
- Interaction with cyclists and recreational users – The existing network separates this.
- Night-time vehicle activity – Limited numbers as most guests remain in the Resort.
- Wet-weather operational safety - Low speed environment
- Emergency vehicle access – This has been provided with an internal driveway providing full access to Emergency services vehicles to all Villas and the central facility building at ground level
- Cyclone evacuation considerations – The Resort guests would be evacuated well before any cyclone arrived. The entire resort has been designed to withstand a cyclone, with all services well elevated so it can continue to operate without any external services. Any remaining vehicles would be moved to the upper level to protect them from inundation.

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## 11. Impact on Local Amenity

The resort will materially alter the traffic environment of Oasis Drive compared with existing conditions.

Expected changes include:

- Increased traffic frequency
- Increased bus movements
- Increased service vehicle activity
- Increased pedestrian movement
- Greater night-time activity levels

However, because the development incorporates comprehensive on-site parking and servicing facilities, many of the common traffic impacts associated with tourist developments are expected to be moderated.

In particular, the proposal removes the likelihood of:

- On-street parking spillover
- Bus queuing on public roads
- Service vehicle obstruction
- Informal roadside loading activity

All of these vehicular functions and requirements are adequately catered for within the site.

## 11.1 Traffic Impact Assessment:

### *11.1.1 Traffic Generation*

1) Traffic generation rates for the operational resort complex at peak times ( July – August )
   336 – 518 vpd ( see page 5.) with an average of 408 vpd.
   Note, we believe these figures are extremely conservative due to the use of buses.

2) Estimate of existing traffic on the road network, based on the population average age, location of services and employment statistics.
   Approximately 50 % of households use Wonga Beach Road for access to their properties, using the intersection of Mossman-Daintree Road / Wonga Beach Road intersection.

   Wonga Beach Population 1301 / 595 houses – average 2.2 residents / household.
   50% (approx..) with 6 – 10 trips per day $\Rightarrow$ 595 x 9 x 50% = **2,680 vpd**
   Less than 3000 vpd is considered Low Traffic volume.
   ( Austroads AGTM08-16 )

3) Wonga Beach Road is largely consistent with an Urban Collector Road.
   Less than 3000 vpd is considered Low Traffic volume. As such, Wonga Beach Road currently operates well within its environmental capacity, with the short section of road between Snapper Island Drive and Mossman Daintree Road carrying the larger volume.

4) Only about 10% of trips in this section of Wonga Beach drive past Oasis Drive.
   10% of total traffic = 268 vpd. Again, this is well below it's capacity, with an adequate and safe intersection design.
   Oasis Drive 17 no. lots, with 12 no. households in the street ( including Bells Reef Close ).
   12 x 9 = 108 vehicle movements / day.

   Even with the addition of the maximum of 518 vpd ( on an extremely rare occasion ) the traffic volumes are well below the road capacity.

### *11.1.2 Traffic Distribution*

All traffic will head north of the site along from Oasis Drive to Wonga Beach Road, then head west towards Mossman-Daintree Road ( 450 m. approx.. from intersection to intersection ). The only section of higher volume traffic is from Snapper Island Drive to Mossman-Daintree Rd ( approximately 250 m ) past rural land.

Trips arriving and departing Wonga Beach would travel on Mossman-Daintree Road from the north or the south.

We would anticipate minimal local trips by vehicle within Wonga Beach as there are few services in the township, and they are within walking or cycling distance.

### *11.1.3 Traffic Impacts*

Traffic impacts will be primarily limited to Oasis Drive and the eastern section of Wonga Beach Road. These are large increases in traffic volume compared to the existing volume, but the total volume remains well within acceptable limits for these roads. Further, the previously approved residential subdivision would have generated approximately 90% of these vehicle movements on Oasis Drive and Wonga Beach Road ( 40 x 9 = 360 vpd ).

Wonga Beach Road is an Urban Collector Road with about 14 properties accessing this road directly. The traffic impacts of the proposal on this road will be noticeable but manageable. The increase in traffic is of the order of 12.5 % in the wet season and 19 % at peak times, well within an acceptable increase in volume, increasing to between 3016 vpd and 3198 vpd,

around the level considered a low volume, and significantly less than 5000 – 6000 vpd that is considered the upper limit of urban collector roads.

We do not consider the proposed development will compromise PO1 – PO3 of State code 6: Protection of state transport networks, for the above reasons.

Accordingly, I am satisfied that the daily traffic impacts of the proposal on the nearby road network are acceptable.

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## 12. Conclusion

The proposed 66 apartment tourist resort at Oasis Drive, Wonga Beach, is expected to generate a moderate increase in traffic relative to the existing residential environment.

Based on realistic occupancy assumptions, the development is estimated to generate approximately:

- 340–520 vehicle movements per day
- Regular coach activity
- Moderate service and delivery vehicle traffic

The inclusion of a conference centre will increase peak transport demand; however, the integrated resort accommodation model and extensive shared transport usage are expected to reduce private vehicle dependency.

Importantly, the provision of:

- Adequate on-site guest and staff parking
- Dedicated on-site bus drop-off facilities
- Internal delivery truck loading bays

substantially mitigates many of the potential adverse traffic impacts commonly associated with large tourist developments.

Subject to appropriate detailed engineering design and operational management measures, the development is considered capable of operating safely and efficiently within the surrounding transport network.

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## References

- Douglas Shire Council Planning Documentation
- Queensland Places – Wonga Beach
- Port Douglas Daintree Destination Tourism Plan 2025
- Austroads
- ABS – population analysis

Planning and locality information sourced from Douglas Shire Council planning records and regional demographic information.

* Department of Main Roads Road Planning & Design Manual Queensland Transport figures

signed:

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