Appendix 4:
Design Review Panel 2 – Applicant Response

Woodlands North

DA Design Report

City of Stirling

place fabric.

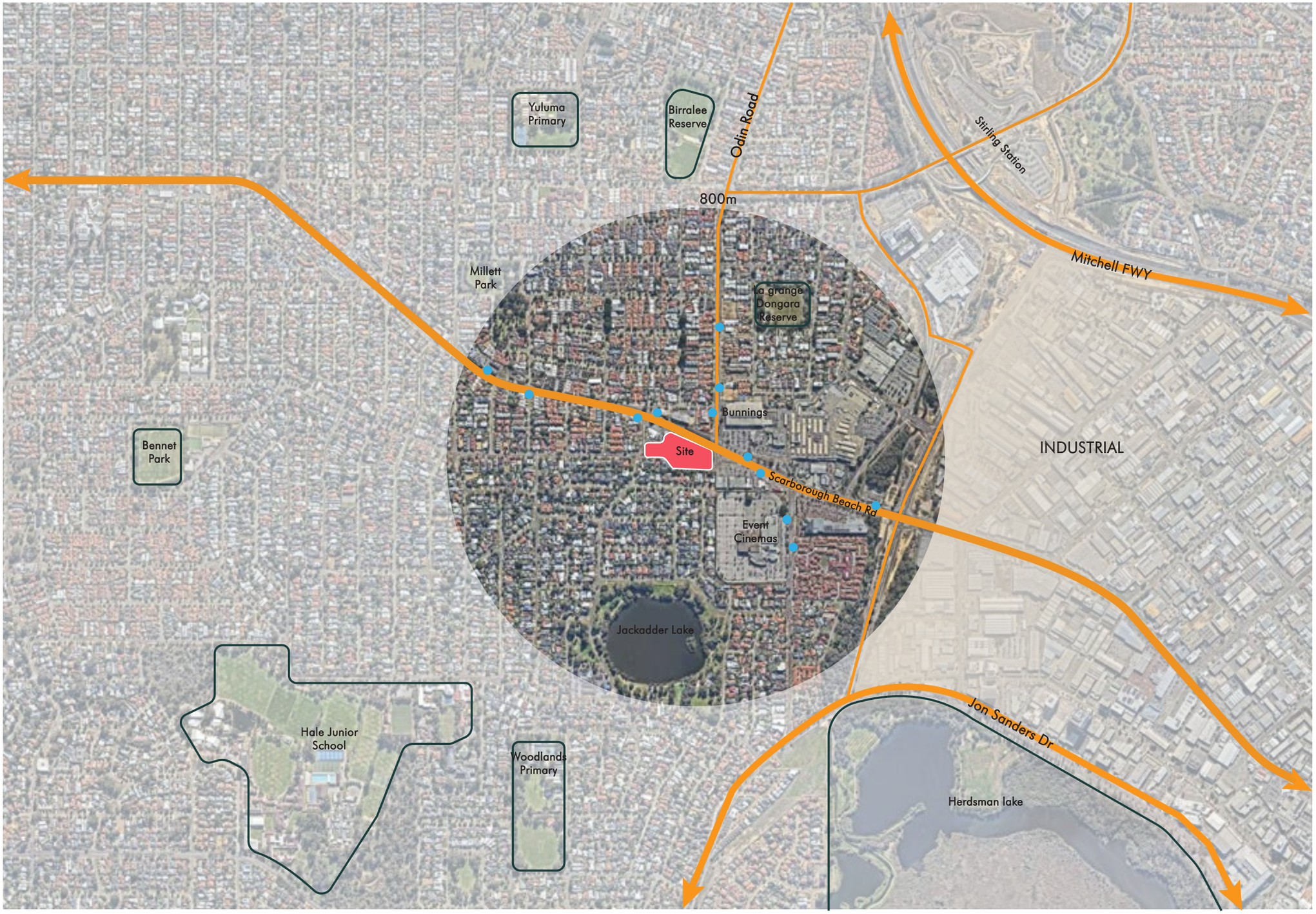
Rev A
08 2025

01

Context and Character

Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.

Broad Context Plan

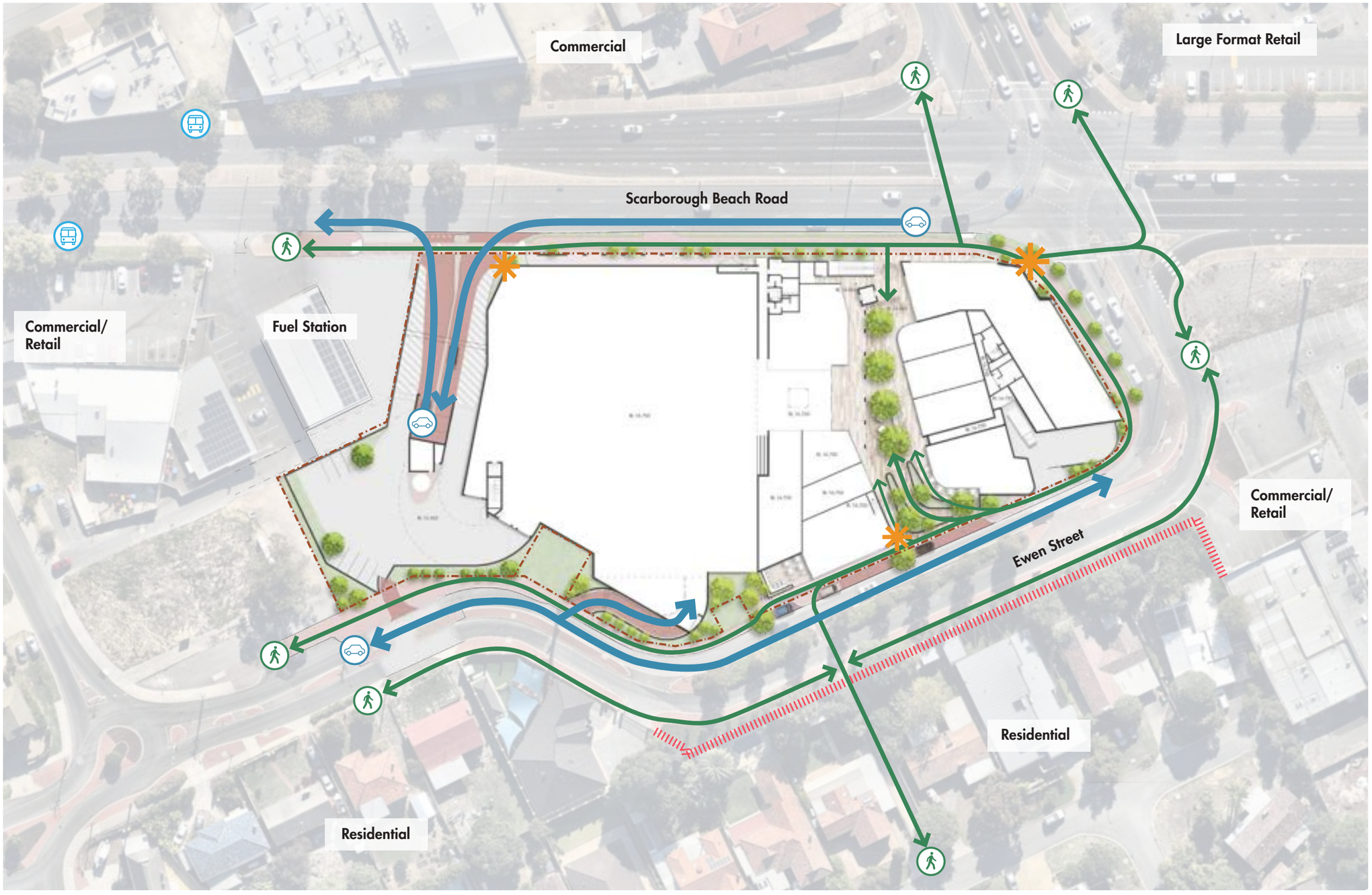


LEGEND

- Key Roads
- Bus Stops

Site Opportunities & Constraints

Context & Character



LEGEND

- Site Boundary
- Bus Stop
- Vehicle Access
- Pedestrian Access
- Landmark Corners
- Limestone Wall

Existing Site Context

Context & Character



View A- Scarborough Beach Road



View B- Ewen Street



View C- Scarborough Beach Road



View D- Ewen Street

Existing Site Context

Context & Character



View A- Scarborough Beach Road



View B- Ewen Street



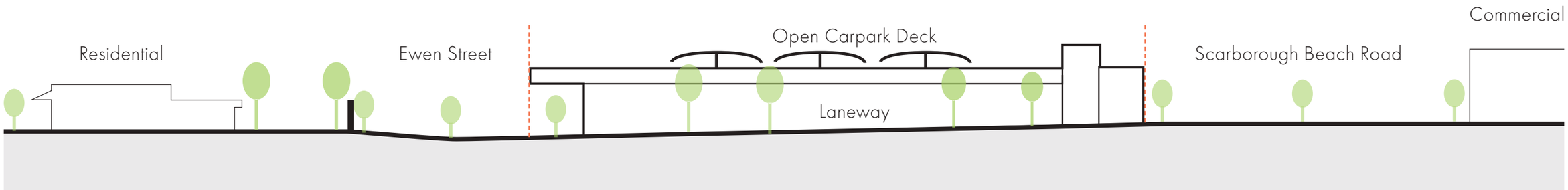
View C- Scarborough Beach Road



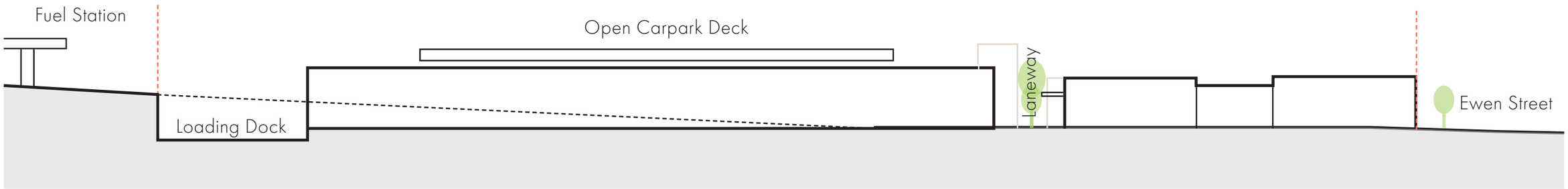
View D- Ewen Street

Site Sections

Context & Character



Indicative North-South Site Section



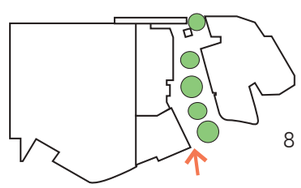
Indicative East-West Site Section



3D Render

Context & Character



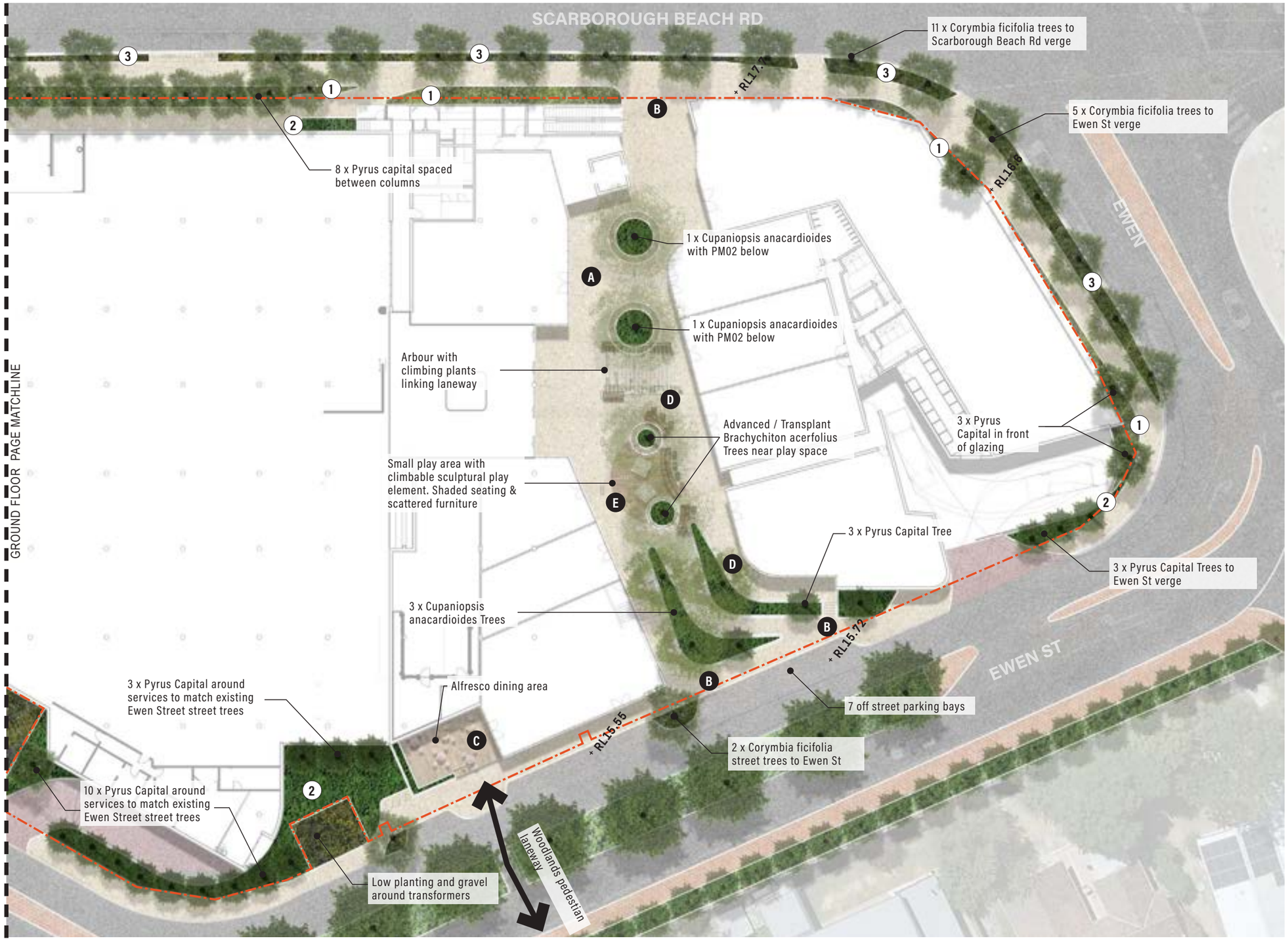


02

Landscape Quality

Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context

1.1 GROUND FLOOR PLAN



KEY

- Lot Boundary
- A The Laneway
- B Pedestrian entrance
- C Alfresco
- D Bike Parking
- E informal play area with sculptural play element
- 1 Plant Mix 1. Low Sunny Feature Planting
- 2 Plant Mix 2. Low Shady Feature Planting
- 3 Plant Mix 3. Low Verge Mix

General Notes:

All planting is in deep soil.

All landscape areas to be fully irrigated. Street tree irrigation may be switched off or reduced beyond the two year maintenance period.

Tree Location indicative pending service locations and sight-line analysis.

Suggested species list included on Pages 7-10.

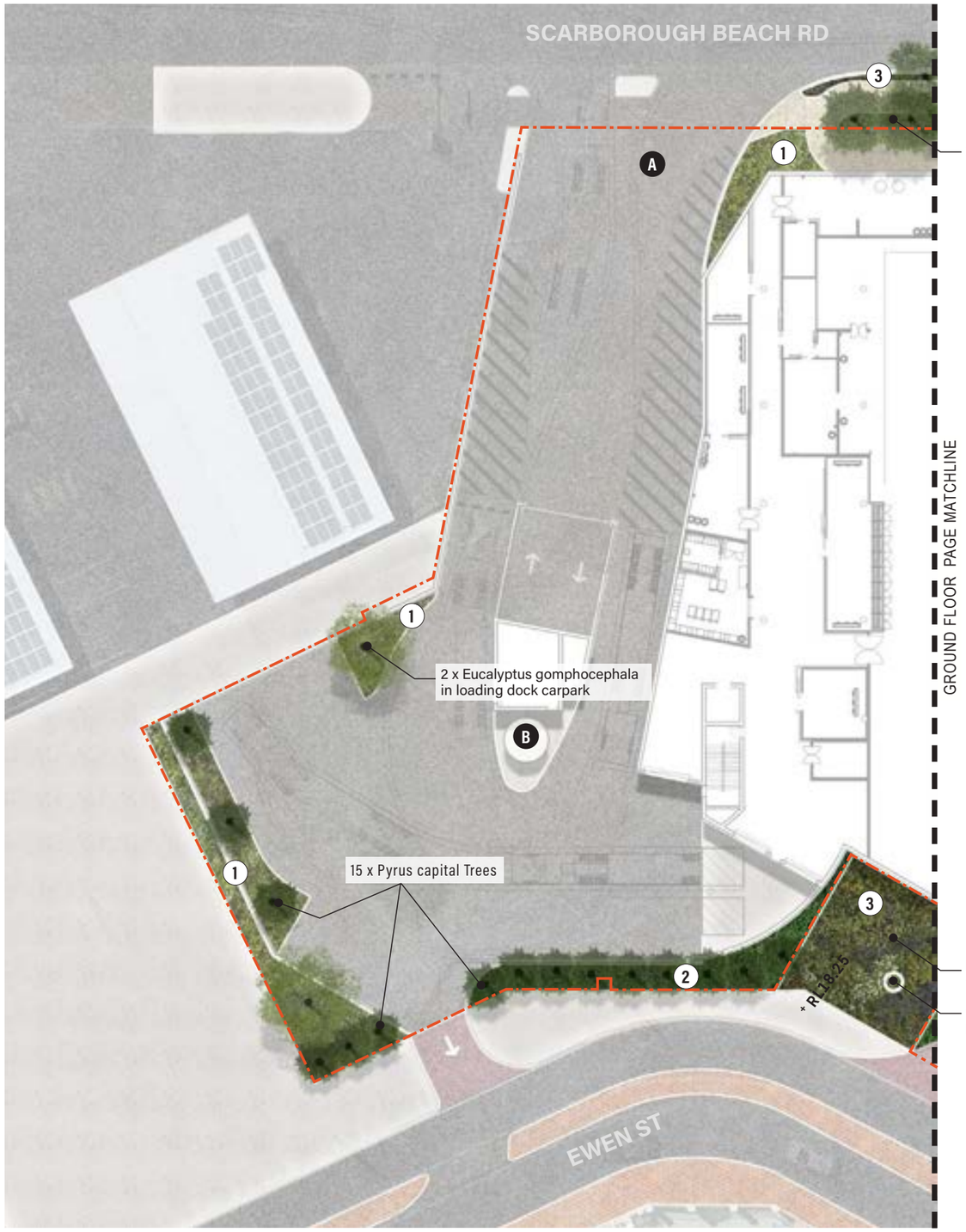
All garden beds to have 75mm depth pine bark mulch.

1:600 @ A3

0m 2m 10m 20m

UDLA³

1.2 GROUND FLOOR PLAN



KEY

- Lot Boundary
- A — Vehicle entry
- B — Fire tanks
- 1 — Plant Mix 1. Low Sunny Feature Planting
- 2 — Plant Mix 2. Low Shady Feature Planting
- 3 — Plant Mix 3. Low Verge Mix

General Notes:

All planting is in deep soil.

All landscape areas to be fully irrigated. Street tree irrigation may be switched off or reduced beyond the two year maintenance period.

Tree Location indicative pending service locations and sight-line analysis.

Suggested species list included on Pages 7-10.

All garden beds to have 75mm depth pine bark mulch.

1:600 @ A3

0m 2m 10m 20m

2.1 INDICATIVE IMAGERY



















3.1 INDICATIVE MATERIALS LIST

SURFACE FINISHES



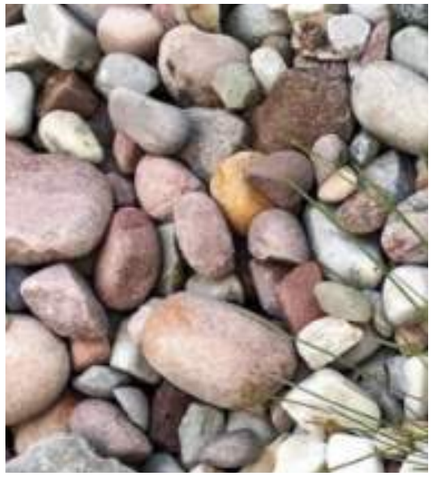
URBANSTONE SHOTBLAST PAVING MIX
GROUND FLOOR



EXPOSED AGGREGATE
GROUND FLOOR



GRANITE SETT FEATURE PAVING

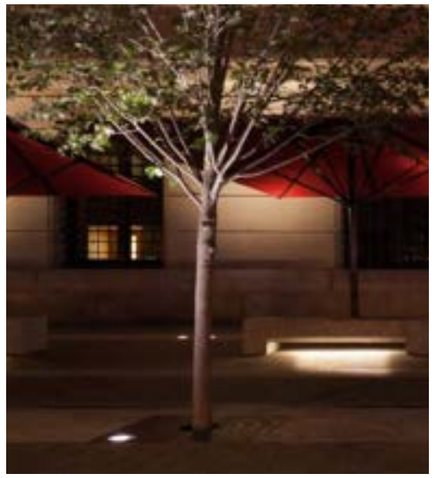


SOUTH WEST RIVER STONE - ATRIUM



CIRCULAR TREE GRATE CLASS A

FURNITURE & FIXTURE MATERIALS



IN-GROUND UPLIGHTING



LINEA RANGEBENCH SEATING



LINEA DDA BAR TABLE



LINEA RANGE BIKE STANDS



STAINLESS STEEL ROPE WIRE TRELLIS

4.1 TREES

EXISTING STREET TREES





Agonis flexuosa
Peppermint Tree
Size: 15m (h) x 10m (w)
Location: Scarborough Beach





Lophestemon conferta
Queensland Box Tree
Size: 8-12m (h) x 8m (w)
Location: Ewen St





Pyrus Capital
Ornamental Pear
Size: 6m (h) x 3m (w)
Location: Ewen St





Corymbia maculata
Spotted Gum
Size: 10m (h) x 5m (w)
Location: Ewen & S. Bch Rd

PROPOSED TREES





Cupaniopsis anacardioides
Tuckeroo
5m wide x 8m high
Use: Feature Tree





Corymbia ficifolia
Red Flowering Gum
4m wide x 6m high
Location: Street Tree S. Bch Rd & Ewen St





Pyrus Capital
Ornamental Pear
Size: 6m (h) x 3m (w)
Location: Ewen St





Brachychiton acerfolius
'Illawarra Flame Tree',
Mature size: 8m wide x 8m high.
Use: Laneway Tree

5.1 PLANTING PALETTE

MIX 1. LOW SUNNY FEATURE PLANTING 3 PLANTS PER SQ M



Westringia fruiticosa
'Coastal Rosemary',
Mature size: 0.6m x 1.2m



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Lomandra longifolia
'Tanika',
Mature size: 0.6m x 0.6m



Rosmarinus officianalis
'Prostrate Rosemary',
Mature size: 0.6m x 1.2m



Euonymus japonicus
Tom Thumb
0.5m H x 04m W



Chamelaucium uncinatum
'Wax Flower',
Mature size: 1.5m x 2m



Olearia axillaris,
Coastal Daisybush
Height: 1m x Width: 1-1.5m



Casuarina glauca
'Cousin It',
Mature size: 0.3m x 1.2m



Raphiolepis indica
Snow Maiden
Mature size: 1m x 1m



Rosemary officianalis
Tuscan Blue
Mature size: 1m x 1.2m



Grevilllea 'Gin Gin Gem'
'Grevillea',
Mature size: 0.2m x 1.2m



Hemiandra pungens
Snake Bush
H: 0.2m x W: 1m



Ficinia nodosa,
Knotted Club Rush
H: 0.8m x W: 1m



Grevillea crithmifolia,
Grevillea
H: 0.2m-0.6M x W: 1m



Calothamnus quadrifidus,
One-sided Bottelbrush
H: 0.5m x W: 1m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m



Leucophyta brownii,
Cushion Bush
H: 0.7m x W: 1m

PLANTING PALETTE

MIX 2. LOW SHADY FEATURE PLANTING 3 PLANTS PER SQ M



Westringia fruiticosa
'Coastal Rosemary',
Mature size: 0.6m x 1.2m



Liriope Muscari
'Evergreen Giant'
H:0.4m x W:0.5m



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m



Juniperus conferta
Shore juniper
H:.4m x W:1m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Dichondra argentea
Silver Falls
H:0.5m x W:0.8m



Arthropodium cirratum
'NZ Rock Lilly'
H:0.6m x W:.5m



Hardenburgia comptoniana
'White Out"
H:0.6m x W:0.9m



Correa alba
'White Correa',
Mature size: 1.5m x 1.2m

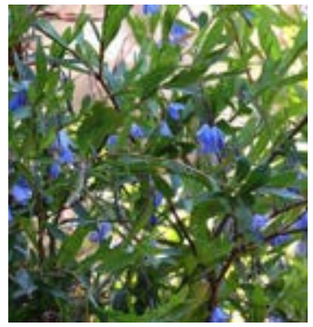
CLIMBING TRELLIS



Trachelospermum jasminoides
'Star Jasmine'
H:0.4m x W:0.5m



Hardenburgia comptoniana
Native Whisteria
H:0.4m x W:0.5m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m

PLANTING PALETTE

MIX 3. VERGE PLANTING MIX 3 PLANTS PER SQ M



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Grevillea crithmifolia,
Grevillea
H: 0.2m-0.6M x W: 1m



Lomandra longifolia
'Tanika',
Mature size: 0.6m x 0.6m



Grevilllea 'Gin Gin Gem'
'Grevillea',
Mature size: 0.2m x 1.2m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Eremophila glabra,
Kalbarri Carpet
H: 0.2m x W: 2m

03

Built Form and Scale

Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area

Existing Site Context

Built Form & Scale



Ground Plane Uses

Built Form & Scale



Proposed Built Form Scale

Built Form & Scale



Activated Frontages

Built Form & Scale



Scarborough Beach Road Activation

Built Form & Scale







04

Functionality and Build Quality

Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle

Site Plan

Functionality & Build Quality



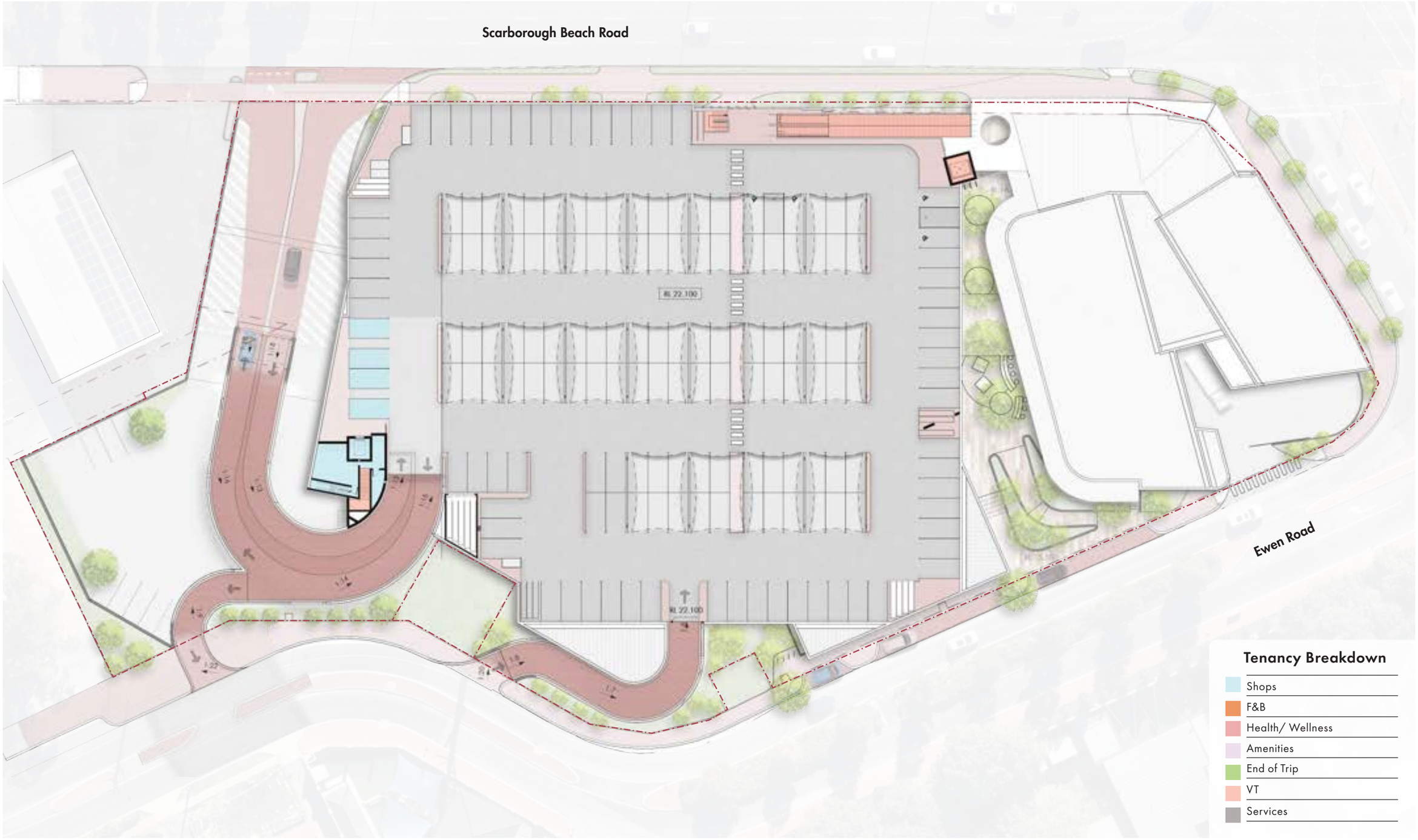
Site Plan

Functionality & Build Quality



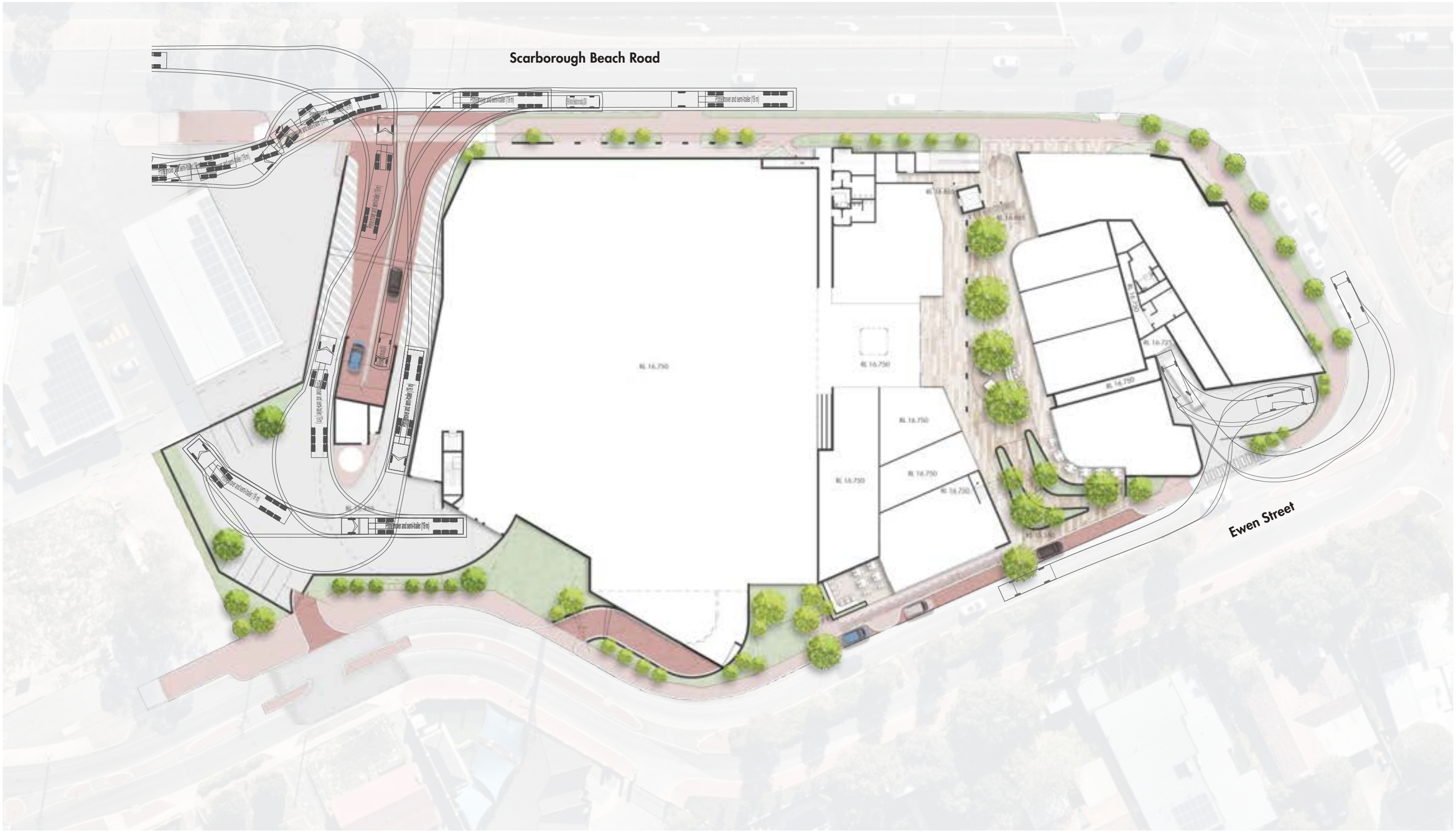
Level 1 Floor Plan

Functionality & Build Quality



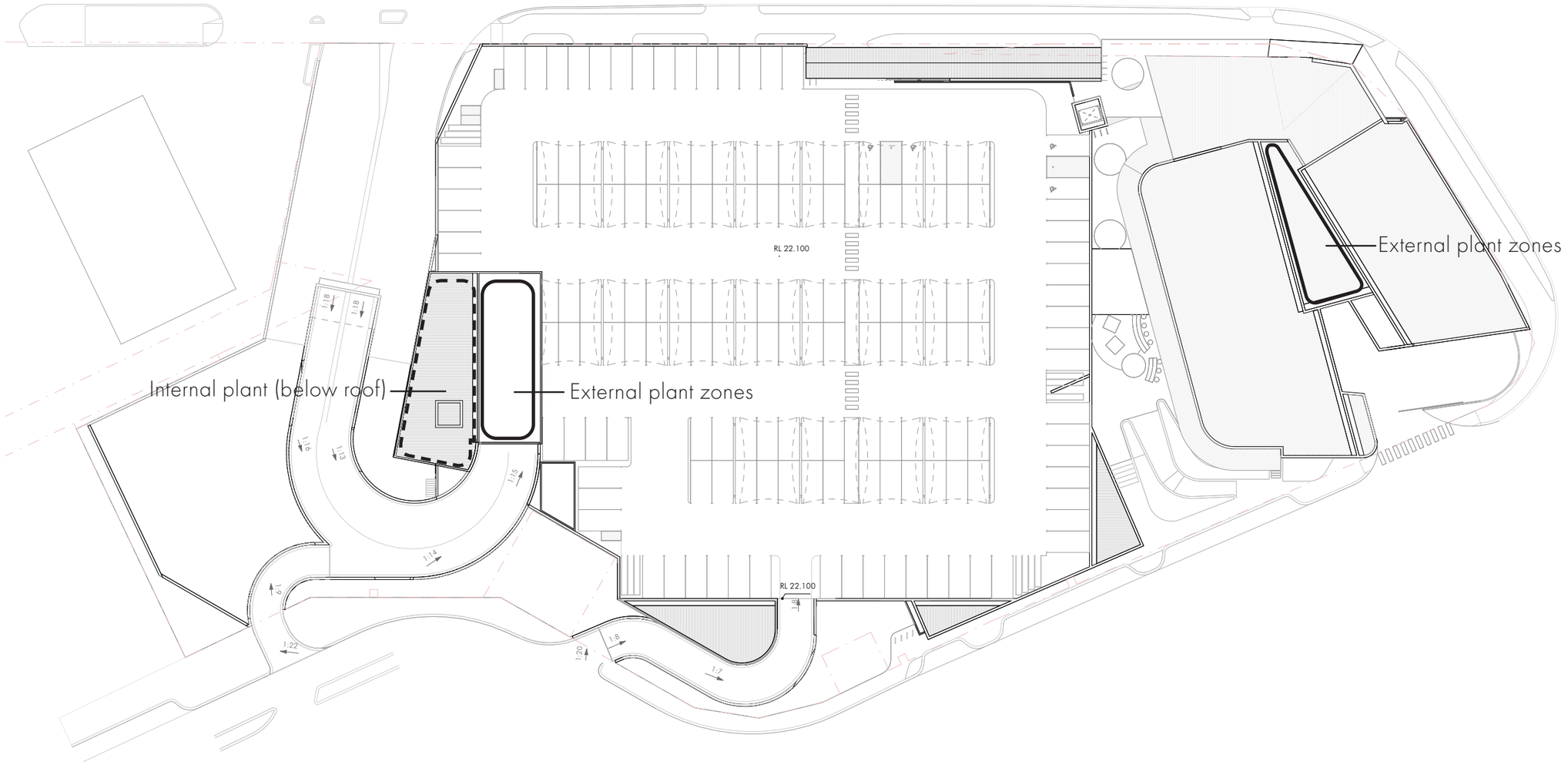
Truck Movement- Loading Docks

Functionality & Build Quality


Scarborough Beach Road
Ewen Street
RL 16.750
RL 16.750
RL 16.750

Roof Plan- Mechanical Plant

Functionality & Build Quality



05

Sustainability

Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.

Sustainability Initiatives

Sustainability



Low VOC's and Formaldehyde content in materials

Sustainable Living- Bike Racks

Future Provision for EV Charging Bays

Water Wise Native Plant Cultivation

End of Trip Facilities

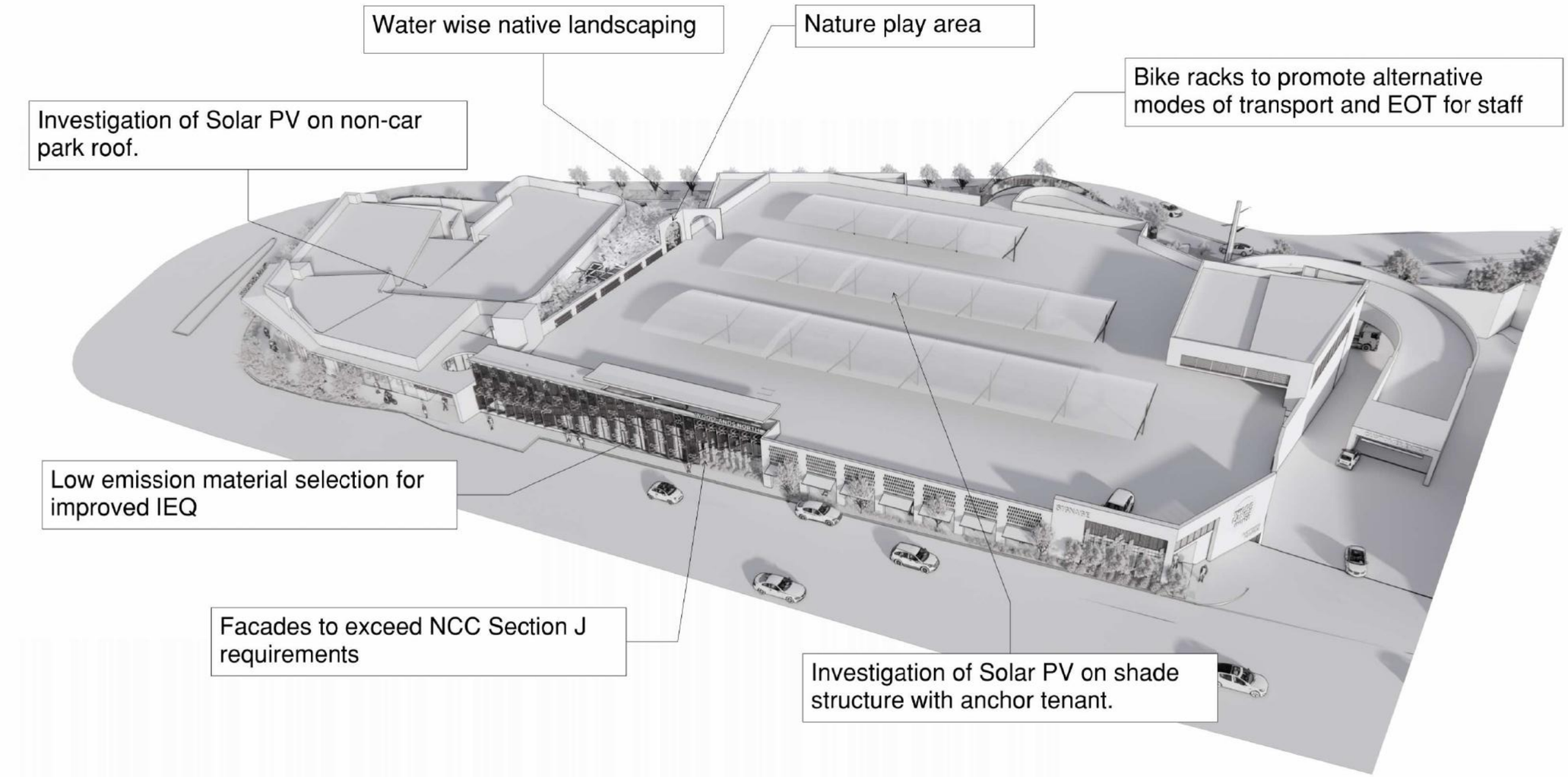
Nature Play Area

LED Signage & Lighting

High Efficiency HVAC System

Sustainability Initiatives

Sustainability



Summation Pty Ltd has been engaged as the sustainability consultants for the project and will be responsible for the delivery of the sustainability outcomes.

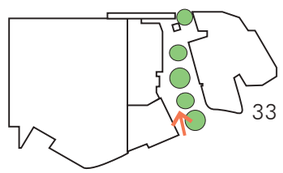
The sustainability team for this project will be led by Prasanna Suraweera, who is a Director with Summation and a Green Star Accredited Professional with over 20 years of experience in delivery of sustainable developments.

SUMMATION

Laneway Render

Sustainability





06

Amenity

Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy

Ground Floor Connections & Uses

Amenity



Ground Plane Activation

Amenity



Laneway

Amenity









Bike Parking

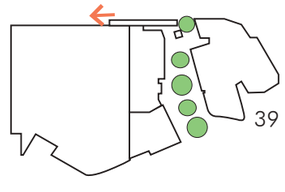
Amenity



Activation to Scarborough Beach Road

Amenity

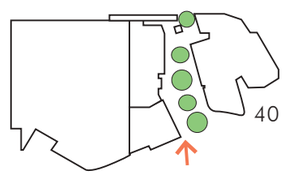




Activation to Ewen Street

Amenity

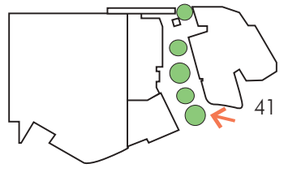




Laneway Render

Amenity





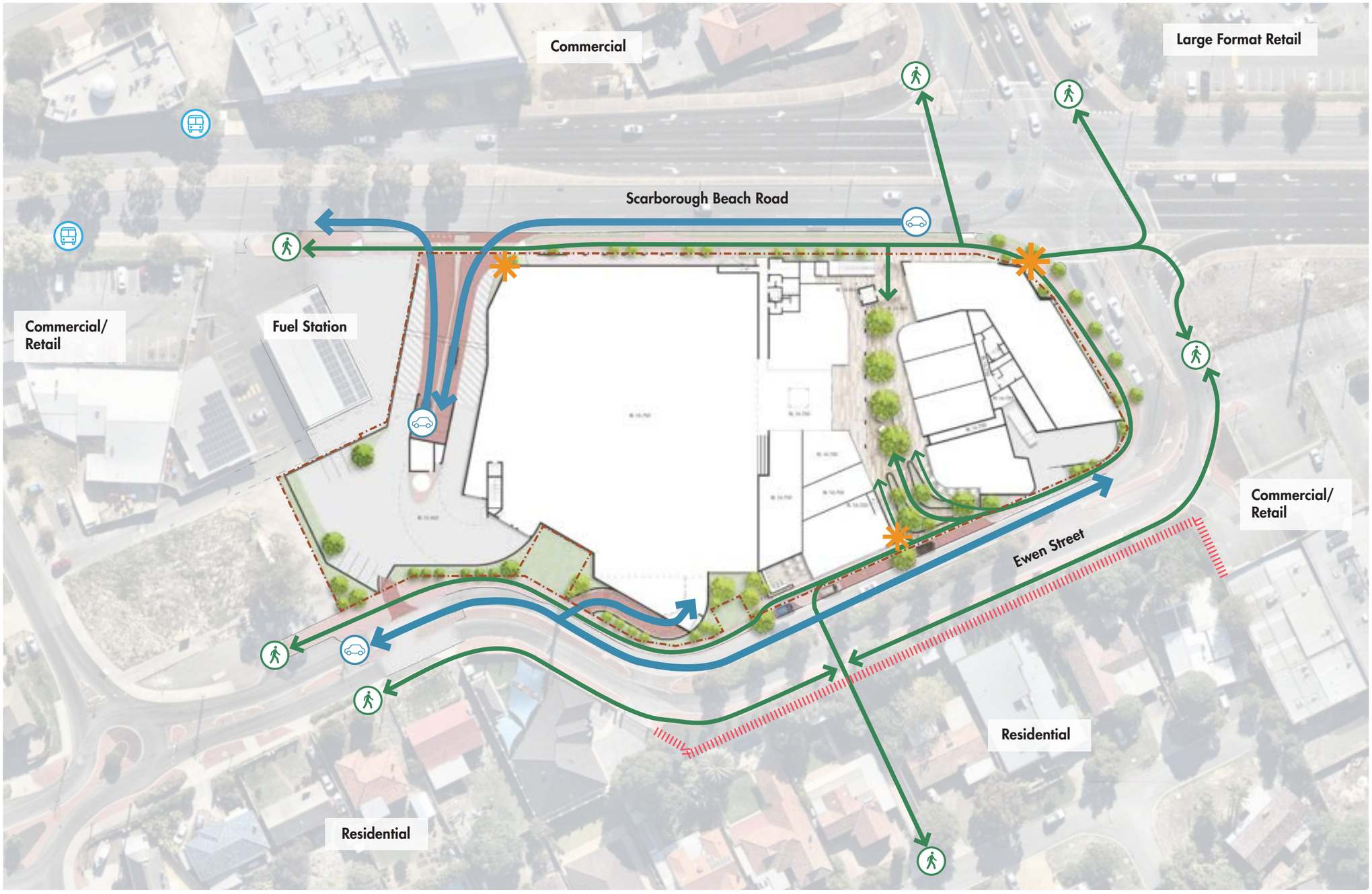
07

Legibility

Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.

Site Legibility & Signage

Legibility



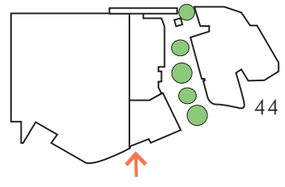
LEGEND

- Site Boundary
- Bus Stop
- Vehicle Access
- Pedestrian Access
- Landmark Corners
- Limestone Wall

Ewen Street- Pedestrian Entry

Legibility

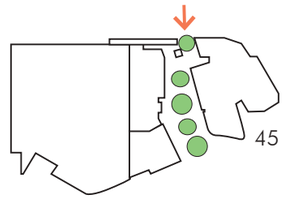




Scarborough Beach Rd- Pedestrian Entry

Legibility

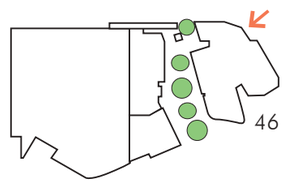




Scarborough Beach Rd- Corner

Legibility

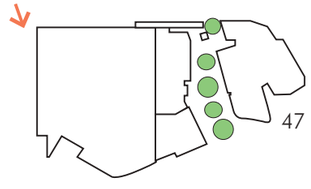




Scarborough Beach Road- Car Entry

Legibility

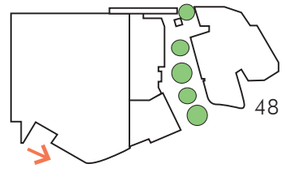




Ewen Street- Car Entry

Legibility





08

Safety

Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.

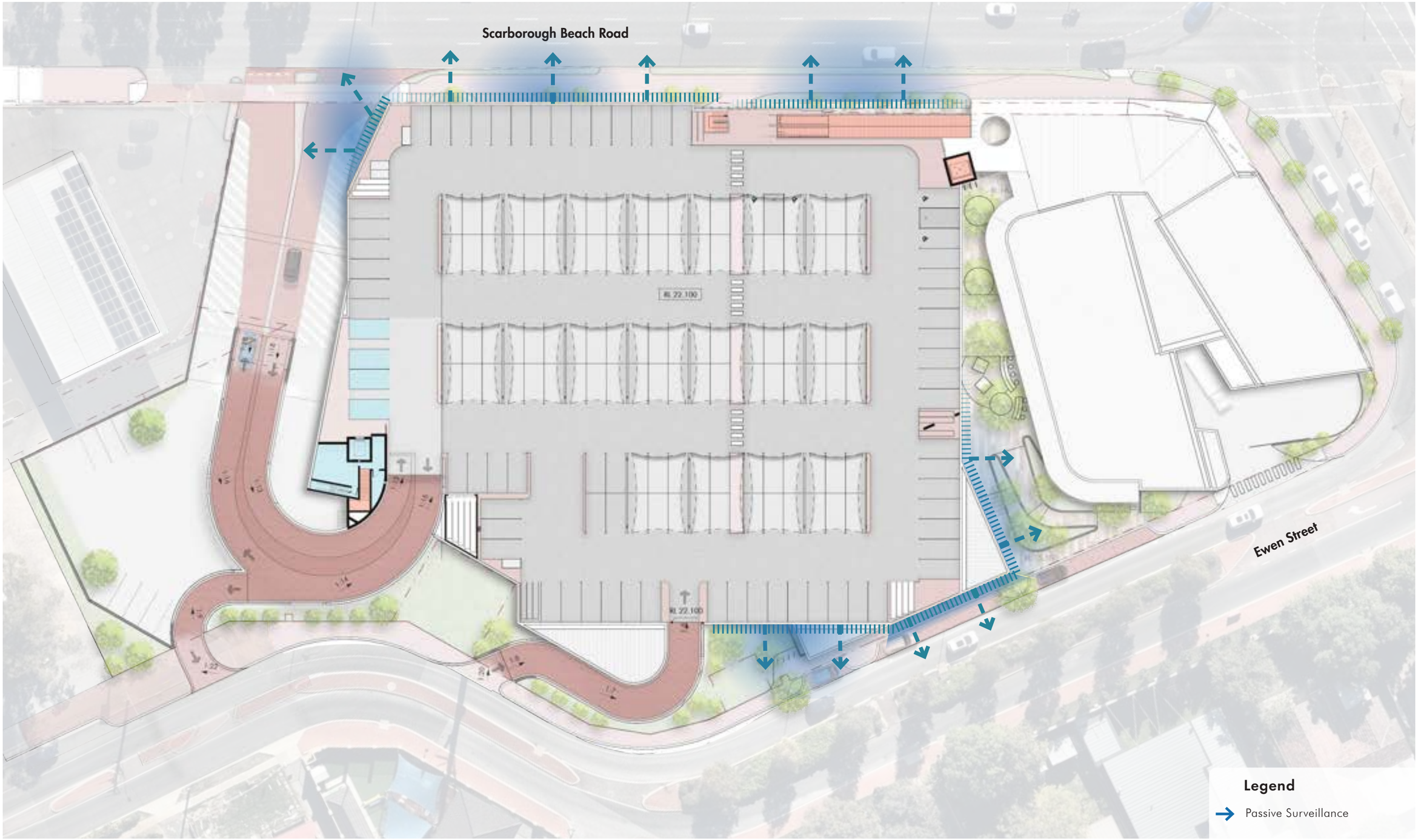
Passive Surveillance - Ground

Safety



Passive Surveillance - Level 1

Safety



3D Render- Ewen Street

Safety

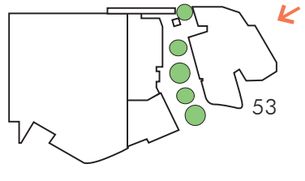




3D Render- Ewen Street

Safety

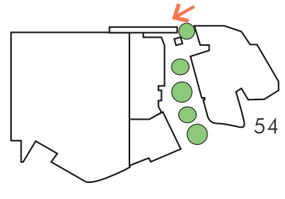




3D Render- Scarborough Beach Rd

Safety

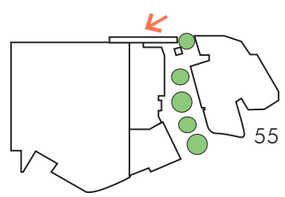




3D Render- Scarborough Beach Rd

Safety





09

Community

Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.

Laneway

Community









Laneway Sections

Community



Laneway Section West



Laneway Section East

Laneway Render

Community



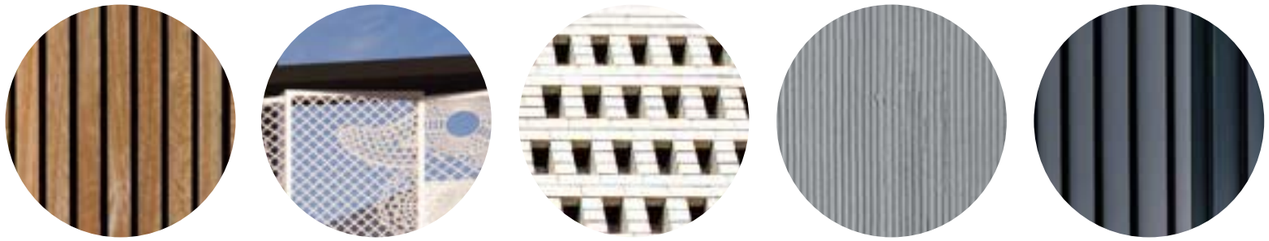
10

Aesthetics

Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.

Materiality

Aesthetics





Scarborough Beach Road Elevation

Aesthetics



North Elevation - A

North Elevation - B



North Elevation - A



North Elevation - B

Ewen Street - South Elevation

Aesthetics



South Elevation - A

South Elevation - B



South Elevation - A



South Elevation - B

Ewen Street - East Elevation

Aesthetics





East Elevation - A

Appendix 5:
Certificates of Title, Strata Plans and Deposited Plan

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1322	**288**

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 12 ON DIAGRAM 43234

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

ONE FUND SERVICES LTD OF GOVERNOR MACQUARIE TOWER LEVEL 16 1 FARRER PLACE SYDNEY NSW 2000

(T P791584) REGISTERED 17/11/2023

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

1. EASEMENT BENEFIT - SEE DIAGRAM 20527 AND SECTION 167A TLA.
2. O166270 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 6/6/2019.
3. P791577 LEASE TO AMPOL AUSTRALIA MANAGEMENT PTY LTD OF LEVEL 24 2 MARKET STREET SYDNEY NSW 2000 EXPIRES: SEE LEASE. REGISTERED 17/11/2023.

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: D43234
PREVIOUS TITLE: 1190-92
PROPERTY STREET ADDRESS: 365 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY: CITY OF STIRLING

NOTE 1: L195574 DEPOSITED PLAN (INTEREST ONLY) 65569 LODGED.

LANDGATE COPY OF ORIGINAL NOT TO SCALE 28/05/2025 03:45 PM Request number: 68261020

Landgate
www.landgate.wa.gov.au

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**162**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 1 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 1 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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Landgate
www.landgate.wa.gov.au

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**163**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 2 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 2 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**164**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 3 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 3 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**165**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 4 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 4 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**166**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 5 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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: SP9013
PREVIOUS TITLE: SP9013
PROPERTY STREET ADDRESS: UNIT 5 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY: CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**167**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 6 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. TITLE EXCLUDES THE LAND SHOWN ON SO DIAGRAM 85006. AS TO PORTION OF THE COMMON PROPERTY ONLY.
3. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
4. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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: SP9013
PREVIOUS TITLE: SP9013
PROPERTY STREET ADDRESS: UNIT 6 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY: CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**168**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 7 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. TITLE EXCLUDES THE LAND SHOWN ON SO DIAGRAM 85006. AS TO PORTION OF THE COMMON PROPERTY CONTAINED HEREIN ONLY.
3. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
4. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 7 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1592	**169**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893 AND THE

STRATA TITLES ACT OF 1985

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 8 ON STRATA PLAN 9013
TOGETHER WITH A SHARE IN COMMON PROPERTY (IF ANY) AS SET OUT ON THE STRATA PLAN

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I807119) REGISTERED 3/3/2004

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

1. INTERESTS NOTIFIED ON THE STRATA PLAN AND ANY AMENDMENTS TO LOTS OR COMMON PROPERTY NOTIFIED THEREON BY VIRTUE OF THE PROVISIONS OF THE STRATA TITLES ACT OF 1985 AS AMENDED.
2. I819904 CAVEAT BY CITY OF STIRLING LODGED 15/3/2004.
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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.

----------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:	SP9013
PREVIOUS TITLE:	SP9013
PROPERTY STREET ADDRESS:	UNIT 8 367 SCARBOROUGH BEACH RD, INNALOO.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: P068164 DEPOSITED PLAN 419546 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1615	**879**

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 4 ON DIAGRAM 20527

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I534195) REGISTERED 1/7/2003

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

1. EASEMENT BENEFIT - SEE DIAGRAM 20527 AND SECTION 167A TLA.
2. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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: 1615-879 (4/D20527)
PREVIOUS TITLE: 1190-92
PROPERTY STREET ADDRESS: 272 EWEN ST, WOODLANDS.
LOCAL GOVERNMENT AUTHORITY: CITY OF STIRLING

NOTE 1: N543789 DEPOSITED PLAN 64022 LODGED

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Landgate
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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1615	**880**

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 5 ON DIAGRAM 20527

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I534195) REGISTERED 1/7/2003

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

1. EASEMENT BENEFIT - SEE DIAGRAM 20527 AND SECTION 167A OF T.L.A.
2. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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: 1615-880 (5/D20527)
PREVIOUS TITLE: 1190-92
PROPERTY STREET ADDRESS: 270 EWEN ST, WOODLANDS.
LOCAL GOVERNMENT AUTHORITY: CITY OF STIRLING

NOTE 1: N543789 DEPOSITED PLAN 64022 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1748	**876**

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

THIS IS A MULTI-LOT TITLE

LAND DESCRIPTION:

LOTS 1, 2 & 3 ON DIAGRAM 20527

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T I534195) REGISTERED 1/7/2003

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

1. EASEMENT BENEFIT FOR RIGHT OF CARRIAGEWAY PURPOSES SEE SECTION 167A T.L.A. AND DIAGRAM 20527
2. K995451 CAVEAT BY CITY OF STIRLING AS TO LOT 1 ON D 20527 ONLY LODGED 1/7/2009.

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:	1748-876 (1/D20527), 1748-876 (2/D20527), 1748-876 (3/D20527)
PREVIOUS TITLE:	135-125A
PROPERTY STREET ADDRESS:	278 EWEN ST, WOODLANDS (1/D20527). 276 EWEN ST, WOODLANDS (2/D20527). 274 EWEN ST, WOODLANDS (3/D20527).
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1:	L018389	DIAGRAM 72445 LODGED
NOTE 2:	I434583	SECTION 138D TLA APPLIES TO CAVEAT D631672
NOTE 3:	I434584	SECTION 138D TLA APPLIES TO CAVEAT D608503
NOTE 4:	L314736	DEPOSITED PLAN (INTEREST ONLY) 65584 LODGED AS TO LOT 1 ON D 20527 ONLY

END OF PAGE 1 - CONTINUED OVER

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NOTE 5: N543789 DEPOSITED PLAN 64022 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1817	**933**

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 66 ON DIAGRAM 20527

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE1, 567 HAY STREET, DAGLISH

(T I534195) REGISTERED 1/7/2003

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

1. EASEMENT BENEFIT FOR RIGHT OF CARRIAGEWAY PURPOSES SEE SECTION 167A T.L.A. AND DIAGRAM 20527
2. EASEMENT BURDEN FOR RIGHT OF CARRIAGEWAY PURPOSES SEE SECTION 167A T.L.A. AND DIAGRAM 20527
3. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.
4. O170851 MEMORIAL. CONTAMINATED SITES ACT 2003 REGISTERED 13/6/2019.

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:	D20527
PREVIOUS TITLE:	1190-92
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: N543789 DEPOSITED PLAN 64022 LODGED

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WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
LR3160	**46**

RECORD OF CERTIFICATE OF CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES

LAND DESCRIPTION:

LOT 167 ON PLAN 7078

STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)

STATUS ORDER/INTEREST: UNALLOCATED CROWN LAND

PRIMARY INTEREST HOLDER: STATE OF WESTERN AUSTRALIA

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

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 CROWN LAND 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:	P7078
PREVIOUS TITLE:	1212-324
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING
RESPONSIBLE AGENCY:	DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: L445529 CORRESPONDENCE FILE 50397-2005-02RO.

LANDGATE COPY OF ORIGINAL NOT TO SCALE 28/05/2025 03:46 PM Request number: 68261020

Landgate
www.landgate.wa.gov.au

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1242	**243**

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 2 ON PLAN 7078

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T J306023) REGISTERED 1/6/2005

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

1. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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:	1242-243 (2/P7078)
PREVIOUS TITLE:	1212-324
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: N543789 DEPOSITED PLAN 64022 LODGED

LANDGATE COPY OF ORIGINAL NOT TO SCALE 28/05/2025 03:45 PM Request number: 68261020

Landgate

www.landgate.wa.gov.au

5440/61 Transfer 19867/1960 (23053)
5490/61 Volume 1212 Folio 324
30870/61

INDEXED.

REGISTER BOOK.

Vol. 1242 Fol. No 243

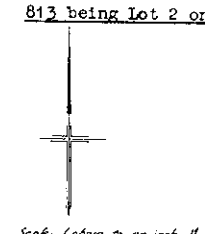
WESTERN AUSTRALIA.

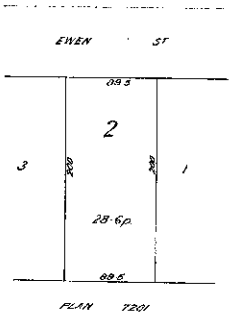
Certificate of Title

CT 1242 0243 F

under "The Transfer of Land Act, 1893" (56 Vic., 14. Sch. 5).

Edward Claassens, Painter and Maria Claassens, his wife, both of 32 Oliver Street, Scarborough, are now the proprietors as joint tenants of an estate in fee simple subject to the easements and encumbrances notified hereunder in all that piece of land delineated and coloured green on the map hereon containing twenty-eight and six-tenths perches or thereabouts, being portion of Swan Location 813 being Lot 2 on Plan 7078.





Dated the twenty-seventh day of October One thousand nine hundred and sixty.

Registrar of Titles.

Transfer 134271/1961 to Joseph Handie, Engineers Assistant and Manon Handie, his wife, Canteen managers, both of 47 Collins Street, Mount Yokine, as joint tenants. Registered 8th September 1961 at 9.32 a.m.

ASSISTANT REGISTRAR OF TITLES

Transfer A 44184 to Percy Pearson of 40 Boronia Avenue, Redlands, Marketing Consultant Registered 25th May 1968 at 9.15 a.m.

ASSISTANT REGISTRAR OF TITLES

Transfer A 81384 to George Buckley Plasterer and Lilian Buckley his wife, both of 8 Salisbury Street, Subiaco, as joint tenants. Registered 16th September 1968 at 9.25 a.m.

ASSISTANT REGISTRAR OF TITLES

Transfer A 814195 to Robert Anthony Steele, Process Worker, and Anita Kathleen Steele his wife, both of Flat 2, 47 Deanmore Road, Scarborough, as joint tenants. Registered 26th April 1974 at 10.060 a.m.

Transfer H176928 to Cabaret Gaming Pty Ltd of 150 West Coast Terrace, Trigg. Registered 26th July 1999 at 9.00 hrs.

OFFICE OF TITLES WESTERN AUSTRALIA

For encumbrances and other matters affecting the land see back.

DK

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www.landgate.wa.gov.au

EASEMENTS AND ENCUMBRANCES REFERRED TO

Instrument stamped $3.15.0
Mortgage 13935/1960 Edward Claassens and Maria Claassens to Australian Netherlands No: 2 Building Society. Registered 27th October 1960 at 9.23 o'c.

H.Blatt
REGISTRAR OF TITLES.

Caveat 2270/1962 Lodged 9-7-1962 at 9.0 o'c

Caveat 11865/63. Lodged 7.3.1963 at 9.12 o'c

WITHDRAWN

withdrawal of 11/6/65 of Caveat 2270/1962 Lodged 11-5-1965 at 9.35 o'c

Withdrawal A44182 of Caveat 11865/63. Lodged 21.5.1968 at 9.16 o'c

Discharge A44183 of Mortgage 13935/1960. Registered 27th May 1968 at 9.15 o'c

Caveat 1792/1968. Lodged 27.8.1968 at 9.16 o'c

WITHDRAWN

Withdrawal A81383 of Caveat 1792/1968. Lodged 12th September 1968 at 9.25 o'c.

Mortgage A81385 to THE COMMISSIONER OF THE STATE BANK OF WESTERN AUSTRALIA. Registered 12th September 1968 at 9.25 o'c

DISCHARGED

Discharge A166330 of Mortgage A81385 Registered 16th May 1969 at 9.15 o'c

Mortgage A814196 to Commonwealth Savings Bank of Australia. Registered 26th April 1974 at 10.06 o'c.

Discharge D413258 of Mortgage A814196. Registered 9th February 1987 at 10.03 o'c.

Mortgage H176929 to National Australia Bank Ltd. Registered 26th July 1999 at 9.00 hrs.

CT 1242 0243 B

CERTIFICATE OF TITLE

Vol. **1242** *Fol.*

Superseded - Copy for Sketch Only

LANDGATE COPY OF ORIGINAL NOT TO SCALE 28/05/2025 03:45 PM Request number: 68261020

Landgate
www.landgate.wa.gov.au

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1266	**231**

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 3 ON PLAN 7078

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T J306023) REGISTERED 1/6/2005

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

1. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.
2. N210650 CAVEAT BY ABWEH PTY LTD LODGED 22/12/2015.

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:	1266-231 (3/P7078)
PREVIOUS TITLE:	1212-324
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1: N543789 DEPOSITED PLAN 64022 LODGED

LANDGATE COPY OF ORIGINAL NOT TO SCALE 28/05/2025 03:45 PM Request number: 68261020

Landgate

www.landgate.wa.gov.au

45777/62 Transfer 20010/1962 (23970)
24667/63 Volume 1212 Folio 324

ORIGINAL

INDEXED

REGISTER BOOK.

Vol. 1266 Fol. No (S) 231

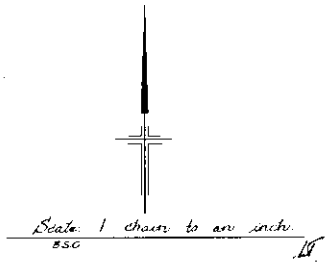
WESTERN AUSTRALIA.

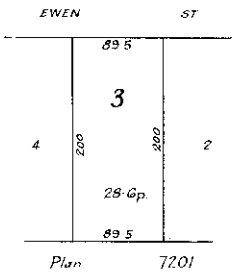
CT 1266 0231 F

Certificate of Title

under "The Transfer of Land Act, 1893" (56 Vic., 14. Sch. 5).

Robert Francis Breakell, Retired Storekeeper, and Linda Edith Breakell, his Wife, both of the Derward Hotel Murray Street Perth, are now the proprietors of an estate in fee simple subject to the easements and encumbrances notified hereunder in all that piece of land delineated and coloured green on the map hereon containing twenty eight and six-tenths perches or thereabouts, being portion of Swan Location 813 and being Lot 3 on Plan 7078.





Dated the twenty-sixth day of October One thousand nine hundred and sixty-two.

Registrar of Titles.

Application 9 was/er on the 24th April 1967 Robert Francis Breakell died and thereupon Linda Edith Breakell became the sole proprietor

15th June 1967 Asst. Registrar of Titles.

Application E952367 The registered proprietor is R & I Trustees Ltd of Level 5, 54 Barrack Street, Perth, as Executor of the Will of Linda Edith Breakell who died on 21-2-1992. (Probate granted 6-6-1992).

3rd August 1992

Transfer F211946 to Walter Francis Breakell of 273 Ewen Street, Woodlands and Raymond Kenneth Breakell of 25B Smythe Street, Rockingham, as tenants in common in equal shares. Registered 8th June, 1993 at 14.06 hrs.

Transfer F613935 to Mear Pty. Ltd. of 67 Stone Street, Bayswater. Registered 14th July 1994 at 10.52 hrs.

The correct address of the registered proprietor is now 42 Lewin Way, Scarborough. By H472887. Dated 15th June, 2000 at 8.07 hrs.

60882/6/62—3m—11/6

For encumbrances and other matters affecting the land see back.

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www.landgate.wa.gov.au

EASEMENTS AND ENCUMBRANCES REFERRED TO

Instrument classified L & T 6
Mortgage 2976/63 DISCHARGED ... Broakell and Linda Edith Broakell, to Trustees of
War Service Homes ... registered 28th May 1963 at 9.25 a.m.
W. ... F.T. Blackmore

Discharge B734410 of Mortgage 2976-63. Registered 21st June, 1979 at 10.23 a'c.

Mortgage F613936 to Commonwealth Bank of Australia. Registered 14th July 1994 at 10.52 hrs.

DISCHARGED

Discharge H472886 of Mortgage F613936. Registered 15th June, 2000 at 8.07 hrs.

Mortgage H472887 to Bank of Western Australia Ltd. Registered 15th June, 2000 at 8.07 hrs.

CT 1266 0231 B

CERTIFICATE OF TITLE

Vol. 1266 Fol. No 231

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Landgate
www.landgate.wa.gov.au

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1286	**171**

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 1 ON PLAN 7078

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

DELTAVIEW PTY LTD OF SUITE 1, 567 HAY STREET, DAGLISH

(T J306024) REGISTERED 1/6/2005

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

1. K995451 CAVEAT BY CITY OF STIRLING LODGED 1/7/2009.

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:	1286-171 (1/P7078)
PREVIOUS TITLE:	1212-324
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	CITY OF STIRLING

NOTE 1:	I694407	SECTION 138D TLA APPLIES TO CAVEAT E990583
NOTE 2:	I694408	SECTION 138D TLA APPLIES TO CAVEAT G412658
NOTE 3:	N543789	DEPOSITED PLAN 64022 LODGED

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Transfer 46257/64 (2446)

Volume 1212 Folio 324

JT

ORIGINAL
REGISTER BOOK.

INDEXED

Vol. 1286 Fol. N° 171

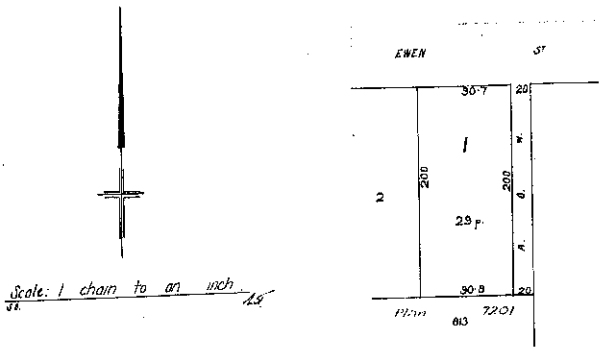
WESTERN AUSTRALIA.

Certificate of Title

CT 1286 0171 F

under "The Transfer of Land Act, 1893" (56 Vic., 14. Sch. 5).

Lillian Rose White of 25 Stanley Street, Scarborough, Widow, is now the proprietor of an estate in fee simple subject to the easements and encumbrances notified hereunder in all that piece of land delineated and coloured green on the map hereon containing twenty-nine perches or thereabouts, being portion of Swan Location 813 and being Lot 1 on Plan 7078.



Dated the ninth day of July One thousand nine hundred and sixty-four.

Registrar of Titles.

Application A927330. On 14-12-1974 Lillian Rose White was married to Kenneth Roy Grande and her name and addition is now Lillian Rose Grande of 277 Ewen Street, Doubleview, Married Woman — 21ST February 1975.

Transfer D269042 to Stephen Francis O'Meara of 25 Franklin Street, Leederville, Policeman. Registered 19th June, 1986 at 9.15 o'c.

Transfer D936928 to Peter Hawkrigg and Jacqueline Jennifer Hawkrigg, both of Unit 4, 95 Westview Street, Scarborough, as joint tenants. Registered 17th November, 1988 at 9.08 hrs.

Transfer E627149 to Brian Robert West of 185 Flamborough Street, Doubleview. By E627149. Dated 11th June, 1991 at 9.39 hrs.

For encumbrances and other matters affecting the land see back.

6619/R12/63—48,500—11/C

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EASEMENTS AND ENCUMBRANCES REFERRED TO

Instrument stamped £3.7.6. Mortgage 46258/64 by Lillian Rose White to Home Building Society Incorporated. Registered 9th July 1964 at 9.36 o'c.

DISCHARGED

REGISTRAR OF TITLES

Discharge C886493 of Mortgage 46258/64. Registered 20th October, 1984 at 12.35 o'c.

Mortgage D269043 to Commonwealth Savings Bank of Australia. Registered 19th June, 1986 at 9.15 o'c. DISCHARGED

Discharge D740482 of Mortgage D269043. Registered 3rd May, 1988 at 10.08 hours.

Mortgage D936929 to Esanda Finance Corporation Ltd. Registered 17th November, 1988 at 9.08 hrs.

DISCHARGED

Discharge E377917 of Mortgage D936929. Registered 8th June, 1990 at 9.45 hrs.

Mortgage E627150 to Challenge Bank Ltd. Registered 11th June, 1991 at 9.39 hrs.

Caveat E990583. Lodged 17.9.92 at 12.42 hrs.

Caveat G412658 Lodged 5.3.1997 at 14.01 hrs.

CT 1286 0171 B

CERTIFICATE OF TITLE

Vol. **1286** *Fol.* Nº 171

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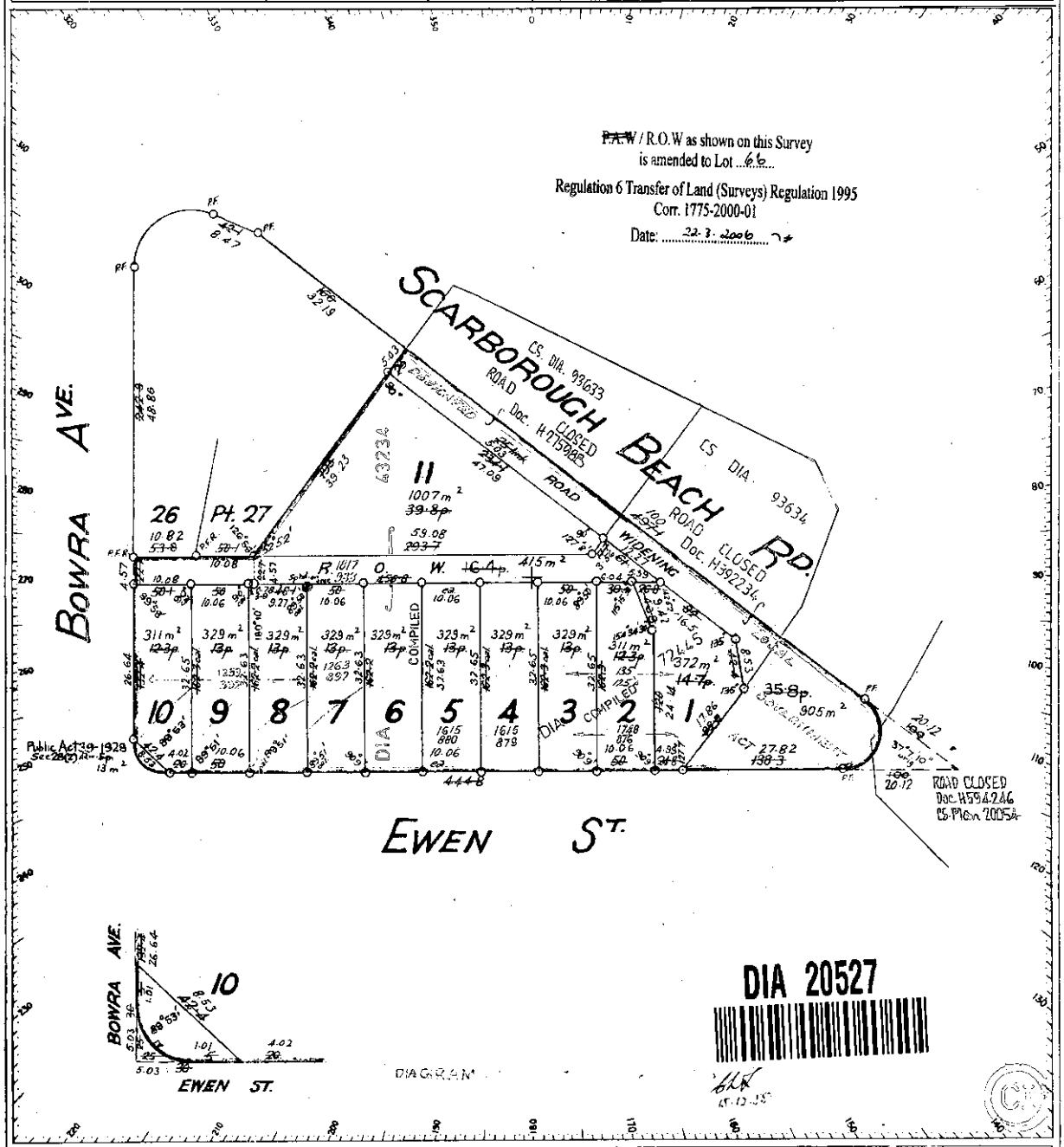
www.landgate.wa.gov.au

Town or District.	Number of Lot or Location.	Field Book.	Scale, ~~Chains to One Inch.~~	Certificate in which Land is Vested.	Area
PERTHSHIRE	Lots 28-32 & Pt. of 27 of Location A1.	15999	1 : 792	Vol. 1000 Fol. 345 1158 228 NOW 1190 92	~~A. R. P.~~

~~P.A.W~~ / R.O.W as shown on this Survey is amended to Lot ...66...

Regulation 6 Transfer of Land (Surveys) Regulation 1995
Corr. 1775-2000-01

Date: 22-3-2006



CERTIFICATE

I hereby certify that this survey was performed by me personally (or under my personal supervision, inspection, and field check), in strict accordance with the Regulations for the guidance of Surveyors, and that this plan is in all respects accurate.

Licensed Surveyor.

Date 23-6-55

Approved by Town Planning Board

TOWN PLANNING BOARD 7 JUL 1955 W.A.

N. Steffanoni Deputy Chairman

Date 4/10/55.

Approved	On	Registered	Diagram No.
Approved Inspector of Plans and Surveys	Plan 5167	19	20527
Examined LMW Dk. 6.3 p 244.	Diagram	1/30/96	
Date 12-1-56	Index Plan 2750(6) PERTH 2000 09.30		

40972/10/50—600—O

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Landgate
www.landgate.wa.gov.au

FORM 1

STRATA PLAN 9013

Ca. 1

PARCEL OF LAND Lot 13 on Diagram 34354 being portion of Perthshire Location At.

CERTIFICATE OF TITLE: Vol: 42 Fol: 285A

LOCAL AUTHORITY City of Stirling

LOCALITY Woodlands INDEX PLAN Perth 2000 09.30

NAME OF BUILDING 367 Scarborough Beach Road, Woodlands.

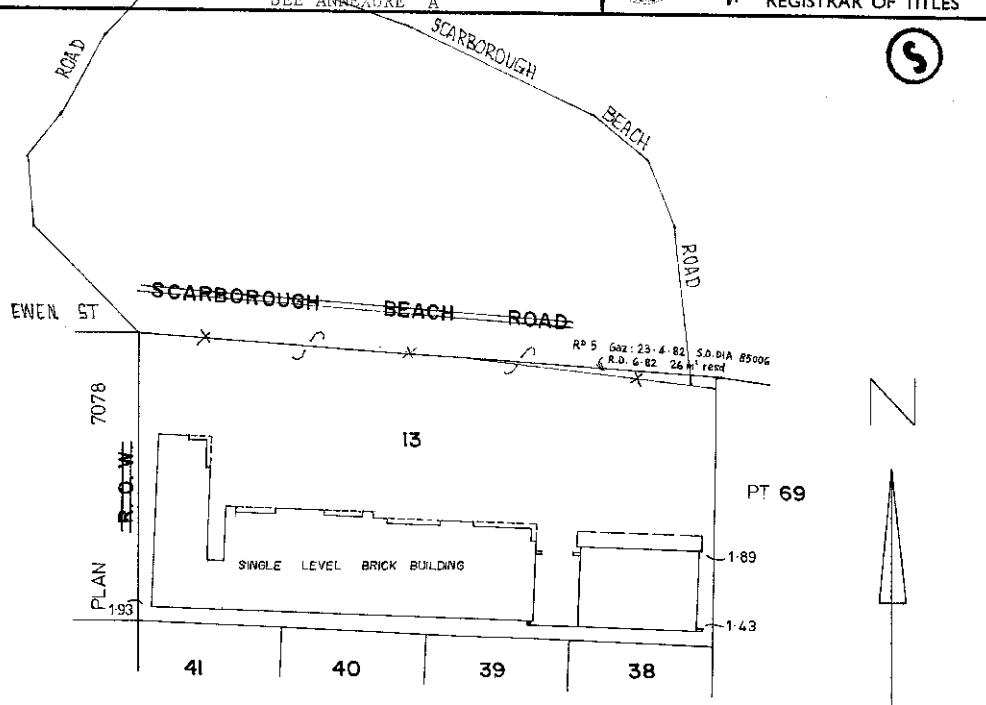
ADDRESS FOR SERVING OF NOTICES ON COMPANY ~~Mr. Plecas, 6 Kinkuna Way, City Beach, 6015~~ SEE ANNEXURE A

LODGED 19-2-81 45341

EXAMINED 23-2-81

REGISTERED 27.5.81 App. C 146519

REGISTRAR OF TITLES



The within land has been amended to include Loc 12953, C.L.T. 3111/217 under Section 87 of the Land Administration Act 1997 Amalgamation Order Doc. H 594252 Reg. 9·11·2000

Asst. Registrar of Titles

KANTHER AND SHIPP
SURVEYORS (09) 349 3605

SCALE 1:750

CI

SCHEDULE OF UNIT ENTITLEMENT		OFFICE USE ONLY CURRENT Cs. of TITLE	
LOT No.	UNIT ENTITLEMENT	VOL.	FOL.
1	19	1592	162
2	17	1592	163
3	12	1592	164
4	14	1592	165
5	14	1592	166
6	6	1592	167
7	6	1592	168
8	6	1592	169
AGGREGATE	94		

SURVEYOR'S CERTIFICATE

I hereby certify that the building shown on the plan is within the external surface boundaries of the parcel ~~and where eaves or guttering project beyond those boundaries, that a registered easement has been granted as an appurtenance of the parcel or, where the projection is over a road that the Local Authority has consented thereto.~~

DATE 20/7/80 LICENSED SURVEYOR.

APPROVED BY THE TOWN PLANNING BOARD FOR THE PURPOSES OF THE STRATA TITLES ACT 39 OF 1966

DATE 17 FEB 1981 CHAIRMAN.

77241/6/78-2M-MS/893

LANDGATE COPY OF ORIGINAL NOT TO SCALE 16/06/2025 02:37 PM Request number: 68344374

Landgate

www.landgate.wa.gov.au

C.A. 3

FORM 3

STRATA PLAN No. 9013

CERTIFICATE OF LOCAL AUTHORITY

FOR THE PURPOSES OF THE STRATA TITLES ACT 39 OF 1966

City of Stirling, THE LOCAL AUTHORITY,

HEREBY CERTIFIES THAT:—

(1) The building shown on the plan has been inspected and that it is consistent with the building plans and specifications in respect thereof that have been approved by the Local Authority.

(2) The building, in the opinion of the local authority, is of sufficient standard and suitable to be divided into lots pursuant to the Strata Titles Act, 1966.

DESCRIPTION OF BUILDING:—

Eight brick units situated on Lot 13 on Diagram 34354 being portion of Perthshire Location At.

Postal Address:- 367 Scarborough Beach Road,
Woodlands. W.A. 6018

DATE 9/2/81

~~SHIRE~~/TOWN CLERK

76962/6/78-2M-F802

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Landgate

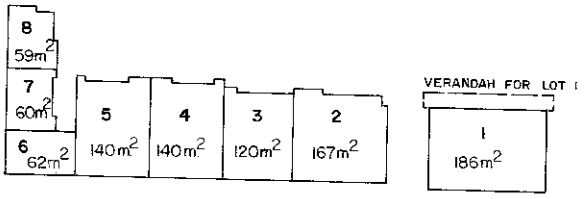
www.landgate.wa.gov.au

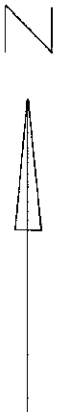
C.A. 4

SHEET No. 1 OF 1 SHEETS

STRATA PLAN No. 9013

GROUND FLOOR





SCALE 1:750

APPROVED

FOR THE PURPOSES OF THE STRATA TITLES ACT 39 OF 1966 AS AMENDED

TOWN PLANNING BOARD

DATE 12 FEB 1981 CHAIRMAN

LOCAL AUTHORITY CITY OF STIRLING

DATE 9/2/81 ~~SHIRE~~ TOWN CLERK

57296/6/78-2M-C397

LANDGATE COPY OF ORIGINAL NOT TO SCALE 16/06/2025 02:37 PM Request number: 68344374

Landgate

www.landgate.wa.gov.au

LANDGATE COPY OF ORIGINAL NOT TO SCALE 16/06/2025 02:37 PM Request number: 68344374

ANNEXURE A OF STRATA PLAN No. 9013 REGISTRAR OF TITLES

SCHEDULE OF REGISTERED PROPRIETORS

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT REGIST'D	SIGNATURE OF REGISTRAR of TITLES
The address for serving of notices on the Company is Geographe Bay Investments Pty Ltd, 9th Floor, Law Chambers, Cathedral Square, Perth. 6000.	Change of Address	E836011	19.3.92	D J Mulcahy

SCHEDULE OF ENCUMBRANCES, ETC.

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGIST'D	SIGNATURE OF REGISTRAR of TITLES	CANCELLATION
~~RD~~	~~6/82~~	~~As to portion of the common property only. Notice of Intention to Resume. (Govt. Gaz. 12-3-82 Item 1).~~			ACTION COMPLETE
Easement	H594247	The right to enter upon the portion of the within land marked 'Easement' (inset B) on Land Administration Plan 20054 for the purpose of constructing, installing, maintaining and operating the installation for the transmission and conveyance of gas as set out in the said Easement is granted to Gas Corporation.	9.11.00		
Easement	H594248	The right to enter upon the portion of the within land marked 'Easement' (inset A) on Land Administration Plan 20054 for the purpose of constructing, maintaining and using electrical transmission works in, upon and across the said land as set out in the said Easement is granted to Electricity Corporation.	9.11.00		

NOTE : ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SIGNATURE OF THE REGISTRAR OF TITLES ARE CANCELLED.

83673/10/89-500-G472

www.landgate.wa.gov.au

LANDGATE COPY OF ORIGINAL NOT TO SCALE 16/06/2025 02:37 PM Request number: 68344374
www.landgate.wa.gov.au

FORM 8

ANNEXURE B OF STRATA ~~/SURVEY - STRATA~~ PLAN No. 9013 REGISTRAR OF TITLES

SCHEDULE OF ENCUMBRANCES ETC.

Instrument			Regist'd	Signature of Registrar of Titles	Cancellation				
Nature	Number				Nature	Number	Regist'd	Time	Signature of Registrar of Titles
Easement	H594249	The right to enter upon the portion of the within land marked ~~'Easement' (inset B) on~~ Land Administration Plan 20054 for the purpose ~~of exercising certain telecommunication rights~~ as set out in the said Easement is granted to Telstra Corporation Ltd.	9.11.00						
Easement	H594250	The right to enter upon the portion of the within land marked 'Easement' (inset B) on Land Administration Plan 20054 for the purpose of exercising certain stormwater pipeline rights as set out in the said Easement is granted to City of Stirling.	9.11.00						
Easement	H594251	The right to enter upon the portion of the within land marked 'Easement' (inset C) on Land Administration Plan 20054 for the purpose of exercising certain water/sewage pipeline rights as set out in the said Easement is granted to Water Corporation.	9.11.00						

Note: Entries may be affected by subsequent endorsements.

Appendix 6:
Draft Deposited Plan

VER.	AMENDMENT	AUTHORISED BY	DATE
7	Convert Lots 104 & 300 to Road Add Lot 105	K. BOWYER	17/4/2023

FOR ROAD CLOSURE INSET
FORMER TENURE & INTERESTS AND NOTIFICATIONS
SEE SHEET2

ENLARGEMENT 'M'
NOT TO SCALE

ENLARGEMENT 'O'
NOT TO SCALE

ENLARGEMENT 'P'
NOT TO SCALE

ENLARGEMENT 'S'
NOT TO SCALE

ENLARGEMENT 'L'
NOT TO SCALE

ENLARGEMENT 'K'
NOT TO SCALE

ENLARGEMENT 'R'
NOT TO SCALE

SCARBOROUGH BEACH ROAD

BOWRA AVENUE

EWEN STREET

HAKEA ROAD

ROAD WIDENING
1m²

105
92m²

101
929m²

103
1198m²

100
1.0901 ha.

- SHN & Plate in Paving
- R/S in Paving

RM SURVEYS LICENSED SURVEYORS
(08) 9457 7900 RMSURVEYS.COM.AU
RMS REF: DWA - EWEN

10 0 SCALE 1:600 50
ALL DISTANCES ARE IN METRES

TYPE	FREEHOLD S.S.A. NO
PURPOSE	SUBDIVISION
PLAN OF	LOTS 100, 101, 103, 105, ROADS, ROAD WIDENING AND EASEMENTS
FORMER TENURE	SEE FORMER TENURE TABLE
LOCAL AUTHORITY	CITY OF STIRLING
LOCALITY	INNALOO / WOODLANDS
D.O.L. FILE	50397 / 2005 V2
FIELD RECORD	110330

SURVEYOR'S CERTIFICATE - REG 54

I, Keith L. BOWYER
hereby certify that this plan is accurate and is a correct representation of the -
(a) *survey; and/or
(b) *calculations from measurements recorded in the field records,
[* delete if inapplicable]
undertaken for the purposes of this plan and that it complies with the relevant written law(s) in relation to which it is lodged.

19-Oct-15

LICENSED SURVEYOR DATE

LODGED

DATE FEE PAID ASSESS No.

I.S.C.

EXAMINED

DATE

WESTERN AUSTRALIAN PLANNING COMMISSION
FILE 159887

Delegated under S.16 P&D Act 2005 DATE

IN ORDER FOR DEALINGS
SUBJECT TO

INSPECTOR OF PLANS AND SURVEYS DATE

APPROVED

INSPECTOR OF PLANS AND SURVEYS DATE
(S. 18 Licensed Surveyors Act 1909)

GOVERNMENT OF WESTERN AUSTRALIA

Landgate

DEPOSITED PLAN
64022
SHEET 1 OF 2 SHEETS
VERSION 7

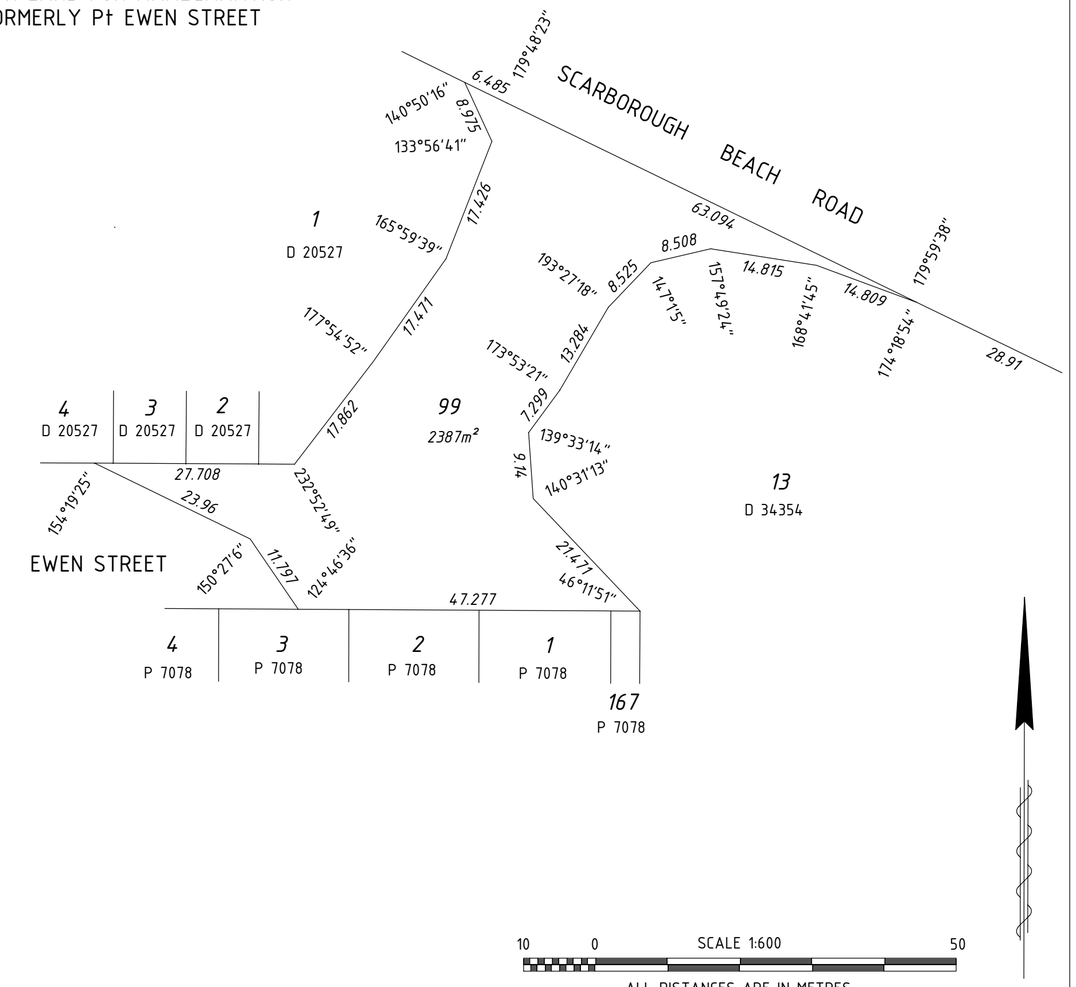
A2 ORIGINAL

HELD BY LANDGATE IN DIGITAL FORMAT ONLY

FORMER TENURE TABLE			
LOT	FORMER TENURE	ON PLAN / DIAGRAM	TITLE
LOT 100	LOT 99	INSET - THIS PLAN	
	Pt. LOT 50	DP 419546	
	Pt. LOT 1	P 7078	1286 / 171
	Pt. LOT 2	P 7078	1242 / 243
	Pt. LOT 3	P 7078	1266 / 231
	LOT 1	D 20527	1748 / 876
	LOT 2	D 20527	1748 / 876
	LOT 3	D 20527	1748 / 876
	Pt. LOT 4	D 20527	1615 / 879
	Pt. LOT 5	D 20527	1615 / 880
	Pt. LOT 167	P 7078	LR 3160 / 46
LOT 101	Pt. LOT 2	P 7078	1242 / 243
	Pt. LOT 3	P 7078	1266 / 231
	Pt. LOT 4	P 7078	1235 / 823
LOT 103	Pt. LOT 457	D 47616	1573 / 623
LOT 105	Pt. LOT 66	D 20527	1817 / 933

INSET
SCALE : 1: 600 @ A2

LOT 99 (ROAD CLOSURE) BEING
CROWN LAND FOR AMALGAMATION
FORMERLY Pt EWEN STREET



INTERESTS AND NOTIFICATIONS						
SUBJECT	PURPOSE	STATUTORY REFERENCE	ORIGIN	LAND BURDENED	BENEFIT TO	COMMENTS
Ⓑ	EASEMENT (Right of Carriageway)		Doc B352260 Doc B352565 Doc B354480 Doc B394490 Doc B991681	LOT 103	SEE DOCUMENT SEE DOCUMENT SEE DOCUMENT SEE DOCUMENT SEE DOCUMENT	
Ⓖ	EASEMENT		Doc	LOT 100	SEE DOCUMENT	RIGHT OF ACCESS
	EASEMENT		Doc	SEE DOCUMENT	LOT 100 Ⓗ	RIGHT OF ACCESS (SEE DP 65569)
Ⓜ	MEMORIAL	CONTAMINATED SITES ACT 2003	Doc K969972	LOT 105	Dept of ENVIRONMENT REGULATION	
33b	EASEMENT (Sewerage)	Sec 167 P & D Act, Reg 33(B)	THIS PLAN	LOT 100	WATER CORPORATION	
Ⓔ	EASEMENT	ENERGY OPERATORS (POWERS) ACT 1979	Doc	LOTS 100 & 101	ELECTRICITY NETWORKS CORPORATION	
Ⓘ	RESTRICTIVE COVENANT	Sec 129BA of the T.L.A.	Doc	LOT 100	ELECTRICITY NETWORKS CORPORATION	
	EASEMENT	Sec 136C of the T.L.A.	Doc	LOT 105	LOT 100	RIGHT OF ACCESS
	RESTRICTIVE COVENANT	Sec 136D of the T.L.A.	Doc	LOT 105	LOT 100	
	NOTIFICATION	Sec 1165 of the P & D Act	Doc	LOT 105	LOT 100	UN-SERVICED LOT

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RMS REF: DWA - EWEN

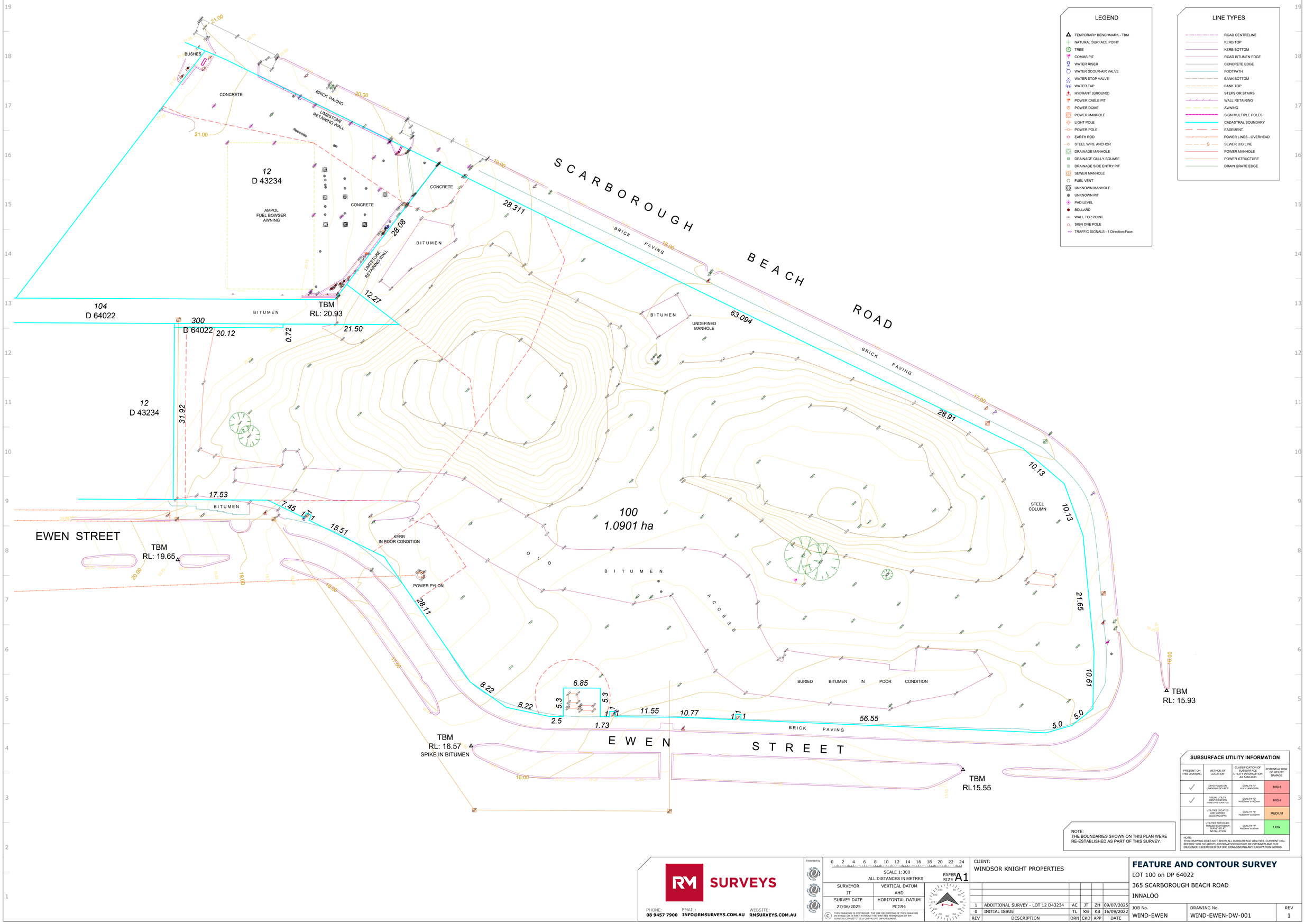
19-Oct-15
LICENSED SURVEYOR DATE

GOVERNMENT OF WESTERN AUSTRALIA

Landgate

DEPOSITED PLAN
64022
SHEET 2 OF 2 SHEETS
VERSION 7

Appendix 7:
Site Feature Survey



LEGEND

- TEMPORARY BENCHMARK - TBM
- NATURAL SURFACE POINT
- TREE
- COMMS PIT
- WATER RISER
- WATER SCOUR-AIR VALVE
- WATER STOP VALVE
- WATER TAP
- HYDRANT (GROUND)
- POWER CABLE PIT
- POWER DOME
- POWER MANHOLE
- LIGHT POLE
- POWER POLE
- EARTH ROD
- STEEL WIRE ANCHOR
- DRAINAGE MANHOLE
- DRAINAGE GULLY SQUARE
- DRAINAGE SIDE ENTRY PIT
- SEWER MANHOLE
- FUEL VENT
- UNKNOWN MANHOLE
- UNKNOWN PIT
- PAD LEVEL
- BOLLARD
- WALL TOP POINT
- SIGN ONE POLE
- TRAFFIC SIGNALS - 1 Direction-Face

LINE TYPES

- ROAD CENTRELINE
- KERB TOP
- KERB BOTTOM
- ROAD BITUMEN EDGE
- CONCRETE EDGE
- FOOTPATH
- BANK BOTTOM
- BANK TOP
- STEPS OR STAIRS
- WALL RETAINING
- AWNING
- SIGN MULTIPLE POLES
- CADASTRAL BOUNDARY
- EASEMENT
- POWER LINES - OVERHEAD
- SEWER U/G LINE
- POWER MANHOLE
- POWER STRUCTURE
- DRAIN GRATE EDGE

SUBSURFACE UTILITY INFORMATION

PRESENT ON THIS DRAWING	METHOD OF LOCATION	CLASSIFICATION OF SUBSURFACE UTILITY INFORMATION AS 5488-2013	POTENTIAL RISK OF UTILITY DAMAGE
✓	DBYD PLANS OR UNKNOWN SOURCE	QUALITY "D" H & V UNKNOWN	HIGH
✓	VISUAL UTILITY IDENTIFICATION (INDICATES MARKING)	QUALITY "C" H=500mm V=500mm	HIGH
	UTILITIES LOCATED AND MARKED (ELECTRO/GPR)	QUALITY "B" Ho300mm V±500mm	MEDIUM
	UTILITIES POTHOLED, TOPOGRAPHICALLY SURVEYED AT INSTALLATION	QUALITY "A" Ho50mm V±50mm	LOW

NOTE: THIS DRAWING DOES NOT SHOW ALL SUBSURFACE UTILITIES. CURRENT DIAL BEFORE YOU DIG (DBYD) INFORMATION SHOULD BE OBTAINED AND DUE DILIGENCE EXCERCISED BEFORE COMMENCING ANY EXCAVATION WORKS.

NOTE:
THE BOUNDARIES SHOWN ON THIS PLAN WERE RE-ESTABLISHED AS PART OF THIS SURVEY.

RM SURVEYS
PHONE: 08 9457 7900
EMAIL: INFO@RMSURVEYS.COM.AU
WEBSITE: RMSURVEYS.COM.AU

Endorsed by

0 2 4 6 8 10 12 14 16 18 20 22 24
SCALE 1:300
ALL DISTANCES IN METRES
PAPER SIZE A1

SURVEYOR	VERTICAL DATUM
JT	AHD
SURVEY DATE	HORIZONTAL DATUM
27/06/2025	PCG94

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CLIENT:
WINDSOR KNIGHT PROPERTIES

REV	DESCRIPTION	DRN	CKD	APP	DATE
1	ADDITIONAL SURVEY - LOT 12 D43234	AC	JT	ZH	09/07/2025
0	INITIAL ISSUE	TL	KB	KB	16/09/2022

FEATURE AND CONTOUR SURVEY

LOT 100 on DP 64022
365 SCARBOROUGH BEACH ROAD
INNALOO

JOB No. WIND-EWEN
DRAWING No. WIND-EWEN-DW-001
REV 1

Appendix 8:
Development Plans

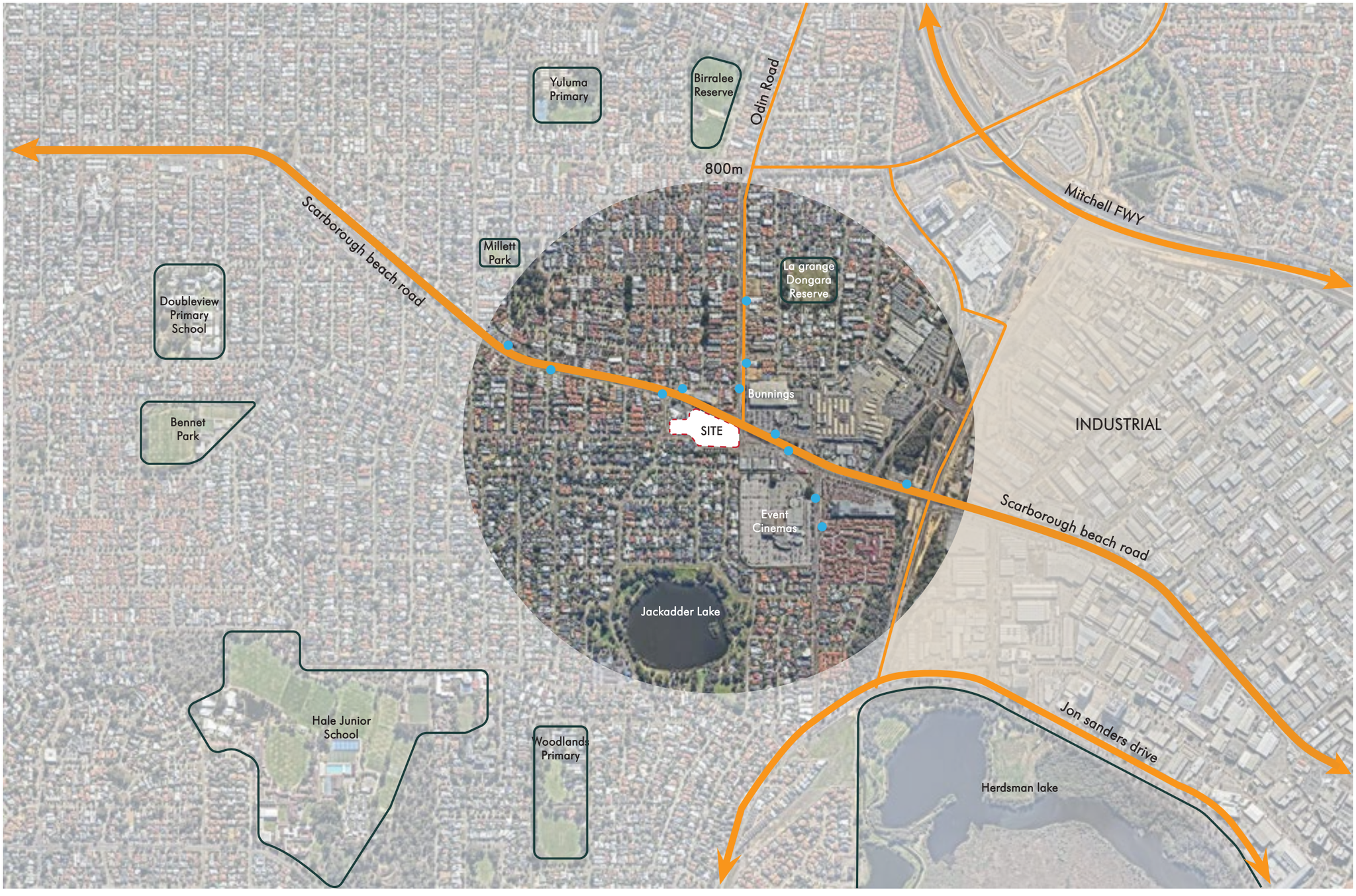
Woodlands North

Development Application

placefabric.

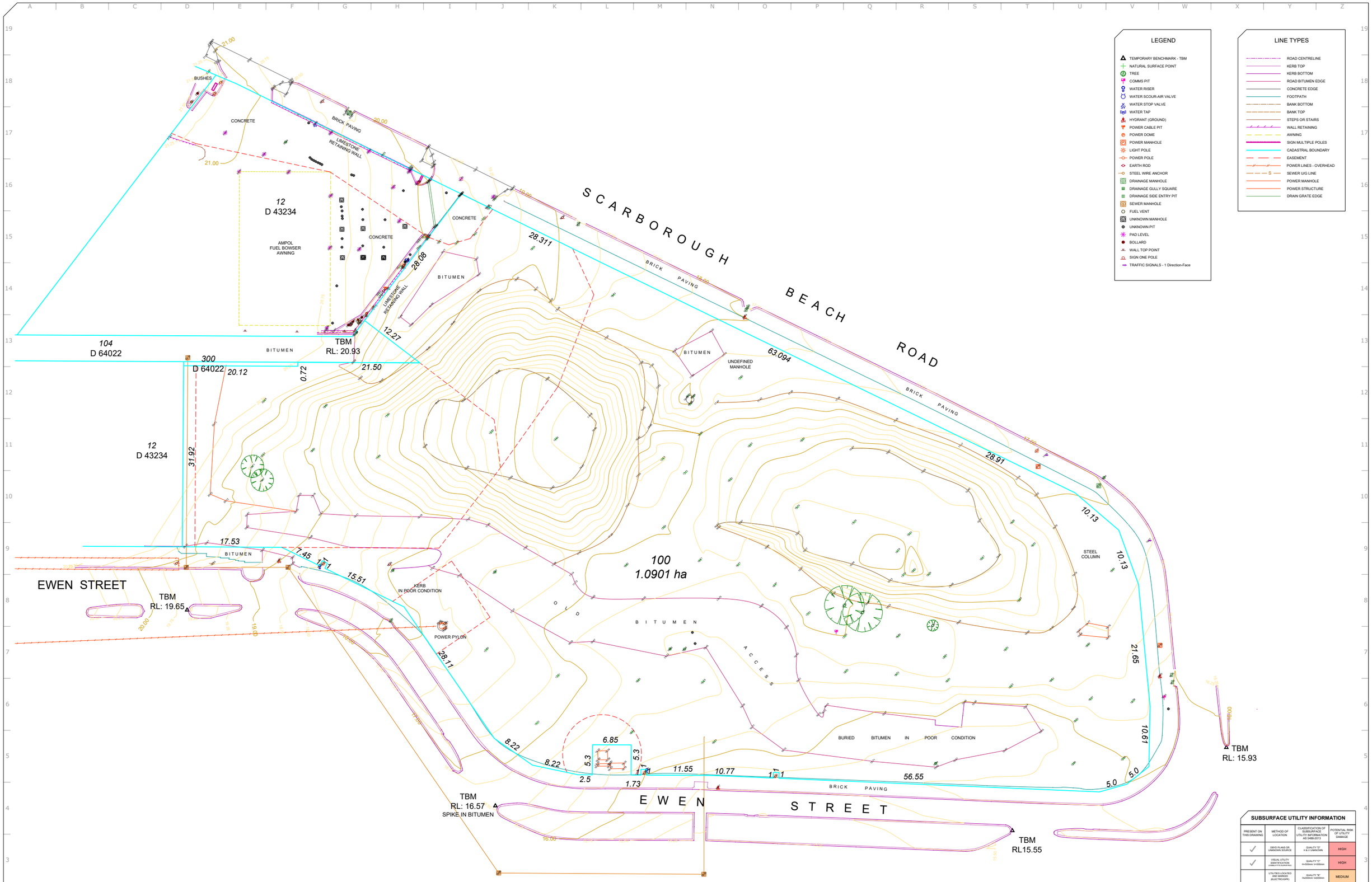
Rev C

19 08 2025



LEGEND

- Key Roads
- Bus stops



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EMAIL: INFO@RMSURVEYS.COM.AU
WEBSITE: RMSURVEYS.COM.AU

Endorsed by

0 2 4 6 8 10 12 14 16 18 20 22 24
SCALE 1:300
ALL DISTANCES IN METRES
PAPER SIZE A1

SURVEYOR	VERTICAL DATUM
JT	AHD
SURVEY DATE	HORIZONTAL DATUM
27/06/2025	PCG94

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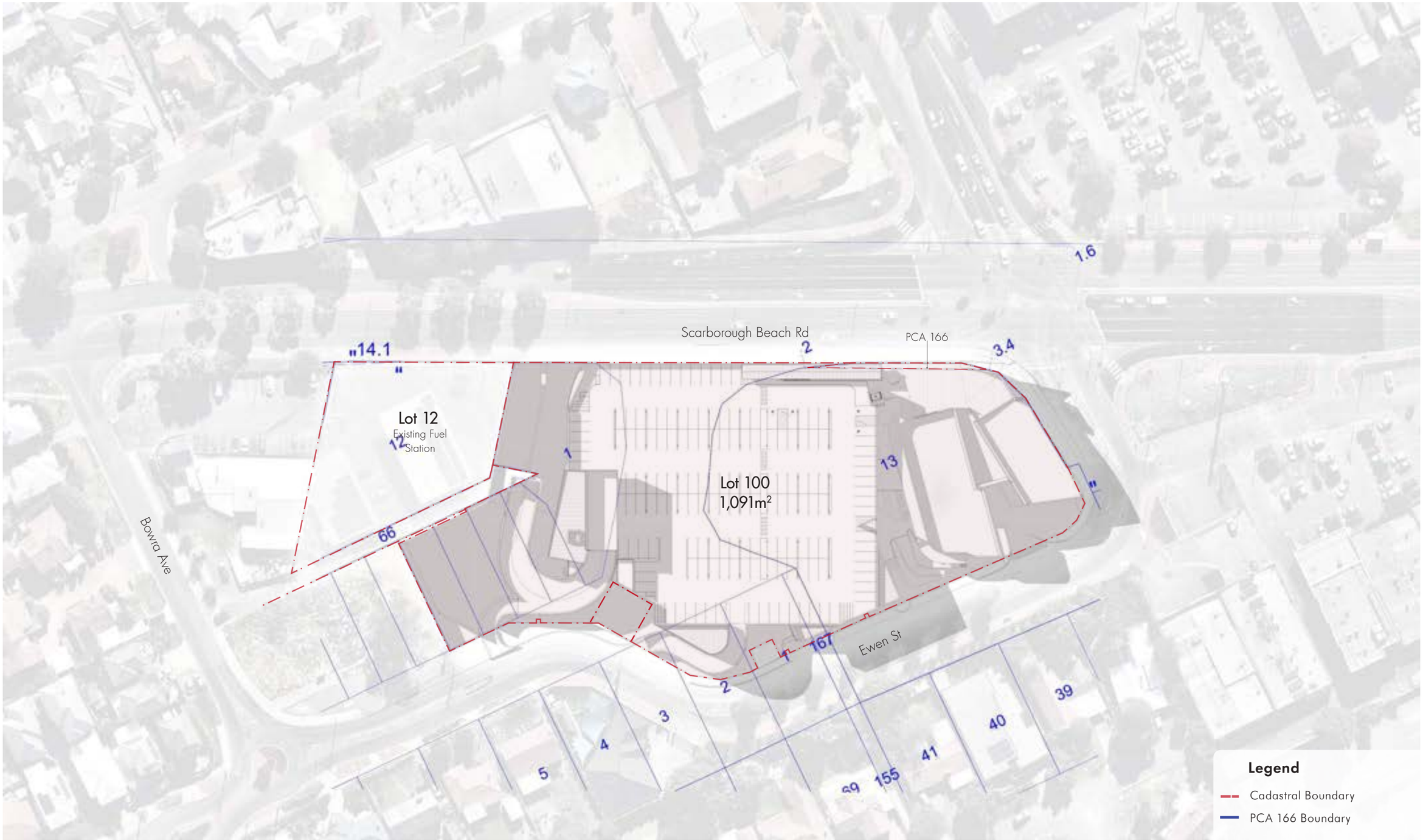
CLIENT:
WINDSOR KNIGHT PROPERTIES

REV	DESCRIPTION	DRN	CKD	APP	DATE
1	ADDITIONAL SURVEY - LOT 12 D43234	AC	JT	ZH	09/07/2025
0	INITIAL ISSUE	TL	KB	KB	16/09/2022

FEATURE AND CONTOUR SURVEY

LOT 100 on DP 64022
365 SCARBOROUGH BEACH ROAD
INNALOO

JOB No.	DRAWING No.	REV
WIND-EWEN	WIND-EWEN-DW-001	1



Scale 1:1000 @ A3

0 10 20 30 40 50

Boundary Information

Pg 4 Rev C

Woodlands North Development Application 08 2025

place fabric.



Scale 1:500 @ A3

0 5 10 15 20 25

Site Plan

Pg 5 Rev C

Woodlands North Development Application 08 2025

place fabric.



Scale 1:500 @ A3

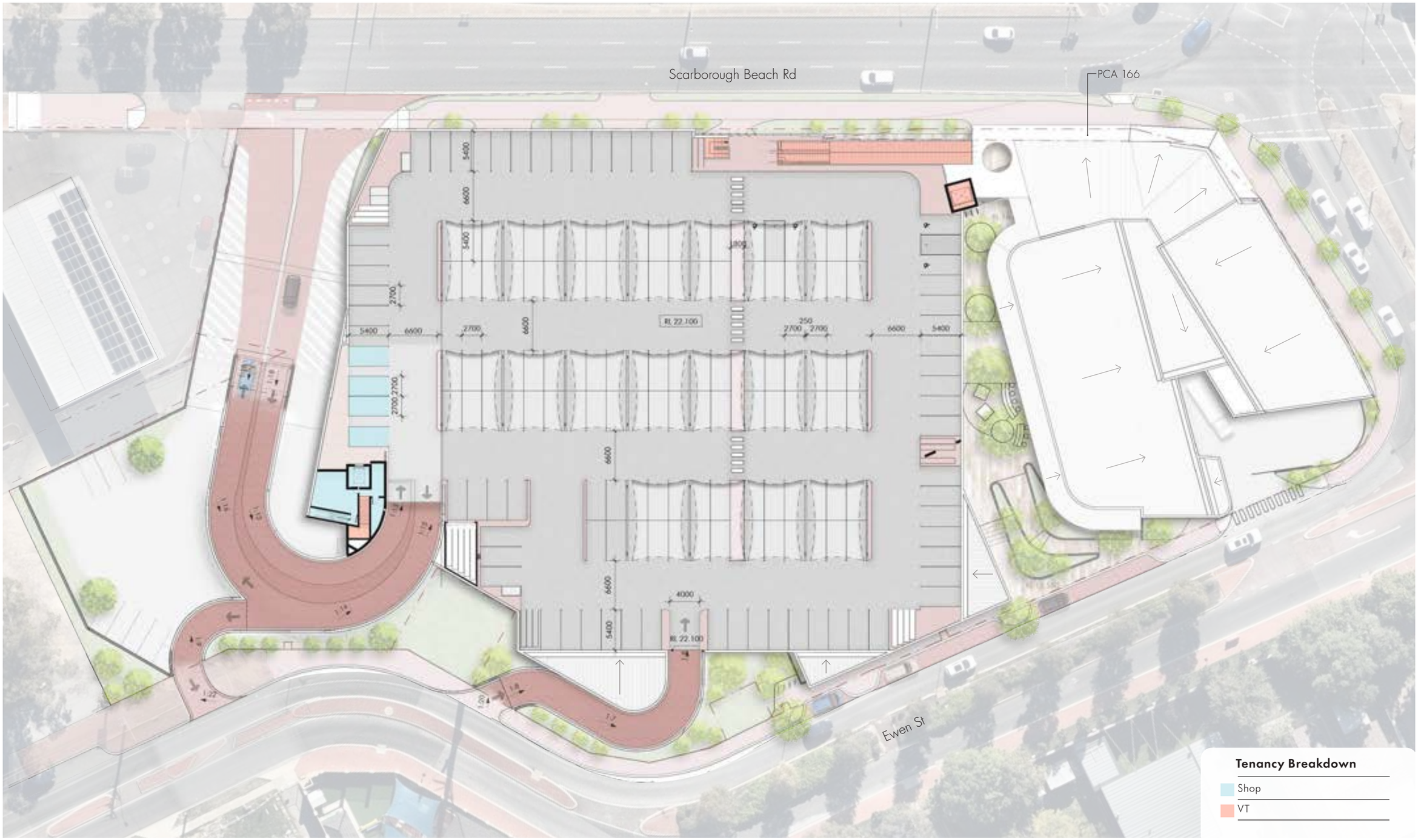
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Tenancies Site Plan

Pg 6 Rev C

Woodlands North Development Application 08 2025

place fabric.



Scale 1:500 @ A3

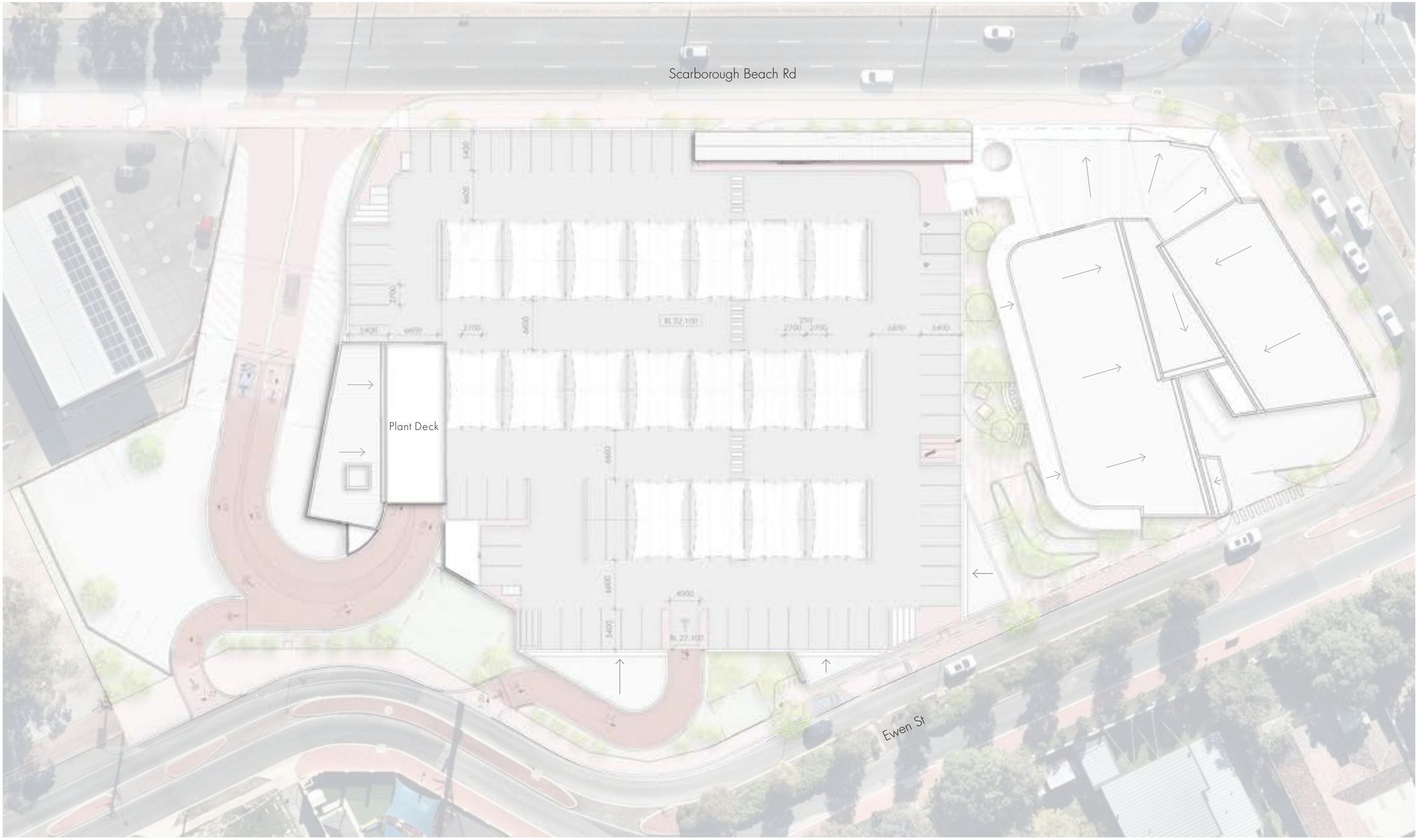
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Level 1 Plan

Pg 7 Rev C

Woodlands North Development Application 08 2025

place fabric.



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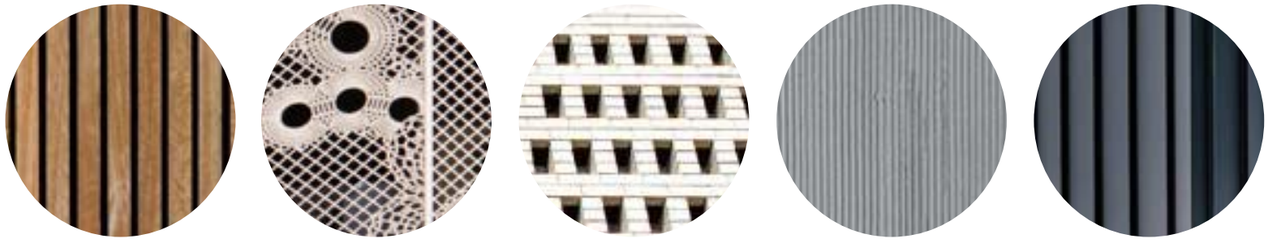
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Roof Plan

Pg 8 Rev C

Woodlands North Development Application 08 2025

place fabric.









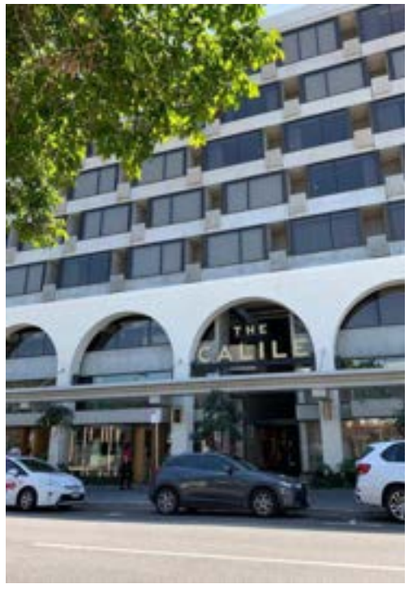










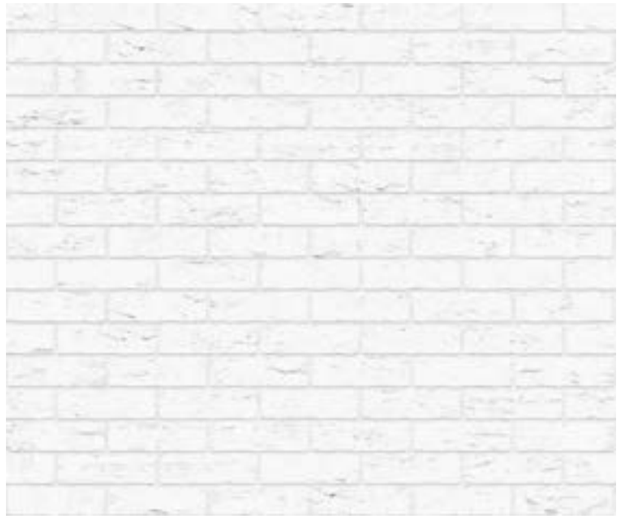

THE
CALILE



1.



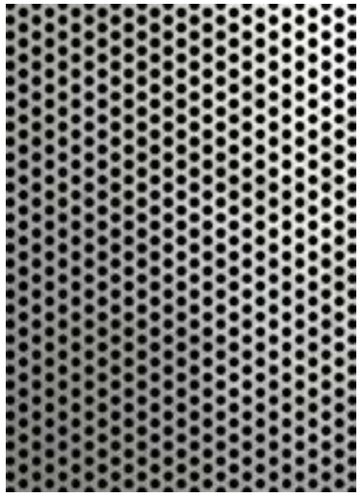
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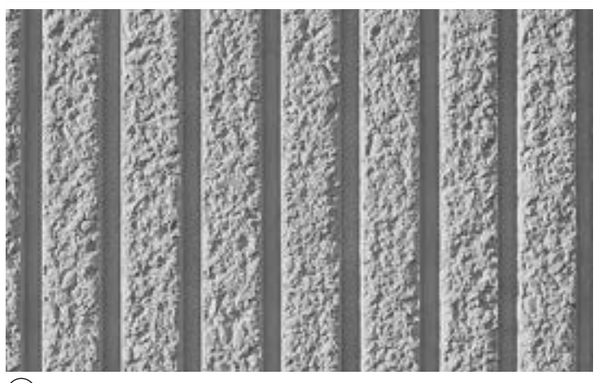
3.



4.



5.



6.



7.



Material Legend

1. Bronze Look Treatment
2. Textured concrete/Masonry
3. Substitute Timber Cladding
4. Perforated Metal
5. Patterned Concrete
6. Vertical Cladding
7. Featured Concrete Masonary



North Elevation - A

North Elevation - B

North Elevation - C



South Elevation - A

South Elevation - B

South Elevation - C



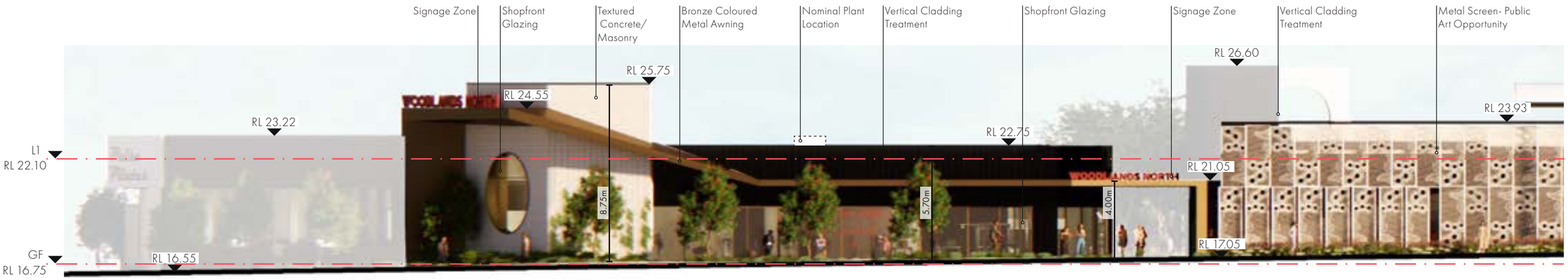
East Elevation - A

East Elevation - B

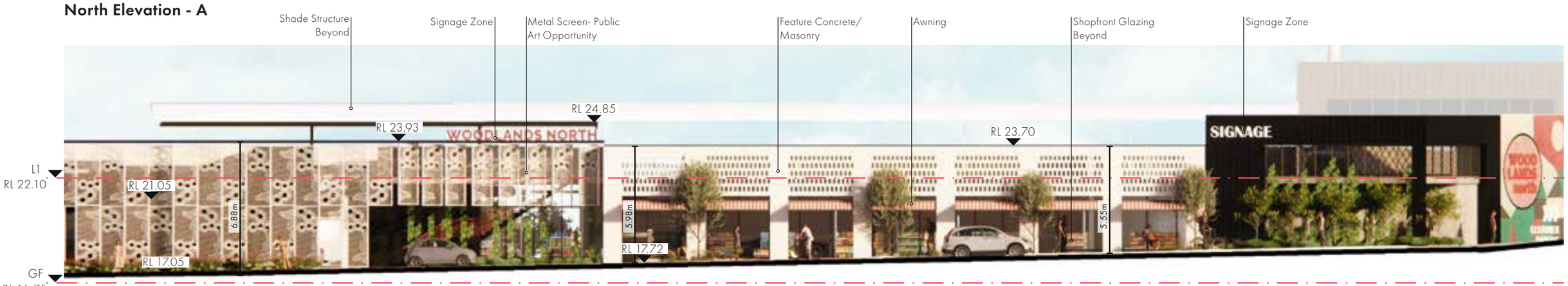


West Elevation - A

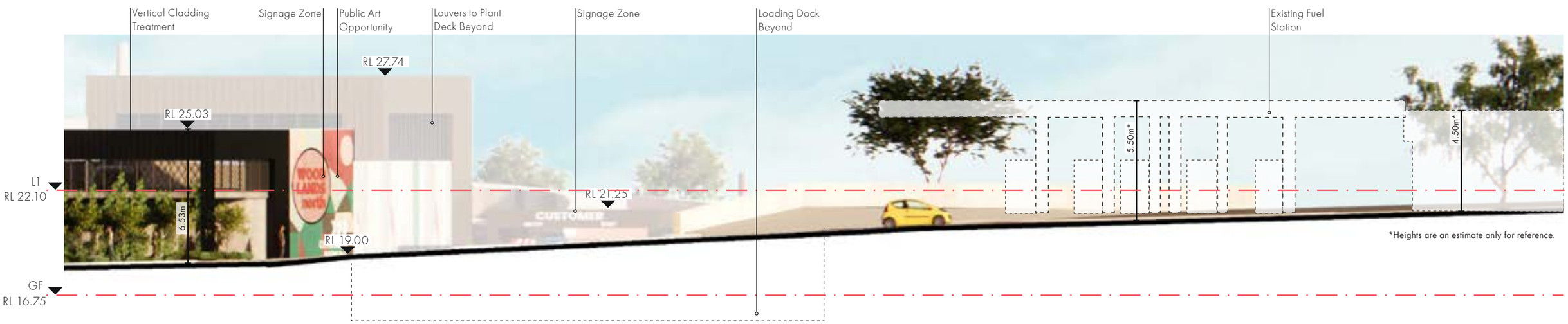
West Elevation - B



North Elevation - A



North Elevation - B



*Heights are an estimate only for reference.

North Elevation - C

Scale 1:200 @ A3

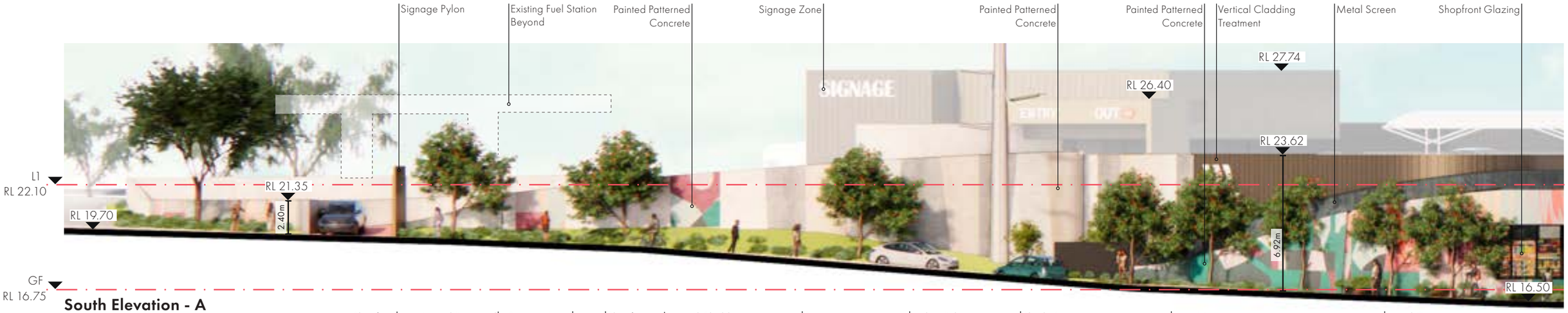
0 1 2 3 4 5 10

North Elevations

Pg 13 Rev C

Woodlands North Development Application 08 2025

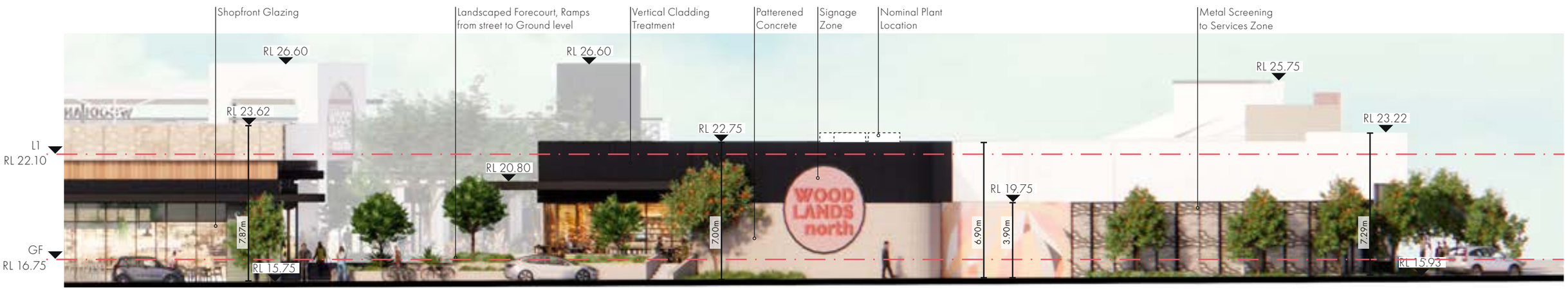
place fabric.



South Elevation - A



South Elevation - B



South Elevation - C

Scale 1:200 @ A3

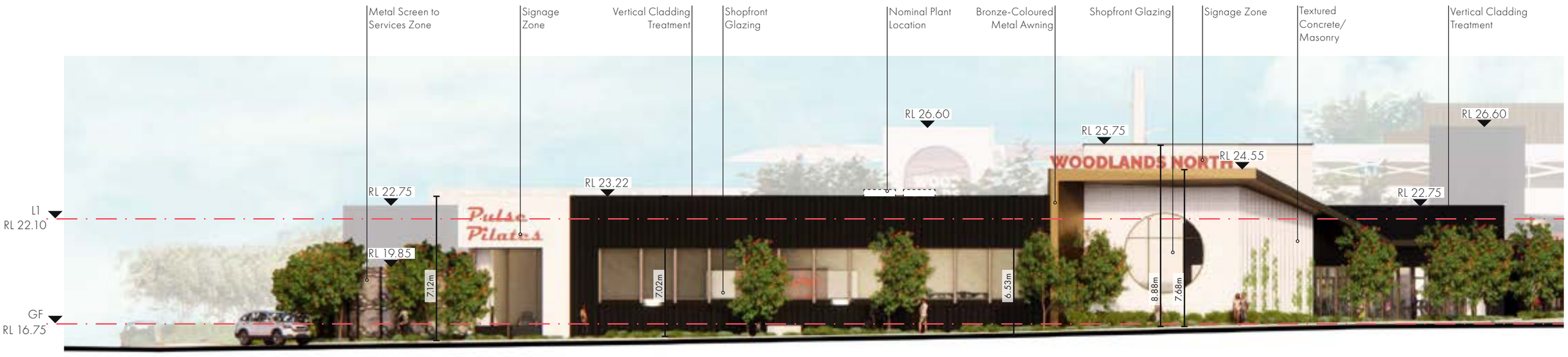
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South Elevations

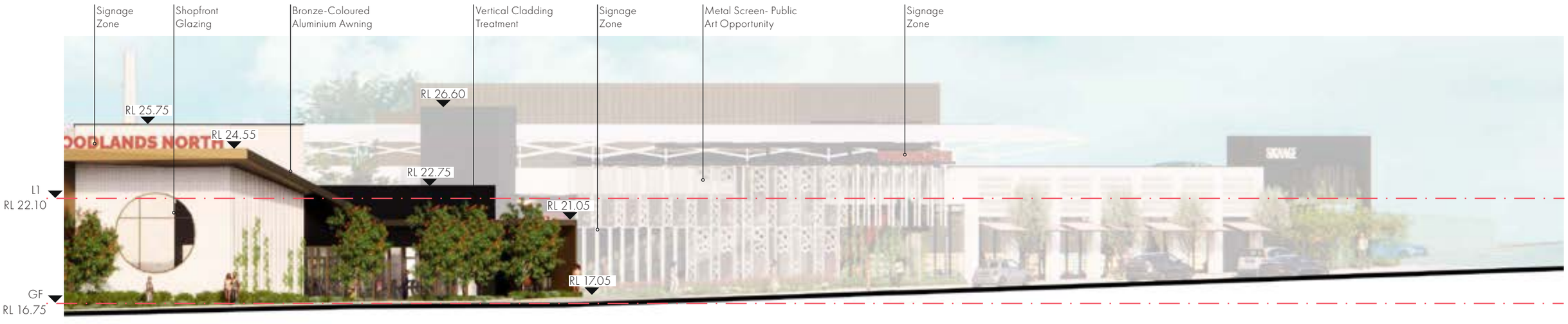
Pg 14 Rev C

Woodlands North Development Application 08 2025

place fabric.



East Elevation - A



East Elevation - B

Scale 1:200 @ A3

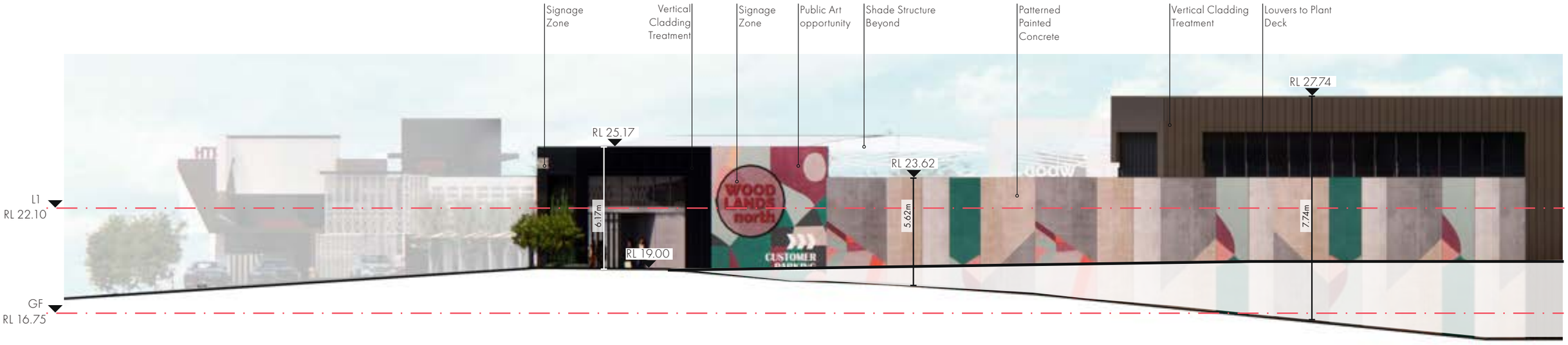
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East Elevations

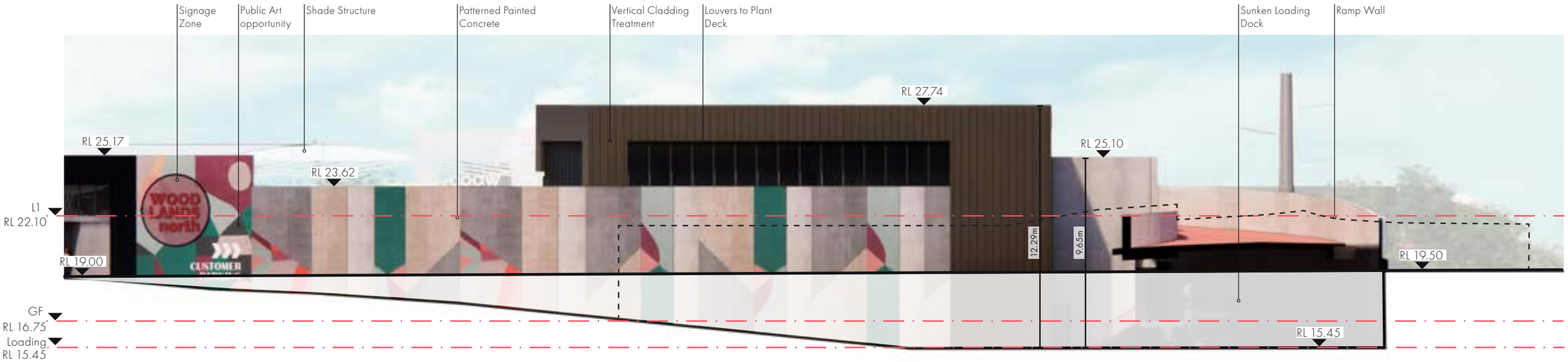
Pg 15 Rev C

Woodlands North Development Application 08 2025

place fabric.



West Elevation - A



West Elevation - B

Scale 1:200 @ A3

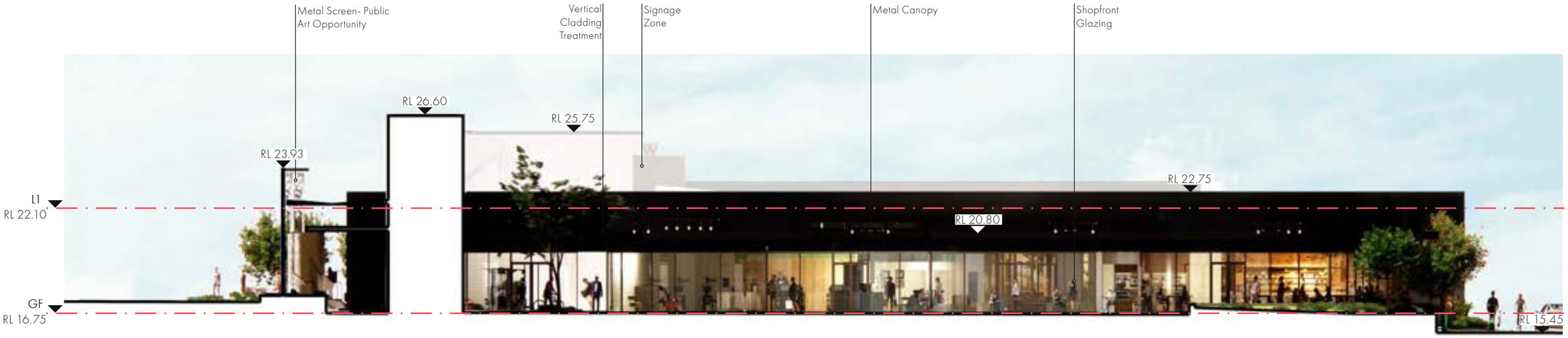
0 1 2 3 4 5 10

West Elevations

Pg 16 Rev C

Woodlands North Development Application 08 2025

place fabric.



East Laneway Elevation



West Laneway Elevation

Scale 1:200 @ A3

0 1 2 3 4 5 10

Laneway Elevations

Pg 17 Rev C

Woodlands North Development Application 08 2025

place fabric.

2305 Woodlands North

Total Site Development (For Reference Only)

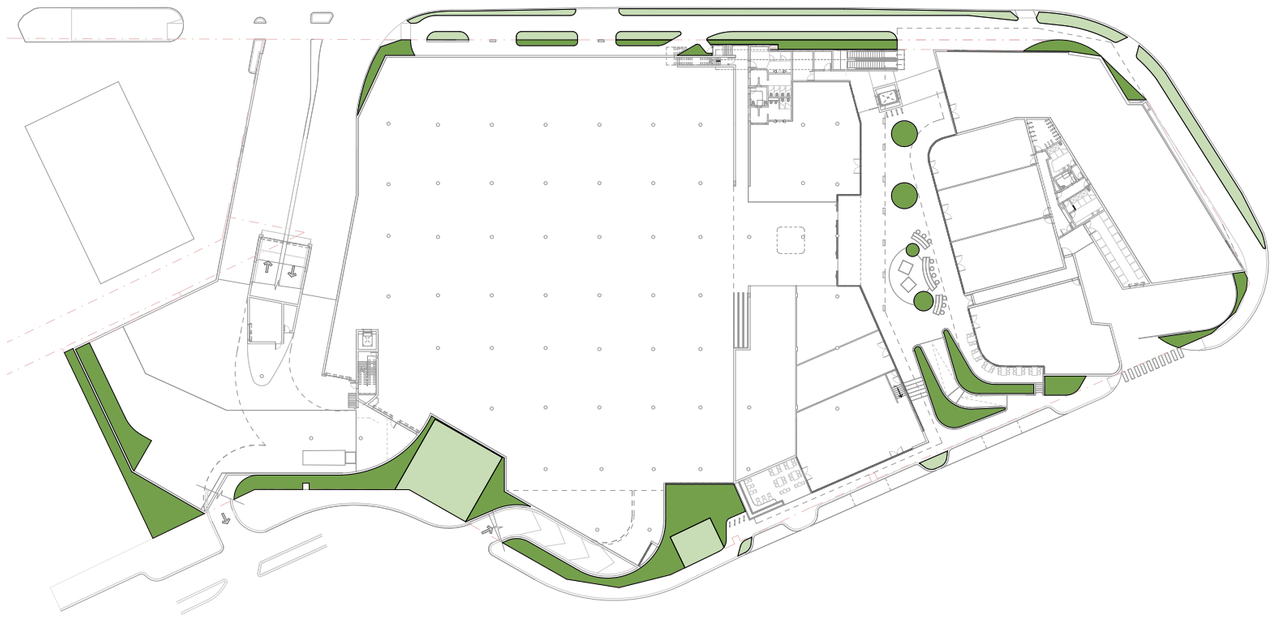
Rev Q (DA)

USE			GLAR (m²)
	T00	Shop	3826
	T01	Shop	240
	T02	Shop	266
	T03	Shop	111
	T04	Shop	100
	T05	Restaurant	228
	T06	Restaurant	237
	T07	Shop	130
	T08	Shop	129
	T09	Shop	118
	T10	Recreation - Private	672
		Mall	234
		Casual mall seating	17
		Corridors	75
		TOTAL	6383

ON-SITE BAYS (DECK)	156
Excluding Major Retail Pick Up Bays	4
TOTAL ON-SITE BAYS	156
Parking Ratio	2.5

ON-STREET BAYS	7
TOTAL BAYS AVAILABLE	163

TOTAL MOTORBIKE BAYS	4



Landscape Breakdown

- Landscaped Area Within Site
- Landscaped Area Outside Site

Area Breakdown

Within Site	628m²
Outside Site	412m²
Total Area	1,040m²
Percentage	9.6%

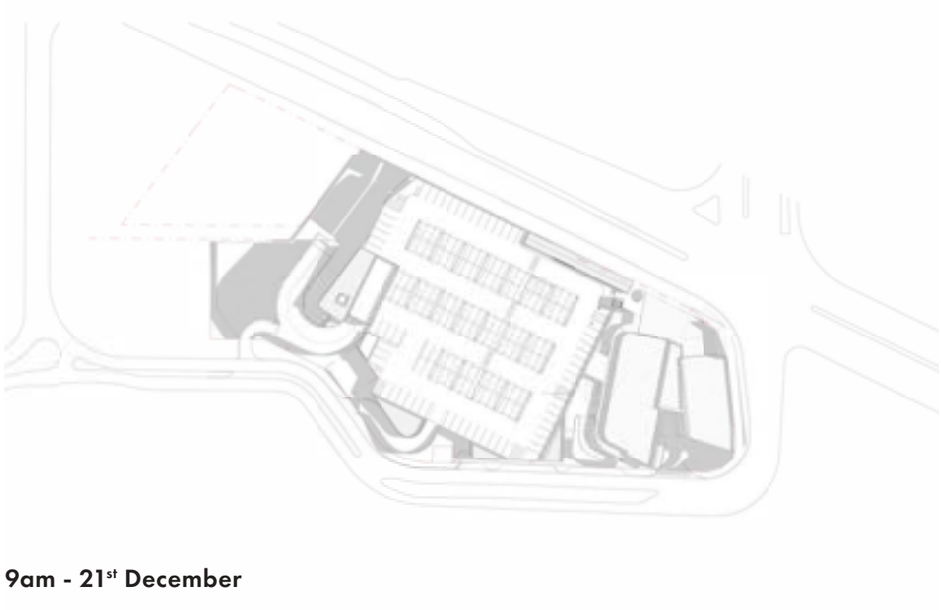
NOTES:

All areas are preliminary only and approximate.

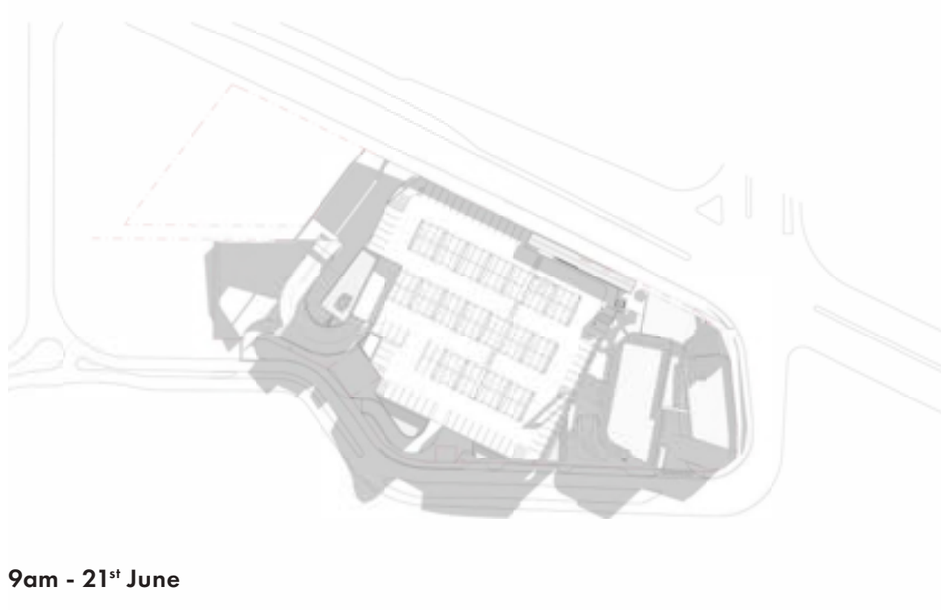
Final lease area calculations and calculations for any legal purposes should be undertaken by a qualified surveyor from the as-constructed conditions.

Areas are likely to adjust during the design development and documentation processes.

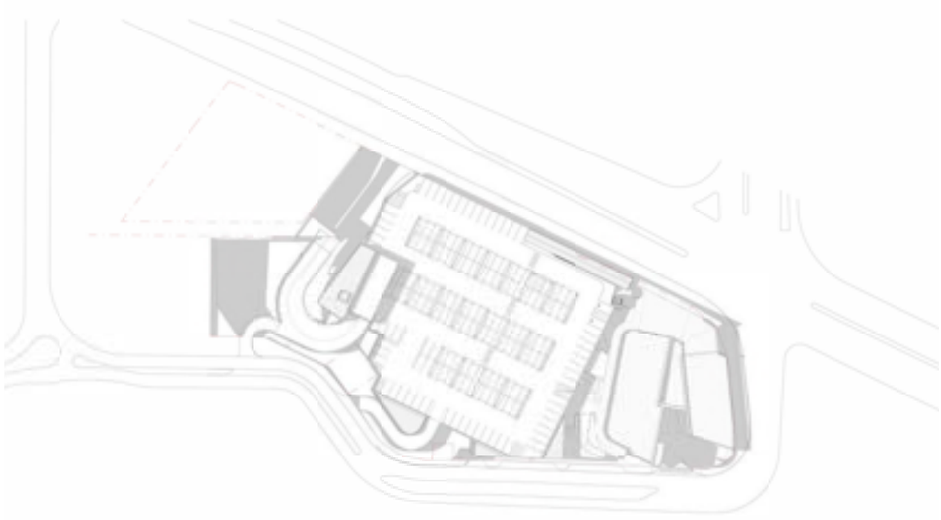
PLEASE NOTE: ALL AREAS IN SQUARE METRES



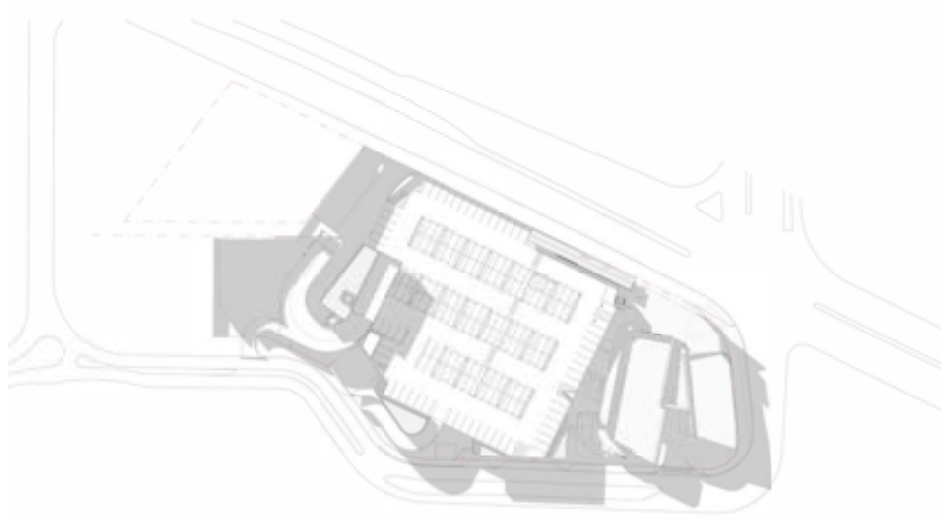
9am - 21st December



9am - 21st June



3pm - 21st December



3pm - 21st June

Scale 1:2000 @ A3

0 20 40 60 80 100

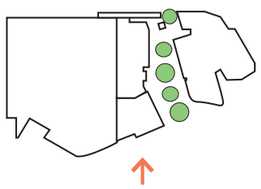
Sun Shading Diagrams

Pg 19 Rev C

Woodlands North Development Application 08 2025

place fabric.





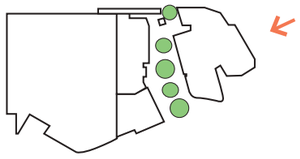
3D Render

Pg 20 Rev C

Woodlands North Development Application 08 2025

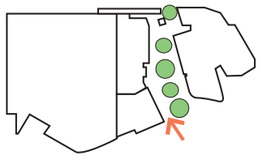
place fabric.



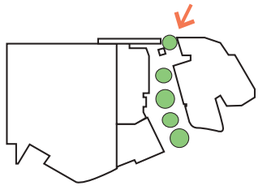


3D Render


OLSEN







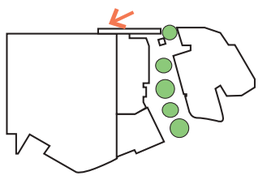
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Pg 23 Rev C

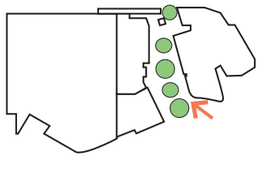
Woodlands North Development Application 08 2025

place fabric.









3D Render

Pg 25 Rev C

Woodlands North Development Application 08 2025

place fabric

Response to DRP2 Minutes

Context & Character

DRP 01- Panel Recommendations	Design Team Responses
a) The Panel is aware of the complex planning context for this site and advised that it's review would be, notwithstanding its use and modest scale compared to the ambition of the various relevant planning documents, based on the proposal being seen as approvable.	Noted.
b) The Panel noted that the provided functional context analysis was successful in guiding the design response and in demonstrating how the proposal will integrate into the context, in plan.	Noted.
c) The Panel stated the materiality, and connectivity is successful and sophisticated in relation to other commercial properties in the surrounding area.	Noted.

Response to DRP2 Minutes

Context & Character

DRP 01- Panel Recommendations	Design Team Responses
d) Comment was made by the Panel the signage on the east end works well. There is opportunity to improve the signage on the western end where the signage is bolder and to find a balance. It would be beneficial for the Panel to understand the intent of the signage strategy, particularly with relation to large format signage likely proposed for the major retailer(s).	The design team has considered the various probable locations for 'Centre ID', for major tenants' signage and for 'others' signage zones, but typically the approach taken is to formulate an overall signage and wayfinding pack and prepare a separate Development Application for same. At this stage, the design team is notionally showing some of the probable signage zones, in so much as this means they can determine 'architectural backgrounds' for signs that will likely be part of the above package. That is to say, the design sufficiently pre-empts and considers where signage might be, rather than seeing it applied randomly at a later date. Refinement of signage zones can only occur after negotation with all prospective tenants. Notwithstanding the above, the signage (and public artwork) at the western end has been updated for the Development Application.

Response to DRP2 Minutes

Context & Character

DRP 01- Panel Recommendations	Design Team Responses
e) The panel recommends reviewing the appearance and visibility of the roof elements from the Ewen St hill to the west and to use this analysis to inform the design of roof and services screening. The Panel was pleased to hear that the carpark shade structures will be lit at nighttime and will provide a feature element.	The roof plant area (and its design) is based around screening (visually and acoustically) the plant for the major tenant. There will be some evolution of this once secondary consultants are engaged to liaise with this tenant – ie after the lodgement of a Development Application. Notwithstanding this, the DRP's comments are noted and any design evolution will remain cognisant on how these areas present from the south west.
f) The Panel is generally supportive of the eastern end of the development and its integration into context but recommends reducing the extent of the service area on the south east corner and increasing activation to this corner with additional small retail offerings.	The applicant and the design team believe that the south eastern dock should be screened/enclosed and not 'on the street'.

Response to DRP2 Minutes

Landscape

DRP 01- Panel Recommendations

a) The Applicant was commended on the mature tree transplants included in the proposal.

b) The Panel stated the selection of trees is good although the Applicant was encouraged to look for alternatives which are not on the Polyphagous shot-hole borer list.

c) The comment was made by the Panel there could be opportunity to improve the street trees and landscaping in this area.

d) Comment was made by the Panel the deep soil zone (DSZ) requirement has not been met. There was a suggestion by the Applicant that this proposal should be considered “urban” with associated reduction in DSZ. The Panel does not agree and seeks justification for this discretion being sought and or more details on how planting will be introduced to meet the requirements.

Design Team Responses

While the site does not achieve the minimum 10% Deep Soil Area (DSA) on the lot itself due to spatial constraints and the urban nature of the development, the proposal includes:

Use of surrounding easement and verge areas to support deep-rooted planting, including larger canopy trees, contributing meaningfully to urban greening and mitigating the reduced on-site DSA.

A landscaped laneway corridor, which features mature tree planting and an integrated playscape. This space not only supports vegetation growth in structurally viable soil volumes but also activates the area as a safe, welcoming, and community-focused public realm.

Considered soil design solutions, such as increased soil depths and volumes in key planting locations (e.g., setbacks and courtyards), to ensure the health and longevity of proposed plantings, even where full DSZ dimensions cannot be achieved.

Response to DRP2 Minutes

Built Form & Scale

DRP 01- Panel Recommendations	Design Team Responses
a) Notwithsthanding its modesty in scale, the size of this single level structure has been designed to generally optimize the built form relationship to its context, especially to the eastern half of the site.	Noted.
b) In DRP1 the Panel commented the colonnade addressing Scarborough Beach Road, with clear glazing to reveal the inside of the supermarket, works well and provides the external pedestrian spaces with good amenity. However, the removal of the turning lane on Scarborough Beach Road has resulted in a second footpath. The Panel recommends further investigation of this new double pathway near the supermarket colonnade from an urban design perspective, as the added roadside footpath may reduce the colonnade's effectiveness. Additional landscaping could encourage users to favour the colonnade, enhancing its functionality and appeal.	The design team has modified the dual footpath design as referred to by the DRP. The design, as lodged for Development Approval, now shows a better connection between the undercover and exterior footpath. In so doing, the 'over-wide' footpath has been reduced slightly.
c) It was suggested by the Panel there is opportunity to reduce the excess of car parking and rationalise the ramping system into one crossover with both the exit and entry combined to one ramp and move the current ramp from Scarborough Beach Road which would create additional space on the south.	The carparking quantum and the methods of vehicle entry and exit have both been audited by the design teams planning and traffic engineering consultants and deemed to be suitable, safe and legible.

Response to DRP2 Minutes

Built, Form & Scale

DRP 01- Panel Recommendations	Design Team Responses
d) Since DRP1, improvements have been made to the south-eastern corner of the development, including a feature architectural element at the southern end of the Pilates/gym tenancy. The Applicant also noted during the meeting that reducing truck size has allowed for a smaller services yard in this area. However, the Panel believes the visual impact of this corner would benefit from further refinement. While the Applicant indicated that a small tenancy (such as a "hole-in-the-wall" cafe) is not financially feasible, the Panel suggests enhancing the corner's presence by integrating it more fully into the architectural form, minimizing reliance on fencing to define the space.	The design of the south-east corner referred to by the DRP has been further modified to further extend the frontage to this part of the Ewen Street corner. The design team has modified the design of the 'art-screen' and landscape elements by with intentionally to express this element differently to that of the built form of the gym.
e) The Panel received additional information around the south-western service zone which now has an additional vehicle ramp further reducing the opportunity for an activation in this area. In lieu of a lack of activated uses to this area, additional and more intensive landscaping could be provided, including on verge, to benefit the community.	The south-western dock has been reduced in size (which has compromised its functionality) and has significantly more landscaped area that was proposed at DRP1.

Response to DRP2 Minutes

Functionality and Built Quality

DRP 01- Panel Recommendations	Design Team Responses
a) The introduction of street parking is supported and a great outcome.	Noted
b) It was noted by the Panel the supermarket is sleeved or addresses the street which is a good outcome.	Noted
c) Comment was made the slip lane removal is a good outcome.	Noted.

Response to DRP2 Minutes

Sustainability

DRP 01- Panel Recommendations	Design Team Responses
a) The Panel thanked the Applicant for engaging a sustainability consultant.	Noted.
b) The Panel stated the proposed sustainability strategies are encouraging but currently lack commitment. The Applicant is recommended to provide additional information and commitments.	Refer to the reporting included in the Development Application.

Response to DRP2 Minutes

Amenity

DRP 01- Panel Recommendations	Design Team Responses
a) It was noted by the Panel bike parking has been integrated into the proposal and is supported.	Noted
b) Comment was made by the Panel the pedestrian laneway is a strong point of the design and provides excellent amenity and is well connected into the surrounding context.	Information on acoustics will be offered at lodgement of the DA (as required).
c) The Panel noted that the open-air design of the central arcade is a positive outcome but raised concerns about wind flow and mitigation strategies. The Applicant responded in the meeting, explaining that the building's low scale and the careful orientation of the space to manage prevailing breezes - drawing on insights from similar projects - address these concerns, which satisfied the Panel.	The design team has no concerns around the lane being 'windy,' and has considered this in the design, to the degree that the lane is angled slightly to the south-east to mitigate any negative impacts of the prevailing south-western breezes.
d) The Panel recommends incorporating design elements that break up the glazing along the northern facade facing the supermarket colonnade. This approach could include varied fenestration patterns, recessed sills, or alernative materials to avoid a continuous, unarticulated stretch of floor-to-ceiling glass, creating a more engaging and visually dynamic frontage whilst maintaining the high levels of visual connection.	The design as lodged for Development Approval has slightly modified the design of the north facing glazing under the colonnade. The design team also notes that there is a significant amount of clear glazing to the trading floor areas of the major tenancy - which the tenant has resisted, but the developer has insisted upon.
e) The Panel suggests incorporating a window at the northern end of the north-south service corridor to the west of the supermarket.	The design team does not endorse the idea of any window openings into the 'back of house' areas of the major tenant.

Response to DRP2 Minutes

Legibility

DRP 01- Panel Recommendations	Design Team Responses
a) The Panel is satisfied with the legibility of the proposal and stated it works well.	Noted.

Response to DRP2 Minutes

Safety

DRP 01- Panel Recommendations

a) This principle is supported on the condition the play space is not going to be formalised as a childern's play space.

Design Team Responses

Noted.

Response to DRP2 Minutes

Community

DRP 01- Panel Recommendations

a) This project is a good outcome for the community in this location and is supported by the Panel.

Design Team Responses

Noted.

Response to DRP2 Minutes

Aesthetics

DRP 01- Panel Recommendations	Design Team Responses
a) The aesthetics of the eastern half of the proposal are progressing well including considered articulation, variation, colour, and façade treatments to enhance the local precinct generally.	Noted.
b) The inclusion of breeze blocks is successful.	Noted.
c) The Panel are supportive of the additional elements to the south-eastern corner of the health and wellness tenancy which now provides some pedestrian activation.	The design of the south-east corner referred to by the DRP has been further modified to further extend the frontage to this park of the Ewen Street corner.
d) The Panel suggests enhancing the south-east corner's presence by integrating it more fully into the architectural form, minimizing reliance on fencing to define the space.	The design team has modified the design of the 'art-screen' and landscape elements but wish intentionally to express the element differently to that of the built form of the gym.
e) The Panel suggested that the approach to artwork and articulation should be more restrained to complement the building's delicate and sophisticated architecture. Overly bold treatments may detract from the elegance of the design, whilst a lack of any treatment will deliver unwelcome blank façades.	All artwork shown on drawings is simply as 'a placeholder' for works that are yet to be commissioned by the developer. The design team is however keen to apply artworks generally where it is shown and for it to 'make a statement.'

Response to DRP2 Minutes

Aesthetics

DRP 01- Panel Recommendations

f) The Panel note the important opportunity for passive nighttime lighting in the proposal.

Design Team Responses

Noted.

Appendix 9:
Sustainability Strategy

SUMMATION

Woodlands North

Sustainability Strategy

Prepared for: Windsor Knight Pty Ltd

Prepared by: Prasanna Suraweera

Date: 21/10/2024

Revision: 001
Project Ref: SUPER24045



Executive Summary

This Sustainability Strategy has been prepared to outline the initiatives that are being incorporated in the Woodlands North Development located in Innaloo, WA.

Summation Pty Ltd has been engaged as the sustainability consultants for the project and will be responsible for the delivery of the sustainability objectives. The sustainability team for this project will be led by Prasanna Suraweera, who is a Director with Summation and a Green Star Accredited Professional with over 20 years of experience in delivery of sustainable developments. It is confirmed that Summation has been engaged during the planning stage.

The following guidelines are acknowledged as applicable to the site and this strategy addresses Principal 5 – Sustainability of the Design Quality Evaluation requirements:

- WA State Planning Policy 7.0 – Design of the Built Environment

"Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes."

Summary of the key sustainability initiatives targeted for the project are outlined below:

- Passive Design Features
- Energy Efficiency and Operational Carbon
- Water Sensitive Design
- Waste Minimisation

Refer to Section 2 for further discussion of the proposed initiatives.

Contents

1 Introduction 3

1.1 Project Background 3
1.2 Disclaimer 3
1.3 WA State Planning Policy 7.0 – Design of the Built Environment 4

2 Proposed Initiatives 5

2.1 Summary of Initiatives 5
2.2 Passive Design Features 5
2.3 Energy Efficiency and Operational Carbon 5
2.4 Solar PV 6
2.5 Water Sensitive Design 6
2.6 Waste Minimisation 6

List of figures

Figure 2 - Site Location and Context 3

Figure 3 – SPP7.0 Sustainability Extract 4

Figure 2 – Key initiatives Considered 5

Abbreviations/Glossary

Abbreviation	Description
ESD	Environmentally Sustainable Design
GBCA	Green Building Council of Australia
GSAP	Green Star Accredited Professional
KPI	Key Performance Indicators
EOT	End of Trip
NCC	National Construction Code
BMS	Building Management System

1 Introduction

1.1 Project Background

The proposed Woodlands North project is located on Lot 100 on Ewen Street Innaloo, WA. The site location is shown in Figure 1 below.



Figure 1 - Site Location and Context

1.2 Disclaimer

This report provides high level guidance regarding the sustainability commitments targeted for this project and the preliminary strategies and initiatives to be adopted therein.

The purpose of this report is to articulate the sustainability initiatives being committed by the project. Due care has been taken to ensure the initiatives are coordinated and achievable for the project, however, note that the specific strategies mentioned in this report are indicative and may evolve throughout the futures stages of design.

1.3 WA State Planning Policy 7.0 – Design of the Built Environment

Refer below for extract of the State Planning Policy as it relates to the sustainability requirements therein. The initiatives outlined in this report is in response to this criterion.

5. Sustainability

Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.

Sustainable landscape and urban design adheres to established water-sensitive urban design principles, minimises negative impacts on existing natural features and ecological processes and facilitates green infrastructure at all project scales.

Sustainable built environments use passive environmental design measures at various scales, responding to local climate and site conditions by providing optimal orientation, shading, thermal performance and natural ventilation. Reducing reliance on technology for heating and cooling minimises energy use, resource consumption and operating costs over the life-cycle of the project.

Sustainable design also includes the use of sustainable construction materials, recycling, good waste management practices, re-use of materials and existing structures, harnessing of renewable energy sources, and total water cycle management.

Figure 2 – SPP7.0 Sustainability Extract

2 Proposed Initiatives

2.1 Summary of Initiatives

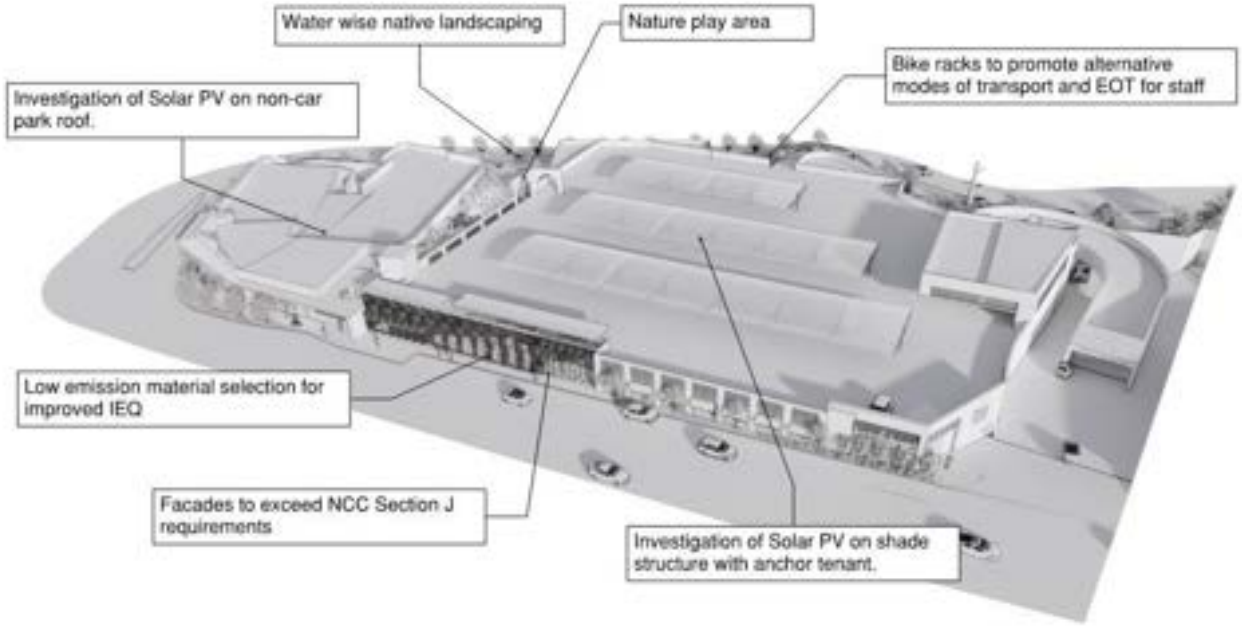


Figure 3 – Key initiatives Considered

A summary and discussion of the key initiatives proposed are outlined below:

- Passive Design Features
- Energy Efficiency and Operational Carbon
- Water Sensitive Design
- Waste Minimisation

2.2 Passive Design Features

Passive design features provide the ideal mechanism for improving energy efficiency. With retail centres, this approach must be cognisant of the functional requirements for shop front glazing. Therefore the project will target high performance glazing systems together with external shading to provide suitable protection.

Key passive design outcomes achieved for this project include:

- Balance of window-to-wall ratio.
- Facades to exceed NCC Section J requirements.
- External shading to exposed glazing.

2.3 Energy Efficiency and Operational Carbon

Energy efficiency requires combination of high-performance building envelope together with efficient servicing strategy. The following fundamental concepts will be considered in the design of this development:

- Efficient HVAC Services – Reverse cycle AC systems.
- High efficiency LED light fittings.
- 30kW Solar PV System to non-car park roof.

2.4 Solar PV

Provision of renewables is critical to the sustainability performance of buildings. It is a key initiative for reducing carbon emissions and will also provide operating cost benefits. Refer below for details of the proposed Solar PV system.

- 30kW Solar PV (~200sqm of roof space)
    - ~48,000 kWh per annum
    - ~24,000 kgCO2e saving per annum

2.5 Water Sensitive Design

Water efficiency will be targeted through careful consideration of end uses for the development. The following initiatives will be targeted:

- Waterwise landscaping to minimise dependence on potable water.
- High efficiency fittings and fixtures – High Water Efficiency Labelling and Standards (WELS) rated fittings:
    - Taps – 5 Star
    - Toilets – 4 Star
    - Showers – 3 Star (7.5 l/min)

2.6 Waste Minimisation

The waste storage areas have sufficient allowance to enable effective waste separation and recycling to occur. Appropriate waste sorting area has been determined based on the expected throughput of each waste streams, these have been located with safe efficient access by staff and waste vehicles. Specific waste streams targeted include the following:

- General
- Comingled Recycling



SUMMATION

Appendix 10:
Landscaping Plan



WOODLANDS NORTH
LANDSCAPE DEVELOPMENT APPLICATION

UDLA

TABLE 1 EDITION DETAILS

PROJECT NAME	
Title	Woodlands North Landscape Development Application
Production Date	4th September 2025
Prepared By	UDLA
Author	Theo Valentine
Status	DA ISSUE
UDLA Project Code	WOODA

TABLE 2 DOCUMENT REGISTER

DOCUMENT REGISTER

Version	Date	Amendments	Prepared By
A	18/06/24	DRAFT	TV
B	25/06/24	DRAFT	TV
C	27/06/24	DRP ISSUE	TV
D	27/06/24	DRP ISSUE 1	TV
E	20/08/24	DRP ISSUE 2	TV
F	03/10/24	DRP ISSUE 3	TV
G	21/11/24	DA ISSUE	TV
H	04/09/25	DA ISSUE	TV

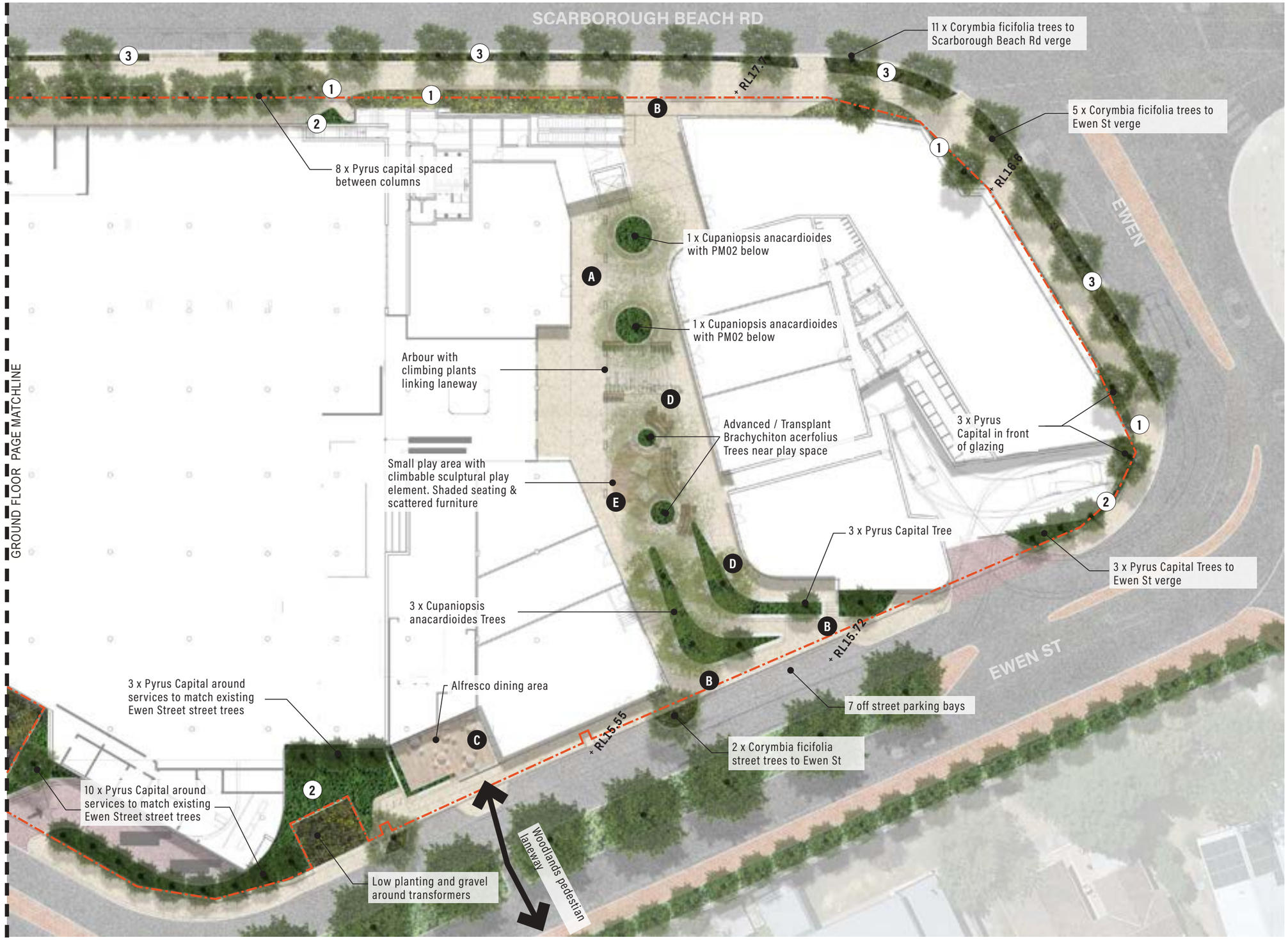
Prepared for: Windsor Knight / Place Fabric

Prepared by: UDLA

Contact: Scott Lang
Position: UDLA Director
Phone: (08) 9336 7577
Email: scott@udla.com.au

LEVEL 1A, 3-5 JOSEPHSON STREET
FREMANTLE, 6160 WA
HELLO@UDLA.COM.AU | (08) 9336 7577

1.1 GROUND FLOOR PLAN



KEY

- Lot Boundary
- A The Laneway
- B Pedestrian entrance
- C Alfresco
- D Bike Parking
- E informal play area with sculptural play element
- 1 Plant Mix 1. Low Sunny Feature Planting
- 2 Plant Mix 2. Low Shady Feature Planting
- 3 Plant Mix 3. Low Verge Mix

General Notes:

All planting is in deep soil.

All landscape areas to be fully irrigated. Street tree irrigation may be switched off or reduced beyond the two year maintenance period.

Tree Location indicative pending service locations and sight-line analysis.

Suggested species list included on Pages 7-10.

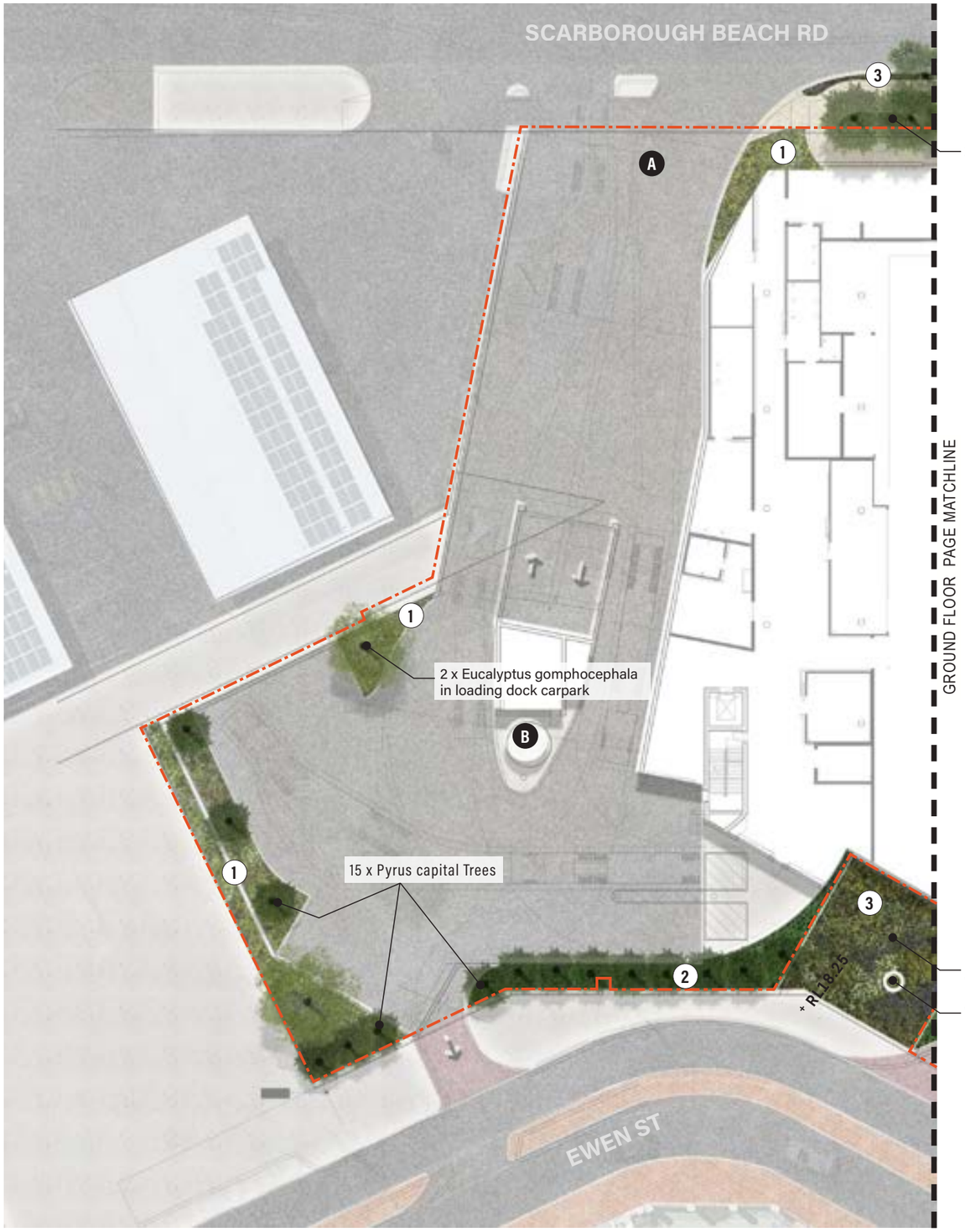
All garden beds to have 75mm depth pine bark mulch.

1:600 @ A3

0m 2m 10m 20m

UDLA 3

1.2 GROUND FLOOR PLAN



KEY

- Lot Boundary
- A — Vehicle entry
- B — Fire tanks
- 1 — Plant Mix 1. Low Sunny Feature Planting
- 2 — Plant Mix 2. Low Shady Feature Planting
- 3 — Plant Mix 3. Low Verge Mix

General Notes:

All planting is in deep soil.

All landscape areas to be fully irrigated. Street tree irrigation may be switched off or reduced beyond the two year maintenance period.

Tree Location indicative pending service locations and sight-line analysis.

Suggested species list included on Pages 7-10.

All garden beds to have 75mm depth pine bark mulch.

1:600 @ A3

0m 2m 10m 20m

2.1 INDICATIVE IMAGERY



















3.1 INDICATIVE MATERIALS LIST

SURFACE FINISHES



URBANSTONE SHOTBLAST PAVING MIX
GROUND FLOOR



EXPOSED AGGREGATE
GROUND FLOOR



GRANITE SETT FEATURE PAVING

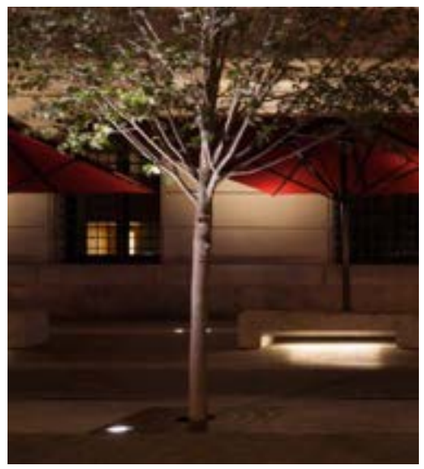


SOUTH WEST RIVER STONE - ATRIUM



CIRCULAR TREE GRATE CLASS A

FURNITURE & FIXTURE MATERIALS



IN-GROUND UPLIGHTING



LINEA RANGEBENCH SEATING



LINEA DDA BAR TABLE



LINEA RANGE BIKE STANDS



STAINLESS STEEL ROPE WIRE TRELLIS

4.1 TREES

EXISTING STREET TREES





Agonis flexuosa
Peppermint Tree
Size: 15m (h) x 10m (w)
Location: Scarborough Beach





Lophestemon conferta
Queensland Box Tree
Size: 8-12m (h) x 8m (w)
Location: Ewen St





Pyrus Capital
Ornamental Pear
Size: 6m (h) x 3m (w)
Location: Ewen St





Corymbia maculata
Spotted Gum
Size: 10m (h) x 5m (w)
Location: Ewen & S. Bch Rd

PROPOSED TREES





Cupaniopsis anacardioides
Tuckeroo
5m wide x 8m high
Use: Feature Tree





Corymbia ficifolia
Red Flowering Gum
4m wide x 6m high
Location: Street Tree S. Bch Rd & Ewen St





Pyrus Capital
Ornamental Pear
Size: 6m (h) x 3m (w)
Location: Ewen St





Brachychiton acerfolius
'Illawarra Flame Tree',
Mature size: 8m wide x 8m high.
Use: Laneway Tree

5.1 PLANTING PALETTE

MIX 1. LOW SUNNY FEATURE PLANTING 3 PLANTS PER SQ M



Westringia fruiticosa
'Coastal Rosemary',
Mature size: 0.6m x 1.2m



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Lomandra longifolia
'Tanika',
Mature size: 0.6m x 0.6m



Rosmarinus officianalis
'Prostrate Rosemary',
Mature size: 0.6m x 1.2m



Euonymus japonicus
Tom Thumb
0.5m H x 04m W



Chamelaucium uncinatum
'Wax Flower',
Mature size: 1.5m x 2m



Olearia axillaris,
Coastal Daisybush
Height: 1m x Width: 1-1.5m



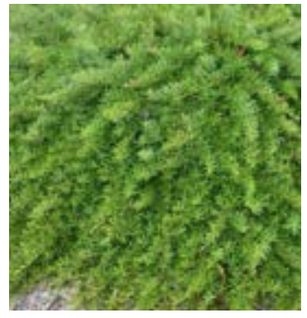
Casuarina glauca
'Cousin It',
Mature size: 0.3m x 1.2m



Raphiolepis indica
Snow Maiden
Mature size: 1m x 1m



Rosemary officianalis
Tuscan Blue
Mature size: 1m x 1.2m



Grevilllea 'Gin Gin Gem'
'Grevillea',
Mature size: 0.2m x 1.2m



Hemiandra pungens
Snake Bush
H: 0.2m x W: 1m



Ficinia nodosa,
Knotted Club Rush
H: 0.8m x W: 1m



Grevillea crithmifolia,
Grevillea
H: 0.2m-0.6M x W: 1m



Calothamnus quadrifidus,
One-sided Bottelbrush
H: 0.5m x W: 1m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m



Leucophyta brownii,
Cushion Bush
H: 0.7m x W: 1m

PLANTING PALETTE

MIX 2. LOW SHADY FEATURE PLANTING 3 PLANTS PER SQ M



Westringia fruiticosa
'Coastal Rosemary',
Mature size: 0.6m x 1.2m



Liriope Muscari
'Evergreen Giant'
H:0.4m x W:0.5m



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m



Juniperus conferta
Shore juniper
H:.4m x W:1m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Dichondra argentea
Silver Falls
H:0.5m x W:0.8m



Arthropodium cirratum
'NZ Rock Lilly'
H:0.6m x W:.5m



Hardenburgia comptoniana
'White Out"
H:0.6m x W:0.9m



Correa alba
'White Correa',
Mature size: 1.5m x 1.2m

CLIMBING TRELLIS



Trachelospermum jasminoides
'Star Jasmine'
H:0.4m x W:0.5m



Hardenburgia comptoniana
Native Whisteria
H:0.4m x W:0.5m



Billardiera fusiformis,
Australian Bluebell
H: 1m x W: 0.5m

PLANTING PALETTE

MIX 3. VERGE PLANTING MIX 3 PLANTS PER SQ M



Hibbertia scandens
'Snake Vine',
Mature size: .3m x 1.5m



Grevillea crithmifolia,
Grevillea
H: 0.2m-0.6M x W: 1m



Lomandra longifolia
'Tanika',
Mature size: 0.6m x 0.6m



Grevilllea 'Gin Gin Gem'
'Grevillea',
Mature size: 0.2m x 1.2m



Carpobrotus virescens,
Pigface
H: 0.2m x W: 2m



Eremophila glabra,
Kalbarri Carpet
H: 0.2m x W: 2m

6.1 DEEP SOIL ZONE & TREE CANOPY REQUIREMENTS

Site Area	Minimum deep soil area	Minimum Req for trees	Proposed trees
10, 772m2	Minmimum required DSA = 10% total area = **1,077m2** This proposal provides **628m2** DSA on ground	**2 x large** trees and **small and medium trees** to suit area.	**2 x large** trees, **2 x medium** trees and **69 x small** trees in deep soil

	Deep soil area (DSA) within lot	DSA Outside lot	Total
Ground	628m2	412m2	1040m2
Total	**628m2**	**412m2**	**1040m2**

	PM01 Low Sunny Feature Planting	PM02 Low Shady Feature Planting	PM03 Verge Mix	Total
Ground	379m2	414m2	348m2	1145m2
Total area	**379m2**	**414m2**	**348m2**	**1145m2**
Total plant qty	1137	1242	1044	3435

6.2 PLANT SCHEDULE

Botanical Name	Common Name	Native / Exotic	Use	Stock Sizes	QTY
Trees					
Corymbia ficifolia	Red Flowering Gum	Native	In ground	100lt	18
Pyrus capital	Ornamental Pear	Exotic	In ground	100lt	42
Brachychiton acerfolius	Illawarra Flame Tree	Native	In ground	Transplant	2
Cupaniopsis anacardioides	Tuckeroo	Native	In ground	100lt	7
Eucalyptus gomphocephala	Tuart	Native	In ground	200lt	2
				Total	71
PM01 - Low Sunny Feature Planting - 3 plants per sq m					
Billardiera fusiformis	Australian Bluebell	Native	Rambling	140mm	66
Calothamnus quadrifidus	One-sided Bottelbrush	Native	Shrub	140mm	66
Carpobrotus virescens	Pigface	Native	Groundcover	140mm	66
Casuarina glauca	Cousin It	Native	Rambling	140mm	66
Chamelaucium uncinatum	Wax Flower	Native	Shrub	140mm	66
Euonymus japonicus	Tom Thumb	Exotic	Low Shrub	140mm	66
Ficinia nodosa	Knotted Club Rush	Native	Rush	140mm	66
Grevillea crithmifolia	Grevillea	Native	Groundcover	140mm	66
Grevilllea 'Gin Gin Gem'	Gin Gin Gem'	Native	Groundcover	140mm	66
Hemiandra pungens	Snake Bush	Native	Groundcover	140mm	66
Hibbertia scandens	Snake Vine	Native	Rambling	140mm	66
Leucophyta brownii	Cushion Bush	Native	Low Shrub	140mm	66
Lomandra longifolia	Tanika	Native	Rush	140mm	66
Olearia axillaris	Coastal Daisybush	Native	Shrub	140mm	66
Raphiolepis indica	Snow Maiden	Exotic	Shrub	140mm	66
Rosmarinus officianalis	Prostrate Rosemary	Exotic	Rambling	140mm	66
Westringia fruiticosa	Coastal Rosemary	Native	Shrub	140mm	66
				Total	1137

PM02 Low Shady Feature Planting - 3 plants per sq m					
Arthropodium cirratum	NZ Rock Lilly	Exotic	Rush	140mm	124
Billardiera fusiformis	Australian Bluebell	Native	Rambling	140mm	124
Carpobrotus virescens	Pigface	Native	Groundcover	140mm	124
Correa alba	White Correa	Native	Shrub	140mm	124
Dichondra argentea	Silver Falls	Exotic	Groundcover	140mm	124
Hibbertia scandens	Snake Vine	Native	Groundcover	140mm	124
Hardenburgia comptoniana	White Out	Native	Rambling	140mm	124
Juniperus conferta	Shore juniper	Exotic	Low Shrub	140mm	124
Liriope Muscari	Evergreen Giant	Exotic	Rush	140mm	124
Westringia fruiticosa	Coastal Rosemary	Native	Shrub	140mm	124
				Total	1242

PM03 Low Verge Mix - 3 plants per sq m					
Carpobrotus virescens	Pigface	Native	Groundcover	140mm	149
Eremophila glabra	Kalbarri Carpet	Exotic	Groundcover	140mm	149
Grevillea crithmifolia	Ground Cover Banksia	Native	Groundcover	140mm	149
Grevilllea 'Gin Gin Gem'	Gin Gin Gem	Native	Groundcover	140mm	149
Grevillea crithmifolia	Grevillea	Exotic	Groundcover	140mm	149
Hibbertia scandens	Snake Vine	Exotic	Groundcover	140mm	149
Lomandra longifolia	Lime Tuff	Native	Shrub	140mm	149

Appendix 11:
TIA and RSA

urbii

Sustainable Transport. Safe Solutions

367 Scarborough Beach Road, Woodlands
Proposed Commercial Development

TRANSPORT IMPACT ASSESSMENT



Prepared for:
Windsor Knight Pty Ltd

September 2025

367 Scarborough Beach Road, Woodlands

Prepared for: Windsor Knight Pty Ltd
Prepared by: Paul Ghantous
Date: 3 September 2025
Project number: U22.035

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Urbii Consulting Pty Ltd
ABN 34 630 529 476
PO BOX 4315
BALDIVIS WA 6171
T: + 61 433 858 164
E: customer@urbii.com.au
W: www.urbii.com.au

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Contents

1 INTRODUCTION 7

2 EXISTING SITUATION 8

2.1 Existing site use, access and parking 8
2.2 Surrounding road network and traffic management on roads 10
2.3 Existing traffic volumes on roads and major intersections 13
2.4 Existing operation of surrounding intersections 13
2.5 Heavy vehicles 14
2.6 Public transport access 14
2.7 Pedestrian access 17
2.8 Bicycle access 18
2.9 Crash data and safety 19

3 DEVELOPMENT PROPOSAL 21

4 VEHICLE ACCESS 22

4.1 Proposed access traffic management 23
4.2 Ewen Street crossover sightline assessment 25

5 CHANGES TO SURROUNDING TRANSPORT NETWORKS 26

5.1 Stephenson Avenue extension 26
5.2 City of Stirling transport planning 27
5.3 Mid-tier public transport planning 31

6 INTEGRATION WITH SURROUNDING AREA 32

7 TRAFFIC ASSESSMENT 33

7.1 Assessment period 33
7.2 Traffic generation 33
7.3 Trip distribution and assignment 34
7.4 10-year post development forecasting 36
7.5 Analysis of intersections and development access 36
7.6 Development crossover sensitivity analysis 41
7.7 Impact on neighbouring areas 42
7.8 Traffic noise and vibration 42

8 PARKING 43

8.1 Parking supply 43
8.2 Parking layout 43

9 PROVISION FOR SERVICE VEHICLES 44

10 PUBLIC TRANSPORT ASSESSMENT 45

11 WALKING ASSESSMENT 48

11.1 Internal provision for walking and active transport 48
11.2 Walking catchment 48

12 CYCLING ASSESSMENT 51

12.1 Bicycle parking and end of trip facilities _____ 51
12.2 Sustainable transport catchment _____ 52
13 CONCLUSION _____ 53
APPENDICES _____ 54

Figures

Figure 1: Subject site 7
Figure 2: Location context plan 8
Figure 3: Stirling City Centre *Structure Plan* 9
Figure 4: MRS status of Scarborough Beach Road 10
Figure 5: Main Roads WA road hierarchy plan 11
Figure 6: Main Roads WA road speed zoning plan 12
Figure 7: Road types and criteria for Western Australia 12
Figure 8: Weekday traffic profile (Scarborough Beach Road east of Odin Road) 13
Figure 9: Transperth bus route 990 map 15
Figure 10: Transperth bus route 410 map 16
Figure 11: Perth bicycle network plan 18
Figure 12: 5-year crash map in the locality (2019-2023) 19
Figure 13: Proposed vehicle access 22
Figure 14: Proposed access traffic management 24
Figure 15: Proposed Ewen St crossover sightline looking right 25
Figure 16: Proposed Ewen St crossover sightline looking left 25
Figure 17: Stephenson Avenue extension concept 26
Figure 18: Stirling City Centre Structure Plan 27
Figure 19: Stirling City Centre – long term transport plan 30
Figure 20: Example bus lanes on Great Eastern Highway, Redcliffe 31
Figure 21: Mapping analysis of competing shopping centres 35
Figure 22: Network model – existing geometry 38
Figure 23: Network model – future geometry with bus lanes 38
Figure 24: Sensitivity analysis traffic volumes 41
Figure 25: Proposed service areas 44
Figure 26: PTA advice on the use of priority bus lanes 45
Figure 27: Indicative future public transit stop 45
Figure 28: Bus lanes case study – Beaufort Street 47
Figure 29: Proposed walking link through the site 49
Figure 30: Subject site walking catchment isochrones 50
Figure 31: Bicycle parking and end of trip facilities – location plan 51
Figure 32: Cycling and micro-mobility catchment 52
Figure 33: Surveyed existing traffic flows weekday and weekend peak hours 61
Figure 34: Development traffic distribution – passing trade 62
Figure 35: Development traffic distribution – primary trips 63
Figure 36: Development traffic – all trips 64
Figure 37: Post-development traffic volumes 65
Figure 38: 10-year post-development traffic volumes (base) 66
Figure 39: 10-year post-development traffic volumes (including development traffic) 67

Tables

Table 1: 5-year crash history in the locality (2019-2023) 20
Table 2: Proposed commercial uses 21
Table 3: Stirling City Centre population targets 28
Table 4: Stirling City Centre – commercial land use targets 29
Table 5: Stirling City Centre – mode share targets 29
Table 6: Adopted trip rates for traffic generation 33
Table 7: Daily and peak hour traffic generation 34
Table 8: Existing shopping centres considered in trip distribution analysis 34
Table 9: SIDRA network sites 36
Table 10: Summary of SIDRA analysis results 39

Appendices

Appendix A: Planning Control Area extracts 54
Appendix B: Proposed development plans 56
Appendix C: Proposed vehicle access traffic management 58
Appendix D: Traffic volume diagrams 60
Appendix E: SIDRA analysis outputs 68
Appendix F: Swept path diagrams 100

1 Introduction

This Transport Impact Assessment has been prepared by Urbii on behalf of Windsor Knight Pty Ltd with regards to the proposed commercial development, located at 367 Scarborough Beach Road, Woodlands.

The subject site is situated on the south-west corner of the signalised intersection of Scarborough Beach Road (SBR), Odin Road and Ewen Street, as shown in Figure 1.

The aim of this Transport Impact Assessment (TIA) is to assess the impact of the proposal on the existing transport network. The TIA was prepared in accordance with the WAPC *Transport Assessment Guidelines* 2016.



Figure 1: Subject site

2 Existing situation

2.1 Existing site use, access and parking

The subject site is presently vacant. There is an existing service station abutting the western boundary of the site, with a shared access easement between the adjoining properties.

Several commercial/retail businesses are operating nearby to the south-east, including the Innaloo Megaplex Cinemas. Westfield Innaloo Shopping Centre and Bunnings are operating nearby to the north-east. Refer to Figure 2 for a context plan showing surrounding land use. The site is located within the *Southern Precinct* of the Stirling City Centre Structure Plan (Figure 3).



Figure 2: Location context plan

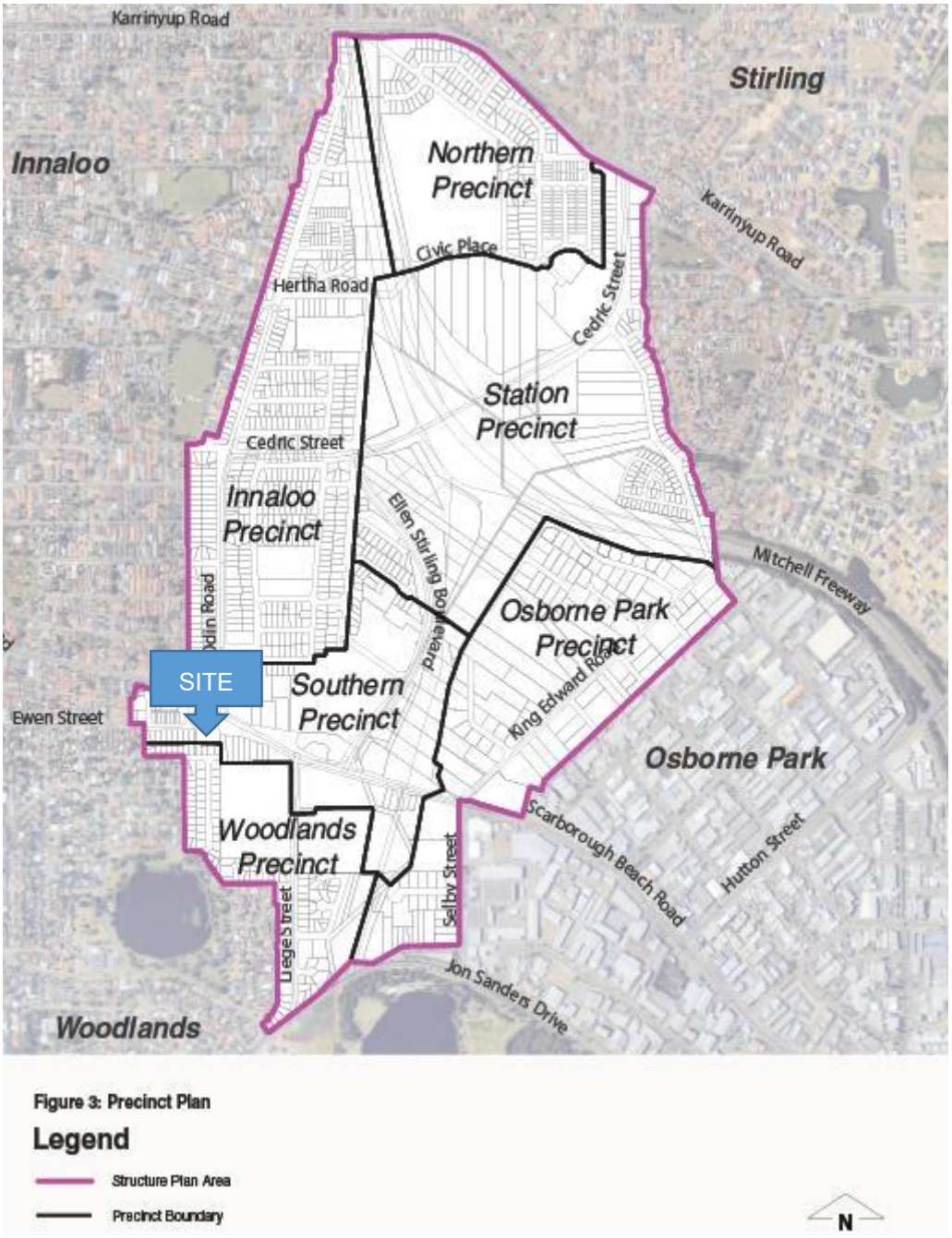


Figure 3: Stirling City Centre *Structure Plan*

2.2 Surrounding road network and traffic management on roads

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the existing traffic management on frontage roads.

2.2.1 Scarborough Beach Road

Scarborough Beach Road (SBR) near the subject site is an approximately 16m wide, four-lane dual carriageway road. It features a wide, kerbed and landscaped median with lighting and tree planting. Approaching the signalised intersection with Odin Road/Ewen Street, SBR widens to five lanes in the eastbound direction (three through lanes with left and right turn pockets approaching the signals). SBR is three lanes wide in the westbound direction adjacent to the site, which then merge to two lanes approaching Bowra Avenue.

A path for walking and cycling is provided on both sides of the road (adjacent to the subject site). It is presently classified as a *Distributor A* road in the Main Roads WA road hierarchy (Figure 5) and operates under a posted speed limit of 60km/h (Figure 6). *Distributor A* roads are normally the responsibility of Local Government. They are predominantly for high-capacity movements between industrial, commercial and residential areas (Figure 7).

Scarborough Beach Road is designated as an "Other Regional Road" (ORR) in the MRS (Figure 4). Scarborough Beach Road is a Category 3 road which means "*Road reservation not accurately defined or under review*". There is a Planning Control Area (PCA) and Clause 32 resolution on this site and a portion of the lot fronting SBR is reserved for future road reservation widening. Refer to Appendix A for more details.



Figure 4: MRS status of Scarborough Beach Road

2.2.2 Ewen Street

Ewen Street near the subject site is an approximately 13m wide, two-lane divided boulevard style road. It features a wide, kerbed and landscaped median with tree planting. Footpaths are provided on both sides of the road. It is classified as a *Distributor B* road in the Main Roads WA road hierarchy (Figure 5) and currently operates under a default speed limit of 50km/h (Figure 6). *Distributor B* roads are normally the responsibility of Local Government. They are predominantly for reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas (Figure 7).

2.2.3 Bowra Avenue

Bowra Avenue is an approximately 110m long road which runs north-south between SBR and Ewen Street.

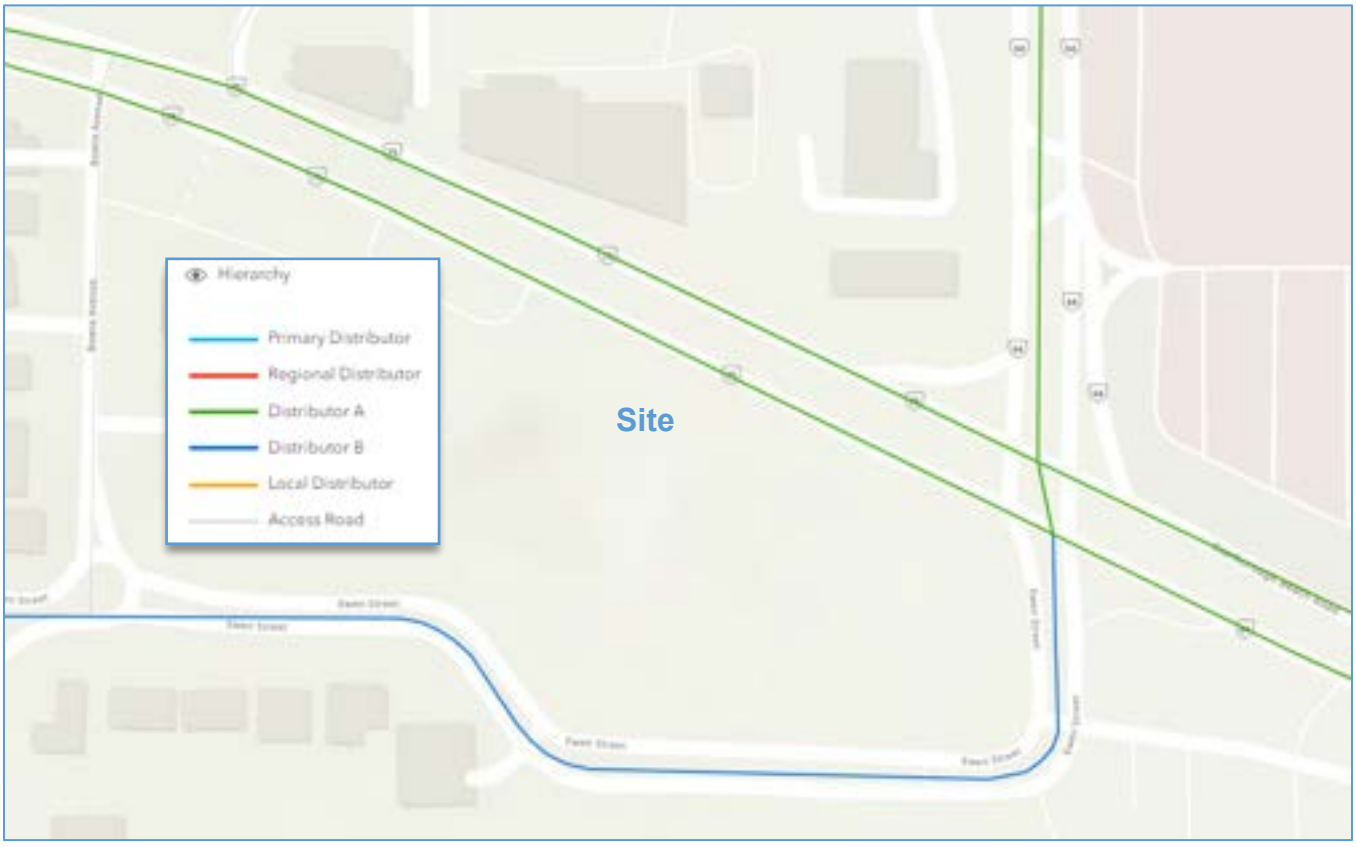


Figure 5: Main Roads WA road hierarchy plan

Source: Main Roads WA Road Information Mapping System (RIM)



Figure 6: Main Roads WA road speed zoning plan

Source: Main Roads WA Road Information Mapping System (RIM)

ROAD HIERARCHY FOR WESTERN AUSTRALIA
ROAD TYPES AND CRITERIA (see Note 1)

CRITERIA	PRIMARY DISTRIBUTOR (PD) (see Note 2)	DISTRICT DISTRIBUTOR A (DA)	DISTRICT DISTRIBUTOR B (DB)	REGIONAL DISTRIBUTOR (RD)	LOCAL DISTRIBUTOR (LD)	ACCESS ROAD (A)
Primary Criteria						
1. Location (see Note 3)	All of WA incl. BUA	Only Built Up Area	Only Built Up Area	Only Non Built Up Area (see Note 4)	All of WA incl. BUA	All of WA incl. BUA
2. Responsibility	Main Roads Western Australia	Local Government	Local Government	Local Government	Local Government	Local Government
3. Degree of Connectivity	High. Connects to other Primary and Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	Medium. Minor Network Role Connects to Distributors and Access Roads.	Low. Provides mainly for property access.
4. Predominant Purpose	Movement of inter regional and/or cross town/city traffic, e.g. freeways, highways and main roads.	High capacity traffic movements between industrial, commercial and residential areas.	Reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas.	Roads linking significant destinations and designed for efficient movement of people and goods between and within regions.	Movement of traffic within local areas and connect access roads to higher order Distributors.	Provision of vehicle access to abutting properties
Secondary Criteria						
5. Indicative Traffic Volume (AADT)	In accordance with Classification Assessment Guidelines.	Above 8 000 vpd	Above 6 000 vpd	Greater than 100 vpd	Built Up Area - Maximum desirable volume 6 000 vpd. Non Built Up Area – up to 100 vpd.	Built Up Area - Maximum desirable volume 3 000 vpd. Non Built Up Area – up to 75 vpd.
6. Recommended Operating Speed	60 – 110 km/h (depending on design characteristics).	60 – 80 km/h.	60 – 70 km/h.	50 – 110 km/h (depending on design characteristics).	Built Up Area 50 - 60 km/h (desired speed) Non Built Up Area 60 – 110 km/h (depending on design characteristics).	Built Up Area 50 km/h (desired speed). Non Built Up Area 50 – 110 km/h (depending on design characteristics).
7. Heavy Vehicles permitted	Yes.	Yes.	Yes.	Yes.	Yes, but preferably only to service properties.	Only to service properties.
8. Intersection treatments	Controlled with appropriate measures e.g. high speed traffic management, signing, line marking, grade separation.	Controlled with appropriate measures e.g. traffic signals.	Controlled with appropriate Local Area Traffic Management.	Controlled with measures such as signing and line marking of intersections.	Controlled with minor Local Area Traffic Management or measures such as signing.	Self controlling with minor measures.
9. Frontage Access	None on Controlled Access Roads. On other routes, preferably none, but limited access is acceptable to service individual properties.	Prefer not to have residential access. Limited commercial access, generally via service roads.	Residential and commercial access due to its historic status. Prefer to limit when and where possible.	Prefer not to have property access. Limited commercial access, generally via lesser roads.	Yes, for property and commercial access due to its historic status. Prefer to limit whenever possible. Side entry is preferred.	Yes.
10. Pedestrians	Preferably none. Crossing should be controlled where possible.	With positive measures for control and safety e.g. pedestrian signals.	With appropriate measures for control and safety e.g. median/islands refuges.	Measures for control and safety such as careful siting of school bus stops and rest areas.	Yes, with minor safety measures where necessary.	Yes.
11. Buses	Yes.	Yes.	Yes.	Yes.	Yes.	If necessary (see Note 5)
12. On-Road Parking	No (emergency parking on shoulders only).	Generally no. Clearways where necessary.	Not preferred. Clearways where necessary.	No – emergency parking on shoulders – encourage parking in off road rest areas where possible.	Built Up Area – yes, where sufficient width and sight distance allow safe passing. Non Built Up Area – no. Emergency parking on shoulders.	Yes, where sufficient width and sight distance allow safe passing.
13. Signs & Linemarking	Centrelines, speed signs, guide and service signs to highway standard.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs and guide signs.	Speed and guide signs.	Urban areas – generally not applicable. Rural areas - Guide signs.
14. Rest Areas/Parking Bays	In accordance with Main Roads' Roadside Stopping Places Policy.	Not Applicable.	Not Applicable.	Parking Bays/Rest Areas Desired at 60km spacing.	Not Applicable.	Not Applicable.

Figure 7: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992

2.3 Existing traffic volumes on roads and major intersections

Traffic volume and speed data obtained from Main Roads WA indicates Scarborough Beach Road carried average weekday traffic flows of around 31,500 vehicles per day (east of Odin Road) in 2021. The weekday peak hours occur from 8am to 9am and from 4pm to 5pm, as detailed in Figure 8. Traffic is directionally biased with higher eastbound traffic in the mornings and higher westbound traffic in the afternoons.

On weekends, the peak traffic hour occurs between 12pm and 1pm.

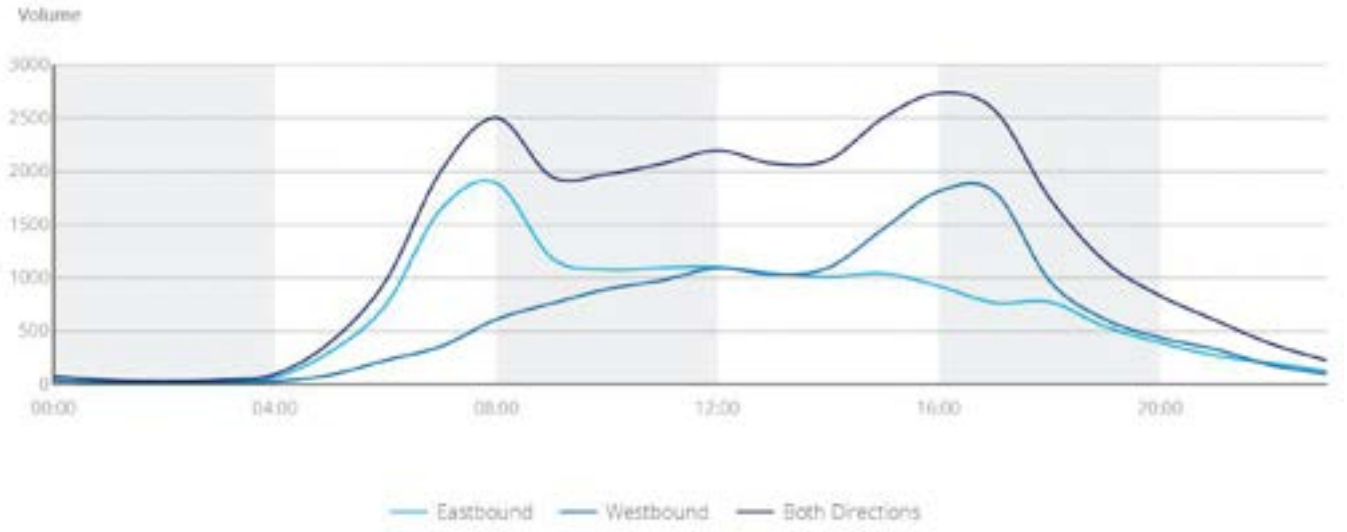


Figure 8: Weekday traffic profile (Scarborough Beach Road east of Odin Road)

To establish existing base traffic flows on the surrounding road network and nearby intersections, Urbii undertook an aerial drone traffic count survey of turning movements at the key intersections in the study area. The traffic count survey was undertaken for a standard Weekday PM peak hour and Weekend midday peak hour in October. Data from various sources was combined to prepare turning movements at various intersections:

- SCATS traffic signal data was collected for Scarborough Beach Road / Odin Road / Ewen Street.
- Midblock traffic counts for Scarborough Beach Road.
- Traffic counts extracted from aerial drone surveys.

The base peak hour traffic flows derived for analysis are detailed in Appendix D.

2.4 Existing operation of surrounding intersections

The operation of existing intersections is documented in Section 7.5 of this report.

2.5 Heavy vehicles

The roads near the subject site form part of RAV Network 1 which permits 19m semi-trailers to travel on these roads under general access, or “as of right” status. General access vehicles may operate state-wide provided they are:

- not a road train or b-double;
- within regulation axle mass limits;
- 19 metres or less in combination length (or a maximum 12.5 metres for rigid vehicles);
- total combination mass less than 42.5 tonnes;
- width less than 2.5 metres (excluding mirrors and lights); and
- height less than 4.3 metres.

The largest HV to service the development will be a 19m Articulated Vehicle (AV), which is permitted to use surrounding roads and intersections.

2.6 Public transport access

Information was collected from Transperth and the Public Transport Authority to assess the existing public transport access to and from the site.

The subject site has access to the following bus services within walking distance:

- Route 990: Perth - Scarborough Beach Bus Stn via Glendalough Stn (Figure 9).
- Route 410: Stirling Stn - Scarborough Beach Bus Stn (Figure 10).

Bus services provide a viable alternative mode of transport for residents and visitors of the proposed development. Bus route 990 operates as a High Frequency Service. Bus stops are accessible on Scarborough Beach Road adjacent to the subject site. Bus services also connect to the rail network at Perth, Glendalough and Stirling train stations for longer trips.



Figure 9: Transperth bus route 990 map

Source: Transperth

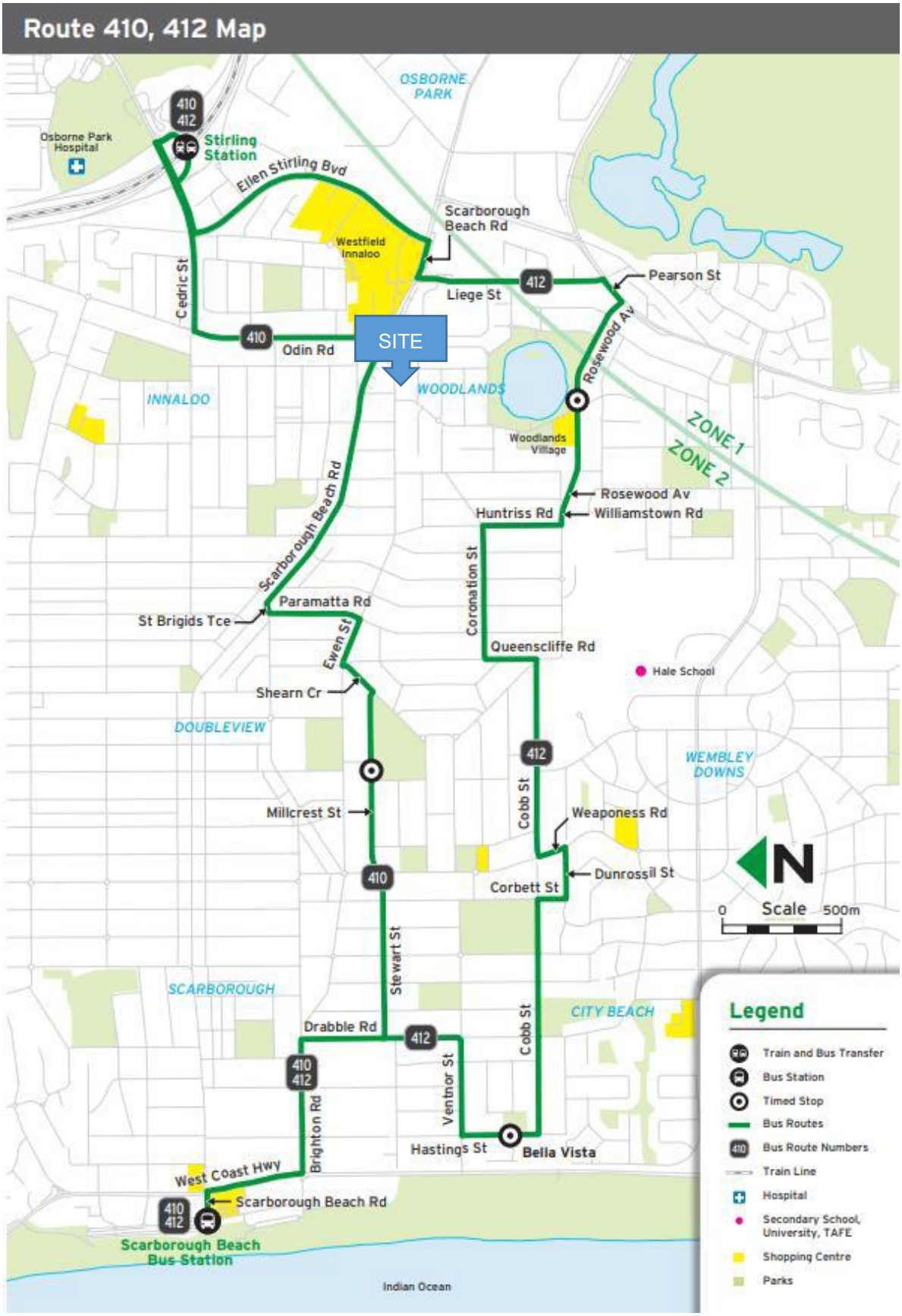


Figure 10: Transperth bus route 410 map

Source: Transperth

2.7 Pedestrian access

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the pedestrian access for the proposed development.

Footpaths are provided around the perimeter of the subject site. Signalised crossings are provided at the intersection of Scarborough Beach Road / Ewen St / Odin Rd. Kerb ramps and median refuge islands are provided at various points along Ewen Street and Scarborough Beach Road, which promotes improved access for bicycles, wheelchairs and prams.

2.8 Bicycle access

Information from online mapping services, Department of Transport, Local Government, and/or site visits was collected to assess bicycle access for the proposed development.

The Department of Transport Perth Bicycle Network Map (see Figure 11) shows the existing cycling connectivity to the subject site. Shared paths are provided on Scarborough Beach Road and connect to the broader cycling network.

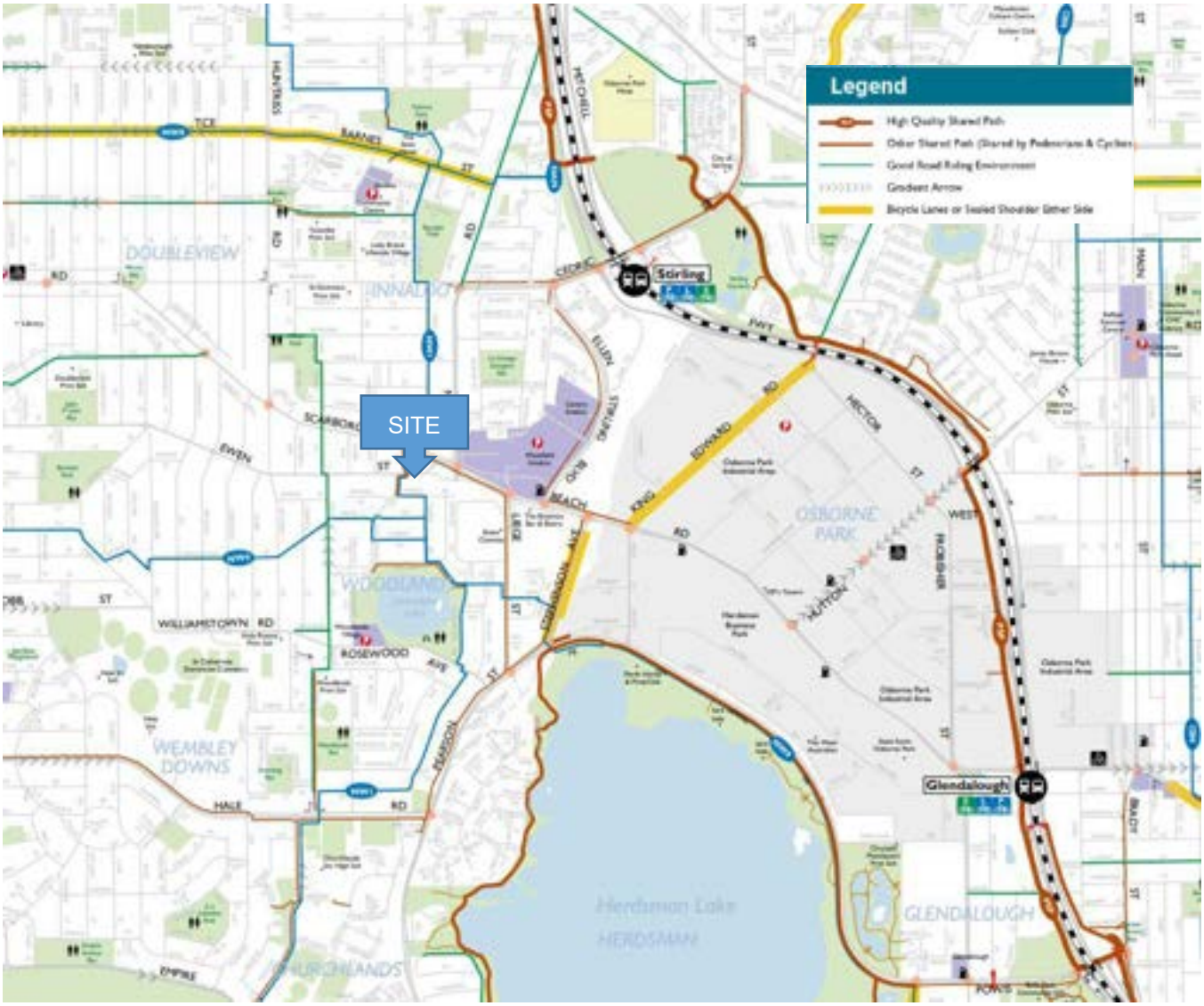


Figure 11: Perth bicycle network plan

2.9 Crash data and safety

The five-year crash history in the vicinity of the site was obtained from Main Roads WA. As detailed in Table 1, 93 crashes were recorded in the locality, which reflects the high traffic volumes along Scarborough Beach Road. The crash map is presented in Figure 12.

No fatal crashes were recorded. Two hospital crashes and 9 medical crashes were recorded, which represent around 12% of crashes. Most crashes were property damage only in severity. The colour of the symbols in Figure 12 crossmatch with the severity of crashes in Table 1.



Figure 12: 5-year crash map in the locality (2019-2023)

Source: MRWA crash mapping tool.

Table 1: 5-year crash history in the locality (2019-2023)

Severity	No.	%
Fatal	0	0
Hospital	2	2.15
Medical	9	9.68
PDO Major	41	44.09
PDO Minor	41	44.09

Year	No.	%
2019	18	19.35
2020	21	22.58
2021	16	17.20
2022	16	17.20
2023	22	23.66

Nature	No.	%
Head On	1	1.08
Hit Animal	0	0
Hit Object	1	1.08
Hit Pedestrian	0	0
Non Collision	0	0
Not Known	0	0
Other / Unknown	4	4.30
Rear End	49	52.69
Right Angle	19	20.43
Right Turn Thru	2	2.15
Sideswipe Opposite Dirn	0	0
Sideswipe Same Dirn	17	18.28

Light	No.	%
Dark - Street Lights Not Provided	0	0
Dark - Street Lights Off	0	0
Dark - Street Lights On	6	6.45
Dawn Or Dusk	4	4.30
Daylight	75	80.65
Not Known	0	0
Other / Unknown	8	8.60

Conditions	No.	%
Dry	80	86.02
Not Known	0	0
Other / Unknown	5	5.38
Wet	8	8.60

Alignment	No.	%
Curve	20	21.51
Not Known	0	0
Other / Unknown	25	26.88
Straight	48	51.61

Total		93

3 Development proposal

A commercial development is proposed for the subject site, which will combine the complementary uses of retail, food and beverage and other specialty tenancies. The proposed commercial uses are detailed in Table 2. Some minor variations in floor area may take place as further plan amendments are made. The floor area excluding corridors is around 6,300m2.

Table 2: Proposed commercial uses

USE			GLAR (m²)
	T00	Major Retail	3826
	T01	Liquor Store	240
	T02	Specialty	257
	T03	Specialty	111
	T04	Specialty	100
	T05	F&B	228
	T06	F&B	237
	T07	Specialty	130
	T08	Specialty	129
	T09	Specialty	118
	T10	Health/ Wellness	681
		Mall	234
		Casual mall seating	17
		Corridors	75
		TOTAL	6383

The proposed development plans are included in Appendix B.

4 Vehicle access

The proposed vehicular access arrangements have been reviewed for efficient and safe traffic circulation.

The proposed access arrangements are summarised in Figure 13. The development proposes a left turn entry and exit (with separator island refuge) off Scarborough Beach Road for direct access into the upper-level car park and the major tenant service area.

One loading dock crossover is proposed on Ewen Street and separate entry and exit crossovers are proposed on Ewen Street to provide secondary access to the upper car park level.

A raised separator island is proposed between the subject site and adjoining service station site crossover on Scarborough Beach Road. The existing service station crossover will be widened to accommodate independent access of fuel delivery trucks to the service station.

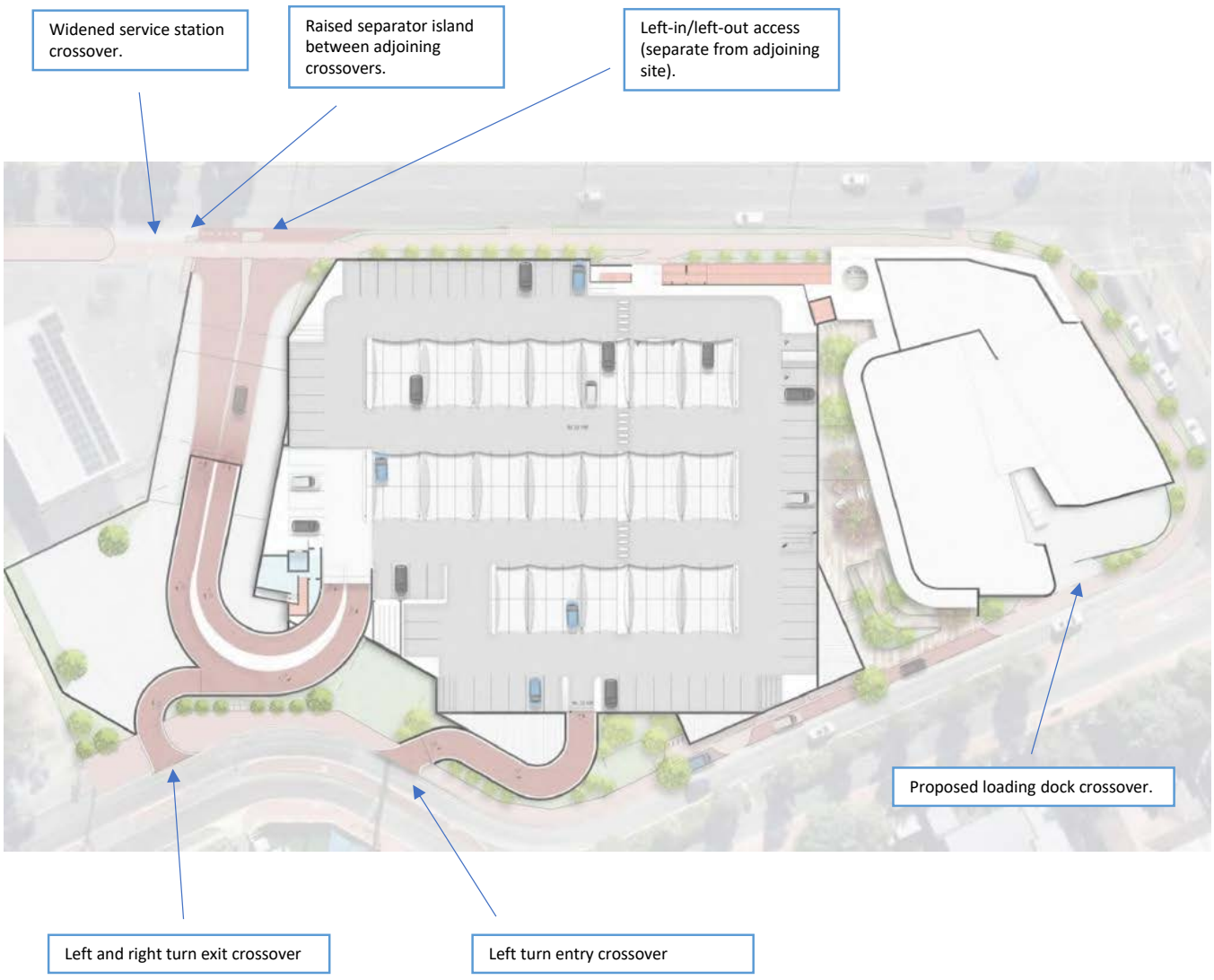


Figure 13: Proposed vehicle access

4.1 Proposed access traffic management

Urbii has developed a traffic management plan for guiding safe and legible access of light vehicles and delivery vehicles. The concept is detailed in Appendix C and in Figure 14.

The following features are noted:

- Development traffic entering from Scarborough Beach Road will utilise the kerbside westbound lane for uninterrupted entry into the site. It is noted this lane will be designated as a bus lane in the future. Vehicles are permitted to utilise the bus lane to turn left into the site. No right turn entry will be allowed.
- All development traffic exiting the site to Scarborough Beach Road will utilise a separate left turn exit.
- A separator island with pedestrian refuge is provided for people using the footpath to shelter between the inbound and outbound development traffic on Scarborough Beach Road. This makes it easier for people to cross in two stages.
- There is a separator island proposed between the subject site exit and the adjoining service station crossover. The separator island includes a refuge for footpath users crossing between the two adjacent sites. The service station driveway will be widened to accommodate independent vehicle entry to their site.
- Yellow pavement marking and signage will be used to separate cars and delivery trucks which enter and exit the development from Scarborough Beach Road. This creates legible access for customers, who are guided away from the rear service area and into the access ramp leading to the upper-level car park.
- Exiting delivery trucks will be stopped at a hold line prior to merging with outbound cars and a traffic signal system will signal a green light when it is safe for trucks to exit. If the system detects an outbound car exiting from the car park, then a red light will inform the delivery truck driver to wait at the hold line.

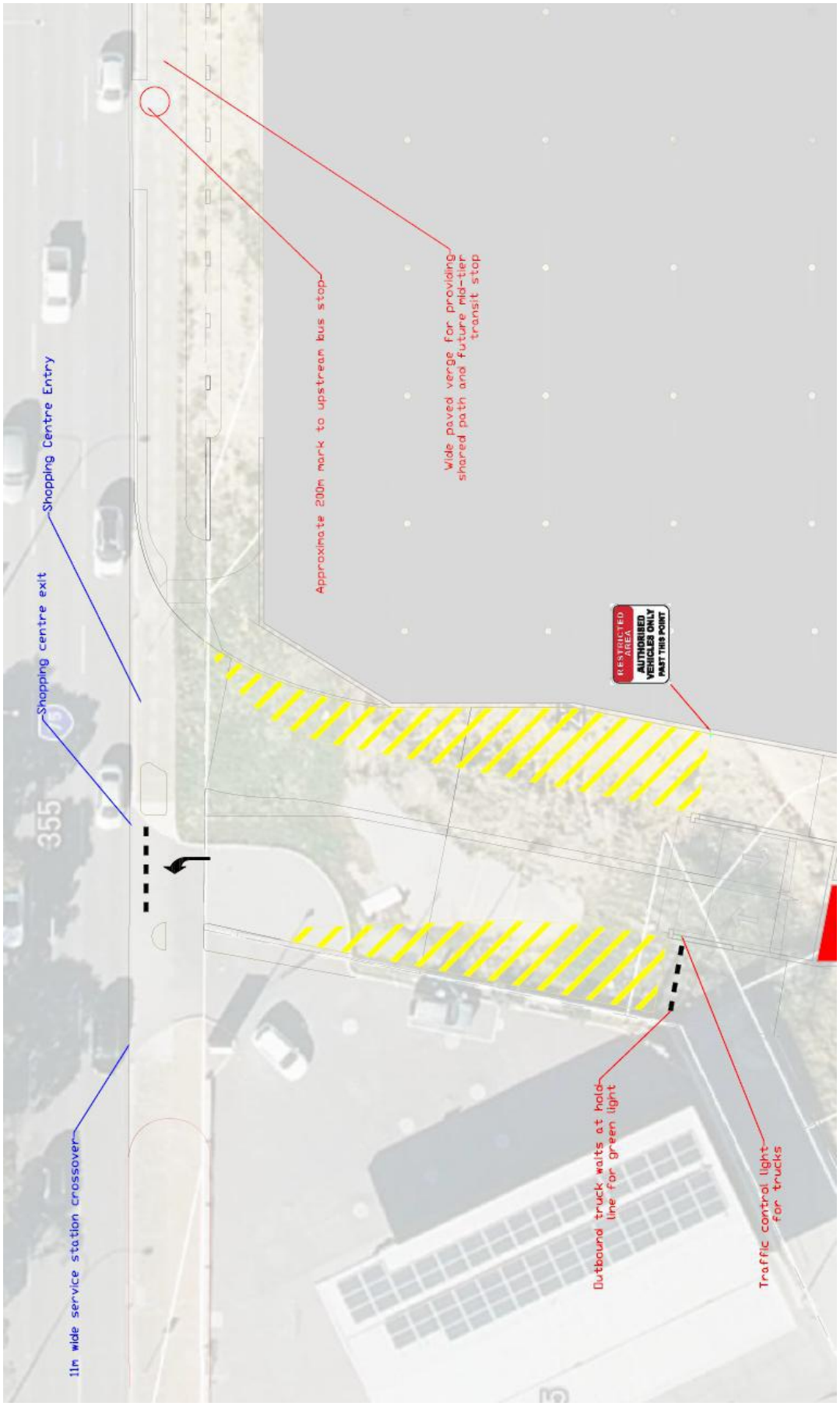


Figure 14: Proposed access traffic management

4.2 Ewen Street crossover sightline assessment

A site visit was undertaken and sightlines were checked for the proposed exit crossovers on Ewen Street. As demonstrated in the below photographs, sufficient sightlines were observed in both directions of traffic flow.



Figure 15: Proposed Ewen St crossover sightline looking right



Figure 16: Proposed Ewen St crossover sightline looking left

5 Changes to surrounding transport networks

5.1 Stephenson Avenue extension

The Stephenson Avenue extension project is currently under construction. The project involves the extension of Stephenson Avenue from Scarborough Beach Road to eventually connect to a new Freeway Interchange. The existing interchange at Cedric Street will be modified as a result and the Stirling Station bus interchange will be upgraded. This project is around 50% complete at the time of preparation of this report.



Figure 17: Stephenson Avenue extension concept

5.2 City of Stirling transport planning

The Stephenson Avenue project is part of a broader scheme to support future intensification of the Stirling City Centre. The structure plan boundary is shown in Figure 18 and the subject site is within the City Centre Sector.

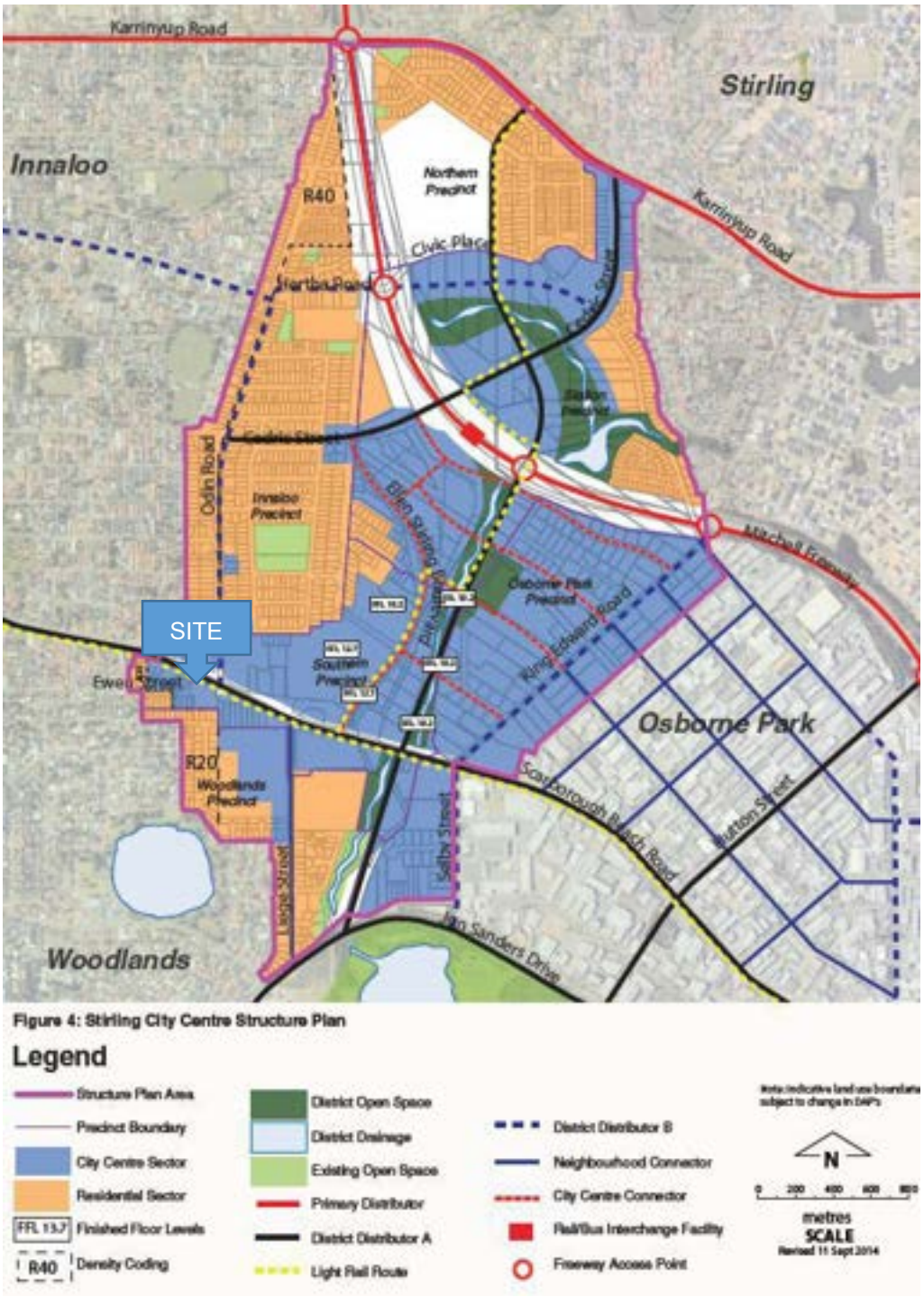


Figure 18: Stirling City Centre Structure Plan

The draft *Stirling City Centre Structure Plan* report (2014) includes transport planning and land use targets. The structure plan proposes an ambitious population growth rate, from the current 3,800 residents to 25,000 residents (Table 3).

Table 3: Stirling City Centre population targets

Current Population:	3,800 residents
Current Dwellings:	1,625 dwellings (comprised of large, single detached houses and grouped housing)
Current Average Occupancy:	2.37 people per household
Current Density:	6 dwellings per hectare
Future Population:	25,000
Future Dwelling:	19,900
Future Average Occupancy:	1.8
Future Density:	45 dwellings per hectare

The structure plan seeks to tie transport with land use planning, as part of an integrated transport planning strategy. The idea is that people will live local and work local. Also, people in the north west corridor may travel by freeway or train and work in Stirling, which will ease traffic congestion on the transport network between Stirling and Perth CBD:

"The road network of the Mitchell Freeway and Scarborough Beach Road is presently close to capacity in peak periods, as too is rail capacity at Stirling Station during peak periods. The northern suburbs railway can grow to 150,000 passengers per day based on a 6-car set with a 3-minute frequency. This highlights the need to focus on a high level of employment around Stirling Station to encourage people to alight and create more capacity between Stirling Station and the City. Stirling is currently the fifth busiest non-CBD station in the network. The bus feeder patronage grew by approximately 20% between 2007 and 2009. Bus access to Stirling Station is over 50% of the mode share. Residential development within the walkable catchment of this station may exacerbate the existing problem and promote increased commuter trips to Perth. Therefore, it is important to develop strategies to encourage local employment opportunities when detailed precinct planning is undertaken. In 2009, the City of Stirling adopted an Integrated Transport Strategy that seeks to tie land use with transport. In respect to Stirling City Centre, the Strategy proposed the following transport elements."

The commercial land use targets, intended to support the integrated transport strategy of self-sufficiency, are detailed in Table 4.

Table 4: Stirling City Centre – commercial land use targets

Precinct	Office Floor Space (NLAm²)	Health/ Welfare/ Community Floorspace (NLAm²)	Shop/ Reatail & Other Retail Floorspace (NLAm²)	Entertainment/ Recreation/ Culture Floorspace (NLAm²)	Min Commercial Floorspace (NLAm²)	Total Commercial Floorspace (NLAm²)
Southern	40,896	6,956	196,901	16,762	173,497	262,875
Station	290,994	4,091	67,814	4,051	244,110	369,864
Northen	16,351	27,516	500	0	29,752	45,079
Osborne Park	77,231	5,455	182,775	2,559	177,961	269,639
Innaloo	0	2,660	369	0	3,067	4,648
Woodlands	12,652	2,012	13,065	0	18,813	28,506
TOTALS	438,124	48,690	461,451	23,372	639,525	968,978

To enable the population and employment targets to be met within the Stirling City Centre, increase in alternative transport modes is required. The aspirational mode share targets are detailed in Table 5. By 2041, the aspiration is for 50% of all trips to be undertaken by means alternative to a private motor car.

Table 5: Stirling City Centre – mode share targets

Mode	2021	2031	2041
Car Driver	50%	42.5%	35%
Car Passenger	20%	17.5%	15%
Public Transport	10%	14%	18%
Walking	4.5%	7.5%	10%
Cycling	15.5%	18.5%	22%

The City has also developed a long-term transport plan to help support achievement of the transport mode share targets (Figure 19). The long -term transport plan proposes a staged mass-transit / light rail system. The first stage will connect from Glendalough Train Station to Stirling Train Station by 2031. Future stages could see transit routes extended:

- North past the Osborne Park Hospital to Karrinyup Rd (possible future extension to Karrinyup Shopping Centre);
- West along Scarborough Beach Road to Scarborough Beach;
- South along Harborne Street to Subiaco; and
- East along Scarborough Beach Road to connect to the Metro Area Express (MAX) system.

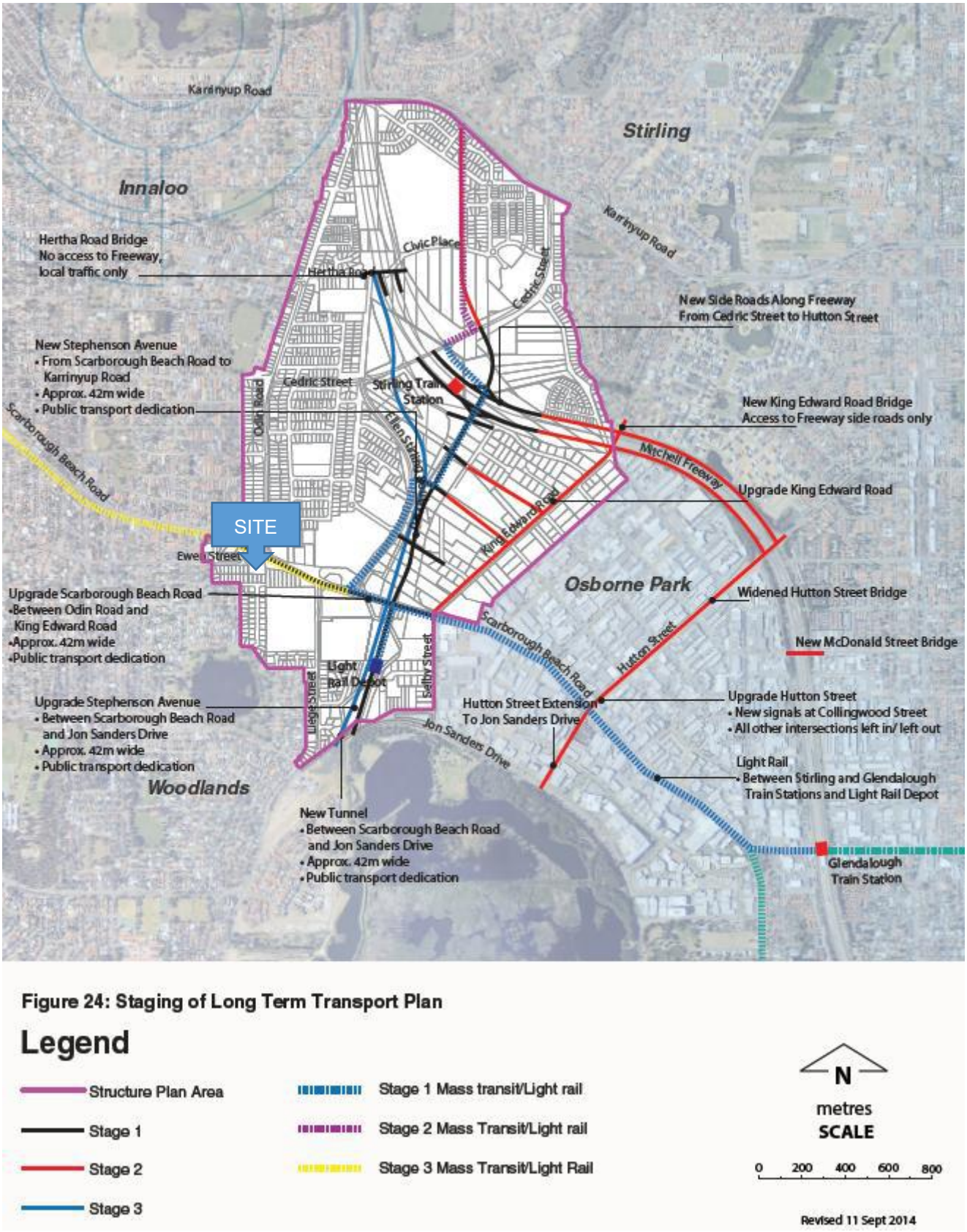


Figure 19: Stirling City Centre – long term transport plan

5.3 Mid-tier public transport planning

The City of Stirling is part of a 15 Local Government Consortium in support of a Mid-Tier Transit Strategy in Perth. Local councils are working with the state transport portfolio to develop a 'high level' Network Plan.

The consortium is seeking State Government support to prioritise the planning for Mid-Tier Transit for Perth so that it can be implemented post Metronet completion.

Perth to Scarborough Beach is one of the 15 corridors which have been short listed for Mid-Tier transit.

The State and Local Government authorities are progressing with a planned high frequency transit route on Scarborough Beach Road. Based on high-level information provided to Urbii, the transit route will likely involve the conversion of the kerbside lanes on Scarborough Beach Road into full-time priority bus lanes. High frequency bus services will then be run along the route in both directions of travel.

An example of similar bus lanes can be seen on Great Eastern Highway (Figure 20).



Figure 20: Example bus lanes on Great Eastern Highway, Redcliffe

6 Integration with surrounding area

The proposed development integrates well with the surrounding area. A mix of commercial uses are proposed. This assists the City with achieving development targets which increase retail floor space and employment self-sufficiency within the Stirling City Centre.

The proposed development provides local amenities including retail and food and beverage, to be accessible for residents within the City Centre. Customers and employees will be able to travel to the site via mid-tier transit or walking and cycling.

7 Traffic assessment

7.1 Assessment period

Two time periods are considered in the traffic assessment:

- Weekday PM peak hour: 4pm to 5pm.
- Weekend midday peak hour: 12pm to 1pm.

The analysis was undertaken for the following scenarios:

- Existing situation (without proposed development traffic).
- Existing situation with development traffic.
- 10yr post-development situation (10 years in the future with development traffic included).

7.2 Traffic generation

The traffic volume that will be generated by the proposed development has been estimated using trip generation rates derived with reference to the following sources:

- RTA NSW Guide to traffic generating developments;
- RTA NSW Technical direction TDT 2013/4A; and,
- RTA NSW *Trip Generation and Parking Demand Surveys of Shopping Centre* Analysis Report, September 2011.

The trip generation rates adopted are detailed in Table 6. *Shopping Centres* in the RTA guide include a wide range of land uses integrated in one centre, this includes supermarkets, slow and fast trade retail, food and beverage, medical and other offices. Therefore, the trip rate for *Shopping Centre* was applied to the entire site for commercial traffic.

Table 6: Adopted trip rates for traffic generation

Land use	Trip rate source	Daily rate	Weekday Peak Hour	Weekend Peak Hour	IN	OUT
Shopping Centre (0 - 20,000m2)	RTA NSW	61 trips per 100m2	6.7 trips per 100m2	7.5 trips per 100m2	50%	50%

The estimated traffic generation of the proposed development is detailed in Table 7. The proposed development is estimated to generate a total of 3,843 vehicles per day (vpd), 422 vehicles in the weekday peak hour and 474 vehicles in the weekend peak hour. The net increase in traffic is **+2,075vpd**, **+228vph** (weekday) and **+256vph** (weekend).

These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be small passenger cars and compact SUVs.

Surveys presented in the RTA Shopping Centre Analysis Report recorded an average passing trade rate of 46%, which was adopted in the analysis.

Table 7: Daily and peak hour traffic generation

Shopping Centre Trips	GLFA (m2)	Daily Trips	Weekday Peak	Weekend Peak	WD Peak		WE Peak	
					IN	OUT	IN	OUT
Primary Trips (54%)	-	2075	228	256	114	114	128	128
Passing Trade (46%)	-	1768	194	218	97	97	109	109
Total Shopping Centre Trips	**6300**	**3843**	**422**	**474**	**211**	**211**	**237**	**237**

7.3 Trip distribution and assignment

The trip distribution for passing trade was assumed to be 90% left-in/left-out on SBR and 10% left-in-left-out on Ewen Street.

The primary trip distribution was based on mapping analysis of competing shopping centres in the locality. There are at least nine competing shopping centres within close distance of the subject site, which are displayed in Figure 21 and listed in Table 8.

Due to the density of competing shopping centres in nearby suburbs, the primary trips are likely to operate on a local attraction scale, and not attract trips based on long distance journeys.

Table 8: Existing shopping centres considered in trip distribution analysis

Shopping Centre	Driving distance from site (km)	Driving time from site (min)
Innaloo Mega centre	1.6	5
Westfield Innaloo	1.4	4
Morris Place	1.6	4
Woodlands	1.2	3
Hilltop	1.3	2
Karrinyup	3.8	7
Primewest Gwelup	4.4	7
Stirling Village	3.9	8
The Downs	3.9	7

The assumed trip distribution and assignment for passing trade and primary trips is detailed in the traffic volume diagrams in Appendix D.

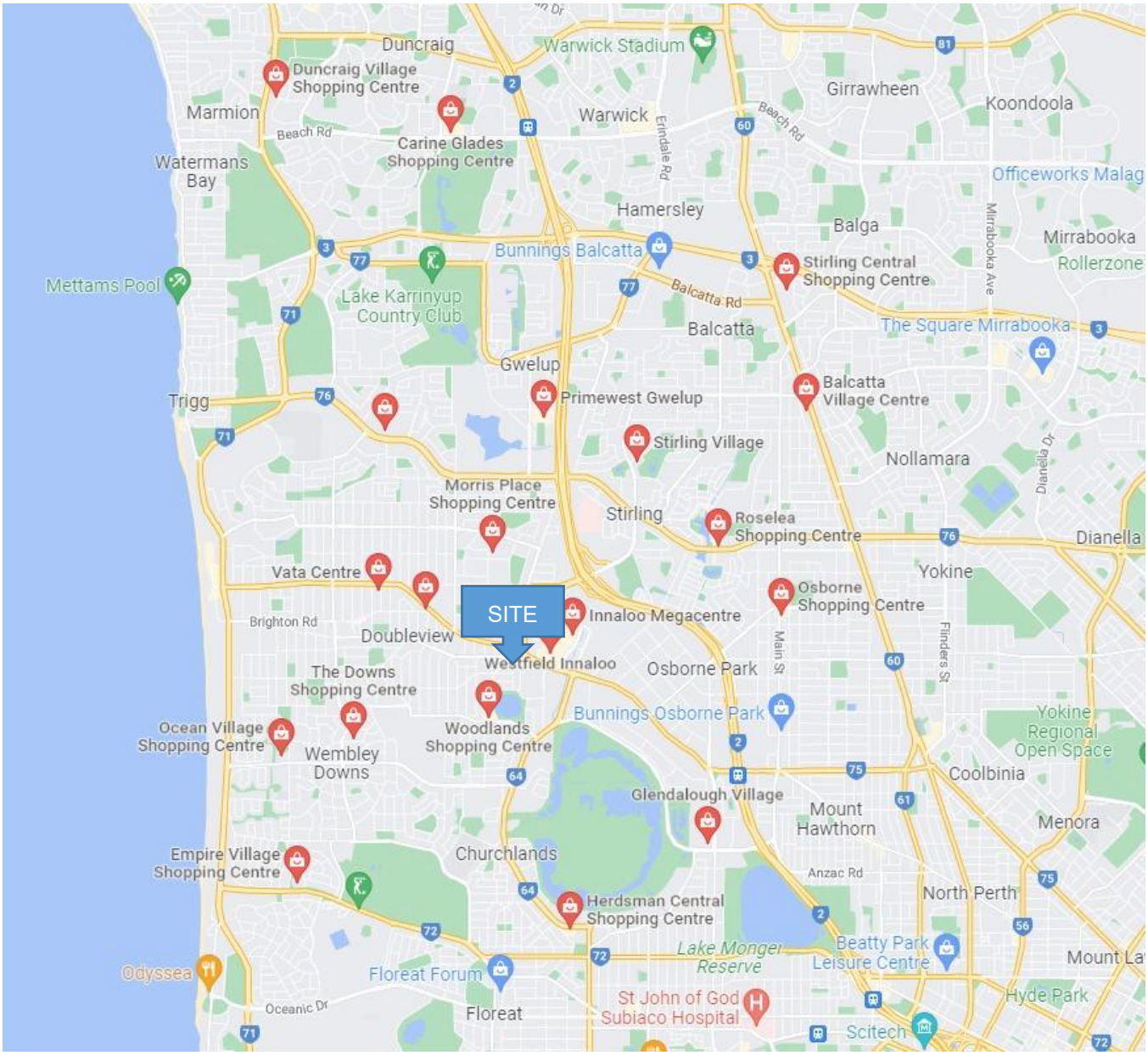


Figure 21: Mapping analysis of competing shopping centres

7.4 10-year post development forecasting

As documented in Section 10 of this report, the proposed bus priority lanes on Scarborough Beach Road will replace the kerbside general traffic lanes, which will reduce general traffic capacity from 3 to 2 lanes in each direction. As there is a reduction in general traffic lane capacity proposed on Scarborough Beach Road, a successful program will need to achieve a significant mode shift from private car to public transportation along the route. This should result in a corresponding reduction in existing traffic volumes on Scarborough Beach Road.

It is assumed that the Scarborough Beach Road priority bus lane project will achieve a 40% reduction in peak hour traffic volumes on Scarborough Beach Road. Traffic on Ewen Street running past the subject site was assumed to be the same as in the existing base case situation, with no reduction in traffic applied.

7.5 Analysis of intersections and development access

Capacity analysis of intersections was undertaken using the SIDRA 9 computer software package. SIDRA 9 is an intersection modelling tool commonly used by traffic engineers for all types of intersections.

A network model was developed with multiple connected intersections. The same network was assumed for existing and post development analysis. The 10-year post development analysis assumed the introduction of bus priority lanes. Proposed development access crossovers were included in the existing network as 'dummy' intersections, so that the same coded network was consistently applied for all analysis scenarios. The network sites are listed in Table 9.

Table 9: SIDRA network sites

SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	Scarborough Beach Rd / Odin Rd / Ewen St
102	NA	Site Crossover / Scarborough Beach Rd
103	NA	Service Station (E) / Scarborough Beach Rd
104	NA	Service Station (W) / Scarborough Beach Rd
105.S1	NA	Scarborough Beach Rd / Bowra Av - Stage 1
105.S2	NA	Scarborough Beach Rd / Bowra Av - Stage 2
106.2	NA	Bowra Av / Ewen St (West)
106.1	NA	Bowra Av / Ewen St (East)
108	NA	Site Crossover (W) / Ewen St
107	NA	Site Crossover (E) / Ewen St

Signal phasing was based on SCATS data which reported an average cycle time of around 120-130 seconds during peak hours. The operation of the existing traffic signals was checked against observations captured via the aerial drone survey. During the weekday PM and Saturday midday peak hours, the longest queues were observed for westbound traffic (on the eastern approach) at the traffic signals. The right turn queue on Scarborough Beach Road turning into Odin Road was regularly observed to extend out of the turn pocket. The SIDRA outputs were checked and matched the observed characteristics on the surrounding network.

Two network models were developed for analysis:

- Existing road and intersection geometry (Figure 22).
- Future road and intersection geometry with bus lanes (Figure 23).

A summary of the analysis results is presented in Table 10. Overall, the SIDRA results indicate that the proposed development will have minimal impact on the road network. Detailed SIDRA outputs for each intersection are provided in Appendix E.

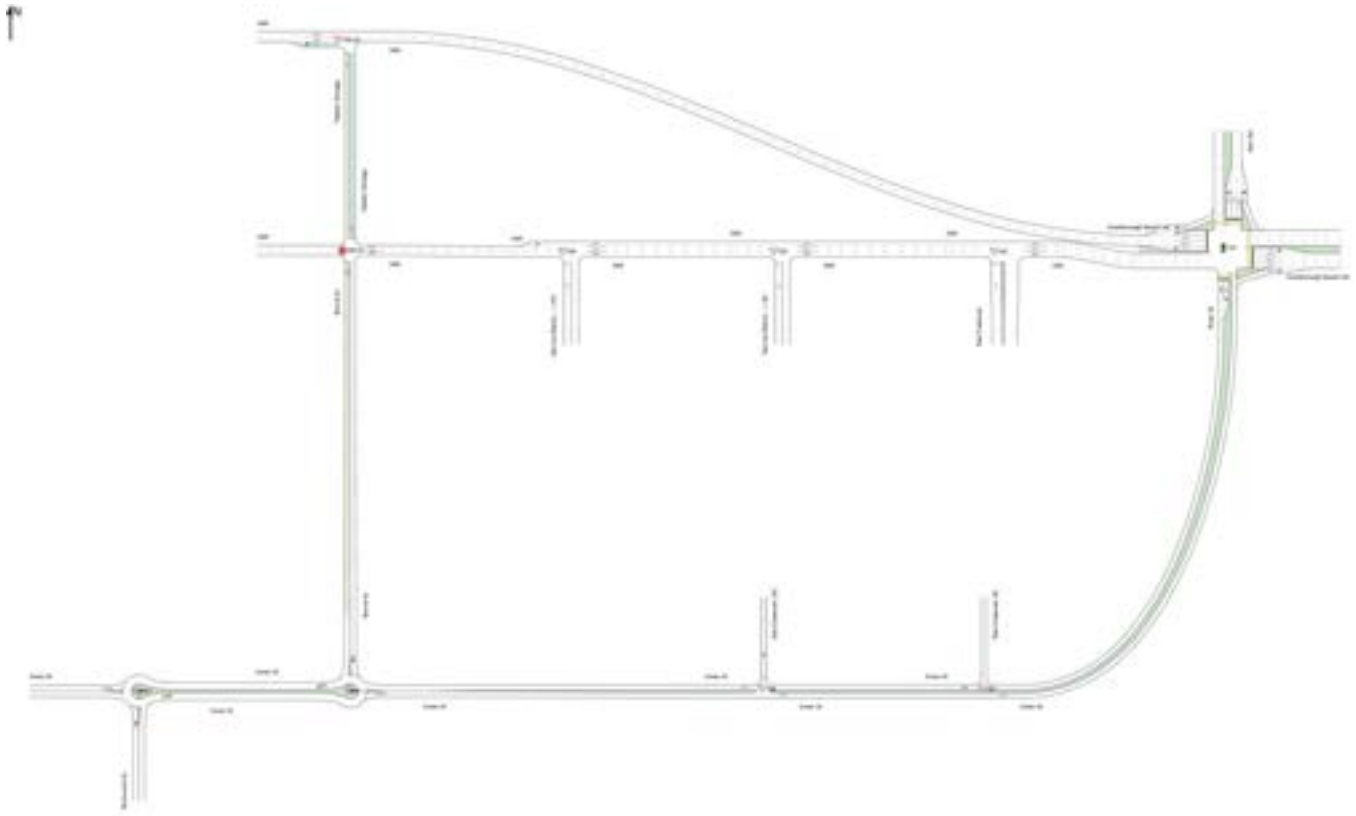


Figure 22: Network model – existing geometry

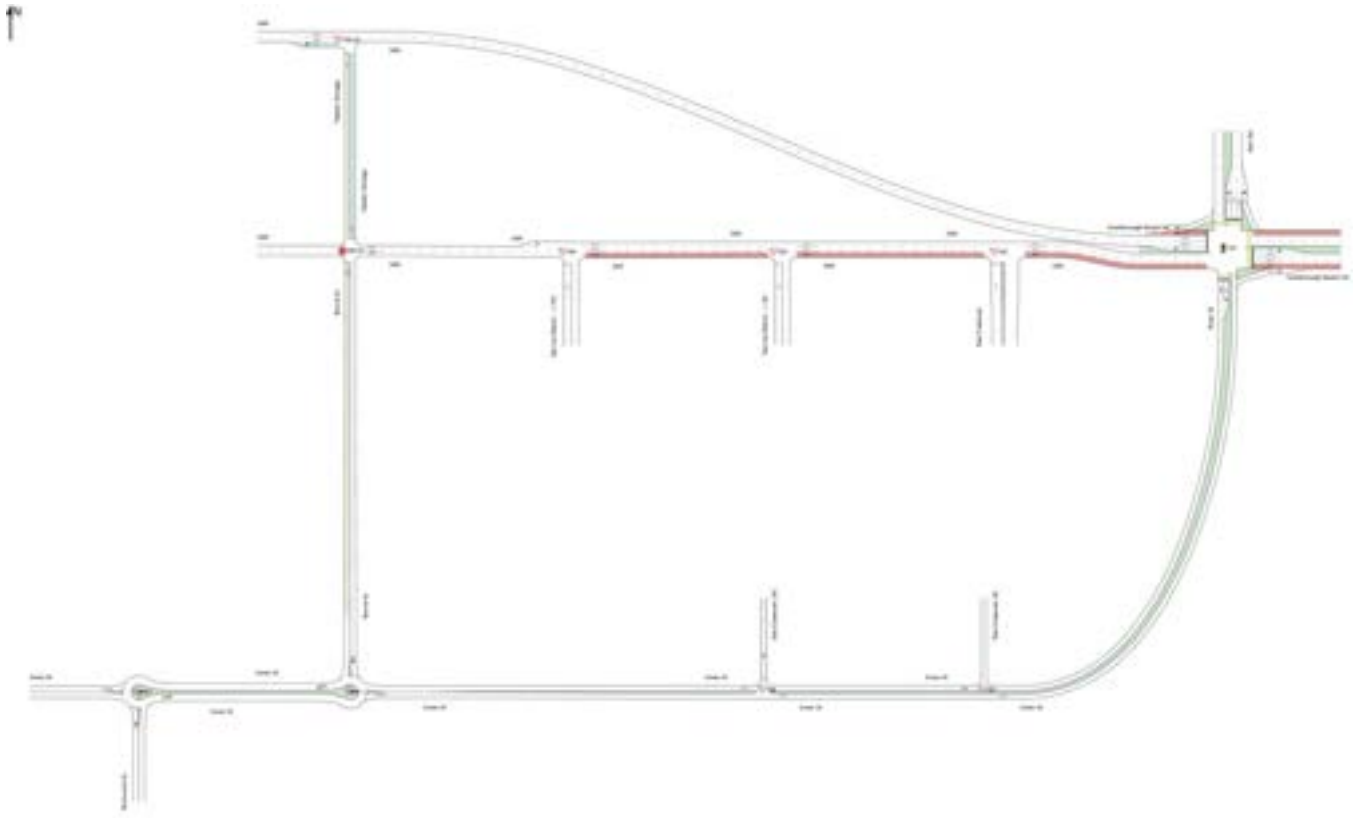


Figure 23: Network model – future geometry with bus lanes

Table 10: Summary of SIDRA analysis results

Site 101 - Scarborough Beach Rd / Odin Rd / Ewen St - Traffic Signals				
Scenario	**v/c**	**Ave Delay (sec)**	**LoS**	**95% Queue (m)**
Existing Weekday	0.783	36.2	D	128.9
Post Development Weekday	0.783	36.7	D	128.9
10-year Post Development Weekday	0.506	34.4	C	101
Existing Weekend	0.839	36.7	D	127.8
Post Development Weekend	0.839	37	D	127.8
10-year Post Development Weekend	0.598	34.4	C	86.4

Site 102 - Proposed Development Crossover/ Scarborough Beach Road				
Scenario	**v/c**	**Ave Delay (sec)**	**LoS**	**95% Queue (m)**
Existing Weekday				
Post Development Weekday	0.265	0.5	A	3.1
10-year Post Development Weekday	0.202	0.6	A	2.4
Existing Weekend				
Post Development Weekend	0.197	0.7	A	3.2
10-year Post Development Weekend	0.141	0.9	A	2.7

Site 103 - Service Station (east) / Scarborough Beach Road				
Scenario	**v/c**	**Ave Delay (sec)**	**LoS**	**95% Queue (m)**
Existing Weekday	0.261	0	A	0.1
Post Development Weekday	0.265	0	A	0.1
10-year Post Development Weekday	0.222	0.1	A	0
Existing Weekend	0.193	0	A	0.2
Post Development Weekend	0.197	0	A	0.2
10-year Post Development Weekend	0.169	0	A	0.1

Site 104 - Service Station (west) / Scarborough Beach Road				
Scenario	**v/c**	**Ave Delay (sec)**	**LoS**	**95% Queue (m)**
Existing Weekday	0.339	0.3	A	1
Post Development Weekday	0.345	0.3	A	1
10-year Post Development Weekday	0.352	0.2	A	0.8
Existing Weekend	0.255	0.1	A	0.2
Post Development Weekend	0.261	0.2	A	0.2
10-year Post Development Weekend	0.269	0.1	A	0.1

Site 105 - Scarborough Beach Road / Bowra Av (south approach)				
Scenario	**v/c**	**Ave Delay (sec)**	**LoS**	**95% Queue (m)**
Existing Weekday	0.645	47.5	E	21.9
Post Development Weekday	0.706	57.7	F	25.1
10-year Post Development Weekday	0.242	11	B	3.6
Existing Weekend	0.411	22.4	C	13.2
Post Development Weekend	0.449	25.2	D	14.6
10-year Post Development Weekend	0.123	9.7	A	3.5

Site 106.1 - Bowra Av / Ewen St (east)				
Scenario	v/c	Ave Delay (sec)	LoS	95% Queue (m)
Existing Weekday	0.107	3.5	A	4
Post Development Weekday	0.156	3.5	A	6.2
10-year Post Development Weekday	0.156	3.5	A	6.2
Existing Weekend	0.143	3.7	A	5.5
Post Development Weekend	0.199	3.7	A	8.2
10-year Post Development Weekend	0.199	3.7	A	8.2

Site 106.2 - Bowra Av / Ewen St (west)				
Scenario	v/c	Ave Delay (sec)	LoS	95% Queue (m)
Existing Weekday	0.126	3.6	A	4.8
Post Development Weekday	0.166	3.8	A	6.7
10-year Post Development Weekday	0.166	3.8	A	6.7
Existing Weekend	0.124	3.7	A	4
Post Development Weekend	0.162	3.9	A	6
10-year Post Development Weekend	0.162	3.9	A	6

Site 108 - Development Crossover (W) / Ewen St				
Scenario	v/c	Ave Delay (sec)	LoS	95% Queue (m)
Existing Weekday				
Post Development Weekday	0.129	0.4	A	2.5
10-year Post Development Weekday	0.129	0.4	A	2.5
Existing Weekend				
Post Development Weekend	0.12	0.5	A	2.8
10-year Post Development Weekend	0.12	0.5	A	2.8

Site 107- Development Crossover (E) / Ewen St				
Scenario	v/c	Ave Delay (sec)	LoS	95% Queue (m)
Existing Weekday				
Post Development Weekday	0.146	0.7	A	0
10-year Post Development Weekday	0.146	0.7	A	0
Existing Weekend				
Post Development Weekend	0.14	0.8	A	0
10-year Post Development Weekend	0.14	0.8	A	0

7.6 Development crossover sensitivity analysis

The SIDRA analysis presented in Section 7.5 assumes a substantial reduction (40%) in existing traffic travelling along Scarborough Beach Road past the subject site. It also assumes no growth in traffic travelling past the site on Ewen Street. This assumption is made on the basis that a general traffic lane is being removed from Scarborough Beach Road and being replaced with a Bus Rapid Transit lane. For this proposal to be successful, it will require a substantial mode shift from private motor vehicle to public transport along the route.

However, to ensure that the proposed development crossovers will operate successfully in the future. A sensitivity analysis has been undertaken with higher traffic volumes travelling past the site crossovers. The sensitivity analysis assumes double the traffic volumes (200% increase) in comparison to the assumed 10 year post development traffic analysed in Section 7.5.

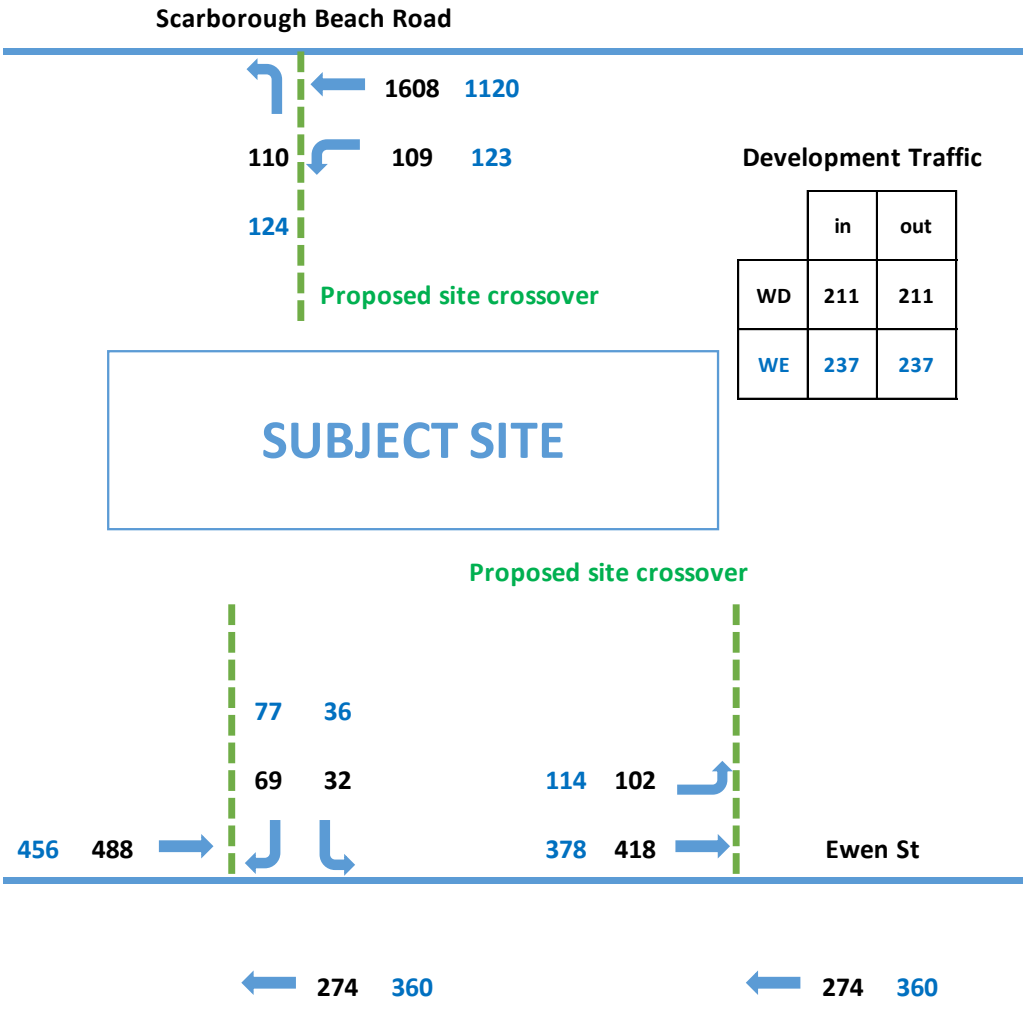


Figure 24: Sensitivity analysis traffic volumes

The sensitivity analysis indicates the development crossovers will still operate at a level of service A, with no delays or queuing, even if double the traffic volumes are passing the site on Scarborough Beach Road and Ewen Street. Detailed SIDRA outputs for each intersection are provided in Appendix E.

7.7 Impact on neighbouring areas

The traffic generated by the proposed development is not expected to significantly affect surrounding areas and the proposed land uses are in line with planning for the local area. Therefore, there is not expected to be any impact on neighbouring areas that would require any further consideration.

7.8 Traffic noise and vibration

It requires a doubling of traffic volumes on a road to produce a perceptible 3dB (A) increase in road noise. The proposed development will not increase traffic volumes or noise on surrounding roads anywhere near this level to result in any perceptible increase in noise.

8 Parking

8.1 Parking supply

A total of 156 onsite bays are provided, which includes 4 x click and collect bays and 2 x ACROD bays. 7 on-street bays and 4 motorcycle bays are also provided. Advice from the project town planners indicates that the parking provision is compliant.

8.2 Parking layout

The parking layout has been reviewed and input was provided to the architect, to help refine the plans through an iterative process. Car park bays, aisles and circulation areas are compliant with AS2890.1. The ramp dimensions and grades are also compliant with AS2890.1.

Swept path analysis for selected movements is included in Appendix F. The car park layout will continue to be refined at subsequent design stages.

9 Provision for service vehicles

The proposed service areas are indicated in Figure 25. The major tenant service area is accessed from Scarborough Beach Road and will be serviced by a 19m AV as the largest permitted vehicle. The other tenancies will be serviced by a shared area at the south east corner of the site. This service area will be accessed from Ewen Street, with a maximum permitted vehicle size equivalent to an 8.8m Medium Rigid Vehicle (MRV).

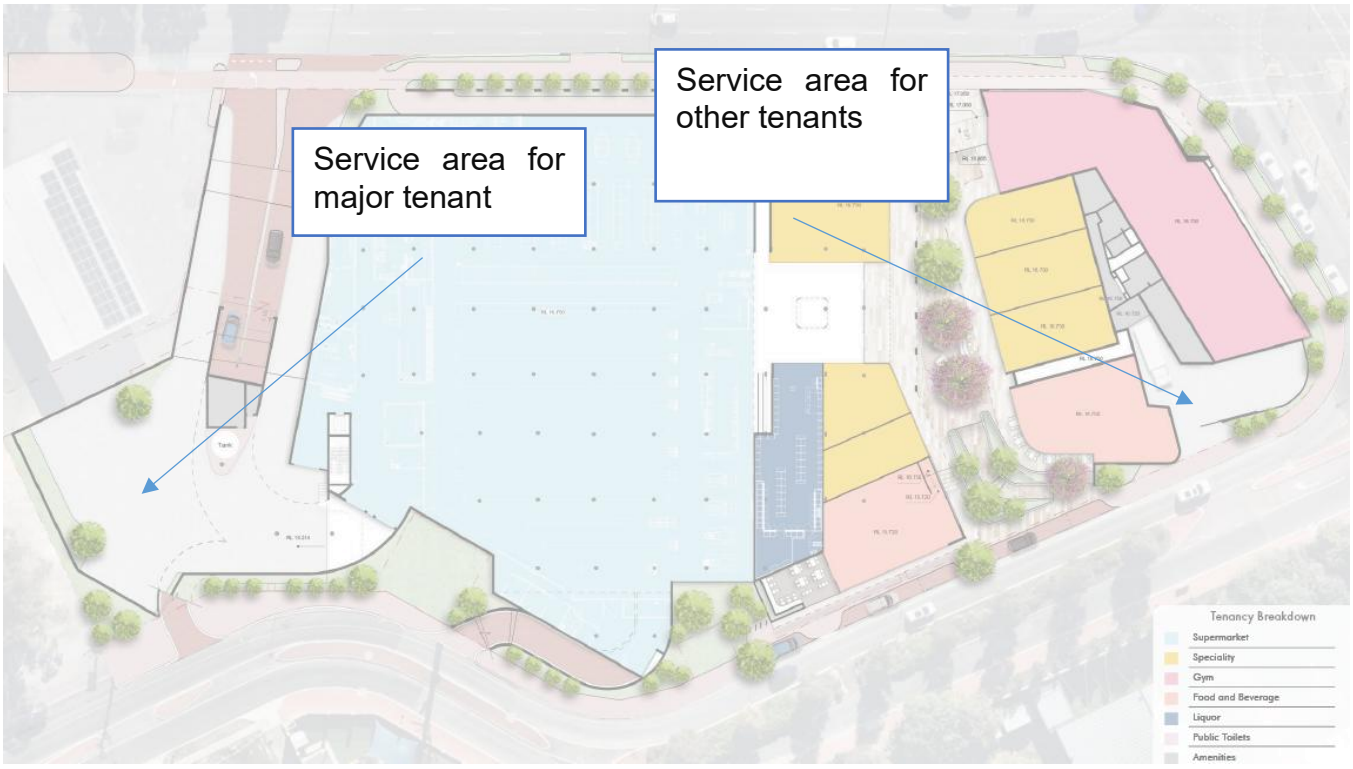


Figure 25: Proposed service areas

Swept path analysis was undertaken by Urbii to help inform the DA plans. Internally, truck movements were checked and the design was developed to accommodate truck swept paths. All service vehicle movements are forward entry and forward exit to and from the road network.

A selection of swept path sketches is included in Appendix F.

10 Public transport assessment

The State and Local Government authorities are progressing with a planned high frequency transit route on Scarborough Beach Road. Based on high-level information provided to Urbii, the transit route will likely involve the conversion of the kerbside lanes on Scarborough Beach Road into full-time priority bus lanes. High frequency bus services will then be run along the route in both directions of travel.

As detailed in Figure 21, vehicles can travel within the future bus lane for up to 100m to enter and exit the proposed development.



Figure 26: PTA advice on the use of priority bus lanes

The proposed development plans make allowance for the provision of a public transit stop on Scarborough Beach Road in front of the site. The indicative location of the public transit stop as indicated in Figure 27 is approximately 200m downstream of the planned stop to the east of the traffic signals.



Figure 27: Indicative future public transit stop

The proposed bus priority lane will replace the kerbside general traffic lane, which will reduce general traffic capacity from 3 to 2 lanes in each direction. As there is a reduction in general traffic lane capacity proposed on Scarborough Beach Road, a successful program will need to achieve a significant mode shift from private car to public transportation along the route. This should result in a reduction in traffic volumes which are presently observed on Scarborough Beach Road.

Review of literature indicates that ridership increases of 10-40% are often reported by Bus Rapid Transit programs[1]

The PTA *Bus Planning and Design Guidelines for Efficient People Movement* provides guidelines for implementing bus lanes in Western Australia. The Beaufort Street bus lanes are presented as a case study in the guidelines. As detailed in Figure 28, the Beaufort Street transit route recorded at 40 percent increase in total patronage in the first year of operation, and patronage continues to increase.

Up to 18,000 people travel by bus on Beaufort Street every day, buses carry 40% of people on the route and only represent 3.2% of vehicles.

Guided by these statistics, it is assumed that the Scarborough Beach Road priority bus lane project will achieve a 40% reduction in peak hour traffic volumes on Scarborough Beach Road.

[1] **A Business Case for Improving Interregional Bus Services** *Why and How to Provide Efficient and Affordable Long-Distance Transit Services* **9 October 2024** Todd Litman *Victoria Transport Policy Institute.*

Corridor Improvement: Beaufort Street Peak Period Bus Priority Lane

The Beaufort Street Bus Priority Lane Project is the culmination of ten years of holistic bus planning between PTA and the cities of Perth, Vincent and Stirling to make bus journeys more reliable.

Planning and design by the PTA and its local government partners saw Clearway zones used for bus only priority lanes during the peak periods (ie to the CBD in the AM peak and from the CBD in the PM peak). Not only did this improve bus running time by up to 15 per cent at peak times, but also retained on street parking to serve shops and businesses along the route at other times.

Each State-Local Government arrangement along this route saw the PTA undertake different levels of work for this project. In one instance the PTA assisted with the undergrounding of power, drainage network upgrade and streetscape upgrades as part of the project to ensure the works were coordinated to minimise disruption to the travelling public while delivering a safe and efficient public transport corridor.

Upon completion of the peak period direction bus lanes along the whole length of Beaufort Street from Roe Street in Perth to the City of Bayswater boundary, four bus services (services 21, 22, 78 and 79) were combined to create the high frequency 950, connecting Morley to UWA and QEII Hospital through the CBD.

Since the 950 was introduced it has achieved a 40 per cent increase in total patronage in the first year of operation and patronage continues to increase.





The statistics:

- Buses carry about **40 per cent** of people on Beaufort Street but only represent **3.2 per cent** of vehicles on that section of road.
- About **18000** people travel via bus along Beaufort Street every day.
- Over the course of a year, more than **1.5 million passengers** will travel this busy route during bus priority times.
- This equates to **a significant savings** now priority lanes are available for the majority of the trip between Morley and the CBD.
- The 950 service operates every **four minutes** during peak periods, **seven to eight minutes** during the day and **every ten minutes** on weekends.
- The new 950 service has recorded one of the **highest satisfaction** scores ever for a bus service across the entire Transperth network.

Figure 28: Bus lanes case study – Beaufort Street

Source: *Bus Planning and Design Guidelines for Efficient People Movement*, PTA.

11 Walking assessment

11.1 Internal provision for walking and active transport

The proposed development provides a high quality walking and cycling link through the site, linking Scarborough Beach Road and Ewen Street (Figure 29). This improves walking and cycling permeability, as people can cut through the link instead of travelling all the way around the site.

The walking link promotes healthy streets principles, providing people with things to see and do, a place to stop and rest, shade and shelter and other sustainable transport benefits.

The proposed development crossover will accommodate a refuge island to assist people crossing.

11.2 Walking catchment

A geospatial analysis was undertaken to estimate the walking catchment within 5 and 10 minutes of the subject site (Figure 30). There is a substantial residential catchment where people living can walk to the development for shopping, dining, entertainment or employment.



Figure 29: Proposed walking link through the site

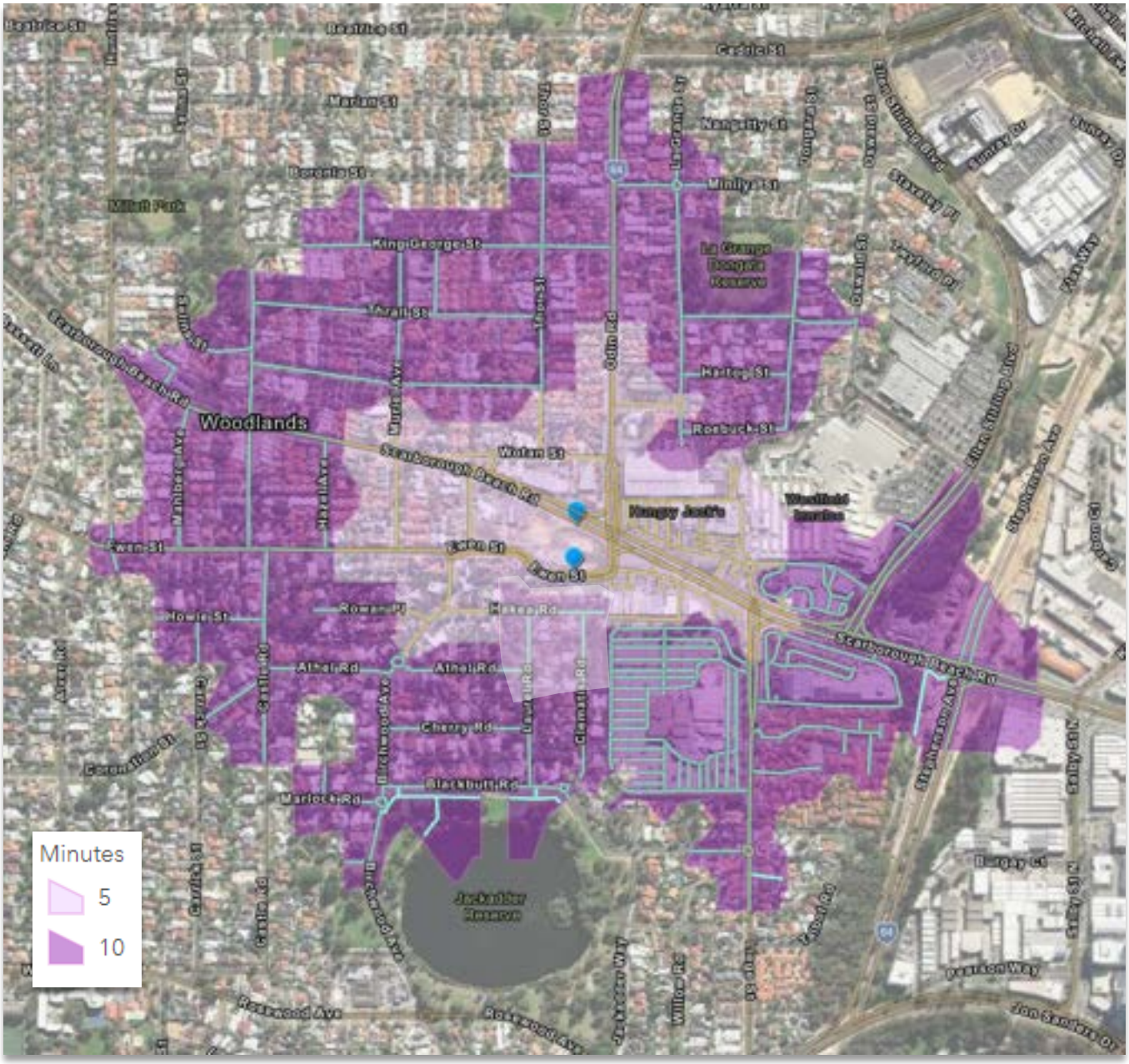


Figure 30: Subject site walking catchment isochrones

12 Cycling assessment

12.1 Bicycle parking and end of trip facilities

A total of 16 bicycle parking spaces are distributed through the development for visitors. A total of 14 bicycle parking spaces are provided for staff in a secure parking facility.

End of Trip facilities, including showers, changing rooms and lockers, are provided in a secure area on the ground level (Figure 31).



Figure 31: Bicycle parking and end of trip facilities – location plan

12.2 Sustainable transport catchment

As detailed in Figure 32, the subject site is well placed for staff and visitors to travel by sustainable modes of transport. A comfortable 8km or 20-25min cycle will provide the development with a large catchment including Subiaco, Nedlands/UWA, Scarborough, Karrinyup and parts of Perth CBD.

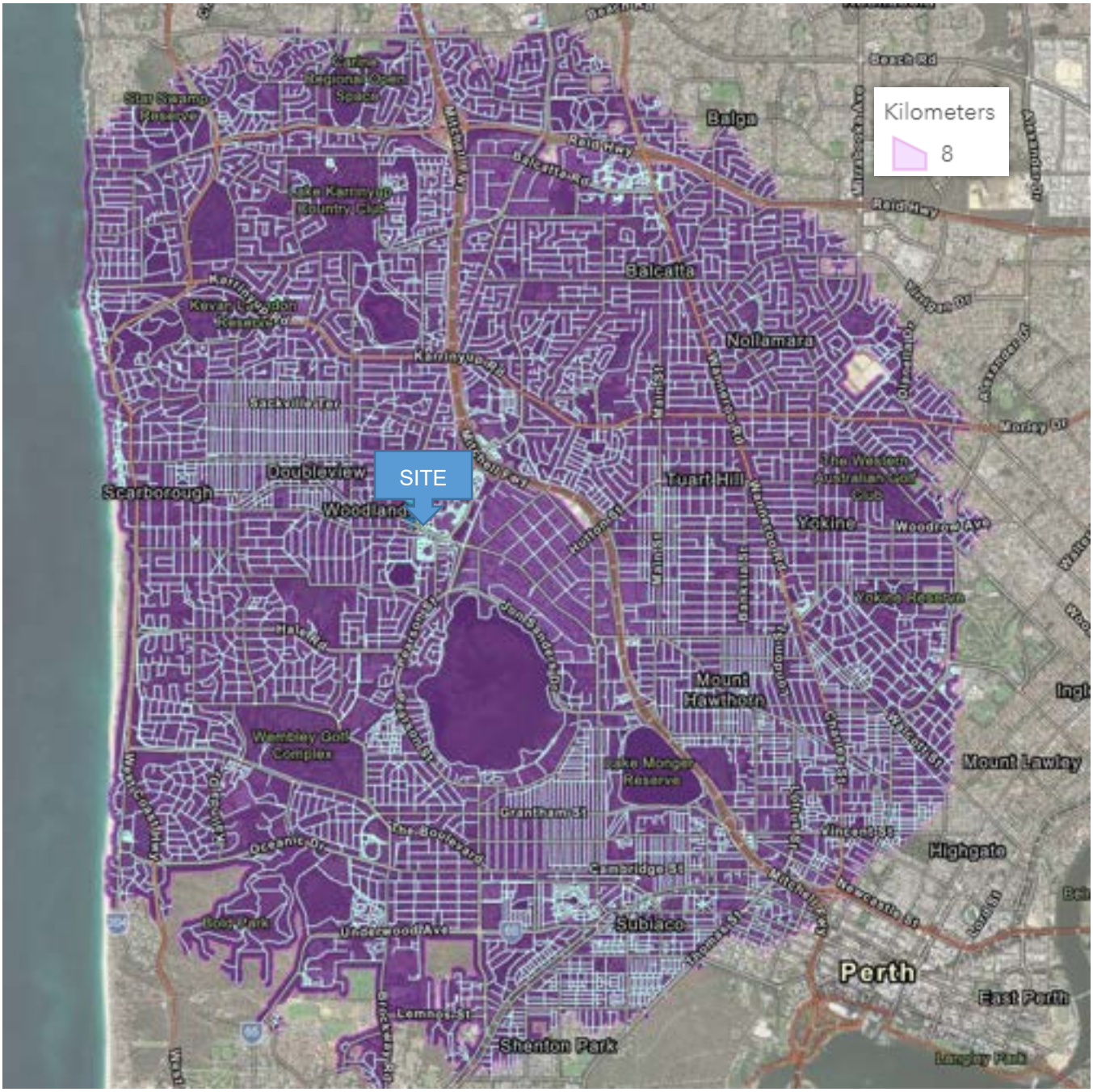


Figure 32: Cycling and micro-mobility catchment

13 Conclusion

This Transport Impact Assessment has been prepared by Urbii on behalf of Windsor Knight Pty Ltd with regards to the proposed commercial development, located at 367 Scarborough Beach Road, Woodlands.

The subject site is situated on the south-west corner of the signalised intersection of Scarborough Beach Road (SBR), Odin Road and Ewen Street.

The site promotes good connectivity with the existing and planned road, cycling and pedestrian network. Consideration has been given to the planned mid-tier public transport route on Scarborough Beach Road. The proposed development integrates well with the planned future transport network.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development can be accommodated by the surrounding roads and intersections.

It is concluded that the findings of this Transport Impact Assessment are supportive of the proposed development.

Appendices

Appendix A: Planning Control Area extracts

PCA 166 - Scarborough Beach Road - Hinderwell Street to Odin Road, King Edward Road to Main Street (Cities of Stirling and Vincent)

General description

The Minister for Planning has granted approval to the declaration of a planning control area over portions of Scarborough Beach Road (from Hinderwell Street to Odin Road and from King Edward Road to Main Street) as shown on Western Australian Planning Commission (WAPC) plan numbers 1.7994, 1.7995, 1.7996 and 1.7997.

Purpose

The purpose of the planning control area is to protect land for the future widening and improvement of the Scarborough Beach Road Other Regional Road reservation. The WAPC considers that the planning control area is required over the property to ensure that no development occurs on this land which might prejudice this purpose until it may be reserved for Other Regional Roads in the Metropolitan Region Scheme.

Duration and effects

The declaration remains in effect for a period of five years from the date of publication of this notice in the Government Gazette or until revoked by the WAPC with approval by the Minister, whichever is the sooner.

A person shall not commence and carry out development in a planning control area without the prior approval of the WAPC. The penalty for failure to comply with this requirement is $200,000 and, in the case of a continuing offence, a further fine of $25,000 for each day during which the offence continues.

Compensation is payable in respect of land injuriously affected by this declaration, and land so affected may be acquired by the WAPC in the same circumstances and in the same manner as if the land had been reserved in the Metropolitan Region Scheme for a public purpose.


WOTAN STREET
204
205
206
207
800
211 6m x 6m truncation
26
0.8
14.1
267
12
66
1
2
18
15.1
4.7
1.6
19.9
3.4
13
10.8
15.6
17.6
3.1
7
6
5
4
3
2
1
167
63
64
65
66
67
68
69
155
41
40
39
38
457
456
455
60
61
HAKEA ROAD

Appendix B: Proposed development plans





Scale 1:500 @ A3

0 5 10 15 20 25

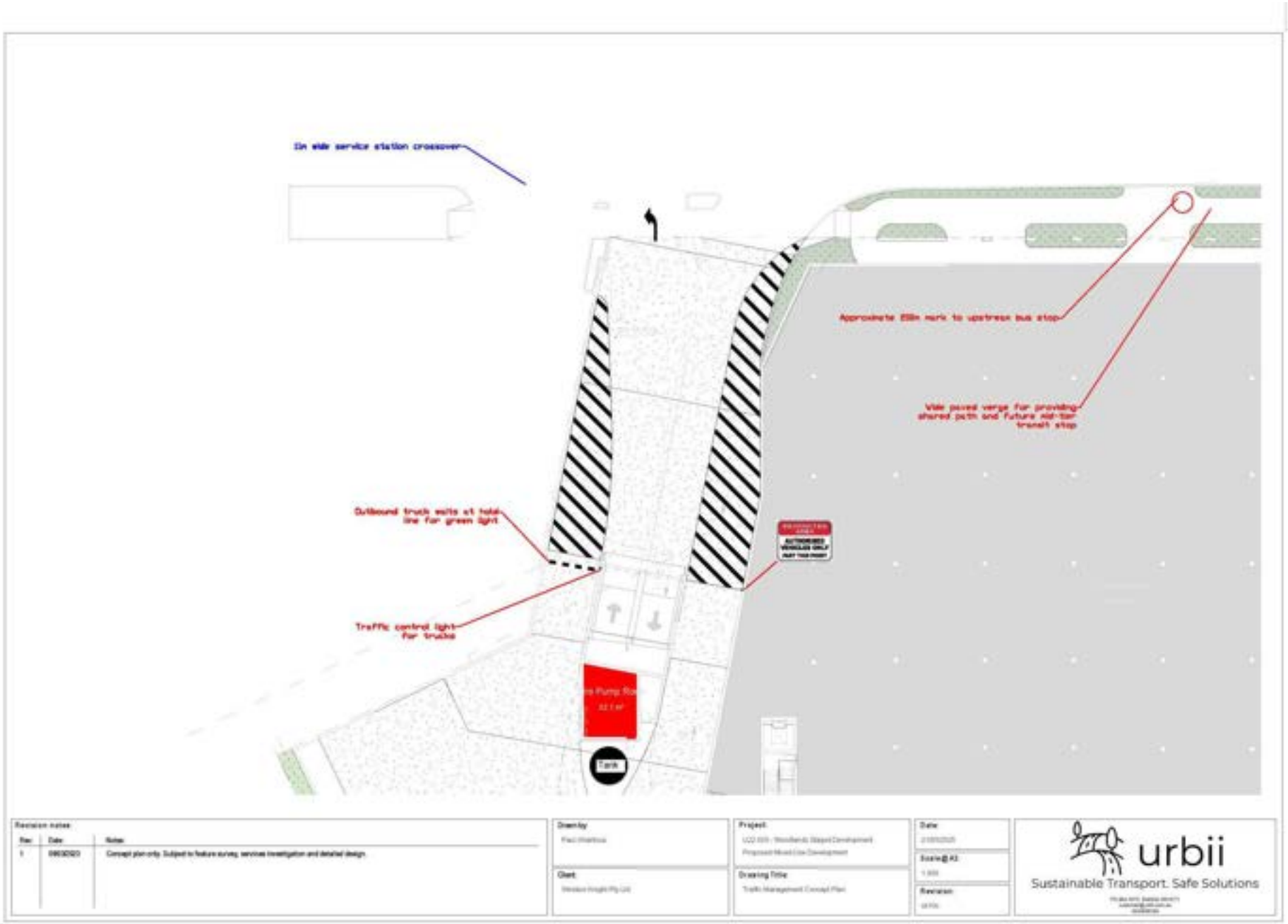
Level 1 Plan

Rg 7 Rev C

Woodlands North Development Application 08 2025

place fabric.

Appendix C: Proposed vehicle access traffic management


In wide service station crossover
Approximate 250m mark to upstream bus stop
Wide paved verge for providing shared path and future mid-block transit stop
Outbound truck waits at hold-line for green light
Traffic control light for trucks
Park
urbii
Sustainable Transport. Safe Solutions

Appendix D: Traffic volume diagrams

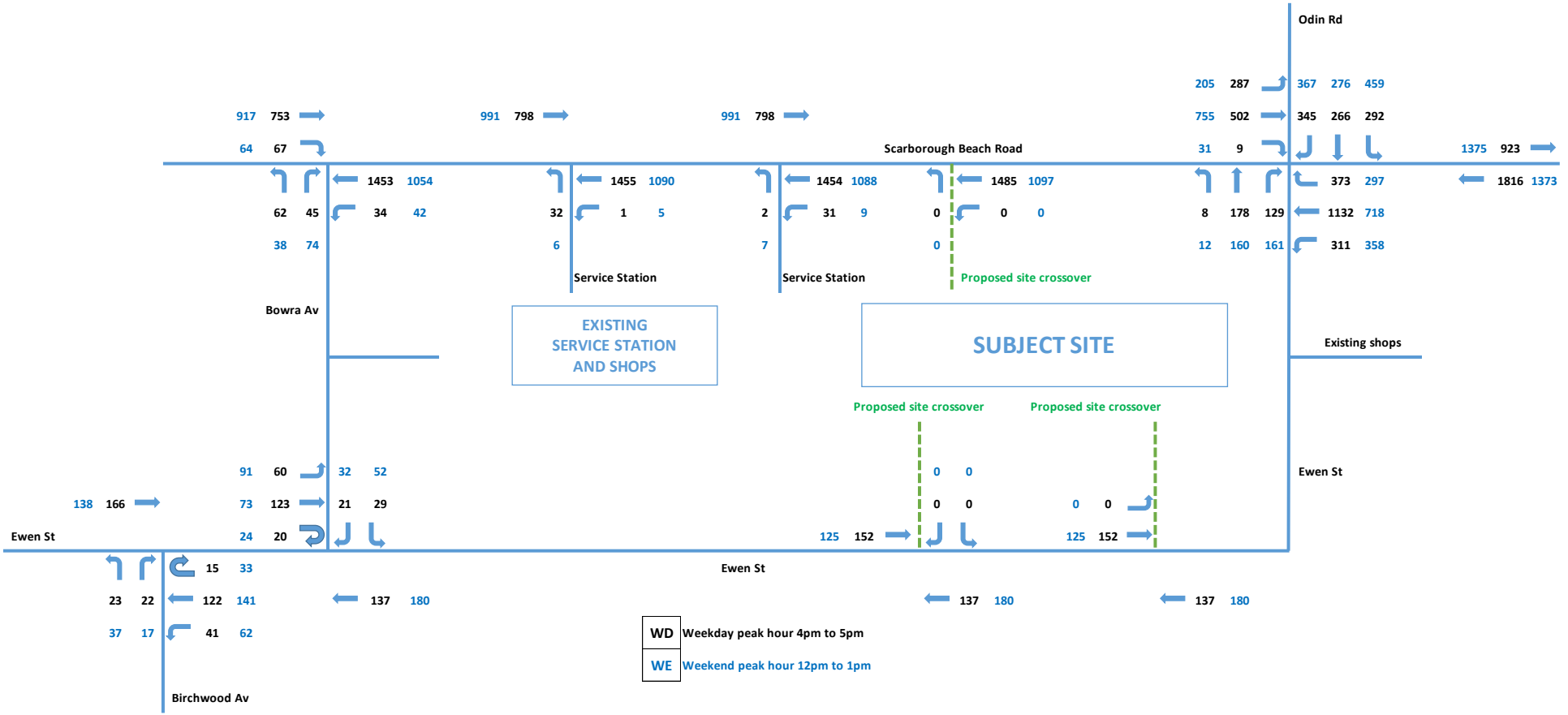
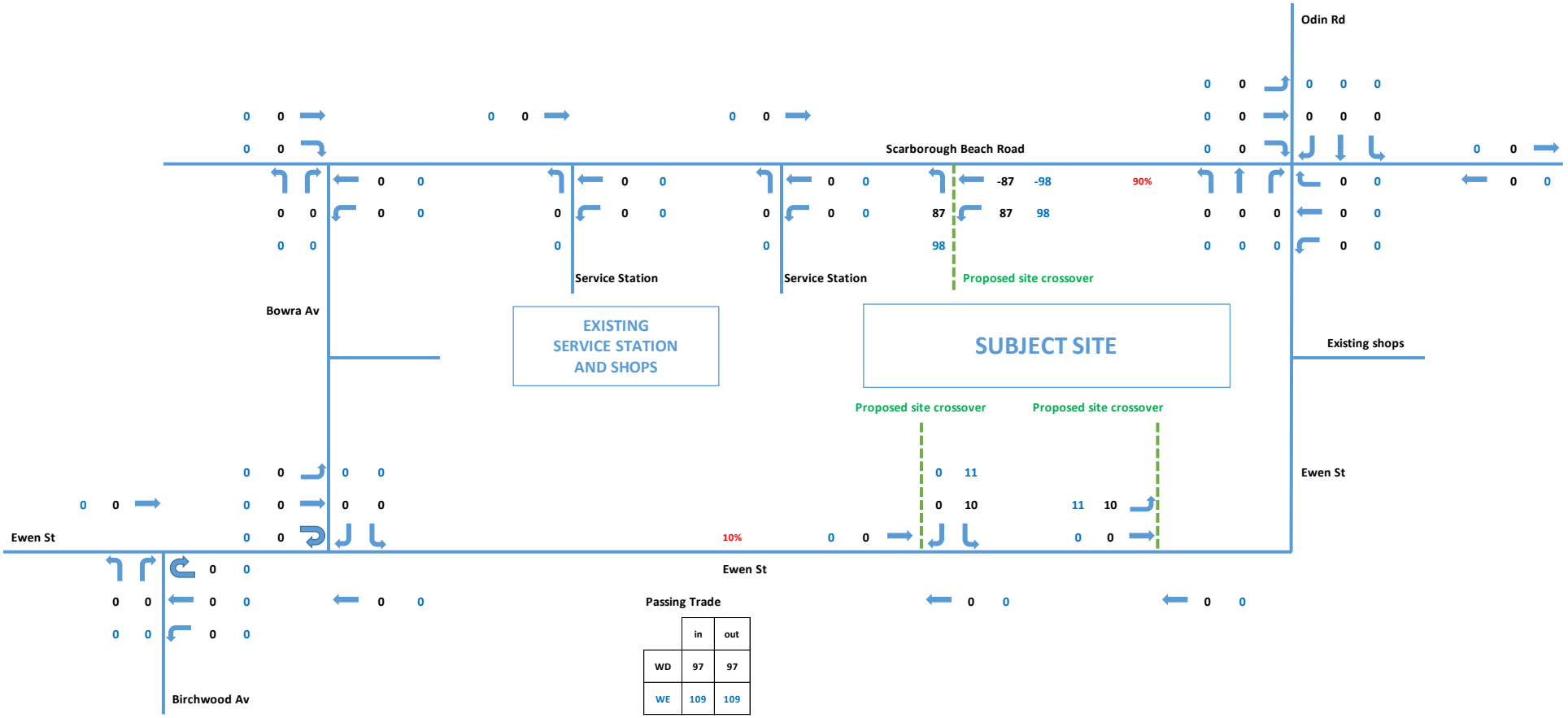
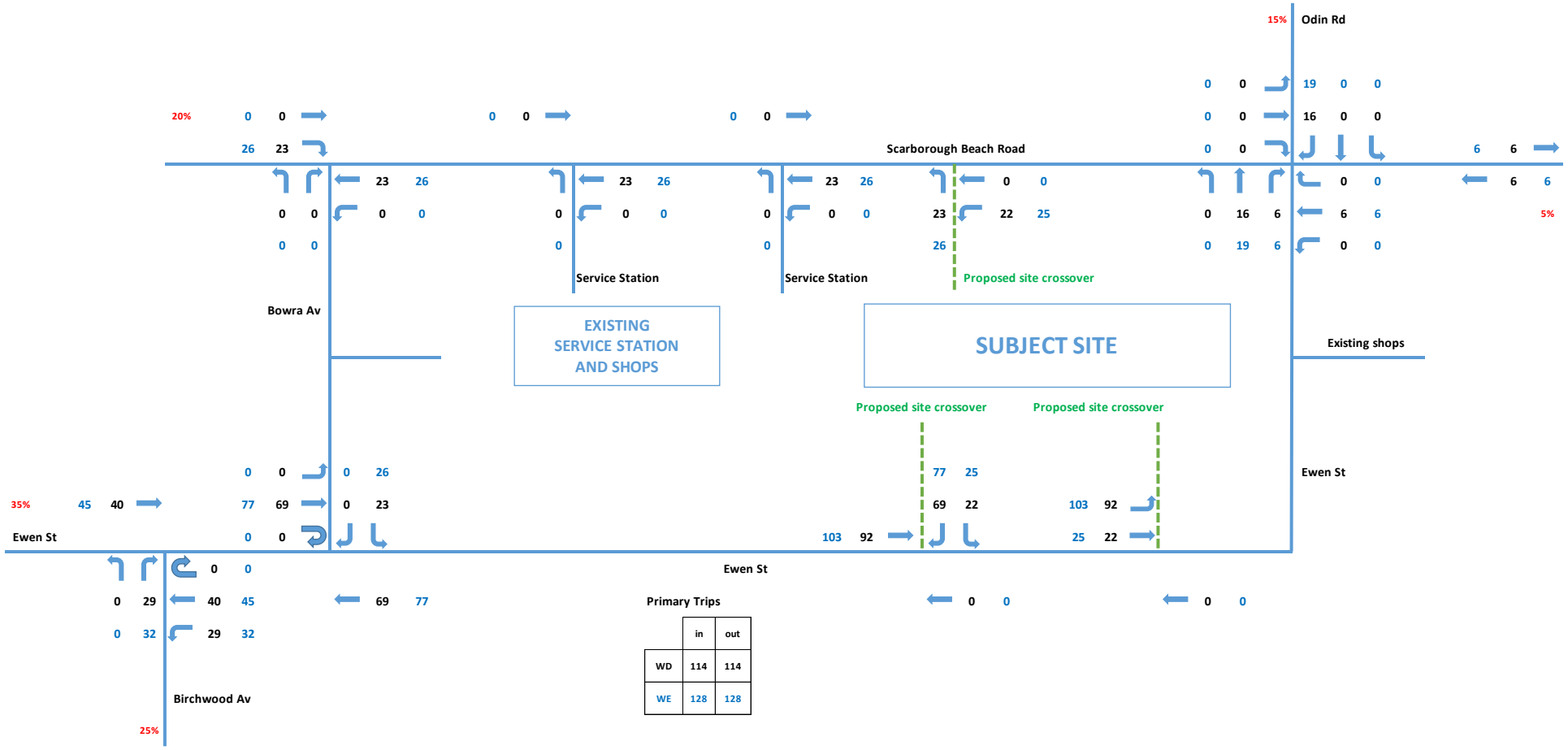


Figure 33: Surveyed existing traffic flows weekday and weekend peak hours



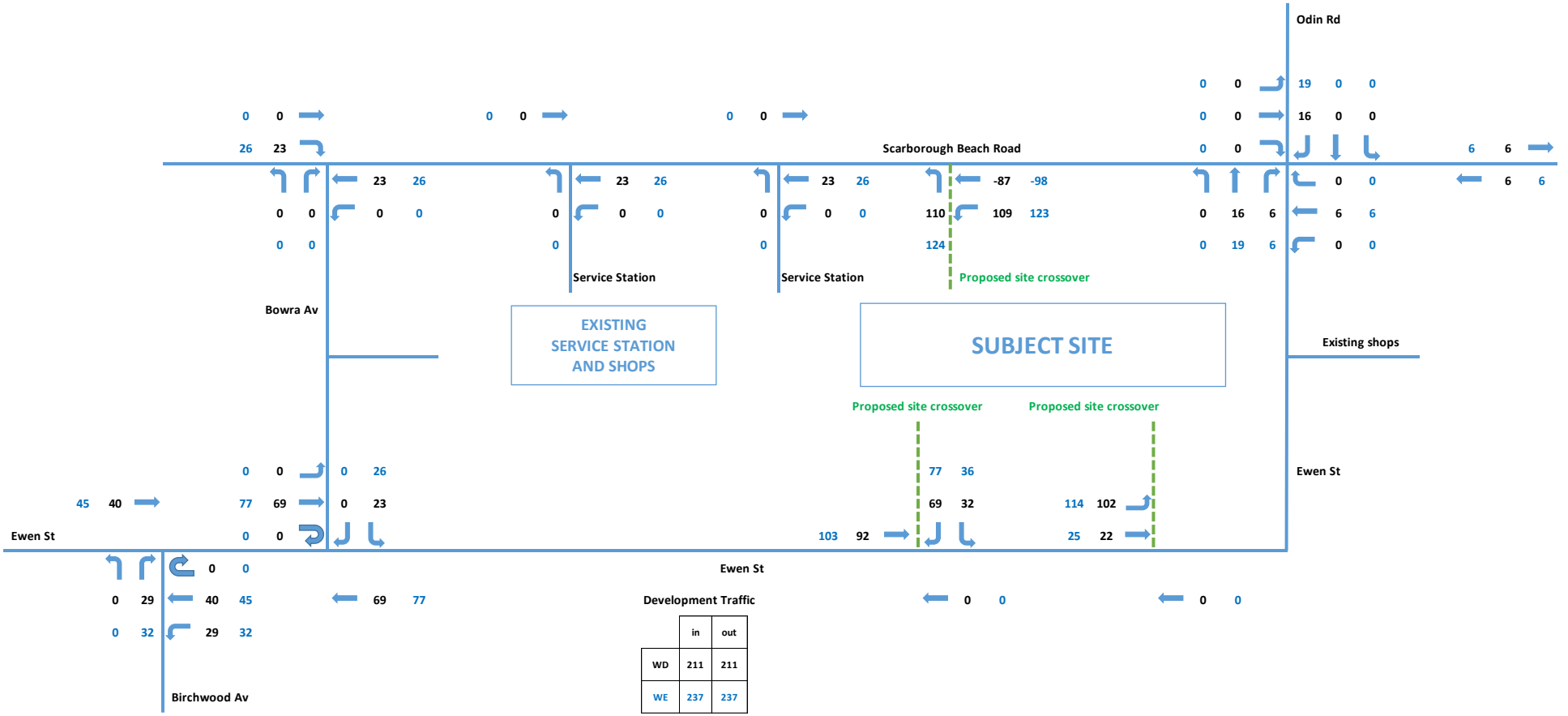
	in	out
WD	97	97
WE	109	109

Figure 34: Development traffic distribution – passing trade



	in	out
WD	114	114
WE	128	128

Figure 35: Development traffic distribution – primary trips



	in	out
WD	211	211
WE	237	237

Figure 36: Development traffic – all trips

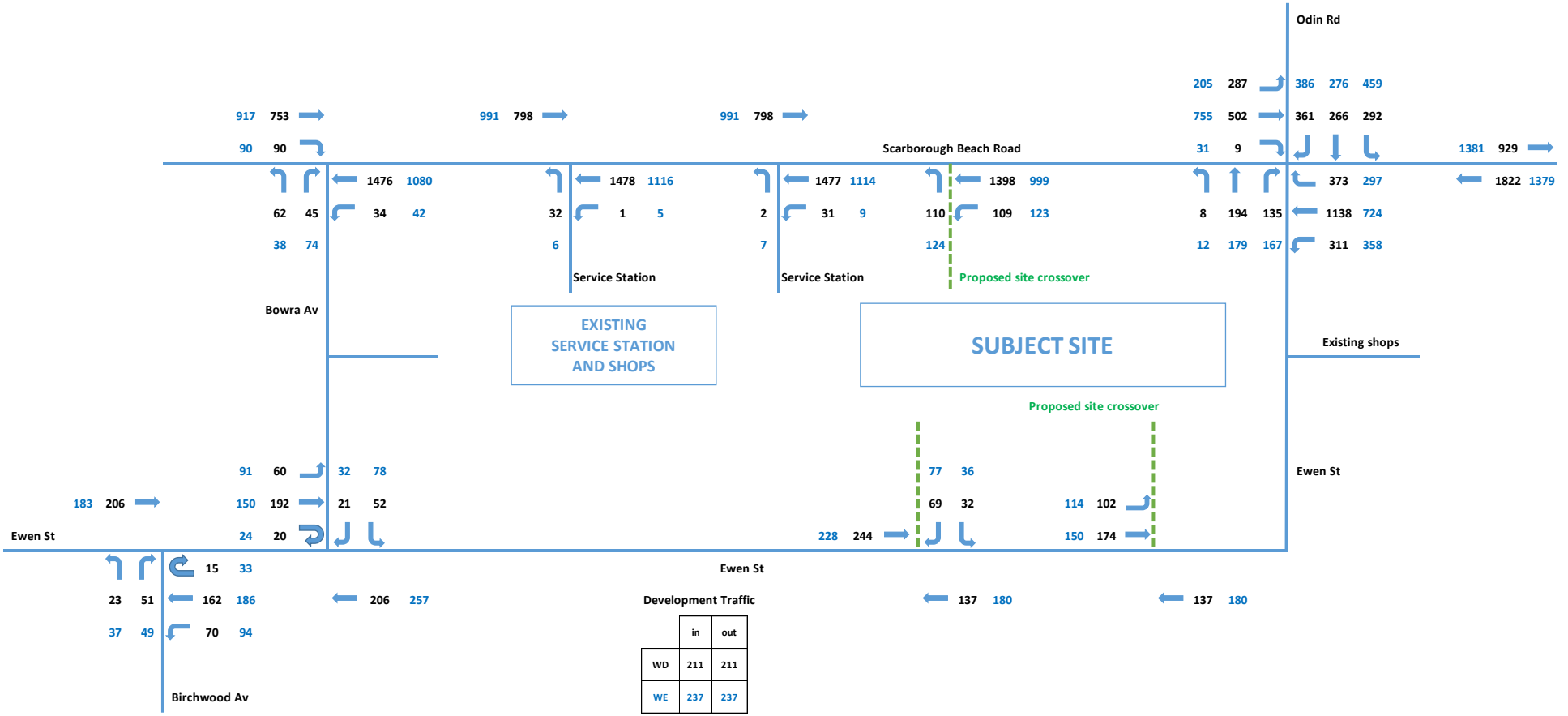


Figure 37: Post-development traffic volumes

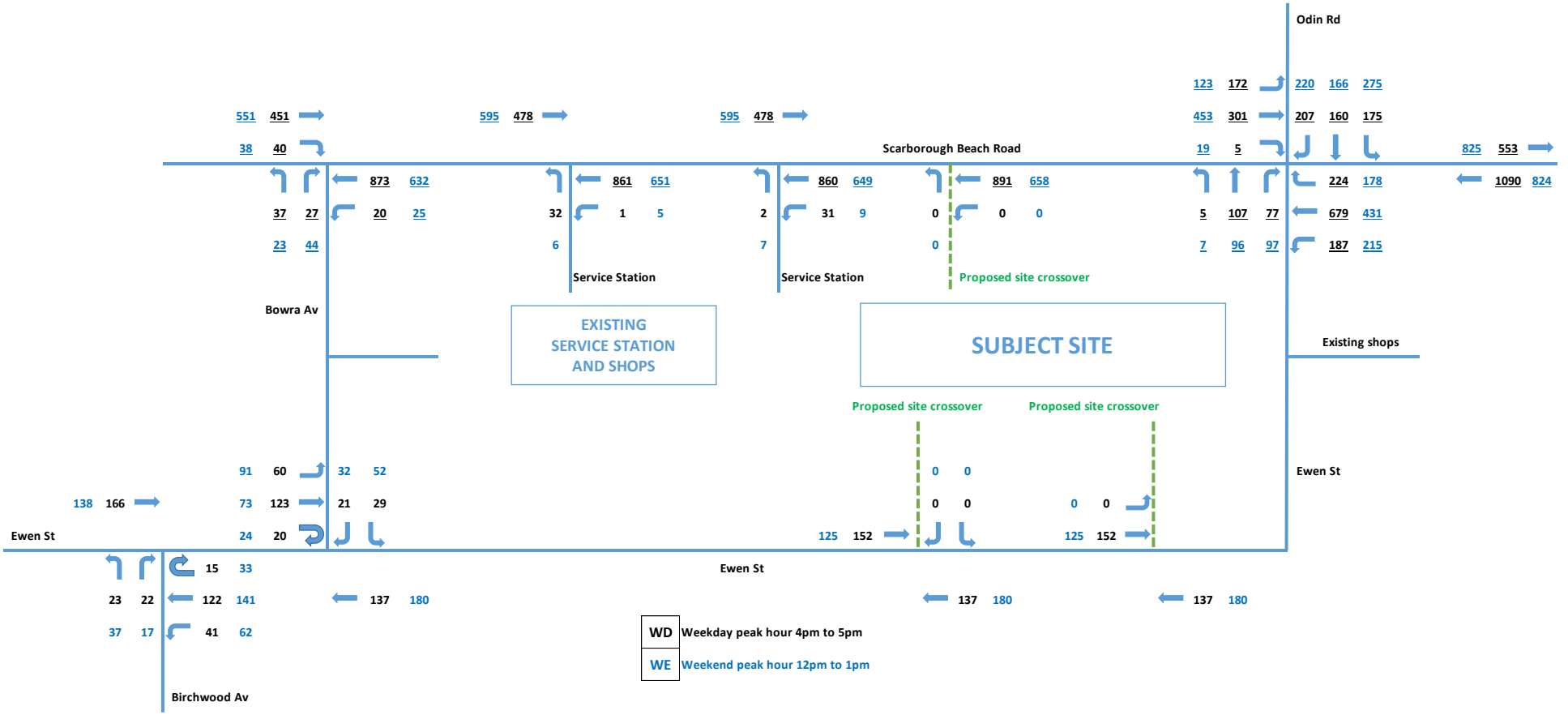


Figure 38: 10-year post-development traffic volumes (base)

Note: Underlined numbers have been reduced by 40% from existing traffic flows. This is to account for a mode shift resulting from a reduction in general traffic lanes and the provision of a mid-tier public transport service on Scarborough Beach Road.

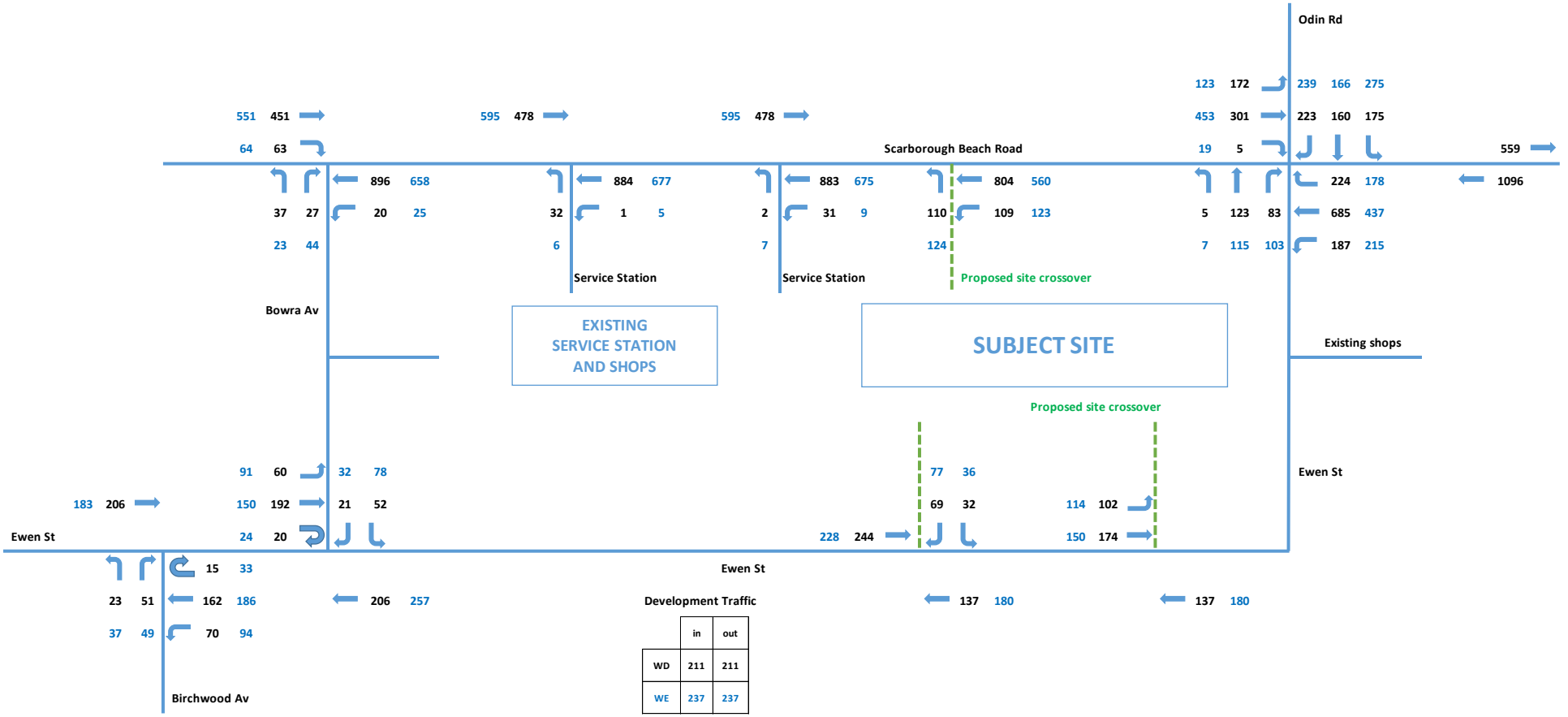


Figure 39: 10-year post-development traffic volumes (including development traffic)

Appendix E: SIDRA analysis outputs

SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation (DoS):** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service (LoS):** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay:** is the average of all travel time delays for vehicles through the intersection.
- **95% Queue:** is the queue length below which 95% of all observed queue lengths fall.

Existing weekday PM peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	8	6.0	8	6.0	0.549	59.2	LOS E	11.2	82.5	0.96	0.79	0.96	11.2
2	T1	178	6.0	178	6.0	0.549	54.5	LOS D	11.2	82.5	0.96	0.79	0.96	26.2
3	R2	129	6.0	129	6.0	0.506	63.0	LOS E	8.0	56.6	0.97	0.80	0.97	23.5
Approach		315	6.0	315	6.0	0.549	58.1	LOS E	11.2	82.5	0.97	0.79	0.97	24.8
East: Scarborough Beach Rd														
4	L2	311	6.0	311	6.0	0.223	8.9	LOS A	4.8	35.1	0.29	0.63	0.29	46.7
5	T1	1132	6.0	1132	6.0	0.437	26.3	LOS C	16.5	121.6	0.73	0.64	0.73	32.7
6	R2	373	6.0	373	6.0	*0.731	32.3	LOS C	14.9	109.6	0.96	0.85	0.97	39.0
Approach		1816	6.0	1816	6.0	0.731	24.6	LOS C	16.5	121.6	0.70	0.68	0.70	36.2
North: Odin Rd														
7	L2	292	6.0	292	6.0	0.229	9.2	LOS A	4.5	33.4	0.32	0.65	0.32	51.3
8	T1	266	6.0	266	6.0	*0.783	60.3	LOS E	17.5	128.9	1.00	0.91	1.10	20.7
9	R2	345	6.0	345	6.0	*0.676	66.5	LOS E	11.1	81.4	1.00	0.83	1.03	19.3
Approach		903	6.0	903	6.0	0.783	46.1	LOS D	17.5	128.9	0.78	0.80	0.82	28.2
West: Scarborough Beach Rd														
10	L2	287	6.0	287	6.0	0.276	14.4	LOS B	7.1	52.1	0.47	0.70	0.47	44.6
11	T1	502	6.0	502	6.0	*0.591	58.3	LOS E	10.4	76.6	0.98	0.80	0.98	26.2
12	R2	9	6.0	9	6.0	0.134	77.3	LOS E	0.6	4.5	0.99	0.67	0.99	9.7
Approach		798	6.0	798	6.0	0.591	42.8	LOS D	10.4	76.6	0.80	0.76	0.80	30.6
All Vehicles		3832	6.0	3832	6.0	0.783	36.2	LOS D	17.5	128.9	0.76	0.73	0.77	31.5

MOVEMENT SUMMARY

Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	2	0.0	2	0.0	0.002	1.6	LOS A	0.0	0.1	0.45	0.25	0.45	17.3
Approach		2	0.0	2	0.0	0.002	1.6	LOS A	0.0	0.1	0.45	0.25	0.45	17.3
East: SBR														
4	L2	31	0.0	31	0.0	0.261	2.1	LOS A	0.0	0.0	0.00	0.03	0.00	37.0
5	T1	1454	6.0	1454	6.0	0.261	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	57.5
Approach		1485	5.9	1485	5.9	0.261	0.0	NA	0.0	0.0	0.00	0.01	0.00	55.1
All Vehicles		1487	5.9	1487	5.9	0.261	0.0	NA	0.0	0.1	0.00	0.01	0.00	54.6

MOVEMENT SUMMARY

Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)] Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	32	0.0	32	0.0	0.039	2.9	LOS A	0.1	1.0	0.54	0.46	0.54	16.0
Approach		32	0.0	32	0.0	0.039	2.9	LOS A	0.1	1.0	0.54	0.46	0.54	16.0
East: SBR														
4	L2	1	0.0	1	0.0	0.339	3.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.5
5	T1	1455	6.0	1455	6.0	0.339	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1456	6.0	1456	6.0	0.339	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1488	5.9	1488	5.9	0.339	0.3	NA	0.1	1.0	0.01	0.01	0.01	54.5

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)] Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	62	6.0	62	6.0	0.645	28.0	LOS D	3.0	21.9	0.91	1.18	1.57	25.4
2	T1	45	6.0	45	6.0	0.645	74.4	LOS F	3.0	21.9	0.91	1.18	1.57	7.9
Approach		107	6.0	107	6.0	0.645	47.5	LOS E	3.0	21.9	0.91	1.18	1.57	19.9
East: SBR														
3	L2	34	6.0	34	6.0	0.393	4.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.1
4	T1	1453	6.0	1453	6.0	0.393	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		1487	6.0	1487	6.0	0.393	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
North: Median Storage														
5	T1	67	6.0	67	6.0	0.306	18.4	LOS C	1.0	7.4	0.89	0.98	1.03	2.9
Approach		67	6.0	67	6.0	0.306	18.4	LOS C	1.0	7.4	0.89	0.98	1.03	2.9
All Vehicles		1661	6.0	1661	6.0	0.645	3.9	NA	3.0	21.9	0.09	0.13	0.14	52.9

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)] Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	45	6.0	45	6.0	0.065	3.9	LOS A	0.2	1.5	0.52	0.59	0.52	8.8
Approach		45	6.0	45	6.0	0.065	3.9	LOS A	0.2	1.5	0.52	0.59	0.52	8.8
West: SBR														
2	T1	753	6.0	753	6.0	0.199	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	67	6.0	67	6.0	0.040	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		820	6.0	820	6.0	0.199	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.0
All Vehicles		865	6.0	865	6.0	0.199	0.7	NA	0.2	1.5	0.03	0.08	0.03	58.4

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)] Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	137	6.0	137	6.0	0.107	3.5	LOS A	0.5	4.0	0.16	0.40	0.16	29.5
Approach		137	6.0	137	6.0	0.107	3.5	LOS A	0.5	4.0	0.16	0.40	0.16	29.5
North: Bowra Av														
7	L2	29	6.0	29	6.0	0.046	4.5	LOS A	0.2	1.5	0.30	0.55	0.30	30.2
9	R2	21	6.0	21	6.0	0.046	7.6	LOS A	0.2	1.5	0.30	0.55	0.30	30.2
Approach		50	6.0	50	6.0	0.046	5.8	LOS A	0.2	1.5	0.30	0.55	0.30	30.2
West: Ewen St														
10	L2	60	6.0	60	6.0	0.105	2.5	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
11	T1	123	6.0	123	6.0	0.105	2.4	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
12w	U	20	6.0	20	6.0	0.105	6.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
Approach		203	6.0	203	6.0	0.105	2.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
All Vehicles		390	6.0	390	6.0	0.107	3.5	LOS A	0.5	4.0	0.09	0.45	0.09	29.3

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [Existing Weekday PM Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [ ] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	23	6.0	23	6.0	0.041	4.5	LOS A	0.2	1.4	0.29	0.55	0.29	45.5
9	R2	22	6.0	22	6.0	0.041	7.6	LOS A	0.2	1.4	0.29	0.55	0.29	42.8
Approach		45	6.0	45	6.0	0.041	6.0	LOS A	0.2	1.4	0.29	0.55	0.29	44.6
East: Ewen St														
10	L2	41	6.0	41	6.0	0.091	2.5	LOS A	0.0	0.0	0.00	0.45	0.00	45.4
11	T1	122	6.0	122	6.0	0.091	2.4	LOS A	0.0	0.0	0.00	0.45	0.00	46.9
12u	U	15	6.0	15	6.0	0.091	6.9	LOS A	0.0	0.0	0.00	0.45	0.00	29.1
Approach		178	6.0	178	6.0	0.091	2.8	LOS A	0.0	0.0	0.00	0.45	0.00	46.2
West: Ewen St														
5	T1	166	6.0	166	6.0	0.126	3.8	LOS A	0.7	4.8	0.15	0.41	0.15	44.8
Approach		166	6.0	166	6.0	0.126	3.8	LOS A	0.7	4.8	0.15	0.41	0.15	44.8
All Vehicles		389	6.0	389	6.0	0.126	3.6	LOS A	0.7	4.8	0.10	0.44	0.10	45.4

Existing weekend midday peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 121 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	12	6.0	12	6.0	0.525	54.4	LOS D	9.4	69.1	0.96	0.79	0.96	12.0
2	T1	160	6.0	160	6.0	0.525	49.8	LOS D	9.4	69.1	0.96	0.79	0.96	27.5
3	R2	161	6.0	161	6.0	0.541	55.4	LOS E	8.9	65.5	0.97	0.80	0.97	25.3
Approach		333	6.0	333	6.0	0.541	52.7	LOS D	9.4	69.1	0.96	0.79	0.96	26.0
East: Scarborough Beach Rd														
4	L2	358	6.0	358	6.0	0.265	9.7	LOS A	5.9	43.2	0.34	0.64	0.34	45.8
5	T1	718	6.0	718	6.0	0.299	24.6	LOS C	9.2	68.0	0.70	0.60	0.70	33.7
6	R2	297	6.0	297	6.0	*0.644	49.2	LOS D	15.7	115.9	0.95	0.84	0.95	33.1
Approach		1373	6.0	1373	6.0	0.644	26.0	LOS C	15.7	115.9	0.66	0.66	0.66	35.5
North: Odin Rd														
7	L2	459	6.0	459	6.0	0.403	12.6	LOS B	10.9	79.9	0.50	0.71	0.50	49.0
8	T1	276	6.0	276	6.0	*0.839	59.2	LOS E	17.4	127.8	1.00	0.97	1.19	21.0
9	R2	367	6.0	367	6.0	*0.617	57.3	LOS E	10.3	75.8	0.98	0.82	0.98	21.3
Approach		1102	6.0	1102	6.0	0.839	39.2	LOS D	17.4	127.8	0.78	0.81	0.83	31.6
West: Scarborough Beach Rd														
10	L2	205	6.0	205	6.0	0.186	12.0	LOS B	4.0	29.7	0.42	0.67	0.42	46.5
11	T1	755	6.0	755	6.0	*0.698	50.7	LOS D	14.2	104.9	0.99	0.85	1.02	28.3
12	R2	31	6.0	31	6.0	0.417	71.8	LOS E	1.9	14.3	1.00	0.72	1.00	10.4
Approach		991	6.0	991	6.0	0.698	43.3	LOS D	14.2	104.9	0.87	0.81	0.89	30.2
All Vehicles		3799	6.0	3799	6.0	0.839	36.7	LOS D	17.4	127.8	0.78	0.75	0.80	31.7

MOVEMENT SUMMARY

Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	7	0.0	7	0.0	0.006	1.2	LOS A	0.0	0.2	0.39	0.21	0.39	17.6
Approach		7	0.0	7	0.0	0.006	1.2	LOS A	0.0	0.2	0.39	0.21	0.39	17.6
East: SBR														
4	L2	9	0.0	9	0.0	0.193	2.1	LOS A	0.0	0.0	0.00	0.01	0.00	37.5
5	T1	1088	6.0	1088	6.0	0.193	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	58.9
Approach		1097	6.0	1097	6.0	0.193	0.0	NA	0.0	0.0	0.00	0.00	0.00	57.9
All Vehicles		1104	5.9	1104	5.9	0.193	0.0	NA	0.0	0.2	0.00	0.01	0.00	55.0

MOVEMENT SUMMARY

Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	6	0.0	6	0.0	0.006	1.8	LOS A	0.0	0.2	0.46	0.28	0.46	17.3
Approach		6	0.0	6	0.0	0.006	1.8	LOS A	0.0	0.2	0.46	0.28	0.46	17.3
East: SBR														
4	L2	5	0.0	5	0.0	0.255	3.0	LOS A	0.0	0.0	0.00	0.01	0.00	41.4
5	T1	1090	6.0	1090	6.0	0.255	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		1095	6.0	1095	6.0	0.255	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.2
All Vehicles		1101	5.9	1101	5.9	0.255	0.1	NA	0.0	0.2	0.00	0.00	0.00	58.0

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	38	6.0	38	6.0	0.411	10.8	LOS B	1.8	13.2	0.82	1.01	1.11	35.5
2	T1	74	6.0	74	6.0	0.411	28.4	LOS D	1.8	13.2	0.82	1.01	1.11	14.1
Approach		112	6.0	112	6.0	0.411	22.4	LOS C	1.8	13.2	0.82	1.01	1.11	25.0
East: SBR														
3	L2	42	6.0	42	6.0	0.290	4.5	LOS A	0.0	0.0	0.00	0.04	0.00	55.6
4	T1	1054	6.0	1054	6.0	0.290	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach		1096	6.0	1096	6.0	0.290	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: Median Storage														
5	T1	64	6.0	64	6.0	0.150	7.5	LOS A	0.5	3.6	0.74	0.74	0.74	5.9
Approach		64	6.0	64	6.0	0.150	7.5	LOS A	0.5	3.6	0.74	0.74	0.74	5.9
All Vehicles		1272	6.0	1272	6.0	0.411	2.5	NA	1.8	13.2	0.11	0.15	0.13	54.8

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	74	6.0	74	6.0	0.130	5.3	LOS A	0.4	3.0	0.62	0.70	0.62	7.3
Approach		74	6.0	74	6.0	0.130	5.3	LOS A	0.4	3.0	0.62	0.70	0.62	7.3
West: SBR														
2	T1	917	6.0	917	6.0	0.242	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	64	6.0	64	6.0	0.036	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		981	6.0	981	6.0	0.242	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.2
All Vehicles		1055	6.0	1055	6.0	0.242	0.8	NA	0.4	3.0	0.04	0.09	0.04	58.1

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	180	6.0	180	6.0	0.143	3.6	LOS A	0.7	5.5	0.20	0.41	0.20	29.0
Approach		180	6.0	180	6.0	0.143	3.6	LOS A	0.7	5.5	0.20	0.41	0.20	29.0
North: Bowra Av														
7	L2	52	6.0	52	6.0	0.074	4.3	LOS A	0.3	2.5	0.25	0.54	0.25	30.7
9	R2	32	6.0	32	6.0	0.074	7.4	LOS A	0.3	2.5	0.25	0.54	0.25	30.7
Approach		84	6.0	84	6.0	0.074	5.5	LOS A	0.3	2.5	0.25	0.54	0.25	30.7
West: Ewen St														
10	L2	91	6.0	91	6.0	0.099	2.5	LOS A	0.0	0.0	0.00	0.49	0.00	27.9
11	T1	73	6.0	73	6.0	0.099	2.4	LOS A	0.0	0.0	0.00	0.49	0.00	27.9
12u	U	24	6.0	24	6.0	0.099	6.9	LOS A	0.0	0.0	0.00	0.49	0.00	27.9
Approach		188	6.0	188	6.0	0.099	3.0	LOS A	0.0	0.0	0.00	0.49	0.00	27.9
All Vehicles		452	6.0	452	6.0	0.143	3.7	LOS A	0.7	5.5	0.12	0.47	0.12	29.1

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [Existing Weekend Midday Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [ ] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	37	6.0	37	6.0	0.051	4.7	LOS A	0.2	1.7	0.33	0.55	0.33	45.7
9	R2	17	6.0	17	6.0	0.051	7.8	LOS A	0.2	1.7	0.33	0.55	0.33	43.2
Approach		54	6.0	54	6.0	0.051	5.7	LOS A	0.2	1.7	0.33	0.55	0.33	45.2
East: Ewen St														
10	L2	62	6.0	62	6.0	0.124	2.5	LOS A	0.0	0.0	0.00	0.48	0.00	45.2
11	T1	141	6.0	141	6.0	0.124	2.4	LOS A	0.0	0.0	0.00	0.48	0.00	46.6
12u	U	33	6.0	33	6.0	0.124	6.9	LOS A	0.0	0.0	0.00	0.48	0.00	28.2
Approach		236	6.0	236	6.0	0.124	3.1	LOS A	0.0	0.0	0.00	0.48	0.00	45.7
West: Ewen St														
5	T1	138	6.0	138	6.0	0.110	3.9	LOS A	0.5	4.0	0.18	0.41	0.18	44.7
Approach		138	6.0	138	6.0	0.110	3.9	LOS A	0.5	4.0	0.18	0.41	0.18	44.7
All Vehicles		428	6.0	428	6.0	0.124	3.7	LOS A	0.5	4.0	0.10	0.46	0.10	45.3

Post development weekday PM peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	8	6.0	8	6.0	0.596	59.7	LOS E	12.3	90.5	0.97	0.81	0.97	11.2
2	T1	194	6.0	194	6.0	0.596	55.1	LOS E	12.3	90.5	0.97	0.81	0.97	26.1
3	R2	135	6.0	135	6.0	0.529	63.2	LOS E	8.4	61.6	0.98	0.80	0.96	23.5
Approach		337	6.0	337	6.0	0.596	58.5	LOS E	12.3	90.5	0.97	0.80	0.97	24.7
East: Scarborough Beach Rd														
4	L2	311	6.0	311	6.0	0.223	8.9	LOS A	4.8	35.1	0.29	0.63	0.29	46.7
5	T1	1138	6.0	1138	6.0	0.439	26.3	LOS C	16.6	122.4	0.73	0.64	0.73	32.7
6	R2	373	6.0	373	6.0	*0.731	32.3	LOS C	14.9	109.6	0.96	0.85	0.97	39.0
Approach		1822	6.0	1822	6.0	0.731	24.6	LOS C	16.6	122.4	0.70	0.68	0.70	36.2
North: Odin Rd														
7	L2	292	6.0	292	6.0	0.230	9.5	LOS A	4.7	34.6	0.33	0.65	0.33	51.1
8	T1	266	6.0	266	6.0	*0.783	60.3	LOS E	17.5	128.9	1.00	0.91	1.10	20.7
9	R2	361	6.0	361	6.0	*0.744	68.3	LOS E	11.9	87.3	1.00	0.87	1.10	19.0
Approach		919	6.0	919	6.0	0.783	47.3	LOS D	17.5	128.9	0.79	0.81	0.85	27.8
West: Scarborough Beach Rd														
10	L2	287	6.0	287	6.0	0.279	14.9	LOS B	7.3	53.4	0.48	0.70	0.48	44.3
11	T1	502	6.0	502	6.0	*0.591	58.3	LOS E	10.4	76.6	0.98	0.80	0.96	26.2
12	R2	9	6.0	9	6.0	0.134	77.3	LOS E	0.6	4.5	0.99	0.67	0.99	9.7
Approach		798	6.0	798	6.0	0.591	42.9	LOS D	10.4	76.6	0.80	0.76	0.80	30.5
All Vehicles		3876	6.0	3876	6.0	0.783	36.7	LOS D	17.5	128.9	0.77	0.74	0.78	31.2

MOVEMENT SUMMARY

Site: 102 [Site Crossover / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Proposed development crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	110	0.0	110	0.0	0.094	1.5	LOS A	0.4	3.1	0.44	0.30	0.44	17.4
Approach		110	0.0	110	0.0	0.094	1.5	LOS A	0.4	3.1	0.44	0.30	0.44	17.4
East: SBR														
4	L2	109	0.0	109	0.0	0.265	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	44.0
5	T1	1398	6.0	1398	6.0	0.265	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	57.0
Approach		1507	5.6	1507	5.6	0.265	0.4	NA	0.0	0.0	0.00	0.04	0.00	55.4
All Vehicles		1617	5.2	1617	5.2	0.265	0.5	NA	0.4	3.1	0.03	0.06	0.03	51.1

MOVEMENT SUMMARY

▽ Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	2	0.0	2	0.0	0.002	1.7	LOS A	0.0	0.1	0.45	0.25	0.45	17.3
Approach		2	0.0	2	0.0	0.002	1.7	LOS A	0.0	0.1	0.45	0.25	0.45	17.3
East: SBR														
4	L2	31	0.0	31	0.0	0.265	2.1	LOS A	0.0	0.0	0.00	0.03	0.00	37.0
5	T1	1477	6.0	1477	6.0	0.265	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	57.5
Approach		1508	5.9	1508	5.9	0.265	0.0	NA	0.0	0.0	0.00	0.01	0.00	55.2
All Vehicles		1510	5.9	1510	5.9	0.265	0.0	NA	0.0	0.1	0.00	0.01	0.00	54.6

MOVEMENT SUMMARY

▽ Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	32	0.0	32	0.0	0.040	3.0	LOS A	0.1	1.0	0.55	0.46	0.55	16.0
Approach		32	0.0	32	0.0	0.040	3.0	LOS A	0.1	1.0	0.55	0.46	0.55	16.0
East: SBR														
4	L2	1	0.0	1	0.0	0.345	3.0	LOS A	0.0	0.0	0.00	0.00	0.00	41.5
5	T1	1478	6.0	1478	6.0	0.345	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1479	6.0	1479	6.0	0.345	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1511	5.9	1511	5.9	0.345	0.3	NA	0.1	1.0	0.01	0.01	0.01	54.5

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	62	6.0	62	6.0	0.706	36.0	LOS E	3.4	25.1	0.93	1.23	1.74	22.8
2	T1	45	6.0	45	6.0	0.706	87.6	LOS F	3.4	25.1	0.93	1.23	1.74	6.7
Approach		107	6.0	107	6.0	0.706	57.7	LOS F	3.4	25.1	0.93	1.23	1.74	17.5
East: SBR														
3	L2	34	6.0	34	6.0	0.399	4.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.1
4	T1	1476	6.0	1476	6.0	0.399	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		1510	6.0	1510	6.0	0.399	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.5
North: Median Storage														
5	T1	90	6.0	90	6.0	0.429	21.8	LOS C	1.5	11.1	0.91	1.07	1.17	2.5
Approach		90	6.0	90	6.0	0.429	21.8	LOS C	1.5	11.1	0.91	1.07	1.17	2.5
All Vehicles		1707	6.0	1707	6.0	0.706	4.9	NA	3.4	25.1	0.11	0.15	0.17	51.4

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	45	6.0	45	6.0	0.065	3.9	LOS A	0.2	1.5	0.52	0.59	0.52	8.8
Approach		45	6.0	45	6.0	0.065	3.9	LOS A	0.2	1.5	0.52	0.59	0.52	8.8
West: SBR														
2	T1	753	6.0	753	6.0	0.199	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	90	6.0	90	6.0	0.063	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		843	6.0	843	6.0	0.199	0.7	NA	0.0	0.0	0.00	0.07	0.00	58.7
All Vehicles		888	6.0	888	6.0	0.199	0.8	NA	0.2	1.5	0.03	0.09	0.03	58.2

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	206	6.0	206	6.0	0.156	3.5	LOS A	0.8	6.2	0.17	0.40	0.17	29.4
Approach		206	6.0	206	6.0	0.156	3.5	LOS A	0.8	6.2	0.17	0.40	0.17	29.4
North: Bowra Av														
7	L2	52	6.0	52	6.0	0.071	4.9	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
9	R2	21	6.0	21	6.0	0.071	6.1	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
Approach		73	6.0	73	6.0	0.071	5.8	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
West: Ewen St														
10	L2	60	6.0	60	6.0	0.139	2.5	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
11	T1	192	6.0	192	6.0	0.139	2.4	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
12u	U	20	6.0	20	6.0	0.139	6.9	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
Approach		272	6.0	272	6.0	0.139	2.8	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
All Vehicles		551	6.0	551	6.0	0.156	3.5	LOS A	0.8	6.2	0.11	0.45	0.11	29.5

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	23	6.0	23	6.0	0.070	4.7	LOS A	0.3	2.4	0.34	0.59	0.34	45.0
9	R2	51	6.0	51	6.0	0.070	7.9	LOS A	0.3	2.4	0.34	0.59	0.34	42.1
Approach		74	6.0	74	6.0	0.070	6.9	LOS A	0.3	2.4	0.34	0.59	0.34	43.4
East: Ewen St														
10	L2	70	6.0	70	6.0	0.126	2.5	LOS A	0.0	0.0	0.00	0.44	0.00	45.5
11	T1	162	6.0	162	6.0	0.126	2.4	LOS A	0.0	0.0	0.00	0.44	0.00	47.0
12u	U	15	6.0	15	6.0	0.126	6.9	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
Approach		247	6.0	247	6.0	0.126	2.7	LOS A	0.0	0.0	0.00	0.44	0.00	46.3
West: Ewen St														
5	T1	206	6.0	206	6.0	0.166	4.0	LOS A	0.9	6.7	0.23	0.42	0.23	44.4
Approach		206	6.0	206	6.0	0.166	4.0	LOS A	0.9	6.7	0.23	0.42	0.23	44.4
All Vehicles		527	6.0	527	6.0	0.166	3.8	LOS A	0.9	6.7	0.14	0.46	0.14	45.1

MOVEMENT SUMMARY

▽ Site: 108 [Site Crossover (W) / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Western car park exit crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	137	6.0	137	6.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		137	6.0	137	6.0	0.072	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: Site Crossover (W)														
7	L2	32	0.0	32	0.0	0.101	0.8	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
9	R2	69	0.0	69	0.0	0.101	2.6	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
Approach		101	0.0	101	0.0	0.101	2.1	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
West: Ewen St														
11	T1	244	6.0	244	6.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		244	6.0	244	6.0	0.129	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		482	4.7	482	4.7	0.129	0.4	NA	0.4	2.5	0.08	0.08	0.08	35.0

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekday PM Peak (Network Folder: General)]

Eastern car park entry crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	137	6.0	137	6.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		137	6.0	137	6.0	0.072	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Ewen St														
10	L2	102	0.0	102	0.0	0.146	3.0	LOS A	0.0	0.0	0.00	0.19	0.00	14.2
11	T1	174	6.0	174	6.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.19	0.00	36.2
Approach		276	3.8	276	3.8	0.146	1.1	NA	0.0	0.0	0.00	0.19	0.00	19.4
All Vehicles		413	4.5	413	4.5	0.146	0.7	NA	0.0	0.0	0.00	0.13	0.00	31.3

Post development weekend midday peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 121 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	12	6.0	12	6.0	0.582	55.0	LOS D	10.6	77.7	0.97	0.80	0.97	11.9
2	T1	179	6.0	179	6.0	0.582	50.4	LOS D	10.6	77.7	0.97	0.80	0.97	27.3
3	R2	167	6.0	167	6.0	0.561	55.6	LOS E	9.3	68.2	0.97	0.81	0.97	25.2
Approach		358	6.0	358	6.0	0.582	53.0	LOS D	10.6	77.7	0.97	0.80	0.97	25.9
East: Scarborough Beach Rd														
4	L2	358	6.0	358	6.0	0.265	9.7	LOS A	5.9	43.2	0.34	0.64	0.34	45.8
5	T1	724	6.0	724	6.0	0.302	24.7	LOS C	9.3	68.6	0.71	0.60	0.71	33.6
6	R2	297	6.0	297	6.0	*0.644	49.2	LOS D	15.7	115.9	0.95	0.84	0.95	33.1
Approach		1379	6.0	1379	6.0	0.644	26.1	LOS C	15.7	115.9	0.66	0.68	0.66	35.4
North: Odin Rd														
7	L2	459	6.0	459	6.0	0.405	13.0	LOS B	11.1	81.6	0.51	0.72	0.51	48.7
8	T1	276	6.0	276	6.0	*0.839	59.2	LOS E	17.4	127.8	1.00	0.97	1.19	21.0
9	R2	386	6.0	386	6.0	*0.649	57.8	LOS E	10.9	80.5	0.99	0.83	1.00	21.2
Approach		1121	6.0	1121	6.0	0.839	39.8	LOS D	17.4	127.8	0.79	0.82	0.84	31.3
West: Scarborough Beach Rd														
10	L2	205	6.0	205	6.0	0.188	12.4	LOS B	4.2	30.6	0.43	0.67	0.43	46.2
11	T1	755	6.0	755	6.0	*0.698	50.7	LOS D	14.2	104.9	0.99	0.85	1.02	28.3
12	R2	31	6.0	31	6.0	0.417	71.8	LOS E	1.9	14.3	1.00	0.72	1.00	10.4
Approach		991	6.0	991	6.0	0.698	43.4	LOS D	14.2	104.9	0.87	0.81	0.89	30.2
All Vehicles		3849	6.0	3849	6.0	0.839	37.0	LOS D	17.4	127.8	0.78	0.76	0.80	31.6

MOVEMENT SUMMARY

Site: 102 [Site Crossover / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Proposed development crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	124	0.0	124	0.0	0.093	0.9	LOS A	0.5	3.2	0.34	0.19	0.34	17.9
Approach		124	0.0	124	0.0	0.093	0.9	LOS A	0.5	3.2	0.34	0.19	0.34	17.9
East: SBR														
4	L2	123	0.0	123	0.0	0.197	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	42.0
5	T1	999	6.0	999	6.0	0.197	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	56.1
Approach		1122	5.3	1122	5.3	0.197	0.6	NA	0.0	0.0	0.00	0.07	0.00	53.4
All Vehicles		1246	4.8	1246	4.8	0.197	0.7	NA	0.5	3.2	0.03	0.08	0.03	48.1

MOVEMENT SUMMARY

▽ Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [%]	ARRIVAL FLOWS [Total veh/h]	HV [%]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist [m]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	7	0.0	7	0.0	0.006	1.2	LOS A	0.0	0.2	0.40	0.22	0.40	17.6
Approach		7	0.0	7	0.0	0.006	1.2	LOS A	0.0	0.2	0.40	0.22	0.40	17.6
East: SBR														
4	L2	9	0.0	9	0.0	0.197	2.1	LOS A	0.0	0.0	0.00	0.01	0.00	37.5
5	T1	1114	6.0	1114	6.0	0.197	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	58.9
Approach		1123	6.0	1123	6.0	0.197	0.0	NA	0.0	0.0	0.00	0.00	0.00	57.9
All Vehicles		1130	5.9	1130	5.9	0.197	0.0	NA	0.0	0.2	0.00	0.01	0.00	55.1

MOVEMENT SUMMARY

▽ Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [%]	ARRIVAL FLOWS [Total veh/h]	HV [%]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist [m]	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	6	0.0	6	0.0	0.006	1.8	LOS A	0.0	0.2	0.47	0.29	0.47	17.2
Approach		6	0.0	6	0.0	0.006	1.8	LOS A	0.0	0.2	0.47	0.29	0.47	17.2
East: SBR														
4	L2	5	0.0	5	0.0	0.261	3.0	LOS A	0.0	0.0	0.00	0.01	0.00	41.4
5	T1	1116	6.0	1116	6.0	0.261	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		1121	6.0	1121	6.0	0.261	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.3
All Vehicles		1127	5.9	1127	5.9	0.261	0.2	NA	0.0	0.2	0.00	0.00	0.00	58.0

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	38	6.0	38	6.0	0.449	12.2	LOS B	2.0	14.6	0.84	1.04	1.18	33.9
2	T1	74	6.0	74	6.0	0.449	32.0	LOS D	2.0	14.6	0.84	1.04	1.18	12.9
Approach		112	6.0	112	6.0	0.449	25.2	LOS D	2.0	14.6	0.84	1.04	1.18	23.4
East: SBR														
3	L2	42	6.0	42	6.0	0.296	4.5	LOS A	0.0	0.0	0.00	0.04	0.00	55.7
4	T1	1080	6.0	1080	6.0	0.296	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach		1122	6.0	1122	6.0	0.296	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.5
North: Median Storage														
5	T1	90	6.0	90	6.0	0.220	8.4	LOS A	0.8	5.6	0.77	0.81	0.82	5.4
Approach		90	6.0	90	6.0	0.220	8.4	LOS A	0.8	5.6	0.77	0.81	0.82	5.4
All Vehicles		1324	6.0	1324	6.0	0.449	2.9	NA	2.0	14.6	0.12	0.16	0.16	54.1

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	74	6.0	74	6.0	0.130	5.3	LOS A	0.4	3.0	0.62	0.70	0.62	7.3
Approach		74	6.0	74	6.0	0.130	5.3	LOS A	0.4	3.0	0.62	0.70	0.62	7.3
West: SBR														
2	T1	917	6.0	917	6.0	0.242	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	90	6.0	90	6.0	0.050	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		1007	6.0	1007	6.0	0.242	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.9
All Vehicles		1081	6.0	1081	6.0	0.242	0.9	NA	0.4	3.0	0.04	0.10	0.04	57.9

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	257	6.0	257	6.0	0.199	3.6	LOS A	1.1	8.2	0.21	0.41	0.21	28.8
Approach		257	6.0	257	6.0	0.199	3.6	LOS A	1.1	8.2	0.21	0.41	0.21	28.8
North: Bowra Av														
7	L2	78	6.0	78	6.0	0.103	4.8	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
9	R2	32	6.0	32	6.0	0.103	7.9	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
Approach		110	6.0	110	6.0	0.103	5.7	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
West: Ewen St														
10	L2	91	6.0	91	6.0	0.137	2.5	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
11	T1	150	6.0	150	6.0	0.137	2.4	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
12u	U	24	6.0	24	6.0	0.137	6.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
Approach		265	6.0	265	6.0	0.137	2.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
All Vehicles		632	6.0	632	6.0	0.199	3.7	LOS A	1.1	8.2	0.15	0.46	0.15	29.2

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	37	6.0	37	6.0	0.084	5.0	LOS A	0.4	2.9	0.38	0.60	0.38	45.1
9	R2	49	6.0	49	6.0	0.084	8.1	LOS A	0.4	2.9	0.38	0.60	0.38	42.3
Approach		86	6.0	86	6.0	0.084	6.8	LOS A	0.4	2.9	0.38	0.60	0.38	44.0
East: Ewen St														
10	L2	94	6.0	94	6.0	0.162	2.5	LOS A	0.0	0.0	0.00	0.46	0.00	45.3
11	T1	186	6.0	186	6.0	0.162	2.4	LOS A	0.0	0.0	0.00	0.46	0.00	46.7
12u	U	33	6.0	33	6.0	0.162	6.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.6
Approach		313	6.0	313	6.0	0.162	2.9	LOS A	0.0	0.0	0.00	0.46	0.00	45.9
West: Ewen St														
5	T1	183	6.0	183	6.0	0.152	4.1	LOS A	0.8	6.0	0.25	0.43	0.25	44.3
Approach		183	6.0	183	6.0	0.152	4.1	LOS A	0.8	6.0	0.25	0.43	0.25	44.3
All Vehicles		582	6.0	582	6.0	0.162	3.9	LOS A	0.8	6.0	0.14	0.47	0.14	45.0

MOVEMENT SUMMARY

▽ Site: 108 [Site Crossover (W) / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Western car park exit crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	180	6.0	180	6.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		180	6.0	180	6.0	0.095	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: Site Crossover (W)														
7	L2	36	0.0	36	0.0	0.115	0.8	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
9	R2	77	0.0	77	0.0	0.115	2.8	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
Approach		113	0.0	113	0.0	0.115	2.1	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
West: Ewen St														
11	T1	228	6.0	228	6.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		228	6.0	228	6.0	0.120	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		521	4.7	521	4.7	0.120	0.5	NA	0.4	2.8	0.00	0.00	0.00	34.2

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St (Site Folder: General)]

Network: N101 [Post Development Weekend Midday Peak (Network Folder: General)]

Eastern car park entry crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	180	6.0	180	6.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		180	6.0	180	6.0	0.095	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Ewen St														
10	L2	114	0.0	114	0.0	0.140	3.0	LOS A	0.0	0.0	0.00	0.23	0.00	14.1
11	T1	150	6.0	150	6.0	0.140	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	34.7
Approach		264	3.4	264	3.4	0.140	1.3	NA	0.0	0.0	0.00	0.23	0.00	18.2
All Vehicles		444	4.5	444	4.5	0.140	0.8	NA	0.0	0.0	0.00	0.13	0.00	32.1

10-year post development weekday PM peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 134 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	5	6.0	5	6.0	0.378	57.2	LOS E	7.4	54.7	0.93	0.75	0.93	11.6
2	T1	123	6.0	123	6.0	0.378	52.6	LOS D	7.4	54.7	0.93	0.75	0.93	26.7
3	R2	83	6.0	83	6.0	0.325	61.2	LOS E	5.0	36.6	0.94	0.77	0.94	23.9
Approach		211	6.0	211	6.0	0.378	56.1	LOS E	7.4	54.7	0.93	0.76	0.93	25.3
East: Scarborough Beach Rd														
4	L2	187	6.0	187	6.0	0.126	7.1	LOS A	1.8	13.1	0.20	0.60	0.20	48.9
5	T1	685	6.0	685	6.0	0.378	25.7	LOS C	14.1	101.0	0.70	0.61	0.70	33.0
6	R2	224	6.0	224	6.0	*0.439	29.4	LOS C	8.0	58.9	0.87	0.79	0.87	40.2
Approach		1096	6.0	1096	6.0	0.439	23.3	LOS C	14.1	101.0	0.65	0.65	0.65	36.9
North: Odin Rd														
7	L2	175	6.0	175	6.0	0.131	7.9	LOS A	2.0	14.7	0.25	0.62	0.25	52.3
8	T1	160	6.0	160	6.0	*0.471	53.6	LOS D	9.5	69.8	0.95	0.77	0.95	22.4
9	R2	223	6.0	223	6.0	*0.437	63.5	LOS E	6.8	50.1	0.96	0.79	0.96	19.9
Approach		558	6.0	558	6.0	0.471	43.2	LOS D	9.5	69.8	0.73	0.73	0.73	29.1
West: Scarborough Beach Rd														
10	L2	172	6.0	172	6.0	0.143	9.1	LOS A	2.5	18.3	0.30	0.64	0.30	48.9
11	T1	301	6.0	301	6.0	*0.506	57.3	LOS E	8.9	64.2	0.97	0.78	0.97	26.5
12	R2	5	6.0	5	6.0	0.074	76.7	LOS E	0.3	2.5	0.99	0.64	0.99	9.8
Approach		478	6.0	478	6.0	0.506	40.2	LOS D	8.9	64.2	0.73	0.73	0.73	31.5
All Vehicles		2343	6.0	2343	6.0	0.506	34.4	LOS C	14.1	101.0	0.71	0.69	0.71	32.2

MOVEMENT SUMMARY

Site: 102 [Site Crossover / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Proposed development crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	110	0.0	110	0.0	0.070	0.1	LOS A	0.3	2.4	0.13	0.04	0.13	19.2
Approach		110	0.0	110	0.0	0.070	0.1	LOS A	0.3	2.4	0.13	0.04	0.13	19.2
East: SBR														
4	L2	109	0.0	109	0.0	0.070	5.6	LOS A	0.0	0.0	0.00	0.48	0.00	35.4
5	T1	804	6.0	804	6.0	0.202	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.2
Approach		913	5.3	913	5.3	0.202	0.7	NA	0.0	0.0	0.00	0.07	0.00	53.1
All Vehicles		1023	4.7	1023	4.7	0.202	0.6	NA	0.3	2.4	0.01	0.07	0.01	48.0

MOVEMENT SUMMARY

▽ Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	2	0.0	2	0.0	0.001	0.1	LOS A	0.0	0.0	0.13	0.03	0.13	19.2
Approach		2	0.0	2	0.0	0.001	0.1	LOS A	0.0	0.0	0.13	0.03	0.13	19.2
East: SBR														
4	L2	31	0.0	31	0.0	0.039	2.1	LOS A	0.0	0.0	0.00	0.28	0.00	32.5
5	T1	883	6.0	883	6.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.0
Approach		914	5.8	914	5.8	0.222	0.1	NA	0.0	0.0	0.00	0.02	0.00	53.0
All Vehicles		916	5.8	916	5.8	0.222	0.1	NA	0.0	0.0	0.00	0.02	0.00	52.3

MOVEMENT SUMMARY

▽ Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	32	0.0	32	0.0	0.028	1.4	LOS A	0.1	0.8	0.41	0.27	0.41	17.5
Approach		32	0.0	32	0.0	0.028	1.4	LOS A	0.1	0.8	0.41	0.27	0.41	17.5
East: SBR														
4	L2	1	0.0	1	0.0	0.023	3.0	LOS A	0.0	0.0	0.00	0.02	0.00	41.0
5	T1	884	6.0	884	6.0	0.352	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		885	6.0	885	6.0	0.352	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		917	5.8	917	5.8	0.352	0.2	NA	0.1	0.8	0.01	0.01	0.01	52.5

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	37	6.0	37	6.0	0.133	6.4	LOS A	0.5	3.6	0.62	0.76	0.62	43.3
2	T1	27	6.0	27	6.0	0.133	17.2	LOS C	0.5	3.6	0.62	0.76	0.62	22.4
Approach		64	6.0	64	6.0	0.133	11.0	LOS B	0.5	3.6	0.62	0.76	0.62	36.7
East: SBR														
3	L2	20	6.0	20	6.0	0.242	4.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.4
4	T1	896	6.0	896	6.0	0.242	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		916	6.0	916	6.0	0.242	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Median Storage														
5	T1	63	6.0	63	6.0	0.115	5.2	LOS A	0.4	2.8	0.65	0.65	0.65	7.5
Approach		63	6.0	63	6.0	0.115	5.2	LOS A	0.4	2.8	0.65	0.65	0.65	7.5
All Vehicles		1043	6.0	1043	6.0	0.242	1.1	NA	0.5	3.6	0.08	0.10	0.08	57.4

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	27	6.0	27	6.0	0.028	2.2	LOS A	0.1	0.7	0.39	0.40	0.39	11.7
Approach		27	6.0	27	6.0	0.028	2.2	LOS A	0.1	0.7	0.39	0.40	0.39	11.7
West: SBR														
2	T1	451	6.0	451	6.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	63	6.0	63	6.0	0.035	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		514	6.0	514	6.0	0.119	0.7	NA	0.0	0.0	0.00	0.08	0.00	58.6
All Vehicles		541	6.0	541	6.0	0.119	0.8	NA	0.1	0.7	0.02	0.09	0.02	58.2

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [ ] %	ARRIVAL FLOWS [Total veh/h]	HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	206	6.0	206	6.0	0.156	3.5	LOS A	0.8	6.2	0.17	0.40	0.17	29.4
Approach		206	6.0	206	6.0	0.156	3.5	LOS A	0.8	6.2	0.17	0.40	0.17	29.4
North: Bowra Av														
7	L2	52	6.0	52	6.0	0.071	4.9	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
9	R2	21	6.0	21	6.0	0.071	8.1	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
Approach		73	6.0	73	6.0	0.071	5.8	LOS A	0.3	2.5	0.37	0.57	0.37	30.2
West: Ewen St														
10	L2	60	6.0	60	6.0	0.139	2.5	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
11	T1	192	6.0	192	6.0	0.139	2.4	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
12u	U	20	6.0	20	6.0	0.139	6.9	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
Approach		272	6.0	272	6.0	0.139	2.8	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
All Vehicles		551	6.0	551	6.0	0.156	3.5	LOS A	0.8	6.2	0.11	0.45	0.11	29.5

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV [ ] %	ARRIVAL FLOWS [Total veh/h]	HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	23	6.0	23	6.0	0.070	4.7	LOS A	0.3	2.4	0.34	0.59	0.34	45.0
9	R2	51	6.0	51	6.0	0.070	7.9	LOS A	0.3	2.4	0.34	0.59	0.34	42.1
Approach		74	6.0	74	6.0	0.070	6.9	LOS A	0.3	2.4	0.34	0.59	0.34	43.4
East: Ewen St														
10	L2	70	6.0	70	6.0	0.126	2.5	LOS A	0.0	0.0	0.00	0.44	0.00	45.5
11	T1	162	6.0	162	6.0	0.126	2.4	LOS A	0.0	0.0	0.00	0.44	0.00	47.0
12u	U	15	6.0	15	6.0	0.126	6.9	LOS A	0.0	0.0	0.00	0.44	0.00	29.3
Approach		247	6.0	247	6.0	0.126	2.7	LOS A	0.0	0.0	0.00	0.44	0.00	46.3
West: Ewen St														
5	T1	206	6.0	206	6.0	0.166	4.0	LOS A	0.9	6.7	0.23	0.42	0.23	44.4
Approach		206	6.0	206	6.0	0.166	4.0	LOS A	0.9	6.7	0.23	0.42	0.23	44.4
All Vehicles		527	6.0	527	6.0	0.166	3.8	LOS A	0.9	6.7	0.14	0.46	0.14	45.1

MOVEMENT SUMMARY

▽ Site: 108 [Site Crossover (W) / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Western car park exit crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	137	6.0	137	6.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		137	6.0	137	6.0	0.072	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: Site Crossover (W)														
7	L2	32	0.0	32	0.0	0.101	0.8	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
9	R2	69	0.0	69	0.0	0.101	2.6	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
Approach		101	0.0	101	0.0	0.101	2.1	LOS A	0.4	2.5	0.37	0.37	0.37	16.8
West: Ewen St														
11	T1	244	6.0	244	6.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		244	6.0	244	6.0	0.129	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		482	4.7	482	4.7	0.129	0.4	NA	0.4	2.5	0.08	0.08	0.08	35.0

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekday PM Peak (Network Folder: General)]

Eastern car park entry crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	137	6.0	137	6.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		137	6.0	137	6.0	0.072	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Ewen St														
10	L2	102	0.0	102	0.0	0.146	3.0	LOS A	0.0	0.0	0.00	0.19	0.00	14.2
11	T1	174	6.0	174	6.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.19	0.00	36.2
Approach		276	3.8	276	3.8	0.146	1.1	NA	0.0	0.0	0.00	0.19	0.00	19.4
All Vehicles		413	4.5	413	4.5	0.146	0.7	NA	0.0	0.0	0.00	0.13	0.00	31.3

10-year post development weekend midday peak hour

MOVEMENT SUMMARY

Site: 101 [Scarborough Beach Rd / Odin Rd / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Signalised Intersection
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 121 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Ewen St														
1	L2	7	6.0	7	6.0	0.372	52.8	LOS D	6.5	47.5	0.93	0.75	0.93	12.3
2	T1	115	6.0	115	6.0	0.372	48.2	LOS D	6.5	47.5	0.93	0.75	0.93	28.0
3	R2	103	6.0	103	6.0	0.346	53.5	LOS D	5.5	40.3	0.93	0.77	0.93	25.7
Approach		225	6.0	225	6.0	0.372	50.8	LOS D	6.5	47.5	0.93	0.76	0.93	26.6
East: Scarborough Beach Rd														
4	L2	215	6.0	215	6.0	0.148	7.3	LOS A	2.1	15.4	0.22	0.61	0.22	48.6
5	T1	437	6.0	437	6.0	0.260	24.1	LOS C	8.0	57.6	0.69	0.58	0.69	34.0
6	R2	178	6.0	178	6.0	+ 0.386	45.8	LOS D	8.7	64.1	0.87	0.79	0.87	34.1
Approach		830	6.0	830	6.0	0.386	24.4	LOS C	8.7	64.1	0.61	0.63	0.61	36.4
North: Odin Rd														
7	L2	275	6.0	275	6.0	0.225	9.4	LOS A	4.2	31.2	0.35	0.65	0.35	51.2
8	T1	166	6.0	166	6.0	+ 0.504	49.6	LOS D	9.0	66.4	0.96	0.78	0.96	23.5
9	R2	239	6.0	239	6.0	+ 0.402	55.2	LOS E	6.4	47.3	0.94	0.79	0.94	21.6
Approach		680	6.0	680	6.0	0.504	35.3	LOS D	9.0	66.4	0.70	0.73	0.70	33.0
West: Scarborough Beach Rd														
10	L2	123	6.0	123	6.0	0.100	8.5	LOS A	1.5	11.1	0.29	0.62	0.29	49.5
11	T1	453	6.0	453	6.0	+ 0.598	46.7	LOS D	12.0	86.4	0.98	0.80	0.96	28.9
12	R2	19	6.0	19	6.0	0.256	70.9	LOS E	1.2	8.6	1.00	0.70	1.00	10.5
Approach		595	6.0	595	6.0	0.598	41.1	LOS D	12.0	86.4	0.82	0.76	0.82	31.0
All Vehicles		2330	6.0	2330	6.0	0.598	34.4	LOS C	12.0	86.4	0.72	0.71	0.72	32.6

MOVEMENT SUMMARY

Site: 102 [Site Crossover / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Proposed development crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	124	0.0	124	0.0	0.078	0.1	LOS A	0.4	2.7	0.10	0.03	0.10	19.3
Approach		124	0.0	124	0.0	0.078	0.1	LOS A	0.4	2.7	0.10	0.03	0.10	19.3
East: SBR														
4	L2	123	0.0	123	0.0	0.080	5.6	LOS A	0.0	0.0	0.00	0.51	0.00	34.7
5	T1	560	6.0	560	6.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.2
Approach		683	4.9	683	4.9	0.141	1.0	NA	0.0	0.0	0.00	0.11	0.00	50.5
All Vehicles		807	4.2	807	4.2	0.141	0.9	NA	0.4	2.7	0.02	0.09	0.02	44.3

MOVEMENT SUMMARY

▽ Site: 103 [Service Station (E) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Modified Eastern Service Station Crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [ ] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (E)														
1	L2	7	0.0	7	0.0	0.004	0.1	LOS A	0.0	0.1	0.11	0.02	0.11	19.3
Approach		7	0.0	7	0.0	0.004	0.1	LOS A	0.0	0.1	0.11	0.02	0.11	19.3
East: SBR														
4	L2	9	0.0	9	0.0	0.022	2.1	LOS A	0.0	0.0	0.00	0.16	0.00	34.5
5	T1	675	6.0	675	6.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.3
Approach		684	5.9	684	5.9	0.169	0.0	NA	0.0	0.0	0.00	0.01	0.00	56.9
All Vehicles		691	5.9	691	5.9	0.169	0.0	NA	0.0	0.1	0.00	0.01	0.00	53.1

MOVEMENT SUMMARY

▽ Site: 104 [Service Station (W) / Scarborough Beach Rd (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Western service station crossover on Scarborough Beach Road
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	DEMAND FLOWS HV [ ] %	ARRIVAL FLOWS [Total veh/h]	ARRIVAL FLOWS HV [ ] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	95% BACK OF QUEUE Dist [ ] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Service Station Crossover (W)														
1	L2	6	0.0	6	0.0	0.005	0.9	LOS A	0.0	0.1	0.35	0.17	0.35	17.8
Approach		6	0.0	6	0.0	0.005	0.9	LOS A	0.0	0.1	0.35	0.17	0.35	17.8
East: SBR														
4	L2	5	0.0	5	0.0	0.020	3.0	LOS A	0.0	0.0	0.00	0.11	0.00	38.7
5	T1	677	6.0	677	6.0	0.269	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		682	6.0	682	6.0	0.269	0.1	NA	0.0	0.0	0.00	0.00	0.00	58.9
All Vehicles		688	5.9	688	5.9	0.269	0.1	NA	0.0	0.1	0.00	0.01	0.00	57.0

MOVEMENT SUMMARY

Site: 105.S1 [Scarborough Beach Rd / Bowra Av - Stage 1 (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Stage 1 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bowra Av														
1	L2	23	6.0	23	6.0	0.123	5.8	LOS A	0.5	3.5	0.58	0.74	0.58	44.4
2	T1	44	6.0	44	6.0	0.123	11.8	LOS B	0.5	3.5	0.58	0.74	0.58	23.8
Approach		67	6.0	67	6.0	0.123	9.7	LOS A	0.5	3.5	0.58	0.74	0.58	35.9
East: SBR														
3	L2	25	6.0	25	6.0	0.180	4.5	LOS A	0.0	0.0	0.00	0.04	0.00	55.8
4	T1	658	6.0	658	6.0	0.180	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
Approach		683	6.0	683	6.0	0.180	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
North: Median Storage														
5	T1	64	6.0	64	6.0	0.087	3.2	LOS A	0.3	2.2	0.53	0.50	0.53	9.9
Approach		64	6.0	64	6.0	0.087	3.2	LOS A	0.3	2.2	0.53	0.50	0.53	9.9
All Vehicles		814	6.0	814	6.0	0.180	1.2	NA	0.5	3.5	0.09	0.12	0.09	57.0

MOVEMENT SUMMARY

Site: 105.S2 [Scarborough Beach Rd / Bowra Av - Stage 2 (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Stage 2 crossing at the intersection of SBR and Bowra Av
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Median Storage														
1	R2	44	6.0	44	6.0	0.051	2.7	LOS A	0.2	1.2	0.44	0.47	0.44	10.6
Approach		44	6.0	44	6.0	0.051	2.7	LOS A	0.2	1.2	0.44	0.47	0.44	10.6
West: SBR														
2	T1	551	6.0	551	6.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	64	6.0	64	6.0	0.036	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		615	6.0	615	6.0	0.145	0.6	NA	0.0	0.0	0.00	0.07	0.00	58.8
All Vehicles		659	6.0	659	6.0	0.145	0.8	NA	0.2	1.2	0.03	0.09	0.03	58.2

MOVEMENT SUMMARY

Site: 106.1 [Bowra Av / Ewen St (East) (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Eastern roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	257	6.0	257	6.0	0.199	3.6	LOS A	1.1	8.2	0.21	0.41	0.21	28.8
Approach		257	6.0	257	6.0	0.199	3.6	LOS A	1.1	8.2	0.21	0.41	0.21	28.8
North: Bowra Av														
7	L2	78	6.0	78	6.0	0.103	4.8	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
9	R2	32	6.0	32	6.0	0.103	7.9	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
Approach		110	6.0	110	6.0	0.103	5.7	LOS A	0.5	3.7	0.35	0.56	0.35	30.4
West: Ewen St														
10	L2	91	6.0	91	6.0	0.137	2.5	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
11	T1	150	6.0	150	6.0	0.137	2.4	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
12u	U	24	6.0	24	6.0	0.137	6.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
Approach		265	6.0	265	6.0	0.137	2.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.7
All Vehicles		632	6.0	632	6.0	0.199	3.7	LOS A	1.1	8.2	0.15	0.46	0.15	29.2

MOVEMENT SUMMARY

Site: 106.2 [Bowra Av / Ewen St (West) (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Western roundabout at Bowra Av / Ewen St / Birchwood Av
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Birchwood Av														
7	L2	37	6.0	37	6.0	0.084	5.0	LOS A	0.4	2.9	0.38	0.60	0.38	45.1
9	R2	49	6.0	49	6.0	0.084	8.1	LOS A	0.4	2.9	0.38	0.60	0.38	42.3
Approach		86	6.0	86	6.0	0.084	6.8	LOS A	0.4	2.9	0.38	0.60	0.38	44.0
East: Ewen St														
10	L2	94	6.0	94	6.0	0.162	2.5	LOS A	0.0	0.0	0.00	0.46	0.00	45.3
11	T1	186	6.0	186	6.0	0.162	2.4	LOS A	0.0	0.0	0.00	0.46	0.00	46.7
12u	U	33	6.0	33	6.0	0.162	6.9	LOS A	0.0	0.0	0.00	0.46	0.00	28.6
Approach		313	6.0	313	6.0	0.162	2.9	LOS A	0.0	0.0	0.00	0.46	0.00	45.9
West: Ewen St														
5	T1	183	6.0	183	6.0	0.152	4.1	LOS A	0.8	6.0	0.25	0.43	0.25	44.3
Approach		183	6.0	183	6.0	0.152	4.1	LOS A	0.8	6.0	0.25	0.43	0.25	44.3
All Vehicles		582	6.0	582	6.0	0.162	3.9	LOS A	0.8	6.0	0.14	0.47	0.14	45.0

MOVEMENT SUMMARY

▽ Site: 108 [Site Crossover (W) / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Western car park exit crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	180	6.0	180	6.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		180	6.0	180	6.0	0.095	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
North: Site Crossover (W)														
7	L2	36	0.0	36	0.0	0.115	0.8	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
9	R2	77	0.0	77	0.0	0.115	2.8	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
Approach		113	0.0	113	0.0	0.115	2.1	LOS A	0.4	2.8	0.37	0.38	0.37	16.7
West: Ewen St														
11	T1	228	6.0	228	6.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		228	6.0	228	6.0	0.120	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
All Vehicles		521	4.7	521	4.7	0.120	0.5	NA	0.4	2.8	0.00	0.00	0.00	34.2

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St (Site Folder: General)]

Network: N101 [2036 Post Development Weekend Midday Peak (Network Folder: General)]

Eastern car park entry crossover
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h]	HV] %	ARRIVAL FLOWS [Total veh/h]	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh]	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	180	6.0	180	6.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		180	6.0	180	6.0	0.095	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Ewen St														
10	L2	114	0.0	114	0.0	0.140	3.0	LOS A	0.0	0.0	0.00	0.23	0.00	14.1
11	T1	150	6.0	150	6.0	0.140	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	34.7
Approach		264	3.4	264	3.4	0.140	1.3	NA	0.0	0.0	0.00	0.23	0.00	18.2
All Vehicles		444	4.5	444	4.5	0.140	0.8	NA	0.0	0.0	0.00	0.13	0.00	32.1

Development crossover sensitivity analysis (10-year post development)

MOVEMENT SUMMARY

Site: 102 [Site Crossover / Scarborough Beach Rd - WD (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekday
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	110	0.0	110	0.0	0.073	0.3	LOS A	0.3	2.1	0.19	0.07	0.19	18.9
Approach		110	0.0	110	0.0	0.073	0.3	LOS A	0.3	2.1	0.19	0.07	0.19	18.9
East: SBR														
4	L2	109	0.0	109	0.0	0.098	5.6	LOS A	0.0	0.0	0.00	0.41	0.00	36.9
5	T1	1608	6.0	1608	6.0	0.404	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.1
Approach		1717	5.6	1717	5.6	0.404	0.4	NA	0.0	0.0	0.00	0.04	0.00	56.0
All Vehicles		1827	5.3	1827	5.3	0.404	0.4	NA	0.3	2.1	0.01	0.04	0.01	52.5

MOVEMENT SUMMARY

Site: 108 [Site Crossover (W) / Ewen St - WD (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekday
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	274	6.0	274	6.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		274	6.0	274	6.0	0.144	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
North: Site Crossover (W)														
7	L2	32	0.0	32	0.0	0.153	2.1	LOS A	0.5	3.6	0.55	0.59	0.55	17.1
9	R2	69	0.0	69	0.0	0.153	5.6	LOS A	0.5	3.6	0.55	0.59	0.55	19.7
Approach		101	0.0	101	0.0	0.153	4.5	LOS A	0.5	3.6	0.55	0.59	0.55	19.0
West: Ewen St														
11	T1	488	6.0	488	6.0	0.257	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		488	6.0	488	6.0	0.257	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		863	5.3	863	5.3	0.257	0.5	NA	0.5	3.6	0.06	0.07	0.06	41.2

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St - WD (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekday
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	274	6.0	274	6.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		274	6.0	274	6.0	0.144	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Ewen St														
10	L2	102	0.0	102	0.0	0.275	3.0	LOS A	0.0	0.0	0.00	0.10	0.00	14.4
11	T1	418	6.0	418	6.0	0.275	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	48.1
Approach		520	4.8	520	4.8	0.275	0.6	NA	0.0	0.0	0.00	0.10	0.00	39.9
All Vehicles		794	5.2	794	5.2	0.275	0.4	NA	0.0	0.0	0.00	0.07	0.00	43.1

MOVEMENT SUMMARY

▽ Site: 102 [Site Crossover / Scarborough Beach Rd - WE (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekend
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Site Crossover														
1	L2	124	0.0	124	0.0	0.080	0.2	LOS A	0.3	2.3	0.15	0.05	0.15	19.1
Approach		124	0.0	124	0.0	0.080	0.2	LOS A	0.3	2.3	0.15	0.05	0.15	19.1
East: SBR														
4	L2	123	0.0	123	0.0	0.094	5.6	LOS A	0.0	0.0	0.00	0.46	0.00	35.8
5	T1	1120	6.0	1120	6.0	0.281	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.2
Approach		1243	5.4	1243	5.4	0.281	0.6	NA	0.0	0.0	0.00	0.06	0.00	54.3
All Vehicles		1367	4.9	1367	4.9	0.281	0.5	NA	0.3	2.3	0.01	0.06	0.01	49.5

MOVEMENT SUMMARY

▽ Site: 108 [Site Crossover (W) / Ewen St - WE (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekend
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	360	6.0	360	6.0	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		360	6.0	360	6.0	0.190	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
North: Site Crossover (W)														
7	L2	36	0.0	36	0.0	0.178	1.9	LOS A	0.6	4.2	0.56	0.60	0.56	16.9
9	R2	77	0.0	77	0.0	0.178	6.1	LOS A	0.6	4.2	0.56	0.60	0.56	19.4
Approach		113	0.0	113	0.0	0.178	4.8	LOS A	0.6	4.2	0.56	0.60	0.56	18.7
West: Ewen St														
11	T1	456	6.0	456	6.0	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		456	6.0	456	6.0	0.240	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
All Vehicles		929	5.3	929	5.3	0.240	0.6	NA	0.6	4.2	0.07	0.07	0.07	40.7

MOVEMENT SUMMARY

▽ Site: 107 [Site Crossover (E) / Ewen St - WE (Site Folder: General)]

Proposed development crossover
2036 Sensitivity Analysis - weekend
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ewen St														
5	T1	360	6.0	360	6.0	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		360	6.0	360	6.0	0.190	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Ewen St														
10	L2	114	0.0	114	0.0	0.260	3.0	LOS A	0.0	0.0	0.00	0.12	0.00	14.4
11	T1	378	6.0	378	6.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	47.6
Approach		492	4.6	492	4.6	0.260	0.7	NA	0.0	0.0	0.00	0.12	0.00	38.3
All Vehicles		852	5.2	852	5.2	0.260	0.4	NA	0.0	0.0	0.00	0.07	0.00	42.9

Appendix F: Swept path diagrams

Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan represents the wheel path of the vehicle

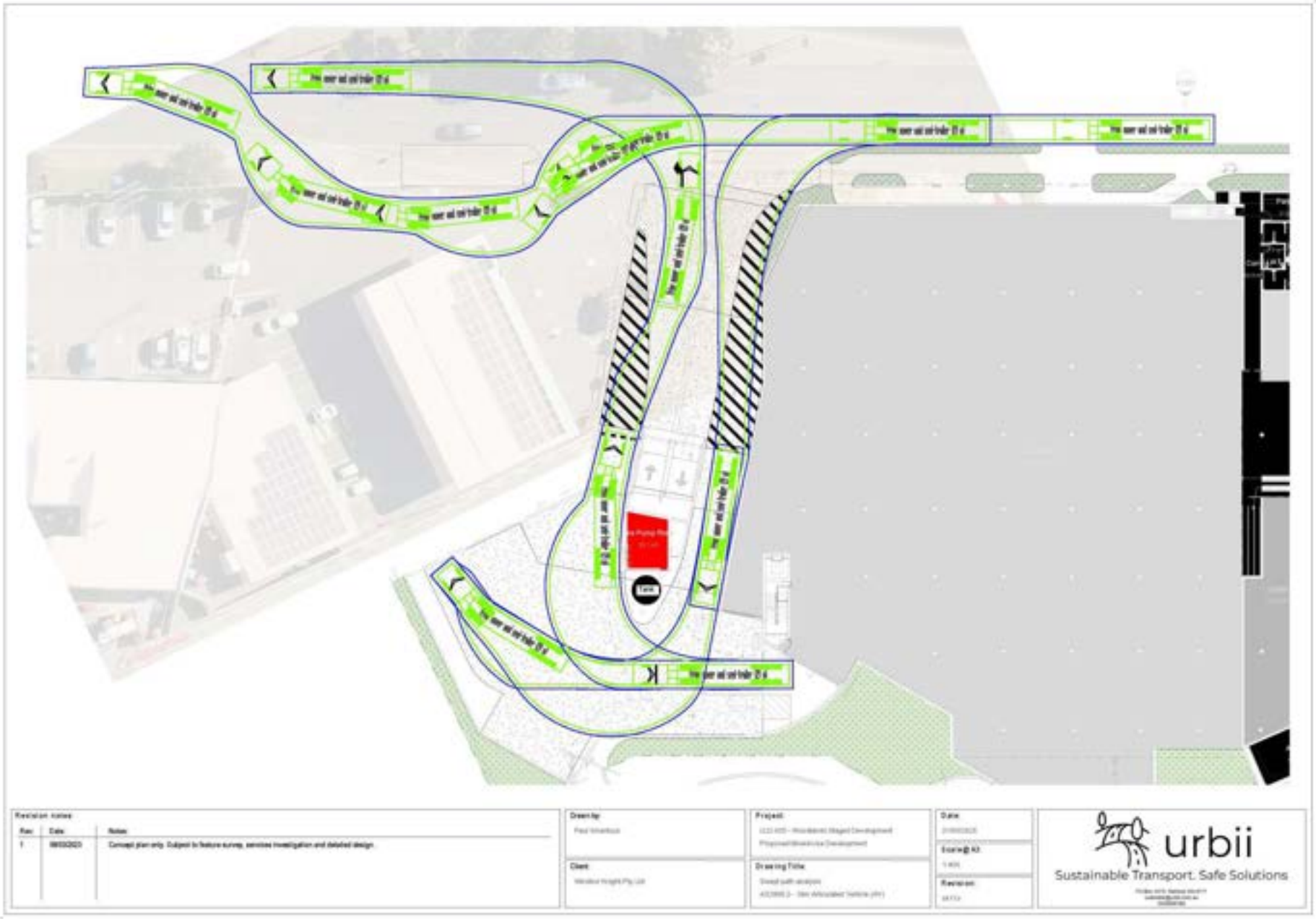
Green represents the vehicle body envelope

Blue represents a buffer line, offset from the vehicle swept path

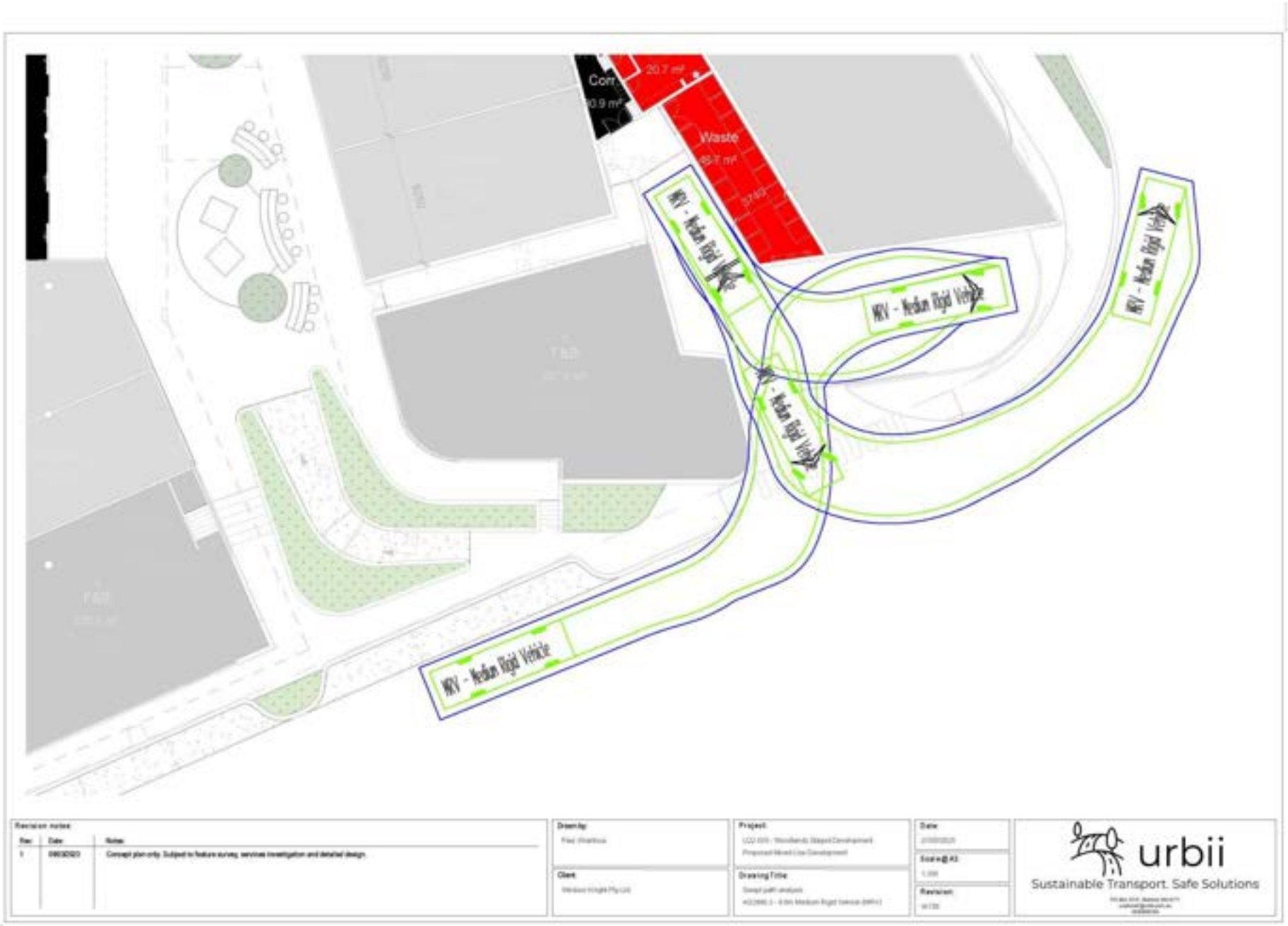
Design vehicles tested include:

- AS2890.1: B99 Car
- AS2890.2: 19m Articulated Vehicles (AVs)
- AS2890.2: 8.8m Medium Rigid Vehicles (MRVs)

The swept path diagrams are also provided separately in high-quality, A3 PDF format.


Revision notes
Rev Date Notes
1 08/03/2023 Concept plan only. Subject to feature survey, services investigation and detailed design.
Drawn by
Client
Project
Drawing Title
Date
Scale @ A3
Revision
urbii
Sustainable Transport. Safe Solutions

urbii
Sustainable Transport. Safe Solutions


Com
20.7 m²
Waste
48.7 m²
MRV - Medium Rigid Vehicle
MRV - Medium Rigid Vehicle
MRV - Medium Rigid Vehicle
MRV - Medium Rigid Vehicle
Revision notes
Rev
Date
Notes
1
Concept plan only. Subject to feature survey, services investigation and detailed design.
Drawn by:
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Project:
Drawing Title:
Date:
Scale @ A3:
Revision:
urbii
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Revision notes
Rev
Date
Notes
1
29/08/2024
Dark blue swept path line represents a 300mm buffer.
Drawn by
Client
Project
Drawing Title
Date
Scale @ A3
Revision
urbii
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WOODLANDS NORTH PROJECT – SCARBOROUGH BEACH ROAD AND EWEN STREET NEW DEVELOPMENT

Road Safety Audit

Stage 2 - Preliminary Design

Audit Ref: 2410021-RSA-001

Prepared for:

Windsor Knight Pty Ltd

By:

Shawmac Traffic & Safety

Report Issue Date: **24/10/2024**

Safety Audit Document Control Sheet

Project Location:	Woodlands North Project – Scarborough Beach Road and Ewen Street
Project Proposal:	New Development
Audit Stage:	15% Design RSA
Prepared for:	Windsor Knight Pty Ltd
Prepared by 1:	Anthony Anastas
Prepared by 2:	Shawmac Traffic & Safety
Audit Team Leader:	Anthony Anastas
Audit Team Leader Organisation:	Shawmac Traffic & Safety
Audit Reference:	2410021-RSA-001
Report Issue Date:	24/10/2024

The Safety Audit Document Control Sheet Above Should be Completed Prior to Editing Any Other Part of the Report Template

Contents

1. INTRODUCTION 4

1.1 Scope of Audit 4

1.2 The Audit Team 5

1.3 Specialist Advisors 5

1.4 Safe System Findings 6

1.5 Previous Safety Audits 6

1.6 Background Data 6

1.6.1 Crash History 6

1.6.2 Traffic and Speed Data 7

1.6.3 Appendices 8

2. ITEMS RAISED IN THIS AUDIT 9

2.1 Finding - Non-frangible hazards in the clear zone 9

2.2 Finding - Signs and Lines 9

2.3 Finding – Tripping Hazard in Footpath 10

2.4 Finding – Pedestrian Crossing Facilities 10

2.5 Finding – Lighting 11

2.6 Finding – Discontinuous Pedestrian Footpath 12

2.7 Finding – Potential Vehicles Queuing 13

2.8 Finding – Potential Sight Distance Obstruction 13

3. Audit Team Statement 15

1. INTRODUCTION

1.1 Scope of Audit

A Road Safety Audit is a formal, systematic, assessment of the potential road safety risks associated with a new road project or road improvement project conducted by an independent qualified audit team. The assessment considers all road users and suggests measures to eliminate or mitigate any risks identified by the audit team.

This Road Safety Audit has been conducted following the general principles detailed in *Austroads Guide to Road Safety Part 6: Road Safety Audit* and in accordance with the requirements contained in the Main Roads Western Australia Policy and Guidelines for Road Safety Audit.

This report results from an 15% Design Audit carried out on Woodlands North Project at Scarborough Beach Road and Ewen Street in Innaloo.

The background and objective of the proposed project is to construct a new development at Scarborough Beach Road and Ewen Street.

The Audit was undertaken by Richard Jois and Anthony Anastas of Shawmac Traffic & Safety with reference to the details provided in the Audit Brief.

The audit comprised an examination of the site and other information supplied as listed in Appendix D.

All the findings described in Section 2 of this report are considered by the audit team to require action in order to improve the safety of the proposed project and to minimise the risk of crash occurrence and reduce potential crash severity.

The audit team has examined and reported only on the road safety implications of the project as presented and has not examined or verified the compliance of the design to any other criteria.

1.2 The Audit Team

Auditor No.	Name	Role	Organisation
00942 (S)	Anthony Anastas	Inspection Team Leader	Shawmac Traffic & Safety
00143 (S)	Richard Jois	Inspection Team Member	Shawmac Traffic & Safety

The audit team visited the site on 21/10/2024 at 05:00pm. At the time of the site visit the weather was cloudy and the existing road surface was dry.

A night audit was undertaken at 7:00pm.

1.3 Specialist Advisors

There were no Specialist Advisors.

1.4 Safe System Findings

The aim of Safe System Findings is to focus the Road Safety Audit process on considering safe speeds and by providing forgiving roads and roadsides. This is to be delivered through the Road Safety Audit process by accepting that people will always make mistakes and by considering the known limits to crash forces the human body can tolerate. This is to be achieved by focusing the Road Safety Audit on particular crash types that are known to result in higher severity outcomes at relatively lower speed environments to reduce the risk of fatal and serious injury crashes.

The additional annotation "**IMPORTANT**" shall be used to provide emphasis to any road safety audit finding that has the potential to result in fatal or serious injury or findings that are likely to result in the following crash types above the related speed environment: head-on (>70 km/h), right angle (>50 km/h), run off road impact object (>40 km/h), and crashes involving vulnerable road users (>30 km/h), as these crash types are known to result in higher severity outcomes at relatively lower speed environments.

The exposure and likelihood of crash occurrence shall then be considered for all findings deemed "**IMPORTANT**" and evaluated based on an auditors professional judgement. Auditors should consider factors such as, traffic volumes and movements, speed environment, crash history and the road environment, and apply road safety engineering and crash investigation experience to determine the likelihood of crash occurrence. The likelihood of crash occurrence shall be considered either "**VERY HIGH**", "**HIGH**", "**MODERATE**" or "**LOW**" and this additional annotation shall be displayed following the "**IMPORTANT**" annotation on applicable findings.

1.5 Previous Safety Audits

There have been no previous Road Safety Audits that the auditors are aware of.

1.6 Background Data

1.6.1 Crash History

A study of the recent crash history has been conducted along Scarborough Beach Road and Ewen Street in the vicinity of the site for the five-year period to the end of December 2023.

At the Intersection:

- The crash types were as follows:
  - 40 rear end crashes;
  - 10 sideswipe crashes;
  - 4 right angle crashes;
  - 2 unknown crashes;

- The crashes resulted in the following:
    - 26 PDO Minor;
    - 25 PDO Major;
    - 4 requiring medical attention;
    - 1 requiring hospital visit.

Scarborough Beach Road Midblock:

- The crash types were as follows:
    - 4 sideswipe crashes;
    - 1 rear end crash.
- The crashes resulted in the following:
    - 4 PDO Minor;
    - 1 requiring medical attention;

Ewen Street Midblock:

- The crash types were as follows:
    - 1 rear end crash.
- The crashes resulted in the following:
    - 1 requiring medical attention;

1.6.2 Traffic and Speed Data

The most recent traffic data was sourced from MRWA's Traffic Map:

Location	VPD	% HV	AM peak	PM peak	Date
Scarborough Beach Road – Site 5139	31,336	6.0	2,504	2,760	2020/21
Ewen Street (LM00251)	7,556*	-	611*	628*	June 2023

* Approximate values due to missing MRWA traffic volume data

The most recent speed data was sourced from MRWA's Traffic Map:

Location	Posted Speed	Average Speed	85th Percentile Speed
Scarborough Beach Road – Site 5139	60km/h	45.0km/h	53.5km/h
Ewen Street	50km/h	-	-

1.6.3 Appendices

Appendix A – Audit Findings Location Plan
Appendix B – Audit Photographs
Appendix C – Crash Reports
Appendix D – List of Documents Provided for the Audit
Appendix E – Corrective Action Report (CAR)

2. ITEMS RAISED IN THIS AUDIT

2.1 Finding - Non-frangible hazards in the clear zone

There are a number of existing trees, non-frangible power poles and infrastructure located within the clear zone along Scarborough Beach Road and Ewen Street.

Justification of the finding

Unprotected hazards located in the clear zone are likely to pose a risk to vehicle occupants in the event that an errant vehicle leaves the road, this would result in serious injury to the occupants of errant vehicles.

In accordance with the MRWA supplement to Austroads Guide to Road Design Part 6 (GRD 6) the required clear zone width for a road with the design speed of ≤ 60 km/h ranges from 3.0m to 5.0m.

Recommendation:

Ensure that the required clear zone is provided as per the MRWA supplement to Austroads GRD 6 or that vehicles are protected by a suitable safety barrier.

[IMPORTANT | LOW]

2.2 Finding - Signs and Lines

Only indicative details of lines are provided.

Justification of the finding

Inadequate or inappropriately designed signs and lines may adversely impact on a driver's ability to safely interpret the road environment and drive in a safe manner. This may increase the risk of road crashes and injury to vehicle occupants.

All signage should be designed in accordance with AS1742 to ensure consistency through the works reducing the risk to road users.

Recommendation

Ensure that signs and lines are designed in accordance with Australian Standard AS 1742 and MRWA guidelines and are detailed in the 85% design drawings.

2.3 Finding – Tripping Hazard in Footpath

It was noted that the footpath along Scarborough Beach Road and Ewen Street had multiple unlevelled service pits that results in a difference in level.

Justification of the finding:

Difference in level within the footpath creates a tripping hazard for pedestrians that could increase the risk of pedestrian injury.

Austroads Guide to Road Design Part 6: Paths for Walking and Cycling indicates that path networks should:

- provide surfaces that provide good surface grip, are free of tripping hazards, smooth, clear of obstructions and are well maintained (e.g. no broken paving);
- have well design landscaping that does not encroach sight lines or operating space;
- minimise conflicts between path users taking into consideration path widths or the provision of separated paths;
- have information signs reminding users of appropriate behaviours in using the path;
- have continuous routes and travel paths as short as possible;
- provide crossings that are appropriate for the traffic volume and traffic speed environment; and
- provide good access to key destinations.

Recommendation

Ensure that any tripping and slipping hazards are eliminated within the footpaths.

2.4 Finding – Pedestrian Crossing Facilities

It was noted that some of the Tactile Ground Surface Indicators (TGSIs) were not installed at the pedestrian crossings along Scarborough Beach Road and Ewen Street.

Justification of the finding:

People with limited or no vision have difficulty identifying where to cross without TGSIs. This increases the risk of conflict with vehicles and could result in hit pedestrian crash.

Kerb ramps should be designed in accordance with MRWA standard drawing 9831-5649 for Type A kerb ramps and standard drawing 9831-5649 for type B ramps.

Tactile Ground Surface Indicators (TGSIs) are essential in assisting people with vision impairment to safely crossroads. It is a DDA requirement for all pedestrian kerb ramps to be provided with TGSIs installed in accordance with the Department of Transport's Planning and Designing for Pedestrians: Guidelines, MRWA Standard Drawings 9831-5649 and 200931-0089, and Australian Standard AS 1428.4.

Recommendation

Ensure missing TGSIs are installed in accordance with MRWA design drawings and AS1428.1.

[IMPORTANT | LOW]

2.5 Finding – Lighting

There are lighting drawings to ensure sufficient lighting to AS1158 specification, with an existing damaged light along Scarborough Beach Road.

Justification of the finding:

If lighting does not meet the requirements of AS1158 there is the potential for poorly lit sections along the alignment. This could increase the potential for night-time crashes along the highway.

Australian Standard AS 1158 sets out performance and design requirements for Category V lighting schemes, having regard to the presence, volume and speed of both pedestrians and vehicles. Category V lighting is acknowledged to be an effective accident countermeasure. It has been demonstrated that Category V lighting can provide significant community benefits and that the costs involved in providing the lighting can be offset by the financial returns from the reduction in road accidents. Studies in Australia and New Zealand, and in other countries, have led to the conclusion that Category V traffic route lighting is likely to reduce night-time casualty accidents by about 30%, taken over the road network.

Recommendation:

Designers to ensure the lighting complies with AS1158.

Additionally, damaged light to be repaired.

2.6 Finding – Discontinuous Pedestrian Footpath

It was noted that the design drawings do not show connection with existing footpath. (2305-2.01)

Justification of the finding:

The lack of a continuous pedestrian footpath forces path users to cross at unexpected locations, increasing the risk of being hit by passing vehicles that does not expect any pedestrians. This results in serious injury or fatal consequences.

Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths lists principles for the provision of footpaths and these include:

- have continuous pedestrian routes to key destinations without barriers that are difficult to cross
- be as continuous as practicable.

Austroads Guide to Road Design Part 6: Paths for Walking and Cycling indicates that path networks should:

- provide surfaces that provide good surface grip, are free of tripping hazards, smooth, clear of obstructions and are well maintained (e.g. no broken paving);
- have well design landscaping that does not encroach sight lines or operating space;
- minimise conflicts between path users taking into consideration path widths or the provision of separated paths;
- have information signs reminding users of appropriate behaviours in using the path;
- have continuous routes and travel paths as short as possible;
- provide crossings that are appropriate for the traffic volume and traffic speed environment; and
- provide good access to key destinations.

Recommendation

Proposed footpath to be connected with existing footpaths.

[IMPORTANT | LOW]

2.7 Finding – Potential Vehicles Queuing

It was noted that the access to the development between two curves, with vehicles potentially queuing into the road. (2305-2.01, 2.11)

Additionally, vehicles exiting the development onto Ewen Street may have insufficient gap during peak hours.

Justification of the finding

Should there be a large number of vehicles entering the facility it would result in vehicles queuing into the roundabout. This would increase the risk of rear-end crashes and the injuring to vehicle occupants.

Additionally, should there be insufficient gap for vehicles entering Ewen Street. This might result in vehicles merging into traffic in an unsafe manner resulting in a sideswipe or right angle crash.

Austroads Guide to Traffic Management Part 2: Traffic Theory indicates that in many traffic situations, particularly at intersections, conflicts between different traffic streams and/or fluctuations in flow can result in the formation of queues of vehicles. Queuing theory provides a way of analysing queue behaviour and predicting its consequences, including queue lengths and queuing delays.

Recommendation

Ensure that queuing is to be analysed and checked for long queuing lengths. If queuing is found to be an issue, reassess the access to the facility.

Additionally, ensure there is sufficient gap for vehicles exiting the development during peak hour traffic.

[IMPORTANT | MODERATE]

2.8 Finding – Potential Sight Distance Obstruction

There are some trees, power poles and infrastructure that might potentially hinder the sight distance at the exits. (2305-2.01, 2.11)

Justification of the finding:

Obstructed sight distance can increase the risk of right-angled crashes with subsequent serious or fatal injury to vehicle occupants.

Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections indicates that Safe Intersection Sight Distance (SISD) is the minimum sight distance which should be provided on the major road at any intersection. Designers should note that the object height for the application of SISD has been increased to 1.25 m (previously driver eye height was used i.e. 1.1 m) based on research by the

Department of Main Roads (Lennie et al. 2008). The basis of the 1.25 m object height for cars is that this height is 0.2 m less than the 15th percentile height of passenger cars (1.45 m) as determined by the study

Recommendation

Ensure there is sufficient sight distance at both exits.

[IMPORTANT | LOW]

3. AUDIT TEAM STATEMENT

I hereby certify that the audit team have examined the documents listed in Appendix D and have inspected the site in undertaking this Road Safety Audit. I also confirm that this audit has been carried out independently of the design team following the general principles detailed in *Austroads Guide to Road Safety Part 6: Road Safety Audit* and in accordance with Main Roads Policy and Guidelines for Road Safety Audit.

The audit has been carried out for the sole purpose of identifying any features of the design which could be altered or removed to improve the safety of the proposal. The identified issues have been noted in this report. The accompanying findings and recommendations are put forward for consideration by the Client for implementation.

Audit Team Leader

Anthony Anastas Shawmac Traffic & Safety		Signature
	24/10/2024	Date

Disclaimer

This report contains findings and recommendations based on examination of the site and/or relevant documentation. The report is based on the conditions viewed on the day of inspection and is relevant at the time of production of the report. Information and data contained within this report is prepared with due care by the Road Safety Audit Team. While the Road Safety Audit Team seeks to ensure accuracy of the data, it cannot guarantee its accuracy.

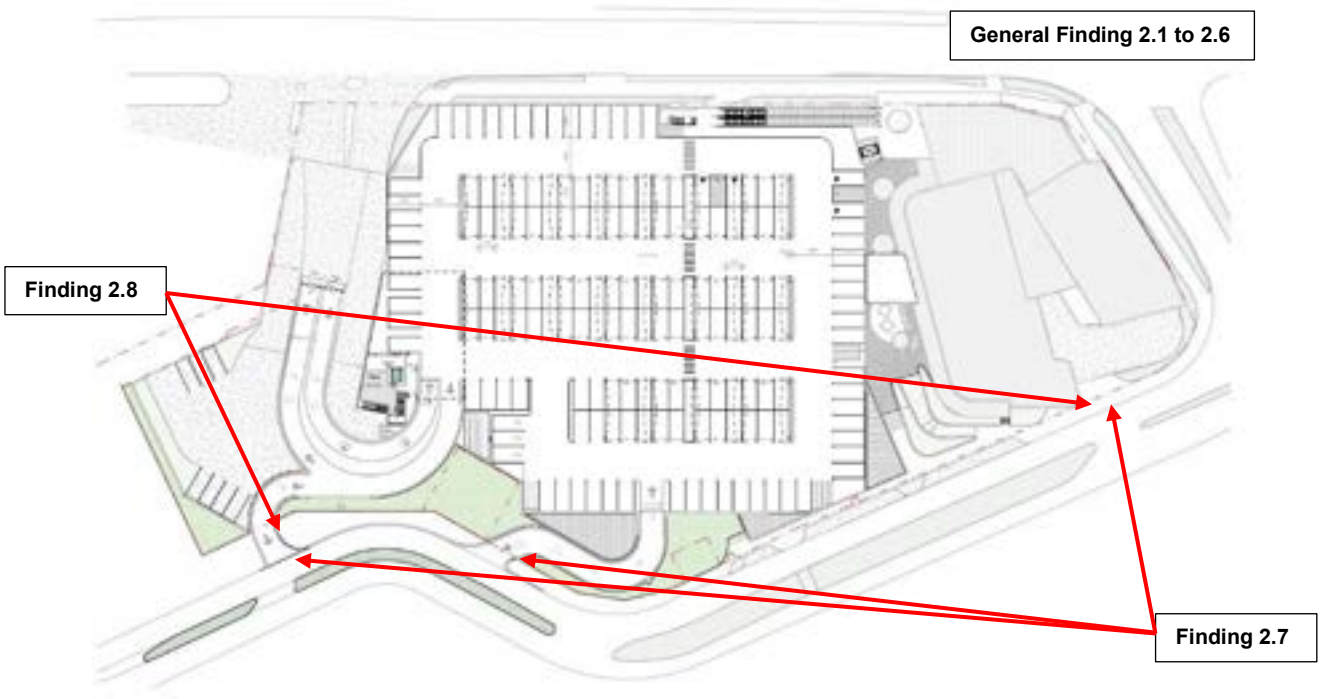
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APPENDIX A

AUDIT FINDINGS LOCATION PLAN



Audit Findings Location Plan

APPENDIX B

AUDIT PHOTOGRAPHS



Finding 2.1



Finding 2.1



Finding 2.1



Finding 2.1



Finding 2.3



Finding 2.3 and 2.4



Finding 2.3



Finding 2.4



Finding 2.4



Finding 2.5

APPENDIX C

CRASH REPORTS

Summary Crash History

Selection Criteria	Value
Intersection	SCARBOROUGH BEACH RD & ODIN RD & EWEN ST (055429)
Date	01/01/2019 to 31/12/2023

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	1	1.8%
Medical	4	7.1%
PDO Major	25	44.6%
PDO Minor	26	46.4%
Other / Unknown	0	0.0%
Total:	**56**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	4	7.1%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	52	92.9%
Total:	**56**	**100.0%**

Light Conditions	Count	Percentage
Daylight	44	78.6%
Dawn Or Dusk	4	7.1%
Dark - Street Lights On	4	7.1%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	4	7.1%
Total:	**56**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	35	62.5%
Crest Of Hill	0	0.0%
Slope	5	8.9%
Other / Unknown	16	28.6%
Total:	**56**	**100.0%**

Road Alignment	Count	Percentage
Curve	12	21.4%
Straight	29	51.8%
Other / Unknown	15	26.8%
Total:	**56**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	56	100.0%
Total:	**56**	**100.0%**

Road Condition	Count	Percentage
Wet	5	8.9%
Dry	48	85.7%
Other / Unknown	3	5.4%
Total:	**56**	**100.0%**

MR Nature	Count	Percentage
Rear End	40	71.4%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	10	17.9%
Right Angle	4	7.1%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	2	3.6%
Total:	**56**	**100.0%**

Summary Crash History

Selection Criteria	Value
Road	SCARBOROUGH BEACH RD (1250069)
Date	01/01/2019 to 31/12/2023
Road SLK	3.77 to 3.99

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	1	1.6%
Medical	5	8.2%
PDO Major	25	41.0%
PDO Minor	30	49.2%
Other / Unknown	0	0.0%
Total:	**61**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	4	6.6%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	57	93.4%
Total:	**61**	**100.0%**

Light Conditions	Count	Percentage
Daylight	49	80.3%
Dawn Or Dusk	4	6.6%
Dark - Street Lights On	4	6.6%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	4	6.6%
Total:	**61**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	38	62.3%
Crest Of Hill	0	0.0%
Slope	7	11.5%
Other / Unknown	16	26.2%
Total:	**61**	**100.0%**

Road Alignment	Count	Percentage
Curve	12	19.7%
Straight	34	55.7%
Other / Unknown	15	24.6%
Total:	**61**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	61	100.0%
Total:	**61**	**100.0%**

Road Condition	Count	Percentage
Wet	5	8.2%
Dry	53	86.9%
Other / Unknown	3	4.9%
Total:	**61**	**100.0%**

MR Nature	Count	Percentage
Rear End	41	67.2%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	14	23.0%
Right Angle	4	6.6%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	2	3.3%
Total:	**61**	**100.0%**

Summary Crash History

Selection Criteria	Value
Road	EWEN ST (1250111)
Date	01/01/2019 to 31/12/2023
Road SLK	0.00 to 0.28

Severity	Count	Percentage
Fatal	0	0.0%
Hospital	1	1.8%
Medical	5	8.8%
PDO Major	25	43.9%
PDO Minor	26	45.6%
Other / Unknown	0	0.0%
Total:	**57**	**100.0%**

MR Type	Count	Percentage
Involving Overtaking	4	7.0%
Involving Parking	0	0.0%
Involving Animal	0	0.0%
Involving Pedestrian	0	0.0%
Entering / Leaving Driveway	0	0.0%
Other / Unknown	53	93.0%
Total:	**57**	**100.0%**

Light Conditions	Count	Percentage
Daylight	44	77.2%
Dawn Or Dusk	4	7.0%
Dark - Street Lights On	4	7.0%
Dark - Street Lights Off	0	0.0%
Dark - Street Lights Not Provided	0	0.0%
Other / Unknown	5	8.8%
Total:	**57**	**100.0%**

Object Hit	Count	Percentage
SEC Pole		
Traffic Light Post		
Traffic Sign		
Commercial Sign Post		
Tree		
Other		
Total:		

Road Grade	Count	Percentage
Level	35	61.4%
Crest Of Hill	0	0.0%
Slope	5	8.8%
Other / Unknown	17	29.8%
Total:	**57**	**100.0%**

Road Alignment	Count	Percentage
Curve	12	21.1%
Straight	29	50.9%
Other / Unknown	16	28.1%
Total:	**57**	**100.0%**

Speed a Factor	Count	Percentage
Yes	0	0.0%
No	0	0.0%
Other / Unknown	57	100.0%
Total:	**57**	**100.0%**

Road Condition	Count	Percentage
Wet	6	10.5%
Dry	48	84.2%
Other / Unknown	3	5.3%
Total:	**57**	**100.0%**

MR Nature	Count	Percentage
Rear End	41	71.9%
Head On	0	0.0%
Sideswipe Opposite Dirn	0	0.0%
Sideswipe Same Dirn	10	17.5%
Right Angle	4	7.0%
Right Turn Thru	0	0.0%
Hit Pedestrian	0	0.0%
Hit Animal	0	0.0%
Hit Object	0	0.0%
Non Collision	0	0.0%
Other / Unknown	2	3.5%
Total:	**57**	**100.0%**

APPENDIX D

LIST OF DOCUMENTS PROVIDED FOR THE AUDIT

Document Numbers:

- 2305-2.01
- 2305-2.11

APPENDIX E

CORRECTIVE ACTION REPORT

Corrective Action Report – Woodlands North Project – Scarborough Beach Road and Ewen Street

15% Design RSA

Findings and Recommendations	Project Manager		
	Agree / Disagree	Reason for Disagreeing	Proposed Action and Comments
2.1 – Finding - Non-frangible hazards in the clear zone There are a number of existing trees, non-frangible power poles and infrastructure located within the clear zone along Scarborough Beach Road and Ewen Street.	Choose an item.		This finding is forwarded to the asset owner for their consideration.
Recommendation Ensure that the required clear zone is provided as per the MRWA supplement to Austroads GRD 6 or that vehicles are protected by a suitable safety barrier. [IMPORTANT | LOW]	Choose an item.		

2.2 – Finding - Signs and Lines Only indicative details of lines are provided.	Agree		
Recommendation Ensure that signs and lines are designed in accordance with Australian Standard AS 1742 and MRWA guidelines and are detailed in the 85% design drawings.	Agree		A concept Traffic Management Plan will be prepared for the Development Application, which will provide indicative traffic control signs, line marking and other measures. This will inform subsequent project design stages.
2.3 – Finding - Tripping Hazard in Footpath It was noted that the footpath along Scarborough Beach Road and Ewen Street had multiple unlevelled service pits that results in a difference in level.	Choose an item.		This finding is forwarded to the asset owner for their consideration. However it is noted that any footpath works that are part of the proposed development will ensure a level walking surface.
Recommendation Ensure that any tripping and slipping hazards are eliminated within the footpaths.	Choose an item.		
2.4 – Finding - Pedestrian Crossing Facilities It was noted that some of the Tactile Ground Surface Indicators (TGSIs) were not installed at	Choose an item.		This finding is forwarded to the asset owner for their consideration.

the pedestrian crossings along Scarborough Beach Road and Ewen Street.			
Recommendation Ensure missing TGSIs are installed in accordance with MRWA design drawings and AS1428.1. [IMPORTANT | LOW]	Choose an item.		
2.5 – Finding - Lighting There are lighting drawings to ensure sufficient lighting to AS1158 specification, with an existing damaged light along Scarborough Beach Road.	Choose an item.		This finding is forwarded to the asset owner for their consideration.
Recommendation Designers to ensure the lighting complies with AS1158. Additionally, damaged light to be repaired.	Choose an item.		
2.6 – Finding - Discontinuous Pedestrian Footpath It was noted that the design drawings do not show connection with existing footpath. (2305-2.01)	Agree		
Recommendation	Agree		The Development Application drawings have been refined to ensure

Proposed footpath to be connected with existing footpaths. [IMPORTANT | LOW]			that a continuous footpath is clearly shown along road frontages adjacent to the development site.
2.7 – Finding - Potential Vehicles Queuing It was noted that the access to the development between two curves, with vehicles potentially queuing into the road. (2305-2.01, 2.11) Additionally, vehicles exiting the development onto Ewen Street may have insufficient gap during peak hours.	Disagree		This is a secondary entry into the car park. Most vehicles will enter the car park from Scarborough Beach Road. Additionally, the entry ramp is 45m long. Queuing is unlikely to extend back to Ewen Street.
Recommendation Ensure that queuing is to be analysed and checked for long queuing lengths. If queuing is found to be an issue, reassess the access to the facility. Additionally, ensure there is sufficient gap for vehicles exiting the development during peak hour traffic. [IMPORTANT | MODERATE]	Agree		SIDRA analysis will be undertaken for the development crossovers, to ensure there is sufficient exit capacity during peak hour traffic. This will be documented in the TIA which will be submitted with the Development Application.
2.8 – Finding - Potential Sight Distance Obstruction	Agree		

There are some trees, power poles and infrastructure that might potentially hinder the sight distance at the exits. (2305-2.01, 2.11)			
Recommendation Ensure there is sufficient sight distance at both exits. [IMPORTANT | LOW]	Agree		A site visit will be undertaken to ensure there are sufficient sightlines at the Ewen Street car park exit crossover.

Corrective Action Report – Woodlands North Project – Scarborough Beach Road and Ewen Street
15% Design RSA

NOTE:

- This Corrective Action Report is to be read in conjunction with the full Road Safety Audit Report and its findings and recommendations.
- The asset owners (MRWA and/or LGA) **must** be informed of these findings, recommendations and proposed actions.
- Items not under the responsibility of this project representative must be forwarded to the persons / agencies who are responsible.

These findings and recommendations have been considered, and the actions listed will be taken accordingly.

Tarryn Stain	***Windsor Knight Pty Ltd***	***General Manager***	***5 November 2024***
Responsible Project Representative	**Company / Agency / Division**	**Position**	**Date**

Asset Owner Representative	**Company / Agency / Division**	**Position**	**Date**

Appendix 12:
Acoustic Report

Woodlands North

Acoustic Report – Development Application

Project No.	P01447
Revision	004
Issued	25 August 2025
Client	Deltaview Pty Ltd.

E-LAB Consulting

Where science and engineering inspire design.

Document QA and Revisions

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	28/10/2024	Draft Issue	Imran Khan	Teresa D Ngyuen
2	18/11/2024	Final Issue	Imran Khan	Teresa D Ngyuen
3	19/11/2024	Final Issue	Imran Khan	Teresa D Ngyuen
4	25/08/2025	Final Issue	Imran Khan	Teresa D Ngyuen

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Authorised by:

Engineering Lab NSW Pty Ltd



Imran Khan | National Technical Director

Acoustics & Vibration

Table of Content

1 INTRODUCTION 3

1.1 DOCUMENT PURPOSE 3
1.2 PROJECT DESCRIPTION 3

2 ACOUSTIC CRITERIA 5

2.1 WA ENVIRONMENTAL PROTECTION(NOISE) REGULATIONS 1997 5

3 NOISE EMISSIONS 8

3.2 LOADING DOCKS 8
3.3 NOISE EMISSIONS - F&B OUTLETS 11
3.4 PREDICTED NOISE EMISSIONS 12
3.5 MECHANICAL SERVICES – NOISE EMISSIONS 13

4 CONCLUSION 14

APPENDIX A NOISE CONTOURS 15

1 INTRODUCTION

1.1 DOCUMENT PURPOSE

E-Lab Consulting have been appointed by Delta view Pty Ltd to undertake acoustic assessment for the proposed retail project Woodlands North. The project consists of a supermarket, speciality stores, F&B tenancies and a Health / Wellness tenancy.

This Acoustic report has been prepared as part of Development Application for the proposed development at 367 Scarborough Beach Road, Innaloo WA 6018. This report addresses potential noise impacts from the development affecting nearby noise sensitive receivers and provides recommendations to maintain compliance to WA Environmental Protection (Noise) Regulations 1997.

1.2 PROJECT DESCRIPTION

1.2.1 Site Location

The project is located at the corner of Scarborough Beach Road and Ewen Street in Innaloo WA. The project site is located within the City of Stirling. Figure 1 shows the project location and the nearest noise sensitive receivers.

The site is surrounded by areas zoned for mixed-use developments under the Local Development Plans for Stirling City Centre – Woodlands (2015) and Southern (2018) Precincts. Figure 2 shows the future development zoning around the project area. There are existing commercial developments to the north, east and west of the site (including a petrol station adjacent), with existing residences to the immediate south across Ewen Street.

The nearest receivers have been identified as compliance with the noise regulations at the nearest receivers is accepted to imply compliance at receivers located further away.

Figure 1: Project Location and the nearest noise-sensitive receivers



Source – City of Stirling Intramaps

Figure 2: City of Stirling, Local Development Plan – Southern Precinct (20 March 2018)



2 ACOUSTIC CRITERIA

2.1 WA ENVIRONMENTAL PROTECTION(NOISE) REGULATIONS 1997

Environmental noise emissions resulting from the development are addressed through the *Environmental Protection Act 1986* with the prescribed standards detailed in the *Environmental Protection (Noise) Regulations 1997* (WA EPNR). The regulations are based on maximum allowable noise levels termed the 'assigned noise level".

According to the EPNR, noise emissions from any premises are deemed not to significantly impact the receiver if the emissions are 5 dB or less below the assigned levels. In summary, assigned noise levels are set by evaluating the presence of commercial and industrial zones, major transport routes, and sporting venues around noise-sensitive premises.

The assigned levels apply at premises receiving the noise (noise sensitive receiver) and not to areas within the project site or lot. In addition, the Environmental Protection (Noise) Regulations 1997 identify the following in Schedule 3, clause 2A.

- *"If the land within either of the circles is categorised on the land use map as land in respect of which mixed uses are permitted, the use of that land that results in the highest influencing factor is to be used in the determination of the influencing factor."*

City of Stirling's online mapping system (Local Planning Scheme 3 and Metropolitan Regional Scheme) have been used to ascertain land use. Zoning of mixed-use development within the Stirling City Centre Development Area were taken from Local Development Plans for Stirling City Centre – Woodlands (2015) and Southern (2018) Precincts. Based on these maps the influencing factor at the nearest noise sensitive receivers has been calculated,

The nearest noise sensitive receivers have been identified as detailed below and shown in Figure 2.

- 22 Hakea Road Woodlands WA
- 365 Scarborough Beach Road Innaloo – Future mixed-use development, site currently being used as a Petrol Station.

Traffic data for roads surrounding the nearest noise sensitive receiver were obtained from Main Roads Western Australia (MRWA). Table 1 presents the traffic data of the nearby roads.

Table 1: Traffic Data (Main Roads WA)

ROAD	WA EPNR CLASSIFICATION	ANNUAL AVERAGE DAILY TRAFFIC VOLUMES / YEAR
Scarborough Beach Rd (East of Odin Rd)	Major Road	31,336 (2020 -21)
Odin Rd (North of Scarb Bch Rd)	Major Road	18,992 (2018- 19)
Liege St	Secondary Rd	12,468 (2018-20)
Ewen St (East of Weaponess Rd)	Secondary Rd	6,134 (2020-21)

2.1.1 Influencing Factor

The influencing factor for results from identifying major roads, commercial and industrial areas for the nearest noise sensitive receivers is detailed in Table 2. The zoning maps used for the calculation of influencing factor showing the land use types has been presented in Figure 3 .

Figure 3: Zoning map for the project and surrounding areas



Table 2: Influencing factor (IF) noise sensitive receiver

NOISE SENSITIVE RECIEVERS	COMMERCIAL	INDUSTRIAL	ROAD	INFLUENCING FACTOR
22 Hakea Road Woodlands (Current)	45 % within 100m radius 26 % within 450m radius	0 % within 100m radius 0 % within 450m radius	Scarborough Beach Road within 100m radius	10 dB
365 Scarborough Beach Road Innaloo (Future)	45 % within 100m radius 26 % within 450m radius	0 % within 100m radius 0 % within 450m radius	Scarborough Beach Road within 100m radius	10 dB

2.1.2 Assigned Noise Levels – Noise Sensitive Receivers

Table 3 summarises the assigned levels at the nearest noise sensitive receivers. All noise emissions from the development are below the assigned level criteria for all defined periods of the day and at the lot boundary of the receiver or 15m from any associated building.

Table 3: Assigned levels – 22 Hakea Rd. & 365 Scarborough Beach Rd(Future)

TYPE OF PREMISES RECEIVING NOISE	TIME OF DAY	ASSIGNED LEVEL (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: Highly sensitive area	0700 to 1900 hours Monday to Saturday	55	65	75
	0900 to 1900 hours Sunday & public holidays	50	60	75
	1900 to 2200 hours all days	50	60	65
	2200 hours on any day to 0700 hours Monday to Saturday, and 0900 hours Sunday & public holidays	45	55	65
Noise sensitive premises: any area other than highly sensitive areas	All Hours	60	75	80
Commercial premises	All Hours	60	75	80
Industrial and utility premises	All Hours	65	80	90

2.1.3 Noise Character Adjustments

Regulation 7 states that the noise character must be "free" of annoying characteristics, namely —

- Tonality, e.g. whining, droning;
- Modulation, e.g. like a siren; and
- Impulsiveness, e.g. banging, thumping.

Regulation 9 (1) establishes the methodology for determining noise characteristics. If these characteristics cannot be reasonably and practicably removed, a series of adjustments to the measured levels are required, indicated in Table 4.

Table 4: Noise character adjustment

ADJUSTMENT WHERE NOISE EMISSION IS NOT MUSIC THESE ADJUSTMENTS ARE CUMULATIVE TO A MAXIMUM OF 15 dB			ADJUSTMENT WHERE NOISE EMISSION IS MUSIC	
Where tonality is present	Where modulation is present	Where impulsiveness is present	Where impulsiveness is not present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

Should music noise from the project become audible at the receiving locations, a +10/15 dB adjustment will be required, likely resulting in non-compliance to the EPNR.

2.1.4 Mechanical Services Noise Emissions

Mechanical equipment serving the project is required to meet the assigned levels of the EPNR at the nearest sensitive receivers. It is important that noise emissions from the site do not present any form of tonality, modulation or impulsiveness (as defined by the EPNR).

3 NOISE EMISSIONS

The noise emitting sources from a development of this type are typically loading docks, mechanical plant used to service the supermarket and operational noise from the tenancies.

Noise emissions from the project site have been assessed for the following two scenarios:

- Current Scenario – Receivers surrounding the project site with their current heights
- Future Scenario – Receivers being developed to have multi storey buildings with heights in accordance with City of Stirling City Centre Local Development Plan

3.1.1 Modelling Parameters

Sound Plan9.0 has been used to develop a 3D model of the project site and the surrounding receivers to predict noise emissions from the project. Latest architectural drawings provided by Place Fabric were used to ascertain the layout and built form of the project in developing the acoustic model.

3.1.2 Algorithm and Meteorological Conditions

ISO 9613 - *Acoustics – Attenuation of sound during propagation outdoors* algorithm has been used for the noise model predictions with a reflection order of 3. The noise model has considered noise source levels, distance from the source to receivers, and screening effects due to existing, proposed buildings and ground topology.

3.1.3 Topography

Terrain contours were sourced from *Geoscience Australia, Digital Elevation Model (DEM) 1 Metre Grid of Australia derived from LiDAR, 2015.*

A reflective ground condition (0.6) was used as the areas surrounding the project are vegetated areas.

3.2 Loading Docks

Noise emissions from loading docks are required to be compliant to the assigned levels outlined in the EPNR. The project has two loading docks located towards the Southwest and Southeast of the project to service the Supermarket and Specialist tenancies as shown in Figure 4.

Figure 4: Architectural plan showing loading docks and truck paths



Source – Place Fabric

3.2.1 Assessment Criteria

Assessment of each noise source against the WA EPNR criteria (L_{A10}, L_{A1}, or L_{Amax}) is proportional to the period of the day, and the combined frequency and duration of each noise event. Noise levels from trucks using the loading bay is mainly truck manoeuvring and unloading / loading of the trucks. Truck's engine and refrigeration plant are switched off during unloading process therefore the duration of noise truck using the loading bay is quite limited for each delivery. Noise emissions from truck is present for less than 10 % of a representative measurement period, and therefore, assessment is conducted against the L_{A1} criteria.

3.2.2 Operating times and Truck Volumes

The delivery schedules of the truck for the supermarket and the specialist tenancies are yet to be confirmed, operating times listed below have been assumed for the assessment.

- Supermarket Loading Dock – Monday to Sunday: 24 hours
- Specialist Tenancies Loading Dock – Monday to Sunday: 24 hours

It assumed that only one truck would be present at any time in each loading dock.

3.2.3 Sound Level Data

Noise generated by truck movements and related operations in these areas typically consists of a mix of continuous and intermittent noise events, including:

- Engine noise (such as ignition, idling, acceleration, and deceleration), reversing alarms, brake squeals, and compression release noises.
- Unloading activities involving forklifts and pallet trucks.
- Noise from hydraulic lifts.

Sound power level of trucks within loading dock for varying truck sizes are presented in Table 5.

Table 5: Sound power level of loading dock activities

NOISE SOURCE	SOUND POWER LEVEL
19 m Articulated trucks driving and reversing	102 dB(A)
19m Truck unloading activities (pallet trucks etc.)	90 dB(A)
Small (< 9m) trucks – arrival or departure movements	96 dB(A)
Small (< 9m) truck unloading / waste loading activities	85 dB(A)

3.2.4 Loading Dock Screening

The loading docks as per the architectural drawings are screened and the screening has been considered in the noise model for the assessment.

Figure 5: Screening to loading docks



The screening provided to loading docks should be solid without any perforations or gaps and should have a minimum surface mass of 15kg/m^2.

3.2.5 Loading Docks - Predicted Noise Emissions

Predicted noise levels due to operation of restaurant daytime and evening / nighttime has been presented in Table 6. Coloured noise maps are presented in Appendix A.

Table 6: Predicted noise emissions – Loading Docks

	NOISE SENSITIVE RECEIVER	HIGHEST PREDICTED NOISE EMISSION L_{A1} dBA	CRITERIA L_{A1} dBA			COMPLIANCE
			DAY	EVENING	NIGHT	
Current	Residential Receivers Hakea Road	47 *(24 Hakea Rd)*	65	60	55	Yes
	Residential Receivers Ewen Street	45 *(252 Ewen St.)*	65	60	55	Yes
Future	Mixed use	59 (365 Scarborough Beach Road)	65	60	55	4 dB Exceedance for Nighttime
	Residential Receivers	45 (267 Ewen Street)	65	60	55	Yes

3.2.6 Discussion

Current Scenario

Predicted noise emissions from the operations of both the loading docks are predicted to be compliant at all times to WA EPNR for the current scenario.

Future Scenario

A marginal exceedance of 4dB has been predicted at 365 Scarborough Beach Road, currently Ampol Petrol, if this gets developed into a mixed use of residential development then the predicted noise emissions exceed the nighttime criteria.

When the adjoining lot gets developed to multi storey residential apartments, following recommendations are made for future scenarios:

- Trucks to be unloaded one at a time. Trucks should not be permitted to idle while unloading is occurring.
- It is recommended that trucks are fitted with broadband type reversing alarms (sometimes referred to as quackers or croakers), rather than single tone alarms (beepers) which may contribute to tonal characteristics at the receiver locations
- Unloading activities are usually characterized by the sound of pallets hitting the truck bed or the loading dock floor. During nighttime unloading, it is important to take measures to minimize this noise.

3.3 Noise Emissions - F&B Outlets

F&B outlets depending on the use may generate noise, however at this stage of the project specific details would not be available. Noise emissions from outdoor alfresco areas has been assessed to demonstrate compliance with WA EPNR. Seating areas outside of the tenancies to the Southeast and Southwest have been modelled as indicated in Figure 6 has been modelled.

Specific noise emissions from within the tenancies are required to be managed by the respective tenants under the provision of an operational noise management plan.

Figure 6: Alfresco areas for the F&B tenancies



Source – Place Fabric

3.3.1 Sound Level Data

Patron Sound Power Levels were predicted using the formula 66 dB(A)/m^2 presented by VDI Standard 3770:2012, "Emissionskennwerte von Schallquellen - Sport und Freizeitanlagen". Predicted Sound Power Levels were benchmarked against the local document "*Licenced Premises Noise Assessment Technical Guideline*". Version 1.0, Association of Australian Acoustical Consultants, AAAC, 2019 and found to be within the range of predictions used by Acoustical Consultants in Australia.

F&B Outlets shall not play music that would become audible at the nearest noise sensitive receivers. Music Level must be set such as not to become audible over patron noise and attract adjustments to the received level per the EPNR criteria.

3.3.2 Assessment Criteria

Assessment of each noise source against the WA EPNR criteria (L_{A10}, L_{A1}, or L_{Amax}) is proportional to the period of the day, and the combined frequency and duration of each noise event.

As patron noise is expected to be present for more than 10 % of a representative measurement period assessment of patron noise is conducted against the L_{A10} criteria.

3.3.3 Operating times

The operators of the tenancies have not been finalised therefore following operational hours for the tenancies has been assumed:

- Monday – Saturday – 0700- 2200 hours
- Sunday – 0900- 1900 hours

3.4 Predicted Noise Emissions

Predicted noise levels due to operations of the F&B tenancies are presented in Table 7. Coloured noise maps are presented in Appendix A.

Table 7: Predicted noise emissions – Patron noise

	NOISE SENSITIVE RECEIVER	HIGHEST PREDICTED NOISE EMISSION L_{A10} dBA	CRITERIA L_{A10} dBA			COMPLIANCE
			DAY	EVENING	NIGHT	
Current	Residential Receivers Hakea Road	50 *(14 Hakea Rd)*	55	50	NA	Yes
	Residential Receivers Ewen Street	49 *(273 Ewen St.)*	55	50	NA	Yes
Future	Residential Receivers Hakea Road	51 *(14 Hakea Rd)*	55	50	NA	1dB For evening time / Sunday day time
	Residential Receivers Ewen Street	51 *(273 Ewen St.)*	55	50	NA	1dB For evening time /Sunday day time

3.4.1 Discussion

Current Scenario

Predicted noise emissions from the operations F&B tenancies are predicted to achieve compliance to all nominated operating times.

Future Scenario

A marginal exceedance of 1dB has been predicted at residential receivers along Hakea Rd and Ewen Street. As the exceedance is marginal(1dB), it would not have any adverse impacts on the receivers when developed in future.

Operators to consider as part of their operational noise management plan limiting the number of user of the alfresco areas during evening / Sunday for full compliance to WA EPNR.

3.5 Mechanical Services – Noise Emissions

Noise produced by the mechanical services of the proposed development must meet the EPNR criteria at all nearby sensitive receptors. Currently, information about the mechanical equipment is not available. As the design advances, specific acoustic treatments will be implemented to ensure compliance with the relevant EPNR noise level standards at the closest noise-sensitive receivers.

The plant most relevant to environmental noise emissions are:

- Super Market rooftop plant and smoke exhaust fans
- F&B tenancy kitchen extract fans
- Fire pumps

At this stage, a reverse brief or limiting Sound Power Level has been established for the Supermarket plant deck:

- Cumulative Sound Power Level of 80 dB(A) (day and evening times as defined by the WA EPNR)
- Reducing to a cumulative Sound Power Level of 75 dBA at night-time, however the equipment is expected to be at a lower load

4 CONCLUSION

E-Lab Consulting were appointed by Delta view Pty Ltd to provide an acoustic assessment report for the Woodlands North project located at 367 Scarborough Beach Road, Innaloo WA 6018.

Acoustic assessment of the operational noise from loading docks has been undertaken to assess compliance with WA Environmental Protection (Noise) Regulations 1997. A 3D noise model using Sound PLAN9.0 was built to assess noise emissions from project.

Noise emissions from the below three sources were assessed:

- Loading Docks
- F&B Outlets
- Mechanical Plant

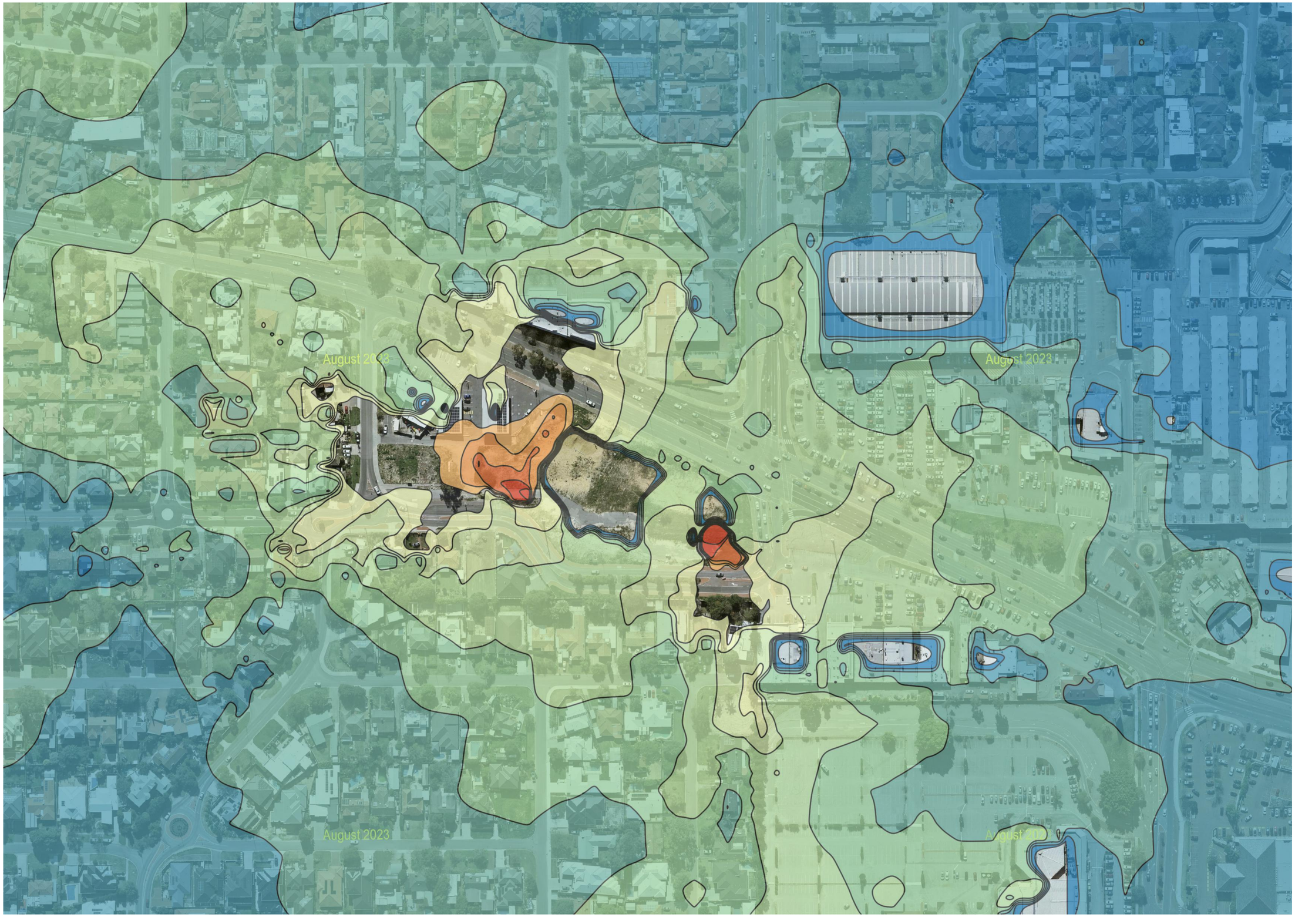
Predicted noise levels were assessed for the current and future scenarios. Noise emissions from the project are predicted to comply with WA EPNR for the current scenario.

Noise emissions for future scenarios were also predicted to comply with WA EPNR for most of the time with exception to marginal exceedances for certain periods of the day. The predicted exceedances would only impact where the receivers are developed in future to be a residential use. It is noted the marginal exceedances are unlikely to have any adverse impacts due to the project's proximity to Scarborough Beach Road and presence of higher noise level from the road traffic.

Mechanical services noise emissions shall be assessed to the environmental noise regulations (EPNR) in the next stages of design, with recommendations provided as necessary to ensure compliance.

In summary, in view of the available information, we consider that the development will be able to comply with the WA EPNR.

Appendix A **Noise Contours**



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	18/11/2024	For Information

LEGEND

Noise Level - L_{A10} dB(A)

15
20
25
30
35
40
45
50
55
60
65
70
75

NOTES

PROJECT
WOODLANDS NORTH

PROJECT NO.
P01447

ARCHITECT
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CLIENT
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SCALE
NTS

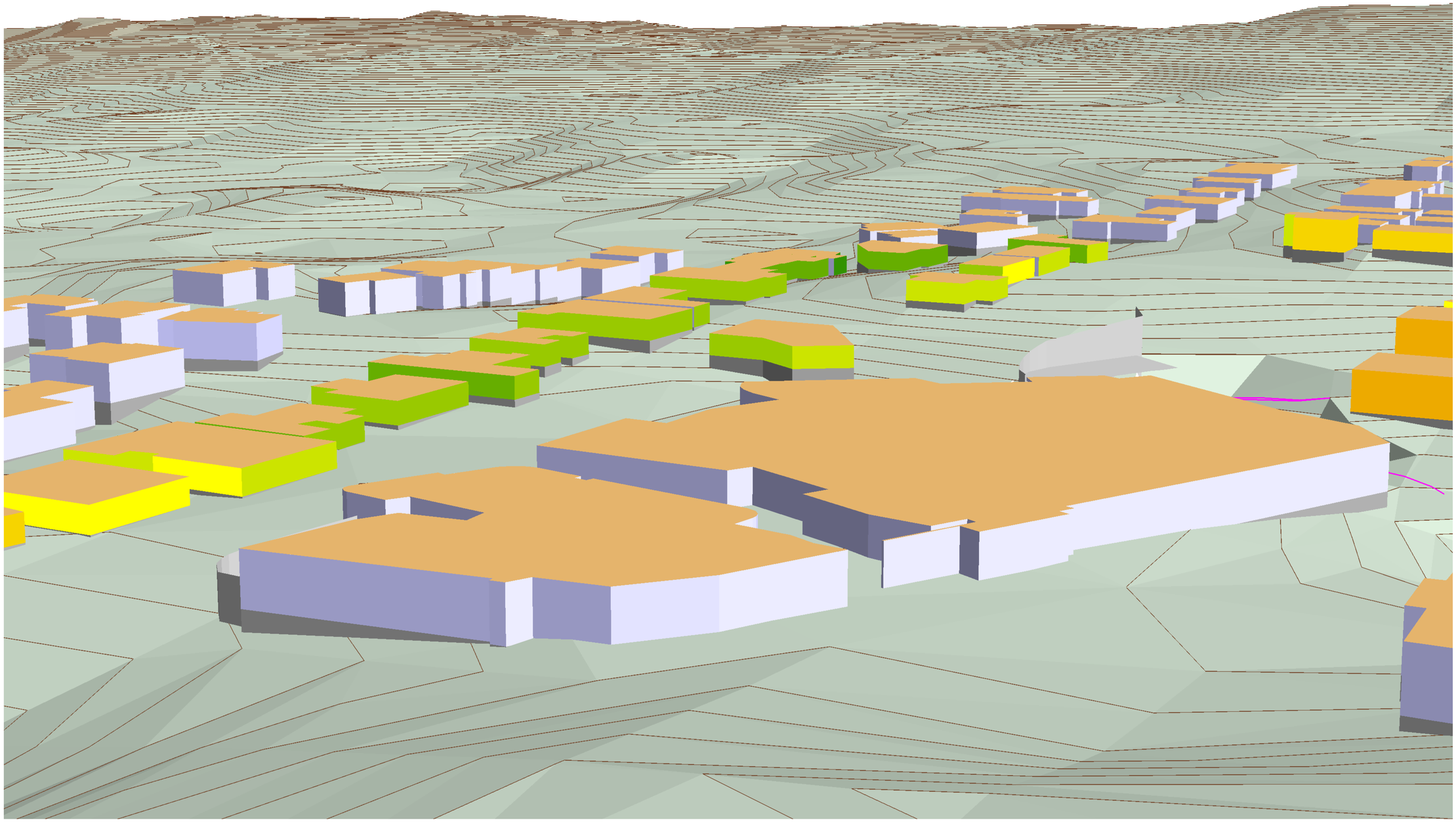
STATUS
ISSUE FOR SSDA

DRAWING
GRID NOISE MAP - LOADING DOCKS

DISCIPLINE
ACOUSTICS

DRAWING NUMBER
AC-DWG-100-01-01

REVISION
001



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	18/11/2024	For Information

LEGEND

Noise Level - L_{A10} dB(A)

	<= 20
20 <	<= 25
25 <	<= 30
30 <	<= 35
35 <	<= 40
40 <	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

NOTES

PROJECT
WOODLANDS NORTH

PROJECT NO.
P01447

ARCHITECT
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DELTAVIEW PTY LTD

SCALE
NTS

STATUS
ISSUE FOR SSDA

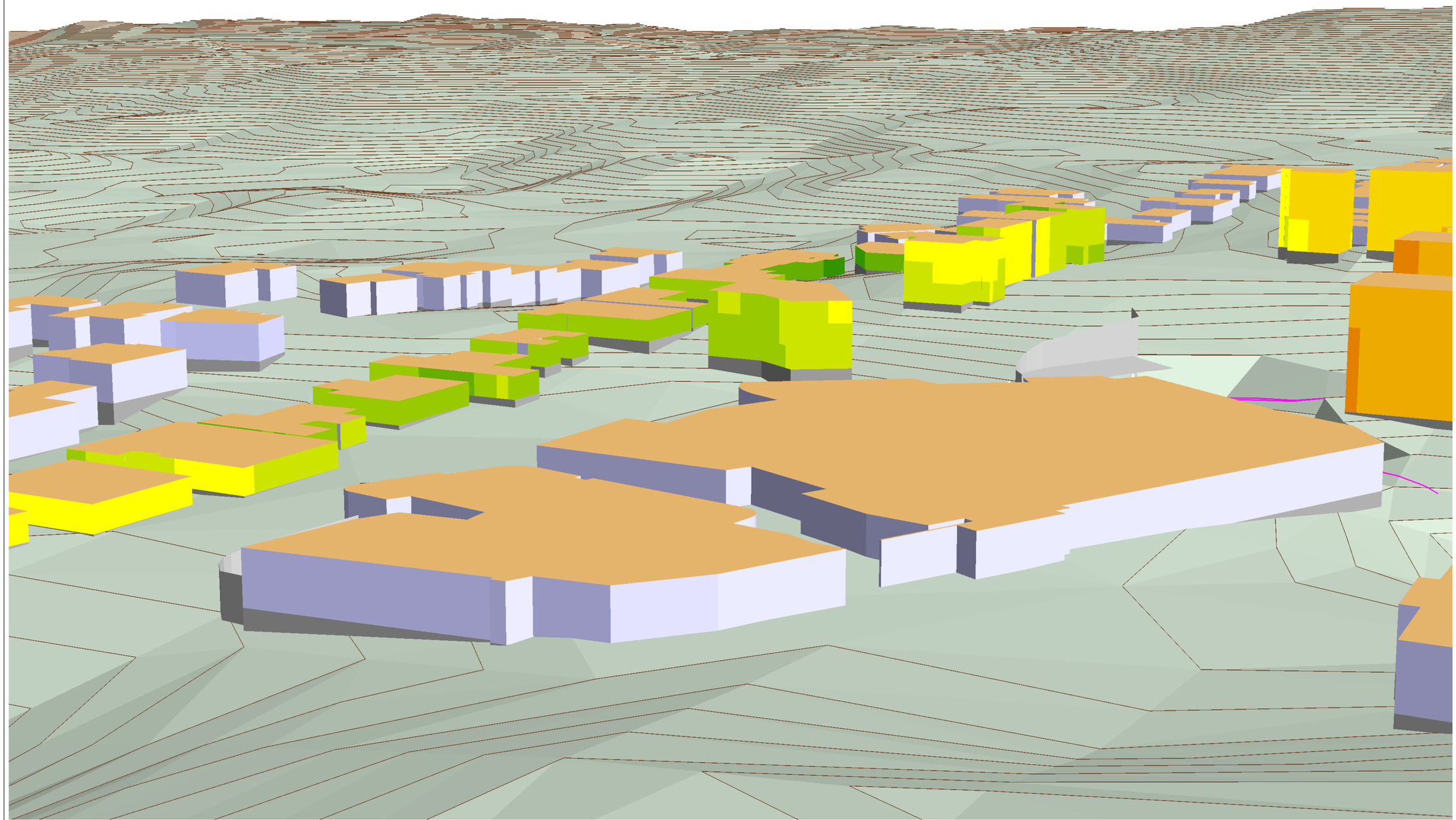
DRAWING
FACADE NOISE MAP - LOADING DOCKS

CURRENT

DISCIPLINE
ACOUSTICS

DRAWING NUMBER
AC-DWG-200-01-01

REVISION
001



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	18/11/2024	For Information

LEGEND

Noise Level - L_{A10} dB(A)

	<= 20
20 <	<= 25
25 <	<= 30
30 <	<= 35
35 <	<= 40
40 <	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

NOTES

PROJECT
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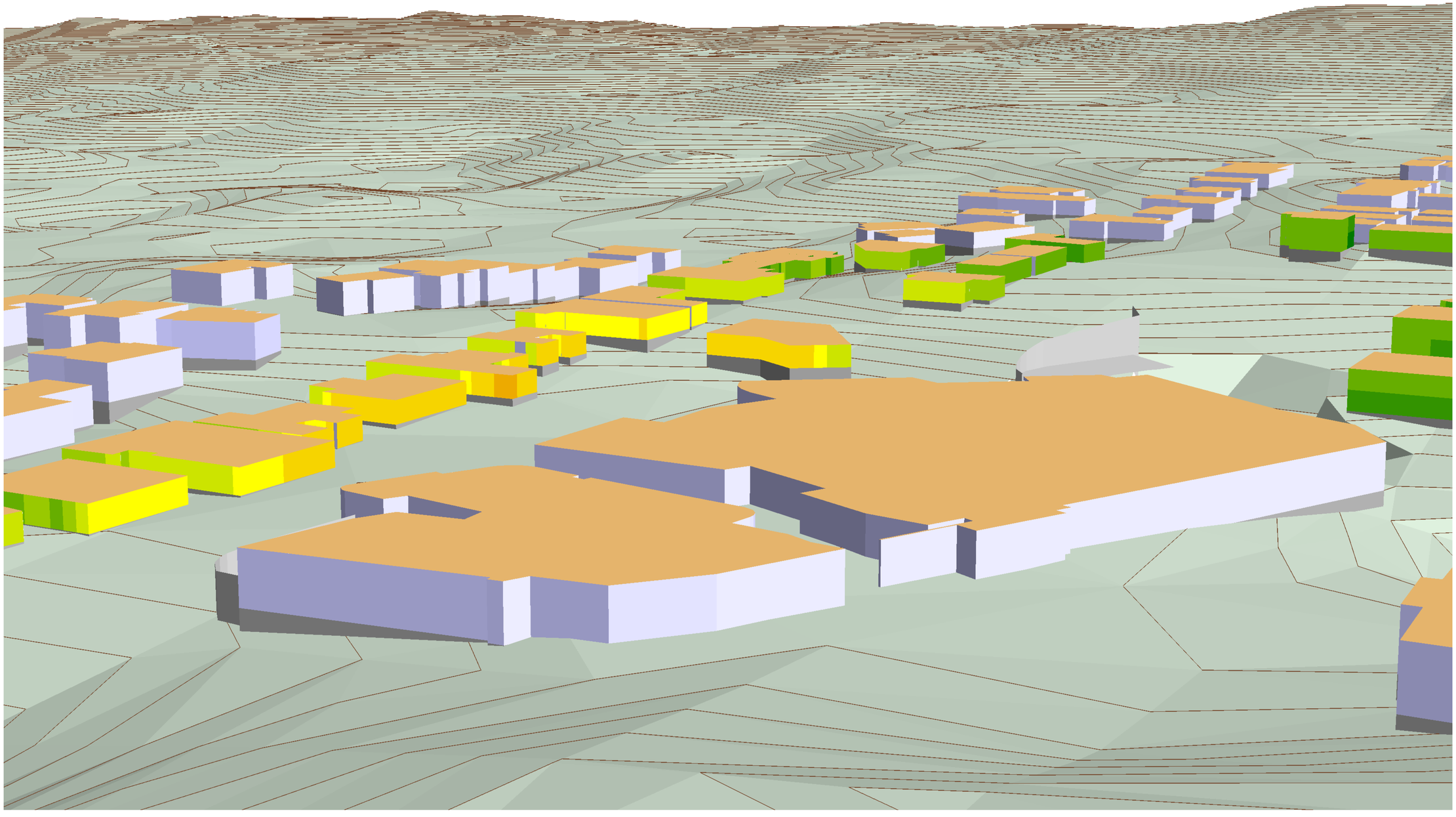
DRAWING
FACADE NOISE MAP - LOADING DOCKS

FUTURE

DISCIPLINE
ACOUSTICS

DRAWING NUMBER
AC-DWG-200-01-02

REVISION
001



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	18/11/2024	For Information

LEGEND

Noise Level - L_{A10} dB(A)

	<= 20
20 <	<= 25
25 <	<= 30
30 <	<= 35
35 <	<= 40
40 <	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

NOTES

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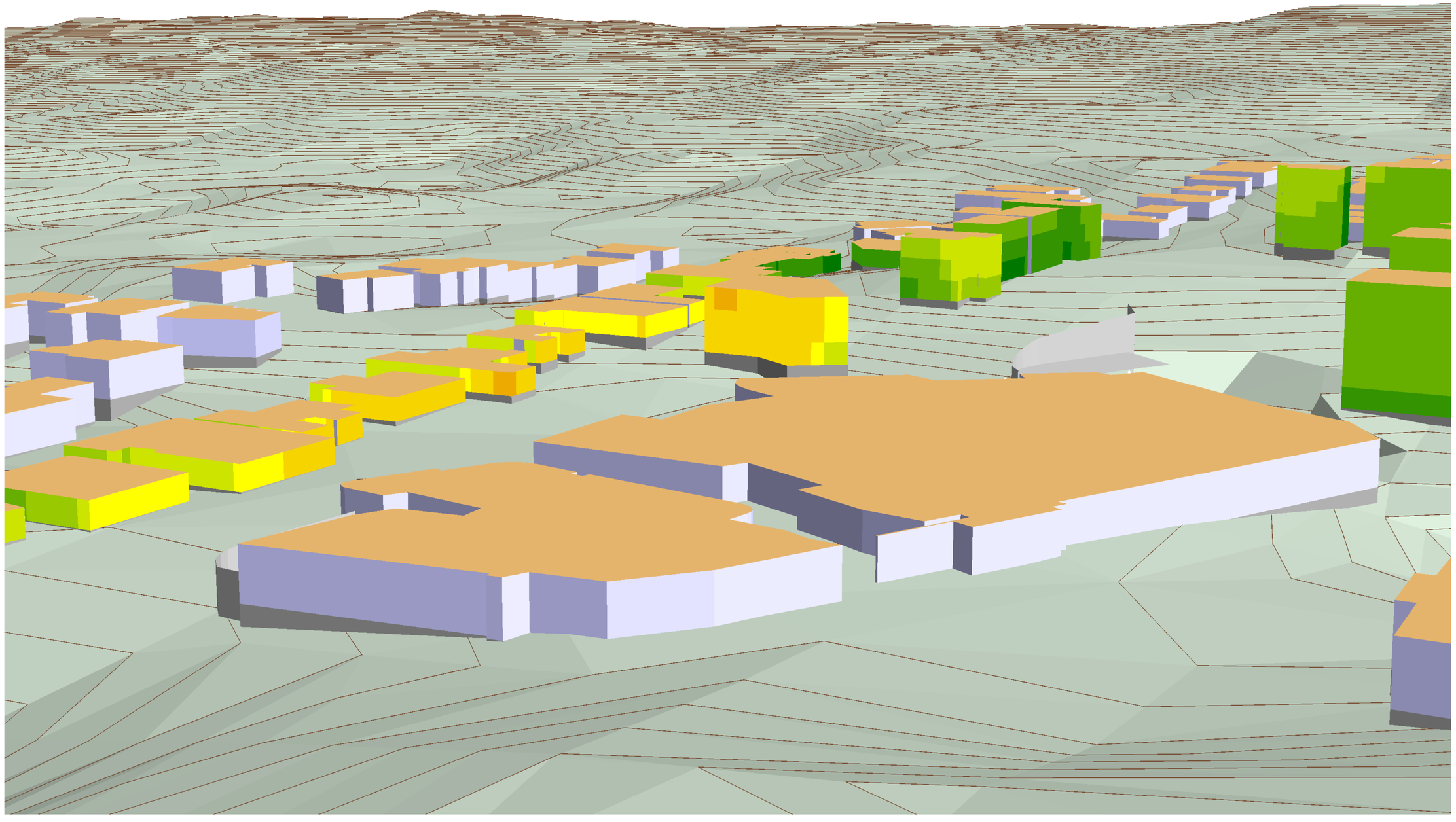
DRAWING
FACADE NOISE MAP - F&B

CURRENT

DISCIPLINE
ACOUSTICS

DRAWING NUMBER
AC-DWG-200-02-02

REVISION
001



E-LAB CONSULTING

ISSUE	DATE	STATUS
1	18/11/2024	For Information

LEGEND

Noise Level - L_{A10} dB(A)

	<= 20
20 <	<= 25
25 <	<= 30
30 <	<= 35
35 <	<= 40
40 <	<= 45
45 <	<= 50
50 <	<= 55
55 <	<= 60
60 <	<= 65
65 <	<= 70
70 <	<= 75
75 <	<= 80
80 <	

NOTES

PROJECT
WOODLANDS NORTH

PROJECT NO.
P01447

ARCHITECT
PLACE FABRIC

CLIENT
DELTAVIEW PTY LTD

SCALE
NTS

STATUS
ISSUE FOR SSDA

DRAWING
FACADE NOISE MAP - F&B

FUTURE

DISCIPLINE
ACOUSTICS

DRAWING NUMBER	REVISION
AC-DWG-200-02-02	001



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Appendix 13:
Waste Management Plan

Waste Management Plan

Woodlands North Development

Prepared for Windsor Knight Pty Ltd

25 August 2025

Project Number: TW22146

DOCUMENT CONTROL

Version	Description	Date	Author	Reviewer	Approver
1.0	First Approved Release	9/11/2022	AB	RH	DP
2.0	Second Approved Release	9/03/2023	AB	RH	DP
3.0	Third Approved Release	2/09/2024	DP	RH	DP
4.0	Fourth Approved Release	6/11/2024	DP	RH	DP
5.0	Fifth Approved Release	15/11/2024	DP	RH	DP
6.0	Sixth Approved Release	25/08/2025	DP	AB	DP

Approval for Release

Name	Position	File Reference
Dilan Patel	Project Manager – Senior Waste Strategy Consultant	TW22146-02_Waste Management Plan_6.0
Signature		

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Executive Summary

Windsor Knight Pty Ltd is seeking development approval for the proposed commercial development located on the corner of Scarborough Beach Road and Ewen Street, Scarborough (the Proposal).

To satisfy the conditions of the development application the City of Stirling (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Talis Consultants has been engaged to prepare this WMP to satisfy the City's requirements.

A summary of the bin size, numbers, collection frequency and collection method is provided in the below table.

Proposed Waste Collection Summary

Waste Type	Generation (L/week)	Bin Size (L)	Number of Bins	Collection Frequency	Collection
Refuse	24,502	1,100	Twelve	Two times each week	Private Contractor
Recycling	7,585	1,100	Four	Two times each week	Private Contractor

A private contractors will service the Proposal onsite, directly from the Bin Storage Area. The private contractor's rear loader collection vehicle will enter and exit the Proposal in forward gear via Ewen Street.

A building manager will oversee the relevant aspects of waste management at the Proposal.

Table of Contents

1 Introduction 1
1.1 Objectives and Scope 1
2 Waste Generation 2
2.1 Proposed Tenancies 2
2.2 Waste Generation Rates 2
2.3 Waste Generation Volumes 3
3 Waste Storage 4
3.1 Internal Transfer of Waste 4
3.2 Bin Sizes 4
3.3 Bin Storage Area Size 4
3.4 Bin Storage Area Design 5
4 Waste Collection 6
4.1 Bulk and Speciality Waste 6
5 Waste Management 7
6 Conclusion 8

Tables

Table 2-1: Waste Generation Rates 2
Table 2-2: Estimated Waste Generation 3
Table 3-1: Typical Bin Dimensions 4
Table 3-2: Bin Requirements for Bin Storage Area 4

Diagrams

Diagram 1: Bin Storage Area

Figures

Figure 1: Locality Plan

1 Introduction

Windsor Knight Pty Ltd is seeking development approval for the proposed commercial development located on the corner of Scarborough Beach Road and Ewen Street, Scarborough (the Proposal).

To satisfy the conditions of the development application the City of Stirling (the City) requires the submission of a Waste Management Plan (WMP) that will identify how waste is to be stored and collected from the Proposal. Talis Consultants has been engaged to prepare this WMP to satisfy the City's requirements.

The Proposal is bordered by Scarborough Beach Road to the north, Ewen Street to the east and south and commercial properties to the west, as shown in Figure 1.

1.1 Objectives and Scope

The objective of this WMP is to outline the equipment and procedures that will be adopted to manage waste (refuse and recyclables) at the Proposal. Specifically, the WMP demonstrates that the Proposal is designed to:

- Adequately cater for the anticipated volume of waste to be generated;
- Provide an adequately sized Bin Storage Area, including appropriate bins; and
- Allow for efficient collection of bins by appropriate waste collection vehicles.

To achieve the objective, the scope of the WMP comprises:

- Section 2: Waste Generation;
- Section 3: Internal Transfer of Waste;
- Section 4: Waste Storage;
- Section 5: Waste Collection;
- Section 6: Waste Management; and
- Section 7: Conclusion.

2 Waste Generation

The following section shows the waste generation rates used and the estimated waste volumes to be generated at the Proposal.

2.1 Proposed Tenancies

The anticipated volume of refuse and recyclables is based on the floor area (m^2) of the commercial tenancies at the Proposal. The Proposal consists of the following:

- T00 – Supermarket – 3,826m^2;
- T01 – Liquor – 240m^2;
- T02 – Speciality – 257m^2;
- T03 – Speciality – 111m^2;
- T04 – Speciality – 100m^2;
- T05 – F&B – 219m^2;
- T06 – F&B – 237m^2;
- T07 – Speciality – 130m^2;
- T08 – Speciality – 129m^2;
- T09 – Speciality – 118m^2; and
- T10 – Health/Fitness – 680m^2.

Note, the Supermarket and associated Liquor tenancy has their own back of house and manages waste through their own internal processes governed by national waste collections contracts, and therefore has not been included as part of this report. The Supermarket will have their own internal bins for the collection of refuse and recyclables. Staff will transfer the contents of these bins to their dedicated Bin Storage Area as required outside of normal operational hours to minimise disturbance to customers and visitors at the Proposal. Waste collection from the Supermarket and associated Liquor tenancy will be completed by private contractors utilising the dedicated loading area/dock.

2.2 Waste Generation Rates

In order to achieve an accurate projection of waste volumes for the Proposal, consideration was given to the City of Perth's *Waste Guidelines for New Developments* (Revision 5, effective from June 2019), the Western Australian Local Government Association's (WALGA) *Commercial and Industrial Waste Management Guidelines* (2014) and the City of Melbourne's *Guidelines for Waste Management Plans* (2021).

Table 2-1 shows the waste generation rates which have been applied to the Proposal.

Table 2-1: Waste Generation Rates

Tenancy Use Type	Guideline Reference	Refuse Generation Rate	Recycling Generation Rate
T02-T04 and T07-T09 – Speciality	Perth – Retail Shops (>100m^2)	50L/100m^2/day	50L/100m^2/day
T05 and 06 – F&B	WALGA – Restaurants	660L/100m^2/day	130L/100m^2/day
T10 – Health/Fitness	Melbourne - Gym	10L/100m^2/day	10L/100m^2/day

2.3 Waste Generation Volumes

Waste generation is estimated by volume in litres (L) as this is generally the influencing factor when considering bin size, numbers and storage space required.

Waste generation volumes in litres per week (L/week) adopted for this waste assessment are shown in Table 2-2. It is estimated that the commercial tenancies at the Proposal will generate 24,502L of refuse and 7,585L of recyclables each week.

Table 2-2: Estimated Waste Generation

Tenancy Use Type	Floor Area (m^2)	Waste Generation Rate	Waste Generation (L/week)
Refuse			
T02 – Speciality	257	50L/100m^2/day	900
T03 – Speciality	111	50L/100m^2/day	389
T04 – Speciality	100	50L/100m^2/day	350
T05 – F&B	219	660L/100m^2/day	10,118
T06 – F&B	237	660L/100m^2/day	10,949
T07 – Speciality	130	50L/100m^2/day	455
T08 – Speciality	129	50L/100m^2/day	452
T09 – Speciality	118	50L/100m^2/day	413
T10 – Health/Fitness	680	10L/100m^2/day	476
		Total	**24,502**
Recyclables			
T02 – Speciality	257	50L/100m^2/day	900
T03 – Speciality	111	50L/100m^2/day	389
T04 – Speciality	100	50L/100m^2/day	350
T05 – F&B	219	660L/100m^2/day	1,993
T06 – F&B	237	660L/100m^2/day	2,157
T07 – Speciality	130	50L/100m^2/day	455
T08 – Speciality	129	50L/100m^2/day	452
T09 – Speciality	118	50L/100m^2/day	413
T10 – Health/Fitness	680	10L/100m^2/day	476
		Total	**7,585**

3 Waste Storage

Waste materials generated within the Proposal will be collected in the bins located in the Bin Storage Area, as shown in Diagram 1, and discussed in the following sub-sections.

3.1 Internal Transfer of Waste

To ensure that waste is managed appropriately at the Proposal, it is important to allow for sufficient space to accommodate the required quantity of bins within the Bin Storage Area.

The commercial tenancies will have a minimum of two bins to facilitate the separate disposal of refuse and recycling. The bins will be transferred by staff/cleaners, or their authorised representative, to the Bin Storage Area and be deposited into the bins during appropriate hours as determined by building management, as required.

All bins will be colour coded and labelled in accordance with Australian Standards (AS 4123.7) to assist the tenants, staff and cleaners to dispose of their separate waste materials in the correct bins.

3.2 Bin Sizes

Table 3-1 gives the typical dimensions of standard bins sizes that may be utilised at the Proposal. It should be noted that these bin dimensions are approximate and can vary slightly between suppliers.

Table 3-1: Typical Bin Dimensions

Dimensions	Bin Sizes			
	240L	360L	660L	1,100L
Depth (mm)	730	848	780	1,070
Width (mm)	585	680	1,260	1,240
Height (mm)	1,060	1,100	1,200	1,300
Area (mm^2)	427	577	983	1,327

Reference: SULO Bin Specification Data Sheets

3.3 Bin Storage Area Size

To ensure sufficient area is available for storage of the commercial bins, the amount of bins required for the Bin Storage Area was modelled utilising the estimated waste generation in Table 2-2, bin sizes in Table 3-1 and based on collection of refuse and recyclables twice each week.

Based on the results shown in Table 3-2 the Bin Storage Area has been sized to accommodate:

- Twelve 1,100L refuse bins; and
- Four 1,100L recycling bins.

Table 3-2: Bin Requirements for Bin Storage Area

Waste Stream	Waste Generation (L/week)	Number of Bins Required			
		240L	360L	660L	1,100L
Refuse	24,502	52	-	19	12
Recycling	7,585	16	11	6	4

The configuration of these bins within the Bin Storage Area is shown in Diagram 1. It is worth noting that the number of bins and corresponding placement of bins shown in Diagram 1 represents the maximum requirements assuming two collections each week of refuse and recyclables.

Diagram 1: Bin Storage Area



3.4 Bin Storage Area Design

The design of the Bin Storage Area will take into consideration:

- Smooth impervious floor sloped to a drain connected to the sewer system;
- Taps for washing of bins and Bin Storage Area;
- Adequate aisle width for easy manoeuvring of bins;
- Doors to the Bin Storage Area self-closing and vermin proof;
- Doors to the Bin Storage Area wide enough to fit bins through;
- Ventilated to a suitable standard;
- Appropriate signage;
- Undercover where possible and be designed to not permit stormwater to enter into the drain;
- Located behind the building setback line;
- Bins not to be visible from the property boundary or areas trafficable by the public; and
- Bins are reasonably secured from theft and vandalism.

Bin numbers and storage space within the Bin Storage Area will be monitored by the building manager during the operation of the Proposal to ensure that the number of bins and collection frequency is sufficient.

4 Waste Collection

A private contractor will service the Proposal and provide the following:

- Twelve 1,100L refuse bins, collected twice each week; and
- Four 1,100L recycling bins, collected twice each week.

The private contractor's rear loader waste collection vehicle will then service the bins onsite, directly from the Bin Storage Area. The private contractor's rear loader waste collection vehicle will travel with left hand lane traffic flow on Ewen Street, turn into the Proposal in forward gear, and reverse up directly opposite the Bin Storage Area for servicing, as shown in Diagram 1.

The private contractor's waste collection staff will ferry bins to and from the rear loader waste collection vehicle and the Bin Storage Area for servicing. The private contractor's waste collection will be provided with key/PIN code access to the Bin Storage Area and security access gates to facilitate servicing, if required.

Once servicing is complete the private contractor's rear loader waste collection vehicle will exit in a forward motion, turning left onto Ewen Street moving with traffic flow.

The above servicing method will preserve the amenity of the area by removing the requirement for bins to be presented to the street on collection days. In addition, servicing of bins onsite will reduce the noise generated in the area during collection. Noise from waste vehicles must comply with the Environmental Protection (Noise) Regulations and such vehicles should not service the site before 7.00am or after 7.00pm Monday to Saturday, or before 9.00am or after 7.00pm on Sundays and Public Holidays. Refer to the acoustic report for further information regarding gate operation.

The ability for an 8.8m Medium Rigid Vehicle to access the Proposal in a safe manner has been assessed by Urbii. Refer to their traffic impact statement for further information.

4.1 Bulk and Speciality Waste

Bulk and speciality waste materials will be removed from the Proposal as they are generated on an 'as required' basis.

Adequate space will be allocated throughout the Proposal for placement of cabinets/containers for collection and storage of bulk and specialty wastes that are unable to be disposed of within the bins in the Bin Storage Area.

These materials will be removed from the Proposal once sufficient volumes have been accumulated to warrant disposal. A temporary skip bin could be utilised for collections, if required. Bulk and specialty waste collection will be monitored by the building manager who will organise their transport to the appropriate waste facility, as required.

5 Waste Management

A building manager will be engaged and responsible for the following:

- Monitoring and maintenance of bins and the Bin Storage Area;
- Monitoring and maintenance of waste systems and equipment;
- Cleaning of bins and the Bin Storage Area, when required;
- Ensure all staff, tenants and cleaners at the Proposal are made aware of this WMP and their responsibilities thereunder;
- Monitor staff, tenants and cleaners and identify requirements for further education and/or signage;
- Monitor bulk and speciality waste accumulation and assist with its removal, as required;
- Regularly engage with staff, tenants and cleaners to develop opportunities to reduce waste volumes and increase resource recovery; and
- Regularly engage with the private contractor to ensure efficient and effective waste service is maintained.

6 Conclusion

As demonstrated within this WMP, the Proposal provides sufficiently sized Bin Storage Area for storage of refuse and recyclables, based on the estimated waste generation volumes and suitable configuration of bins. This indicates that an adequately designed Bin Storage Area has been provided, and collection of refuse and recyclables can be completed from the Proposal.

The above is achieved using:

- Twelve 1,100L refuse bins, collected twice each week; and
- Four 1,100L recycling bins, collected twice each week.

A private contractors will service the Proposal onsite, directly from the Bin Storage Area. The private contractor's rear loader collection vehicle will enter and exit the Proposal in forward gear via Ewen Street.

A building manager will oversee the relevant aspects of waste management at the Proposal.

Figures

Figure 1: Locality Plan

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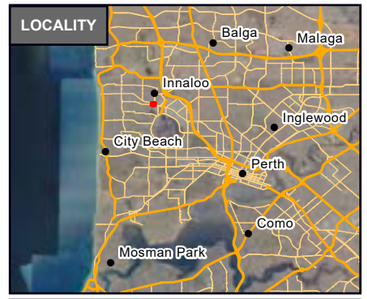
LEGEND

- Site Boundary

Cadastre

- Freehold
- Road
- Strata Plan or Lot
- Easement

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LOCALITY

367 Scarborough Beach Rd
Innaloo WA 6018

Scarborough Beach Road Project Pty Ltd

N
m
0 5 10 15 20

Coordinate System: GDA2020 MGA Zone 50
Scale @ A3: 1:600

Prepared: T Baskerville	Date: 28/10/2022
Reviewed: A Brouwer	Revision: A
Project: TW22146	

talis consultants

Figure 01

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Talis Consultants

Head Office
Level 1, 604 Newcastle Street,
Leederville
Western Australia 6007

PO Box 454,
Leederville
Western Australia 6903

NSW Office
5/62 North Street, Nowra
New South Wales, 2541

PO Box 1189, Nowra
New South Wales, 2541

P: 1300 251 070
E: info@talisconsultants.com.au