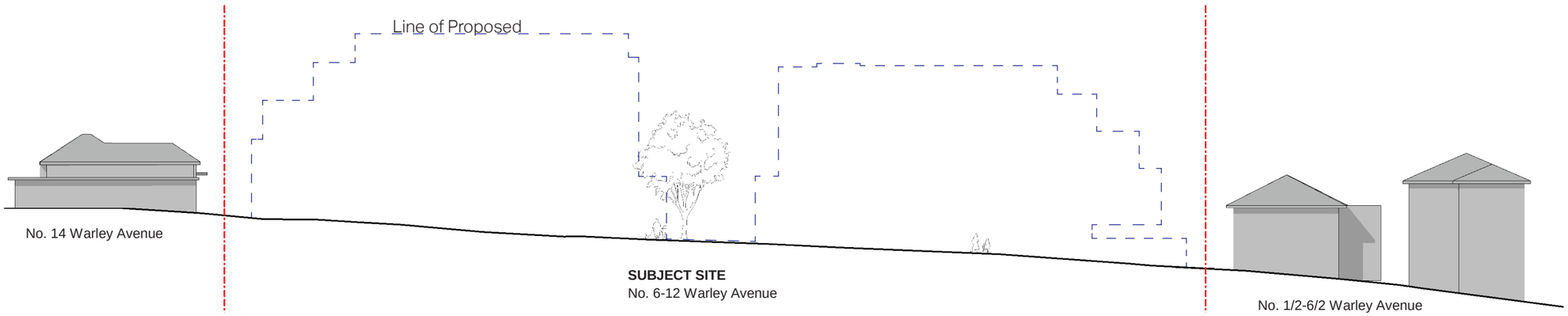
Urban context plan - existing Streetscape



Existing Streetscape



14 Warley Avenue to the south of subject site



Northern edge of Subject Site



1/2 - 6/2 Warley Avenue

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8 Warley Ave Pty Ltd
ACN 653 584 902

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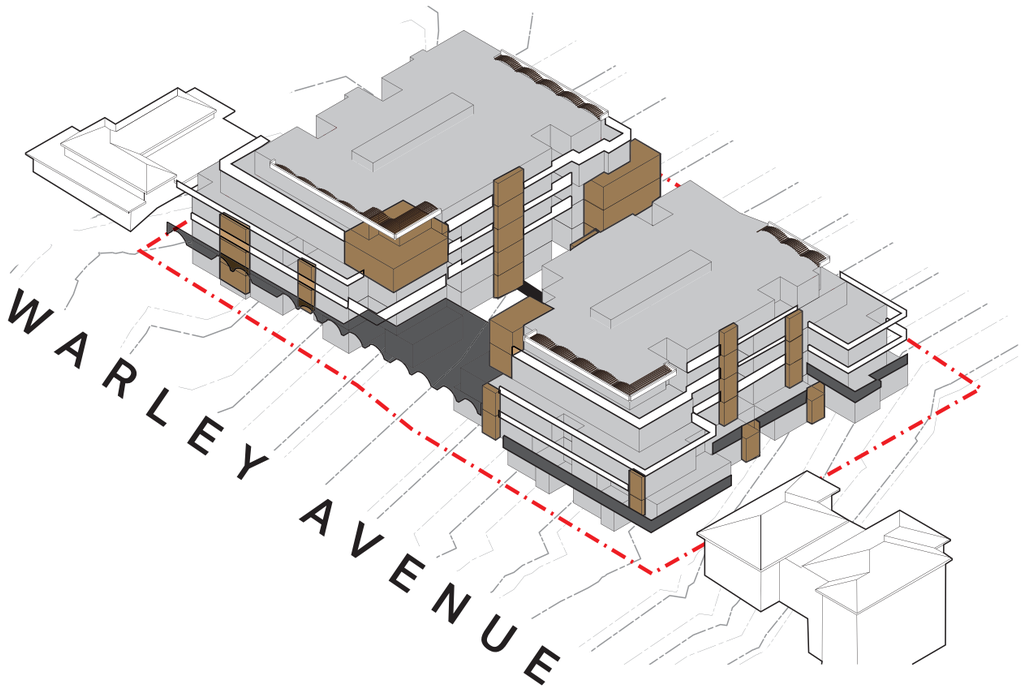
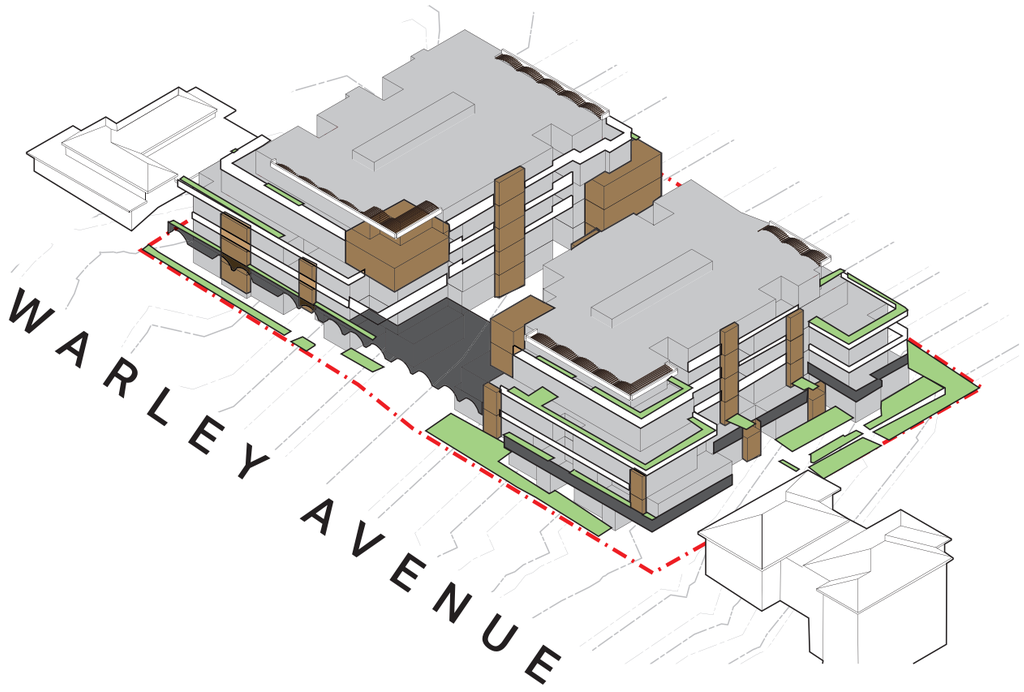
5.
Articulations and Reinforcement of Built form

To create a true sense of entry the two buildings are connected with an vaulted entrance, providing shelter from the weather prior to entering either lobby. Further vertical articulation along the building form creates a sense of scale to the street and identifies each dwelling, creating a more intimate form.



6.
Landscape

The built form and landscape are tiered to complement the natural fall of the site and provide stepping in the landscape creating private courtyards hidden behind landscaped areas. The upper levels continue this language with garden planters allowing greenery to spill between balustrade framing.



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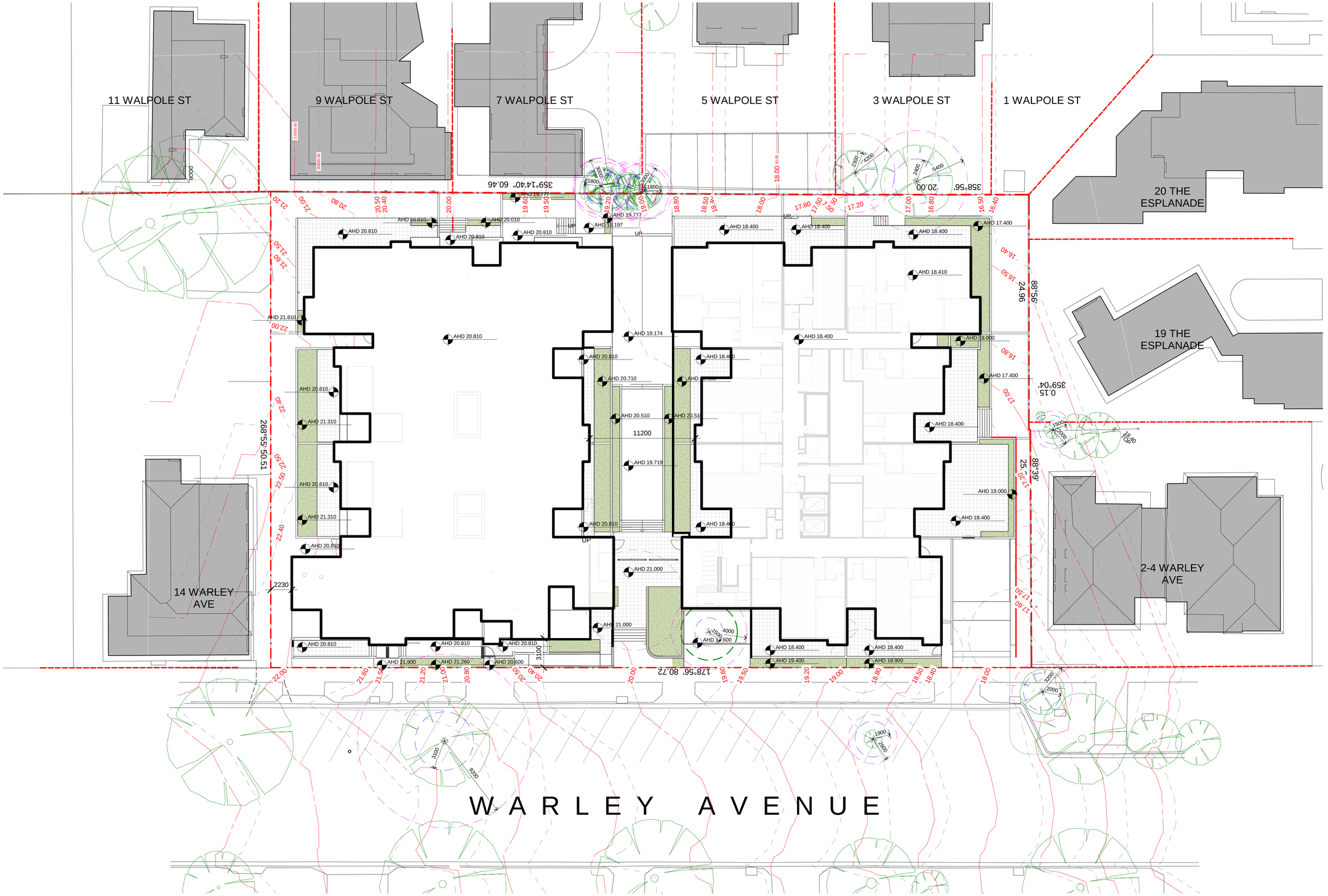

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8 WARLEY AVENUE COWES

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C	1/07/22	ISSUED FOR TOWN PLANNING
D	21/07/22	ISSUED FOR TOWN PLANNING
E	28/07/22	ISSUED FOR TOWN PLANNING
F	14/09/22	RESPONSE TO RFI
G	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE PLAN AND LEVELS- LEVELS

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: G
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-201

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2

ALL BALCONIES AND COURTYARD SPACES (AT ALL LEVELS) TO INCLUDE OUTDOOR TAPS AND WASTE CONNECTION.

1100 1100L GENERAL WASTE (GARBAGE)

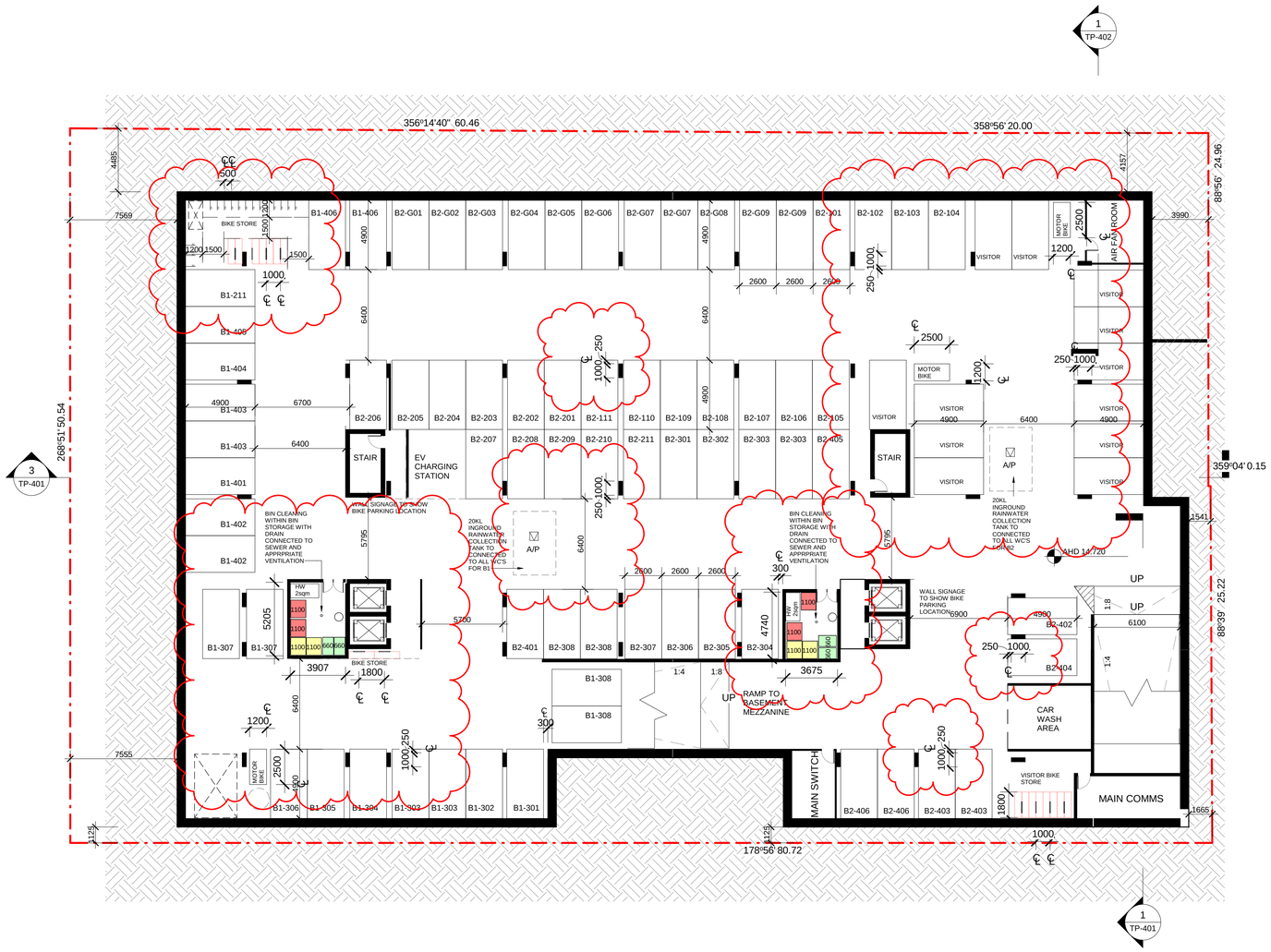
1100 1100L RECYCLEING WASTE

660 660L GREEN WASTE (ORGANIC)

DENOTES ALL DISUSED OR REDUNDANT VEHICLE CROSSINGS TO BE REMOVED AND THE AREA RE-INSTATED WITH FOOTPATH, NATURESTRIP AND KERB AND CHANNEL TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITY.

DENOTES PROPOSED ALTERATIONS TO CROSSOVER TO BE CONSTRUCTED TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITY

NOTE: CARPARK VENTILATION FANS ARE DRIVEN BY A VSD MOTOR CONNECTED TO CO SENSORS



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8 WARLEY AVENUE COWES

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F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - BASEMENT

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-202

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2

ALL BALCONIES AND COURTYARD SPACES (AT ALL LEVELS) TO INCLUDE OUTDOOR TAPS AND WASTE CONNECTION.

1100 1100L GENERAL WASTE (GARBAGE)

1100 1100L RECYCLEING WASTE

660 660L GREEN WASTE (ORGANIC)

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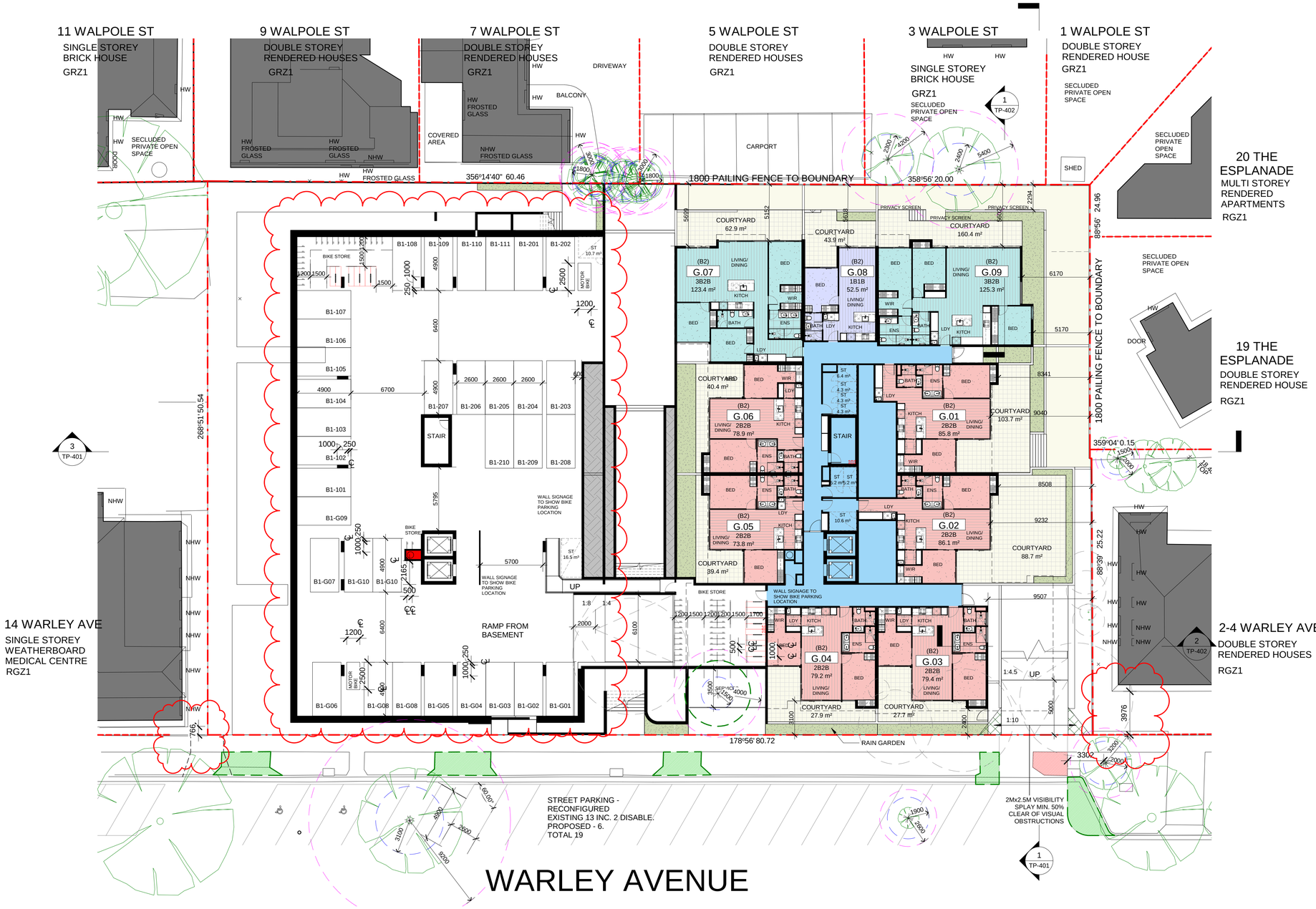
DENOTES PROPOSED ALTERATIONS TO CROSSOVER TO BE CONSTRUCTED TO THE SATISFACTION OF THE RESPONSIBLE AUTHORITY

NOTE: CARPARK VENTILATION FANS ARE DRIVEN BY A VSD MOTOR CONNECTED TO CO SENSORS



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8 WARLEY AVENUE COWES

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E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - LOWER GROUND

DATE: 24/05/2022 JOB No: 42009

SCALE: 1:200@A1 REVISION No: F

DRAWN: Author

DRAWING STATUS: TOWN PLANNING

DRAWING No: TP-203

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2, REFER TO LANDSCAPE PLANS

MINIMUM 30KW SOLAR PV SYSTEM CONNECTED TO COMMON AREA ELECTRICITY DEMAND. TOTAL OF 75 PANELS AT 400W PER PANEL.

ALL BALCONIES AND COURTYARD SPACES (AT ALL LEVELS) TO INCLUDE OUTDOOR TAPS AND WASTE CONNECTION

LANDSCAPE IRRIGATION SYSTEM TO BE CONNECTED TO THE RAINWATER TANK AND NO POTABLE WATER IS TO BE USED FOR IRRIGATION

ALL EXPOSED EAST AND WEST HABITABLE ROOM WINDOWS TO HAVE OPERABLE SHADING DEVICE

DENOTES CROSS OVER INFILL

DENOTES CROSS OVER ALTERATIONS

CEILING FANS TO BEDROOMS AND LIVING ROOMS OF:
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08

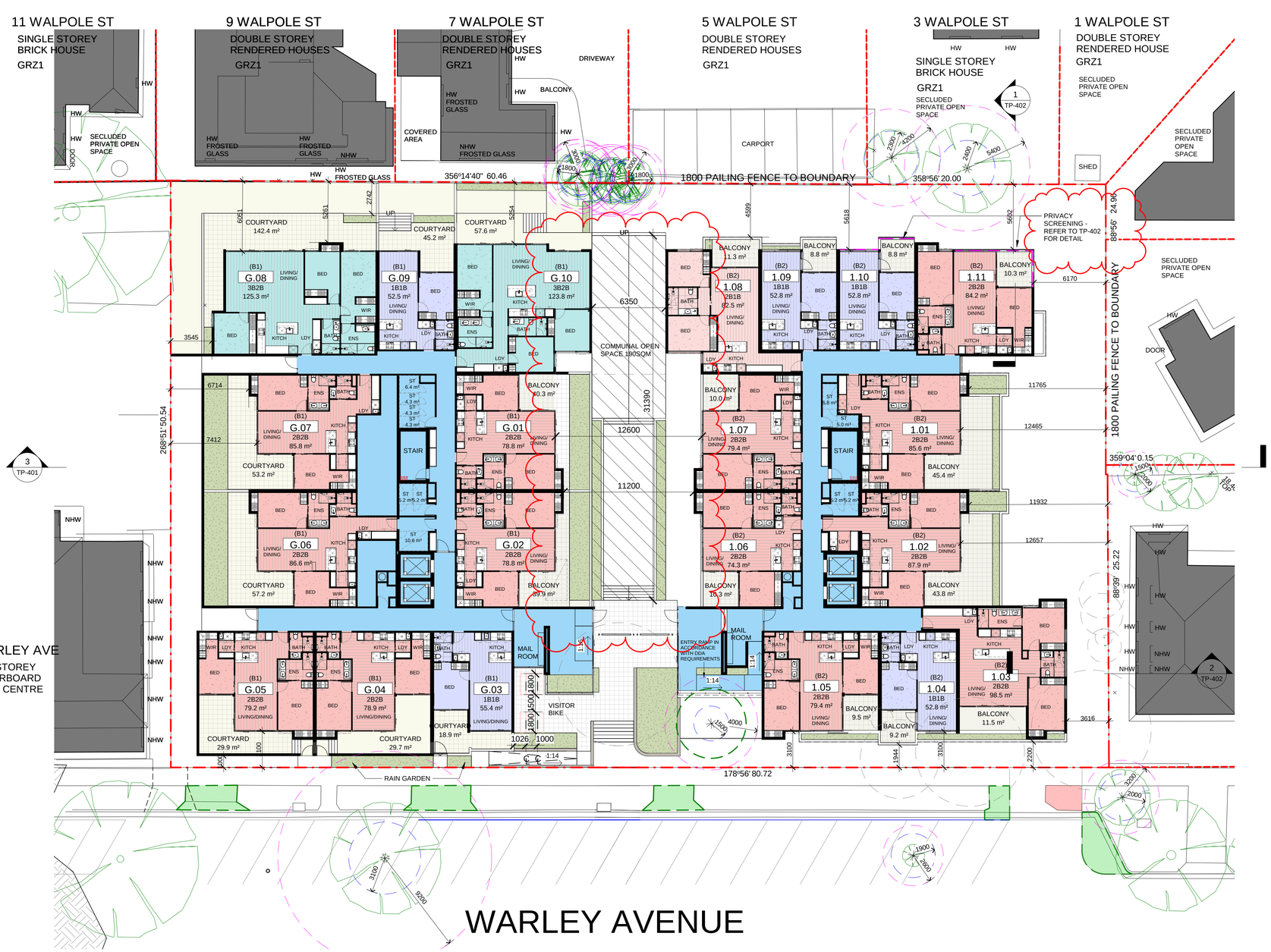
SIGNAGE TO BE PROVIDED IN ALL PUBLIC AREAS IDENTIFYING LOCATION OF GARBAGE AND RECYCLING BINS AND STORAGE AREAS

DENOTES EXTENT OF TREE PROTECTION ZONE AS PER DEVELOPMENT IMPACT ASSESSMENT PREPARED BY ARBOR SURVEY

DENOTES EXTENT OF STRUCTURAL ROOT ZONE AS PER DEVELOPMENT IMPACT ASSESSMENT PREPARED BY ARBOR SURVEY

DENOTES TREE TO BE REMOVED

DENOTES TREE TO BE RELOCATED TO WESTERN SIDE OF SITE. REFER TO LANDSCAPE PLANS FOR LOCATION



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8 WARLEY AVENUE COWES

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D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - GROUND

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-204

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2, REFER TO LANDSCAPE PLANS

MINIMUM 30KW SOLAR PV SYSTEM CONNECTED TO COMMON AREA ELECTRICITY DEMAND. TOTAL OF 75 PANELS AT 400W PER PANEL.

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DENOTES CROSS OVER INFILL

DENOTES CROSS OVER ALTERATIONS

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B2 3.03 & 3.08
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08

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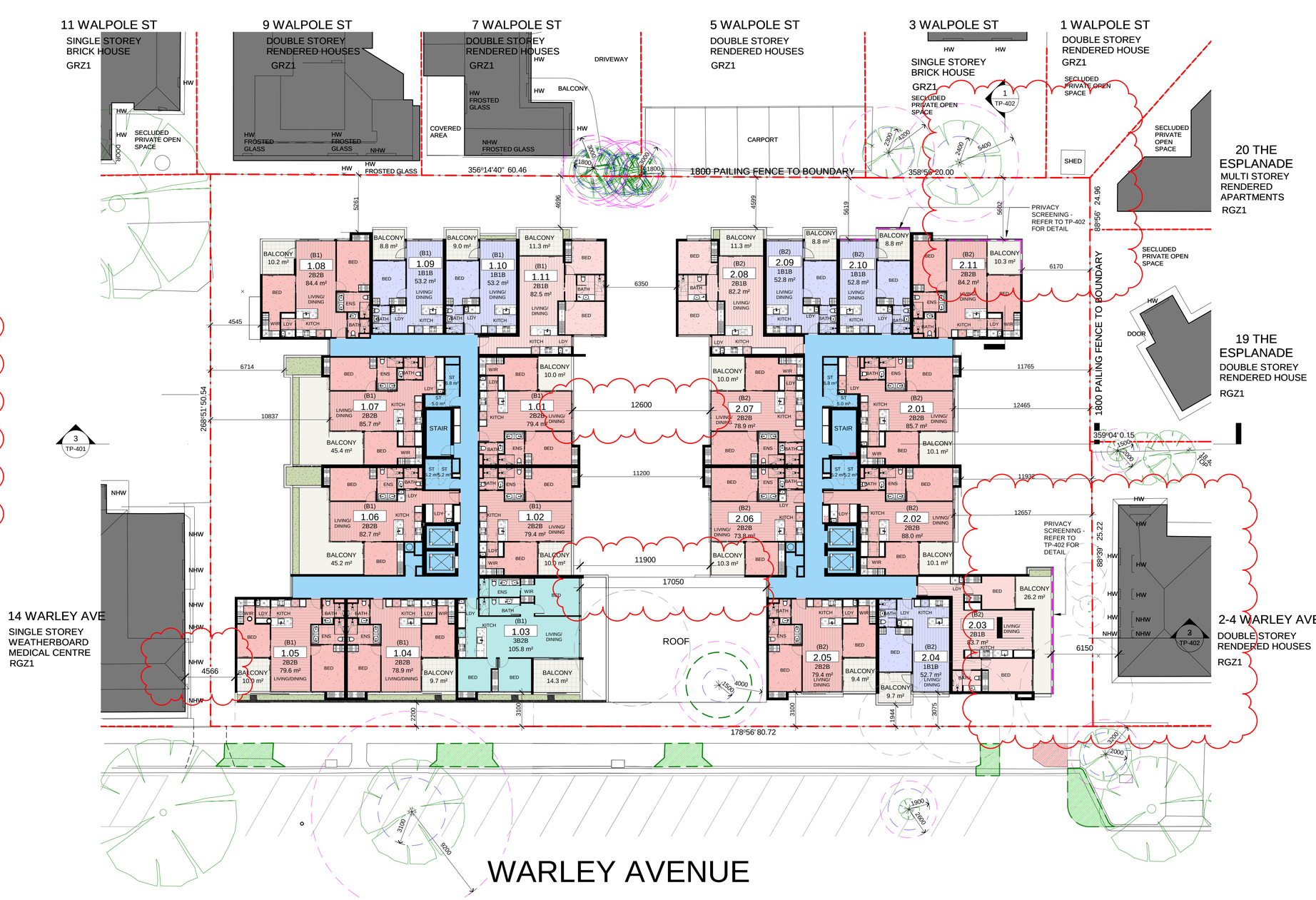

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8 WARLEY AVENUE COWES

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D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

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PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - LEVEL 01

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-205

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2, REFER TO LANDSCAPE PLANS

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ALL BALCONIES AND COURTYARD SPACES (AT ALL LEVELS) TO INCLUDE OUTDOOR TAPS AND WASTE CONNECTION

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DENOTES CROSS OVER ALTERATIONS

CEILING FANS TO BEDROOMS AND LIVING ROOMS OF:
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08

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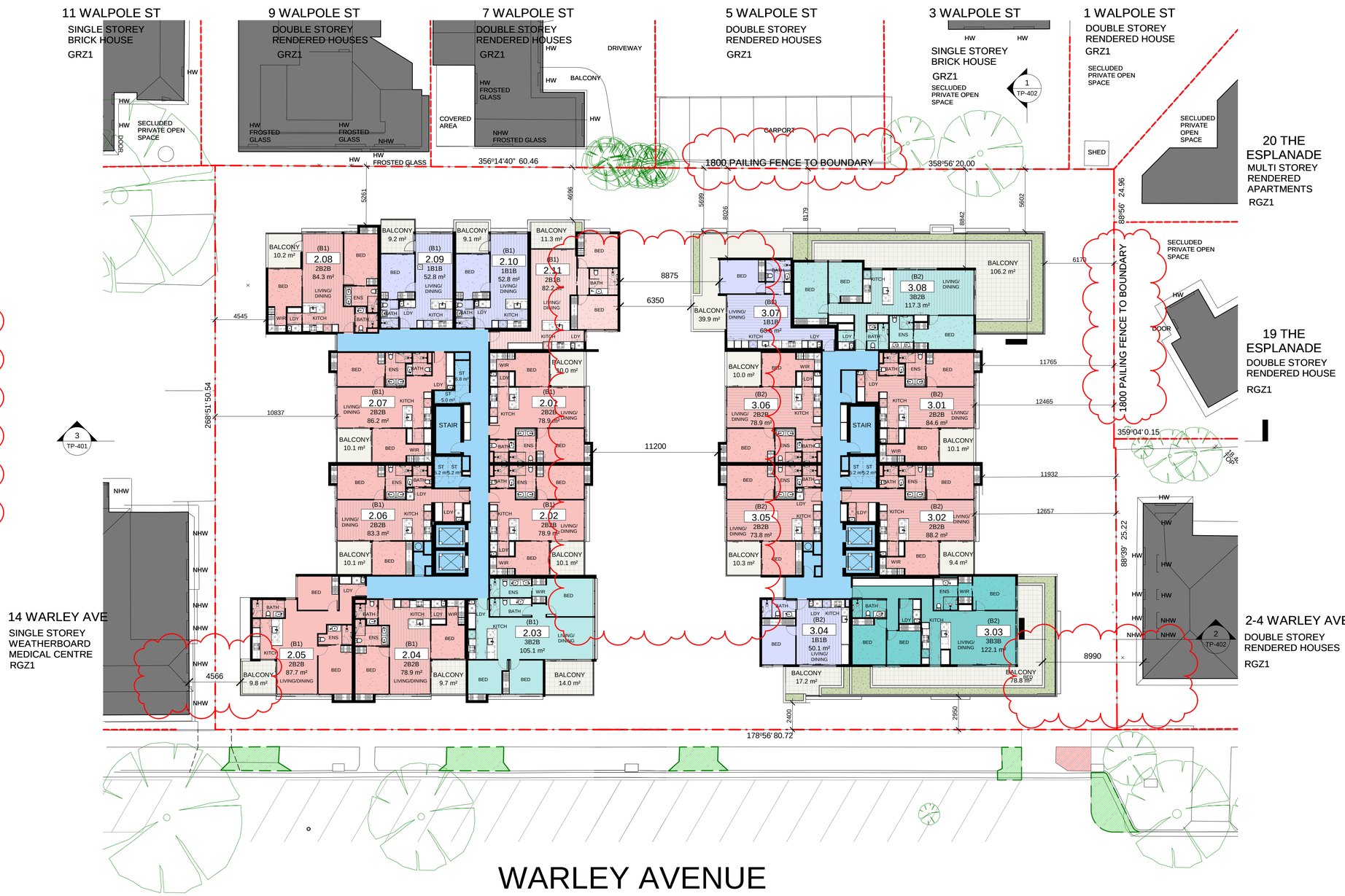

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8 WARLEY AVENUE COWES

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E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - LEVEL 02

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-206

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2, REFER TO LANDSCAPE PLANS

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CEILING FANS TO BEDROOMS AND LIVING ROOMS OF:
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B2 3.03 & 3.08
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DENOTES TREE TO BE REMOVED

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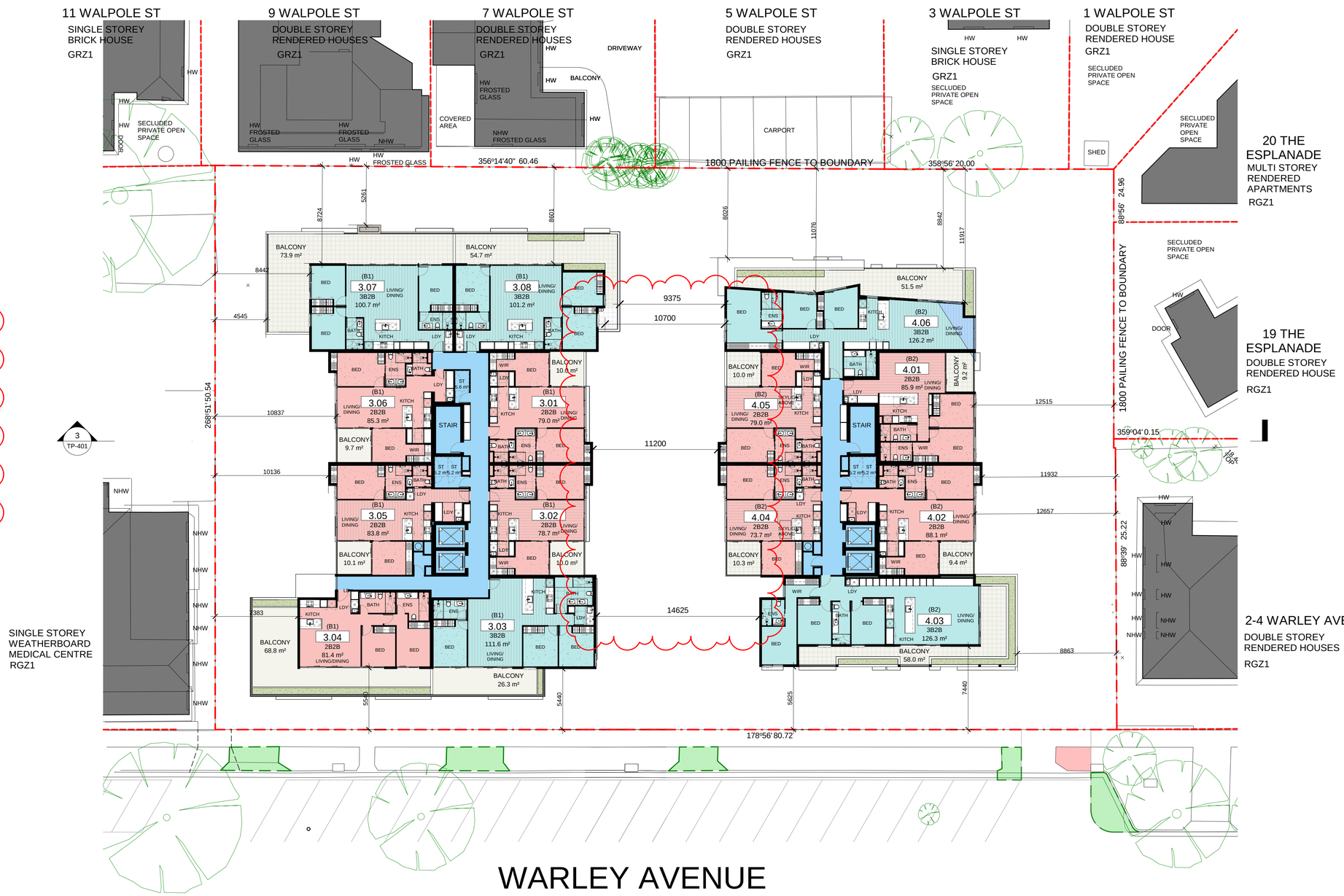

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8 WARLEY AVENUE COWES

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C	1/07/22	ISSUED FOR TOWN PLANNING
D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - LEVEL 03

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-207

RAINWATER IS TO BE COLLECTED FROM THE WEST AND EAST TERRACES OF BUILDING 1 AND BUILDING 2. THE RAINWATER IS TO BE DIRECTED TO A TOTAL AREA OF ≥9M2 MINIMUM 1,150MM DEEP RAINGARDEN/S WITH 100MM OF EXTENDED DETENTION FOR BUILDING 1 AND ≥8M2 FOR BUILDING 2, REFER TO LANDSCAPE PLANS

MINIMUM 30KW SOLAR PV SYSTEM CONNECTED TO COMMON AREA ELECTRICITY DEMAND. TOTAL OF 75 PANELS AT 400W PER PANEL.

ALL BALCONIES AND COURTYARD SPACES (AT ALL LEVELS) TO INCLUDE OUTDOOR TAPS AND WASTE CONNECTION

LANDSCAPE IRRIGATION SYSTEM TO BE CONNECTED TO THE RAINWATER TANK AND NO POTABLE WATER IS TO BE USED FOR IRRIGATION

ALL EXPOSED EAST AND WEST HABITABLE ROOM WINDOWS TO HAVE OPERABLE SHADING DEVICE

DENOTES CROSS OVER INFILL

DENOTES CROSS OVER ALTERATIONS

CEILING FANS TO BEDROOMS AND LIVING ROOMS OF:
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08
B1 3.03, 3.07 & 3.08
B2 3.03 & 3.08

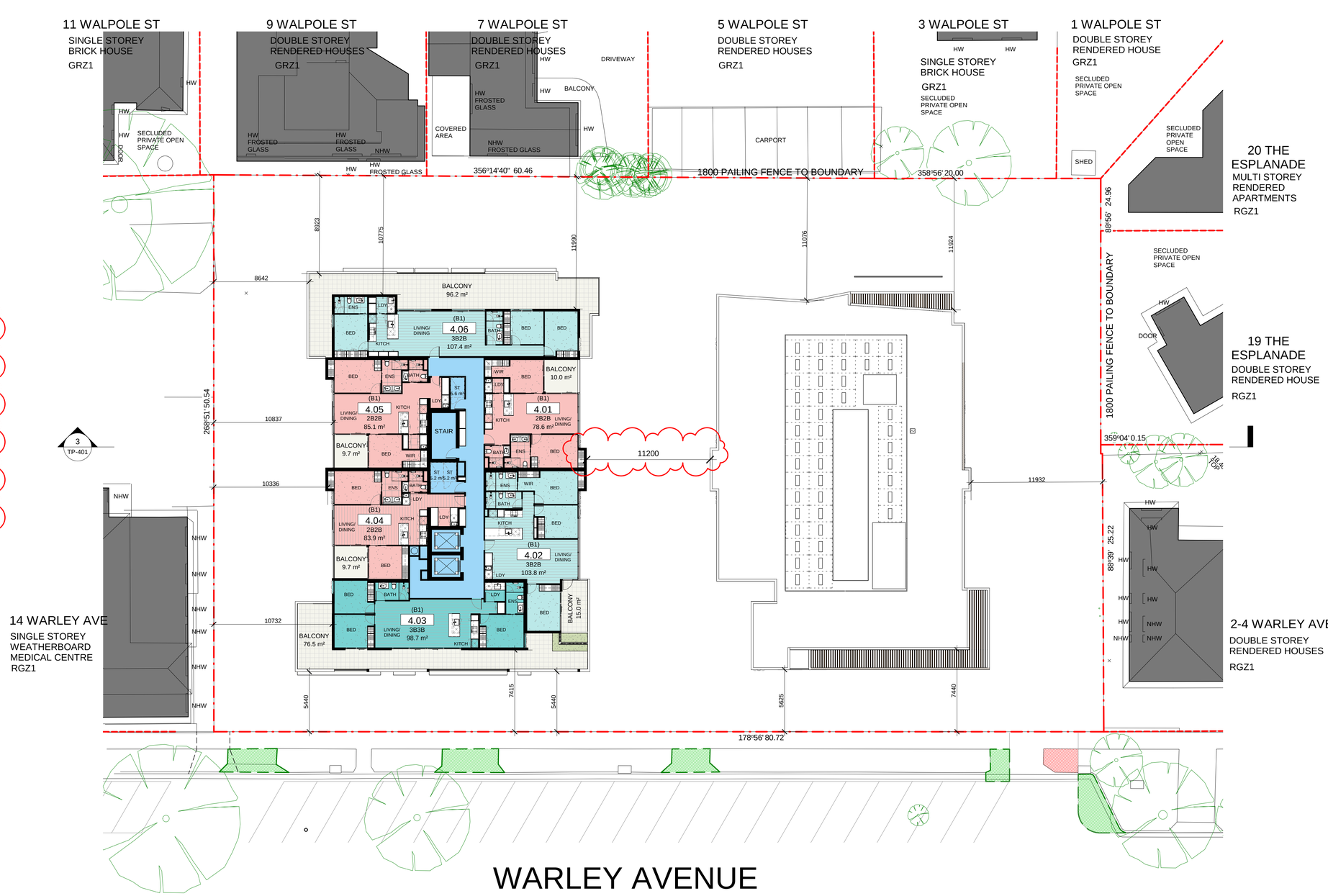
SIGNAGE TO BE PROVIDED IN ALL PUBLIC AREAS IDENTIFYING LOCATION OF GARBAGE AND RECYCLING BINS AND STORAGE AREAS

DENOTES EXTENT OF TREE PROTECTION ZONE AS PER DEVELOPMENT IMPACT ASSESSMENT PREPARED BY ARBOR SURVEY

DENOTES EXTENT OF STRUCTURAL ROOT ZONE AS PER DEVELOPMENT IMPACT ASSESSMENT PREPARED BY ARBOR SURVEY

DENOTES TREE TO BE REMOVED

DENOTES TREE TO BE RELOCATED TO WESTERN SIDE OF SITE. REFER TO LANDSCAPE PLANS FOR LOCATION



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8 WARLEY AVENUE COWES

NOTES:
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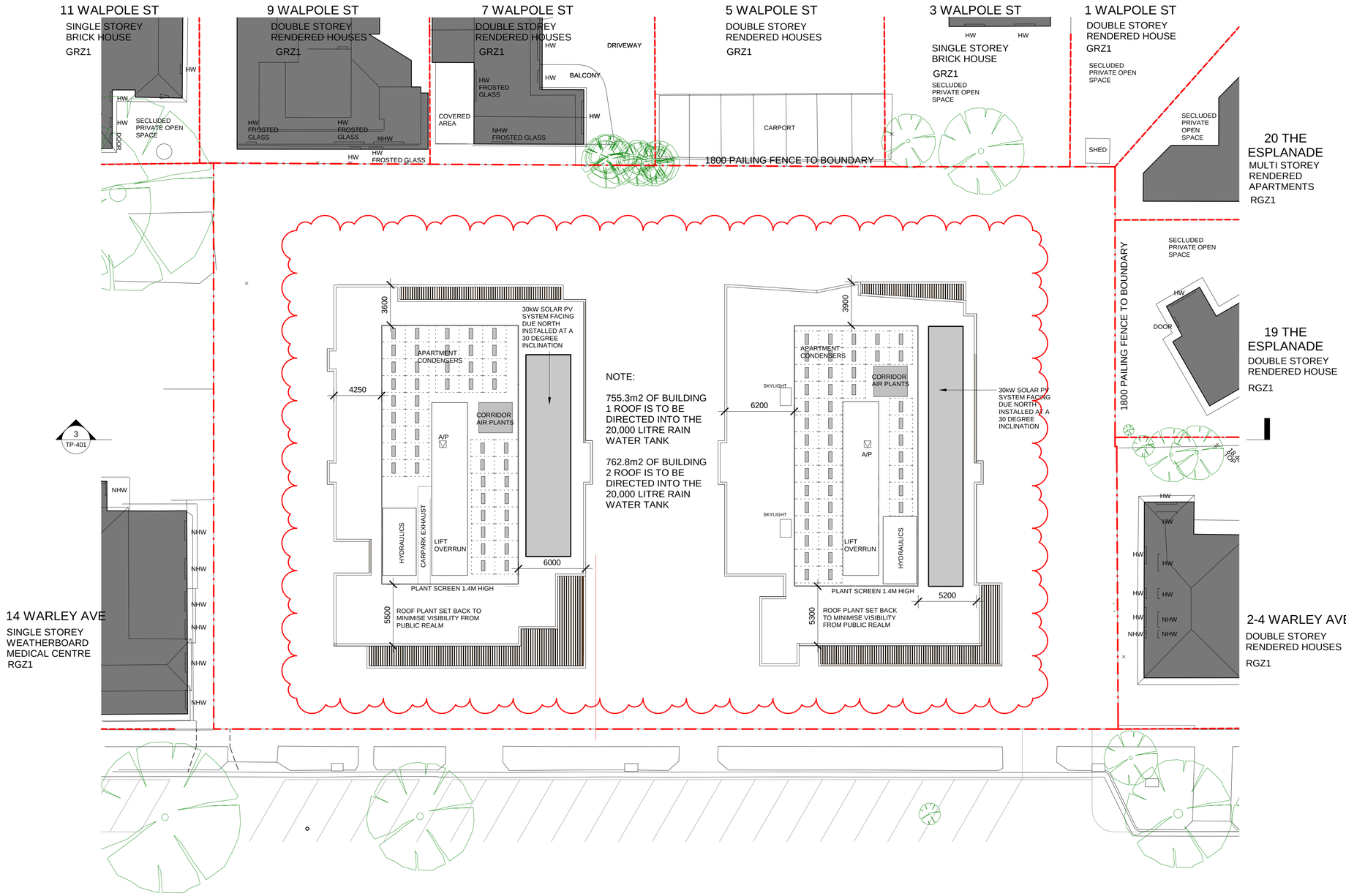
D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - LEVEL 04

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-208



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8 WARLEY AVENUE COWES

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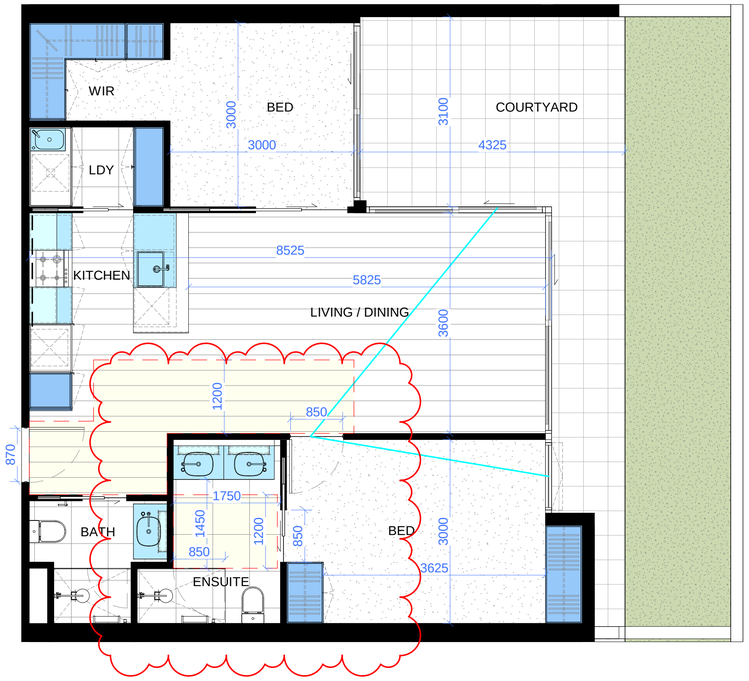
D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE - ROOF

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:200@A1
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-209



UNIT TYPE B1-G01

APPLICABLE TO UNIT:
B1: G01, G02
B2: G06

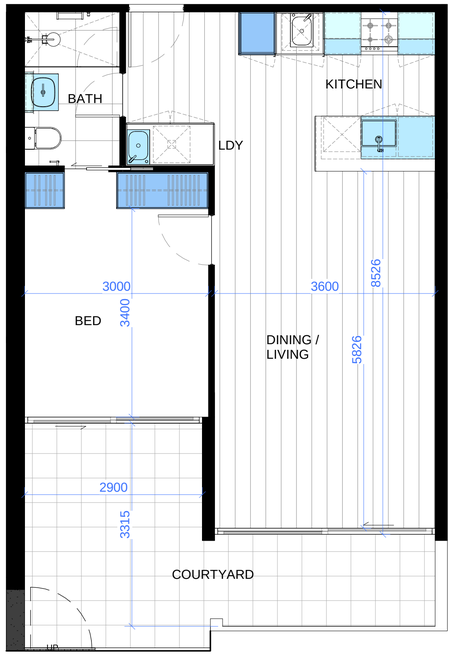
Apt No.	Name	Area
G.01	2B2B	78.8 m²
G.01	BALCONY	40.3 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 4.56 x 2.4 = 10.95m³
BENCH HEIGHT: 3.31 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.27m³



UNIT TYPE B1-G03

APPLICABLE TO UNIT:
B1: G03

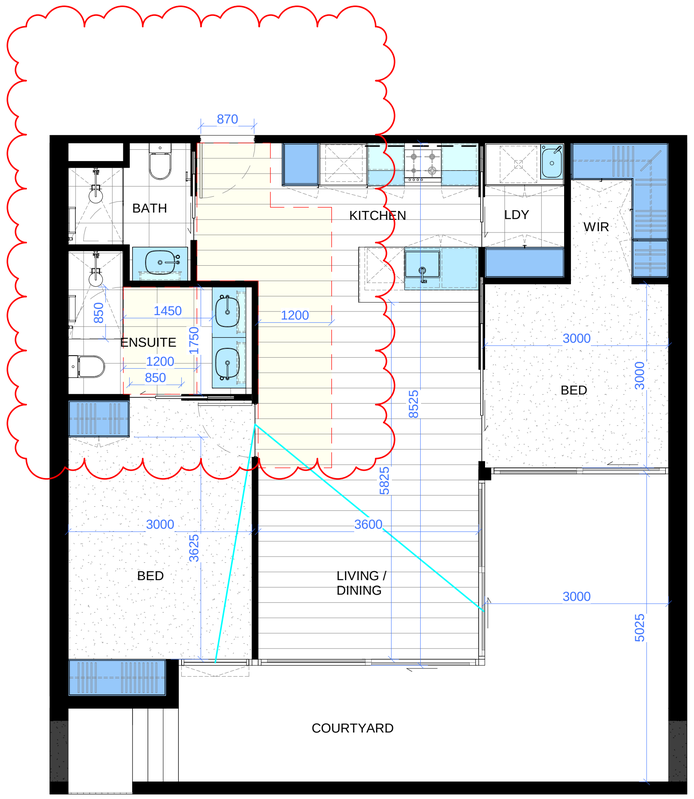
Apt No.	Name	Area
G.03	1B1B	55.4 m²
G.03	COURTYARD	18.9 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE		✗
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

INTERNAL STORAGE:

FULL HEIGHT: 1.71 x 2.4 = 4.10m³
BENCH HEIGHT: 2.24 x 0.75 = 1.68m³
OVERHEAD: 0.63 x 0.75 = 0.48m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 6.47m³



UNIT TYPE B1-G04

APPLICABLE TO UNIT:
B1: G04, G05
B2: G03, G04

Apt No.	Name	Area
G.04	2B2B	78.9 m²
G.04	COURTYARD	29.7 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 4.56 x 2.4 = 10.95m³
BENCH HEIGHT: 3.31 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.27m³

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8 WARLEY AVENUE COWES

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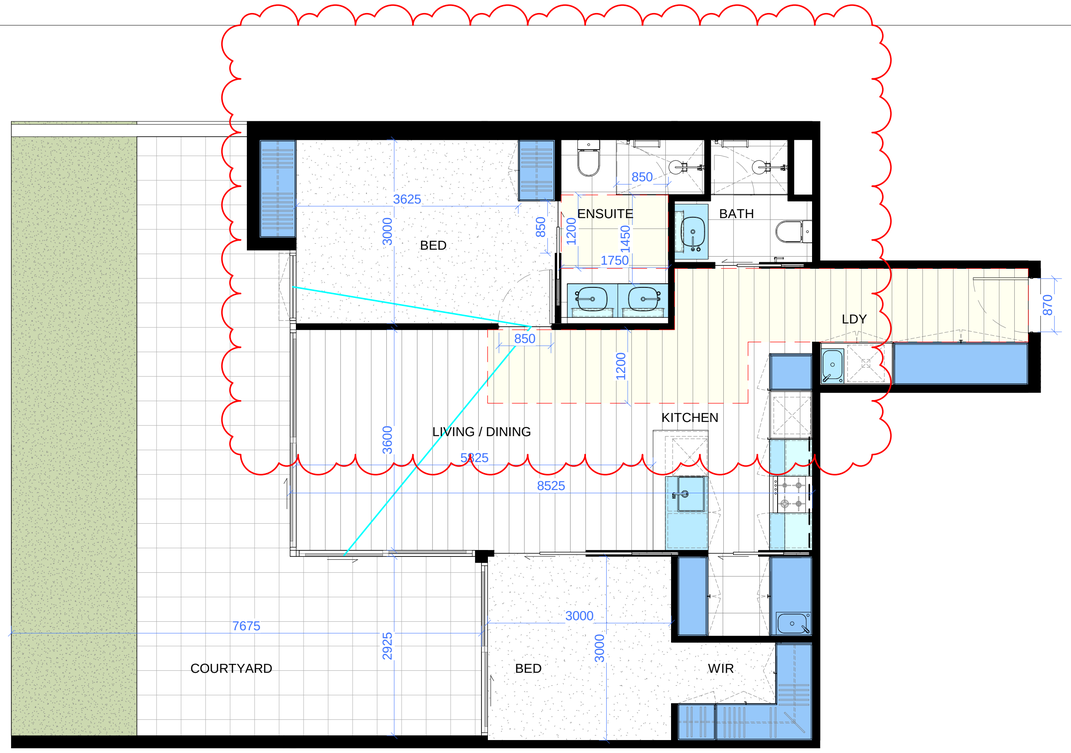
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - G01, G03, G04

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-221



UNIT TYPE B1-G06

APPLICABLE TO UNIT:
B1: G06

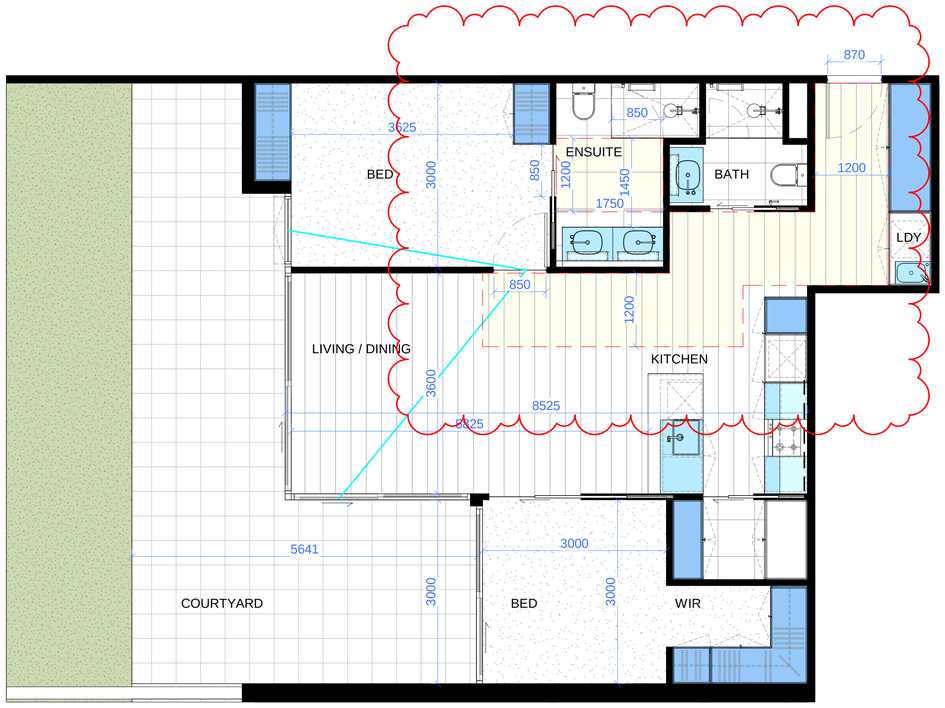
Apt No.	Name	Area
G.06	2B2B	86.6 m²
G.06	COURTYARD	57.2 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 7.00 x 2.4 = 16.80m³
BENCH HEIGHT: 3.31 x 0.75 = 2.48m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 20.13m³



UNIT TYPE B1-G07

APPLICABLE TO UNIT:
B1: G07

Apt No.	Name	Area
G.07	2B2B	85.8 m²
G.07	COURTYARD	53.2 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 6.02 x 2.4 = 14.45m³
BENCH HEIGHT: 3.31 x 0.75 = 2.48m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 17.78m³

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8 WARLEY AVENUE COWES

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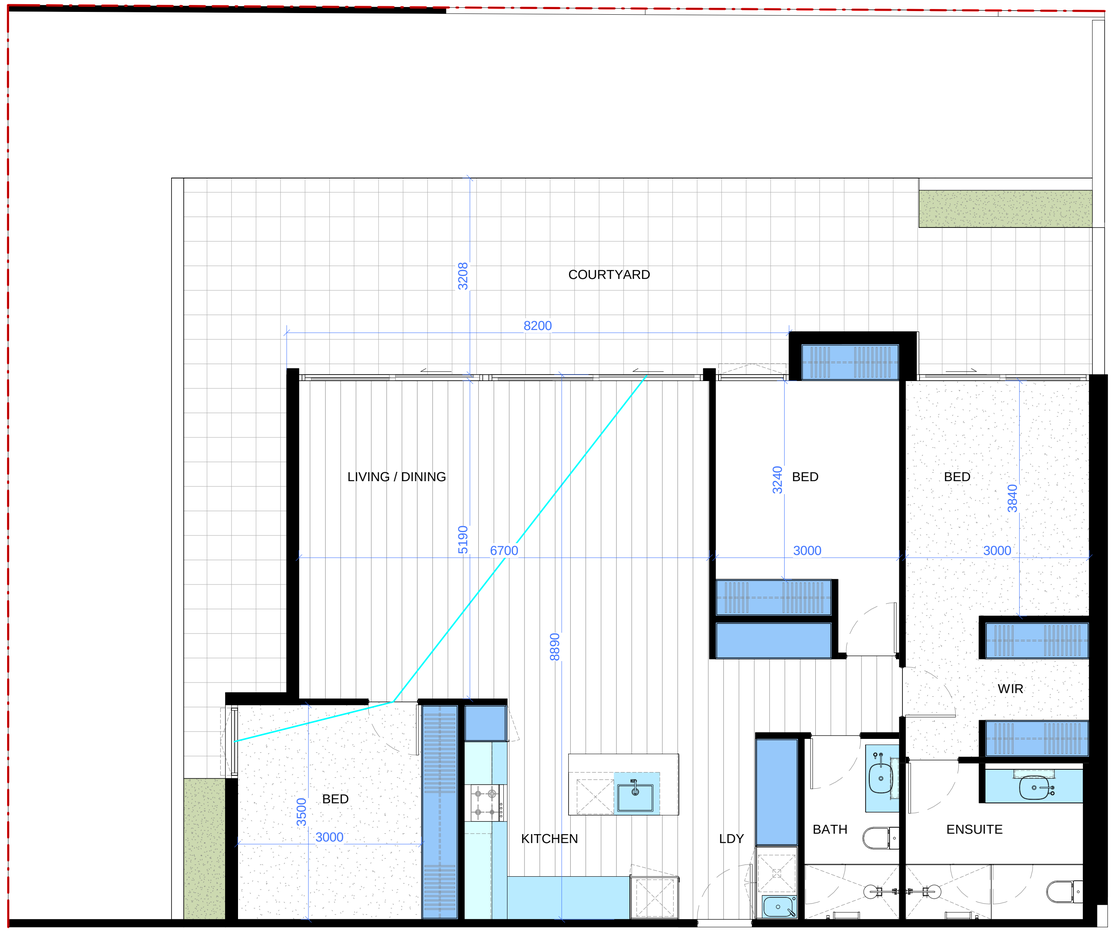
E	04/10/22	RESPONSE TO RFI

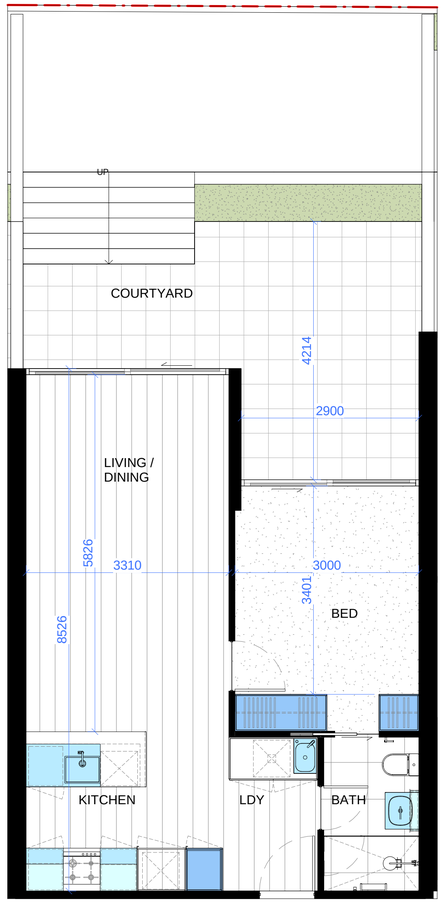
0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - G06, G07

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-222





UNIT TYPE B1-G08

APPLICABLE TO UNIT:
B1: G08

Apt No.	Name	Area
G.08	3B2B	125.3 m²
G.08	COURTYARD	142.4 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 9.57 x 2.4 = 22.97m³
BENCH HEIGHT: 5.02 x 0.75 = 3.76m³
OVERHEAD: 1.23 x 0.75 = 0.92m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 27.87m³

UNIT TYPE B1-G09

APPLICABLE TO UNIT:
B1: G09

Apt No.	Name	Area
G.09	1B1B	52.5 m²
G.09	COURTYARD	45.2 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

INTERNAL STORAGE:

FULL HEIGHT: 1.71 x 2.4 = 4.10m³
BENCH HEIGHT: 2.24 x 0.75 = 1.68m³
OVERHEAD: 0.63 x 0.75 = 0.47m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 6.47m³

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8 WARLEY AVENUE COWES

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D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - G08, G09

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-223



UNIT TYPE B1-G10

APPLICABLE TO UNIT:
B1: G10

Apt No.	Name	Area
G.10	3B2B	123.8 m²
G.10	COURTYARD	57.6 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 6.64 x 2.4 = 15.94m³
BENCH HEIGHT: 3.71 x 0.75 = 2.78m³
OVERHEAD: 1.02 x 0.75 = 0.77m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.70m³



UNIT TYPE B1-101

APPLICABLE TO UNIT:
B1: 101, 102, 104, 105, 201, 202, 204, 301, 302, 401
B2: 105, 107, 205, 207, 306, 405

Apt No.	Name	Area
1.01	2B2B	79.4 m²
1.01	BALCONY	10.0 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 4.56 x 2.4 = 10.95m³
BENCH HEIGHT: 3.31 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.27m³

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8 WARLEY AVENUE COWES

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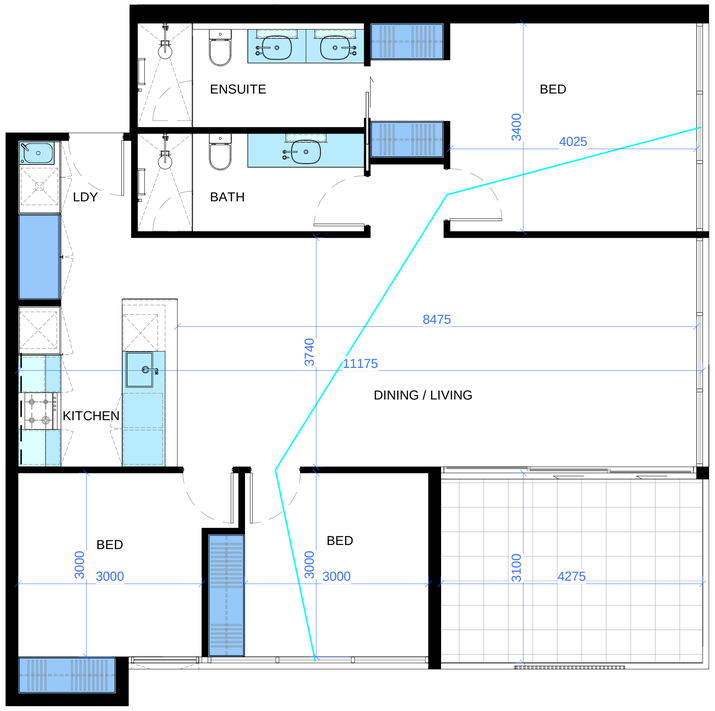
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - G10, 101

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-224



UNIT TYPE B1-103

APPLICABLE TO UNIT:
B1: 103, 203

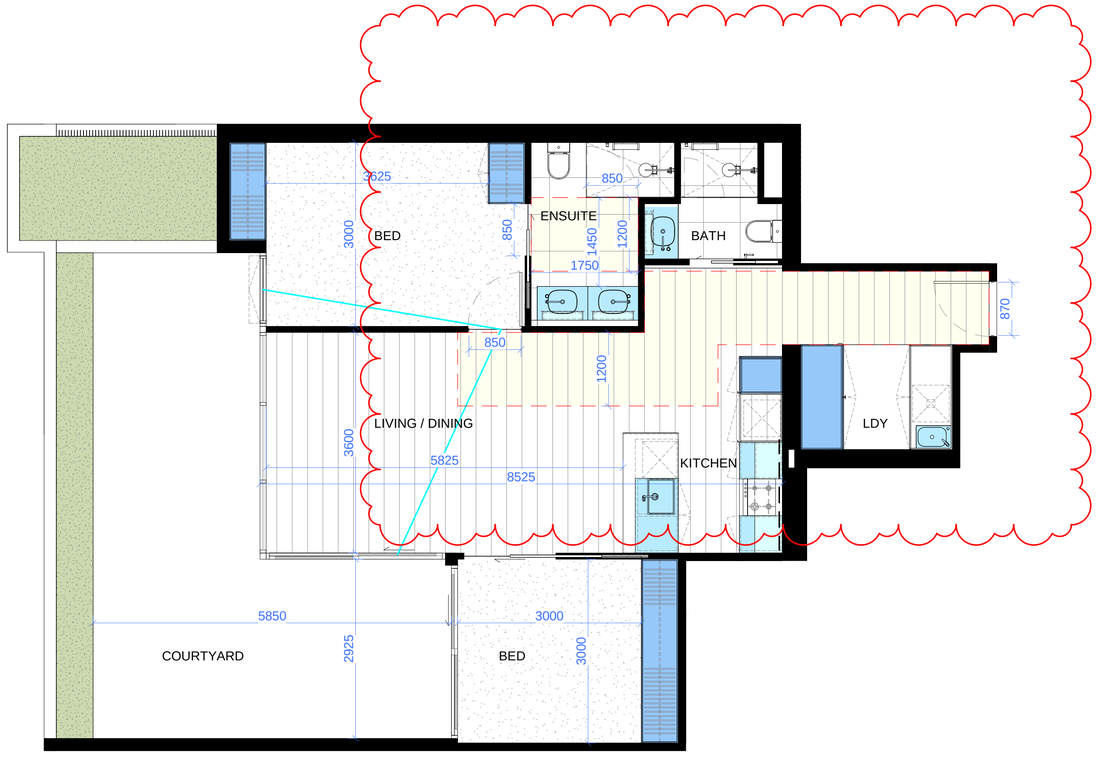
Apt No.	Name	Area
1.03	3B2B	105.8 m²
1.03	BALCONY	14.3 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 4.58 x 2.4 = 11.00m³
BENCH HEIGHT: 4.47 x 0.75 = 3.56m³
OVERHEAD: 0.74 x 0.75 = 0.57m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 15.12m³



UNIT TYPE B1-106

APPLICABLE TO UNIT:
B1: 106

Apt No.	Name	Area
1.06	2B2B	82.7 m²
1.06	BALCONY	45.2 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 4.98 x 2.4 = 11.94m³
BENCH HEIGHT: 3.33 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 15.27m³

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8 WARLEY AVENUE COWES

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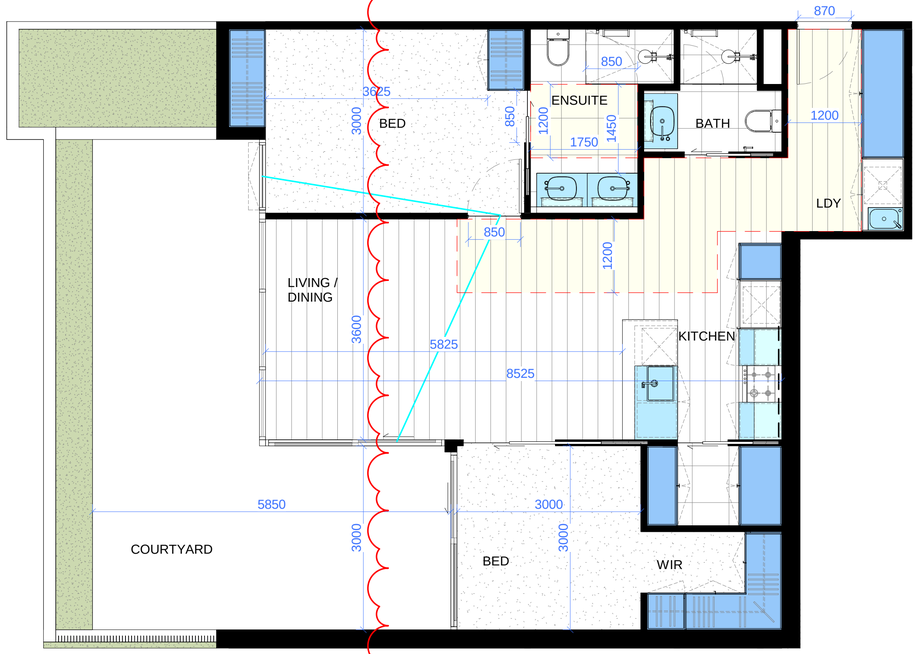
B	1/07/22	ISSUED FOR TOWN PLANNING
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 103, 106

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-225



UNIT TYPE B1-107

APPLICABLE TO UNIT:
B1: 107
B2: 101

Apt No.	Name	Area
1.07	2B2B	85.7 m²
1.07	BALCONY	45.4 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.93 x 2.4 = 16.64m³
BENCH HEIGHT: 3.31 x 0.75 = 2.48m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.97m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-108

APPLICABLE TO UNIT:
B1: 108, 208
B2: 111, 211

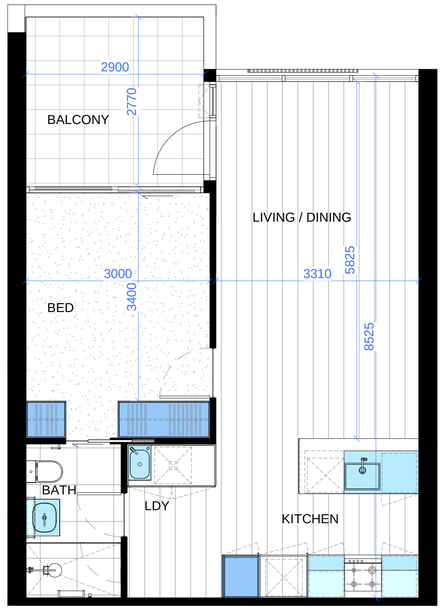
Apt No.	Name	Area
1.08	2B2B	84.4 m²
1.08	BALCONY	10.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.56 x 2.4 = 10.95m³
BENCH HEIGHT: 3.31 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.27m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-109

APPLICABLE TO UNIT:
B1: 109, 110, 209, 210
B2: 104, 109, 110, 204, 209, 210

Apt No.	Name	Area
1.09	1B1B	53.2 m²
1.09	BALCONY	8.8 m²

INTERNAL STORAGE:

FULL HEIGHT: 1.71 x 2.4 = 4.10m³
BENCH HEIGHT: 2.24 x 0.75 = 1.68m³
OVERHEAD: 0.63 x 0.75 = 0.47m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 6.47m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

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8 WARLEY AVENUE COWES

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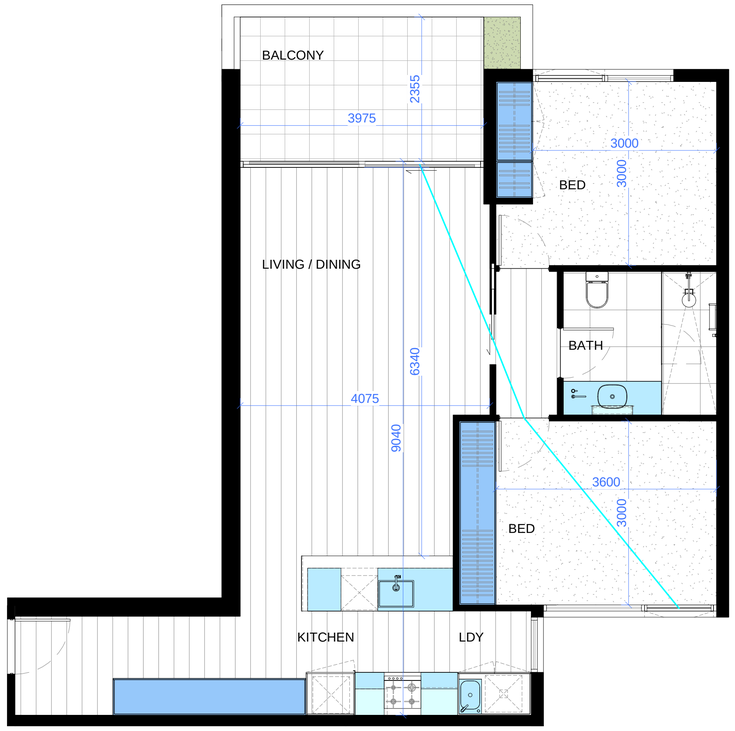
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 107, 108, 109

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-226



UNIT TYPE B1-111

APPLICABLE TO UNIT:
B1: 111, 211
B2: 108, 208

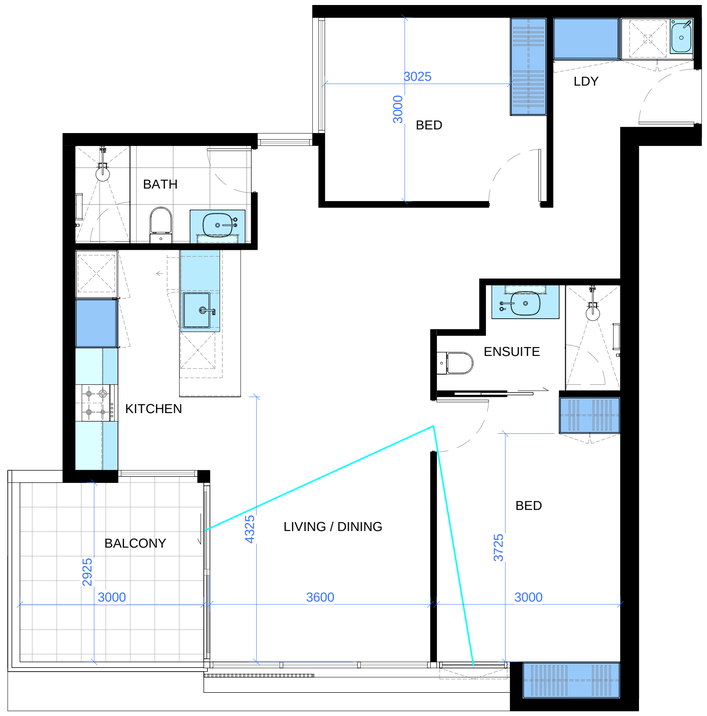
Apt No.	Name	Area
1.11	2B1B	82.5 m²
1.11	BALCONY	11.3 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.83 x 2.4 = 11.59m³
BENCH HEIGHT: 3.09 x 0.75 = 2.31m³
OVERHEAD: 0.56 x 0.75 = 0.42m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.54m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-205

APPLICABLE TO UNIT:
B1: 205

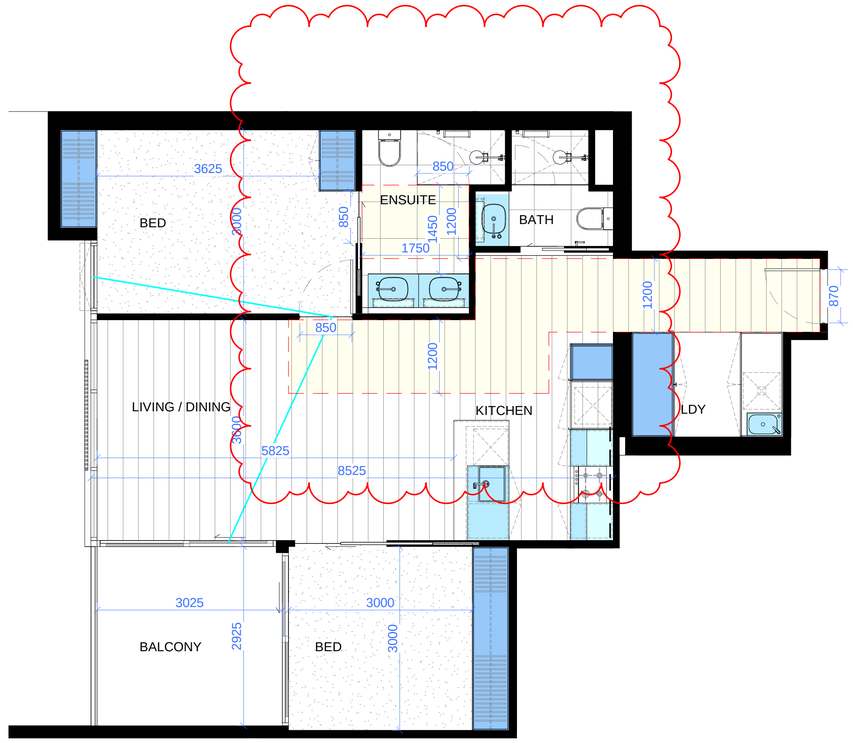
Apt No.	Name	Area
2.05	2B2B	87.7 m²
2.05	BALCONY	9.8 m²

INTERNAL STORAGE:

FULL HEIGHT: 3.86 x 2.4 = 9.26m³
BENCH HEIGHT: 3.45 x 0.75 = 2.59m³
OVERHEAD: 0.91 x 0.75 = 0.68m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 12.75m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-206

APPLICABLE TO UNIT:
B1: 206, 305, 404

Apt No.	Name	Area
2.06	2B2B	83.3 m²
2.06	BALCONY	10.1 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.94 x 2.4 = 11.86m³
BENCH HEIGHT: 3.29 x 0.75 = 2.47m³
OVERHEAD: 0.80 x 0.75 = 0.60m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 15.15m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

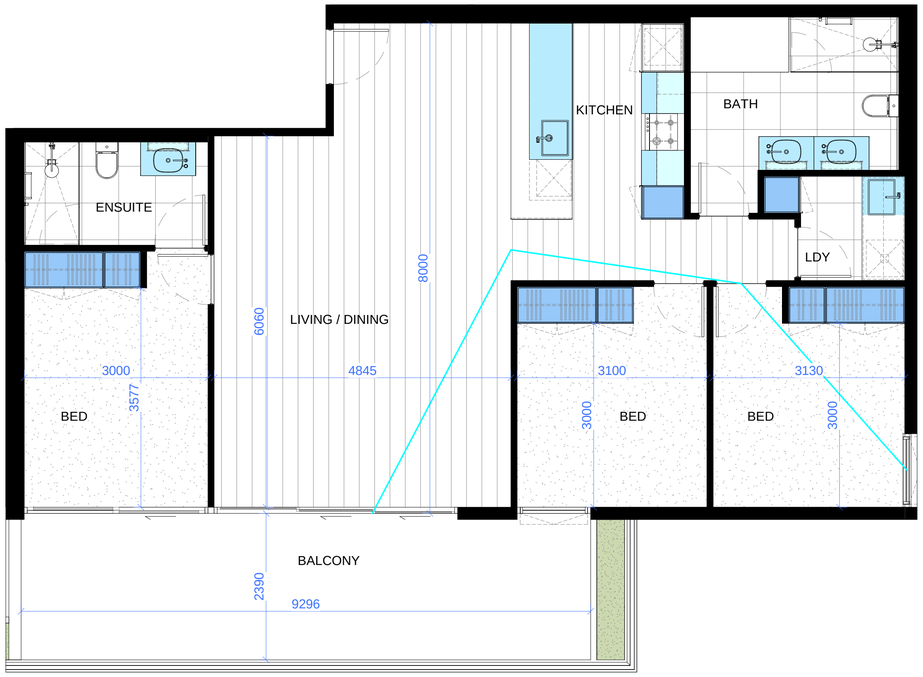
0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 111, 205, 206

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-227

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-303

APPLICABLE TO UNIT:
B1: 303

Apt No.	Name	Area
3.03	3B2B	111.6 m²
3.03	BALCONY	26.3 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.16 x 2.4 = 9.97m³
BENCH HEIGHT: 4.38 x 0.75 = 3.29m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

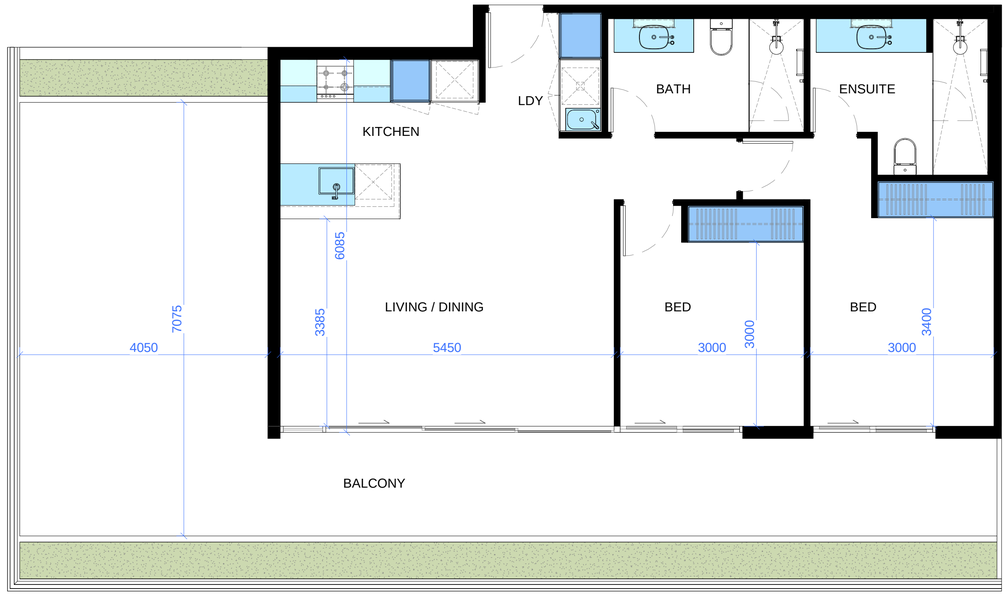
TOTAL: 14.11m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

INTERNAL STORAGE:

FULL HEIGHT: 3.26 x 2.4 = 7.82m³
BENCH HEIGHT: 3.59 x 0.75 = 2.69m³
OVERHEAD: 0.70 x 0.75 = 0.53m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 11.26m³



UNIT TYPE B1-304

APPLICABLE TO UNIT:
B1: 304

Apt No.	Name	Area
3.04	2B2B	81.4 m²
3.04	BALCONY	68.8 m²

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

UNIT TYPE B1-207

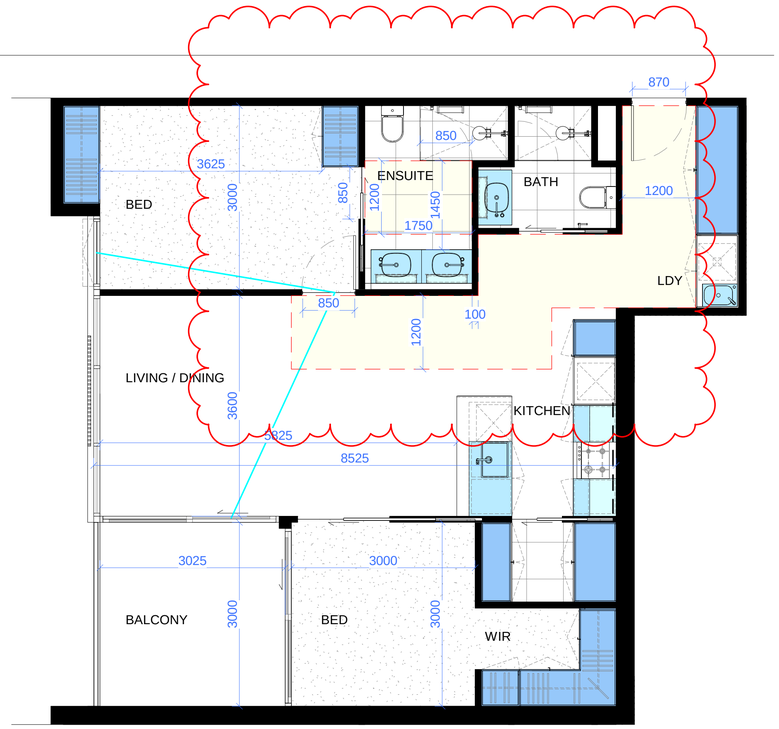
APPLICABLE TO UNIT:
B1: 207
B2: 201

Apt No.	Name	Area
2.07	2B2B	86.2 m²
2.07	BALCONY	10.1 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.88 x 2.4 = 16.51m³
BENCH HEIGHT: 3.32 x 0.75 = 2.49m³
OVERHEAD: 0.80 x 0.75 = 0.60m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.81m³



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8 WARLEY AVENUE COWES

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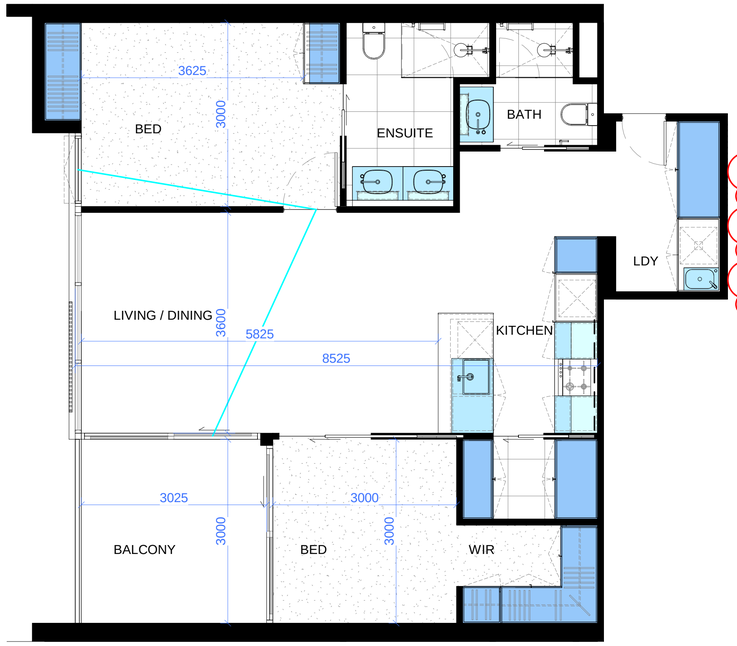
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 207, 303, 304

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-228



UNIT TYPE B1-306

APPLICABLE TO UNIT:
B1: 306, 405
B2: 301

Apt No.	Name	Area
3.06	2B2B	85.3 m²
3.06	BALCONY	9.7 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.56 x 2.4 = 15.75m³
BENCH HEIGHT: 3.29x 0.75 = 2.47m³
OVERHEAD: 0.80 x 0.75 = 0.60m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.03m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

UNIT TYPE B1-308

APPLICABLE TO UNIT:
B1: 308

Apt No.	Name	Area
3.08	3B2B	101.2 m²
3.08	BALCONY	54.7 m²

INTERNAL STORAGE:

FULL HEIGHT: 5.43 x 2.4 = 13.03m³
BENCH HEIGHT: 3.17 x 0.75 = 2.38m³
OVERHEAD: 0.74 x 0.75 = 0.56m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

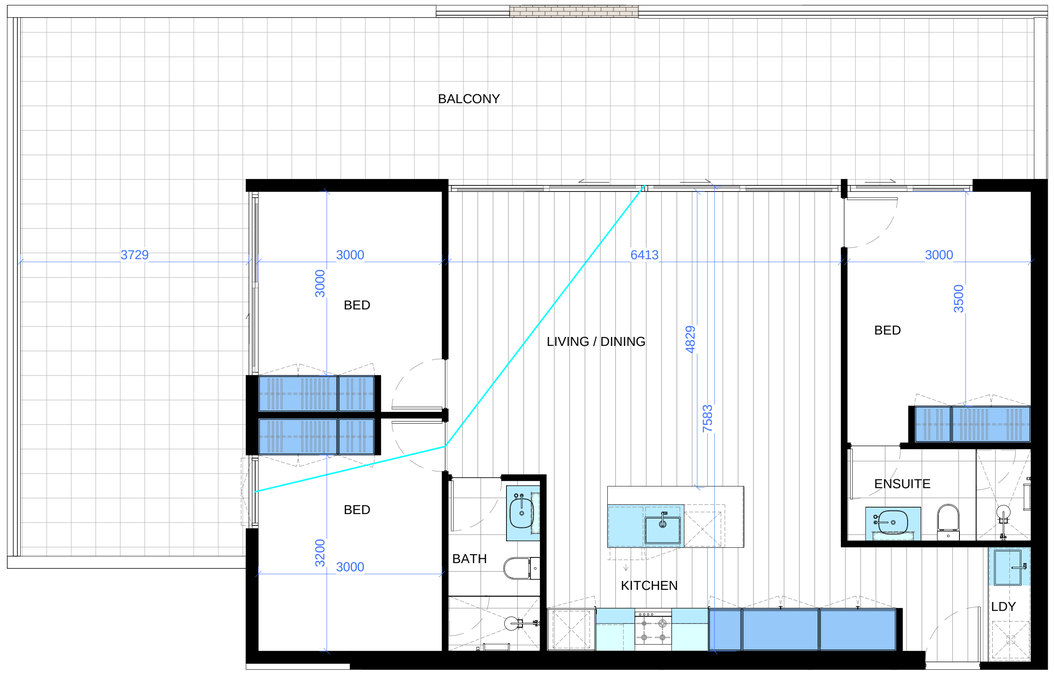
TOTAL: 16.18m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

UNIT TYPE B1-307

APPLICABLE TO UNIT:
B1: 307

Apt No.	Name	Area
3.07	3B2B	100.7 m²
3.07	BALCONY	73.9 m²

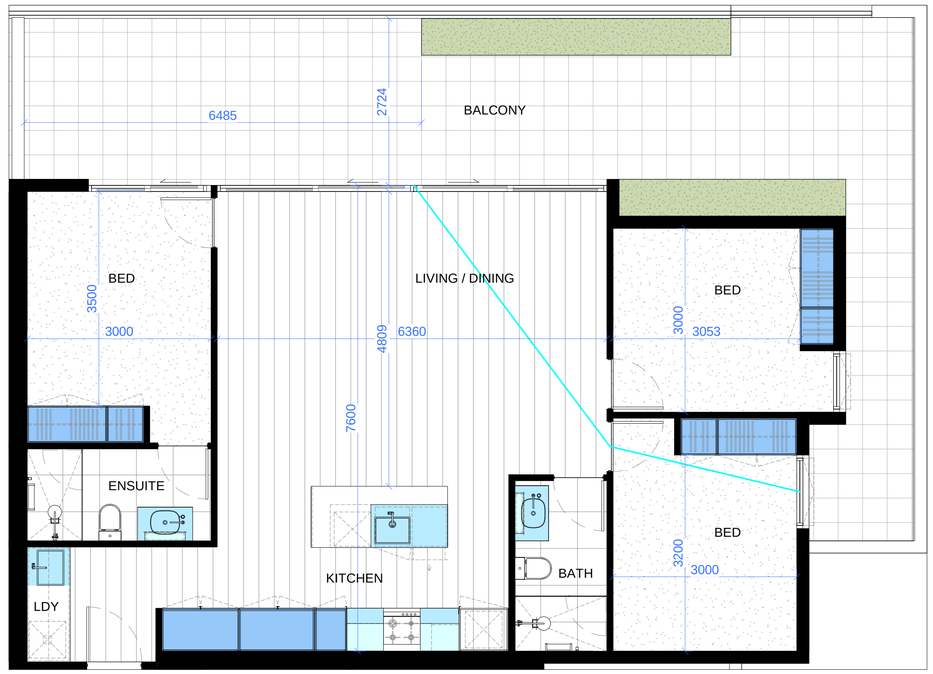


	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

INTERNAL STORAGE:

FULL HEIGHT: 5.57 x 2.4 = 13.37m³
BENCH HEIGHT: 3.17 x 0.75 = 2.38m³
OVERHEAD: 0.74 x 0.75 = 0.56m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 16.51m³



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8 WARLEY AVENUE COWES

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C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 306, 307, 308

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-229

UNIT TYPE B1-403

APPLICABLE TO UNIT:
B1: 403

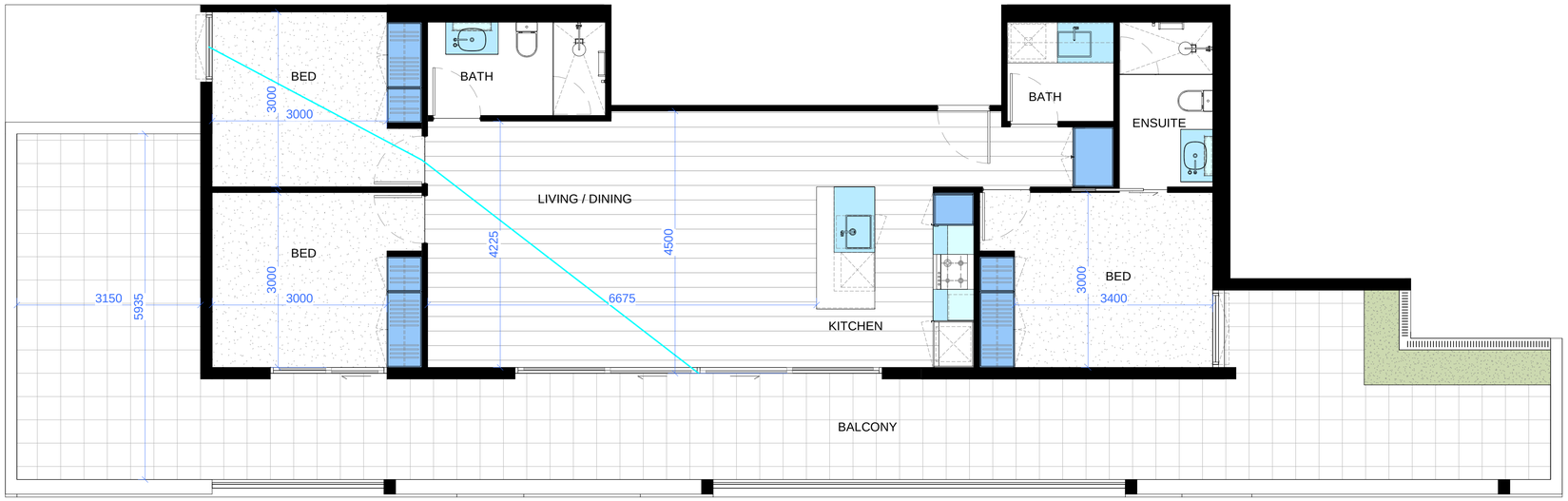
Apt No.	Name	Area
4.03	3B3B	98.7 m²
4.03	BALCONY	76.5 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.42 x 2.4 = 10.62m³
BENCH HEIGHT: 3.18 x 0.75 = 2.39m³
OVERHEAD: 0.65 x 0.75 = 0.49m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 13.71m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B1-402

APPLICABLE TO UNIT:
B1: 402

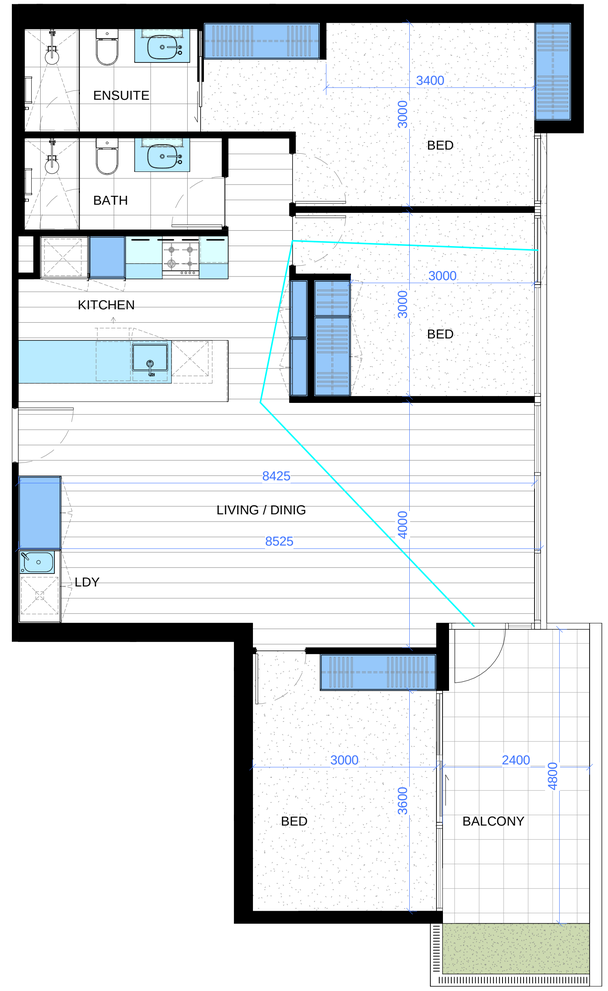
Apt No.	Name	Area
4.02	3B2B	103.8 m²
4.02	BALCONY	15.0 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.21 x 2.4 = 14.90m³
BENCH HEIGHT: 3.70 x 0.75 = 2.78m³
OVERHEAD: 0.67 x 0.75 = 0.50m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 18.40m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



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8 WARLEY AVENUE COWES

NOTES:
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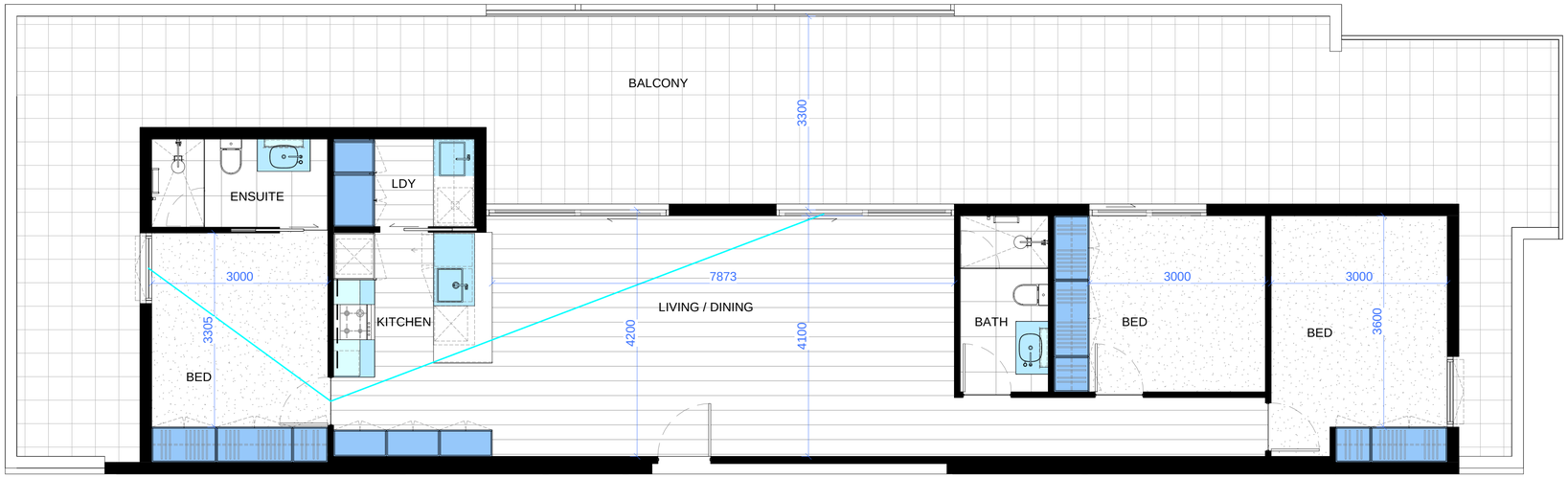
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 402, 403

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-230



UNIT TYPE B1-406

APPLICABLE TO UNIT:
B1: 406

Apt No.	Name	Area
4.06	3B2B	107.4 m²
4.06	BALCONY	96.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 7.00 x 2.4 = 16.80m³
BENCH HEIGHT: 3.03 x 0.75 = 2.27m³
OVERHEAD: 0.65 x 0.75 = 0.49m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.77m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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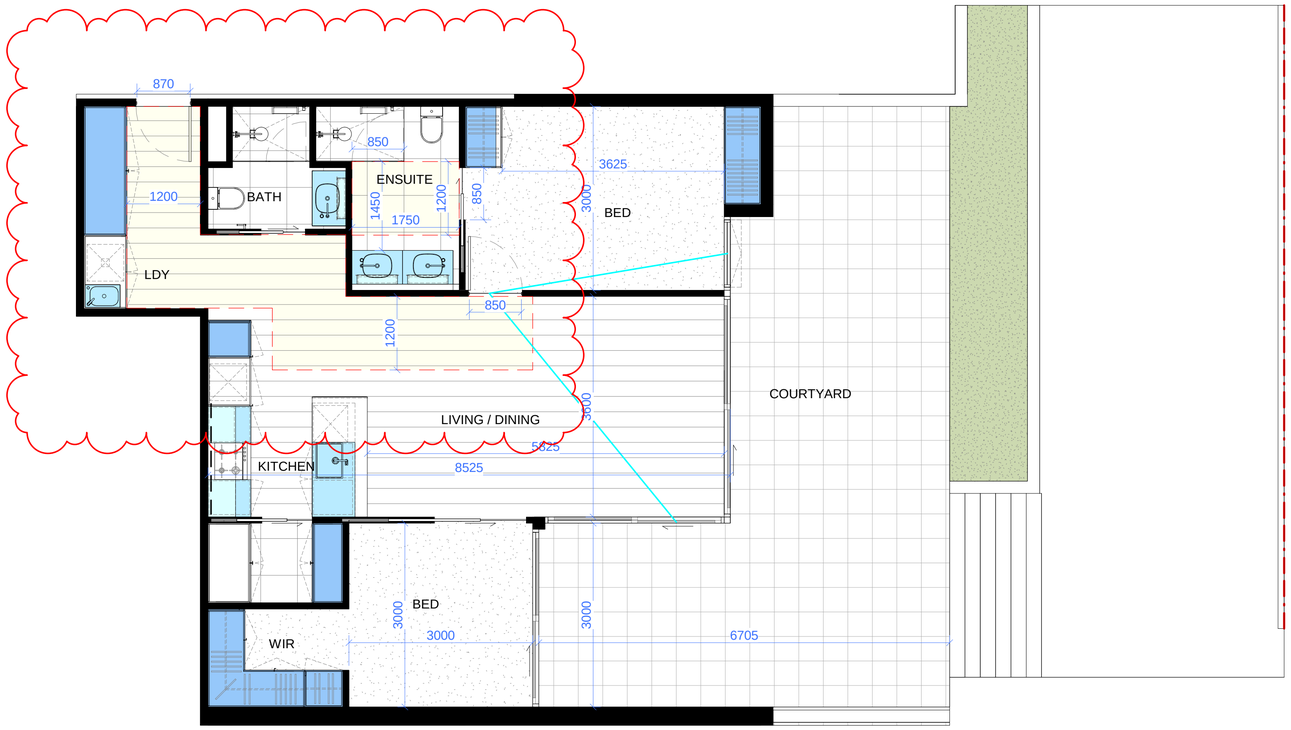
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B1 - 406

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-231



UNIT TYPE B2 - G01

APPLICABLE TO UNIT:
B2: G01

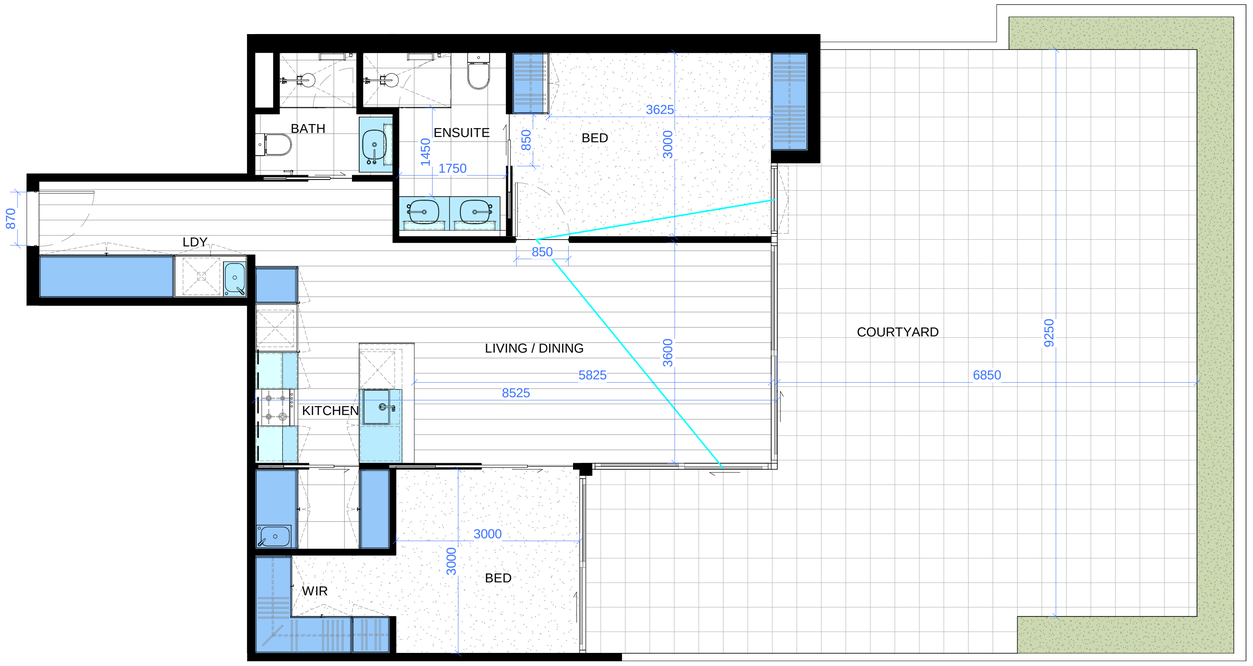
Apt No.	Name	Area
G.01	2B2B	85.8 m²
G.01	COURTYARD	103.7 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.02 x 2.4 = 14.45m³
BENCH HEIGHT: 3.31 x 0.75 = 2.49m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 17.78m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B2 - G02

APPLICABLE TO UNIT:
B2: G02

Apt No.	Name	Area
G.02	2B2B	86.1 m²
G.02	COURTYARD	88.7 m²

INTERNAL STORAGE:

FULL HEIGHT: 7.00 x 2.4 = 16.80m³
BENCH HEIGHT: 3.31 x 0.75 = 2.48m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 20.13m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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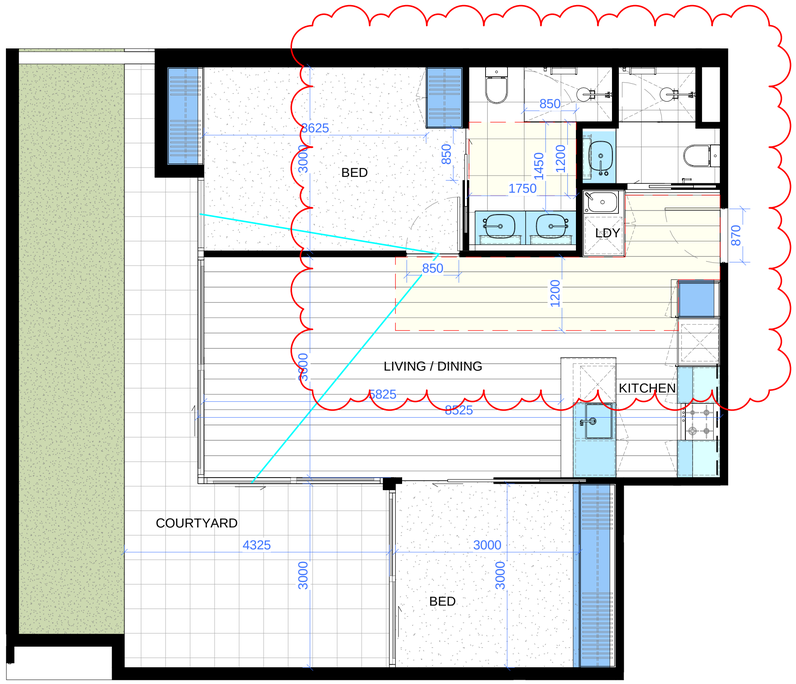
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - G01, G02

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-232



UNIT TYPE B2 - G05

APPLICABLE TO UNIT:
B2: G05

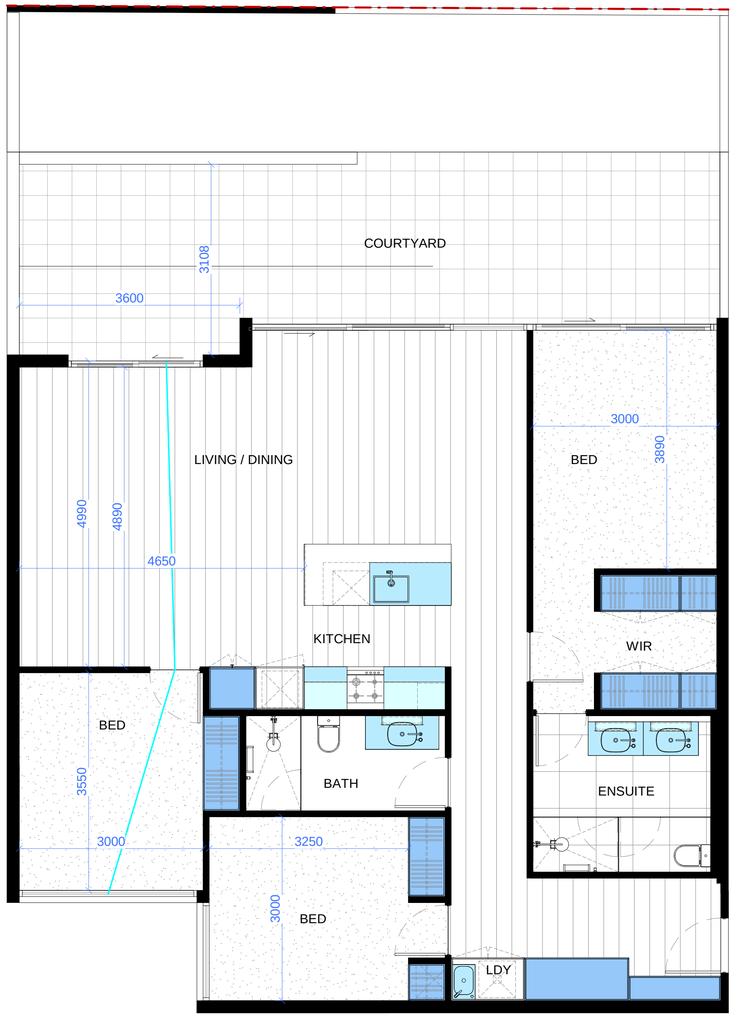
Apt No.	Name	Area
G.05	2B2B	73.8 m²
G.05	COURTYARD	39.4 m²

INTERNAL STORAGE:

FULL HEIGHT: 3.79 x 2.4 = 9.11m³
BENCH HEIGHT: 3.10 x 0.75 = 2.33m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 12.28m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B2 - G07

APPLICABLE TO UNIT:
B2: G07

Apt No.	Name	Area
G.07	3B2B	123.4 m²
G.07	COURTYARD	62.9 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.64 x 2.4 = 15.94m³
BENCH HEIGHT: 3.71 x 0.75 = 2.78m³
OVERHEAD: 1.02 x 0.75 = 0.77m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.70m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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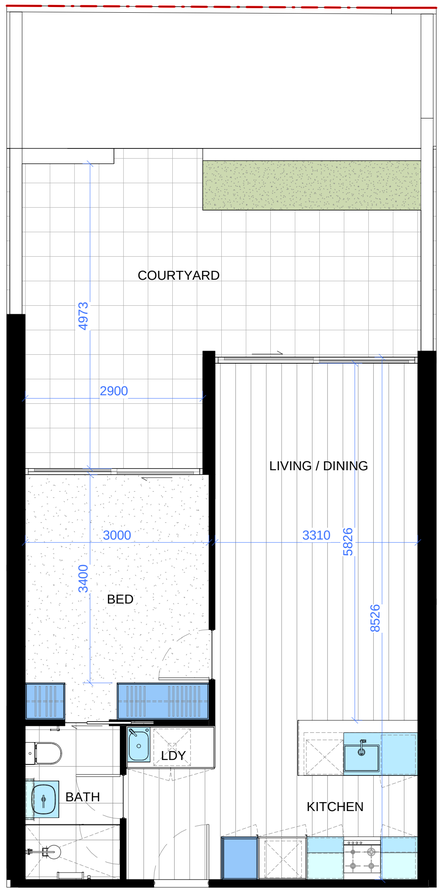
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

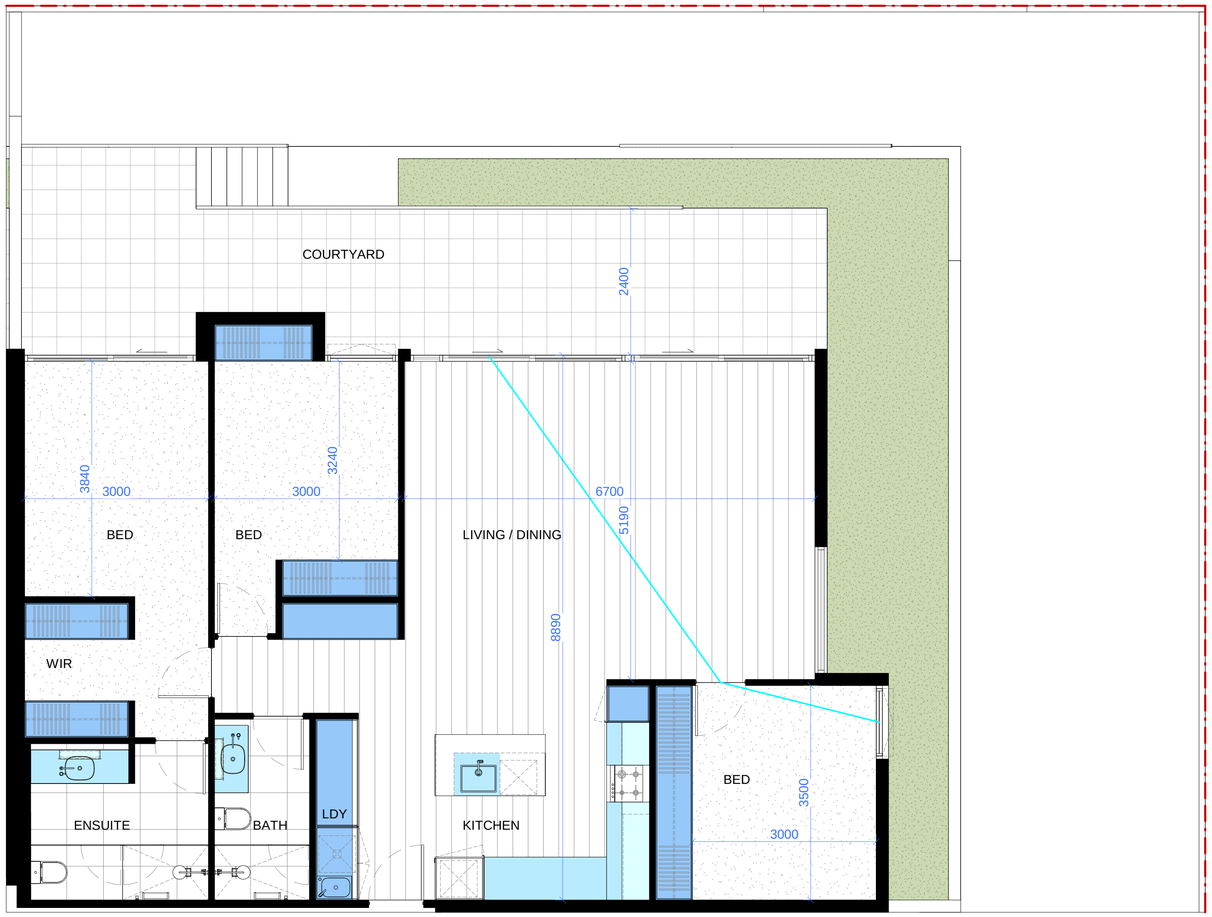
0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - G05, G07

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-233





UNIT TYPE B2 - G08

APPLICABLE TO UNIT:
B2: G08

Apt No.	Name	Area
G.08	1B1B	52.5 m²
G.08	COURTYARD	43.9 m²

INTERNAL STORAGE:

FULL HEIGHT: 1.71 x 2.4 = 4.10m³
BENCH HEIGHT: 2.24 x 0.75 = 1.68m³
OVERHEAD: 0.63 x 0.75 = 0.47m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 6.47m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

UNIT TYPE B2 - G09

APPLICABLE TO UNIT:
B2: G09

Apt No.	Name	Area
G.09	3B2B	125.3 m²
G.09	COURTYARD	160.4 m²

INTERNAL STORAGE:

FULL HEIGHT: 9.57 x 2.4 = 22.97m³
BENCH HEIGHT: 5.02 x 0.75 = 3.76m³
OVERHEAD: 1.23 x 0.75 = 0.92m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 27.87m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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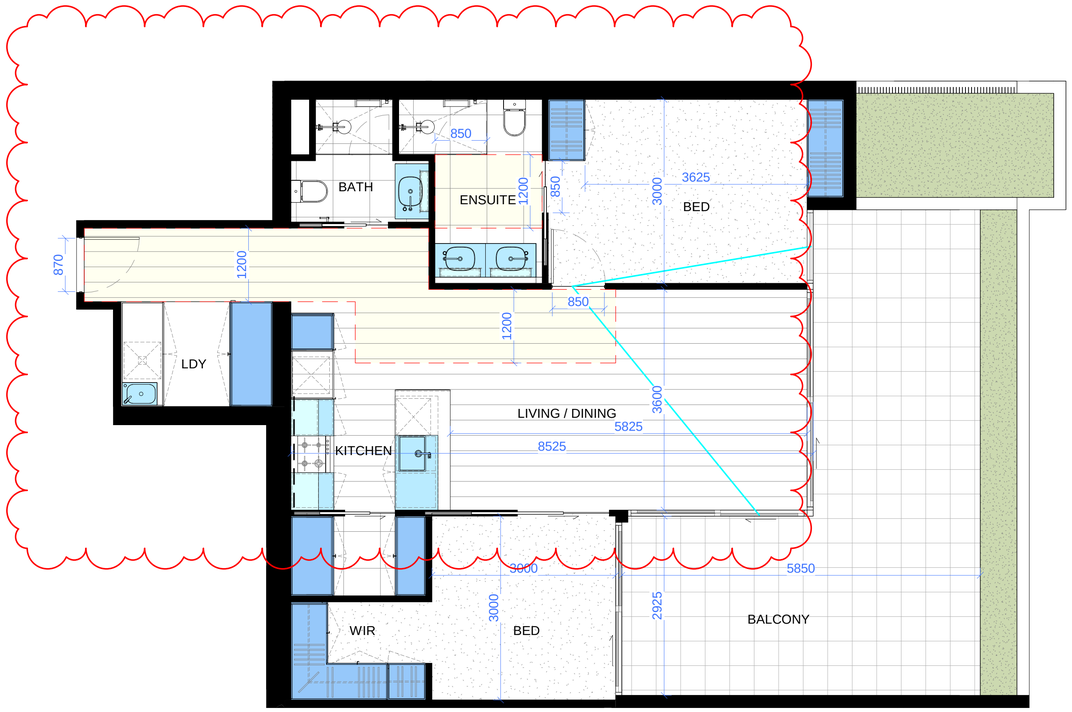
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - G08, G09

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-234



UNIT TYPE B2 - 102

APPLICABLE TO UNIT:
B2: 102

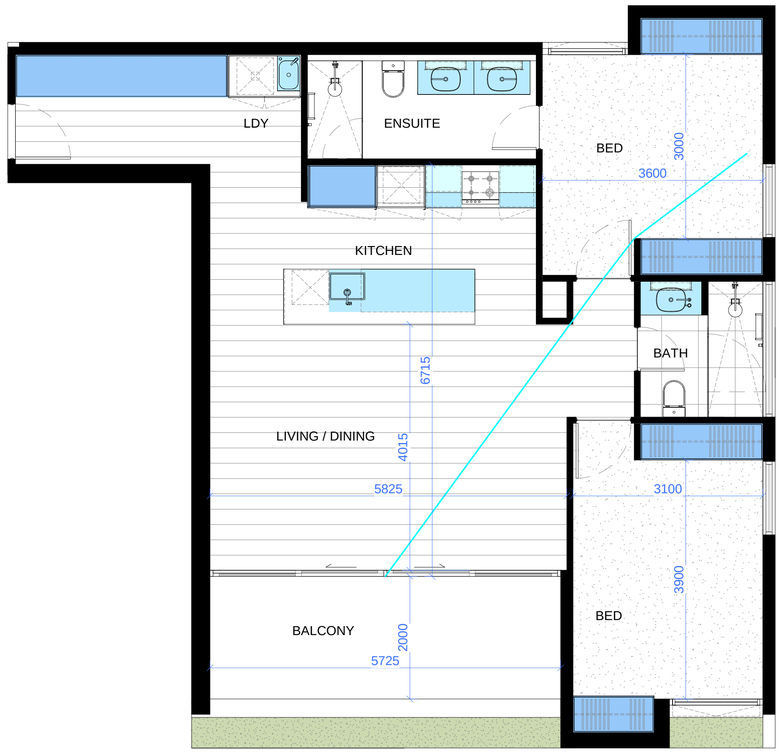
Apt No.	Name	Area
1.02	2B2B	87.9 m²
1.02	BALCONY	43.8 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.66 x 2.4 = 15.98m³
BENCH HEIGHT: 3.33 x 0.75 = 2.49m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.30m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B2 - 103

APPLICABLE TO UNIT:
B2: 103

Apt No.	Name	Area
1.03	2B2B	98.5 m²
1.03	BALCONY	11.5 m²

INTERNAL STORAGE:

FULL HEIGHT: 5.61 x 2.4 = 13.47m³
BENCH HEIGHT: 4.29 x 0.75 = 3.22m³
OVERHEAD: 0.82 x 0.75 = 0.62m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 17.52m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

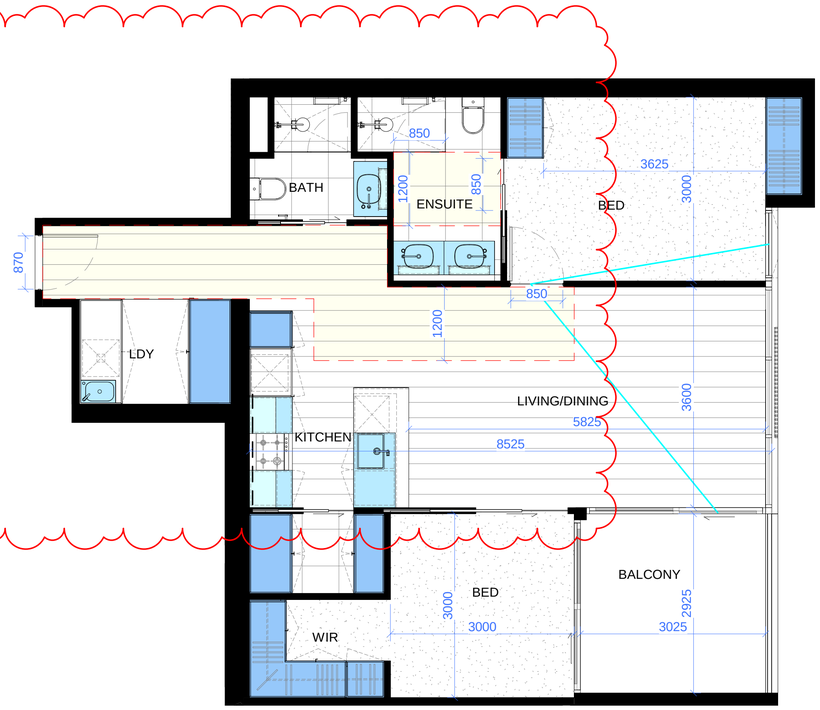
0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 102, 103

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-235





UNIT TYPE B2 - 106

APPLICABLE TO UNIT:
B2: 106, 206, 305, 404

Apt No.	Name	Area
1.06	2B2B	74.3 m²
1.06	BALCONY	10.3 m²

INTERNAL STORAGE:

FULL HEIGHT: 3.77 x 2.4 = 9.05m³
BENCH HEIGHT: 3.33 x 0.75 = 2.50m³
OVERHEAD: 0.84 x 0.75 = 0.63m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 12.39m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

UNIT TYPE B2 - 202

APPLICABLE TO UNIT:
B2: 202, 302, 402

Apt No.	Name	Area
2.02	2B2B	88.0 m²
2.02	BALCONY	10.1 m²

INTERNAL STORAGE:

FULL HEIGHT: 6.62 x 2.4 = 15.90m³
BENCH HEIGHT: 3.29 x 0.75 = 2.47m³
OVERHEAD: 0.80 x 0.75 = 0.60m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 19.18m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

NOTES:
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A	24/05/22	ISSUED FOR INFORMATION
B	1/07/22	ISSUED FOR TOWN PLANNING
C	21/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 106, 202

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-236



UNIT TYPE B2 - 203

APPLICABLE TO UNIT:
B2: 203

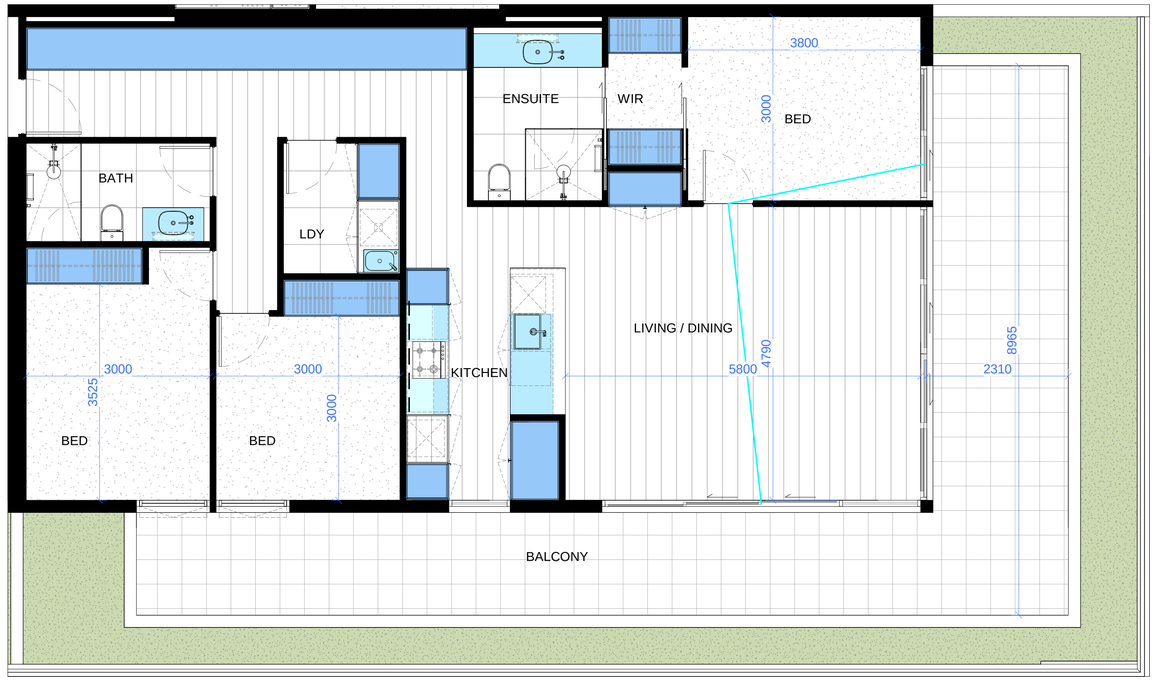
Apt No.	Name	Area
2.03	2B1B	83.7 m²
2.03	BALCONY	26.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 5.79 x 2.4 = 13.90m³
BENCH HEIGHT: 2.23 x 0.75 = 1.67m³
OVERHEAD: 0.36 x 0.75 = 0.27m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 16.07m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗



UNIT TYPE B2 - 303

APPLICABLE TO UNIT:
B2: 303

Apt No.	Name	Area
3.03	3B3B	122.1 m²
3.03	BALCONY	78.8 m²

INTERNAL STORAGE:

FULL HEIGHT: 11.98 x 2.4 = 28.75m³
BENCH HEIGHT: 3.91 x 0.75 = 2.93m³
OVERHEAD: 0.72 x 0.75 = 0.54m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 32.44m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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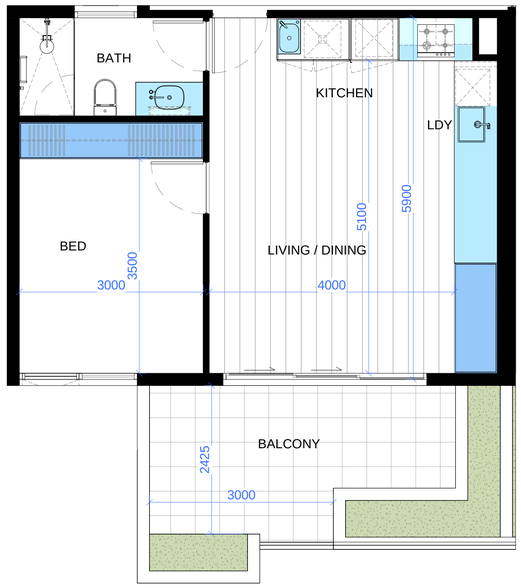
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 203, 303

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-237



UNIT TYPE B2 - 304

APPLICABLE TO UNIT:
B2: 304

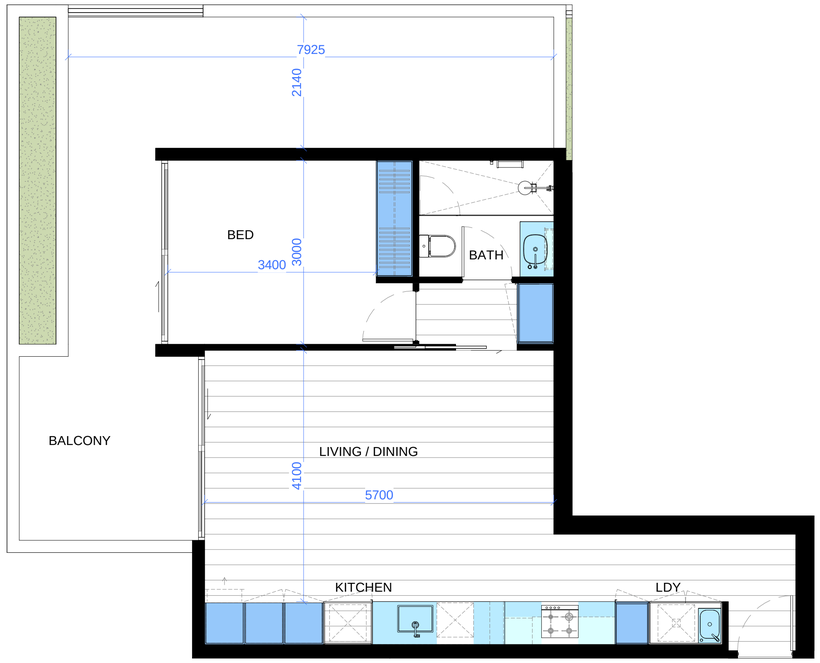
Apt No.	Name	Area
3.04	1B1B	50.1 m²
3.04	BALCONY	17.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 3.06 x 2.4 = 7.34m³
BENCH HEIGHT: 3.03 x 0.75 = 2.27m³
OVERHEAD: 0.35 x 0.75 = 0.26m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 10.09m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗



UNIT TYPE B2 - 307

APPLICABLE TO UNIT:
B2: 307

Apt No.	Name	Area
3.07	1B1B	60.5 m²
3.07	BALCONY	39.9 m²

INTERNAL STORAGE:

FULL HEIGHT: 3.44 x 2.4 = 8.26m³
BENCH HEIGHT: 2.64 x 0.75 = 1.98m³
OVERHEAD: 0.63 x 0.75 = 0.47m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 10.93m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

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8 WARLEY AVENUE COWES

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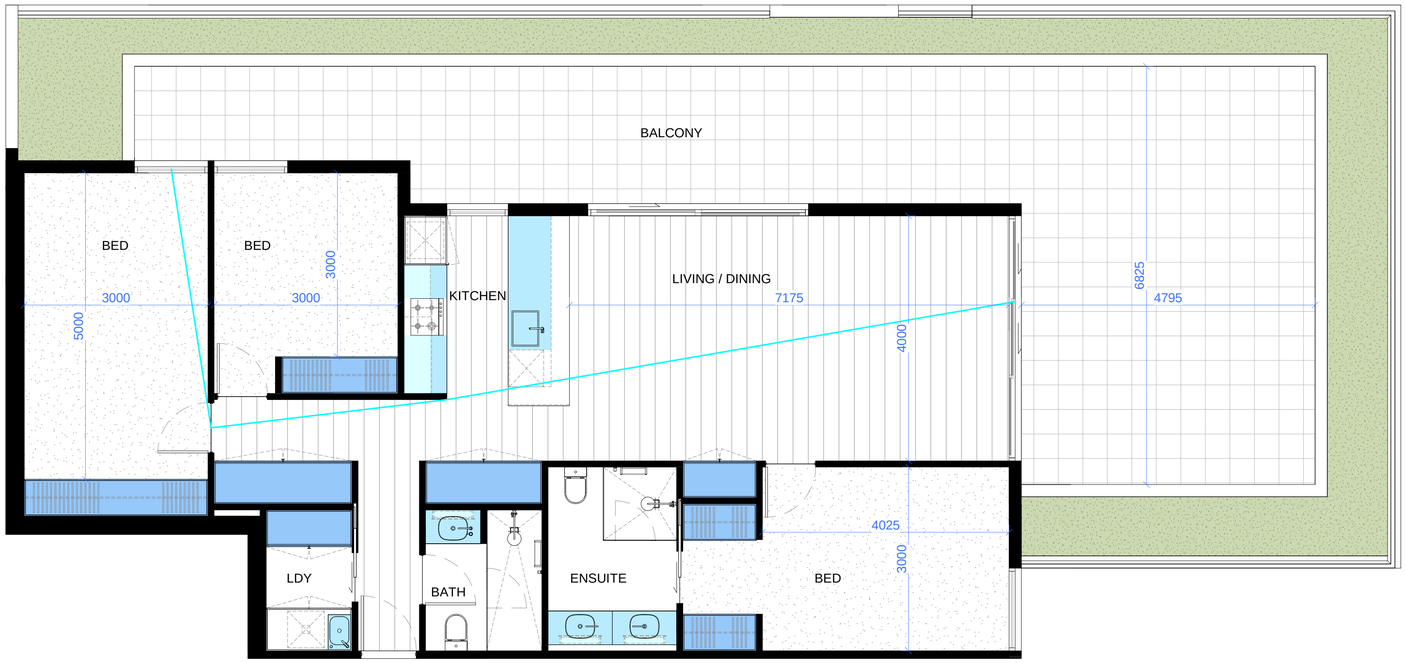
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 304, 307

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-238



UNIT TYPE B2 - 308

APPLICABLE TO UNIT:
B2: 308

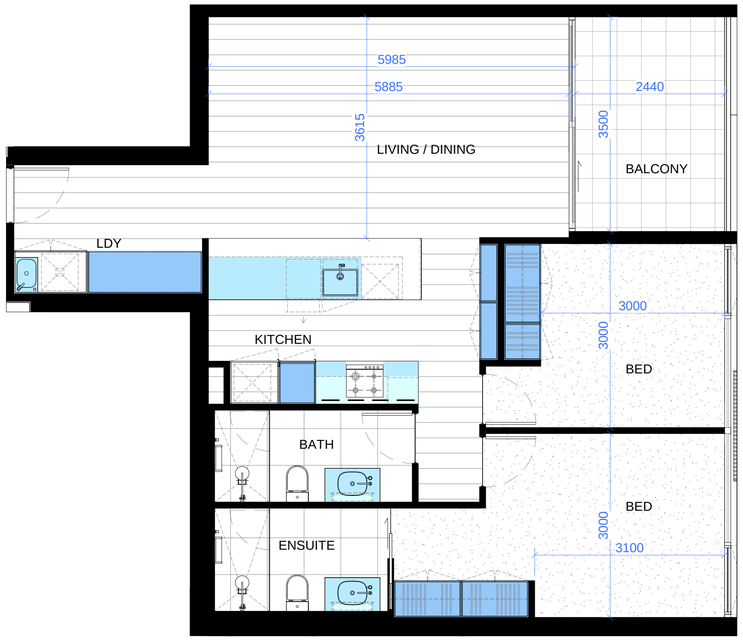
Apt No.	Name	Area
3.08	3B2B	117.3 m²
3.08	BALCONY	106.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 8.85 x 2.4 = 21.23m³
BENCH HEIGHT: 4.44 x 0.75 = 3.33m³
OVERHEAD: 0.92 x 0.75 = 0.69m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 25.47m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B2 - 401

APPLICABLE TO UNIT:
B2: 401

Apt No.	Name	Area
4.01	2B2B	85.9 m²
4.01	BALCONY	9.2 m²

INTERNAL STORAGE:

FULL HEIGHT: 4.76 x 2.4 = 11.43m³
BENCH HEIGHT: 3.70 x 0.75 = 2.78m³
OVERHEAD: 0.67 x 0.75 = 0.50m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 14.92m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION		✗

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8 WARLEY AVENUE COWES

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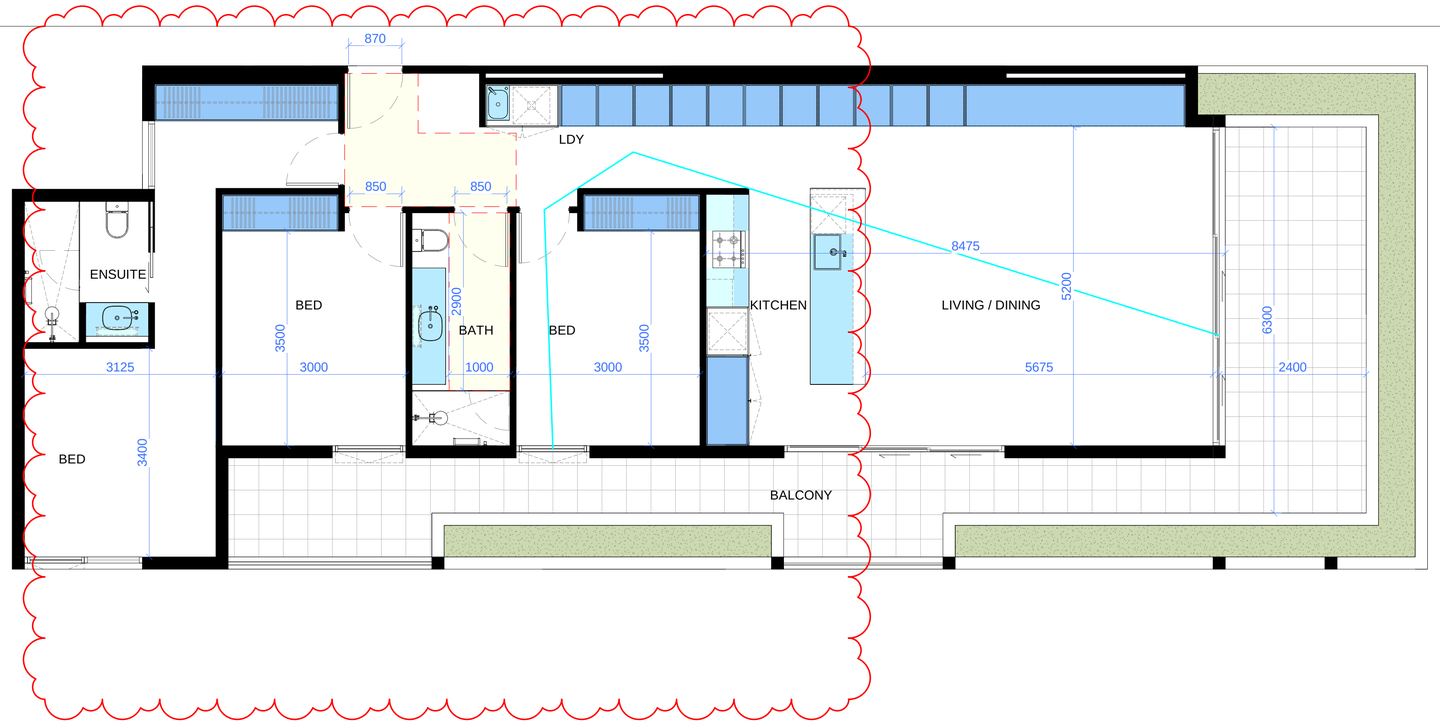
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 308, 401

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-239



UNIT TYPE B2 - 403

APPLICABLE TO UNIT:
B2: 403

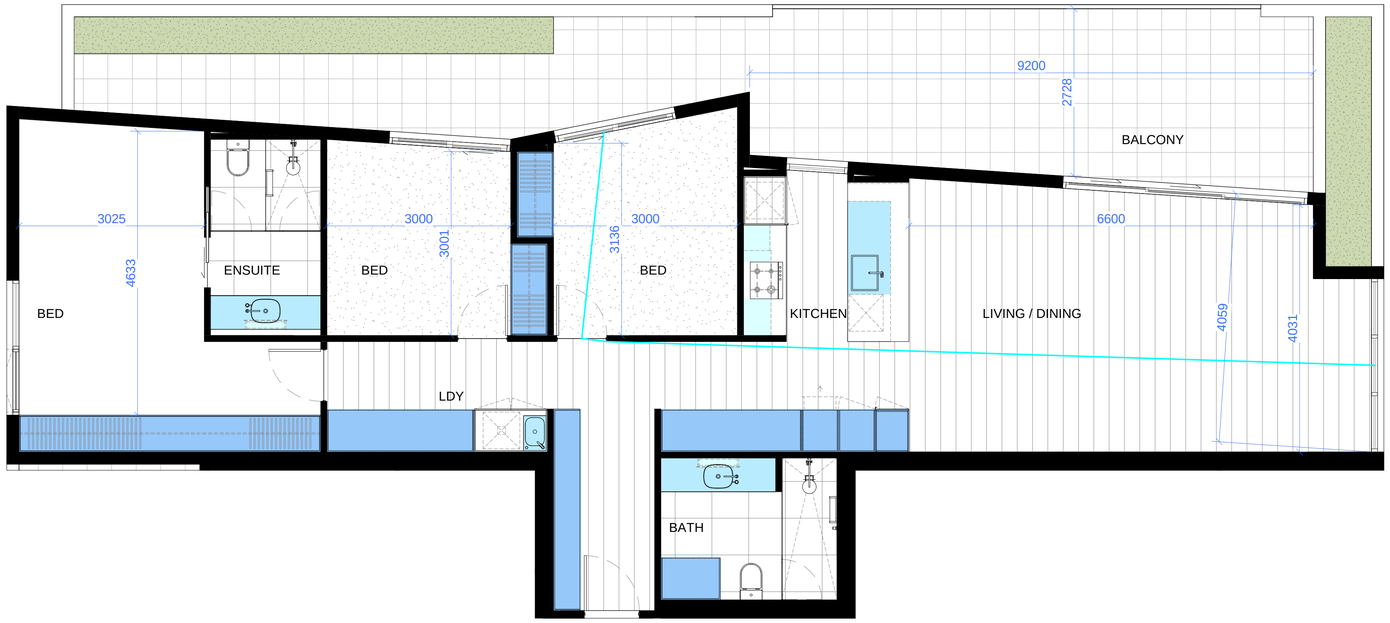
Apt No.	Name	Area
4.03	3B2B	126.3 m²
4.03	BALCONY	58.0 m²

INTERNAL STORAGE:

FULL HEIGHT: 12.26 x 2.4 = 29.43m³
BENCH HEIGHT: 4.41 x 0.75 = 3.30m³
OVERHEAD: 0.74 x 0.75 = 0.56m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 33.51m³

	YES	NO
STANDARD D18 - ACCESSIBILITY	✓	
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	



UNIT TYPE B2 - 406

APPLICABLE TO UNIT:
B2: 406

Apt No.	Name	Area
4.06	3B2B	126.2 m²
4.06	BALCONY	51.5 m²

INTERNAL STORAGE:

FULL HEIGHT: 11.4 x 2.4 = 27.30m³
BENCH HEIGHT: 3.30 x 0.75 = 2.47m³
OVERHEAD: 0.73 x 0.75 = 0.55m³
FRIDGE HEAD: 0.48 x 0.45 = 0.22m³

TOTAL: 30.53m³

	YES	NO
STANDARD D18 - ACCESSIBILITY		✗
STANDARD D20 - PRIVATE OPEN SPACE	✓	
STANDARD D21 - STORAGE	✓	
STANDARD D24 - FUNCTIONAL LAYOUT	✓	
STANDARD D26 - ROOM DEPTH	✓	
STANDARD D28 - WINDOWS	✓	
STANDARD D29 - NATURAL VENTILATION	✓	

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8 WARLEY AVENUE COWES

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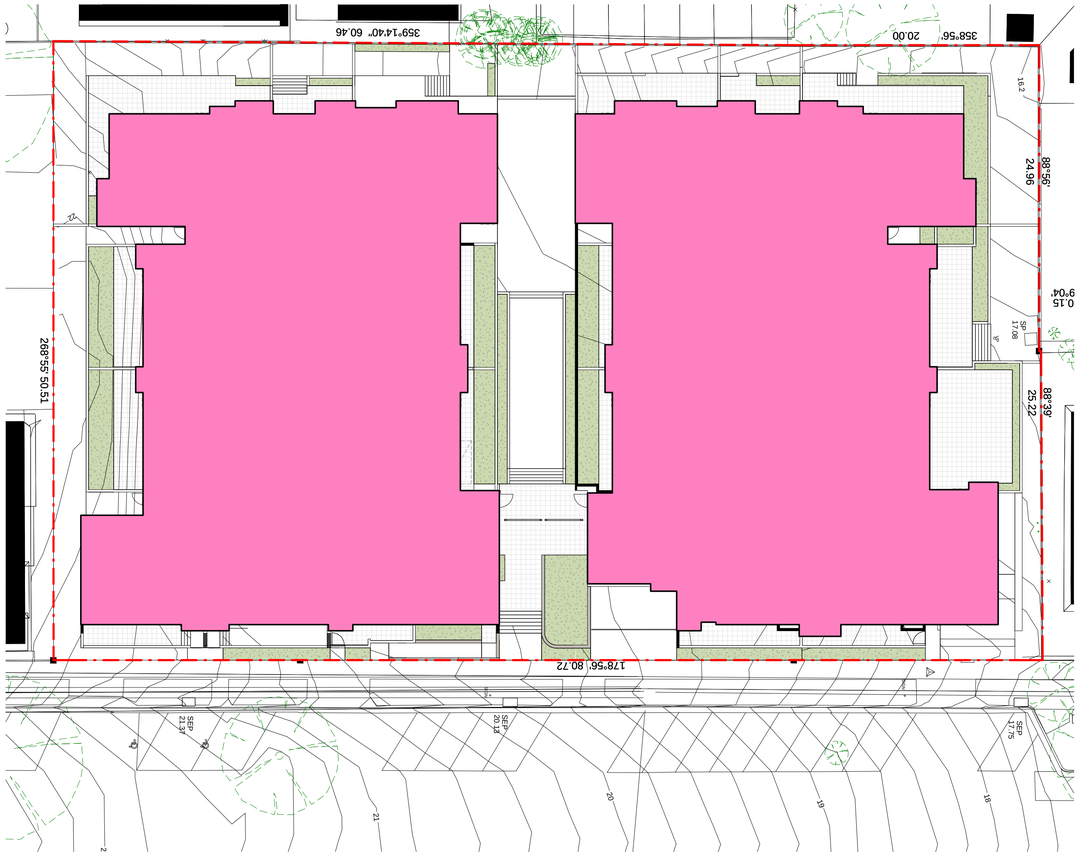
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.2 0.5 1. 2.0m

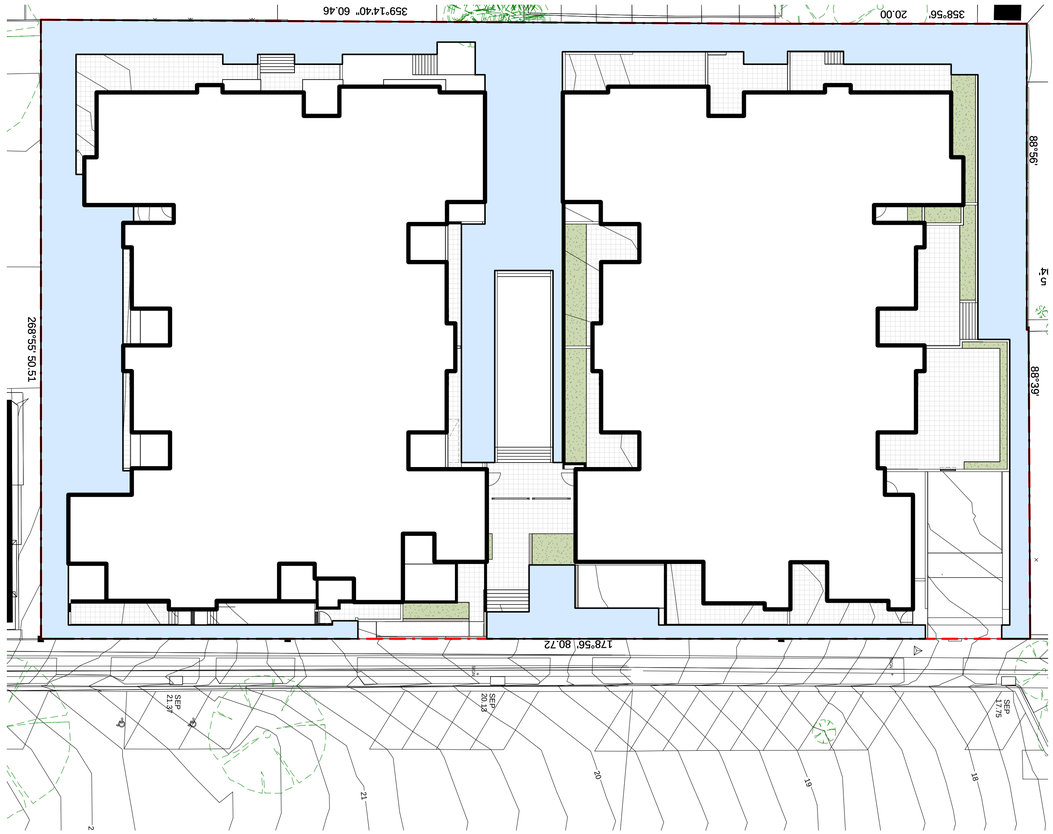
PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
APARTMENT TYPE - B2 - 403, 406

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:50@A1
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-240



SITE COVERAGE



SITE PERMEABILITY

SITE COVERAGE - 2450 SQM
OF 4052 SQM
TOTAL = 60.5%

PERMEABILITY - 853 SQM
OF 4052 SQM
TOTAL = 20%

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8 WARLEY AVENUE COWES

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REV	DATE	DESCRIPTION
A	14/09/22	RESPONSE TO RFI
B	04/10/22	RESPONSE TO RFI

0 1 3 5 10 m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SITE COVERAGE AND PERMEABILITY

DATE: 13/09/22
JOB No: 42009
SCALE:
REVISION No: B
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-250



ELEVATION - EAST

AF 01	CONCRETE, (OR SIMILAR) WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES
AL01/TM01	PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)
BAL01	METAL BALUSTRADE - COLOUR TO MATCH AL01(OR SIMILAR)
BR01	PROPOSED FACE BRICKWORK TO WALLS AND FENCES AS SHOWN. BRICK TO BAGGED RENDER BEIGE IN COLOUR (OR SIMILAR).
GL01	PROPOSED GENERAL GLAZING TYPE. ALUMINIUM GLAZING FRAME TO SELECTED BLACK POWDERCOAT FINISH. CLEAR GLASS INFILLS. GLAZING TO INCORPORATE SASH WINDOWS AND SLIDING DOORS AS PER PLANS / ELEVATIONS. WHERE DENOTED 'OB' GLAZED WINDOWS TO INCORPORATE REEDED GLASS OR OBSCURE GLASS AS APPROVED

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8 WARLEY AVENUE COWES

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E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 0.5 1 2.0 5.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
EAST ELEVATION

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-301



ELEVATION - NORTH



ELEVATION - SOUTH

AF 01	CONCRETE, (OR SIMILAR) WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES
AL01/TM01	PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)
BAL01	METAL BALUSTRADE - COLOUR TO MATCH AL01(OR SIMILAR)
BR01	PROPOSED FACE BRICKWORK TO WALLS AND FENCES AS SHOWN. BRICK TO BAGGED RENDER BEIGE IN COLOUR (OR SIMILAR).
GL01	PROPOSED GENERAL GLAZING TYPE. ALUMINIUM GLAZING FRAME TO SELECTED BLACK POWDERCOAT FINISH. CLEAR GLASS INFILLS. GLAZING TO INCORPORATE SASH WINDOWS AND SLIDING DOORS AS PER PLANS / ELEVATIONS. WHERE DENOTED 'OB' GLAZED WINDOWS TO INCORPORATE REEDED GLASS OR OBSCURE GLASS AS APPROVED

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8 WARLEY AVENUE COWES

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B	17/06/22	ISSUED FOR INFORMATION
C	1/07/22	ISSUED FOR TOWN PLANNING
D	14/09/22	RESPONSE TO RFI
E	04/10/22	RESPONSE TO RFI

0 0.5 1 2.0 5.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
NORTH & SOUTH ELEVATION

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: E
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-302

ELEVATION - WEST



AF 01	CONCRETE, (OR SIMILAR) WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES
AL01/TM01	PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)
BAL01	METAL BALUSTRADE - COLOUR TO MATCH AL01(OR SIMILAR)
BR01	PROPOSED FACE BRICKWORK TO WALLS AND FENCES AS SHOWN. BRICK TO BAGGED RENDER BEIGE IN COLOUR (OR SIMILAR).
GL01	PROPOSED GENERAL GLAZING TYPE. ALUMINIUM GLAZING FRAME TO SELECTED BLACK POWDERCOAT FINISH. CLEAR GLASS INFILLS. GLAZING TO INCORPORATE SASH WINDOWS AND SLIDING DOORS AS PER PLANS / ELEVATIONS. WHERE DENOTED 'OB' GLAZED WINDOWS TO INCORPORATE REEDED GLASS OR OBSCURE GLASS AS APPROVED

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8 WARLEY AVENUE COWES

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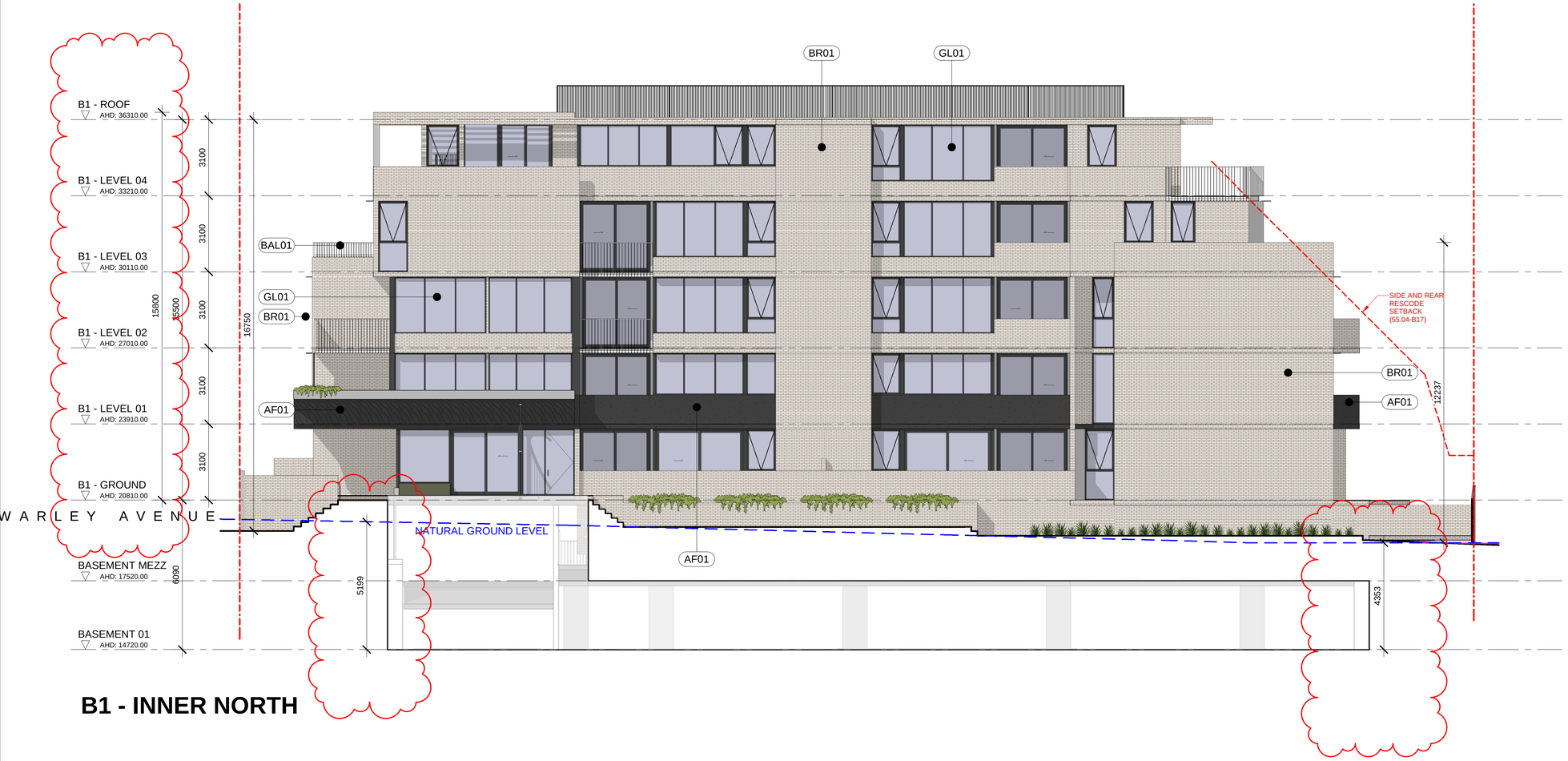
D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

0 0.5 1. 2.0 5.0m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
WEST ELEVATION

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-303



B1 - INNER NORTH

AF 01	CONCRETE, (OR SIMILAR) WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES
AL01/TM01	PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)
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8 WARLEY AVENUE COWES

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D	21/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

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PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
B1 - INNER NORTH ELEVATION

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-304



B2 - INNER SOUTH

AF 01	CONCRETE, (OR SIMILAR) WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES
AL01/TM01	PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)
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8 WARLEY AVENUE COWES

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E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

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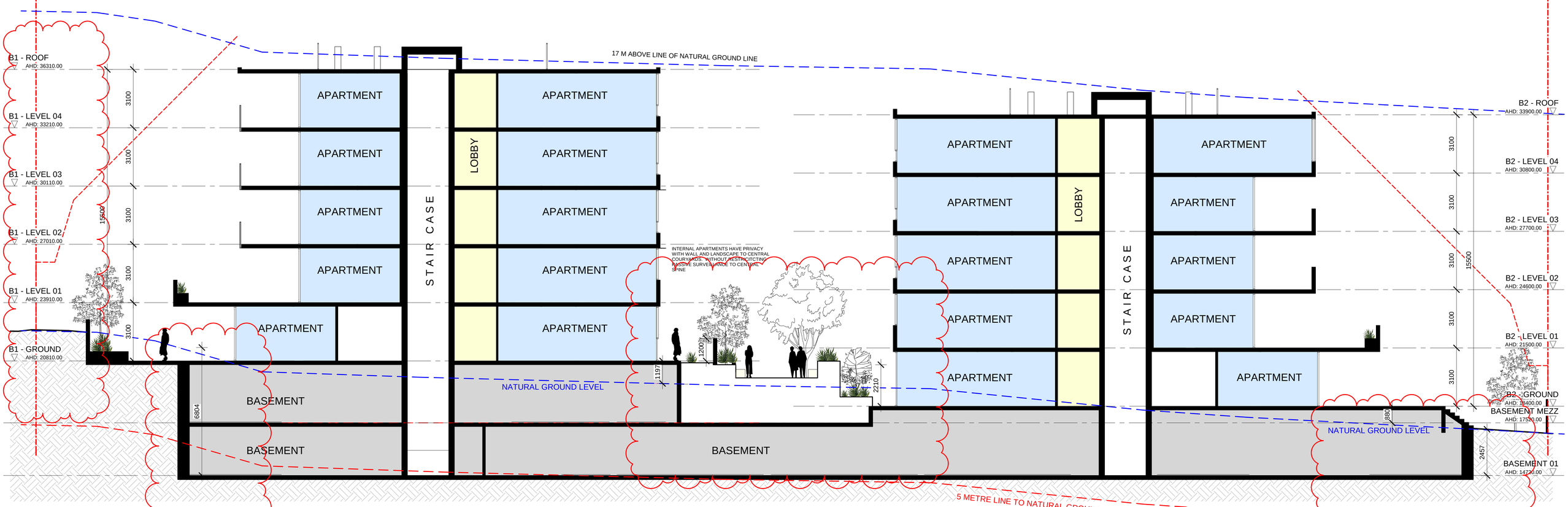
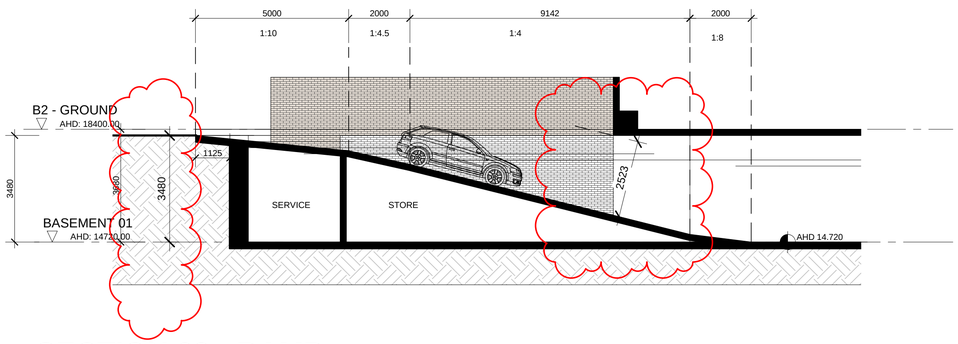
PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
B2 - INNER SOUTH ELEVATION

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-305



SECTION 01 - LONG SECTION



SECTION 02 - RAMP

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F	04/10/22	RESPONSE TO RFI

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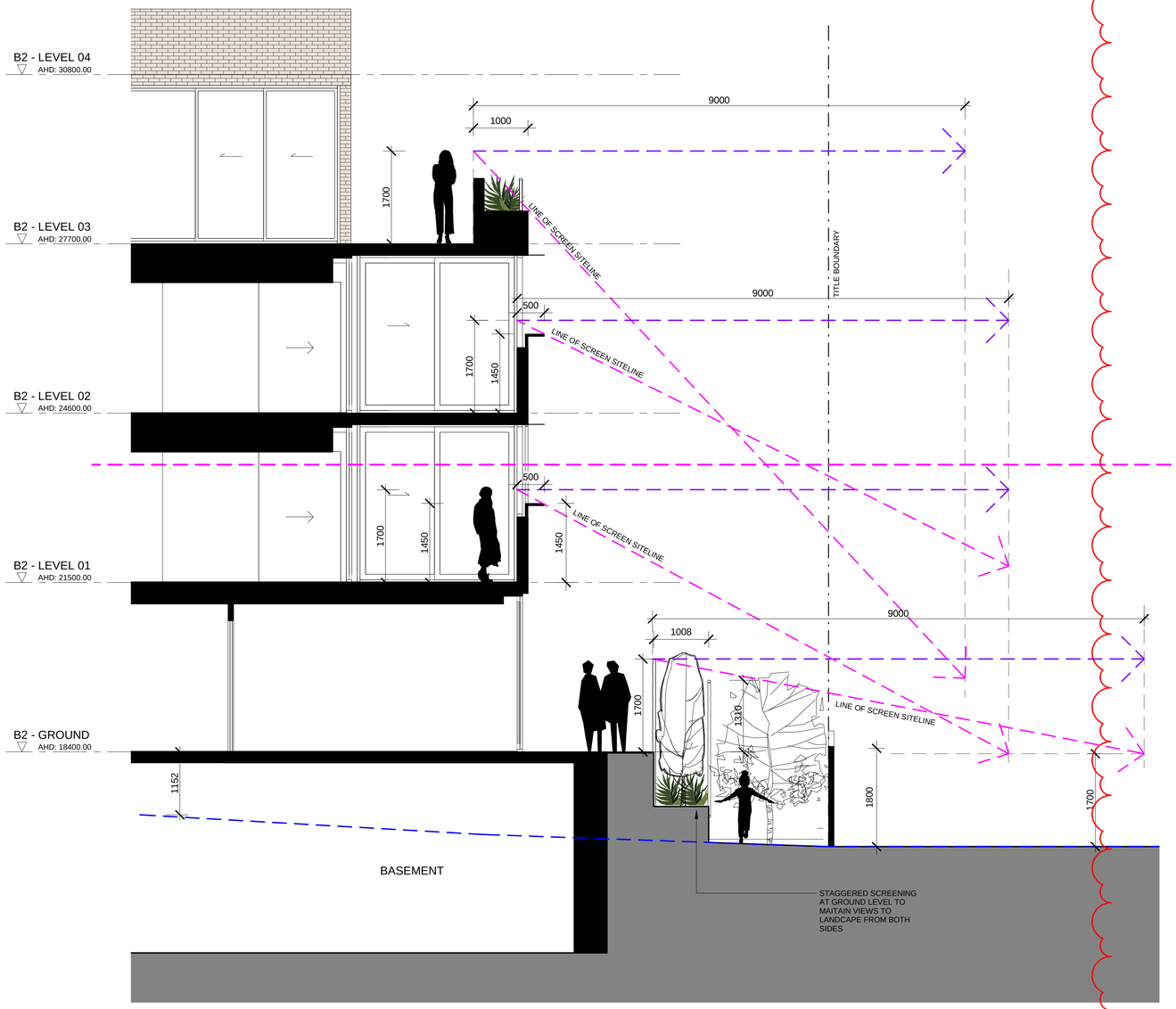
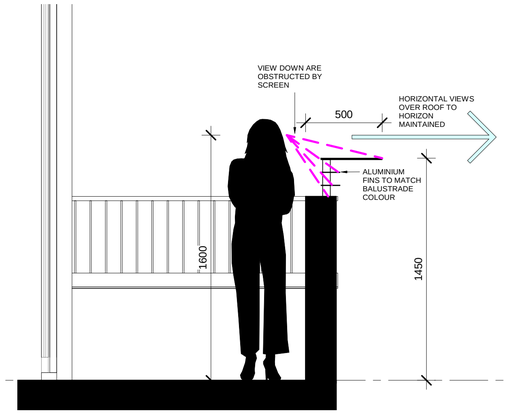
PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

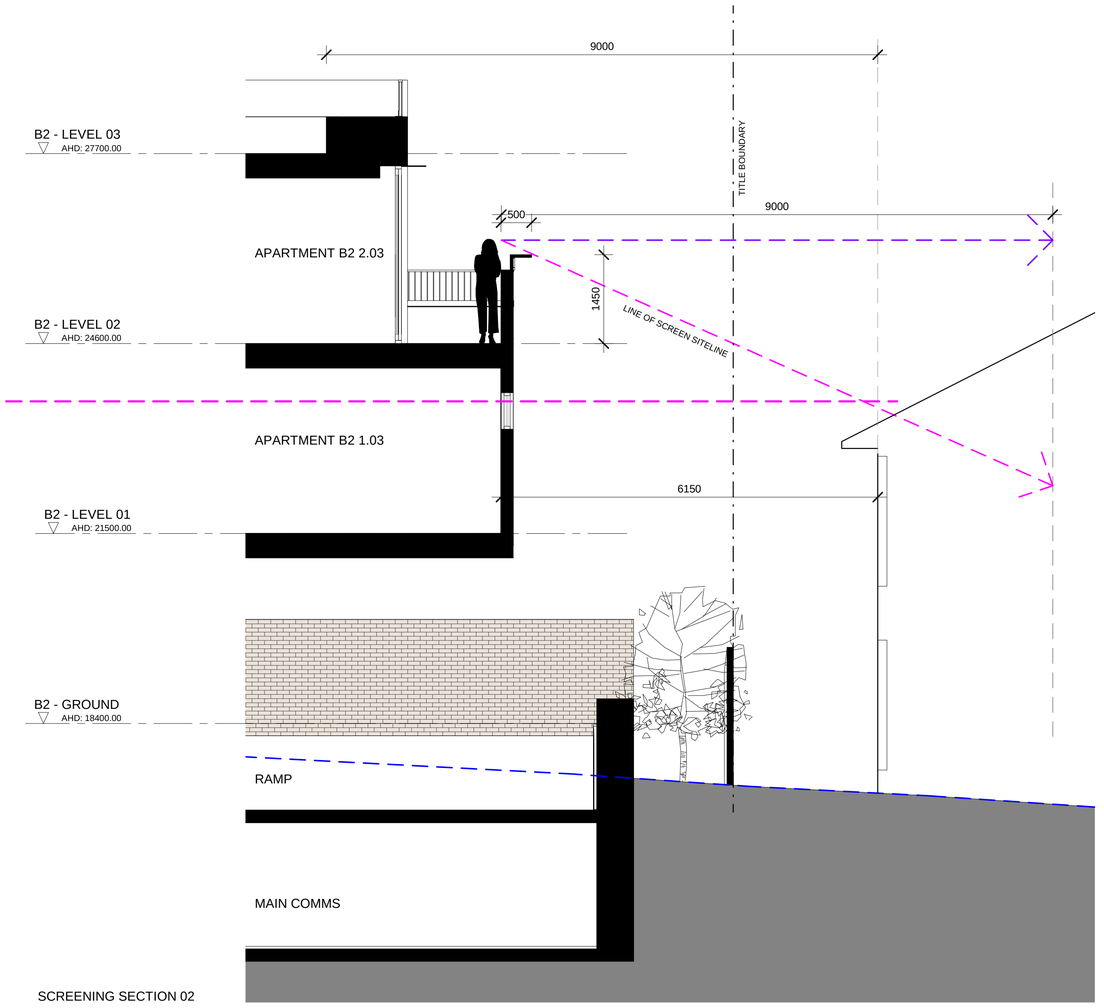
DRAWING TITLE:
PROPOSED SECTIONS

DATE: 24/05/2022
JOB No: 42009
SCALE: 1:100@A1
REVISION No: F
DRAWN: BHA
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-401



OVERLOOKING SCREEN DETAIL





SCREENING SECTION 01

SCREENING SECTION 02

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8 WARLEY AVENUE COWES

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PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
PRIVACY SCREENS

DATE: 06/08/22
JOB No: 42009
SCALE:
REVISION No: D
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-402



AF01 - CONCRETE (OR SIMILAR), WITH NATURAL FINISH, UNDERSIDE OF ARCH TO BE FINISHED IN TIMBER LOOK FORMLINER WITH SMOOTH VERTICAL FACES

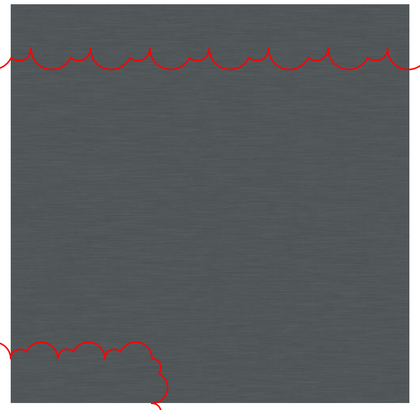


GL01 - PROPOSED GENERAL GLAZING TYPE. ALUMINIUM GLAZING FRAME TO SELECTED GRET POWDERCOAT FINISH. CLEAR GLASS INFILLS. GLAZING TO INCORPORATE SASH WINDOWS AND SLIDING DOORS AS PER PLANS / ELEVATIONS.

DOUBLE GLAZING OR BETTER IS TO BE PROVIDED TO ALL WINDOWS



BR01 - PROPOSED FACE BRICKWORK TO WALLS AND FENCES AS SHOWN. BRICK TO BAGGED RENDER BEIGE IN COLOUR (OR SIMILAR)



AL01 / TM01 - PROPOSED FRAMES, FEATURE FINS, LOUVRES, WINDOW FRAMES, CANOPIES, PRIVACY SCREENS AND SHADING DEVICES. COLOUR CHARCOAL (OR SIMILAR)



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8 WARLEY AVENUE COWES

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PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
FINISHES SCHEDULE

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-501

BUILDING 1 - GROUND				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
G01	2B2B	N	78.8	39.7
G02	2B2B	N	78.8	39.9
G03	1B1B	E	55.4	16.6
G04	2B2B	E	78.9	29.7
G05	2B2B	E	79.2	29.9
G06	2B2B	S	86.6	57.2
G07	2B2B	S	85.8	53.2
G08	3B2B	W	125.3	142.4
G09	1B1B	W	52.5	45.2
G10	3B2B	W	123.6	64.0
TOTAL	**10**		**844.9**	**517.8**

BUILDING 2 - GROUND				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
G01	2B2B	N	85.8	103.7
G02	2B2B	N	86.1	88.7
G03	2B2B	E	79.4	27.7
G04	2B2B	E	79.2	27.9
G05	2B2B	S	73.8	40.3
G06	2B2B	S	78.9	40.4
G07	3B2B	W	123.4	62.9
G08	1B1B	W	52.5	43.9
G09	3B2B	W	125.3	160.4
TOTAL	**9**		**784.4**	**595.9**

BUILDING 1 - LEVEL 01				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
101	2B2B	N	78.9	10.0
102	2B2B	N	79.4	10.0
103	2B2B	E	105.8	14.3
104	2B2B	E	78.9	9.7
105	2B2B	E	79.6	10.0
106	2B2B	S	83.3	44.3
107	2B2B	S	85.7	44.4
108	2B2B	W	84.4	10.2
109	1B1B	W	53.2	8.8
110	1B1B	W	53.2	9.0
111	2B2B	W	82.2	11.3
TOTAL	**11**		**864.6**	**182.0**

BUILDING 2 - LEVEL 01				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
101	2B2B	N	85.6	45.4
102	2B2B	N	87.9	43.8
103	2B2B	E	97.3	11.5
104	1B1B	E	53.0	9.5
105	2B2B	E	79.4	9.0
106	2B2B	S	73.8	10.3
107	2B2B	S	78.9	10.0
108	2B1B	W	82.2	11.3
109	1B1B	W	52.8	8.8
110	1B1B	W	52.8	8.8
111	2B2B	W	83.7	10.3
TOTAL	**11**		**827.4**	**178.7**

BUILDING 1 - LEVEL 02				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
201	2B2B	N	78.9	10.0
202	2B2B	N	78.9	10.1
203	2B2B	E	105.1	14.0
204	2B2B	E	78.9	9.7
205	2B2B	E	87.7	9.8
206	2B2B	S	83.8	10.1
207	2B2B	S	86.2	9.7
208	2B2B	W	83.8	10.2
209	1B1B	W	52.8	8.6
210	1B1B	W	52.8	8.0
211	2B2B	W	82.8	9.4
TOTAL	**11**		**871.7**	**109.6**

BUILDING 2 - LEVEL 02				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
201	2B2B	N	85.7	10.1
202	2B2B	N	88.0	10.1
203	2B1B	E	83.7	26.2
204	1B1B	E	52.7	9.7
205	2B2B	E	79.4	9.4
206	2B2B	S	73.8	10.3
207	2B2B	S	78.8	10.0
208	2B1B	W	82.3	11.3
209	1B1B	W	52.8	8.8
210	1B1B	W	52.8	8.8
211	2B2B	W	83.7	10.3
TOTAL	**11**		**813.7**	**125.0**

BUILDING 1 - LEVEL 03				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
301	2B2B	N	79.0	10.0
302	2B2B	N	78.7	10.0
303	3B2B	E	111.3	26.3
304	2B2B	E	81.4	68.8
305	2B2B	S	83.8	10.1
306	2B2B	S	85.3	9.7
307	3B2B	S&W	100.5	73.8
308	3B2B	N&W	101.4	54.8
TOTAL	**8**		**721.4**	**263.5**

BUILDING 2 - LEVEL 03				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
301	2B2B	N	84.6	10.1
302	2B2B	N	88.2	9.4
303	3B3B	N&E	122.1	78.8
304	1B1B	E	50.1	17.2
305	2B2B	S	73.8	10.3
306	2B2B	S	78.9	10.0
307	1B1B	S	60.5	39.9
308	3B2B	N&W	117.3	106.2
TOTAL	**8**		**675.5**	**281.9**

BUILDING 1 - LEVEL 04				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
401	2B2B	N	78.6	10.0
402	3B2B	N	103.4	15.0
403	3B2B	S&E	99.1	76.5
404	2B2B	S	83.9	9.7
405	2B2B	S	85.1	9.7
406	3B2B	N&W	107.4	96.2
TOTAL	**6**		**557.5**	**217.1**

BUILDING 2 - LEVEL 04				
UNIT NO.	APARTMENT TYPE	ORIENTATION	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
401	2B2B	N	85.9	9.2
402	2B2B	N	88.1	9.4
403	3B2B	N&E	126.2	58.0
404	2B2B	S	73.7	10.3
405	2B2B	S	79.0	10.0
406	3B2B	S&W	126.2	51.5
TOTAL	**6**		**579.1**	**148.4**

APARTMENT TOTALS / AREAS - BUILDING 1						
LEVEL	1B	2B	3B	TOTAL	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
GROUND	2	6	2	10	844.9	517.8
LEVEL 01	2	9	0	11	864.6	182.0
LEVEL 02	2	9	0	11	871.7	109.6
LEVEL 03	0	5	3	8	721.4	263.5
LEVEL 04	0	3	3	6	557.5	217.1
SUBTOTAL	**6**	**32**	**8**	**46**	**3860.1**	**1290.0**
PERCENT	**13%**	**70%**	**17%**			

APARTMENT TOTALS / AREAS - BUILDING 2						
LEVEL	1B	2B	3B	TOTAL	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
GROUND	1	6	2	9	784.4	595.9
LEVEL 01	3	8	0	11	827.4	178.7
LEVEL 02	3	8	0	11	813.7	125.0
LEVEL 03	2	4	2	8	675.5	281.9
LEVEL 04	0	4	2	6	579.1	148.4
SUBTOTAL	**9**	**30**	**6**	**45**	**3680.1**	**1329.9**
PERCENT	**20%**	**67%**	**13%**			

APARTMENT TOTALS / AREAS - TOTAL						
LEVEL	1B	2B	3B	TOTAL	APARTMENT GFA (sq.m.)	SPOS GFA (sq.m.)
GROUND	3	12	4	19	1629.3	1113.7
LEVEL 01	5	17	0	22	1692.0	360.7
LEVEL 02	5	17	0	22	1685.4	234.6
LEVEL 03	2	9	5	16	1396.9	545.4
LEVEL 04	0	7	5	12	1136.6	365.5
SUBTOTAL	**15**	**62**	**14**	**91**	**7540.2**	**2619.9**
PERCENT	**16%**	**68%**	**15%**			

GROSS FLOOR AREAS						
LEVEL	CARPARK / STORE	CORE / STRUCTURE	LOBBY	APARTMENT	EXTERIOR	TOTAL GFA (EXCL. EXT.)
BASEMENT	**2877**	**220**	**20**	0	0	3117
MEZAANINE	**1283**	**29**	**11**	0	0	1323
GROUND	485			1629	1114	2114
LEVEL 01	344			1692	361	2036
LEVEL 02	277			1685	235	1962
LEVEL 03	213			1397	545	1610
LEVEL 04	179			1137	366	1316
TOTAL	**5938**			**7540**	**2620**	**13478**

CAR PARKING			
LOCATION	FOR RESIDENTS	FOR VISITORS	TOTAL
BASEMENT	72	12	84
MEZZANINE	33	0	33
TOTAL	**105**	**12**	**117**

OTHER PARKING	FOR RESIDENTS	FOR VISITORS	TOTAL
BICYCLE	91	21	112
MOTOR	5		5

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8 WARLEY AVENUE COWES

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B	1/07/22	ISSUED FOR TOWN PLANNING
C	21/07/22	ISSUED FOR TOWN PLANNING
D	28/07/22	ISSUED FOR TOWN PLANNING
E	14/09/22	RESPONSE TO RFI
F	04/10/22	RESPONSE TO RFI

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

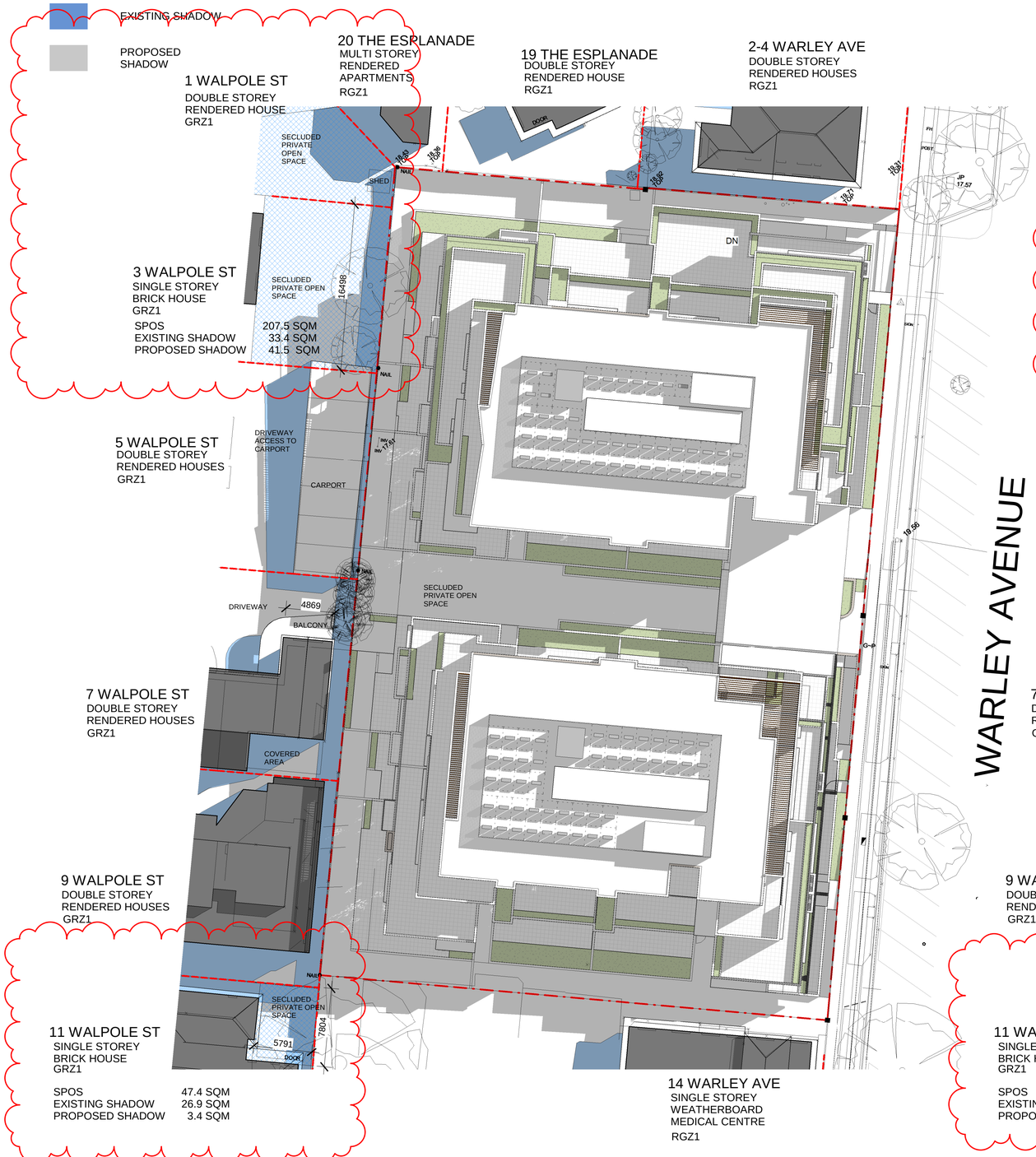
DRAWING TITLE:
AREA SCHEDULES

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: F
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-502

LEGEND

EXISTING SHADOW

PROPOSED SHADOW



September 22 - 9am



September 22 - 10am

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8 WARLEY AVENUE COWES

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E	04/10/22	RESPONSE TO RFI

0 2 5 1 20m

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

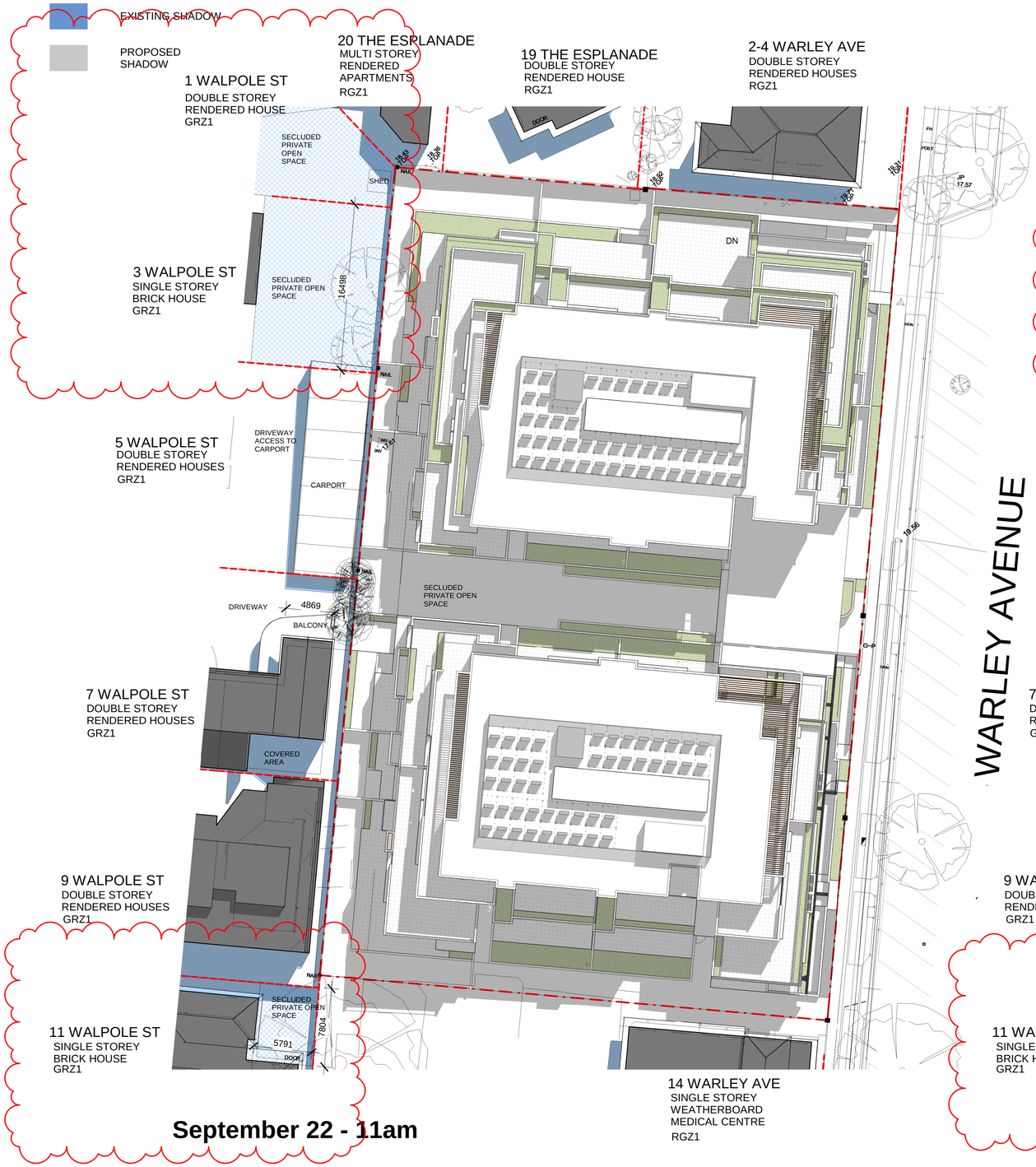
DRAWING TITLE:
SHADOW DIAGRAMS

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-600

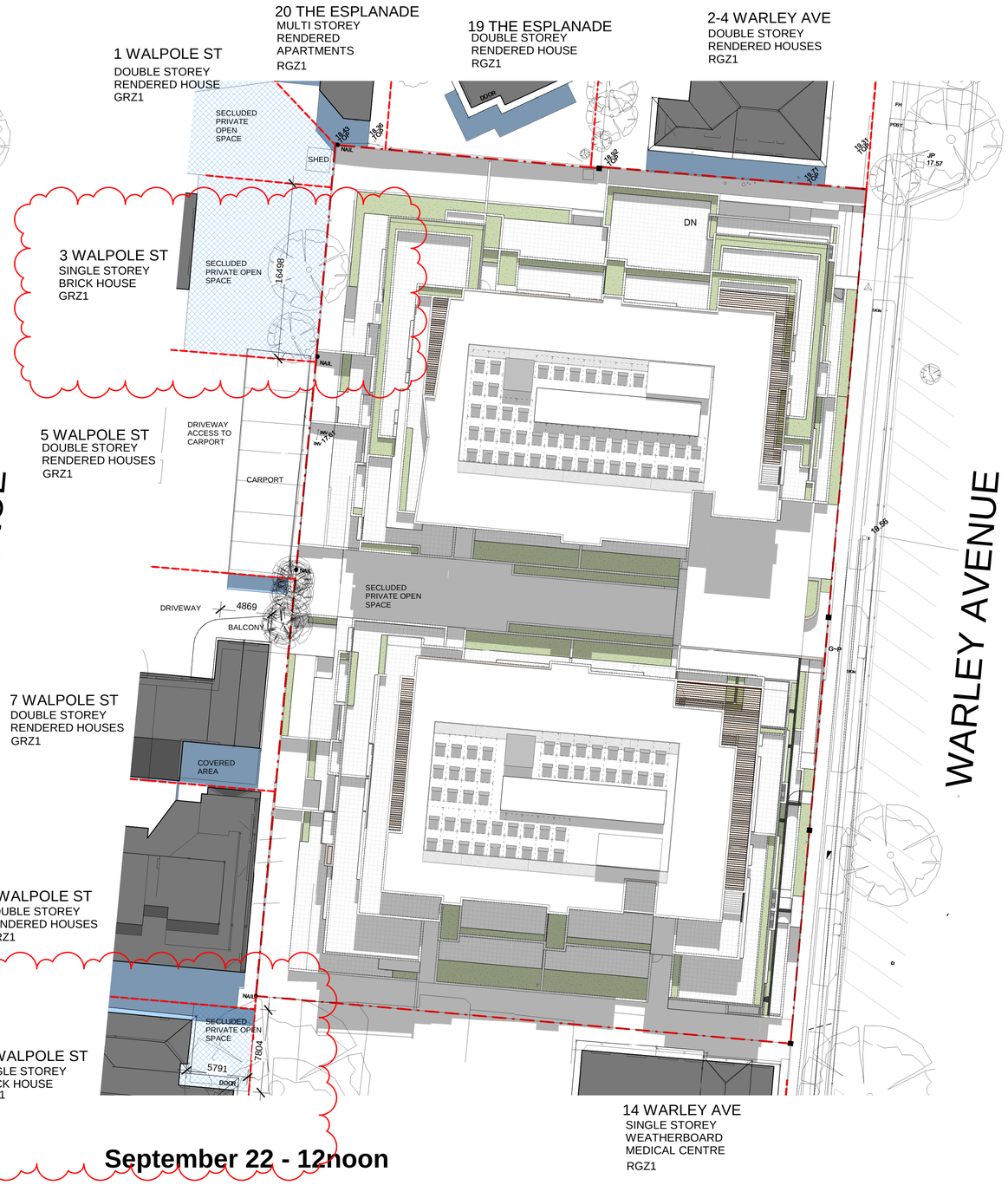
LEGEND

EXISTING SHADOW

PROPOSED SHADOW



September 22 - 11am



September 22 - 12noon

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8 WARLEY AVENUE COWES

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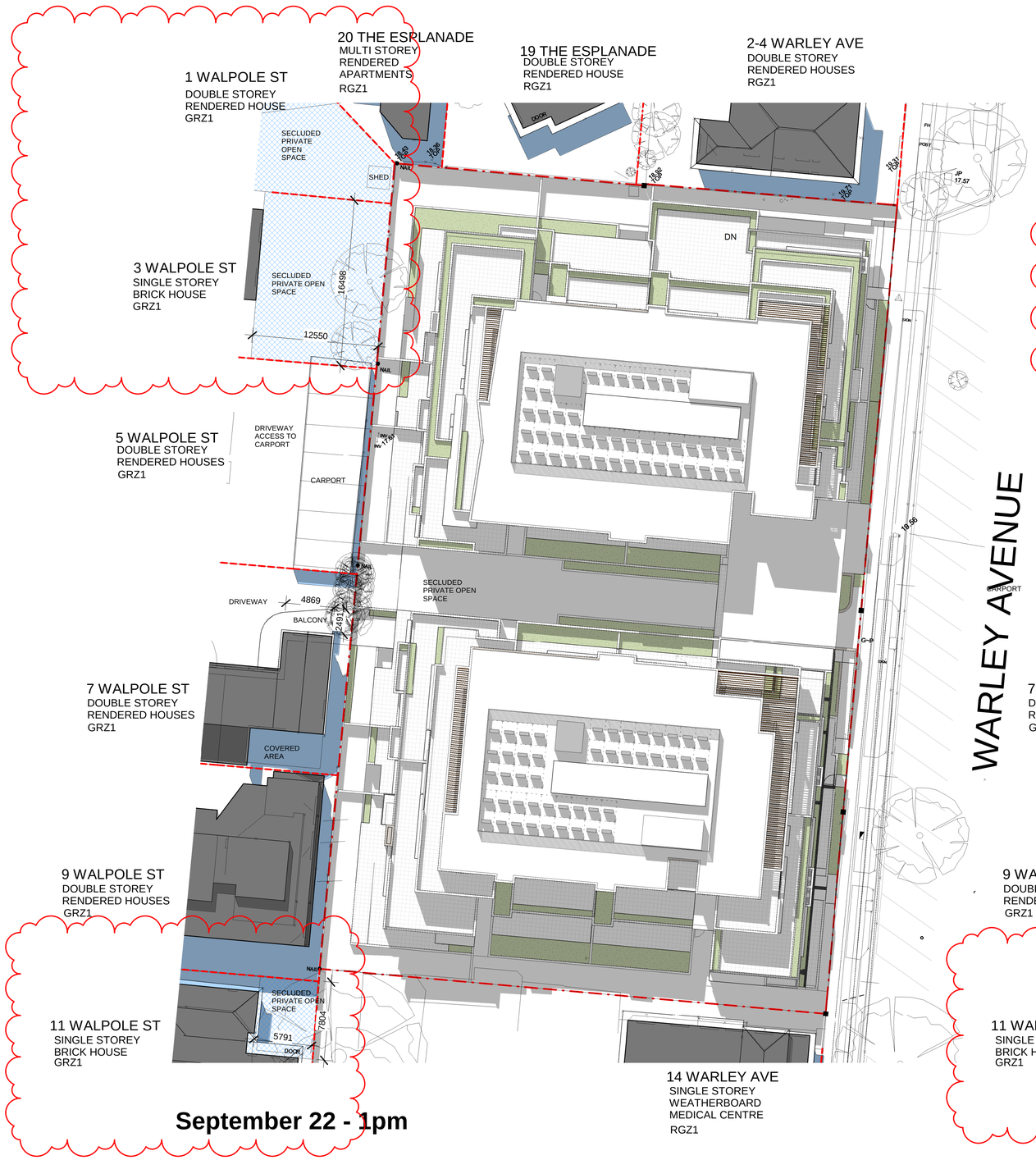
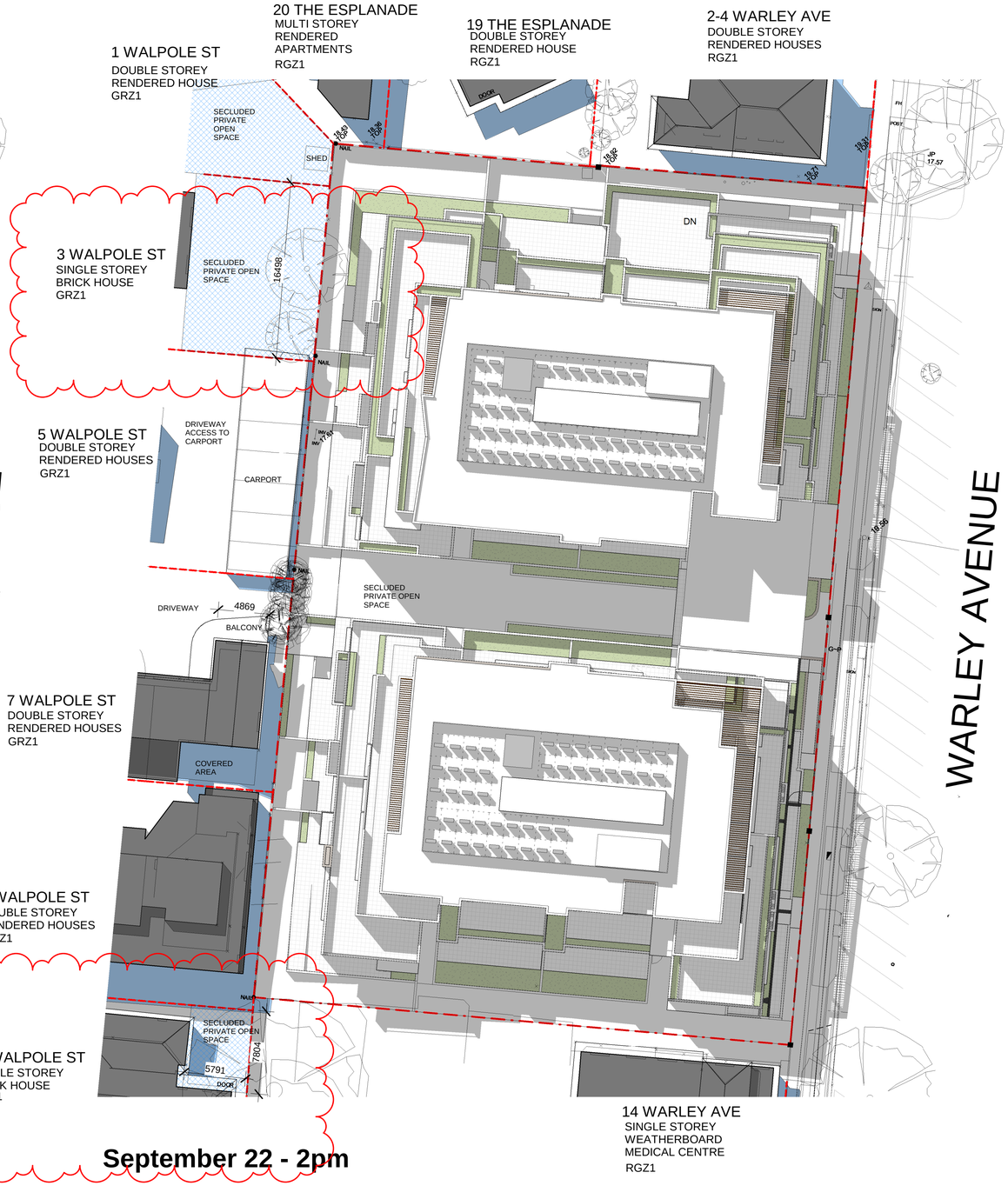
PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SHADOW DIAGRAMS

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-601





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8 WARLEY AVENUE COWES

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E	04/10/22	RESPONSE TO RFI

LEGEND

EXISTING SHADOW

PROPOSED SHADOW

PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

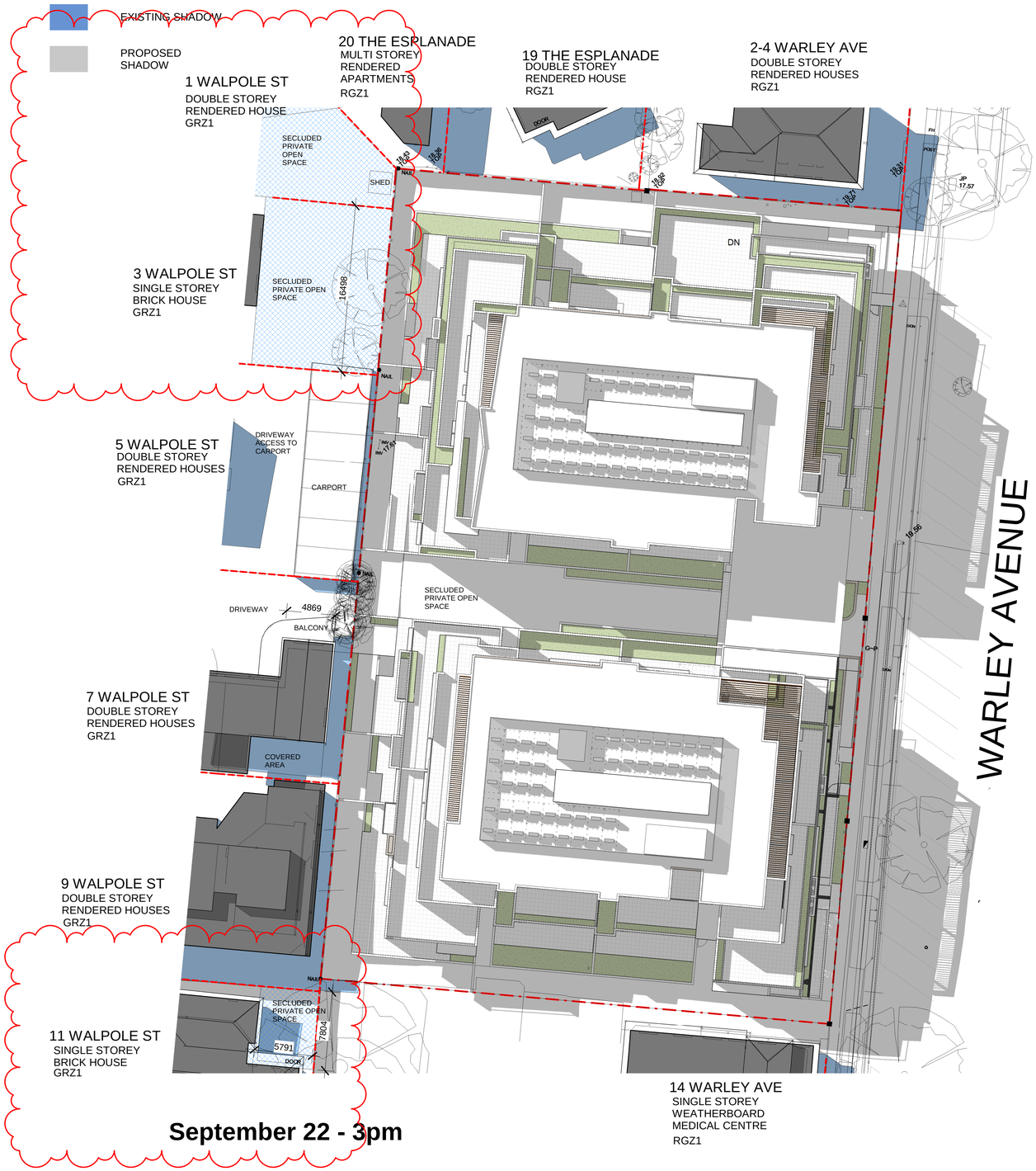
DRAWING TITLE:
SHADOW DIAGRAMS

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-602

LEGEND

EXISTING SHADOW

PROPOSED SHADOW



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8 WARLEY AVENUE COWES

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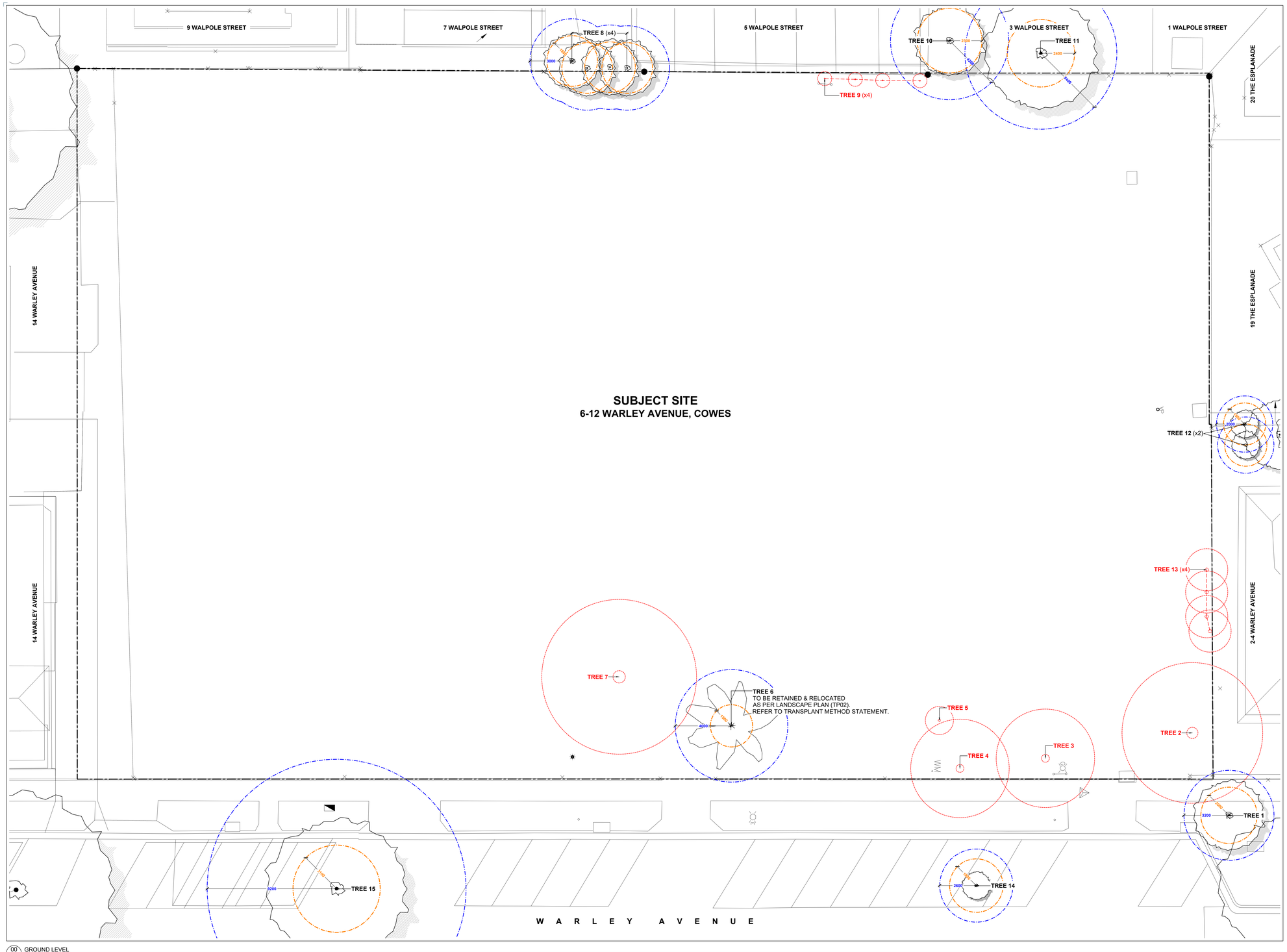
PROJECT:
PROPOSED
6 - 12 Warley Avenue, Cowes

DRAWING TITLE:
SHADOW DIAGRAMS

DATE: 24/05/2022
JOB No: 42009
SCALE:
REVISION No: E
DRAWN: Author
DRAWING STATUS: TOWN PLANNING
DRAWING No: TP-603



00 GROUND LEVEL
Scale 1:100 @ A0

LEGEND

- Existing Tree to be Retained
  Refer to Arboricultural Report (Nov 2021)
  & Development Impact Assessment by
  Arbor Survey (Apr 2022) for Further Details
- Tree Protection Zone (TPZ) Dashed Blue
  Structural Root Zone (SRZ) Dashed Orange
  Refer to Tree Protection Notes
- Existing Palm to be Relocated
  Refer to Transplant Method Statement
- Existing Tree to be Removed
  Refer to Existing Vegetation Schedule

EXISTING VEGETATION SCHEDULE

No.	BOTANICAL NAME	COMMON NAME	HEIGHT X WIDTH	Structural Root Zone (SRZ) Radius	Tree Protection Zone (TPZ) Radius	RETAIN / REMOVE	COMMENTS
TREES*							
1	*Photinia serratifolia*	Chinese Photinia	5 x 6m	2.0m	3.2n	Retain	Street Tree
2	*Chamaecyparis lawsoniana*	Law son's Cypress	13 x 10m	-	-	Remove	-
3	*Corymbia ficifolia*	Red Flow ering Gum	7 x 7m	-	-	Remove	-
4	*Agonis flexuosa*	Willow Myrtle	7.5 x 7m	-	-	Remove	-
5	*Rosa rubiginosa*	Briar Rose	2 x 1m	-	-	Remove	-
6	*Phoenix canariensis*	Canary Island Palm	10 x 6m	1.5m	4.0m	Retain	To Be Relocated
7	*Laphostemon confertus*	Queensland Brushbox	10.5 x 11m	-	-	Remove	-
8	*Pittosporum tenuifolium*	Kohuhu	7.5 x 3m	1.8m	3.0m	Retain	Neighbouring
9	*Hydrangea sp.*	Hydrangea	2 x 1m	-	-	Remove	-
10	*Eriobotrya japonica*	Loquat	6 x 5m	2.3m	4.2m	Retain	Neighbouring
11	*Pyrus calleryana*	Callery Pear	9 x 10m	2.4m	5.4m	Retain	Neighbouring
12	*Musa sp.*	Banana Palms	5.5 x 2m	1.5m	2.0m	Retain	Neighbouring
13	*Cinnamomum camphora*	Camphor Laurel	5.5 x 3m	-	-	Remove	-
14	*Araucaria heterophylla*	Norfolk Island Pine	7 x 2.5m	1.9m	2.6m	Retain	Street Tree
15	*Araucaria heterophylla*	Norfolk Island Pine	18 x 8m	3.1m	9.2m	Retain	Street Tree

*Refer to Arboricultural Report by Arbor Survey (Nov 2021) &
Development Impact Assessment by Arbor Survey (Apr 2022) for Further Details

TREE PROTECTION NOTES

BACKGROUND

Arbor Survey Pty Ltd assesses individual tree protection requirements based upon the Australian Standard *AS4970-2009 - Protection of Trees on Development Sites*. Tree protection requirements are calculated based upon trunk diameter of the tree at breast height. These calculations produce what is referred to in this report as the Tree Protection Zone (TPZ) and is provided as a measurement in metres in a radius from the centre of the trunk.

The TPZ is the zone in which protective measures should be applied in order to protect the tree(s) whilst maintaining the current levels of health and vigour.

Determination of the structural root zone or the zone of rapid taper is provided as the Structural Root Zone (SRZ). The structural root zone calculations (may also be referred to as the Root Plate Radius (RPR)) of the tree, based upon the *Australian Standard AS4970-2009*. The SRZ determines the minimum distance around the tree in which the structural stability of the tree should be able to be maintained.

It is important to note that the SRZ only determines the root plate area or the zone of rapid taper. Excavation within this area will not only cause a decline in tree vigour but may also cause catastrophic tree failure (Coder, 1996).

Often it is difficult to protect the entire TPZ due to site constraints. In such events it is imperative that condition and species tolerance to disturbance are evaluated in conjunction with the site characteristics. Helliwell (1985) and Harris (1999) identified that a healthy tree may tolerate removal of up to one-third of its roots and possibly up to 50% in some cases, although stability may be compromised at this level.

In situations where the TPZ of a tree to be retained will be in close proximity to a proposed development or where there will be encroachment into the TPZ of a tree, a specific tree management plan should be developed. This plan provides prescriptive measures to protect trees on development sites

GENERAL TREE PROTECTION REQUIREMENTS

The following requirements are only provided only for basic guidance, these guidelines do not constitute a specific tree management and protection plan.

- A tree protective fence should be installed at the recommended distance allocated for each tree to be retained. The fence should be located at the TPZ distance provided where possible.
- The protection fence should be rigid (chain link or similar) and should not be less than 1.8 metres in height. Fencing should be firmly attached to a removable concrete or similar base. Alternatively, star pickets (1.5 metre spacing) and para-webbing may be used to define the tree protection area. Fencing should be in accordance with the *Australian Standard for Temporary Fencing AS4687*.
- In cases where the TPZ cannot be entirely fenced, it is recommended that ground protection is used. Specific ground protection requirements will form part of a tree protection plan that should be developed for all trees to be retained.
- No soil levels must be altered within the fenced TPZ area, no heavy machinery should be allowed to pass within this area and no spoil, chemicals, building materials or refuse should be stored within this area. Nothing whatsoever should be attached to the tree (excluding tape to identify a tree to be protected).
- The area within the tree protection fence should be covered with a layer of organic mulch (mixed particle sized woodchip) to a depth of 100mm prior to the commencement of the project. Mulch material should comply with *Australian Standard AS4454*.
- The tree protective fencing should be installed prior to any works (including demolition) commencing on site and should remain in place until all site development work is completed. The protective fencing should be located at the prescribed TPZ distance where possible and clearly signed **TREE PROTECTION ZONE**. The sign should be similar to the attached image (as recommended by the *Australian Standard AS4970-2009*) and should be of a size no smaller than 400mm x 300mm.
- An area should be designated on site, outside of any tree protection zone, where all building materials, chemicals etc. can be stored throughout the proposed development.
- Open trenching for underground services located within the recommended tree protection zone (TPZ) must be avoided. Should there be no alternative for service location; the services must be bored underneath the TPZ or a non-destructive root investigation (NDRI) should be undertaken. No trenching with machinery should be used to install services within the protected area.
- Soil moisture during construction should be maintained at not less than 50% of field capacity (usually 10 litres of water per 10mm of each tree DBH per week). Irrigation may be applied by hand, automatic or manual irrigation system, or by fine spray from water tanker located outside the fenced area. Water is to be applied at a volume and frequency required so as to maintain turgor and leaf retention and encourage healthy root development. The Project Arborist should discuss variations to the amount of water to be supplied with the site or Project Manager.
- Remedial pruning works recommended to be undertaken on the project trees must be carried out to *Australian Standard AS4373-2007 – Pruning of Amenity Trees*, by a qualified Arborist (Minimum AQF Level 3). If pruning works are to be undertaken, then these works should be carried out prior to any construction works beginning on site.
- Documentation should be provided to the site manager by the Project Arborist for each inspection during the development process which details the consultant Arborist name, date and time of inspection, the stage of development, and provides comments of what actions are required.

TRANSPLANT METHOD STATEMENT

Relocation of Tree 6

1. Prior to the commencements of works, Tree 6, a Canary Island Palm, is to be lifted and stored off-site until construction is complete and landscape works have commenced. The palm can then be returned to site and replanted in the location specified on the endorsed Landscape Architectural plan.
2. All handling of the palm throughout the entire transplant period is only to be carried out by a reputable company experienced in the relocation of large palms.
3. As the palm is located close to the boundary, permission may need to be sought from the owner of the neighbouring property to enter and maybe excavate within their property to facilitate removal of the palm from its current location.

Timing

4. Although Canary Island Date Palms can be moved at any time of year, transplanting during the warmer months (October to February) is preferred during active growth, so the palm can quickly re-establish new roots.
5. This applies to retrieval of the Palm off-site, as well as to final transplanting at the end of works.

Root pruning

6. Palms should be root pruned between 4-8 weeks before transplanting. While not essential, it is recommended for large palms as it encourages new root growth which can then be included in the root ball for transplanting. Root pruning is to take place 750mm from the palm trunk, with this to be the size of the eventual root ball (a diameter of 1.5m). As the palm is located close to the boundary, permission may need to be sought from the owner of the neighbouring property to achieve

Notes on digging

7. If soil is very sandy, dig by hand. If soil is sandy the soil should be wet thoroughly before digging to keep root ball intact.

Transport and Storage

8. The palm should be well supported to prevent damage to the apical bud.
9. With Canary Island Date Palms it is recommended that the trunk be splinted with a beam attached to the trunk, and extending up into the crown of the palm. The trunk and crown must be protected with burlap, or like material, where chains, ropes etc. may cause damage during lifting.
10. Half the leaves of the palm should be removed at the time of transport, including the ring of fronds directly below the base to provide clearance when craning. The remaining fronds shall be tied up with biodegradable string to protect the bud and reduce transpiration.
11. The palm is to be stored off site, in-ground (or in a suitable planting enclosure) and managed by the contractor until the end of construction works where final transplanting can be undertaken.

Replanting

12. The planting hole is to extend 450mm laterally beyond the root ball and is to be no deeper than the root ball. The palm is not to be planted into a hole with standing water present, and under no circumstances is to be replanted any deeper than the depth at which it was originally grown.
13. The backfill is not to be modified and should not have any air pockets present. A berm is to be constructed around the re-planted palm to catch irrigation water.
14. If deemed necessary by the contractor. This bracing should consist of 50x100mm wooden boards being braced to the trunk which is wrapped in burlap or like material to prevent damage. Under no circumstances are nails to be driven into the trunk.
15. The initial irrigation is to be deep and thorough so that the root ball is fully wet. The root ball should by evenly moist but not saturated for the first 4-6 months after transplanting, with it being recommended that the palm is watered once a week for the first season, and then monthly. During particularly hot weather the trunk and leaves can also be moistened.
16. A light application of palm specific, granular, slow release fertilizer can be added in a ring at the edge of the planting ball, with a foliage spray of micronutrients added. After new fronds start to develop a regular fertilization program can begin.

Maintenance Period

17. The Palm is to be managed post-transplanting for a period of 12 months by the arborist. Inspections are to be undertaken every 3 months during this period.

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admin@johnpatrick.com.au
www.johnpatrick.com.au

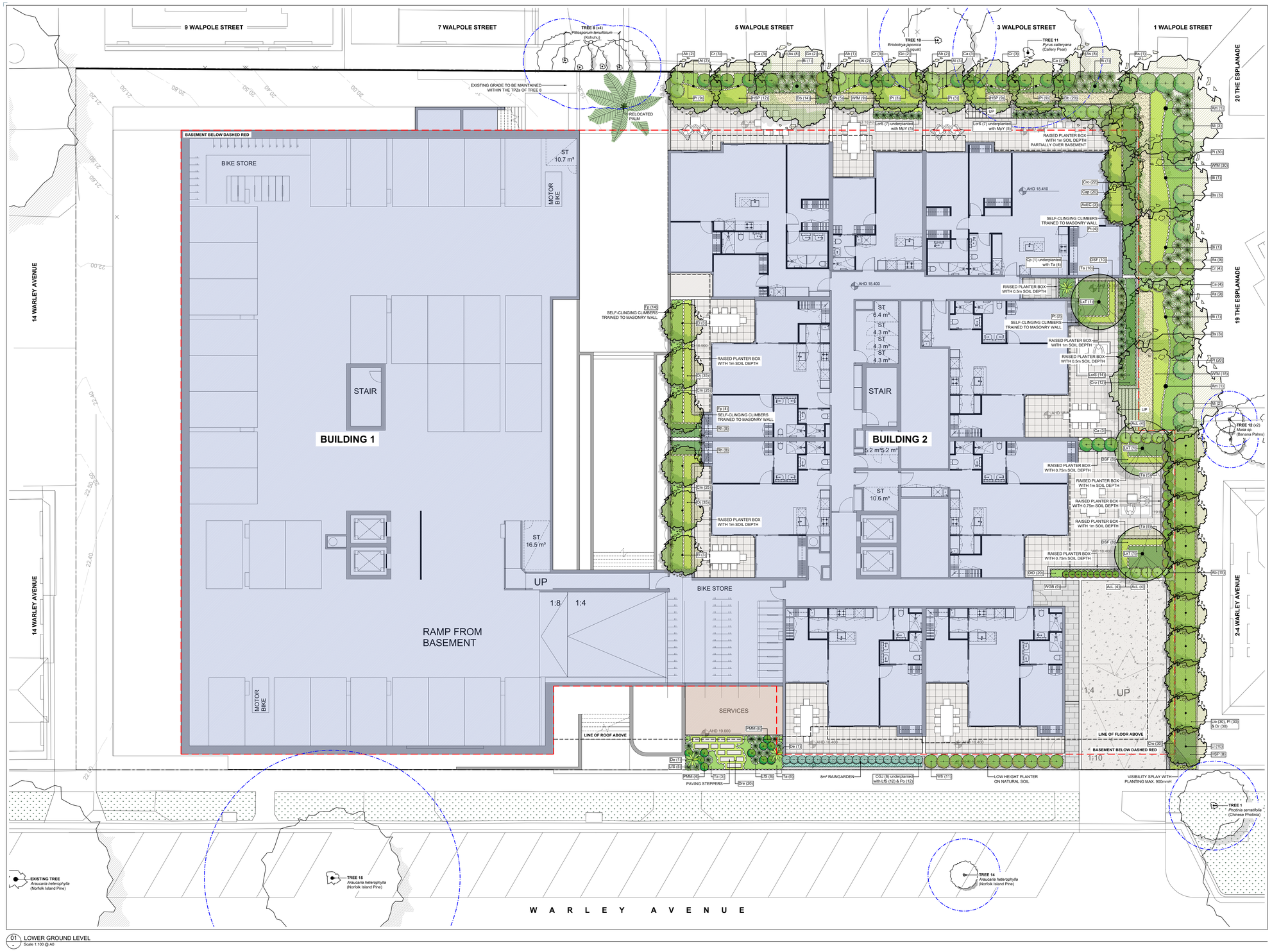
REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
Existing Vegetation Plan
for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-560
DWG NO	L-TP00 Rev A
CAD FILE	21-560 L-TP Rev A.dwg



01 LOWER GROUND LEVEL
Scale 1:100 @ A0

LEGEND

- Existing Tree to be Retained. Tree Protection Zone (TPZ) Dashed Blue. Refer to Existing Vegetation Plan & Tree Protection Notes (TP00)
- Proposed New Location for Existing Palm. Refer to Transplant Method Statement (TP00)
- Proposed New Evergreen Trees. Refer to Plant Schedule
- Proposed New Deciduous Trees. Refer to Plant Schedule
- Proposed New Shrubs. Refer to Plant Schedule
- Proposed New Groundcovers & Grasses. Refer to Plant Schedule
- Proposed New Climbers. Refer to Plant Schedule
- Proposed New Raingarden. Refer to Plant Schedule & Typical Detail D4 (TP06)
- Proposed New Gravel Surface. Refer to Specification (TP06)
- Proposed New Feature Paving. To Later Detail
- Proposed New Paving. To Later Detail
- Proposed New Concrete Driveway. To Engineer's Detail
- Proposed New Raised Planter Box. Min. 1m Soil Depth for Trees, 0.75mm for Shrubs & 0.5m for Groundcovers. Refer to Specification (TP06)
- Proposed New Retaining Wall. To Architect's Detail
- Reinstated/Repaired Naturestrip. Refer to Specification (TP06)

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

PLANT SCHEDULE - LOWER GROUND LEVEL

SYM	BOTANICAL NAME	COMMON NAME	D/E I/N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
TREES						
AcEC	*Acacia cognata* 'Emerald Curl'	Emerald Curl River Wattle	E/N	3-5 x 3m	30cm²1.5mH	3
Am	*Acacia melanoxylon*	Blackwood	E/I	12 x 8m	50cm²2.0mH	2
Al	*Allocasuarina littoralis*	Black Sheoak	E/I	7 x 3m	50cm²2.0mH	7
Bi	*Banksia integrifolia*	Coast Banksia	E/I	12 x 6m	50cm²2.0mH	5
El	*Eupomatia laurina*	Copper Laurel	E/Ex	5 x 3m (Clipped)	50cm²2.0mH	6
LxT	*Lagerstroemia in. x L. fa.* 'Tuscarora'	Tuscarora Crepe Myrtle	D/Ex	7 x 4m	50cm²2.0mH	3
Ll	*Leptospermum lanigerum*	Woolly Tea-tree	E/I	6 x 3m	30cm²1.5mH	10
					TOTAL	**36**
SHRUBS						
AcL	*Acacia cognata* 'Limelight'	Limelight Dw arf River Wattle	E/N	0.5 x 1m	200mm pot	12
Ab	*Alyxia buxifolia*	Sea Box	E/I	1 x 1m (Clipped)	200mm pot	20
Bs	*Bursaria spinosa*	Sw eet Bursaria	E/I	4 x 2m (Clipped)	200mm pot	7
Ca	*Correa alba*	White Correa	E/I	1.5 x 1m (Clipped)	200mm pot	16
Cr	*Correa reflexa*	Common Correa	E/I	1 x 1m	200mm pot	13
Cp	*Crinum pedunculatum*	Sw amp Lily	E/N	2.5 x 1.5m	200mm pot	1
De	*Doryanthes excelsa*	Gymea Lily	E/N	2.5 x 1.5m	200mm pot	2
Go	*Goodenia ovata*	Hop Goodenia	E/I	1 x 1.5m	200mm pot	4
Mi	*Myoporum insulare*	Boobialla	E/I	5 x 2m	200mm pot	5
PMM	*Pittosporum tobira* 'Miss Muffett'	Miss Muffett Pittosporum	E/Ex	0.5 x 0.5m (Clipped)	200mm pot	10
WGB	*Westringia* 'Grey Box'	Native Box	E/N	0.5 x 0.5m	200mm pot	9
Wfr	*Westringia fruticosa* 'Blue Gem'	Blue Gem Coastal Rosemary	E/N	1.5 x 1m	200mm pot	11
					TOTAL	**110**
GROUNDCOVERS & GRASSES						
As	*Austrostipa stipoides*	Prickly Spear-grass	E/I	0.8 x 0.8m	140mm pot	34
Cro	*Carpobrotus rossii*	Karkalla	E/I	Spreading	140mm pot	64
Cap	*Chrysocephalum apiculatum*	Common Everlasting	E/I	0.5 x 0.8m	140mm pot	20
Cm	*Clivia miniata* 'Belgian Hybrid'	Belgian Hybrid Clivia	E/Ex	0.6 x 0.6m	140mm pot	50
Db	*Dianella brevicaulis*	Small-flow er Flax Lily	E/I	0.5 x 0.4m	140mm pot	34
Dr	*Dianella revoluta*	Black Anther Flax Lily	E/I	1 x 1m	140mm pot	30
DtD	*Dianella tasmanica* 'Destiny'	Destiny Flax Lily	E/N	0.3 x 0.3m	140mm pot	20
DSF	*Dichondra argentea* 'Silver Falls'	Silver Falls Dichondra	E/Ex	0.1 x Trailing	140mm pot	26
Dre	*Dichondra repens*	Kidney Plant	E/I	0.1 x 1m	140mm pot	20
HSP	*Hardenbergia violacea* 'Sea of Purple'	Sea of Purple Coral Pea	E/N	0.4 x 1m	140mm pot	29
LFS	*Lomandra fluviatilis* 'Shara'	Shara Mat-rush	E/N	0.4 x 0.5m	140mm pot	13
Llo	*Lomandra longifolia*	Spiny-headed Mat-rush	E/I	1 x 1m	140mm pot	30
MpY	*Myoporum parvifolium* 'Yareena'	Yareena Creeping Boobialla	E/N	0.1 x 1m	140mm pot	10
Oj	*Ophiopogon jaburan*	Giant Mondo Grass	E/Ex	0.4 x 0.4m	140mm pot	70
Pl	*Poa labillardieri*	Tussock Grass	E/I	0.8 x 0.8m	140mm pot	109
Rh	*Ruscus hypoglossum*	Butcher's Broom	E/Ex	0.5 x 0.6m	140mm pot	16
Ta	*Trachelospermum asiaticum*	Yellow Star Jasmine	E/Ex	0.2 x Trailing	140mm pot	36
WfM	*Westringia fruticosa* 'Mundi'	Groundcover Coastal Rosemary	E/N	0.4 x 1.5m	140mm pot	57
					TOTAL	**668**
CLIMBERS						
Fp	*Ficus pumila*	Climbing Fig	E/Ex	Self-clinging Climber	140mm pot	18
Pt	*Parthenocissus tricuspidata*	Boston Ivy	D/Ex	Self-clinging Climber	140mm pot	6
					TOTAL	**24**
RAINGARDEN						
CGJ	*Callistemon viminalis* 'Green John'	Green John Bottlebrush	E/N	1 x 0.6m	140mm pot	8
LFS	*Lomandra fluviatilis* 'Shara'	Shara Mat-rush	E/N	0.4 x 0.5m	140mm pot	12
Po	*Patersonia occidentalis*	Long-leaf Purple Flag	E/I	0.3 x 0.5m	140mm pot	12
					TOTAL	**32**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic
Indigenous plants selected from 'Indigenous Plants of Bass Coast Shire' Brochure

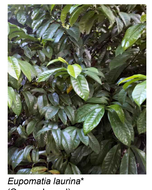
PLANT PALETTE


Acacia cognata 'Emerald Curl'
(Emerald Curl River Wattle)

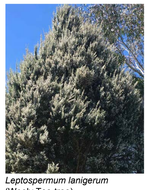

Acacia melanoxylon
(Blackwood)


Allocasuarina littoralis
(Black Sheoak)


Banksia integrifolia
(Coast Banksia)

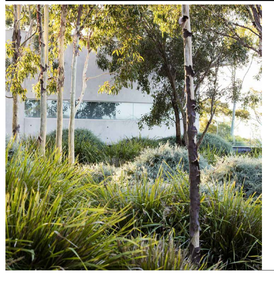
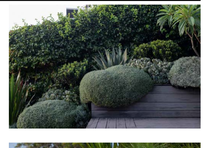
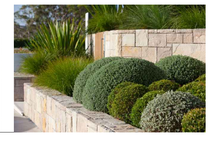

*Eupomatia laurina**
(Copper Laurel)


Lagerstroemia in. x L. fa. 'Tuscarora'
(Tuscarora Crepe Myrtle)


Leptospermum lanigerum
(Wooly Tea-tree)

***Note re Central Walkway**
Eupomatia laurina (Copper Laurel) is a small tree naturally occurring around coastal rainforests of Queensland, New South Wales and far eastern Victoria. It thrives in shady, protected areas and can grow in a diversity of soils. For example it is known to perform well under the dense canopy of Moreton Bay Figs where conditions are dry and heavily shaded.

PRECEDENT IMAGES

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REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
- Lower Ground Level -
Landscape Plan for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-060
DWG NO	L-TP01 Rev A
CAD FILE	21-060 L-TP Rev A.dwg



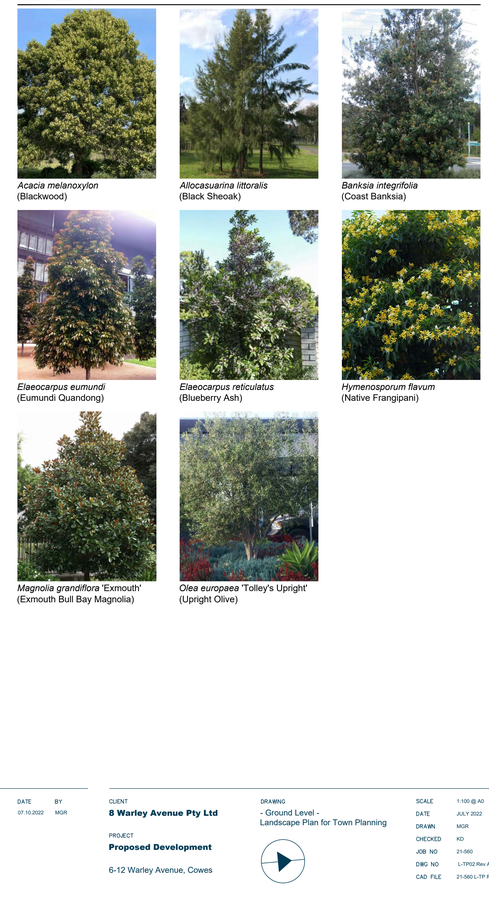
02 GROUND LEVEL
Scale 1:100 @ A0

PLANT SCHEDULE - GROUND LEVEL

SYM	BOTANICAL NAME	COMMON NAME	D/E	I/N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
TREES							
Am	*Acacia melanoxylon*	Blackwood	E/I		12 x 8m	50cm/2.0mH	1
Al	*Allocasuarina littoralis*	Black Sheoak	E/I		7 x 3m	50cm/2.0mH	10
Bi	*Banksia integrifolia*	Coast Banksia	E/I		12 x 6m	50cm/2.0mH	2
Ee	*Elaeocarpus eumundi*	Eumundi Quandong	E/N		5 x 3m (Clipped)	50cm/2.0mH	6
Er	*Elaeocarpus reticulatus*	Blueberry Ash	E/N		8 x 4m	50cm/2.0mH	2
Hf	*Hymenosporum flavum*	Native Frangipani	E/N		8 x 4m	50cm/2.0mH	3
MgE	*Magnolia grandiflora 'Exmouth'*	Exmouth Bull Bay Magnolia	E/Ex		8 x 3m	50cm/2.0mH	6
OeTU	*Olea europaea "Tolley's Upright'*	Upright Olive	E/Ex		4 x 3m	30cm/1.5mH	2
						TOTAL	**32**
TREES							
Pr	*Phoenix roebelenii*	Pygmy Date Palm	E/Ex		3 x 1.5m	1.5mH (Trunk)	3
						TOTAL	**3**
SHRUBS							
AcMC	*Acacia cognata 'Mini Cog'*	Dw arf River Wattle 'Mini Cog'	E/N		0.8 x 1.8m	200mm pot	1
Ama	*Alocasia macrorrhiza*	Giant Elephant Ears	E/Ex		1.8 x 1.5m	200mm pot	12
Ab	*Alyxia buxifolia*	Sea Box	E/I		1 x 1m (Clipped)	200mm pot	11
Aa	*Asplenium australasicum*	Birdsnest Fern	E/N		1 x 1.5m	300mm pot	4
BgSL	*Blechnum gibbum 'Silver Lady'*	Silver Fern	E/Ex		1.2 x 1m	300mm pot	3
Bs	*Bursaria spinosa*	Sw eet Bursaria	E/I		4 x 2m (Clipped)	200mm pot	4
Ca	*Correa alba*	White Correa	E/I		1.5 x 1m (Clipped)	200mm pot	9
Cr	*Correa reflexa*	Common Correa	E/I		1 x 1m	200mm pot	15
Cp	*Crinum pedunculatum*	Sw amp Lily	E/N		2.5 x 1.5m	200mm pot	5
Go	*Goodenia ovata*	Hop Goodenia	E/I		1 x 1.5m	200mm pot	17
Rx	*Rhododendron 'Xanadu'*	Dw arf Rhododendron	E/Ex		1 x 1m	200mm pot	54
Sr	*Sarcococca ruscifolia*	Fragrant Sw eet Box	E/Ex		1.5 x 1m (Clipped)	140mm pot	14
SaBC	*Syzygium australe 'Bush Christmas'*	Bush Christmas Lilly-pilly	E/N		2 x 1m (Clipped)	200mm pot	16
Wfr	*Westringia fruticosa 'Blue Gem'*	Blue Gem Coastal Rosemary	E/N		1.5 x 1m	200mm pot	12
WGB	*Westringia 'Grey Box'*	Native Box	E/N		0.5 x 0.5m	200mm pot	36
						TOTAL	**213**
GROUNDCOVERS & GRASSES							
AcTP	*Arthropodium cirratum 'Te Puna'*	Te Puna Renga Lily	E/Ex		0.4 x 0.5m	140mm pot	68
As	*Austrostipa stipoides*	Prickly Spear-grass	E/I		0.8 x 0.8m	140mm pot	16
Bn	*Blechnum nudum*	Fishbone Water-fern	E/N		0.6 x 0.6m	200mm pot	23
Cro	*Carpobrotus rossii*	Karkalla	E/I		Spreading	140mm pot	2
Cap	*Chrysocephalum apiculatum*	Common Everlasting	E/I		0.5 x 0.8m	140mm pot	48
Dr	*Dianella revoluta*	Black Anther Flax Lily	E/I		0.5 x 1m	140mm pot	18
DtEA	*Dianella tasmanica 'Emerald Arch'*	Emerald Arch Flax Lily	E/N		0.5 x 0.5m	140mm pot	91
DtD	*Dianella tasmanica 'Destiny'*	Destiny Flax Lily	E/N		0.3 x 0.3m	140mm pot	60
Dre	*Dichondra repens*	Kidney Plant	E/I		0.1 x 1m	140mm pot	20
DSF	*Dichondra argentea 'Silver Falls'*	Silver Falls Dichondra	E/Ex		0.1 x Trailing	140mm pot	25
EaG	*Epipremnum aureum* (Green)	Green Devil's Ivy	E/Ex		0.3 x Trailing	140mm pot	22
LcrS	*Lomandra confertifolia* spp. *r. 'Seascape'*	Seascape Mat-rush	E/N		0.5 x 0.6m	140mm pot	76
LbR	*Lotus berthelotii 'Red Flame'*	Red Flame Parrot's Beak	E/Ex		0.2 x 0.5m	140mm pot	12
MpY	*Myoporum parvifolium 'Yareena'*	Yareena Creeping Boobialla	E/N		0.1 x 1m	140mm pot	35
Oj	*Ophiopogon jaburan*	Giant Mondo Grass	E/Ex		0.4 x 0.4m	140mm pot	101
Pt	*Poa labillardieri*	Tussock Grass	E/I		0.8 x 0.8m	140mm pot	30
Rh	*Ruscus hypoglossum*	Butcher's Broom	E/Ex		0.5 x 0.6m	140mm pot	18
SPP	*Spathiphyllum 'Pow er Petite'*	Pow er Petite Peace Lily	E/Ex		0.3 x 0.3m	140mm pot	32
Ta	*Trachelospermum asiaticum*	Yellow Star Jasmine	E/Ex		0.2 x Trailing	140mm pot	36
VmA	*Vinca minor 'Alba'*	White Lesser Periw inkle	E/Ex		0.2 x Spreading	140mm pot	31
Vh	*Viola hederacea*	Native Violet	E/I		0.15 x Spreading	140mm pot	10
WfM	*Westringia fruticosa 'Mundi'*	Groundcover Coastal Rosemary	E/N		0.4 x 1.5m	140mm pot	33
						TOTAL	**807**
CLIMBERS							
Cru	*Cissus rhombifolia*	Grape Ivy	E/Ex		Tendril Climber	140mm pot	12
Fp	*Ficus pumila*	Climbing Fig	E/Ex		Self-clinging Climber	140mm pot	3
Pt	*Parthenocissus tricuspidata*	Boston Ivy	D/Ex		Self-clinging Climber	140mm pot	8
						TOTAL	**23**
RAINGARDEN							
CCJ	*Callistemon viminalis 'Green John'*	Green John Bottlebrush	E/N		1 x 0.6m	140mm pot	12
LfS	*Lomandra fluviatilis 'Shara'*	Shara Mat-rush	E/N		0.4 x 0.5m	140mm pot	11
Po	*Pteterosmia occidentalis*	Long-leaf Purple Flag	E/I		0.3 x 0.5m	140mm pot	11
						TOTAL	**34**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic
Indigenous plants selected from 'Indigenous Plants of Bass Coast Shire' Brochure*

PLANT PALETTE



Acacia melanoxylon (Blackwood)
Allocasuarina littoralis (Black Sheoak)
Banksia integrifolia (Coast Banksia)
Elaeocarpus eumundi (Eumundi Quandong)
Elaeocarpus reticulatus (Blueberry Ash)
Hymenosporum flavum (Native Frangipani)
Magnolia grandiflora 'Exmouth' (Exmouth Bull Bay Magnolia)
Olea europaea 'Tolley's Upright' (Upright Olive)

LEGEND

- Existing Tree to be Retained. Tree Protection Zone (TPZ) Dashed Blue. Refer to Existing Vegetation Plan & Tree Protection Notes (TP00)
- Proposed New Location for Existing Palm. Refer to Transplant Method Statement (TP00)
- Proposed New Evergreen Trees. Refer to Plant Schedule
- Proposed New Deciduous Trees. Refer to Plant Schedule
- Proposed New Palms. Refer to Plant Schedule
- Proposed New Shrubs. Refer to Plant Schedule
- Proposed New Groundcovers & Grasses. Refer to Plant Schedule
- Proposed New Climbers. Refer to Plant Schedule
- Proposed New Raingarden. Refer to Plant Schedule & Typical Detail D4 (TP06)
- Proposed New Permeable Gravel Surface. Refer to Specification (TP00)
- Proposed New Permeable Decking. To Later Detail
- Proposed New Permeable Paving. To Later Detail
- Proposed New Feature Paving. To Later Detail
- Proposed New Paving. To Later Detail
- Proposed New Concrete Driveway. To Engineer's Detail
- Proposed New Raised Planter Box. Min. 1m Soil Depth for Trees, 0.75mm for Shrubs & 0.5m for Groundcovers. Refer to Specification (TP00)
- Proposed New Retaining Wall. To Architect's Detail
- Reinstated/Repaired Nature strip. Refer to Specification (TP06)

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

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REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
- Ground Level -
Landscape Plan for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-660
DWG NO	L-TP02 Rev A
CAD FILE	21-660 L-TP Rev A.dwg



03 LEVEL 01
Scale 1:100 @ A0

LEGEND

- Proposed New Evergreen Trees — Refer to Plant Schedule
- Proposed New Shrubs — Refer to Plant Schedule
- Proposed New Groundcovers & Grasses — Refer to Plant Schedule
- Proposed New Climbers — Refer to Plant Schedule
- Proposed New Paving — To Latter Detail
- Proposed New Raised Planter Box — Min. 1m Soil Depth for Trees, 0.75mm for Shrubs & 0.5m for Groundcovers — Refer to Specification (TP06)

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

PLANT SCHEDULE - LEVEL 01

SYM	BOTANICAL NAME	COMMON NAME	D/E I/N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
TREES						
LMC	*Laurus nobilis* 'Miles Choice'	Miles Choice Bay	E/Ex	4 x 3m	30cm^1.5mH	2
					TOTAL	**2**
SHRUBS						
WGB	*Westringia* 'Grey Box'	Native Box	E/N	0.5 x 0.5m	200mm pot	36
					TOTAL	**36**
GROUNDCOVERS & TRAILING PLANTS						
AcTP	*Arthropodium cirratum* 'Te Puna'	Te Puna Renga Lily	E/Ex	0.4 x 0.5m	140mm pot	16
Cro	*Carpobrotus rossii*	Karkalla	E/I	Spreading	140mm pot	4
CgCl	*Casuarina glauca* 'Cousin It'	Cousin It Groundcover	E/N	0.1 x Trailing	140mm pot	48
LcrS	*Lomandra confertifolia* spp. *r.* 'Seascape'	Seascape Mat-rush	E/N	0.5 x 0.6m	140mm pot	4
MpY	*Myoporum parvifolium* 'Yareena'	Yareena Creeping Boobialla	E/N	0.2 x Trailing	140mm pot	30
					TOTAL	**102**
CLIMBERS						
Fp	*Ficus pumila*	Climbing Fig	E/Ex	Self-clinging Climber	140mm pot	4
					TOTAL	**4**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic

PLANT PALETTE


Laurus nobilis 'Miles Choice'
(Miles Choice Bay)

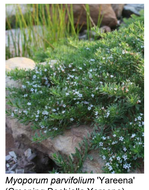

Westringia 'Grey Box'
(Native Box)

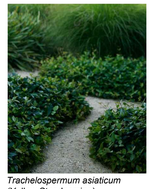

Arthropodium cirratum 'Te Puna'
(Te Puna Renga Lily)


Carpobrotus rossii
(Karkalla)


Casuarina glauca 'Cousin It'
(Cousin It Groundcover)


Lomandra confertifolia 'Seascape'
(Seascape Mat-rush)


Myoporum parvifolium 'Yareena'
(Creeping Boobialla Yareena)


Trachelospermum asiaticum
(Yellow Star Jasmine)

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REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
- Level 01 -
Landscape Plan for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-060
DWG NO	L-TP03 Rev A
CAD FILE	21-060 L-TP Rev A.dwg



04 LEVEL 02
Scale 1:100 @ A0

LEGEND

- Proposed New Evergreen Trees Refer to Plant Schedule
- Proposed New Shrubs Refer to Plant Schedule
- Proposed New Groundcovers & Grasses Refer to Plant Schedule
- Proposed New Climbers Refer to Plant Schedule
- Proposed New Paving To Latter Detail
- Proposed New Raised Planter Box Min. 1m Soil Depth for Trees, 0.75mm for Shrubs & 0.5m for Groundcovers Refer to Specification (TP06)

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

PLANT SCHEDULE - LEVEL 02

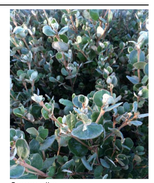
SYM	BOTANICAL NAME	COMMON NAME	D/E I/N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
TREES						
McFF	*Metrosideros collina* 'Fiji Fire'	Dw arf NZ Xmas Tree	E/Ex	3 x 2m	30cm^1.5mH	2
					TOTAL	**2**
SHRUBS						
CLJ	*Callistemon* 'Little John'	Little John Bottlebrush	E/N	1 x 1m (Clipped)	200mm pot	26
Ca	*Correa alba*	White Correa	E/I	1 x 1m (Clipped)	200mm pot	35
Wfr	*Westringia fruticosa* 'Blue Gem'	Blue Gem Coastal Rosemary	E/N	1 x 1m (Clipped)	200mm pot	34
					TOTAL	**95**
GROUNDCOVERS & TRAILING PLANTS						
Cro	*Carpobrotus rossii*	Karkalla	E/I	Spreading	140mm pot	2
CgCl	*Casuarina glauca* 'Cousin It'	Cousin It Groundcover	E/N	0.1 x Trailing	140mm pot	10
LcrS	*Lomandra confertifolia* spp. r. 'Seascape'	Seascape Mat-rush	E/N	0.5 x 0.6m	140mm pot	14
LbRF	*Lotus berthelotii* 'Red Flame'	Red Flame Parrot's Beak	E/Ex	0.2 x 0.9m	140mm pot	6
MpY	*Myoporum parvifolium* 'Yareena'	Yareena Creeping Boobialla	E/N	0.2 x Trailing	140mm pot	27
RoP	*Rosmarinus officinalis* 'Prostratus'	Prostrate Rosemary	E/Ex	0.5 x 1.5m	140mm pot	4
					TOTAL	**63**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic

PLANT PALETTE


Metrosideros collina 'Fiji Fire'
(Dwarf NZ Xmas Tree)


Callistemon 'Little John'
(Little John Bottlebrush)

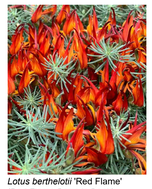

Correa alba
(White Correa)

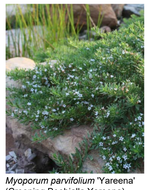

Westringia fruticosa 'Blue Gem'
(Blue Gem Coastal Rosemary)


Carpobrotus rossii
(Karkalla)


Casuarina glauca 'Cousin It'
(Cousin It Groundcover)


Lomandra confertifolia 'Seascape'
(Seascape Mat-rush)


Lotus berthelotii 'Red Flame'
(Red Flame Parrot's Beak)


Myoporum parvifolium 'Yareena'
(Creeping Boobialla Yareena)


Rosmarinus officinalis 'Prostratus'
(Prostrate Rosemary)

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REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
- Level 02 -
Landscape Plan for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-060
DWG NO	L-TP04 Rev A
CAD FILE	21-060 L-TP Rev A.dwg

9 WALPOLE STREET

7 WALPOLE STREET

5 WALPOLE STREET

3 WALPOLE STREET

1 WALPOLE STREET

356°14'40" 60.46

358°56' 20.00

88°56' 24.96

20 THE ESPLANADE

19 THE ESPLANADE

359°04' 0.15

88°39' 25.22

24 WARLEY AVENUE

14 WARLEY AVENUE

268°51' 50.54

178°56' 80.72

W A R L E Y A V E N U E

RAISED PLANTER BOX WITH 0.75m SOIL DEPTH

WGB (10)

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

LcrS (7)

ST 5.6 m²

STAIR

BUILDING 1

5.2 m² 5.2 m²

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

CASCADING / TRAILING GROUNDCOVERS

Ta (8)

Ca (22)

WGB (5)

RAISED PLANTER BOX WITH 0.75m SOIL DEPTH

RAISED PLANTER BOX WITH 0.75m SOIL DEPTH

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

CASCADING / TRAILING GROUNDCOVERS

RGP (10)

CgCl (8)

CASCADING / TRAILING GROUNDCOVERS

STAIR

BUILDING 2

5.2 m² 5.2 m²

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

RGP (4)

CgCl (15)

Myo (10)

MyY (14)

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

CASCADING / TRAILING GROUNDCOVERS

RAISED PLANTER BOX WITH 0.5m SOIL DEPTH

CASCADING / TRAILING GROUNDCOVERS

05 - LEVEL 03
Scale 1:100 @ A0

LEGEND

Proposed New Evergreen Trees
Refer to Plant Schedule

Proposed New Shrubs
Refer to Plant Schedule

Proposed New Groundcovers & Grasses
Refer to Plant Schedule

Proposed New Climbers
Refer to Plant Schedule

Proposed New Paving
To Latter Detail

Proposed New Raised Planter Box
Min. 0.75mm for Shrubs & 0.5m for Groundcovers
Refer to Specification (TP06)

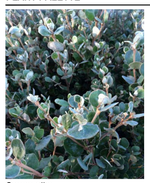
IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

PLANT SCHEDULE - LEVEL 03

SYM	BOTANICAL NAME	COMMON NAME	D/E I/N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
SHRUBS						
Ca	*Correa alba*	White Correa	E/I	1 x 1m (Clipped)	200mm pot	22
WGB	*Westringia* 'Grey Box'	Native Box	E/N	0.5 x 0.5m	200mm pot	15
					TOTAL	**37**
GROUNDCOVERS & TRAILING PLANTS						
CgCl	*Casuarina glauca* 'Cousin It'	Cousin It Groundcover	E/N	0.1 x Trailing	140mm pot	23
LcrS	*Lomandra confertifolia* spp. *r.* 'Seascape'	Seascape Mat-rush	E/N	0.5 x 0.6m	140mm pot	7
MpY	*Myoporum parvifolium* 'Yareena'	Yareena Creeping Boobialla	E/N	0.2 x Trailing	140mm pot	24
RoP	*Rosmarinus officinalis* 'Prostratus'	Prostrate Rosemary	E/Ex	0.5 x 1.5m	140mm pot	14
Ta	*Trachelospermum asiaticum*	Yellow Star Jasmine	E/Ex	0.2 x Trailing	140mm pot	8
					TOTAL	**76**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic

PLANT PALETTE



Correa alba
(White Correa)



Westringia 'Grey Box'
(Native Box)



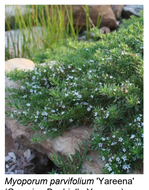
Carpobrotus rossii
(Karkalla)



Casuarina glauca 'Cousin It'
(Cousin It Groundcover)



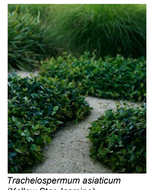
Lomandra confertifolia 'Seascape'
(Seascape Mat-rush)



Myoporum parvifolium 'Yareena'
(Creeping Boobialla Yareena)



Rosmarinus officinalis 'Prostratus'
(Prostrate Rosemary)



Trachelospermum asiaticum
(Yellow Star Jasmine)

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PROJECT
Proposed Development

6-12 Warley Avenue, Cowes

DRAWING
- Level 03 -
Landscape Plan for Town Planning

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CHECKED	KD
JOB NO	21-060
DWG NO	L-TP05 Rev A
CAD FILE	21-060 L-TP Rev A.dwg



06 LEVEL 04
Scale 1:100 @ A0

LEGEND

Proposed New Shrubs
Refer to Plant Schedule

Proposed New Groundcovers & Grasses
Refer to Plant Schedule

Proposed New Paving
To Later Detail

Proposed New Raised Planter Box
Min. 0.75mm for Shrubs & 0.5m for Groundcovers
Refer to Specification (TP06)

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

PLANT SCHEDULE - LEVEL 04

SYM	BOTANICAL NAME	COMMON NAME	D/E I N/Ex*	HEIGHT X WIDTH AT MATURITY	MIN SUPPLY SIZE	QTY
SHRUBS						
CLJ	*Callistemon* 'Little John'	Little John Bottlebrush	E/N	1 x 1m (Clipped)	200mm pot	3
					TOTAL	**3**
GROUNDCOVERS & TRAILING PLANTS						
LcrS	*Lomandra confertifolia* spp. *r.* 'Seascape'	Seascape Mat-rush	E/N	0.5 x 0.6m	140mm pot	7
					TOTAL	**7**

*D/E = Deciduous/Evergreen I/N/Ex = Indigenous/Native/Exotic

PLANT PALETTE



Callistemon 'Little John'
(Little John Bottlebrush)



Lomandra confertifolia 'Seascape'
(Seascape Mat-rush)

SPECIFICATION NOTES

Soil Preparation
Crushed rock, concrete spillage and any other material restrictive to plant growth (e.g. large rocks) shall be removed from the site of any planting beds and semi-advanced trees. All trees to be removed shall be stump ground and all rubbish/vegetative spoil is to be removed from site. Existing top soil in planting areas is to be preserved so that it does not receive additional compaction from site machinery and so that no rubble or building supplies are stored in these areas.

No imported top soil is to be used within the root zones of trees to be protected. Any preparation of existing soil for planting within these areas is to be done by hand only. Holes (e.g. as the result of plant removal) and uneven soil levels may be patched using topsoil as specified below.

Any imported topsoil is to be free of weeds, rubble and other materials damaging to plant growth and is to be of a medium texture (sandy loam) with a pH of 6.0-7.0. Top soil is to be laid over a prepared sub-base which has had any materials damaging to plant growth (e.g. rubble and large rocks) removed, spread to the appropriate depth and cultivated into the existing site soil to a minimum depth of 150mm.

Imported top soil is to be lightly and uniformly compacted in 150mm layers to a minimum depth of 100mm on lawn areas and 300mm on excavated planting beds.

Weed Removal
All weeds shall be thoroughly removed. All vegetative material, including roots and rhizomes of non-woody perennials and woody suckering weeds, is to be removed or appropriately controlled using chemical means. The stumps of non-suckering woody perennials are to be stump ground. All vegetative material shall be appropriately disposed of off site in a manner which will not allow their re-establishment elsewhere. Any chemical controls are to be used in accordance with manufacturer's instructions and standard occupational health and safety procedures.

Care must be taken to ensure that all trees to be retained are not damaged during weed removal. This also implies that any herbicides used are suitable for use around the vegetation to be retained.

Topsoil
Imported Topsoil for Garden Beds (excluding Raised Planter Boxes)
The use of imported topsoil for garden beds shall conform generally to the following criteria:

- Imported topsoil for garden beds is to be Medium Texture General Purpose Garden Soil, to comply with AS 4419-2003 Soils for landscaping and garden use, and as follows:
- Free from perennial weeds and their roots, bulbs and rhizomes;
- Free from building rubble, including bricks, concrete, or any other matter deleterious to plant growth;
- Free from rocks or stones greater than 25mm in diameter, but in any case, to have less than 5% stone by dry weight;
- PH to be 6.0 - 7.0;
- Texture to be light to medium friable loam;
- Free from silt material.

Imported topsoil for nature strip lawns shall also have the above characteristics, but shall be a free-draining sandy loam.

Planting
Planting shall be carried out using accepted horticultural practices with all plants conforming to the species, size and quantities indicated on the Landscape Plan and Plant Schedule. Plants shall be thoroughly soaked through immersion in water prior to planting and if the planting soil is very dry then the planting hole is also to be filled with water and allowed to drain completely.

All plants shall be appropriately hardened off in the nursery. Use plants with the following characteristics: Large healthy root systems with no evidence of root curl or pot bound restriction or damage, vigorous, well established, free from disease and pests and of good form, consistent with the species or variety.

Planting holes for shrubs and groundcovers are to be of minimum size 75mm larger than the planting pot in all directions. Semi-advanced tree planting holes are to be the same depth as the rootball and 2-3 times its diameter, with the top of the rootball being at grade. A 75mm high berm is to be constructed at edge of root-ball to hold water. All plants are to be thoroughly watered after planting and slow release fertiliser added at the quantities specified by the manufacturer.

Mulch
Garden Beds
Mulch is to be supplied to all garden beds and is to be an organic type laid to a minimum depth of 75mm, consisting of fine dark coloured chipped or shredded pine bark or hardwood with not more than 5% fines content by volume (preferably zero fines). The average size of the woodchip must be approximately 10mm x 20mm x 5mm and the maximum length is not to exceed 30mm. Mulch shall be free of damaging matter such as soil, weeds and sticks and is to be stockpiled and thoroughly weathered prior to delivery. Mulch is to be kept back 100mm from the stems of all plants to prevent collar rot. For planter boxes, refer to Raised Planter Boxes Mulch specification note.

Raised Planters - Lower Ground / Ground Floors
Mulch is to be supplied to all raised planter box garden beds and is to be 'Water Saver Range' mulch from Bio Gro in small grade size. Allow for 50mm layer of specified mulch to top of beds and a finished level 25-50mm below the planter rim. Drip irrigation as specified is to be installed beneath the mulch layer.

Raised Planters - Upper Levels
Wind tolerant pebble mulch is to be installed to all planter boxes, comprising of a 50mm layer of pebbles (14mmØ 'Cream' or similar, no fines). Mulch shall be free of damaging matter such as soil, weeds and sticks and is to be kept back 100mm from the stems of all plants to prevent collar rot.

Irrigation
1. To ensure long-term plant health & viability, an automatic drip irrigation system is to be professionally installed to all raised planter boxes and garden beds.
2. The irrigation system is to be connected to rainwater tank/s using harvested rainwater with a back-up to mains supply.
3. Via a system of highest quality, Australian Standard compliant, drip tube, laterals, mains and electronic control valves, regulated volumes of irrigation water are to be applied efficiently to the immediate vicinity of the root zones of plants in each area, to meet plant water demands according to the season.
4. Pressure-compensating, copper-impregnated (for plant root intrusion protection), anti-siphon, self-flushing drip emitters shall be used throughout the installation. (e.g. Netafim 'Techline AS XR').
5. To reduce debris entering the system at start-up/shut-down, ensure at least x1 Air Valve is installed to each zone.
6. To enable regular flushing of any built up debris in the system, ensure at least x1 manually operated Flush Valve is installed to each irrigation zone (i.e. at the ends of the lines).
7. System Monitoring shall be via the following sensors:
   a. Flow Sensor - for the rapid detection of system leaks/breaks, and subsequent automatic shut-down of the system, for protection against flooding.
   b. Rain Sensor - for automatic system shut-down during significant rain events.
   c. Soil Moisture Sensor - once the growing media reaches a desired level of saturation (i.e. visible via a screen on the sensor's wall module), the system can be manually shut down. Some calibration of the sensor to the characteristics of the growing media will be required.
8. To ensure continued trouble free operation, the drip irrigation system will require some regular maintenance by trained landscape maintenance technicians. To include:
   - regular flushing of the system via installed, manual flush valves.
   - monitoring of sensors (calibration & adjustment will be required),
   - checking the integrity of fittings & components.
9. An Irrigation Management Plan (IMP) shall be prepared for the site and provided to all property owners. A condition of the Body Corporate shall be that the IMP shall be implemented in all area with raised gardens.

Drainage
Agricultural drains are to be installed to garden beds. Pipes shall be 90mm diameter slotted P.V.C. flexible coil laid with one line of perforations at the bottom. Trench floor is to be uniformly graded, with falls directed towards pits and bed pipes on a continuous 75mm layer of screenings. Tees, couplings or adapters suitable for the works required are to be used at the junctions of pipes with pipes to be surrounded with open graded crushed rock to 100mm with opened graded crushed rock to 100mm above pipes. Connect Agricultural drains to storm water.

Raised Planter Boxes
Raised planter construction is to include, but not necessarily be limited to, the supply and installation of agricultural drains, drainage cells at base, filter fabric, planting medium, mulch and irrigation. Planter boxes must be effectively tanked and lined with coreflute to prevent leaking.

Drainage Detail
Each bed to be drained with Atlantis Flo-Cell® 30 mm installed according to the manufacturer's specification, with connection to the stormwater system.
Depth of cell system 30 mm, weight of cell system 33 kg/sq m saturated, depth of blinding sand layer above cell layer 25 mm, weight of sand layer saturated 50 kg/sq m. Total weight drainage layer 83 kg/sq m saturated.

Substrate Specification - (General)
Supply and spread evenly Bio Gro Planter Box Potting Mix (source Bio Gro Pty Ltd). Compact evenly in 150mm layers/lifts. Avoid differential subsidence and excess compaction and produce a finished surface that is graded evenly and ready for planting.

Substrate - Bio Gro Planter Box Potting Mix
This raised planter mix may be ordered and prepared as special batch by Bio Gro (Contact Michelle Torcasio 03 8788 1700). This medium will guarantee support for a long-term outcome to alleviate potential soil level dropping issues and compaction.

Substrate Composition
The nominated mix for raised planters shall conform to the following criteria
Structure:

- 60% Composted Pine Bark
- 25% Coco Peat
- 25% Scoria

Fertilisers:

- 2kg/m3 Osmocote Pro (12-14 month)
- Osmocote NXT
- Dolomite Lime
- Granular Re - Wetting Agent
- Ferrous Sulphate
- Trace Elements
- Gypsum Fine
- Gypsum Coarse
- Calcium Nitrate
- Superphosphate
- Copper Sulphate
- Fine lime for pH adjustment
- pH: 5.5 - 6.00

Substrate Properties
Bio Gro Planter Box Potting Mix to be tested by Bio Gro before supply. The following substrate properties are test results on a previous product, batched and dispatched.

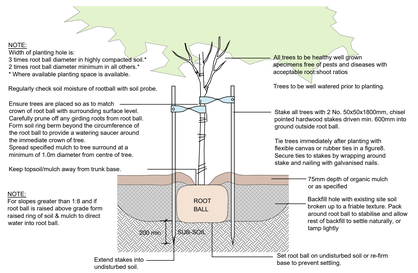
- Dispatch estimated weight (per m³): 650-700kg
- Saturated bulk density (per m³): ~850-900kg
- Air filled porosity (AFP): 11-13%
- Water-holding capacity (WHC): Supplied mix to be tested
- pH: 5.8 - 6.00
- Electrical conductivity (EC): 1.25
- Cation exchange capacity (CEC): NA (Requires external lab testing)
- Infiltartion rate: Supplied mix to be tested
- Ammonium <20; <20
- Nitrate <250; 62

Repair/Restoration of damaged Nature-strips
Nature strips are to be restored to current grades with any depressions filled with topsoil to specifications above and lightly compacted in 150mm layers. Areas are then to be re-seeded using an appropriate and matching turf type and the area fenced off to allow the re-establishment of lawn. Re-seeded areas are to be well irrigated and the area supplied with a slow release fertiliser at the quantities recommended by the manufacturer.

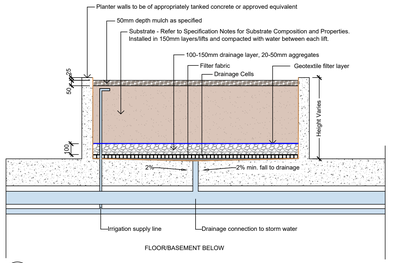
Any areas of lawn which have failed to germinate (achieve an evenly green 95% covering of a consistent height) are to be re-seeded within one month of original sowing date.

Plant Establishment Period
There shall be a 13 weeks Plant Establishment Period following the approval of Practical Completion by the responsible authority. During this period the landscape contractor shall make good all defects in his/her scope of works. Maintenance and Establishment means the care and maintenance of the contract area by accepted horticultural practices, as well as rectifying any defects that become apparent in the work under normal use. This shall include, but shall not be limited to watering, fertilising, weeding, pruning, pest and disease control, cultivation, re-staking and replacement of any plants that fail with plants of the same species and size.

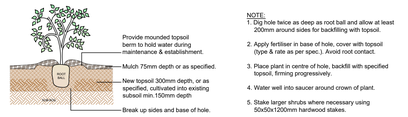
TYPICAL DETAILS



D1 TYPICAL TREE PLANTING DETAIL
Scale N.T.S.

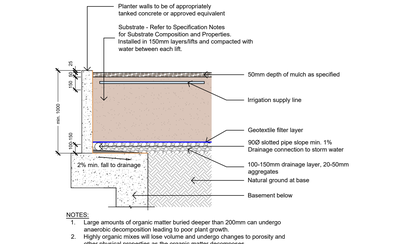


D5 TYPICAL LIGHTWEIGHT PLANTER BOX DETAIL
Scale 1:20 - STRUCTURE TO ENGINEER'S DETAIL



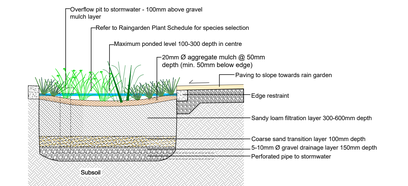
NOTE:
1. Dig hole twice as deep as root ball and allow at least 200mm around sides for backfilling with topsoil.
2. Apply fertiliser in base of hole, cover with topsoil (type & rate as per spec.). Avoid root contact.
3. Place plant in centre of hole, backfill with specified topsoil, firming progressively.
4. Water well into saucer around crown of plant.
5. Stake larger shrubs where necessary using 50x50x1200mm hardwood stakes.

D2 TYPICAL SHRUB PLANTING DETAIL
Scale N.T.S.

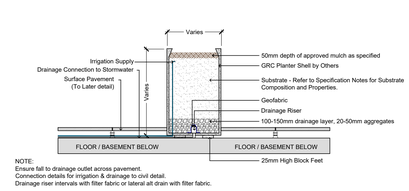


NOTES:
1. Large amounts of organic matter buried deeper than 200mm can undergo anaerobic decomposition leading to poor plant growth.
2. Highly organic mixes will lose volume and undergo changes to porosity and other physical properties as the organic matter decomposes.

D6 TYPICAL RAISED PLANTER DETAIL PARTIALLY OVER BASEMENT
Scale 1:20 - STRUCTURE TO ENGINEER'S DETAIL



D3 TYPICAL GRAVEL PATH & TIMBER EDGING DETAIL
Scale 1:20



NOTES:
1. Large amounts of organic matter buried deeper than 200mm can undergo anaerobic decomposition leading to poor plant growth.
2. Highly organic mixes will lose volume and undergo changes to porosity and other physical properties as the organic matter decomposes.

D7 TYPICAL RAISED PLANTER AS RETAINING WALL DETAIL
Scale 1:20 - STRUCTURE TO ENGINEER'S DETAIL

D4 TYPICAL RAIN GARDEN IN GROUND DETAIL - Refer to Civil Documentation
Scale 1:20

NOTE:
Ensure fall to drainage outlet across pavement.
Connection details for irrigation & drainage to civil detail.
Drainage riser intervals with filter fabric or lateral ait drain with filter fabric.

D8 TYPICAL GRC PLANTER DETAIL
Scale 1:20

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6-12 Warley Avenue, Cowes

DRAWING
- Level 04 -
Landscape Plan, Typical Details & Specification Notes for Town Planning

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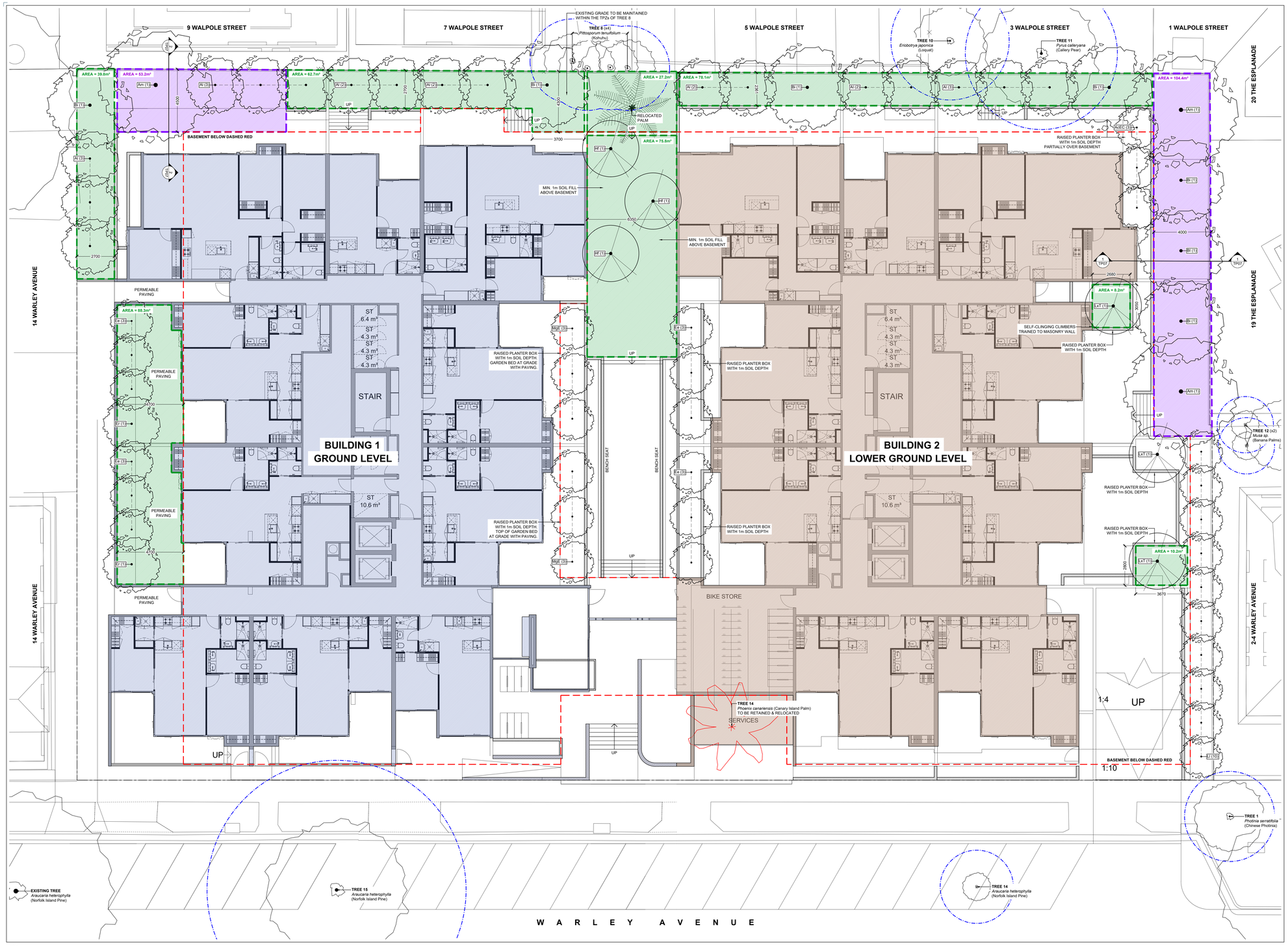
DWG NO	L-TP06 Rev A
CAD FILE	21-060 L-TP Rev A.dwg



01 LOWER GROUND LEVEL
Scale 1:100 @ A0

PLANT SCHEDULE - LOWER GROUND LEVEL

SYM	BOTANICAL NAME	COMMON NAME	HEIGHT X WIDTH AT MATURITY	CANOPY AREA (m²)	QTY	TOTAL CANOPY AREA (m²)
TREES						
AcEC	*Acacia cognata* 'Emerald Curl'	Emerald Curl River Wattle	3-5 x 3m	7.06	3	21.18
Am	*Acacia melanoxylon* **(TYPE B)**	Blackw ood	12 x 8m	50.26	3	150.78
Al	*Allocasuarina littoralis* **(TYPE A)**	Black Sheoak	7 x 3m	7.06	17	120.02
Bi	*Banksia integrifolia* **(TYPE A)**	Coast Banksia	12 x 6m	28.27	7	197.89
Ee	*Elaeocarpus eumundi*	Eumundi Quandong	5 x 3m (Clipped)	7.06	6	42.36
Er	*Elaeocarpus reticulatus* **(TYPE A)**	Blueberry Ash	8 x 4m	12.56	2	25.12
El	*Eupomatia laurina*	Copper Laurel	5 x 3m (Clipped)	7.06	6	42.36
Hf	*Hymenosporum flavum* **(TYPE A)**	Native Frangipani	8 x 4m	12.56	3	37.68
LxT	*Lagerstroemia 'Tuscarora'* **(TYPE A)**	Tuscarora Crepe Myrtle	7 x 4m	12.56	3	37.68
Ll	*Leptospermum lanigerum*	Woolly Tea-tree	6 x 3m	7.06	10	70.6
MgE	*Magnolia grandiflora* 'Exmouth'	Exmouth Bull Bay Magnolia	8 x 3m	7.06	6	42.36
				TOTAL	**66**	**788.03**

DEVELOPMENT SUMMARY TABLE

Site Area = 4,052m²

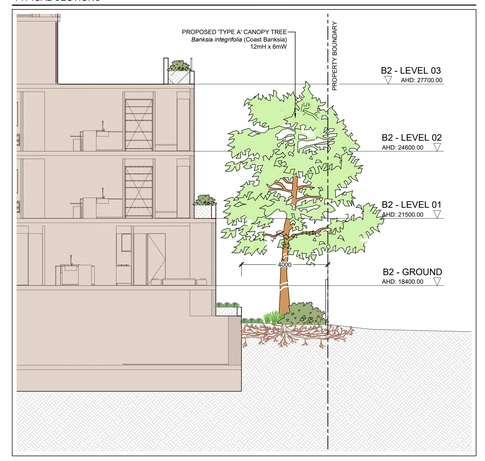
Min. Deep Soil Requirement* = 607.8m²
**15% of site area*
Proposed Deep Soil Area = 571.9m²

Min. Canopy Cover Required* = 660.4m²
**350 square metres plus 20% of site area above 2500 square metres*
Proposed Canopy Cover = 788m²

Standard B38: D4 Table - Tree Types & Sizes
Type A - min. 6m high x 4m wide
Type B - min. 8m high x 8m wide

Proposal includes:
32 x Type A Trees
3 x Type B Trees

TYPICAL SECTIONS



SECTION 1
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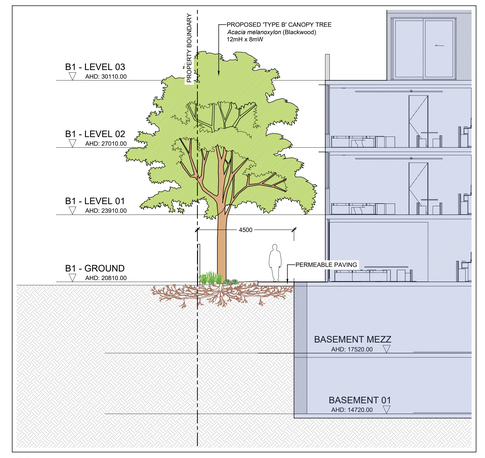

SECTION 2
Scale 1:100 @ A0

LEGEND

- Existing Tree to be Retained Tree Protection Zone (TPZ) Dashed Blue Refer to Existing Vegetation Plan & Tree Protection Notes (TP00)
- Proposed New Location for Existing Palm Refer to Transplant Method Statement (TP00)
- Proposed New Evergreen Trees Refer to Plant Schedule
- Proposed New Deciduous Trees Refer to Plant Schedule
- Proposed New Deep Soil Area "TYPE A" - Tree Planting Zone Min. Garden Bed Dimension = 2.5m
- Proposed New Deep Soil Area "TYPE B" - Tree Planting Zone Min. Garden Bed Dimension = 4.5m
- Proposed New Raised Planter Box Min. 1m Soil Depth for Trees, 0.75mm for Shrubs & 0.5m for Groundcovers Refer to Specification (TP06)
- Proposed New Retaining Wall To Architect's Detail

IRRIGATION:
An approved drip irrigation system is to be supplied to all planter boxes and garden beds. The system is to be connected to rainwater tanks utilising harvested rainwater with a back-up to mains supply and include a rain shut-off device. Refer to Specification Notes (TP06) for Further Details.

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REVISION		DATE	BY
A	To Council Request	07.10.2022	MGR

CLIENT
8 Warley Avenue Pty Ltd

PROJECT
Proposed Development
6-12 Warley Avenue, Cowes

DRAWING
- Deep Soil Areas -
Landscape Plan for Town Planning

SCALE	1:100 @ A0
DATE	JULY 2022
DRAWN	MGR
CHECKED	KD
JOB NO	21-060
DWG NO	L-TP07 Rev A
CAD FILE	21-060 L-TP Rev A.dwg

6 - 12 Warley Avenue, Cowes

Transport Impact Assessment



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28 July 2022

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Prepared by	Nicholas Tosin	Reviewed by	James Dear
Signature		Signature	

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APPENDIX A SWEPT PATH DIAGRAMS

1 INTRODUCTION

onemilegrid has been requested by 8 Warley Avenue Pty Ltd to undertake a Transport Impact Assessment of the proposed residential development at 6 - 12 Warley Avenue, Cowes.

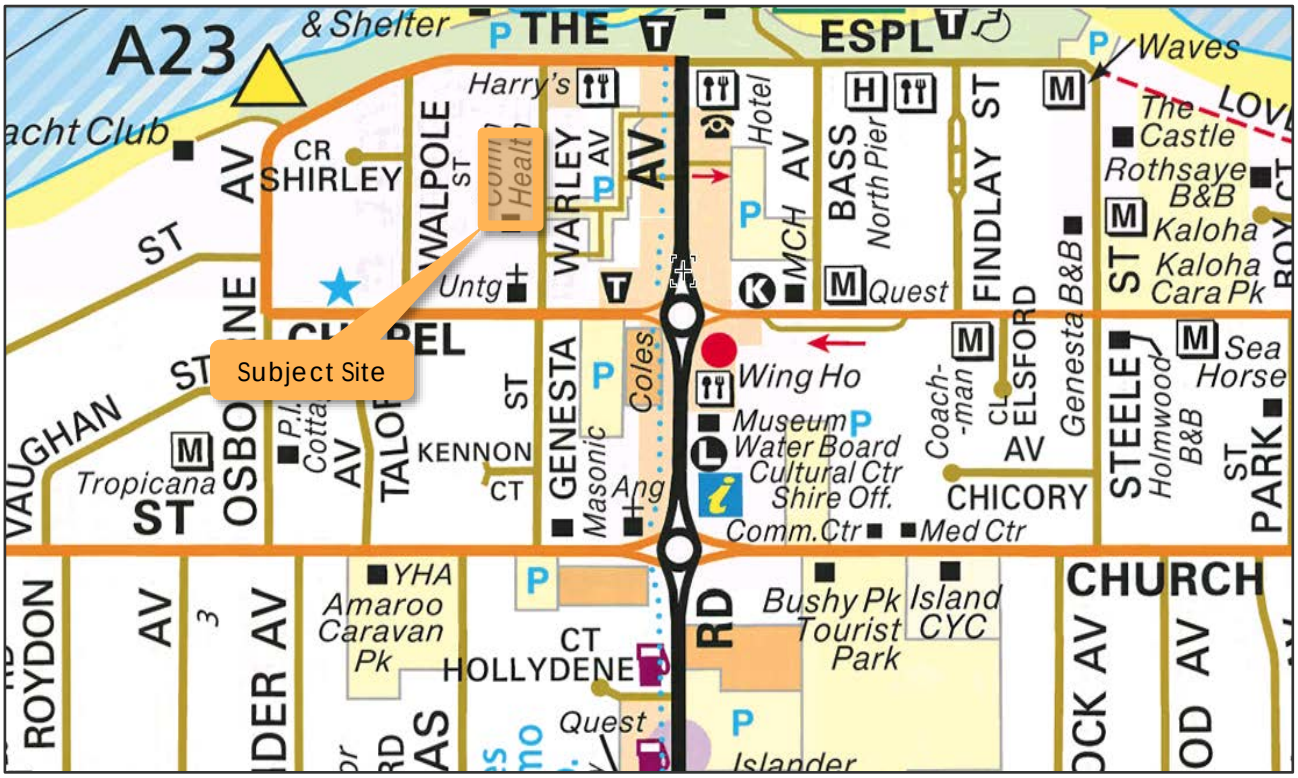
As part of this assessment the subject site has been reviewed with due consideration of the development proposal, traffic and parking data has been sourced and relevant background reports have been reviewed.

2 EXISTING CONDITIONS

2.1 Site Location

The subject site is located on the west side of Warley Avenue, and is addressed at 6 - 12 Warley Avenue, Cowes, as shown in Figure 1.

Figure 1 Site Location



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The subject site is rectangular in shape, with frontage to Warley Avenue of approximately 80 metres and a depth of approximately 50 metres for a total site area of 4,065 square metres.

The site is currently vacant, with vehicle access provided from three crossovers along the site frontage to Warley Avenue. The site was previously occupied an aged and mental health facility. As part of the previous use, only in the order of 10 car spaces were provided on-site and accordingly a reliance on on-street car parking during the operation of the previous use was commonplace.

Land use in the immediate vicinity of the site is largely residential in nature, however the active Thompson Avenue 'strip' is located just to the east of the site which includes retail and commercial uses as part of the Phillip Island 'strip' shopping centre. Of note, multiple restaurants, shops

(including a supermarket) and other amenities are provided within the strip. To the south of the site on the corner of Chapel Street and Warley Avenue is a church.

An aerial view of the subject site is provided in Figure 2.

Figure 2 Site Context (27 September 2021)

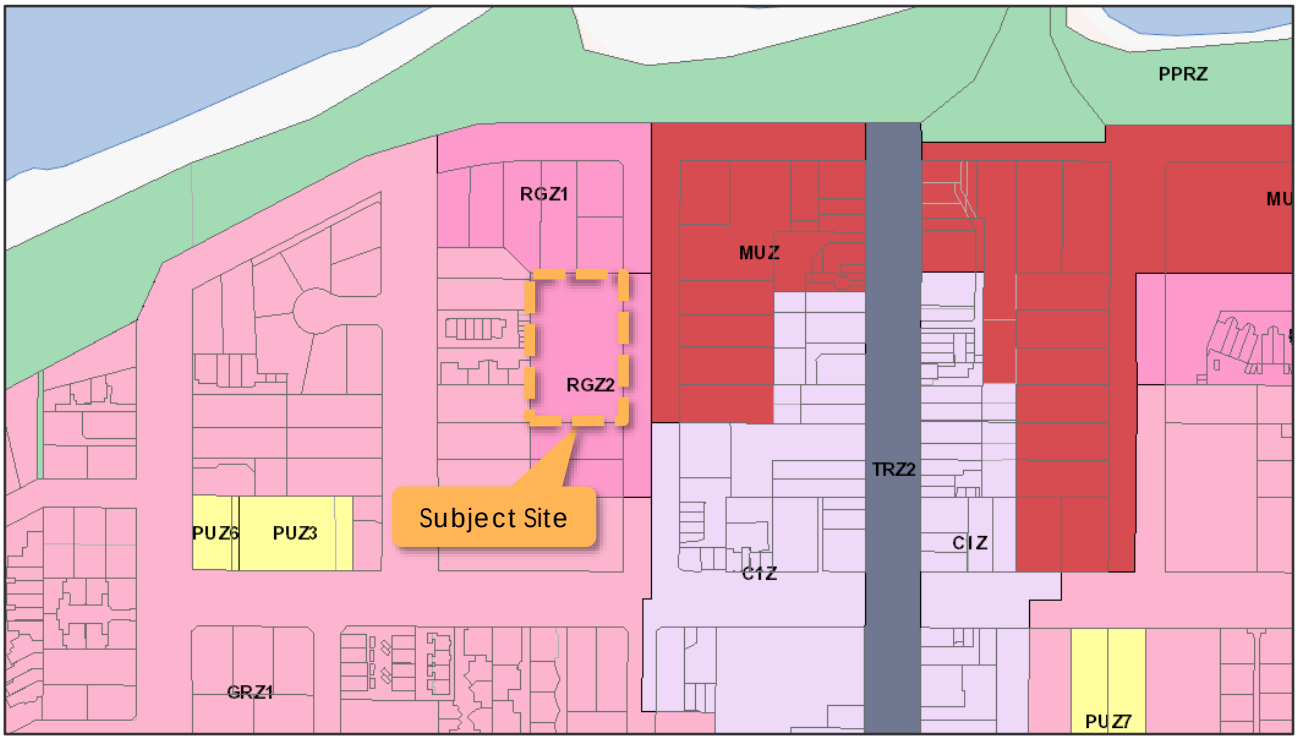


Copyright Nearmap

2.2 Planning Zones and Overlays

It is shown in Figure 3 that the site is located within a General Residential Zone (GRZ2).

Figure 3 Planning Scheme Zones



Furthermore, a Design and Development Overlay (DDO13, DDO1) and a Vegetation Protection Overlay (VPO2) applies to the subject site.

2.3 Road Network

2.3.1 Warley Avenue

Warley Avenue is a local road generally aligned north-south, running between The Esplanade in the north, and Chapel Street in the south. Warley Avenue operates within a wide road reservation, with a wide pavement that provides for traffic in each direction as well as parking against each kerb. Kerbside parking comprises of angled parking on the west side of the road and parallel parking on the east side. Parking is generally restricted to 2-hours 9:00am - 5:00pm throughout the week in the vicinity of the site. Outside of these periods 'No Stopping' restrictions are in place presumably to discourage any campervans from parking overnight on Warley Avenue, however authorised vehicles are excepted

Along the frontage of the site, in between existing crossovers and the site boundary 14 angled parking spaces are provided.

The default 50km/h speed limit applies to Warley Avenue in the vicinity of the site.

2.3.2 Chapel Street

Chapel Street is a local road generally aligned east-west, running between Osbourne Avenue to the west, and Dunsmore Road in the east. Chapel Street operates within a wide road reservation, with a wide pavement that provides for traffic in each direction with parking against each kerb. Kerbside parking is provided on both sides of the road, with angled parking on the north side of the road and parallel parking on the south side. In the vicinity of the site, parking is generally mixed between unrestricted and 1-hour parking between 9:00am and 5:00pm.

A 50km/h speed limit applies to Chapel Street in the vicinity of the site.

2.4 Traffic Volumes

In order to understand existing traffic volumes in the vicinity of the site, traffic volume surveys were undertaken by Trans Traffic Survey on behalf of onemilegrid at the intersection of Chapel Street / Warley Avenue and Chapel Street / Thompson Avenue on the following dates:

- Friday 4th March 2022, between 6:30am and 9:30am, and between 4:00pm and 7:00pm; and
- Saturday 5th March, between 10:00am and 3:00pm.

The peak hour results of the surveys are shown in Figure 4.

Figure 4 Existing Traffic Volumes - Friday 4 March 2022 AM Peak

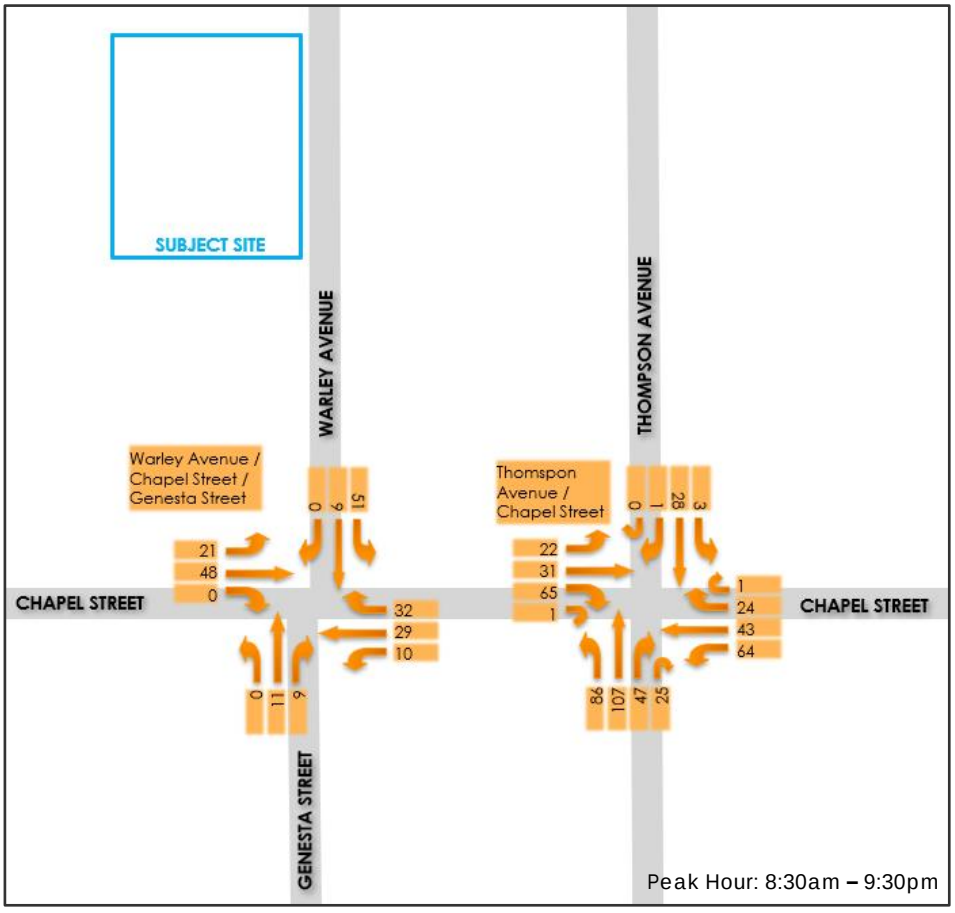


Figure 5 Existing Traffic Volumes - Friday 4 March 2022 PM Peak

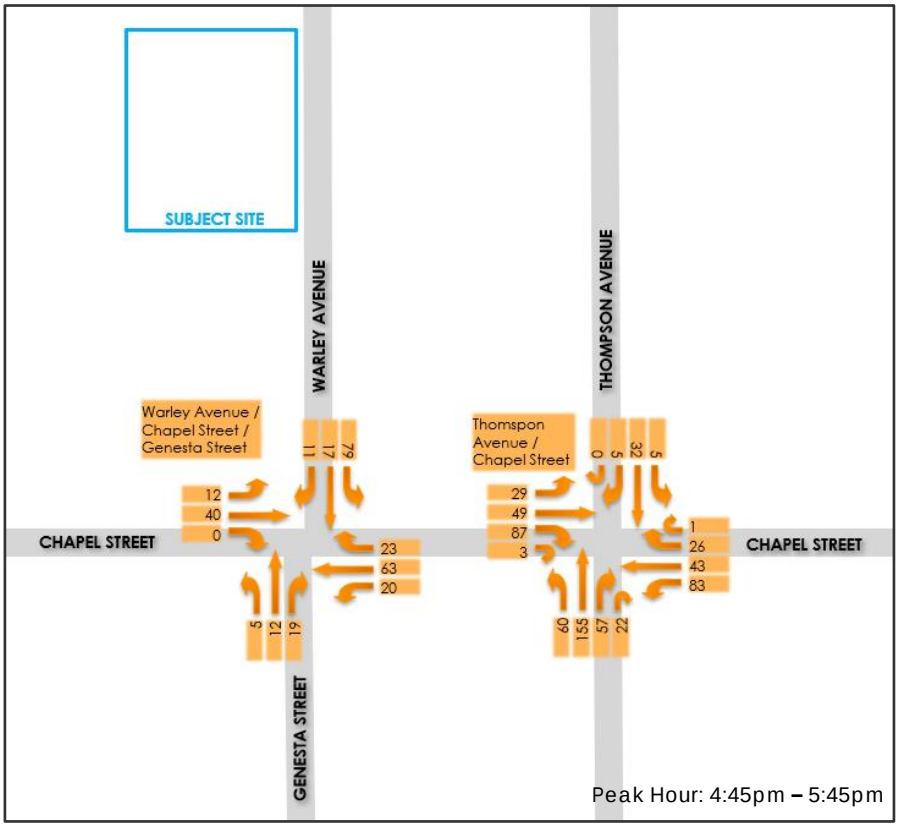


Figure 6 Existing Traffic Volumes - Saturday 5 March 2022 AM Peak

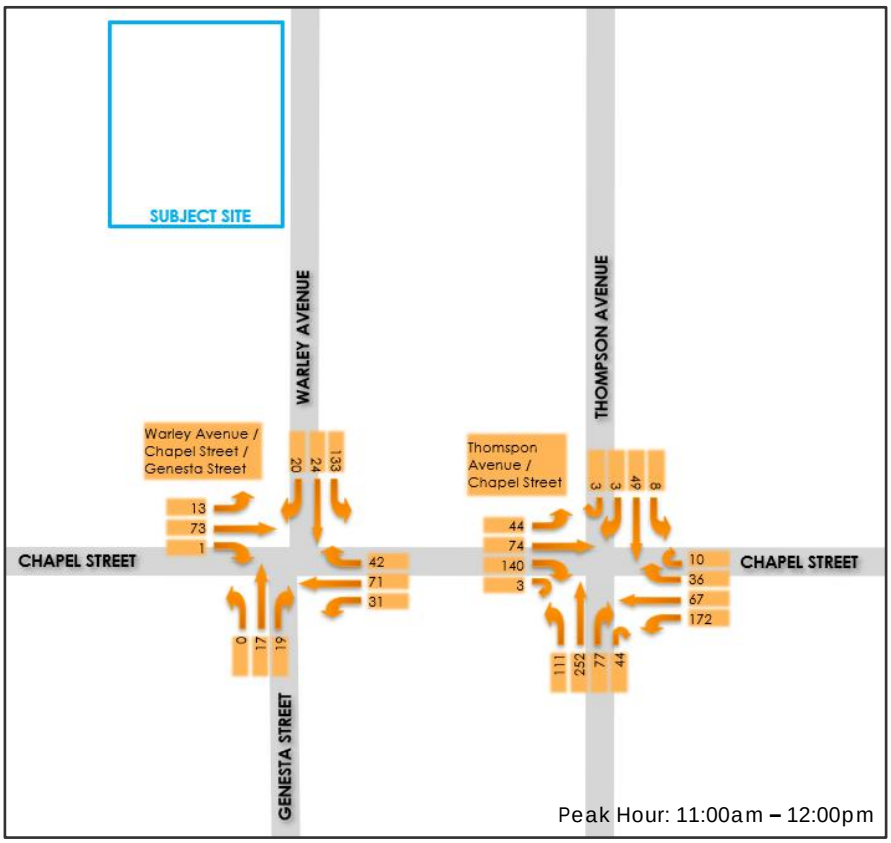
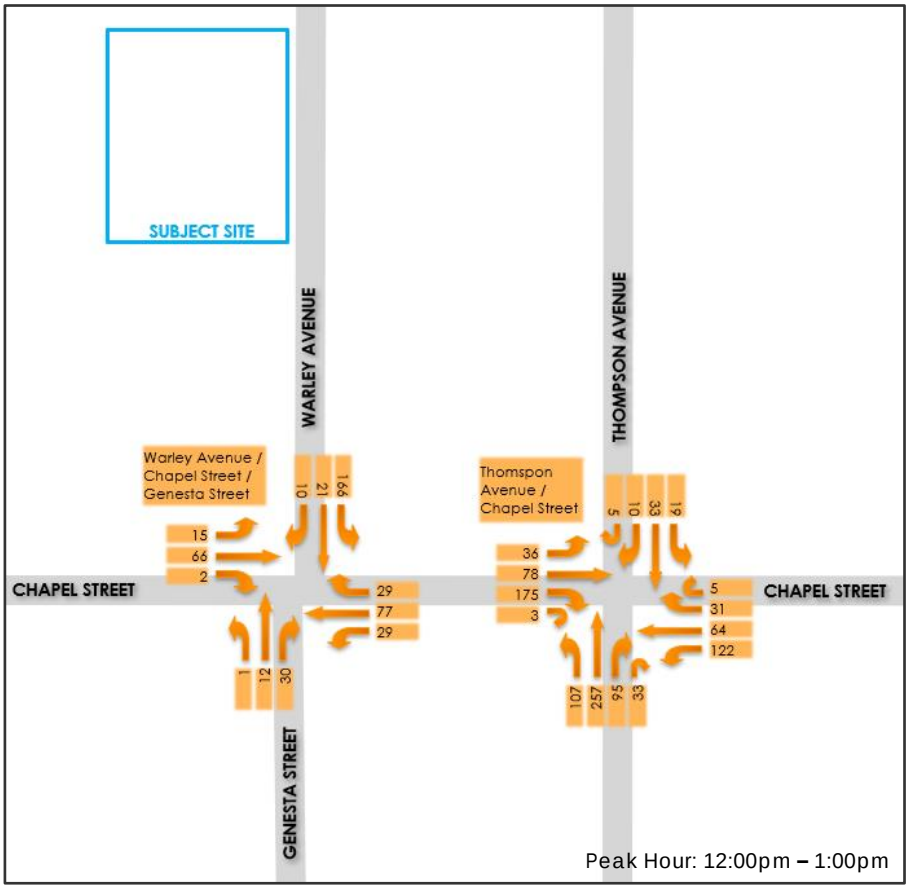


Figure 7 Existing Traffic Volumes - Saturday 5 March 2022 PM Peak



As can be expected for a holiday destination, traffic volumes on the weekend were higher than during the week. That said, volumes were well within the capacities of each road and intersection in the vicinity.

2.5 Sustainable Transport

The public transport provision in the vicinity of the site is shown in Figure 8.

Figure 8 Public Transport Provision



It is shown above that the site is limited to bus services, with the Cowes – Fountain Gate and Cowes – Wonthaggi services in the vicinity of the site.

The site is also well-located for access by bike, with on-road bicycle lanes provided along Thompson Avenue.

3 DEVELOPMENT PROPOSAL

3.1 Overview

It is proposed to develop the subject site for the purposes of a residential development containing 91 apartments across two five-storey buildings. The apartments will comprise a combination of 1, 2 and 3-bedroom product across the development as summarised in Table 1.

Table 1 Proposed Development

Component	*No/Area*
1-Bedroom Apartment	15
2-Bedroom Apartment	62
3-Bedroom Apartment	14
Total Apartments	91

3.2 Car Parking and Access

A total of 117 car spaces are proposed in a basement and mezzanine car park, with access via a double width ramp to Warley Avenue in the northeast corner of the site. The existing crossovers will be removed and reinstated with kerb and channel.

The basement and mezzanine car parking levels are connected via an internal ramp taking advantage of the natural slope of the site. The basement car park level is proposed to include 83 car spaces inclusive of an EV charging bay and car wash area. In addition, 5 motorcycle spaces are provided across the car parking levels.

As a result of the reinstatement of the existing crossovers and consolidation of the existing angled on-street car parking spaces, a total of 19 spaces will be available along the Warley Avenue frontage of the site representing an increase in public car parking resources of 6 spaces. Of the car parking provided on-site, it is proposed to allocate 105 spaces to residents and 12 spaces to visitors.

3.3 Bicycle Parking

A significant provision of bicycle parking is proposed across the site with 112 spaces distributed throughout the basement and mezzanine car parking levels for the use of residents and visitors.

3.4 Waste Collection

Two bin storage areas are proposed on-site in the northern and southern sections of the basement car park to service each of the building forms. Each bin storage area will include a waste chute from the levels above.

Waste will be collected by a private contractor with two waste collection strategies provided, including street collection on Warley Avenue and from within the basement itself. Refer to the Waste Management Plan prepared by onemilegrid for more information.

4 DESIGN ASSESSMENT

4.1 Bass Coast Planning Scheme – Clause 52.06

onemilegrid has undertaken an assessment of the car parking layout and access for the proposed development with due consideration of the Design Standards detailed within Clause 52.06-9 of the Planning Scheme. A review of those relevant Design Standards is provided in the following section.

4.1.1 Design Standard 1: Accessways

A summary of the assessment for Design Standard 1 is provided in Table 2.

Table 2 Clause 52.06-9 Design Assessment – Design Standard 1

Requirement	*Comments*
Be at least 3 metres wide.	Satisfied – Access widths vary with 6.1m for the main site access ramp whilst car parking aisles vary from 5.7m to 6.9m
Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide.	Satisfied – changes of direction are more than 4.2m wide
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	N/A – private car park
Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres.	Satisfied – a minimum height clearance of 2.1 metres is achieved
If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction.	Satisfied – all vehicles can exit in a forward direction
Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.	N/A – does not connect to a Transport Zone, nonetheless, satisfied
Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.	Satisfied – sight triangles are provided clear of obstructions.
If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway.	N/A – does not connect to a Transport Zone, nonetheless satisfied.

4.1.2 Design Standard 2: Car Parking Spaces

All basement car spaces are proposed with a minimum width of 2.6 metres, length of 4.9 metres and are accessed from aisles of no less than 6.4 metres in accordance with Table 2 of Design Standard 2 of the Planning Scheme.

4.1.3 Design Standard 3: Gradients

The first 5 metres at the top of the ramp has been provided with a grade of 1:10 while the maximum grade of the remainder of the ramp is no more than 1:4, in accordance with the requirements of Design Standard 3. Transitions are provided where changes of grade exceed 12.5%, and transition lengths have been designed to prevent potential scraping.

Furthermore, all car parking spaces are proposed with a maximum grade of 1:16.

5 LOADING

Clause 65 (Decision Guidelines) of the Bass Coast Planning Scheme identifies that "*Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate: The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.*"

It is expected that loading facilities will only be required for occasional removalist vehicles, which may utilise the existing on-street parking along the site frontage, or the basement car park for smaller vehicles.

The provision for loading is therefore considered appropriate for the proposed use.

6 BICYCLE PARKING

The bicycle parking requirements for the subject site are identified in Clause 52.34 of the Bass Coast Planning Scheme, which specifies the following requirements for a residential development of four of more stories.

- 1 space per 5 dwellings for residents; and
- 1 space per 10 dwellings for visitors.

Considering the above, there is a requirement for 27 bicycle spaces for the proposed development, consisting of 18 resident spaces and 9 visitor spaces.

It is proposed to provide a total of 112 bicycle parking spaces across the basement and mezzanine levels available for both resident and visitor use.

The provision of bicycle parking significantly exceeds the minimum Planning Scheme requirements and is therefore considered acceptable.

7 CAR PARKING

7.1 Statutory Car Parking Requirements

7.1.1 Car Parking Requirements – Clause 52.06

The car parking requirements for the subject site are identified in Clause 52.06 of the Bass Coast Planning Scheme, which specifies the following requirements for the proposed development.

Table 3 Clause 52.06 – Car Parking Requirements

Use	*No/Area*	*Rate*	*Car Parking Measure*	*Total*
Dwelling	77	1	to each one or two bedroom dwelling, plus	77
	14	2	to each three or more bedroom dwelling (with studies or studios that are separate rooms counted as bedrooms), plus	28
	91	1	for visitors to every 5 dwellings for developments of 5 or more dwellings	18
Total				123

Based on the above calculations, a total of 123 parking spaces are required for the proposed development.

7.1.2 Proposed Car Parking Provision

It is proposed to provide a total of 117 car parking spaces to service the proposed development within the basement and mezzanine levels. Of the car parking proposed, 105 spaces will be allocated to residents which satisfies the resident car parking requirements. In relation to visitors, the development includes 12 car spaces within the basement which results in a modest shortfall of just 6 car spaces against the Planning Scheme requirements.

In this regard, the application seeks a reduction in car parking of 6 car spaces associated with visitors. It is noted that the proposed development will provide 6 additional on-street car spaces along the frontage of the site, with a total of 19 spaces along the frontage resulting. This provision of car parking along the frontage will more than comfortably accommodate the visitor requirement whilst also leaving a significant supply for public use.

Notwithstanding, strictly speaking the application seeks a reduction in car parking. In this regard, Clause 52.06-7 of the Bass Coast Planning Scheme indicates that an application to reduce (including reduce to zero) the requirement for car spaces must be accompanied by a Car Parking Demand Assessment. The Assessment must assess the car parking demand likely to be generated by the proposed development, having consideration to:

- The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.
- The variation of car parking demand likely to be generated by the proposed use over time.
- The short-stay and long-stay car parking demand likely to be generated by the proposed use.
- The availability of public transport in the locality of the land.
- The convenience of pedestrian and cyclist access to the land.
- The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.
- The anticipated car ownership rates of likely or proposed visitors to or occupants (residents or employees) of the land.
- Any empirical assessment or case study.

An assessment of the likely parking demands and the appropriateness of reducing the car parking provision below them is set out below.

7.2 Car Parking Demand Assessment

7.2.1 Empirical Assessment

It has been our experience that visitor demands vary between 0.1 and 0.15 spaces per dwelling equating to a demand for between 9 and 14 spaces which is largely satisfied by the provision of car parking provided on-site.

In addition to the above, it is likely that a significant number of dwellings may be used as holiday apartments, and therefore will not generate any visitor parking demand for a large portion of the year.

7.2.2 Aerial Photo Review

Notwithstanding the above, conservatively assuming a shortfall of 6 spaces results, a review of car parking conditions in the area has been undertaken.

onemilegrid has undertaken a review of aerial photography of parking availability within the on-street parking in the vicinity of the site, using the latest available Nearmap imagery. A review of the five most recent weekday dates, between 7 September 2020 and 29 April 2021, provided the parking occupancy shown in Table 4 below.

Any parking spaces restricted to 1P or less was deemed unsuitable for visitors and have been omitted from the results.

Table 4 Parking Availability

Street	*Supply*	*Spaces Occupied*			
		2:54pm Saturday 25/11/2017	*1:10pm Wednesday 23/10/2019*	*2:20pm Wednesday 19/11/2020*	*3:17pm Friday 19/01/2022*
Warley Avenue (East)	16	12	9	6	12
Warley Avenue (West)	32	11	14	12	15
Chapel Street (North)	18	4	5	6	5
Chapel Street (South)	16	1	3	3	3
The Esplanade (South)	40	24	11	13	20
Total	122	52	42	40	55
% Occupied		43%	34%	33%	45%
Availability		70	80	82	67

The review suggests that a minimum of 67 parking spaces were available on each of the photographs reviewed which includes one date in January the typically busy summer period. Specifically, on Warley Avenue in close proximity to the site, a minimum of 21 spaces were available on each of the photographs reviewed. Consequently, a peak demand for six short term spaces associated with visitors can be easily accommodated by the existing parking availability without even considering the additional 6 spaces provided as part of the development due to the consolidation of crossovers.

7.3 Review of Car Parking

The proposed provision of 105 car spaces for residents satisfies the resident car parking requirement.

In relation to visitors, 12 spaces are to be allocated to visitors on-site which equates to a modest shortfall of just 6 spaces. Based on the above review, it is considered that the modest shortfall of 6 spaces can be suitably accommodated noting the following:

- Case study data estimates a maximum parking demand of 14 spaces for visitors;
- A significant number of dwellings are expected to be used as holiday apartments;
- The previous use has a historical reliance on on-street car parking;
- The development will provide for 6 additional on-street car spaces along the frontage of the site to take the total site frontage angled car parking supply to 19 spaces; and
- The aerial review of Warley Avenue and the surrounding streets identify sufficient street parking availability for any visitor parking that cannot be accommodated on-site.

8 TRAFFIC

8.1 Traffic Generation

Surveys undertaken by other traffic engineering firms at residential dwellings have shown that the daily traffic generation rates vary depending on the size, location and type of the dwelling, the parking provision and proximity to local facilities and public transport.

Considering the size of the dwellings proposed, the proximity of the site to an active shopping strip, the beach and other attractions, it is anticipated that the proposed dwellings may generate up to 6 vehicle trips per apartment per day when occupied, 10% of which occur during the peak periods.

For the proposed 91 apartments, this equates to approximately 546 vehicle trips per day, or approximately 55 trips during the peak periods, equating to approximately one vehicle trip every minute.

Furthermore, during the morning peak, it is estimated that 80% of the residential traffic will be outbound, while during the afternoon peak, 60% of the residential traffic will be inbound. It is therefore anticipated that the 36 projected vehicle movements will comprise 11 arrival and 44 departures during the AM peak and 33 arrivals and 22 departure during the PM peak.

It is on note that a large portion of apartments will be utilised as holiday apartments, and therefore will only generate traffic for a small period of the year.

8.2 Traffic Distribution

Considering the location of the site in relation to the arterial road network, public transport facilities, schools, recreation and retail and employment precincts, the directional distribution shown in Table 5 has been adopted.

Table 5 Adopted Directional Traffic Distribution

Origin/Destination	*Percentage*
Warley Avenue – North	5%
Warley Avenue – South	95%

8.3 Generated Traffic Volumes

Based on the above, the following post development traffic volumes are expected to be generated at the intersection of Warley Avenue and Chapel Street, and the intersection of Chapel Street and Thompson Avenue.

Figure 9 Post Development Traffic Volumes – Friday AM Peak

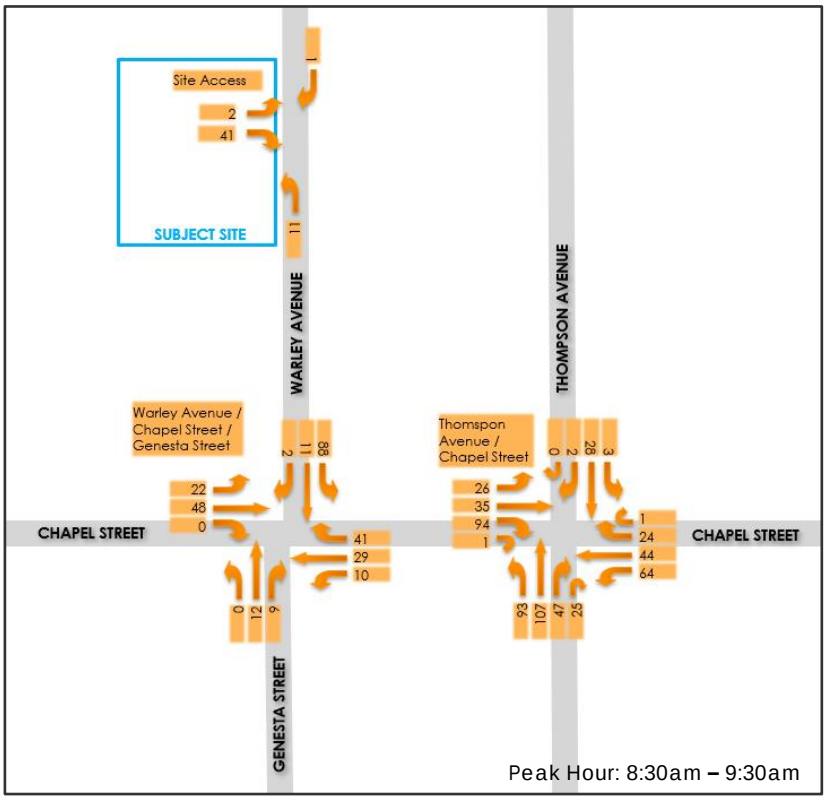


Figure 10 Post Development Traffic Volumes – Friday PM Peak

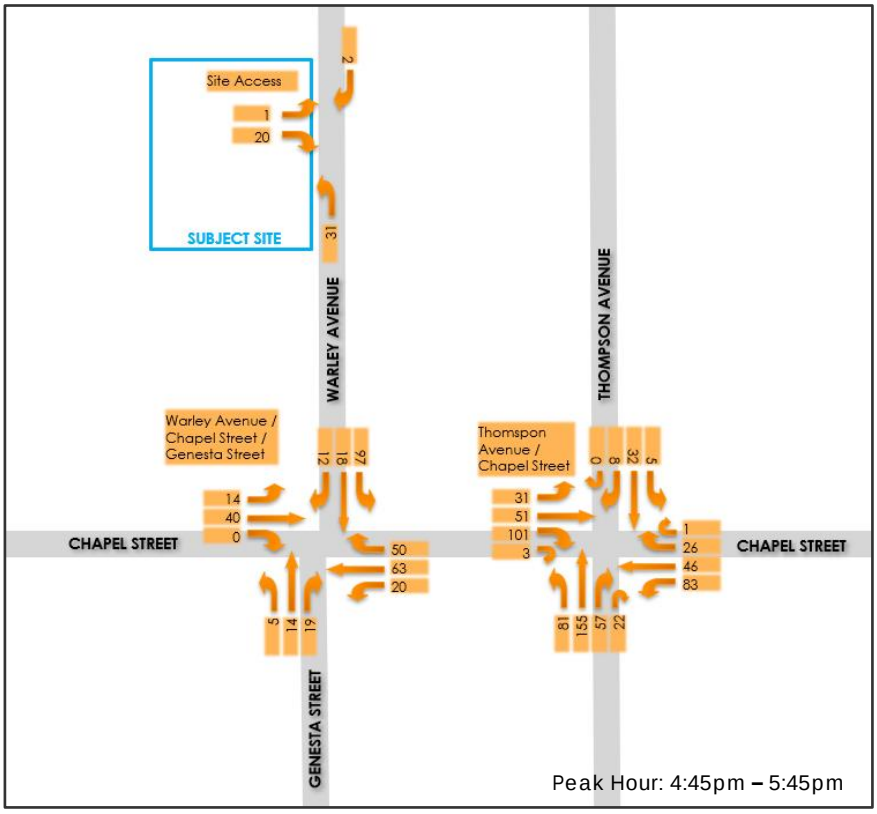


Figure 11 Post Development Traffic Volumes – Saturday AM Peak

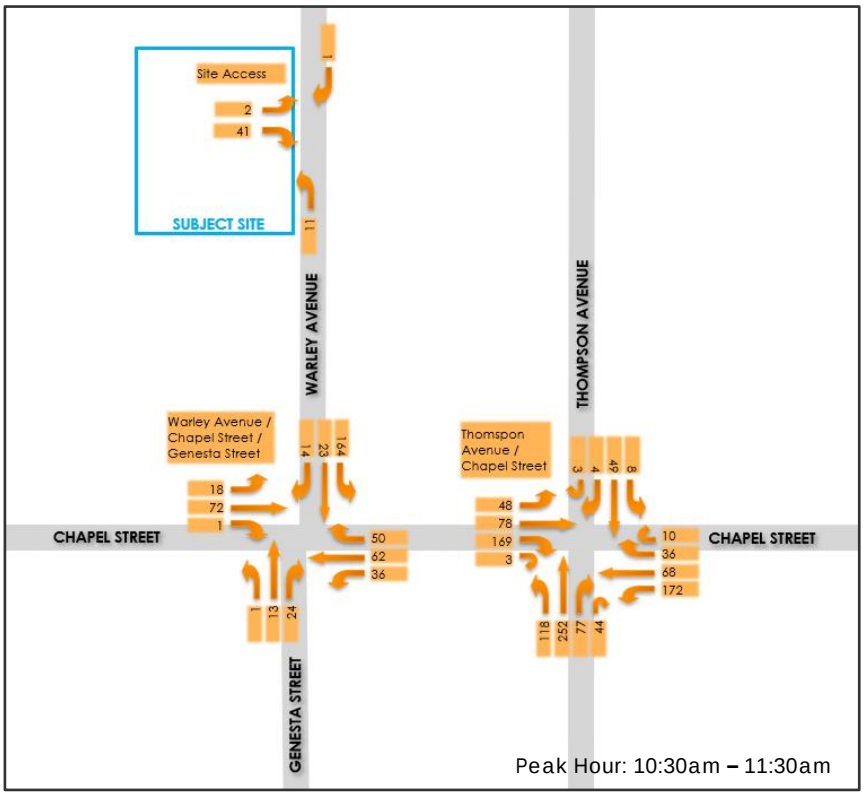
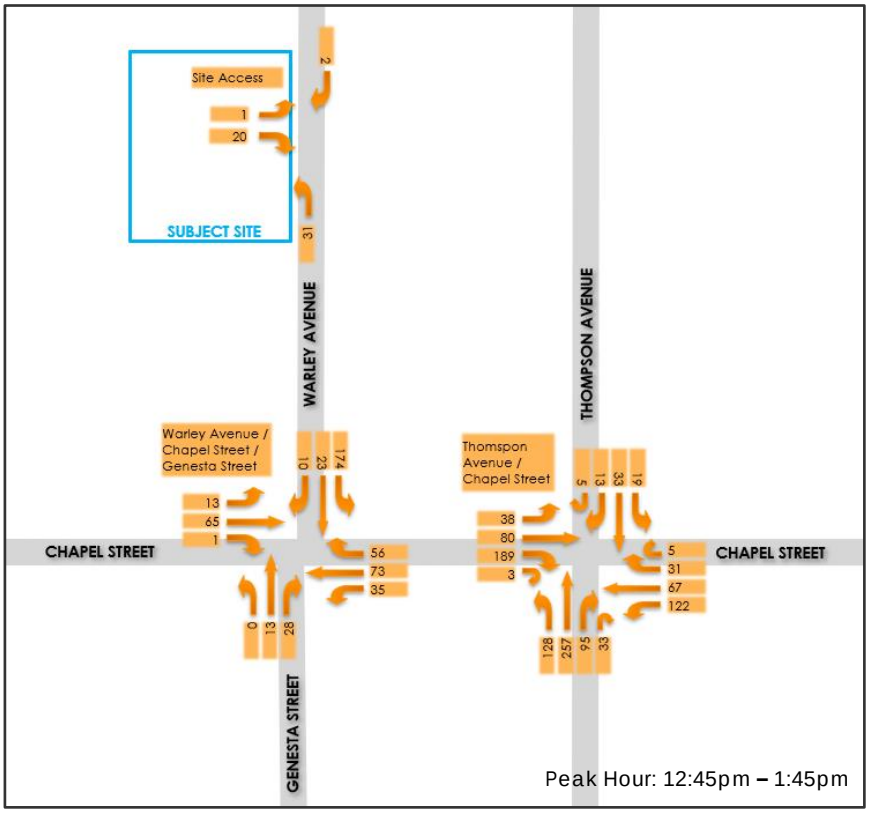


Figure 12 Post Development Traffic Volumes – Saturday PM Peak



8.4 Traffic Impact

Reviewing the volumes above, it is noted that a maximum of 55 vehicle movements per hour are expected in or out of the site, equivalent to one vehicle trip every minute. This amount of traffic is considered very low, and is expected to be easily absorbed into the surrounding road network.

Specifically, the subject site is expected to have little impact on the Warley Avenue / Chapel Street intersection and the Thompson Avenue / Chapel Street intersection.

As noted above in Figure 12, traffic volumes are generally the highest on Saturday during the PM peak hour. During this period, a maximum of 174 traffic movements are expected through the Warley Avenue / Chapel Street intersection, turning left from Warley Avenue onto Chapel Street. This amount of traffic is equivalent to approximately three vehicle movement per minute and an increase of 5% when compared to the existing traffic volumes.

Similarly, a maximum of 189 traffic movements are expected from the Thomson Avenue / Chapel Street Intersection on the Saturday, turning right from Chapel Street into Thompson Avenue. This amount of traffic is equivalent to approximately three vehicle movement per minute and an increase of 8% when compared to the existing traffic volumes.

Considering the above, the post development traffic volumes are considered acceptable and are not expected to have an impact on the operation of Warley Avenue, Chapel Street, Thompson Road, or the surrounding road network.

9 CONCLUSIONS

It is proposed to develop the subject site for the purposes of an apartment development comprising of 91 dwellings, with car parking provided in a basement and mezzanine level.

Considering the analysis presented above, it is concluded that:

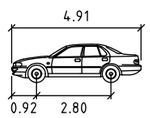
- The proposed access arrangements to the site will see a consolidation of crossovers which will provide for an increase of the public car parking supply from 13 spaces to 19 spaces (an increase of 6 spaces);
- The proposed car parking, bicycle parking and access design is considered appropriate;
- The proposed provision of resident and visitor bicycle parking exceeds the requirements of the Planning Scheme, and is therefore considered appropriate;
- The proposed provision of parking meets the statutory requirements for resident car parking and is considered acceptable;
- The provision of 12 visitor parking spaces equates to a shortfall of 6 spaces;
- A review of car parking in the area coupled with the fact that the development will provide 6 new public on-street spaces indicates that the modest shortfall of just 6 spaces can be comfortably accommodated without impacting on other users;
- The anticipated traffic volumes generated by the development is not expected to have an impact on the operation of Warley Avenue, Chapel Street, or the surrounding road network.

Appendix A Swept Path Diagrams



CAD File: \\auvlcs03\Company\Projects\2021\210810\Drawings\210810SPA101.dgn

Date Plotted: 28-07-2022 12:07:57



B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

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onemilegrid operates from Wurundjeri Woiworung Country of the Kulin nation.
We acknowledge and extend our appreciation to the Wurundjeri People, the Traditional Owners of the land. We pay our respects to leaders and Elders past, present and emerging for they hold the memories, the traditions, the culture, and the hopes of all Wurundjeri Peoples.

Aerial Photography
Aerial photography provided by Nearmap

SWEPT PATH LEGEND

- – – – – DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- ····· 300mm CLEARANCE ENVELOPE SHOWN DOTTED

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Scale 1:200 @ A3 (0 1 2 4)

Drawing Title
6-12 WARLEY AVENUE, COWES
SITE VEHICLE ACCESS
SWEPT PATH ANALYSIS

Designed	Approved	Melway Ref
CM	VG	NA

Project Number	Drawing Number	Revision
210810	SPA101	B

Arbor Survey

DEVELOPMENT IMPACT ASSESSMENT



Site Address:
6-12 Warley Avenue
COWES

Prepared: 13 April 2022

Document Ref:
R5840 6-12 Warley Avenue COWES

Version / Revision: 1

Issued: 29/07/2022

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DOCUMENT CONTROL

ITEM	DETAIL
Arbor Survey Reference:	R5840 6-12 Warley Avenue COWES
Client Reference:	42009 (Bruce Henderson Architects)
Site / Data Collected:	01/11/2021
Report Prepared:	13/04/2022
Reviewed:	29/07/2022
Status:	Final
Version / Revision No:	1
Revision Date:	Not Applicable
Issued Date:	29/07/2022
Issue format:	Portable Document Format (*.pdf) – Uncontrolled when Printed

1. SUMMARY

The Development Impact Assessment has been undertaken to determine the impact to trees or vegetation on or adjoining 6-12 Warley Avenue, Cowes from the proposed construction of an apartment complex. The report provides an overview of the site characteristics and relevant regulatory controls, the arboricultural condition of the trees and determines the Protection Value of the trees and vegetation on the project site and adjoining lands where the tree protection zones may be impacted. The primary purpose of this assessment is to identify the impact from the proposed construction and to outline impact mitigation and tree protection measures for trees of high or moderate protection value. The survey has identified a total of 15 trees and or groups of trees within and surrounding the project site. The following is a summary of the protection value of the trees.

HIGH PROTECTION VALUE TREES

- 7 trees or groups of trees are of high protection value. Trees 1, 8 (Group), 10, 11, 12 (Group), 14 and 15 are located on adjoining land (Private property or Council owned land) and potential construction impacts should be minimised where possible.

MODERATE PROTECTION VALUE TREES

- 2 trees, Trees 6 and 7 are of moderate protection value. These trees have been given this rating as they are of fair-good arboricultural condition and of moderate landscape significance. These trees may have characteristics that can be improved with modern arboricultural practices. Where possible and practical, these trees should be considered for protection within the project site.

TREES OF NO PROTECTION VALUE

- 6 trees / groups (Trees 2-5, 9 (Group) & 13 (Group)) are of no protection value. Trees of no protection value may be of poor arboricultural condition overall, low landscape significance, unsuitable within the project site as they are situated in an inappropriate location for long term growth or landscape functionality or causing damage to surrounding infrastructure. The removal of these trees may be subject to a planning permit.

The proposed development plans were viewed in the preparation of this report. Based on the proposed design and the guidelines of the *Australian Standard AS4970 - 2009 - Protection of Trees on Development Sites*:

TREES THAT CANNOT BE PROTECTED

- 7 trees / groups cannot be protected as they are located within building envelopes or they are within close proximity to works and will incur a high level of encroachment into the Tree Protection Zone (TPZ) and the Structural Root Zone (SRZ). Of these trees:
    - Trees 6* and 7 are of moderate protection value and,
    - Trees 2-5 and 13 (group) are of no protection value.

***Note – It is proposed that Tree 6 (*Phoenix canariensis* – Canary Island Date Palm) is to be transplanted to the western boundary of the project site and utilised as part of the new landscape.**

TREES THAT WILL INCUR MAJOR ENCROACHMENT (GREATER THAN 10%) INTO THE TREE PROTECTION ZONE

- 1 group of trees (Tree group 8) will incur 'Major Encroachment' into the tree protection zones. The potential impact to these high protection value trees may be mitigated through the recommendations provided in Section 6.2.

TREES THAT WILL INCUR NO OR MINOR ENCROACHMENT (10% OR LESS) INTO THEIR TREE PROTECTION ZONE

- 7 trees / groups of trees will incur no or 'Minor Encroachment' into the tree protection zones.
    - Trees 1, 10, 11, 12 (Group), 14 and 15) are of high protection value. Impact mitigation (where required) and protection measures are outlined in Section 6.2.
    - Tree 9 (Group) is of no protection value and should not be retained or protected as part of any future development.

The Tree Location Plan (Existing Conditions) and Development Impact Plan in Section 7.2 provide a visual representation of the protection values of the trees and indicates the Tree Protection Zone (TPZ), Structural Root Zone (SRZ) and encroachment from proposed works for trees that are considered to be of high or moderate protection value.

2. INTRODUCTION

Arbor Survey Pty Ltd has undertaken a Development Impact Assessment in accordance with the *Australian Standard AS4970 - 2009 - Protection of Trees on Development Sites* for the trees on and adjoining 6-12 Warley Avenue, Cowes. This assessment is an analysis of 15 trees or groups of trees that are located within the project site and on adjacent land where the tree protection zones (TPZ) may extend into the project site and may be affected by the proposed construction. Site analysis and field data collection was undertaken on 1 November 2021.

This report provides an assessment of the condition of the trees, expressed as the Arboricultural Value and a determination of the Protection Value. The Protection Value of the trees takes into account the arboricultural condition, landscape and environmental significance, ownership and relevant legislative controls including local municipal laws and vegetation, environmental/ landscape significance, cultural or heritage overlays or any other relevant considerations (i.e. exemptions) of the relevant Planning Scheme.

The assessment of the trees in terms of their overall condition has been made in accordance with the Survey Methodology and Descriptors in Appendix 8.1. These must be referred to when reading this report.

Impact mitigation and tree protection measures are recommended to reduce the impact on high and moderate protection value trees were possible. These measures are based on the guidelines of the *Australian Standard AS4970 - 2009 - Protection of Trees on Development Sites.*

3. REPORT OBJECTIVES, RESOURCE DOCUMENTS AND VEGETATION CONTROLS

3.1 REPORT OBJECTIVES

The Development Impact Assessment has been prepared in accordance with relevant industry standards. The report objectives are:

- To assess tree condition based on the Visual Tree Assessment Methodology (VTA) and landscape significance of the trees or groups of trees on the project site and adjacent land where the tree protection zones (TPZ) may extend into the project site and may be affected by any proposed development or construction
- To identify any relevant Local Laws or Planning controls or exemptions that may be applicable to the site
- To assess the impact to all trees from the proposed development or construction (based upon the *Australian Standard AS 4970 - 2009 - Protection of Trees on Development Sites*)
- To provide impact mitigation and tree protection measures for trees of moderate or high protection value.

The recommendations given are based on the condition of the trees or groups of trees and their suitability for retention and or protection in relation to their current and future growing environment. Recommendations are not driven by the proposed development of the land and impact mitigation measures are provided where possible and practical regarding trees that are of moderate or high protection value.

Trees that are considered to be worthy of protection are afforded general guidelines for tree protection measures. These guidelines do not constitute a Tree Management or Protection Plan (as per the *Australian Standard AS 4970 - 2009 - Protection of Trees on Development Sites*).

3.2 Documents / Resources viewed in preparation of this report

The following documents and resources were viewed or relied upon in preparation of this report:

Plans

- Existing Conditions: Boundary Re-establishment Feature & Level Survey from Veris (Ref No.: 303756, Sheet: 1, Version: N/A, Dated: 22/10/2021)
- Proposed Development Plans: Bruce Henderson Architects (Ref No.: 42009, Drawings: TP-201 – TP-210, TP-301 – TP-305, TP-401 – TP-403, , Revision: N/A, Dated: 24/03/2023).
  (Note: All plans assessed from others and used as a basis for this assessment are assumed to be true and correct)

Planning Controls

- Vic Plan – Department of Environment, Land, Water and Planning (DELWP) (https://mapshare.vic.gov.au/vicplan/)

Responsible Authority

- Bass Coast Planning Scheme

Other

- VicMap Data (Spatial Property Cadastre) (http://services.land.vic.gov.au/SpatialDatamart/)
- Aerial Photograph of the site (Nearmap™ – Dated: 19/01/2022)
- Preliminary Arboricultural Assessment prepared by Arbor Survey Pty Ltd (Ref: R5621, Date: 08/11/2021).

3.3 Vegetation Controls

The project site is located within Residential Growth Zone – Schedule 2 (RGZ2) of the Bass Coast Planning Scheme. The site is subject to the following overlays:

Table 1: Vegetation Protection Controls

Vegetation Controls / Exemptions	Applies to Site	Applies to tree(s):	Reason
Heritage Overlay (HO)	No	N/A	Does not apply.
Significant Landscape Overlay (SLO)	No	N/A	Does not apply.
Environmental Significance Overlay (ESO)	No	N/A	Does not apply.
Vegetation Protection Overlay (VPO)	VPO2	**Project Site** Trees 3, 4, & 7 **Council** Trees 14 & 15	A permit is required to remove, destroy or lop any tree or shrub with a girth greater than 30 cm (measured at 30cm above ground level) or a height of 2 metres. Introduced species of ornamental shrubs, fruit trees, weeds & dead vegetation are exempt. Pruning for maintenance purposes does not require a permit.
Clause 52.17 'Native Vegetation'	Yes	N/A	Site area is greater than 4000m^2 however all trees are not indigenous to Victorian and therefore are exempt.
Clause 52.12 'Bushfire Protection: Exemptions'	No	N/A	Site is not within a Bushfire Prone Area (BPA)
Local Law	No	N/A	No Tree Protection Local Law exists within the municipality.

4. Site Analysis

4.1 Site Location, Area and Topography

The project site is located on the western side of Warley Avenue, Cowes. The site is approximately 4052m² in size and has a change in grade of approximately 6 metres from the north to the south. The aerial photograph in Figure 1 shows the project site and the approximate outline of the property boundaries.



Figure 1: Aerial photograph and property outline (Nearmap™ – Dated: 19/01/2022)

4.2 Tree Location

From the 15 trees or groups of trees assessed:

- 8 trees or groups of trees are located within the project site boundaries,
- 4 trees or groups of trees are located on the neighbouring properties to the north and west of the project site, and
- 3 trees are located on the Council owned road reserve and car parking cut-outs.

4.3 Origin and Landscape Significance

From the assessment, 5 trees are Australian Native specimens (not Indigenous to Victoria) and 10 tree / groups are Exotic specimens. All trees are considered to be planted and there are no remnant trees within the project site.

From the trees or groups of trees assessed:

- 1 tree, Tree 15 is of high landscape significance. This Norfolk Island Pine is located on the Council road reserve and is dominant to the site and to the streetscape.
- 4 trees, Trees 2, 6, 7 and 11 are of moderate landscape significance. These trees may provide screening or other landscape attributes that are of value.

The remaining trees are of low landscape significance and value in terms of their mass and contribution to the canopy coverage to the immediate local area. Some of these trees may be in good condition in terms of their arboricultural characteristics, however, the landscape or amenity value they provide could easily be replaced with new planting.

5. Arboricultural and Protection Value Assessment

5.1 Arboricultural Value Assessment

Arboricultural value is rated according to the overall health, structure, life expectancy and significance within the landscape. The Arboricultural Value only relates to the physical condition of the tree or trees and does not take into account the vegetation/ environmental status/ controls, the suitability of the tree in the landscape or the ownership of the tree (Refer to Appendix 8.1 for further information on the descriptors used).

The Arboricultural Value rankings are provided in the tree data is found in Section 7.1. The Arboricultural Value only provides a rating of the arboricultural condition of the trees. In general, trees that are considered to be of moderate to high Arboricultural Value are also considered to be of moderate to high Protection Value unless the trees are inappropriate for long term growth or landscape functionality or causing damage to surrounding infrastructure. Additionally, some trees may be of no Protection Value if there are relevant planning exemptions (i.e. Clause 52.12). Similarly, some trees may be of low Arboricultural Value, however they are given a high Protection Value as they are located on adjoining private property or Council owned land.

5.2 Protection Value Assessment

The Protection Value of the trees has been determined by taking into consideration the arboricultural value, landscape significance, habitat value, ownership and relevant legislative controls (including local municipal laws, vegetation protection and environmental/landscape significance overlays and cultural/heritage overlays) or any other relevant considerations (i.e. exemptions) of the relevant Planning Scheme. Only trees of high and moderate protection value should be considered for protection (Refer to Appendix 8.1 for further information).

Table 2 documents the trees that are worthy of protection and provides the trunk and basal diameters (DBH and Basal Dia.), Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) (Note: SRZ and TPZ are a radial measurement from the centre of the trunk).

This table should be viewed in conjunction with the Tree Location (Existing Conditions) and Development Impact (Proposed Development) Plans located in Section 7.2. Trees that have been determined to have a high and moderate protection value are shown and have the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) drawn.

Table 2: High and Moderate Protection Value Trees - Tree Protection Distances

Tree No	Botanical Name	Ownership	Protection Value	DBH (cm)	Basal Dia (cm)	SRZ (m)	TPZ (m)	TPZ Area (m^2)
1	*Photinia serratifolia*	Council	High	16/9/16/ 11.5 (26.9)	31	2.0	3.2	32
6	*Phoenix canariensis*	Project Site	Moderate	73	87	1.5	4.0	50
7	*Lophostemon confertus*	Project Site	Moderate	80	85	3.1	9.6	290
8 (GROUP)	*Pittosporum tenuifolium*	Neighbour	High	Multi-stem	Approx. 25	1.8	3.0	28
10	*Eriobotrya japonica*	Neighbour	High	Approx. 35	Approx. 40	2.3	4.2	55
11	*Pyrus calleryana*	Neighbour	High	Multi-stem	Approx. 45	2.4	5.4	92
12 (GROUP)	*Musa* sp.	Neighbour	High	Approx. 15	Approx. 15	1.5	2.0	13
14	*Araucaria heterophylla*	Council	High	22	28	1.9	2.6	21
15	*Araucaria heterophylla*	Council	High	77	88	3.1	9.2	266

Note: *DBH (cm) is the diameter at breast height (1.4m from natural ground level), Basal Dia (cm) is the diameter of the trunk above the root flare, SRZ (m) is the structural root zone in metres in a radius from the centre of the trunk, TPZ (m) is the tree protection zone in metres in a radius from the centre of the trunk. These measurements and distances are calculated based on the Australian Standard AS4970 - 2009 - Protection of Trees on Development sites.*

6. Development Impact Assessment and Impact Mitigation Recommendations

6.1 Development / Construction Impact Assessment

The following table provides a summary of the impact of the proposal on the assessed trees based on their protection value in accordance with the guidelines of the *Australian Standard AS4970 - 2009 - Protection of Trees on Development Sites*. The encroachment is based on all works including the building footprint, crossovers, driveways and hard landscaping elements such as pathways.

Table 3: Encroachment Summary

Protection Value	No Encroachment	Minor Encroachment	Major Encroachment	Cannot be Protected
None	0 trees	1 group **(Trees 9*)**	0 trees	5 trees / groups **(Trees 2-5 & 13*)**
Moderate	0 trees	0 trees	0 trees	2 trees **(Trees 6 & 7)**
High	4 trees / groups **(Trees 1, 10, 12* & 14)**	2 trees **(Trees 11 & 15)**	1 group **(Tree 8*)**	0 trees

*** - denotes tree groups**

The encroachment into the tree protection zone from buildings and or any works (including the construction of paths, driveways, landscaping etc) may be considered as low impact to significant impact. For example, a tree may have an encroachment of 30% into the tree protection zone (TPZ), however this encroachment is from landscaping/ path works or for a wooden deck that is to be constructed above natural ground level. In such cases, the impact can be defined as 'Low Impact' and impact mitigation actions can be easily applied during construction. Conversely, an encroachment into the TPZ of 30% may be from a deep excavation (such as a basement) in which case the impact would be defined as 'Significant Impact' and impact mitigation can only be achieved through a redesign of the works proposal.

In some cases, similar type works (i.e. such as a new driveway or crossover in a TPZ) may be defined as either Low, Moderate, High or Significant Impact. In these cases, the impact level will be defined by the topography of the site and the ability to construct above natural grade.

Table 4 below provides a summary of the encroachment and indicates whether the impact is considered to be Low, Moderate, High or Significant. The impact mitigation recommendations in Section 6.2 outline what is required to protect these trees where possible. The impact to trees of no protection value are not provided as these trees should not be considered for retention or protection as part of the proposal. Encroachment calculations are provided for these trees in the tree data in Section 7.1

Table 4: Construction / Development Impact Summary

Tree No.	Botanical Name	Protection Value	Encroachment	Element	Impact Level
1	*Photinia serratifolia*	High	0%	None	No Impact. Standard Tree Protection recommended.
*6	*Phoenix canariensis*	Moderate	100%	Apartment Complex	*Lost – Tree lost under proposed works footprint but is proposed to be transplanted to western boundary of the project site
7	*Lophostemon confertus*	Moderate	100%	Apartment Complex	Lost – Tree within works footprint.
8 (GROUP)	*Pittosporum tenuifolium*	High	Up to 30%	Retaining Wall	Significant – Refer to potential design changes recommendations.
10	*Eriobotrya japonica*	High	0%	None	No Impact. Standard Tree Protection recommended
11	*Pyrus calleryana*	High	10%	Retaining Wall/ Paving	Low – Minor Encroachment. Standard Tree Protection recommended.

Tree No.	Botanical Name	Protection Value	Encroachment	Element	Impact Level
12 (GROUP)	*Musa* sp.	High	0%	None	No Impact. Standard Tree Protection recommended
14	*Araucaria heterophylla*	High	0%	None	No Impact. Standard Tree Protection recommended
15	*Araucaria heterophylla*	High	4%	Apartment Complex	Low – Minor Encroachment. Standard Tree Protection recommended.

6.2 Impact Mitigation Recommendations

Trees that have been determined to have no protection value should not be considered for long term retention and or protection as part of any future development on the project site. Trees of no protection value are not provided impact mitigation recommendations in this Development Impact Assessment.

Tree protection and impact mitigation measures are listed below in order to reduce the potential of direct or indirect impacts (soil compaction, physical tree/root damage etc). For further information on general guidelines for tree protection see Appendix 8.3.

Trees Protection Status

- It is recommended that all trees of high protection value (Trees 1, 8 (Group), 10, 11, 12 (Group), 14 & 15) are protected as part of the works proposed unless permission for their removal is approved by the property owner / Responsible Authority. .
- Although Trees 6 and 7 are of moderate protection value, they are unable to be retained.
- The remaining trees (Trees 2-5, 9 (Group) & 13 (Group)) are not worthy of retention. The removal of Trees 3 and 4 is subject to a permit under the VPO2. Suitable replacement planting should be undertaken in lieu of their removal.

Permit Requirements

- The removal of Trees 3 (*Corymbia ficifolia*), 4 (*Agonis flexuosa*) and 7 (*Lophostemon confertus*) is subject to a permit under the VPO2.
- The remaining trees within the Project Site are exempt from requiring a permit as they are Exotic (not Native to Australia) specimens.

Potential Design alterations

- It is recommended that the retaining wall within the Tree Protection Zone (TPZ) of Tree group 8 is modified so that it is outside the Structural Root Zone (SRZ) of the trees i.e. a planter box or similar is created that can be retained at natural ground level.

Further investigation required

- No further investigation is required at this stage. If the modification of the retaining wall within the TPZ of Tree group 8 is not feasible then a Non-Destructive Root Investigation may be necessary to accurately determine the extent of root growth into the Project Site. .

Specific construction recommendations

- The excavation for the retaining wall within the TPZs of Tree group 8 and Tree 11 should be supervised by a qualified Arborist. Roots observed should be correctly pruned with sharp sterile tools.

Standard Tree Protection Measures

- Standard tree protection fencing must be established around the TPZs of Protected Trees (where outside proposed works footprint). The fencing is to remain in place during all site preparation / levelling and construction works.

Specialised Tree Protection Measures

- Ground protection will be required where the TPZs cannot be adequately isolated with fencing and heavy vehicle access is required i.e. along the driveway.

General Tree Protection Requirements

- Soil levels within the TPZs (where outside building/ driveway or works footprints) should remain at existing grade and permeable
- Any excavation (demolition and construction) within the TPZs should be supervised by a qualified arborist. Any roots uncovered must be cleanly pruned with sharp/sterile hand tools
- All tree protection measures must remain in place for the duration of works and can only be removed in consultation with the Project Arborist or local Responsible Authority
- Any new boundary fencing within the TPZ should be of light weight construction with no continuous footings and manually excavated stump holes (by hand or post hole auger only)
- Any required pruning must be in accordance with *Australian Standard AS4373-2007 Pruning of Amenity Trees* and carried out by a minimum AQF Level 3 Arborist.
- All services should be located outside the TPZ of trees to be protected. Where no alternative exists, a non-destructive root investigation or directional boring under supervision of a qualified Arborist must be undertaken to install the services.

Tree Management During Construction

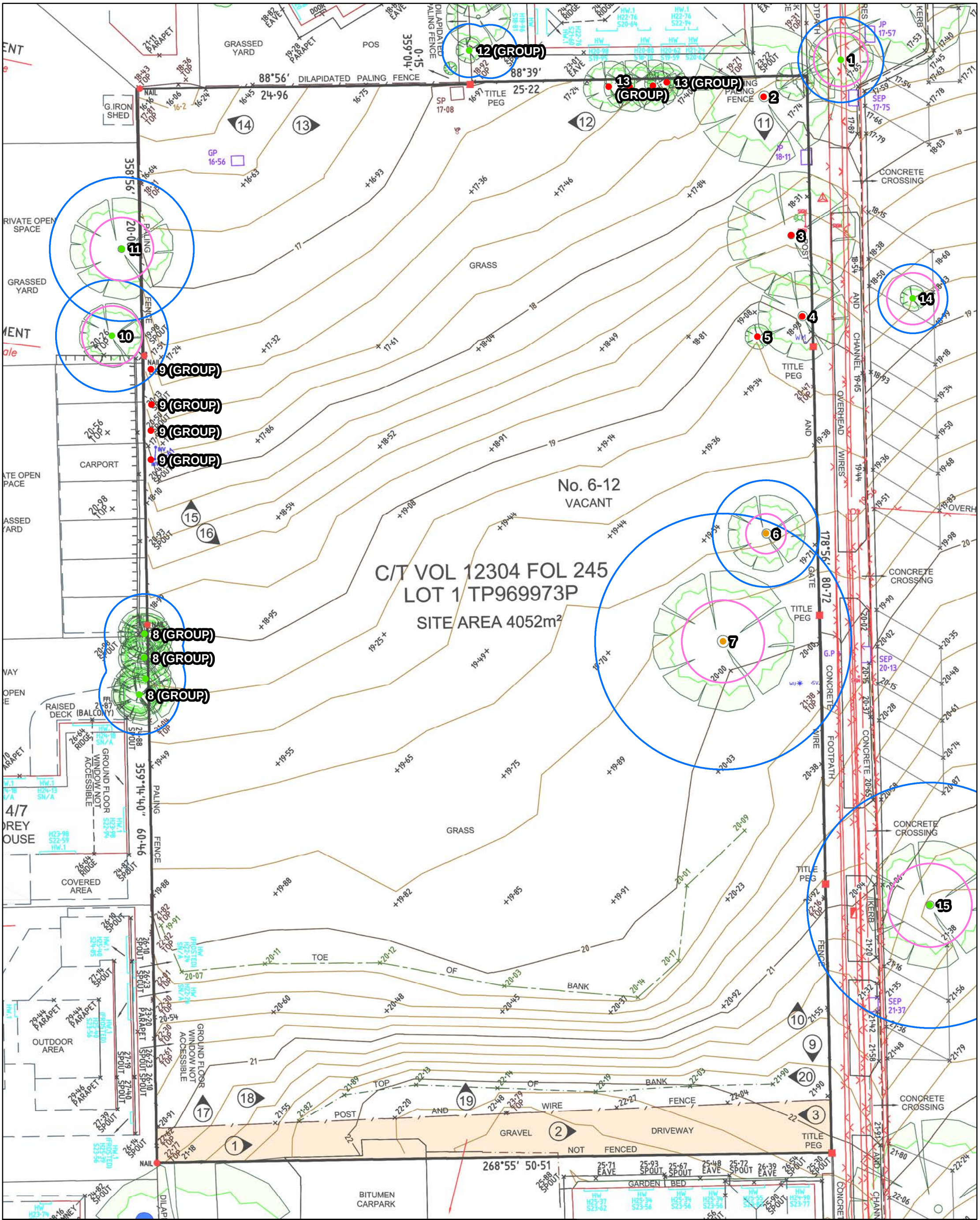
Dependant on the final design, it is recommended that a Tree Management Report and Protection Plan (TMPP) is created as a condition of permit that will specify the exact requirements for tree protection of all high and moderate protection value trees to be protected. As part of the TMPP, it is recommended that there is a certification framework that details the actions required at all stages of development, the timing of supervision and the Certification methods to be undertaken by the Project Arborist.

7. Tree Data and Plans

7.1 Tree Data

Tree No	Botanical Name	Common Name	Origin	DBH (cm)	Basal Dia (cm)	Height (m)	Spread (m)	Health	Structure	Age Class	Arbor Value	Ownership	Protect Value	SRZ (m)	TPZ (m)	Encroach (%)	Notes
1	*Photinia serratifolia*	Chinese Photinia	Exotic	16/9/16/ 11.5 (26.9)	31	5	6	Poor	Fair	Semi-Mature	Low	Council	High	2.0	3.2	0%	Deadwood, multi-stem form
2	*Chamaecyparis lawsoniana*	Lawson's Cypress	Exotic	26/71 (75.6)	87	13	10	Good	Fair-Poor	Mature	Low	Project Site	None	3.1	9.1	100%	Deadwood, asymmetrical canopy, heavily pruned on northern side
3	*Corymbia ficifolia*	Red Flowering Gum	Aus Native	49	56	7	7	Good	Fair-Poor	Mature	Low	Project Site	None	2.6	5.9	100%	2 large wounds with Kino present on main stem, cleared from powerlines, asymmetrical canopy
4	*Agonis flexuosa*	Willow Myrtle	Aus Native	66	63	7.5	7	Good	Fair	Mature	Medium	Project Site	None	2.7	7.9	100%	Codominant stems with included bark, deadwood
5	*Rosa rubiginosa*	Briar Rose	Exotic	Multi-stem	10	2	1	Poor	Poor	Mature	Low	Project Site	None	1.5	2.0	100%	Canopy dieback
6	*Phoenix canariensis*	Canary Island Palm	Exotic	73	87	10	6	Good	Fair-Good	Mature	Medium	Project Site	Moderate	1.5	4.0	100%	Dead fronds
7	*Lophostemon confertus*	Queensland Brushbox	Aus Native	80	85	10.5	11	Good	Fair	Mature	Medium	Project Site	Moderate	3.1	9.6	100%	Codominant stems, poor pruning on lower lateral branches
8 (GROUP)	*Pittosporum tenuifolium*	Kohuhu	Exotic	Multi-stem	Approx. 25	7.5	3	Poor	Poor	Semi-Mature	Low	Neighbour	High	1.8	3.0	Up to 30%	Group of 4, sparse canopy, multi-stemmed from base
9 (GROUP)	*Hydrangea* sp.	Hydrangea	Exotic	Multi-stem	Approx.15	2	1	Poor	Poor	Semi-Mature	Low	Project Site	None	1.5	2.0	1%	Group of 4, multi-stemmed from base
10	*Eriobotrya japonica*	Loquat	Exotic	Approx. 35	Approx. 40	6	5	Poor	Poor	Semi-Mature	Low	Neighbour	High	2.3	4.2	0%	Major deadwood present, possum grazing
11	*Pyrus calleryana*	Callery Pear	Exotic	Multi-stem	Approx. 45	9	10	Poor	Poor	Mature	Low	Neighbour	High	2.4	5.4	10%	Multiple stems with included bark unions, major deadwood, 60% epicormic
12 (GROUP)	*Musa sp.*	Banana Palms	Exotic	Approx. 15	Approx. 15	5.5	2	Fair	Poor	Mature	Low	Neighbour	High	1.5	2.0	0%	Group of 2, No Impact, shed on other side of fence
13 (GROUP)	*Cinnamomum camphora*	Camphor Laurel	Exotic	Multi-stem	Approx.20	5.5	3	Poor	Poor	Semi-Mature	Low	Project Site	None	1.7	2.4	100%	Group of 4, multi-stemmed from base
14	*Araucaria heterophylla*	Norfolk Island Pine	Aus Native	22	28	7	2.5	Poor	Fair-Good	Semi-Mature	Low	Council	High	1.9	2.6	0%	Low landscape value, low vitality
15	*Araucaria heterophylla*	Norfolk Island Pine	Aus Native	77	88	18	8	Fair	Fair	Mature	Medium	Council	High	3.1	9.2	4%	Low landscape value, deadwood, 2 wounds on main stem, near base and 2 m high

Note: DBH (cm) is the diameter at breast height (1.4m from natural ground level), Basal Dia (cm) is the diameter of the trunk above the root flare, Arbor Value is the Arboriculture Vale, SRZ (m) is the structural root zone in metres in a radius from the centre of the trunk, TPZ (m) is the tree protection zone in metres in a radius from the centre of the trunk. The Encroach (%) is the level of encroachment into the tree protection zone of the tree from the excavation/ construction works. These measurements and distances are calculated from the Australian Standard AS4970 - 2009 - Protection of Trees on Development sites.



Arbor Survey
37 Arbor Way
CARRUM DOWNS VIC 3201
Phone: 03 8521 4966

7.2 TREE LOCATION PLAN

Site: 6 - 12 Warley Avenue COWES	Revision: -
Client: 8 Warley Ave Pty LTD	Date Drawn: 04 November 2021
	Arbor Survey Ref: R5621

0 1.5 3 6 9 12 15 18 Meters

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:250 at Sheet Size A3

Source Plan:
Feature Level Survey Plan
Veris
Ref: 303756 Date: 22/10/2021

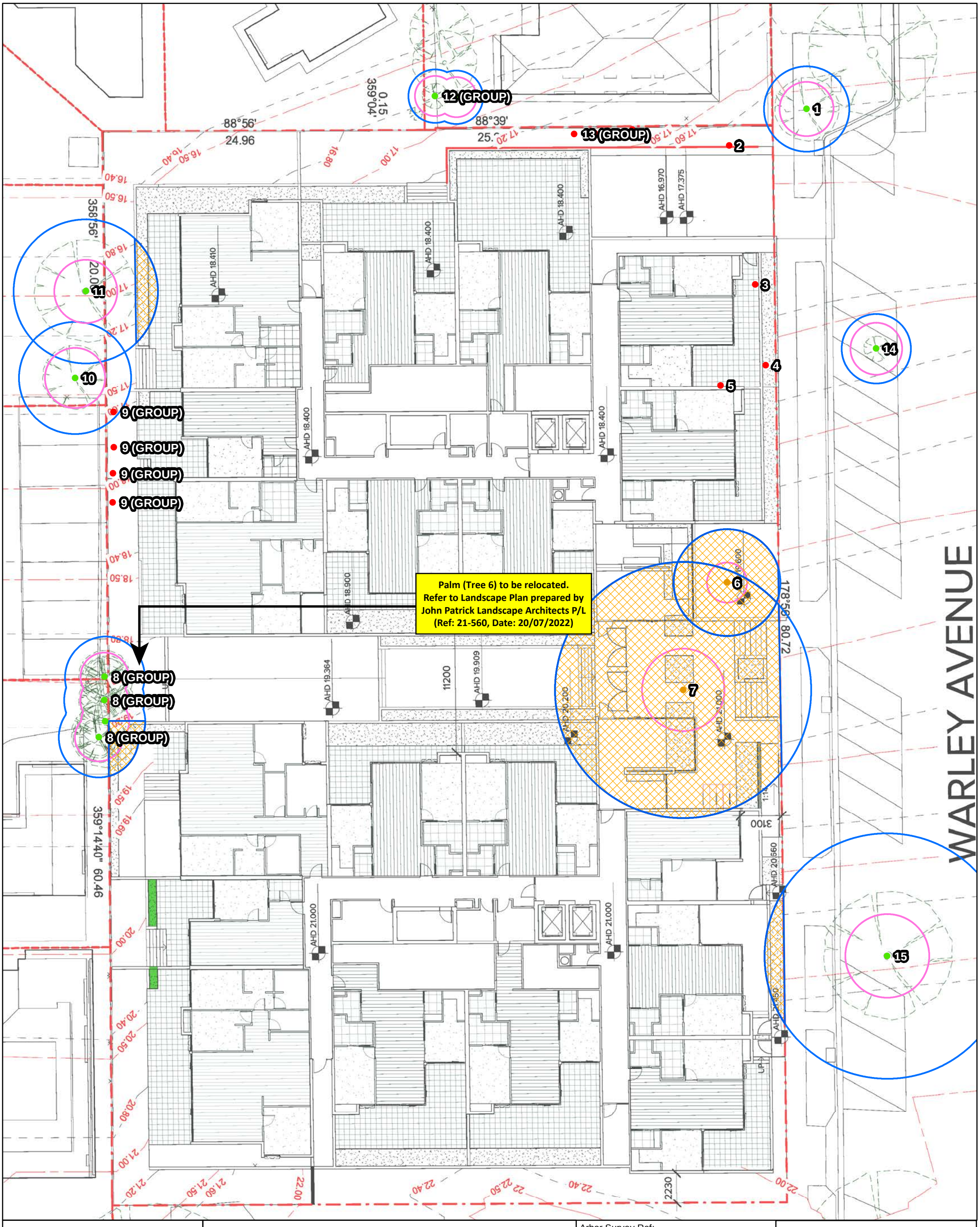
Legend

Tree Protection Value

- High
- Moderate
- None

Tree Protection Areas

- Structural Root Zone (SRZ)
- Tree Protection Zone (TPZ)



Arbor Survey
37 Arbor Way
CARRUM DOWNS VIC 3201
Phone: 03 8521 4966

7.2 DEVELOPMENT IMPACT PLAN

Site:
[REDACTED]

Client:
8 Warley Ave Pty LTD

0 1.5 3 6 9 12 15 18 Meters

Coordinate System: GDA 1994 MGA Zone 55
Scale: 1:250 at Sheet Size A3

Arbor Survey Ref:
R5621

Revision:
A (29/07/2022)

Date Drawn:
13 April 2022

Source Plan:
Site Levels
Bruce Henderson Architects
Ref: 42009 Date: 24/03/2022

Legend

Tree Protection Value
- High
- Moderate
- None

Tree Protection Areas
- Structural Root Zone (SRZ)
- Tree Protection Zone (TPZ)
- Encroahcment Area

7.3 PHOTOGRAPHIC REFERENCES



Tree 1: Chinese Photinia



Tree 2: Lawson's Cypress



Tree 3: Red Flowering Gum



Tree 4: Willow Myrtle



Tree 6: Canary Island Palm



Tree 7: Queensland Brush Box



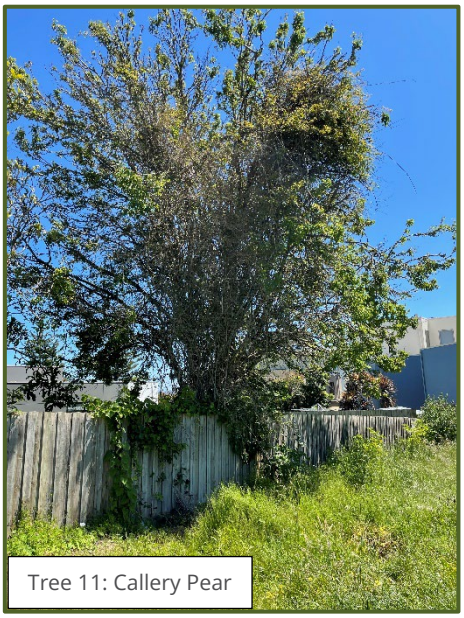
Tree group 8: Kohuhu



Tree group 9: Hydrangea



Tree 10: Loquat



Tree 11: Callery Pear



Tree group 12: Banana Palms



Tree group 13: Camphor Laurel



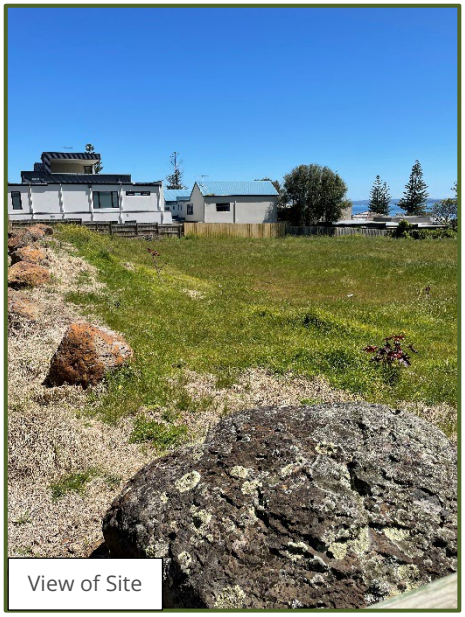
Tree 14: Norfolk Island Pine



Tree 15: Norfolk Island Pine



View of Site



View of Site



View of Site



View of Site

8. APPENDICES

8.1 SURVEY METHODOLOGY AND DESCRIPTORS

Site observations and tree data was recorded on site at the date noted within Section 2 (Introduction). This report is based upon the condition of the trees and the site conditions noted on the inspection date(s) only. The characteristics of each tree or group of trees of similar characteristics have been undertaken in accordance with the Visual Tree Assessment (VTA) methodology (Mattheck & Breloer, 1998).

The data is included in this report in a detailed table, located in Section 7.1. Tree Location (existing conditions) and Development Impact (proposed development) Plans are provided in Section 7.2 where relevant. Site photographs (if relevant) are provided in Section 7.3.

The survey identifies all trees or groups of trees within the project site over 2 metres in height and on adjoining lands (neighbouring properties and or Council or other regulatory body or Crown land) where their projected Tree Protection Zones (TPZs) extend to within the project site and may be affected by the proposed buildings and or works. The assessment is undertaken from a visual inspection from ground level only. No individual tree or trees were climbed and no samples of soil, plant material or pest and disease infestation (if present) were taken for analysis. Defects not apparent from this ground-based visual inspection are excluded from the discussion within this report. This report is not a risk assessment and no other assessment methodologies have been used.

This assessment is based on an improved and modified version of current industry best practice. 'Retention Value' is not used as the primary driver for any recommendations. The primary driver for the recommendations within the report is the characteristic of 'Protection Value'. Protection value is derived from a combination of the physical arboricultural characteristics and life expectancy recorded as the 'Arboricultural Value' in conjunction with the landscape significance or amenity value, ownership, and relevant regulatory controls.

The following data is recorded on site:

- **Tree Identification Number (Tree No.)** – This is a sequential numeric numbering system used to identify each tree on the attached site map. These numbers may also relate to tags placed on each tree in the field if required. Any deviation of the numbering system will be specifically noted within the report.

- **Genus/ Species (Botanical Name)** – Species identification is considered as common and made using species characteristics observed on site or sampled and researched off site. Specific cultivar or subspecies details are omitted unless where known. No samples have been taken to the National Herbarium of Victoria for accurate analysis and identification unless specifically noted within the report.

- **Common Name** – This is the typical common name assigned to the tree species. For many trees, there is likely to be numerous common names that could be used. The common name provided should only be seen as a secondary identification tool.

- **Origin** – This may be recorded as Native (originates from Australia, outside of the survey area), Indigenous (originates from within the survey area), Exotic (originates from outside of Australia).

- **DBH (cm)** – this is the Diameter at Breast Height (DBH) measured using a diameter tape at approximately 1.4 metres from natural ground level. Where the trunk diameter at this point may be affected by natural growth such as a major union point, the DBH will be measured just below this union point. For multiple stemmed trees, the measurements are provided for up to 4 stems (at 1.4 metres from natural ground level). These will be recorded, and the combined or total diameter will be calculated in accordance with the Australian Standard AS 4970-2009-Protection of Trees on Development Sites using the formula below:

$$\text{Total DBH} = \sqrt{(\text{DBH}_1)^2 + (\text{DBH}_2)^2 + (\text{DBH}_3)^2 + (\text{DBH}_4)^2}$$

This is represented in the tree data as "Stem1/Stem2/Stem3/Stem4 (Calculated DBH)" – i.e. 15/28/34/19 (50.3). The calculated DBH of the stems is used to determine the Tree Protection Zone. For trees with more than 4 stems, the DBH (cm) measurement is recorded as 'Multi-stemmed' or similar. In instances where 'Multi-stemmed' is recorded, the Tree Protection Zone will be based on a basal measurement. For neighbouring property trees and where access is limited, an approximate DBH (cm) will be provided.

- **Basal Dia (cm)** – this is the diameter of the tree at the trunk base (including multiple stemmed trees) at a level above the trunk basal flare. This is used to determine the Structural Root Zone (SRZ). In some cases, this will be noted as being 'Multi -stemmed' and the SRZ will be estimated using an approximate basal diameter. For neighbouring property trees and where access is limited, an approximate Basal Diameter (cm) will be provided.

- **Height (m)** – this is the approximate height of the canopy of the tree or the largest canopy height of a group of trees. This is an approximated height based on known landscape reference points. In cases of large significant trees where accurate height measurements are required (as height will directly affect the outcome or recommendations of the report), a Nikon Forestry Pro Laser Range finder will be used. Where measured heights have been used, this will be noted within the report data and detailed within the report.

- **Spread (m)** – this is the approximate canopy spread of the tree on the widest axis. This is given as a single measure and is provided as a guide to show overall canopy spread within the landscape. Where multiple canopy dimensions are required (i.e. proximity to buildings and or severely asymmetric canopy growth) as it may affect the outcome of tree protection, these will be noted within the report data and detailed in the Development Impact Assessment.

- **Health** - relates to the tree vigour and canopy density. The characteristic assigned to the tree may be represented as a combination of any of these categories (e.g. Fair to Poor or Fair–Poor). In these instances, there may be a combination of the characteristics listed below or the foliage density is at the upper or lower scale of each category. In some cases, 'Health' may be noted as being 'Very Good' which indicates an optimal condition or 'Very Poor' which indicates that the tree is of such poor health and is unlikely to recover. In some cases, the 'Health' condition will be provided as 'Dead'. In this case, there is no observable indication that the tree is alive at the time of inspection. Health is rated according to the following categories:

Category	Description
Good	Foliage density / bud formation (Deciduous) is greater than 75% at optimal growth. There is less than 10% canopy dieback present and foliage has no or very minor tip dieback. Tree may also have visible extension growth if it is in active growth and is showing no signs of nutrient deficiency (i.e. chlorosis) or active pest or disease presence. The tree may also have good wound wood development.
Fair	Foliage density / bud formation (Deciduous) is between 50-75% at optimal growth for the species. There may be 10-30% canopy dieback present and foliage may have minor tip dieback. Tree maybe showing signs of normal growth, but it is not consistent throughout the crown. Some foliage discolouration may be present from possible nutrient deficiency or other cause (i.e. pest or disease).
Poor	Canopy may be asymmetrical (not typical for the species and affecting vigour) and or canopy may be suppressed. There may be greater than 30% canopy dieback present and foliage density is below 50%. Stunted growth through leaf size or petiole extension and discolouration of the leaf may be present. Tree may be producing epicormic shoots as a stress response. Nutrient deficiency, lack of resources (water, light etc) or pathogens may be the causal agent in the tree's decline.

- **Structure** - relates to the physical form of the tree, including the trunk(s), main scaffold branches and roots. Structure includes the attributes that may influence the probability of trunk, limb, or root plate failure. The characteristic assigned to the tree may be represented as a combination of any of these categories (e.g. Fair to Poor or Fair to Good). In these instances, there may be a combination of the characteristics listed below. In some cases, 'Structure' may be noted as being 'Very Good' which indicates an optimal condition or 'Very Poor' which indicates that the tree has major structural defects and may be of a relatively high risk of failure of the identified tree part.
  Structure is rated according to the following categories:

Category	Description
Good	The form of the tree is excurrent or decurrent and typical of the species characteristics and exhibits good symmetrical form. Major limbs are well formed with acceptable branch taper and unions appear to be strong with no signs of major defects. The tree has minimal defects or decay throughout the trunk and limbs. There is no signs of root plate heave or damage to the root system (mechanical or other). The tree is unlikely to suffer major branch or trunk failure under normal environmental (weather) conditions.
Fair	The form of the tree is excurrent or decurrent and typical of the species characteristics and has a fairly symmetrical form. Tree may exhibit minor structural defects that may be managed through formative/remedial/restorative or structural pruning. Only minor wounds and or areas of decay are present that do not affect the overall stability or structural integrity of any major parts of the tree. Minor root damage may have occurred in the past. Defects present are likely to cause only minor branch failure under normal environmental (weather) conditions.
Poor	Tree has a poorly formed crown that is not symmetrical. Branch and or trunk taper may be unacceptable and scaffold limbs may be overextended. Branch unions may exhibit significant defects that cannot be managed through formative pruning. There is likely to be decay in parts of the tree that may result in branch or trunk failure. Major root damage may have occurred and there may be evidence of root plate heave. Defects that are present may result in major failure of branches or trunk under normal environmental (weather) conditions.

- **Age Class** - is given as a guide to the current life stage of the tree. Ultimately, the level of maturity that a tree may reach is dependent on the growing environment. The 'Mature' age class may extend for many years and is given only as an indication of the maturity of the tree based on the conditions of the local environment. Age Class is rated according to the following categories:

Category	Description
New Planting	Planted within approximately 2 years
Juvenile	Estimated as between 2 - 10 years old
Semi-mature	Estimated at between 10 – 20 years old, however, this may be species dependant
Mature	Estimated at over 25 years old or in a life stage that is considered at the peak of growth for the species.
Senescent	In the declining phase of the tree's lifespan

- **Arboricultural Value** - is rated according to the overall health, structure, and estimated life expectancy of the tree (often referred to as 'Useful Life Expectancy -ULE'). Often the life expectancy or ULE of a tree may be difficult to quantify as there are too many variables and therefore it is not directly recorded as a characteristic in the report. ULE has traditionally been used to guide future replanting and tree population heuristics.

  The 'Arboricultural Value' takes into account the overall condition and life expectancy of the tree however it does not take into account the landscape or environmental status or suitability of the tree in the landscape. This rating is not a 'Retention Value' or 'Protection Value', it is only a rating of the overall condition of the physical characteristics of the tree and its expected longevity (based on growing conditions). For example, a tree of a semi mature or younger age class may be given a medium or high arboricultural value based on its condition, however it may be given no protection value based on its current size and low landscape significance and or amenity value. The arboricultural value is rated based on the following categories:

Category	Description
Low	A tree of low arboricultural value may be considered to be in poor condition overall with a low life expectancy (less than 10 years). The tree may be showing signs of poor health and or structure. The tree may either have a poor health rating and it is unlikely to recover or a poor structure that cannot be remedied though normal arboricultural pruning practices.
Medium	A tree of medium arboricultural value may be considered to be in fair condition overall. This tree may be considered as an average tree that provides average benefits to the site and local area with an estimated longevity of between 10 – 20 years. The tree may have evidence of fair to poor health that may be improved through cultural practices. The tree may have some structural defects that can be remedied through normal arboricultural pruning practices.

Category	Description
High	A tree of high arboricultural value may be considered to be of good overall health and structure. The tree is considered to have a life expectancy of greater than 20 years. Under normal maintenance practices this tree is expected to perform well in the landscape in the long term.

- **Ownership** – the ownership is noted as this may affect the 'Protection Value' of a tree or group of trees. Generally, trees and or vegetation that are located on adjoining lands that are not of the ownership of the project site may be subject to permission for removal and or works within the tree protection zone. Traditionally, this may be referred to as 'Third Party Ownership'. Adjoining lands may be owned by private property owners and this is noted as being in the category 'Neighbours'. Trees located on road reserves, nature strips or adjoining parklands/ open spaces are often owned or managed by the local Responsible Authority and are given the ownership category of 'Council'. Where known, ownership may be noted as being 'Crown' or another regulatory body (e.g. Melbourne Water). In some cases, the ownership will be noted as 'Other' and this will be explained in the 'Site Analysis' section of the report.

- **Protection Value** - is determined based on a combination of the Arboricultural Value, the ownership/ location of the tree, the landscape/ ecological and or cultural / heritage significance of the tree. The Protection Value also takes into account the suitability of the tree in the current and future landscape and the species status (i.e. identified weed species). The tree may also be protected under any relevant Planning or Local Law regulations which is also taken into account under Protection Value. Protection Value is rated according to the following categories:

Category	Description
None	A tree or group of trees of 'No' protection value may be considered to be in poor condition overall and is assigned a low arboricultural value and is within the project site. The tree may be of medium or high arboricultural value, however, if it is a known weed species, is doing considerable infrastructure damage or is not suitable to the site (based on its physical characteristics) it is considered to be of no protection value. The tree may be a juvenile to young specimen that can easily be replaced with new tree planting that will provide a greater amenity in the next 5 – 10 years. This tree may have a low landscape significance in terms of its height and mass within the landscape (I.e. generally less than 8 metres in height and spread) Trees that are located on adjoining land may be given a rating of 'None' if they are found to be dead or extremely hazardous and do not have any regulatory protection and or habitat value. In such instances this will be defined within the report. The tree(s) may or may not be subject to any local Planning or other regulatory control (i.e. Local Law).
Moderate	A tree or group of trees of 'Moderate' protection value may be considered to be in fair to good condition overall and is located within the project site. The tree may be of medium or high arboricultural value, however, it may or may not be suitable to the site in the long term (based on its physical characteristics) for greater than 20 years. The tree may provide a moderate level of landscape significance or amenity and be of moderate individual significance. The tree may be in a semi mature to early mature life stage. Ideally any future development should consider a moderate protection value to be retained and incorporated into the design. However, if the retention and or adequate protection of this tree cannot be achieved with a reasonable design footprint then consideration should be given to the removal of the tree and replacement with a new tree suitable to the landscape and available space. Only trees within the project site may be given a rating of 'Moderate'. Trees that are located on adjoining land are not given a rating of 'Moderate'. The tree(s) may or may not be subject to any local Planning or other regulatory control (i.e. Local Law).

Category	Description
High	A tree or group of trees of 'High' protection value may be considered to be in good condition overall and is suitably located within the project site (i.e. within the front setback). The tree (if within the project site) will be of high arboricultural value and should have a life expectancy of greater than 20 years if protected and managed. The tree may provide a moderate to high level of landscape significance or amenity and be of moderate to high individual significance. The tree will be in a mature life stage but not beginning senescence. Ideally any future development should consider a high protection value to be retained and incorporated into the design when the tree is located on the site. The design should have regard to the adequate protection of this tree throughout any development on the project site. This tree may have a high landscape significance in terms of its height and mass within the landscape (I.e. generally greater than 12 metres in height and spread) Trees located on adjoining lands, not of the ownership of the project site, are given a high protection value, regardless of their overall condition (Arboricultural Value), the environmental / landscape significance and or cultural / heritage significance (i.e. historic or remnant old veteran trees) unless they are Dead and do not have any regulatory protection and or habitat value. High protection value may also be assigned to known weed species, however this will be noted within the report. The tree(s) may or may not be subject to any local Planning or other regulatory control (i.e. Local Law).

- **SRZ (m)** - The Structural Root Zone (SRZ) (referenced from *Australian Standard AS4970-2009 - Protection of Trees on Development Sites*) is the calculated distance based on Basal Dia (cm). The SRZ identifies the minimum radius at which the root plate should not be disturbed. This measure only relates to the trees' stability and does not take into account the implications of a decline in health. The measurement is given in metres in a radius from the centre of the tree trunk.

- **TPZ (m)** - The Tree Protection Zone (TPZ) (referenced from *Australian Standard AS4970-2009 - Protection of Trees on Development Sites*) is the calculated distance based on the DBH of the tree. The TPZ addresses the physiological implications by retaining an ideal area around the tree to survive in the landscape on a long-term basis. The measurement is given in metres in a radius from the centre of the trunk.

- **TPZArea (m2)** - is the tree protection zone in square metres (m^2) around the trunk.

- **TPZ10% (m)** - identifies the 10% encroachment radial distance into the tree protection zone on one side of the tree only (Minor Encroachment).

- **Encroach (%)** - is the level of encroachment into the TPZ of the tree from the excavation/ buildings and works.

- **Notes/ Comments** – The general notes/ comments provide additional support where required for the tree data collected in the field.

8.2 GLOSSARY OF COMMONLY USED TERMS

Amenity
Although difficult to quantify, the term as used in this report relates to the contribution given to the landscape or streetscape in terms of visual aesthetics. It may also relate to the contribution in terms of shade or protection from the elements.

Bifurcation
A stem or branch forked or divided into two or more parts or branches. Used to describe a union point. A bifurcation may have different characteristics dependant on the load distribution on the union and the size of the branches or stems that arise from the union point.

Branch Bark Ridge
Swelling of bark tissue on the upper side of the branch junction or union. Considered the normal pattern of development in contrast to included bark (from Matheny & Clark, 1994).

Branch collar
Trunk tissue that forms around the base of a branch between the main stem and the branch. As the branch decreases in vigour or begins to die, the branch collar becomes more pronounced (AS4373).

Chlorotic
Discolouration of the leaves, yellow in colour resulting from a lack of chlorophyll

Codominant
Generally, relates to trunks/ stems (although it may relate to scaffold branches within the crown) of two or more and of equal or similar size and relative importance (Matheny & Clark, 1994).

Compartmentalisation
Physiological process which creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms (Matheny & Clark, 1994).

Decay
Degeneration and de-lignification of plant tissue, including wood, by pathogens or micro-organisms (AS4373).

Epicormic Shoots
Shoots which arise from adventitious or latent buds (usually dormant). They are generally produced in response to environmental stress.

Included Bark
The pattern of development at a branch union where bark is turned inward rather than outward or pushed out. Relates to the branch bark ridge and bifurcations. (Matheny & Clark, 1994)

Live Crown Ratio (LCR)
Relative proportion of healthy crown in proportion to overall tree height. Often not used in isolation due to the different natural forms of many species and growing conditions. Generally, an LCR of less than 30% may result in a poor structural rating, however, when this is used and noted within this report, it is based on potential changes to the environment where this condition may have an effect on long term protection value.

Lateral
A branch arising from another branch or stem (AS4373)

Lopping
Cutting back a limb or stem at any point with no regard to natural target pruning. Random cutting of branches or stems between branch unions or at internodes on young trees. Not considered an acceptable practice as part of the *Australian Standard AS4373-2007 - Pruning of Amenity Trees.*

Senescence or Senescent
The organic process of age and the deterioration of tissue within the tree.

Wound wood/ Reaction Wood
Lignified, partially differentiated tissue which develops from the callus associated with wound or pruning cuts.

8.3 Bibliography and Cited References

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Harris, R.W. Clark, J.R. & Matheny, N.P., 1999, *Arboriculture, Integrated Management of Landscape Trees, Shrubs and Vines*, 3rd Edn. Prentice-Hall, Inc, USA.

Helliwell, D.R., 1985, *Trees on Development Sites*, Arboricultural Association, Romsey, England

Matheny, N.P. & Clark, J.R., 1994, *Evaluation of Hazard Trees in Urban Areas,* 2nd Edn., ISA Publications

Mattheck, C. & Breloer, H., 1998, *The Body Language of Trees – A Handbook for Failure Analysis,* The Stationary Office, Norwich, London.

Standards Australia 2007, *Australian Standard AS4373-2007, Pruning of Amenity Trees*, 14 March 2007.

Standards Australia 2009, *Australian Standard AS4970-2009, Protection of Trees on Development Sites*, 31 July 2009.

8.4 Tree Protection Guidelines

8.4.1 Background

Arbor Survey Pty Ltd assesses individual tree protection requirements based upon the *Australian Standard AS4970-2009 - Protection of Trees on Development Sites*. Tree protection requirements are calculated based upon trunk diameter of the tree at breast height. These calculations produce what is referred to in this report as the Tree Protection Zone (TPZ) and is provided as a measurement in metres in a radius from the centre of the trunk.

The TPZ is the zone in which protective measures should be applied in order to protect the tree(s) whilst maintaining the current levels of health and vigour.

Determination of the structural root zone or the zone of rapid taper is provided as the Structural Root Zone (SRZ). The structural root zone calculations (may also be referred to as the Root Plate Radius (RPR)) of the tree, based upon the *Australian Standard AS4970-2009*. The SRZ determines the minimum distance around the tree in which the structural stability of the tree should be able to be maintained.

It is important to note that the SRZ only determines the root plate area or the zone of rapid taper. Excavation within this area will not only cause a decline in tree vigour but may also cause catastrophic tree failure (Coder, 1996).

Often it is difficult to protect the entire TPZ due to site constraints. In such events it is imperative that condition and species tolerance to disturbance are evaluated in conjunction with the site characteristics. Helliwell (1985) and Harris (1999) identified that a healthy tree may tolerate removal of up to one-third of its roots and possibly up to 50% in some cases, although stability may be compromised at this level.

In situations where the TPZ of a tree to be retained will be in close proximity to a proposed development or where there will be encroachment into the TPZ of a tree, a specific tree management plan should be developed. This plan provides prescriptive measures to protect trees on development sites

8.4.2 General Tree Protection Requirements

The following requirements are only provided only for basic guidance, these guidelines do not constitute a specific tree management and protection plan.

- A tree protective fence should be installed at the recommended distance allocated for each tree to be retained. The fence should be located at the TPZ distance provided where possible.

- The protection fence should be rigid (chain link or similar) and should not be less than 1.8 metres in height. Fencing should be firmly attached to a removable concrete or similar base. Alternatively, star pickets (1.5 metre spacing) and para-webbing may be used to define the tree protection area. Fencing should be in accordance with the *Australian Standard for Temporary Fencing AS4687*.

- In cases where the TPZ cannot be entirely fenced, it is recommended that ground protection is used. Specific ground protection requirements will form part of a tree protection plan that should be developed for all trees to be retained.

- No soil levels must be altered within the fenced TPZ area, no heavy machinery should be allowed to pass within this area and no spoil, chemicals, building materials or refuse should be stored within this area. Nothing whatsoever should be attached to the tree (excluding tape to identify a tree to be protected).

- The area within the tree protection fence should be covered with a layer of organic mulch (mixed particle sized woodchip) to a depth of 100mm prior to the commencement of the project. Mulch material should comply with *Australian Standard* AS4454.

- The tree protective fencing should be installed prior to any works (including demolition) commencing on site and should remain in place until all site development work is completed. The protective fencing should be located at the prescribed TPZ distance where possible and clearly signed **TREE PROTECTION ZONE**. The sign should be similar to the attached image (as recommended by the *Australian Standard AS4970-2009*) and should be of a size no smaller than 400mm x 300mm:



- An area should be designated on site, outside of any tree protection zone, where all building materials, chemicals etc. can be stored throughout the proposed development.

- Open trenching for underground services located within the recommended tree protection zone (TPZ) must be avoided. Should there be no alternative for service location; the services must be bored underneath the TPZ or a non-destructive root investigation (NDRI) should be undertaken. No trenching with machinery should be used to install services within the protected area.

- Soil moisture during construction should be maintained at not less than 50% of field capacity (usually 10 litres of water per 10mm of each tree DBH per week). Irrigation may be applied by hand, automatic or manual irrigation system, or by fine spray from water tanker located outside the fenced area. Water is to be applied at a volume and frequency required so as to maintain turgor and leaf retention and encourage healthy root development. The Project Arborist should discuss variations to the amount of water to be supplied with the site or Project Manager.

- Remedial pruning works recommended to be undertaken on the project trees must be carried out to *Australian Standard AS4373-2007 – Pruning of Amenity Trees*, by a qualified Arborist (Minimum AQF Level 3). If pruning works are to be undertaken, then these works should be carried out prior to any construction works beginning on site.

- Documentation should be provided to the site manager by the Project Arborist for each inspection during the development process which details the consultant Arborist name, date and time of inspection, the stage of development, and provides comments of what actions are required.

8.5 COMPANY PROFILE AND QUALIFICATIONS

8.5.1 COMPANY PROFILE

Arbor Survey Pty Ltd is an Arboricultural Consulting company based in Victoria, Australia. The principal consultant, Mark Reynolds has been involved within the Arboricultural Industry for a period of over 20 years, working for both private sector clients and within the public sector at numerous Victorian Local Government Authorities.

Our consultants have vast experience in providing Arboricultural referral within local councils in relation to planning applications and Strategic Planning advice relating to planning scheme amendments. We have extensive experience in Quantified Tree Risk Assessment (QTRA and TRAQ), Health and Structural Condition Assessments, Tree Valuations, Development Impact Assessments and Tree Management and Protection Plans. We also have provided Expert Evidence statements and represented numerous private and public sector clients at the Victorian Civil and Administrative Tribunal (VCAT) and Magistrates Court.

Arbor Survey Pty Ltd is dedicated to best practice within the industry and are committed to ongoing professional development.

PROFESSIONAL MEMBERSHIPS

- Member of the International Society of Arboriculture (ISA)
- Member of Arboriculture Australia
- Member of the Victorian Tree Industry Association (VTIO)
- Member of the Victorian Environment and Planning Law Association (VEPLA)

8.5.2 MARK REYNOLDS

QUALIFICATIONS

- Bachelor of Applied Science (Horticulture) - University of Melbourne (Burnley Campus)
- Registered Quantified Tree Risk Assessment (QTRA)
- ISA TRAQ Register User

EXPERIENCE

- Senior Arborist – Boroondara Council
- Open Space Coordinator – Cardinia Shire Council
- Senior Arborist – City of Kingston
- Private arboricultural and vegetation consulting under Tri_dimensional Consulting
- Treescape Consulting Pty Ltd – Arboricultural Consultant
- Bayside City Council – Vegetation Planner/ Senior Investigations Arborist

8.5.3 SCOTT MULHOLLAND

QUALIFICATIONS

- Diploma in Arboriculture – Melbourne Polytechnic
- Registered Quantified Tree Risk Assessment (QTRA)

EXPERIENCE

- Senior Arborist –Cardinia Shire Council
- Arborist – Citywide Services
- Horticulturist – Fulton Hogan

8.5.4 CLAUDINE REYNOLDS

QUALIFICATIONS

- Graduate Certificate in Arboriculture - University of Melbourne (Burnley Campus)
- Diploma of Horticulture – Holmesglen Institute (Waverley Campus)
- Bachelor of Science / Commerce – Monash University (Clayton Campus)
- Registered Quantified Tree Risk Assessment (QTRA)
- ISA TRAQ Register User

8.6 TERMS AND CONDITIONS

1. Arbor Survey Pty Ltd contracts with you on the basis that you promise that all legal information which you provide, including land title and ownership of other property, are correct. The author is not responsible for verifying or ascertaining any of these issues.

2. Arbor Survey Pty Ltd contracts with you on the basis that your promise that all affected property complies with all applicable statutes and legislation.

3. Arbor Survey Pty Ltd has taken reasonable care to obtain necessary information from reliable sources and to verify data. However, the author neither guarantees nor is responsible for the accuracy of information provided by others.

4. If, after delivery of this report, you later require a representative to attend court to give evidence or to assist in the preparation for a hearing because of this report, you must pay an additional fee at the current rate for expert evidence.

5. Alteration of this report invalidates the entire report.

6. Arbor Survey Pty Ltd retains the copyright in this report. Possession of the original or a copy of this report does not give you or anyone else any right of reproduction, publication or use without the written permission of Arbor Survey Pty Ltd.

7. The contents of this report represent the professional opinion of the consultant. The consultancy fee for the preparation of this report is in no way contingent upon the consultant reporting a particular conclusion of fact, nor upon the occurrence of a subsequent event.

8. Sketches, diagrams, graphs, and photographs in this report are intended as visual aids, are not to scale unless stated to be so, and must not be construed as engineering or architectural reports or as surveys.

9. Unless expressly stated otherwise:

    a. The information in this report covers only those items which were examined and reflects the condition of those items at the time of the inspection only.

    b. The inspection is limited to visual examination of accessible components without dissection, excavation, or probing. There is no warranty or guarantee, expressed or implied, that even if they were not present during our inspection, problems or defects in plants or property examined may not arise in the future.

10. This agreement supersedes all prior discussions and representations between Arbor Survey Pty Ltd and the client on the subject and is the entire agreement and understanding between the two parties.

6 - 12 Warley Avenue, Cowes

Waste Management Plan



210810WMP001C-F.docx

28 July 2022

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APPENDIX A SWEPT PATH DIAGRAM
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1 INTRODUCTION

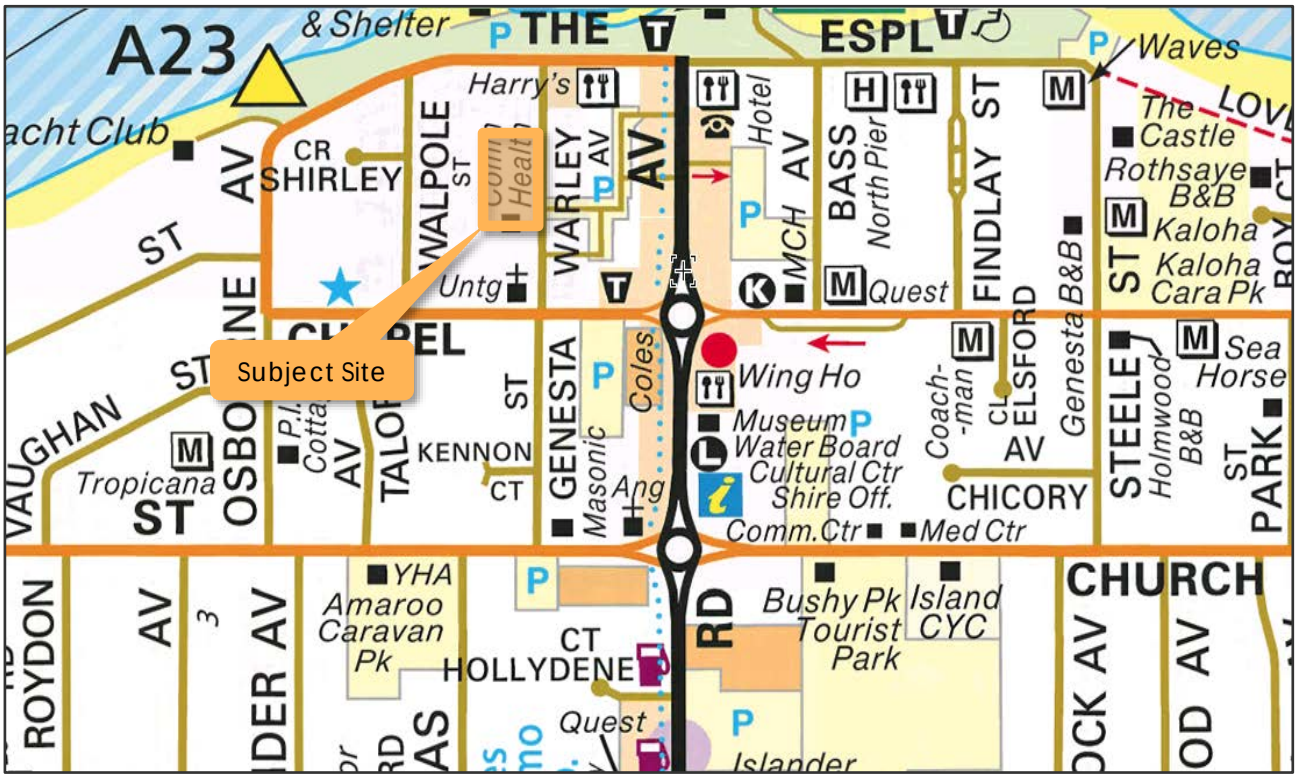
onemilegrid has been requested by 8 Warley Avenue Pty Ltd to prepare a Waste Management Plan for the proposed apartment development at 6 - 12 Warley Avenue, Cowes.

The preparation of this management plan has been undertaken with due consideration of the Sustainability Victoria Better Practice Guide for Waste Management and Recycling in Multi-unit Developments and relevant Council documentation.

2 EXISTING SITE CONDITIONS

The subject site is located on the west side of Warley Avenue, and is addressed at 6 - 12 Warley Avenue, Cowes, as shown in Figure 1.

Figure 1 Site Location



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The subject site is rectangular in shape, with frontage to Warley Avenue of approximately 80 metres and a depth of approximately 50 metres for a total site area of 4,065 square metres.

3 DEVELOPMENT PROPOSAL

3.1 General

It is proposed to develop the subject site for the purposes of a residential development containing 91 apartments across two five-storey buildings. The apartments will comprise a combination of 1, 2 and 3-bedroom apartments as summarised in Table 1.

Table 1 Proposed Development

Component	*No/Area*
1-Bedroom Apartment	15
2-Bedroom Apartment	62
3-Bedroom Apartment	14
Total Apartments	91

Access to the site is proposed via a double width ramp to Warley Avenue in the northeast corner of the site, leading to a basement and mezzanine car park.

3.2 Waste Management

An effective waste management strategy is proposed for the site which includes two bin storage areas located within the northern and southern sections of the basement car park to service each of the building forms. A chute system will be provided within each building for the disposal of garbage. Residents will be responsible for disposing of garbage into the waste chutes located on each floor of the development, or directly into the appropriate bins located within the bin storage room. The Owner's Corporation will be responsible for rotating bins within the bin storage room to ensure the bins do not overflow.

In relation to waste collection, it is proposed to utilise a private contractor to manage the collection and disposal of garbage, recycling and organic waste associated with the development.

Two waste collection strategies are proposed for the site to take into account the available services in the area. At the current time, private waste contractors that service Philip Island do not operate with the required vehicle for waste collection within the basement (a 6.4 m rear-lift waste collection vehicle (mini-loader)). As Cowes and the surrounding area develops in the future, it is expected that private contractors will start including these vehicles to their fleet. This will provide the Owners Corporation the option to continue with street level collection or revert to basement level collection.

Each of the collection strategies are assessed within this report to provide that flexibility.

Basement Collection

When waste collection via the basement is available, the waste collection vehicle, a 6.4 m rear-lift waste collection vehicle (mini-loader), will enter the basement and prop adjacent the bin store, from where the bins will be transferred directly to the waiting truck for emptying. The bins will be returned to the bin storage area immediately following collection and the waste vehicle will leave the site in a forwards direction.

Street Level Collection

Under the street level collection strategy, bins will be manually transferred up the ramp basement ramp using a bin tug and placed along the sites frontage to Warley Avenue. The Owner's Corporation will be responsible for the transfer of bins to and from the site frontage for collection.

The collection location and expected transfer route for the basement and street level collection scenarios are shown below in Figure 2 and Figure 3.

Swept path diagrams showing the movements of the waste collection vehicle in the basement collection scenario are attached in Appendix A.

Figure 2 Bin Storage and Collection Details – Basement Collection

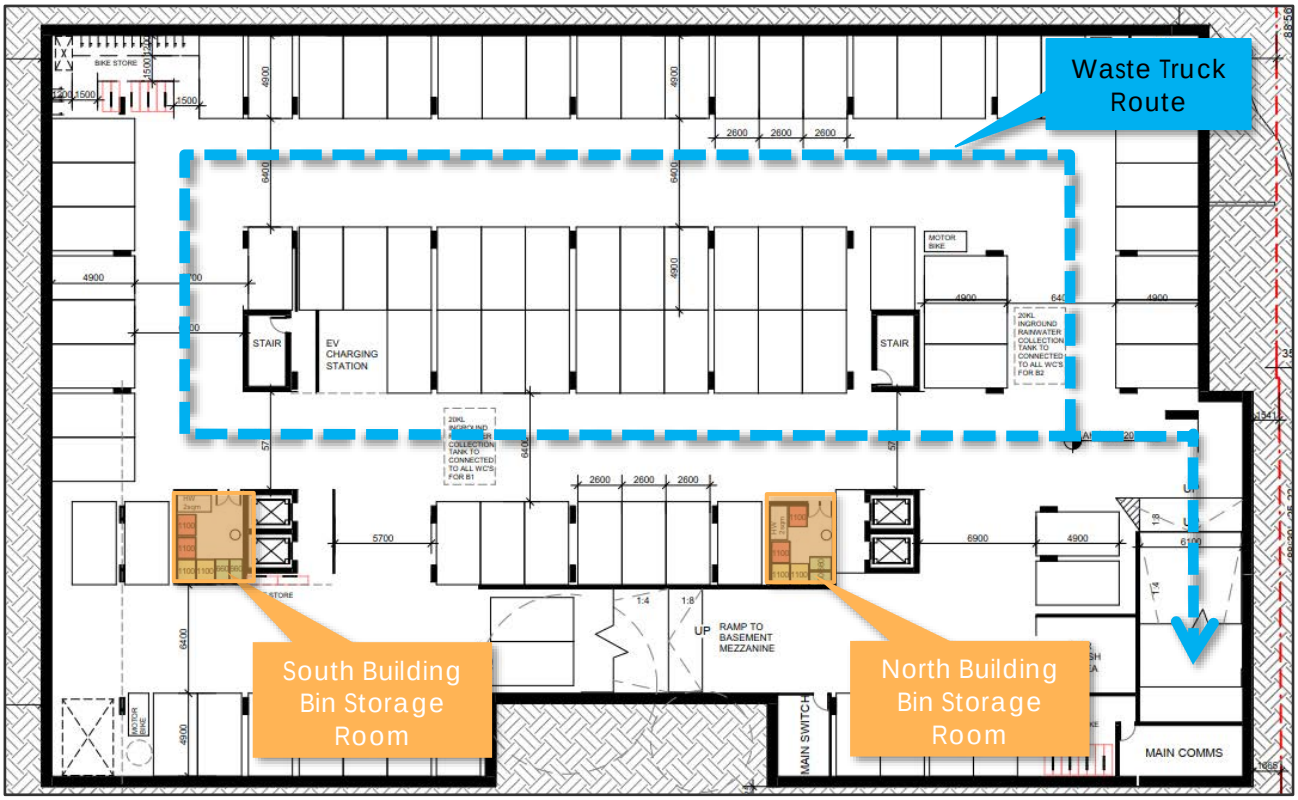
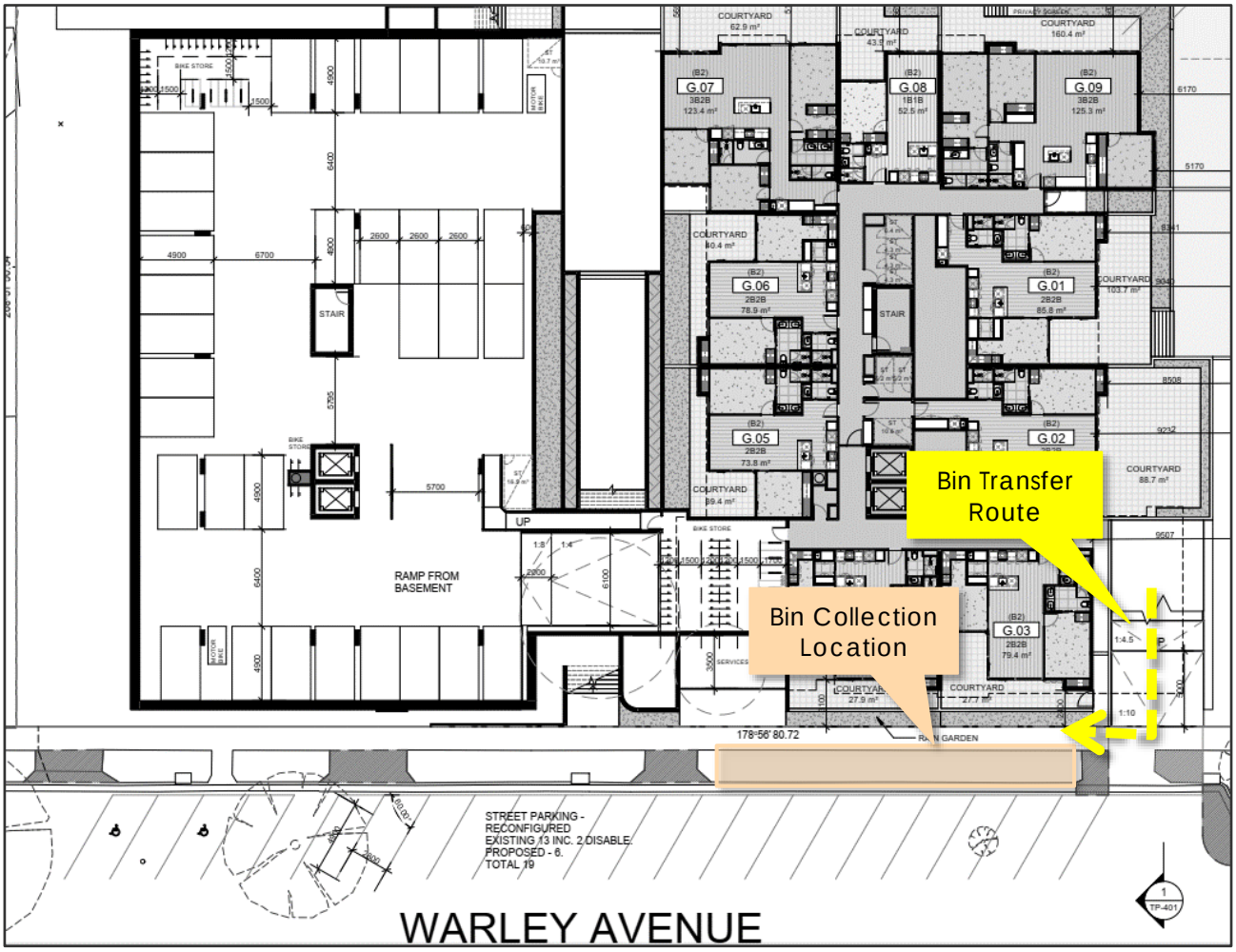


Figure 3 Collection Details – Street Collection



4 WASTE GENERATION

4.1 Sustainability Victoria Recommended Rates

Waste generation rates published within Sustainability Victoria's "Better Practice Guide for Waste Management and Recycling in Multi-unit Developments" suggest the following rates for multi-unit developments:

Table 2 Sustainability Victoria Recommended Rates – Residential

Dwelling Size	*Garbage*	*Recycling and Paper*
1 bedroom or studio apartment	80L	80L
2-bedroom apartment	100L	100L
3-bedroom apartment	120L	120L

Furthermore, it is expected that the residential component will generate a significant portion of organics waste. A rate of 35% of garbage as organics will be adopted, equating to the following waste generation rates.

Table 3 Adopted Waste Generation Rates (per dwelling per week) – Residential

Dwelling Size	*Garbage*	*Recycling*	*Organics*
1 bedroom or studio apartment	52L	80L	28L
2-bedroom apartment	65L	100L	35L
3-bedroom apartment	78L	120L	42L

4.2 Expected Waste Generation

4.2.1 Garbage, Organics and Recycling

Based on the waste generation rates above, the anticipated waste generation for each building is shown in Table 4 and Table 5.

Table 4 Expected Waste Generation – North Building

Stream	*Component*	*No of Dwellings*	*Rate / Dwelling / Week*	*Total Waste / Week*
Garbage	1-Bedroom Apartment	9	52 litres	468 litres
	2-Bedroom Apartment	30	65 litres	1,950 litres
	3-Bedroom Apartment	6	78 litres	468 litres
	Total	45		2,886 litres
Recycling	1-Bedroom Apartment	9	80 litres	720 litres
	2-Bedroom Apartment	30	100 litres	3,000 litres
	3-Bedroom Apartment	6	120 litres	720 litres
	Total	45		4,440 litres
Organics	1-Bedroom Apartment	9	28 litres	252 litres
	2-Bedroom Apartment	30	35 litres	1,050 litres
	3-Bedroom Apartment	6	42 litres	252 litres
	Total	45		1,554 litres

Table 5 Expected Waste Generation – South Building

Stream	Component	No of Dwellings	Rate / Dwelling / Week	Total Waste / Week
Garbage	1-Bedroom Apartment	6	52 litres	312 litres
	2-Bedroom Apartment	32	65 litres	2,080 litres
	3-Bedroom Apartment	8	78 litres	624 litres
	Total	46		3,016 litres
Recycling	1-Bedroom Apartment	6	80 litres	480 litres
	2-Bedroom Apartment	32	100 litres	3,200 litres
	3-Bedroom Apartment	8	120 litres	960 litres
	Total	46		4,640 litres
Organics	1-Bedroom Apartment	6	28 litres	168 litres
	2-Bedroom Apartment	32	35 litres	1,120 litres
	3-Bedroom Apartment	8	42 litres	336 litres
	Total	46		1,624 litres

4.2.2 Green Waste

Given the nature of the proposed development and dwellings (being multi-level), it is expected that green waste generation will be minimal or negligible, and therefore a green waste collection service is not expected to be required.

It is expected that any maintenance and gardening undertaken on common property will be managed by a contractor appointed by the Owner's Corporation. The appointed contractor will be responsible for the disposal of any green waste accumulated during the course of their duties.

4.2.3 Hard Waste

Hard waste collection will be organised with a private contractor. Hard waste is to be temporarily stored within two designated hard waste storage areas in the bin storage rooms. The Owner's corporation will monitor the hard waste amounts to ensure it does not impact on the functionality of the surrounding area. Hard waste will be collected as required.

Hard waste must not be left in common areas, including the waste chute rooms on each floor.

4.2.4 Electronic Waste (E-Waste)

E-waste includes all manner of electronic waste, such as televisions, computers, cameras, phones, household electronic equipment, batteries and light bulbs. On 1st July 2019, the disposal of E-waste to landfill was banned by the Victorian Government. E-waste contains valuable materials that can be recovered and reused such as tin, nickel, zinc, aluminium, copper, silver and gold.

A large number of e-waste collection points are available in Victoria and private contractors are equipped with the resources to undertake E-waste collections.

Council does not provide a residential kerbside pick-up service for E-waste, therefore E-waste must be taken by residents to the appropriate collection centre, as described below:

- Planet Ark operate a number of e-waste recycling drop-off locations throughout Victoria;
- Officeworks stores accept small amounts of personal E-waste; and
- Aldi stores accept batteries.

Additional recycling locations are provided at https://recyclingnearyou.com.au/

4.2.5 Soft Plastics

Soft plastic waste is estimated to contribute approximately 20% of landfill waste volumes, and includes such things as bread bags, plastic bags, bubble wrap and snap lock bags.

Soft plastics can be recycled via REDcycle bins located at most Coles and Woolworths supermarkets, including Cowes Woolworths and Cowes Coles in the vicinity of the site.

No specific bin provision is required for soft plastic recycling, though it is recommended that residents are made aware of soft plastic recycling, and operators are encouraged to facilitate the collection and deposit of soft plastics at REDcycle bin locations.

5 BIN REQUIREMENTS

5.1 Bin Provision and Specifications

It is proposed to utilise a private waste contractor for the collection of all waste services of the proposed development.

Consequently, the following bins will be required for the proposed development.

Table 6 Bin Provision

Building	*Stream*	*Total Waste/Week*	*Bin Size*	*Collection Frequency*	*Bins Required*
North Building	Garbage	2,886 litres	1,100 litres	2x Weekly	2 bins
	Recycling	4,440 litres	1,100 litres	2x Weekly	2 bins
	Organics	1,554 litres	660 litres	2x Weekly	2 bins
Subtotal					6 bins
South Building	Garbage	3,016 litres	1,100 litres	2x Weekly	2 bins
	Recycling	4,640 litres	1,100 litres	2x Weekly	2 bins
	Organics	1,624 litres	660 litres	2x Weekly	2 bins
Subtotal					6 bins
Total					12 bins

It is of note that the above bin provision is considered conservative, as many apartments may be used as holiday apartments and therefore will not generate waste all-year round. The site operator can adjust the bin collection frequency as required to suit the needs of the development.

Typical bin sizes and dimensions are provided in Table 7 below.

Table 7 Bin Specifications

Capacity	*Width*	*Depth*	*Height*	*Area*
660 litres	1.25m	0.80m	1.30m	1.00 m²
1,100 litres	1.25m	1.10m	1.35m	1.38 m²

Bin lids will be colour coded to the Australian Standard (AS4123) or to the standard colour specifications of the private contractor.

5.2 Bin Storage

It is proposed to provide two bin storage areas on the basement level of the proposed development, with a total floor area of 18 m² and 22 m² for the north and south buildings respectively. The layout of the bin storage area is shown in Figure 4, which demonstrates that the area is capable of accommodating the required bins.

Some additional area is also provided within the bin storage room to allow for the temporary storage of bulk items and packaging, under the control of the Owners Corporation.

Furthermore, the bin storage room is located appropriately for access by residents and is secured from the common areas. The bin storage room should be vermin proof, and have appropriate ventilation, lighting and drainage. The bin storage room shall be ventilated, and shall be cleaned regularly by the operator or waste collection contractor, to minimise odour.

Figure 4 South Bin Storage Room Layout

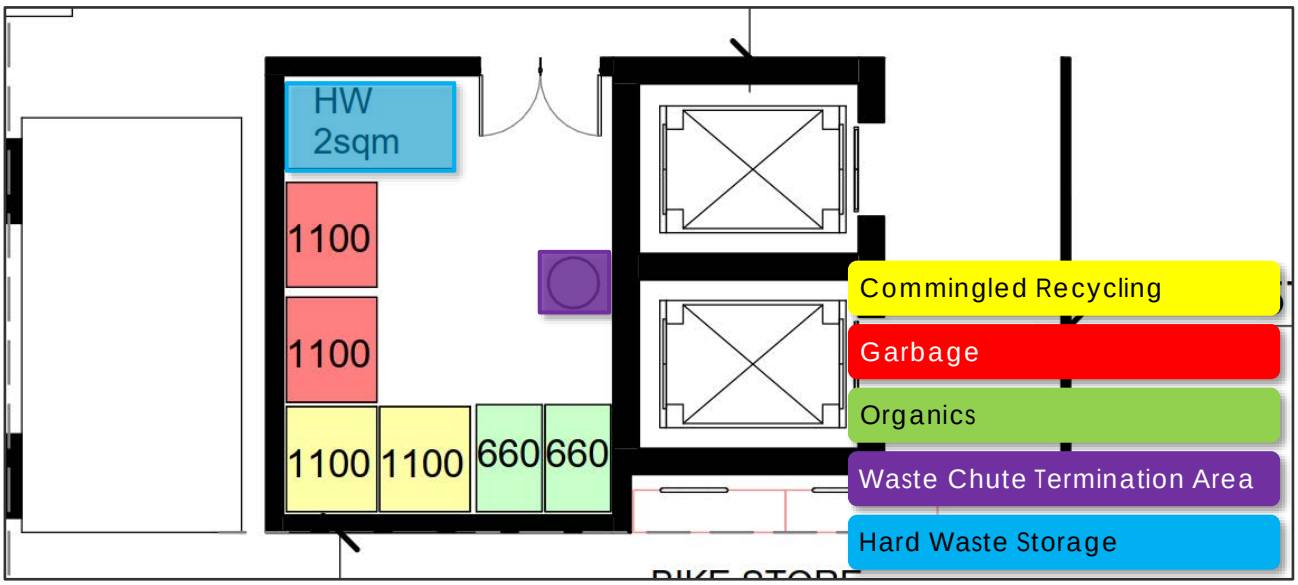
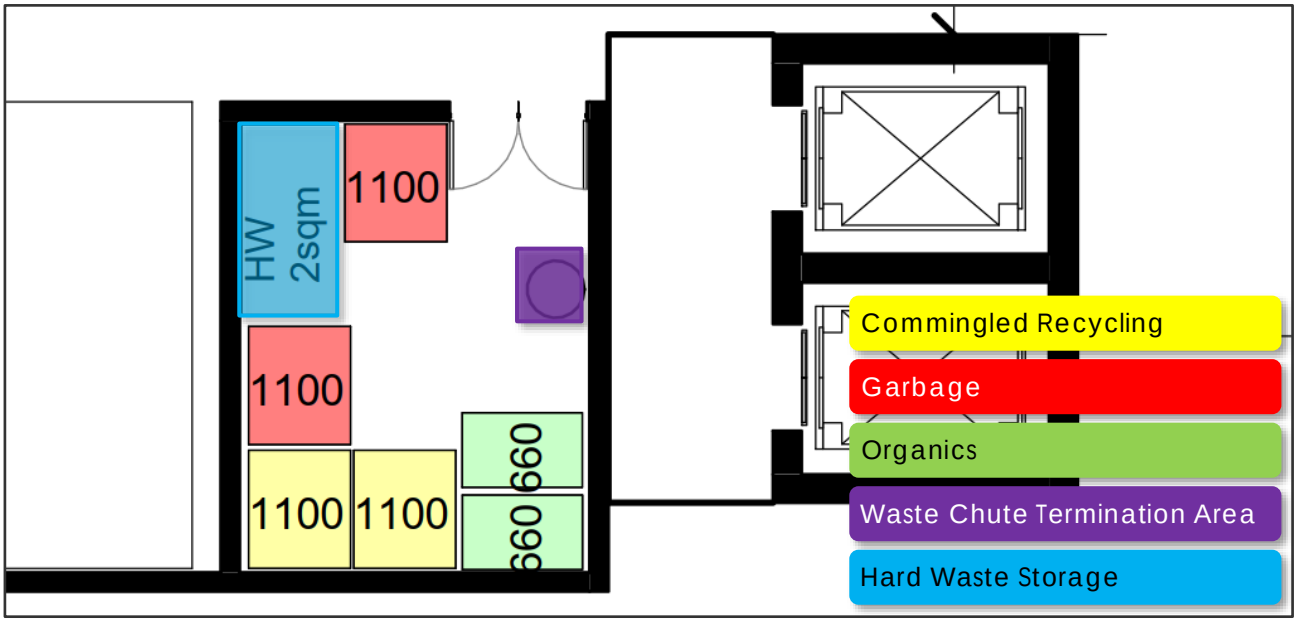


Figure 5 North Bin Storage Room Layout



5.3 Waste Chute Rooms

A waste chute collection area is located within each bin storage room on the basement level. A waste disposal room is located on each floor of both buildings, and includes a single chute and a self-closing door to ensure that odours do not permeate into the lobby.

The following general rules apply when using the waste chutes:

- General household rubbish (essentially kitchen & bathroom rubbish) is the ONLY waste that should be placed in the garbage chutes;
- NO glass, cardboard, open food containers, plastic or papers is to be placed down the garbage chute; *use the recycling bins*;
- No rubbish is to be left on floor in the waste chute room.

A building manager will be responsible for rotating bins between the chute termination room and the bin storage room to ensure the bins do not overflow.

5.4 Bin Collection

Street Level Collection

Bins will be manually transferred up the ramp basement ramp using a bin tug and positioned kerbside for collection. Bins will be brought up to street level only once the truck arrives to ensure that bins are not left kerbside for extended periods. The truck will need to prop on-street whilst the collection takes place.

Following collection, bins will be moved back to the bin storage rooms in the basement. The Owner's Corporation or contractor will be responsible for the transfer of bins to and from the site frontage for collection.

A bin tug with capacity of up to 1,100 litres bins will be required to transfer bins up the basement ramp. The Electrodrive Tug Rise powered Tug is an example of one bin tug which meets this criteria, with the specification sheet attached in Appendix B.

Basement Collection

In the basement scenario, the waste collection vehicle, a 6.4 m rear-lift waste collection vehicle (mini-loader), will enter the basement and prop adjacent the bin store, from where the bins will be transferred directly to the waiting truck for emptying. The bins will be returned to the bin storage area immediately following collection and the waste vehicle will leave the site in a forwards direction.

Swept path diagrams showing the movements of the waste collection vehicle within the basement are attached in Appendix A.

5.5 Bin Cleaning

The Owners Corporation shall ensure that the shared residential bins are kept in a clean state, to minimise odours and to discourage vermin. This may include regular cleaning by a third party, cleaning by the waste contractor, bin swapping by the waste contractor, or maintenance by residents.

A bin cleaning area should be provided within the bin storage area, with a drain connected to sewer.

6 WASTE MANAGEMENT

6.1 Best Practice Waste Management

Best Practice Waste Management is an initiative designed to reduce the amount of waste generated through encouraging a change of behaviour and action on waste management and moreover recycling.

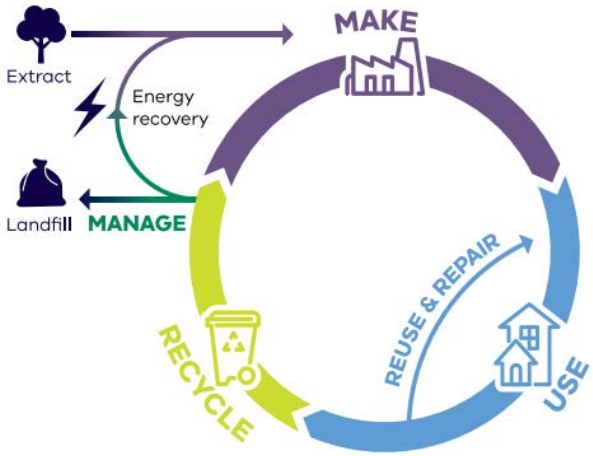
The benefits of reducing waste generation are far reaching and have been identified as significantly important by Council and the Victorian Government.

Recycling Victoria: A New Economy is a policy and 10-year action plan, prepared by the Victoria Government, to "deliver a cleaner, greener Victoria, with less waste and pollution, better recycling, more jobs and a stronger economy".

Four overarching goals have been identified in order to achieve a circular economy in relation to waste, as below:

1. MAKE – Design to last, repair and recycle;
2. USE – Use products to create more value;
3. RECYCLE – Recycle more resources;
4. MANAGE – Reduce harm from waste and pollution.

Figure 6 Resource Flows in a Circular Economy



In relation to the proposed development, recycling is of key importance, and in this regard, the Owners Corporation shall encourage residents to participate in minimising and reducing solid waste production by:

- Promoting the waste hierarchy, which in order of preference seeks to:
  - Avoid waste generation in the first place;
  - Increase the reuse and recycling of waste when it is generated; and
  - Recover, treat or contain waste preferentially to;
  - Its disposal in Land Fill (which is least desirable).
- Providing information detailing recyclable materials to ensure that non-recyclable materials do not contaminate recycling collections;
- Providing information regarding safe chemical waste disposal methods and solutions, including correct battery and electronics disposal methods;
- Encouraging composting for residents; and
- Providing tips for recycling and reusing waste, including encouraging the disposal of reusable items in good condition via donations to Opportunity Shops and Charities.

6.2 Bin Usage

Residents will bag and dispose of garbage in the provided waste chutes on each floor of both buildings.

Residents will transport and dispose of recyclables (non-bagged) in the provided bins, located in the bin storage room. Cardboard boxes should be flattened, and containers rinsed and cleaned prior to disposal in the provided bins.

Residents will transport and dispose of organic waste (non-bagged) in the provided bins in the residential bin storage room.

6.3 Common Property Litter and Waste Removal

The proposed development includes a number of common property areas, including foyers, hallways, waste disposal rooms, parking areas and the bin storage rooms.

The Owners Corporation shall ensure that all common areas are kept clear of litter, and that all waste is removed from common areas on a regular basis. This includes the bin storage area and waste chute rooms in particular, to discourage vermin.

6.4 Signage

To avoid contamination between garbage streams, bin lids will be colour coded generally in accordance with contractor standards, to ensure the bin type is easily distinguishable. Furthermore, bins should include typical signage (preferably on the bin lid) to reinforce the appropriate materials to be deposited in each bin. Example signage available from Sustainability Victoria is shown below.

Figure 7 Example Waste Signage



6.5 Noise Control

To minimise the disturbance to residents during waste collection, the collection should follow the criteria specified by the EPA, as below:

- Collections occurring more than once a week should be restricted to the hours 7:00am to 6:00pm, Monday to Saturday;
- Compaction should only be carried out while on the move;
- Bottles should not be broken up at the point of collection;
- Routes that service entirely residential areas should be altered regularly to reduce early morning disturbance; and
- Noisy verbal communication between operators should be avoided where possible.

6.6 Resident Information

To ensure all residents are aware of their responsibilities with regard to waste and bin management, an information package will be provided by the Owners Corporation to all residents, including the following information:

- A copy of this Waste Management Plan;
- Methods and techniques for waste reduction and minimisation;
- Information regarding bin collection days and requirements;
- Resident responsibilities with regard to bin usage, storage, and collection; and
- Resident responsibilities with regard to litter and waste removal from the common property.

7 PLANNING SCHEME REQUIREMENTS – CLAUSE 58.06-3

Clause 58.06-3 (Waste and recycling) and Standard D23 apply to apartment developments of five or more storeys (excluding a basement) in a residential zone and all apartment developments in other zones

Clause 58.06-3 of the Bass Coast Planning Scheme identifies the waste and recycling objectives for Apartment Developments, including:

- To ensure dwellings are designed to encourage waste recycling.
- To ensure that waste and recycling facilities are accessible, adequate and attractive.
- To ensure that waste and recycling facilities are designed and managed to minimise impacts on residential amenity, health and the public realm.

In particular, Standard D23 indicates that developments should include dedicated areas for:

- Waste and recycling enclosures which are:
  - Adequate in size, durable, waterproof and blend in with the development.
  - Adequately ventilated.
  - Located and designed for convenient access by residents and made easily accessible to people with limited mobility.
- Adequate facilities for bin washing. These areas should be adequately ventilated.
- Collection, separation and storage of waste and recyclables, including where appropriate opportunities for on-site management of food waste through composting or other waste recovery as appropriate.
- Collection, storage and reuse of garden waste, including opportunities for on-site treatment, where appropriate, or off-site removal for reprocessing.
- Adequate circulation to allow waste and recycling collection vehicles to enter and leave the site without reversing.
- Adequate internal storage space within each dwelling to enable the separation of waste, recyclables and food waste where appropriate.

Waste and recycling management facilities should be design and managed in accordance with a Waste Management Plan approved by the responsible authority and:

- Be designed to meet the best practice waste and recycling management guidelines for residential development adopted by Sustainability Victoria.
- Protect public health and amenity of residents and adjoining premises from the impacts of odour, noise and hazards associated with waste collection vehicle movements.

In relation to the above, the proposed development provides two centrally located and accessible bin storage area for all residents, which can accommodate the required waste bins, in addition to bin washing facilities and a hard waste storage area.

8 OCCUPATIONAL HEALTH & SAFETY RESPONSIBILITIES

The Owners Corporation/site operator shall ensure compliance to all relevant OH&S regulations and legislation, including the following:

- Worksafe Victoria Guidelines for Non-Hazardous Waste and Recyclable Materials

9 CONCLUSION

It is proposed to develop the site for the purposes of an apartment building comprising 91 dwellings across two five-storey buildings, with garbage stored in two bin storage rooms in the basement.

The above waste management plan has been prepared with consideration of the Sustainability Victoria Better Practice Guide for Waste Management and Recycling in Multi-unit Developments and relevant Council documentation, noting the following:

- The development will separate garbage into separate general waste, recycling, and organic waste bins;
- A waste chute disposal system is provided for each of the buildings, providing garbage disposal for each floor. The waste chutes terminate in the waste storage rooms in the basement;
- Organic and recycling waste will be disposed of manually by residents into the bin storage rooms;
- Two waste collection strategies are proposed for the site to take into account the available services in the area;
  - At the current time, private waste contractors that service Philip Island do not operate with the required vehicle for waste collection within the basement. While a waste collection service with a mini-loader is unavailable, bins will be manually transferred to Warley Avenue for street collection;
  - When private waste contractors start using mini-loaders in their fleet, the waste truck will enter the basement to collect the waste directly from the bin storage rooms;
- All waste streams will initially be collected twice weekly, but can be adjusted to suit the needs of the development, noting many apartments may be used during holiday periods only.

10 CONTACT INFORMATION

10.1 Council

Bass Coast Shire Council

Phone: 1300 226 278 or (03) 5671 2211

Email basscoast@basscoast.vic.gov.au

Web: www.basscoast.vic.gov.au

10.2 Contractors

WM Waste Management

Services: Private contractor

Phone: (03) 9721 1900

Web: www.wmwaste.com.au/

Urban Waste

Services: Private contractor

Phone: 0429 309 269

Web: www.urbanwaste.com.au

Email: info@urbanwaste.com.au

Cleanaway

Services: Private contractor

Phone: 131 339

Web: www.cleanaway.com.au/

JJ Richards & Sons

Services: Private contractor including bin tugs

Phone: (03) 9703 5222

Web: www.jjrichards.com.au

Email: operations.melbourne@jjrichards.com.au

WasteWise

Services: Private contractor

Phone: 1300 550 408

Web: www.wastewise.com.au

10.3 Others

Sustainability Victoria

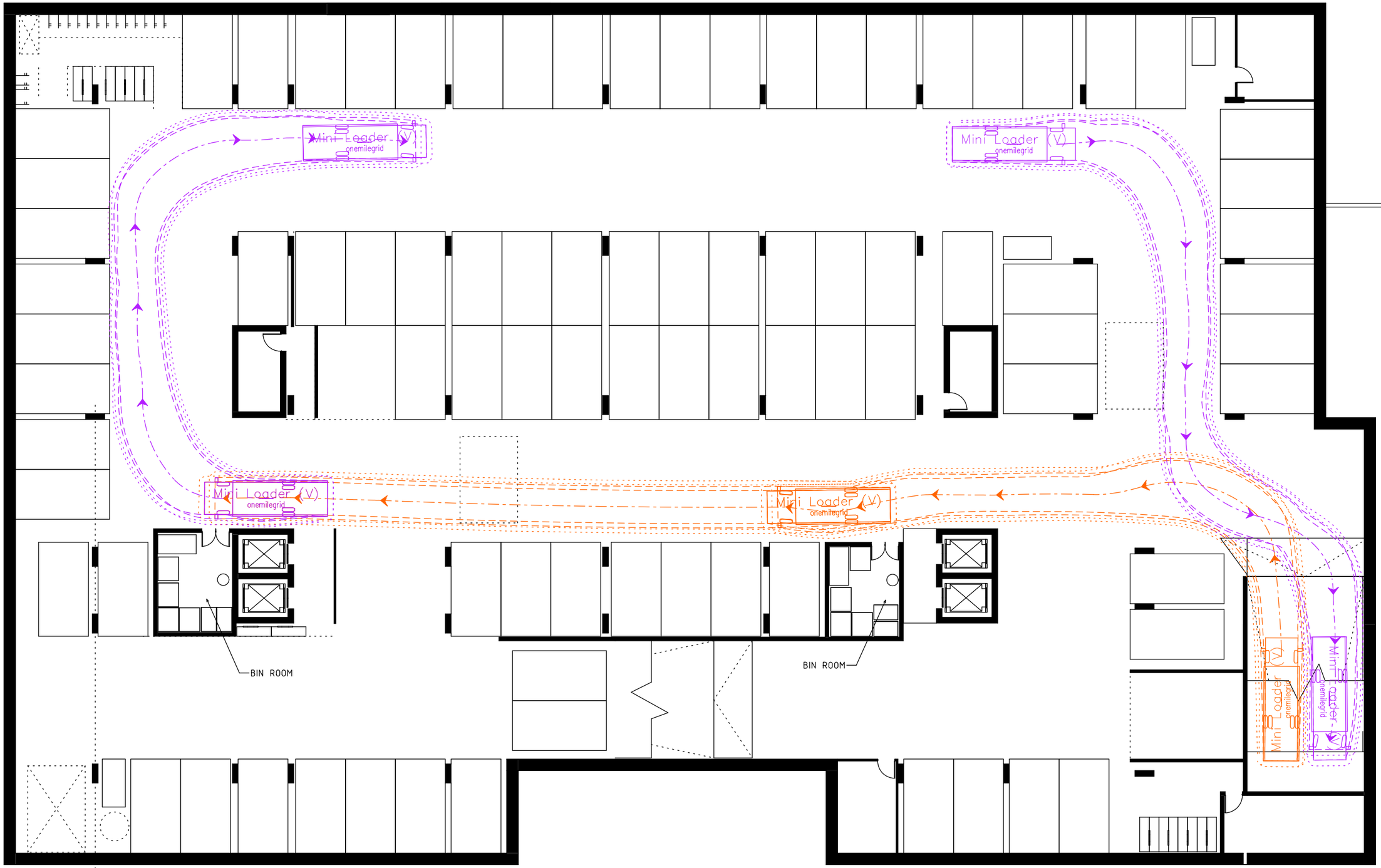
Services: Sustainable Waste Management initiatives and information

Phone: 1300 363 744 (Energy, Waste and Recycling)

Web: www.sustainability.vic.gov.au

Email: info@sustainability.vic.gov.au

Appendix A Swept Path Diagram



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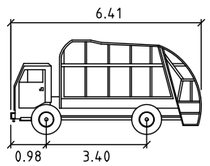

WASTE MINI LOADER meters

Width	: 1.85
Track	: 1.85
Lock to Lock Time	: 4.0
Steering Angle	: 33.6

SWEPT PATH LEGEND

- – – – – DESIGN VEHICLE SWEPT PATHS SHOWN DASHED
- ····· 300mm CLEARANCE ENVELOPE SHOWN DOTTED

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onemilegrid operates from Wurundjeri Woiworung Country of the Kulin nation.
We acknowledge and extend our appreciation To the Wurundjeri People, the Traditional Owners of the land.
We pay our respects to leaders and Elders past ,present and emergirg for they hold the memories.
the traditions, the culture, and the hopes of all Wurundjeri Peoples.

Aerial Photography
Aerial photography provided by Nearmap

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Phone (03) 9939 8250

Scale 1:200 @ A3 (0 1 2 4)

Drawing Title
6-12 WARLEY AVENUE, COWES
SITE VEHICLE ACCESS
SWEPT PATH ANALYSIS

Designed	Approved	Melway Ref
CM	VG	NA

Project Number	Drawing Number	Revision
210810	SPA100	B

Appendix B Bin Tug Specification Sheet





ELECTRODRIVE & LIFTMASTER

MATERIALS HANDLING PRODUCT RANGE

ISSUE 43 (05/22)

100 YEARS 1920-2020
MANUFACTURING IN AUSTRALIA









Fallshaw GROUP

MOBILITY SOLUTIONS TO HELP YOU
PUSH, PULL & LIFT WITH EASE



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Niftylift BIN LIFTER





A manually operated bin lifter that aids in the lifting and tipping of wheelie bins—weighing up to 30 kg—into steel skip bins.

The assisted lift and slow-release gas-struts lift bins safely, while protecting the user from costly back injuries associated with lifting heavy loads above shoulder height.

MADE IN AUSTRALIA

Typical applications

Suitable for retail outlets, offices and factories.

Features

Lifting	
Capacity:	30 kg
Mechanism:	Full-swing
Recommended use	
Per person per day:	2 lifts
Bin compatibility	
Wheelie:	120 and 240 litre
Skip:	Up to 1500 mm
Operation	
Method:	Manual assisted lift
Time:	45 seconds
Dimensions (L/W/H)	900/800/1420 mm
Highest tip point	2850 mm
Fits through internal doorways	Yes

Safety features

- Skip bin hooks: Secures the bin lifter to a steel dumper bin, and only operates when secured.
- Padlock: The unit can only operate when unlocked.
- Slow-release gas-struts: Ensures the bin won't suddenly drop and potentially cause injury.
- Base cradle hook: The unit can only operate when the bin is resting on the base cradle hook.

	ORDER CODE
Niftylift bin lifter 30 kg	NIFTYLIFT30

Rugged (manual) BIN LIFTER



Designed with manoeuvrability in mind, its small footprint, light weight and its spark-free, manual handpump operation, make it the perfect solution for emptying wheelie bins into steel skip bins. Ideal for building sites, industrial worksites, mines, factories and spark-free environments.

The All Terrain model is perfect for outdoor use with its pneumatic wheels (pictured below).

The lift mechanism is a full-swing operation.

Made in Australia.



The Rugged Manual All Terrain model, with pneumatic wheels.

Note: The All Terrain is 140-150 mm higher than BLHP1500.



Typical applications

Suitable for construction sites, industrial worksites, mines, factories and spark-free environments.

Features

Lifting Capacity: Mechanism:	 • 100 kg • Full-swing
Recommended use Per person per day:	 10 lifts
Bin compatibility Wheelie: Skip:	 • 80, 120, 140 and 240 litre • 1500 and 1800 mm ***Please note: Not compatible with 660 and 1100 litre plastic skip bins*** *due to insufficient weight for holding the bin lifter in place when emptying 240 litre wheelie bins.*
Operation Method: Time:	 • Hydraulic hand-pump • 45 seconds/28 pumps
Dimensions (L/W/H)	BLHP1500: 850/850/1700 mm BLHP1800: 850/850/1960 mm
Highest tip point	BLHP1500/1500LL: 3278 mm BLHP1800: 3752 mm
Fits through internal doorways	Yes

Safety features

- Hand-pump ensures gradual contolled lift.
- Braking castors for stability.

	ORDER CODES
Rugged Manual bin lifter for 1500 mm skip bins	BLHP1500
Rugged Manual All Terrain bin lifter for 1500 mm skip bins	BLHPAT1500
BHLP1500—lid lifter compatible	BLHP1500LL
Rugged Manual bin lifter for 1800 mm skip bins	BLHP1800

Rugged (powered) BIN LIFTER



Designed with manoeuvrability in mind, its small footprint and light weight—combined with the 240V electro-hydraulic operation—make it the perfect solution for emptying heavy wheelie bins into steel skip bins on building and industrial sites.

The All Terrain model is perfect for outdoor use with its pneumatic wheels (pictured below).

The lift mechanism is a full-swing operation.

Made in Australia.



The Rugged Powered All Terrain model, with pneumatic wheels.

Note: The All Terrain is 140-150 mm higher than BLEH1500.



Typical applications

Suitable for construction sites, hotels, apartments, high-rise basements, caravan parks and other large outdoor areas

Features

Lifting Capacity: Mechanism:	 • 150 kg • Full-swing
Recommended use Per day:	 50 lifts
Bin compatibility Wheelie: Skip:	 • 80, 120, 140 and 240 litre • 1500 and 1800 mm ***Please note: Not compatible with 660 and 1100 litre plastic skip bins*** *due to insufficient weight for holding the bin lifter in place when emptying 240 litre wheelie bins.*
Operation Method: Mode: Time:	 • Push-button hydraulic system • Full-swing • 35 seconds
Dimensions (L/W/H)	BLEH1500: 850/850/1700 mm BLEH1800: 850/850/1960 mm
Battery	• 12V rechargeable & smart charger • 10A main outlet
Highest tip point	BLEH1500/1500LL: 3278 mm BLEH1800: 3752 mm
Swept radius	BLEH1500/1500LL: 1629 mm BLEH1800: 1909 mm
Fits through internal doorways	Yes

Safety features

• Braking castors for stability.

	ORDER CODES
Rugged Powered for 1500 mm skip bins	BLEH1500
Rugged Powered All Terrain for 1500 mm skip bins	BLEHAT1500
BLEH1500—lid lifter compatible	BLEH1500LL
Rugged Powered for 1800 mm skip bins	BLEH1800

Ecolift BIN LIFTER



A lift-and-tilt crank handle operated unit for lifting and tipping wheelie bins into skip bins. Suitable for schools, factories, retail outlets and offices.

Eliminating all lifting from the process of emptying wheelie bins into skip bins, the bin is lifted by simply manually rotating the crank-handle—protecting the user from costly back injuries associated with lifting heavy loads above shoulder height.

MADE IN AUSTRALIA



Typical applications

Suitable for schools, factories, retail outlets and offices.

Features

Lifting	
Capacity:	50 kg
Mechanism:	Lift-and-tilt
Recommended use	
Per person per day:	6 lifts
Bin compatibility	
Wheelie:	80, 120, 140 and 240 litre
Skip:	Up to 1500 mm
Operation	
Method:	Manual winding crank-handle
Time:	45 seconds
Cable length	3.2 m
Dimensions (L/W/H)	1200/800/2000 mm
Highest tip point	2800 mm
Fits through internal doorways	Yes (with winch handle removed)

Safety features

- Safety cage panels to protect operators and bystanders.
- The winding motion of the crank handle operation ensures gradual controlled bin lifting.
- Braking castors for stability.

	ORDER CODE
Ecolift bin lifter 50 kg for 1500 mm skip bins.	ECOLIFT50

Simplicity Plus BIN LIFTER



A battery operated hydraulic push button unit that aids in the lifting and emptying of wheelie bins into dumper bins.

The ideal unit for heavy weight and frequent lifts. The push-button operation eliminates the manual handling and associated risks of lifting bins.

Suitable for factories, warehouses, storage facilities, apartment blocks, waste management companies, event organisers.

MADE IN AUSTRALIA



Typical applications

Suitable for factories, warehouses, storage facilities, apartment blocks, waste management companies, event organisers.

Features

Lifting	
Capacity:	150 kg
Mechanism:	Lift-and-tilt
Recommended use	
Per day:	100 lifts
Bin compatibility	
Wheelie:	80, 120, 140 and 240 litre
Skip:	1500 and 1800 mm
Operation	
Method:	Push-button hydraulic system
Time:	35 seconds
Dimensions (L/W/H)	1500/980/2200 mm
Battery	• 12V rechargeable battery and smart charger • 10A main outlet
Highest tip point	SIMPLUS150HY1500: 2550 mm SIMPLUS150HY1800: 2800 mm

Safety features

- Safety cage eliminates hand and foot crush-points for operators and bystanders.
- Braking castors for stability.

	ORDER CODES
Simplicity Plus for 1500 mm skip bins	SIMPLUS150HY1500
Simplicity Plus for 1800 mm skip bins	SIMPLUS150HY1800

Universal BIN LIFTER



A battery operated hydraulic push button unit that aids in the lifting and emptying of wheelie bins into dumper bins. Completely Australian Standards compliant, the safety cage and extra guarding adds extra protection for users.

This is an ideal unit for heavy weight and frequent lifts. The push-button operation eliminates manual handling and associated risks of lifting bins.

Suitable for supermarkets, schools, construction sites, apartment blocks, waste management companies, event organisers.

MADE IN AUSTRALIA



Typical applications

Suitable for supermarkets, schools, construction sites, apartment blocks, waste management companies, event organisers.

Features

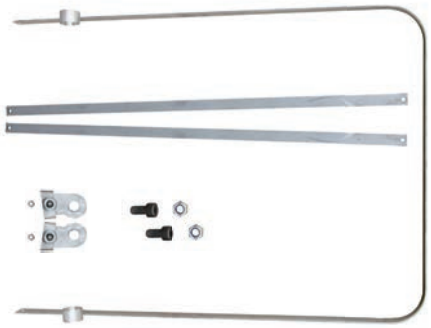
Lifting	
Capacity:	250 kg
Mechanism:	Lift-and-tilt
Recommended use	
Per day:	100+ lifts
Bin compatibility	
Wheelie:	80, 120, 140 and 240 litre
Skip:	1500 and 1800 mm
Operation	
Method:	Push-button hydraulic system
Time:	35 seconds
Dimensions (L/W/H)	1500/980/2200 mm
Battery	• 12V rechargeable battery and smart charger • 10A main outlet
Highest tip point	UBL250HYD1500: 2550 mm UBL250HYD1800: 2800 mm

Safety features

- Safety cage and door eliminates all hand and foot crush-points for operators and bystanders.
- Braking castors for stability.
- Sturdy, stand-alone unit.

	ORDER CODES
Universal bin lifter for 1500 mm skip bins	UBL250HYD1500
Universal bin lifter for 1800 mm skip bins	UBL250HYD1800

Wheelie bin lid opener KIT



MADE IN AUSTRALIA



For use in food, medical and industrial operations the Wheelie Bin Lid Opener bin is the hygienic way to dispose of waste without getting your hands dirty touching the bin.

Simply use the foot pedal to open and close a lidded wheelie bin. Designed and fitted right here in Australia from stainless steel the Wheelie Bin Lid Opener is perfectly suited for fast paced environments where waste needs to be handled quickly and efficiently.

We also offer the Wheelie Bin Lid Opener unassembled so you can purchase in bulk and save in shipping and handling charges.

- The bin can be partially opened (and held in place with your foot) for quick use.
- Fully opened for times when large waste needs to be emptied and closed again with a quick press of the pedal.

Features and benefits

- Full stainless steel.
- Can be purchased fully assembled or unassembled.
- Hygienic hands-free operation.
- Can be operated from the front or side.
- Prevents cross contamination from bin to food transfer.
- Cost savings can be achieved by a reduction on handwashing, glove use and hand sanitiser.
- A Wheelie Bin Lid Opener bin can be emptied by a Liftmaster bin lifter into a bulk bin.
- Can be picked up and emptied by a waste bin truck in the usual weekly/daily collection.
- Compatible with 80, 120 and 240 litre wheel bins.
- Designed to be used only on Sulo and Schaefer bins.

Wheelie Bin Lid Opener kit components

- A foot pedal frame and vertical bars.
- Hinges.
- Nuts and bolts.

Typical applications

Suitable for commercial kitchens and food preparation areas. Washrooms and bathrooms, medical and healthcare facilities, industrial and construction, commercial or residential sites where emptying waste safely is required.

KITS	BIN SIZE	ORDER CODES
Kit sold separately. For fitting to your existing wheelie bin.	80 litres	SPLIFTALID80
	120 litres	SPLIFTALID120
	240 litres	SPLIFTALID240
Unassembled kit with wheelie bin. Ideal for buying in bulk.	80 litres	SPLIFTALID80UN
	120 litres	SPLIFTALID120UN
	240 litres	SPLIFTALID240UN
Pre-assembled kit fitted to a wheelie bin.	80 litres	SPLIFTALID80AS
	120 litres	SPLIFTALID120AS
	240 litres	SPLIFTALID240AS

WHEELIE BINS	BIN SIZE	ORDER CODES
80 litre wheelie bin. Dimensions (H x D x W): 825 x 496 x 440 mm	80 litre	80LTBIN
120 litre wheelie bin. Dimensions (H x D x W): 925 x 555 x 480 mm	120 litre	120LTBIN
240 litre wheelie bin. Dimensions (H x D x W): 1060 x 730 x 550 mm	240 litre	240LTBIN
360 litre wheelie bin*. Dimensions (H x D x W): 1116 x 904 x 669 mm	360 litre	360LTBIN

** The 360LTBIN is a special order. We do not stock this item.*

SPARE PARTS	ORDER CODE
Wheelie bin wheels	RPL200(DTR)

Modular bin trailer BIN MOVER





The Modular Bin Trailer is the ideal solution for moving multiple wheelie bins to a centralised area, and suited to facilities with multiple wheelie bins which need to be moved regularly for emptying.

Available in two sizes—a three-bay bin or a six-bay bin model—the Modular Bin Trailer is compatible with 80, 120, 140, 240 and 360 litre wheelie bins.

When coupled with an Electrodrive powered tug (tow capacity depending on application), the tug can be configured to attach directly to the Modular Bin Trailer (or your large waste bin).

Please note: These units are supplied flat-packed ready for assembly.

MADE IN AUSTRALIA

Typical applications

Suitable for apartment buildings, schools, sports grounds, hotels, universities and institutions.

Features

Load capacity	3-bay trailer: Up to 240 kg per bin bay. 6-bay trailer: Up to 200 kg per bin bay. (Maximum weight capacity of 1200 kg castors)
Usability	Fits within one standard car parking space.
Bin compatibility	80, 120, 140, 240 and 360 litre wheelie bins
Hitching	• Comes with a drawbar to suit pin hitch as standard. • Also available with tow ball or hitch couplings.
Dimensions (L/W/H)	• 3-bay trailer: 2850/700/1432 mm • 6-bay trailer: 2874/1378/1447 mm
Shipping dimensions (L/W/H)	2400/700/1432 mm

Safety features

Gas strut actuated bin ramp.

	ORDER CODES
Three bay trailer for 80–360 L wheelie bins	MODULAR3
Six bay trailer for 80–360 L wheelie bins	MODULAR6

Powered bin trolley BIN MOVER





The Powered Bin Trolley can move up to three 240 litre wheelie bins—weighing up to 400 kg—over a flat surface. Its powered drive-wheel can also handle ramps with up to 5° inclines.

The smart design allows for an easy turning circle and smooth manoeuverability, while the operator safely stays in front of the load, maximising forward vision.

MADE IN AUSTRALIA

Typical applications

Suitable for nursing homes, car parks, theme parks, hospitals and sporting complexes.

Features

Tow capacity	400 kg on flat ground or up to 5° inclines.
Load capacity	Up to three 240 litre wheelie bins
Max. speed	Up to 4 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Powered drive wheel can carry loads over ramps up to 5°. • No driver's licence required. • Simple to use with easy turning action. • Quiet, smooth operation. • Zero emissions.
Dimensions (L/W/H)	2887/739/1596 mm 2600/739/1596 mm (handle folded up)
Battery	12V MK-gel with smart charger

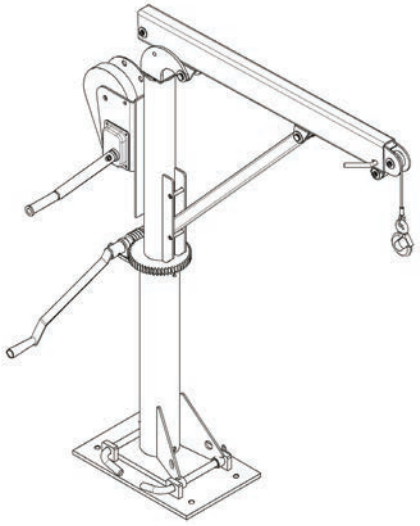
Safety features

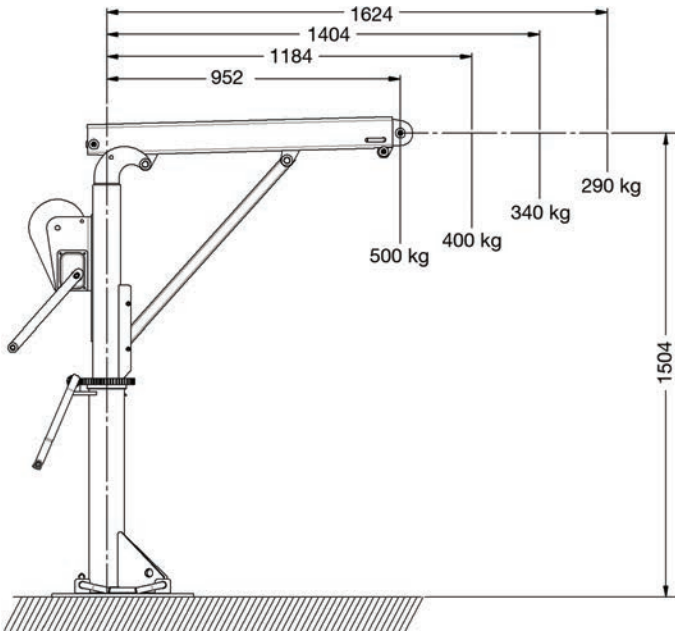
- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Powered Bin Trolley	POWBINTROLLEY

Strong Arm HOIST





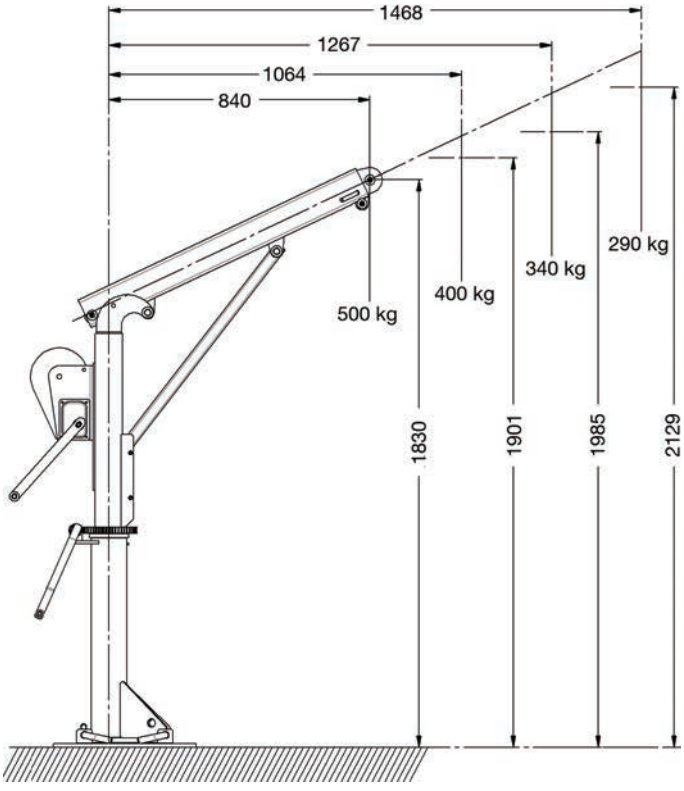


Typical applications

Suitable for plant equipment, workshops, manufacturing and factories.

Features

Lifting capacity:	500 kg
Usage:	Base plate be bolted to a concrete floor. (Can be folded for storage.)
Operation method:	Hand winch
Cable length:	10 m
Dimensions (L/W/H)	1171/508/1557 mm



The Strong Arm is a cantilever crane designed to be statically bolted to a concrete floor (eg. loading bay).

An integral piece of plant equipment used for lifting loads between floors—while effectively eliminating the need for manually carrying heavy, bulky equipment on stairs, or the use of a forklift.

A hand winch is low-geared to ensure loads of up to 500 kg can be easily raised, while precise positioning of the load is achieved through geared hand-slewing of the mast.

Extra lift height can be achieved by raising the boom (prior to lifting the load).

The mast is fitted to the base plate with two pins. Remove the first pin and the mast can be folded down for easy travel. Remove the second (pivot) pin and the Strong Arm can be stowed away.

Please note: *Supply only. Fitting is as per specific site requirements. Onsite installation and mounting must be performed by a qualified engineer.*

	ORDER CODE
Strong Arm hoist 500 kg	SIS4HW

Tub trolley mover





An ergonomic tub trolley solution to eliminate awkward bending, unsafe lifting and difficult steering when moving tubs.

Designed for the food and retail industries, Electrodrive's ergonomic tub trolley improves manual handling of food and goods by reducing the risk of musculoskeletal injury caused by awkward bending and pushing of heavy tubs at floor level.

Easy to use—simply position the trolley on either side of the tub, and then push down on the foot pedal to lift the tub and securely lock it into place—enabling effortless transportation of heavy tubs.

Customer trials have proven to increase the overall productivity by 30%. This was achieved by eliminating manual handling associated with lifting, shifting and tipping heavy tubs, and reducing the labour hours involved in the daily process of emptying food waste.

MADE IN AUSTRALIA

Typical applications

Suitable for the food and retail industries for improved handling of food and goods.

Features

Load capacity	560 kg (with Fallshaw's non-marking 100 mm grey rubber castors).
Finish	Two options are available: • Powder-coat for general use. • Stainless steel (grade 304) for raw food handling.
Usability	• Highly manoeuvrable and easy to use. • Proven to increase efficiency by up to 30%. • Ergonomic design to reduce the risk of injury. • Foot pedal for lifting and securely locking tubs into the trolley frame, or for releasing them. • Can be designed to suit your current tubs. • Can be used with an Electrodrive tipper (contact us for info).
Castors	Fitted with quality Australian-made Fallshaw food-grade castors (100 mm non-marking grey rubber): • Two swivel (order code: MSC100G/MSP) • Two fixed (order code: MSC100G/MSF).
Dimensions (L/W/H)	1055/580/948 mm

	ORDER CODE
Tub trolley (minimum order quantity of 6)	SIE3038

For a commercial custom-made waste solution, ask about our 'Custom-Made Loading Dock Tipper Station' for use with the tub trolley.

Follow-Me trolley



The Follow-Me Trolley is a highly manoeuvrable flatbed trolley with an articulation system inspired by B-Double trailers and road trains.

Designed with a quick hitching mechanism, each trolley can be easily hitched into a train where it mimics the movement of the object directly in front, giving the whole train a very tight turn circle and allowing it to negotiate tight corners and S-bends.

Combined with an Electrodrive powered tug, up to 10 fully loaded Follow-Me Trolleys can be towed safely by one person through tight shopping aisles.

Designed for the smallest tug in our range, the Tug Compact (with its width of only 609 mm) allows it to comfortably fit through doorways and corridors.



Pictured:
A chain of Follow-Me Trolleys hitched to the Tug Compact (can be ordered separately).

MADE IN AUSTRALIA



Typical applications

Suitable for retail or industrial environments, including supermarkets where shoppers are pushing trolleys around aisles and passages.

Features

Usability	• High manoeuvrability of trolley trains through tight corners and S-bends. • Stay in 'front of load', preventing push-pull injuries and the risk of collisions with pedestrians or objects. • Suitable for retail or industrial environments, including supermarkets where shoppers are pushing trolleys around aisles and passages. • Can be ordered separately or with the Tug Compact. • Articulation system can be retrofitted to your existing fleet of trolleys. • Made to order.
Hitching	Quick release levers for easy hitching and unhitching.
Dimensions (L/W/H)	Standard size: 819/411/943 mm

Custom sizes available

Can also be customised to suit any application. The articulation system can even be retrofitted to your existing fleet of trolleys.
For a hitch that is designed to suit your equipment please see pages 29-31.

	ORDER CODES
Follow-Me Trolley (single trolley)*	FOLLOWMETRLY
Tug Compact (no hitch)	TUGCOM500NH
Tug hitch	EDHTFLWMETRLY

** FOLLOWMETRLY: minimum order quantity of six.*

Tug Compact POWERED TUG



A nimble powered tug that allows a user to tow up to 500 kg safely. It is the ideal tug for towing document, stock, bin, linen and medical trolleys in and around tight spaces and aisles with ease.

Using the tiller handle to tow the tug, the operator is in front of the load, increasing visibility and reducing the risk of collisions.

Powered towing can eliminate push/pull injuries caused by manually moving heavy trolleys or repetitive movements.

See pages 29-31 for hitch options.

MADE IN AUSTRALIA





Typical applications

Suitable for warehouses, hospitals, linen service, casinos, hospitality, universities.

Features

Tow capacity	500 kg on flat ground.
Max. speed	Up to 5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Grey non-marking tyres. • No driver's licence required. • Simple to use. • Quiet, smooth operation. • Zero emissions.
Hitching	• Supplied with a pin hitch. • Wide variety of hitches available for easy attachment to trolleys.
Dimensions (L/W/H)	1100/609/891 mm (handle down)
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.
- Emergency back-off button.

	ORDER CODES
Tug Compact 500 kg	TUGCOM500NH
Pin hitch (16 mm)	EDHT1810-002
Pin hitch (19 mm)	EDHT1810-043
Clamp hitch*	EDHTCLAMP001
Self-centering hitch	EDHT1810-006

** Each clamp hitch must be supplied with EDHT1810-006 (self-centering htich) for the Tug Compact.*

Tug Rise POWERED TUG





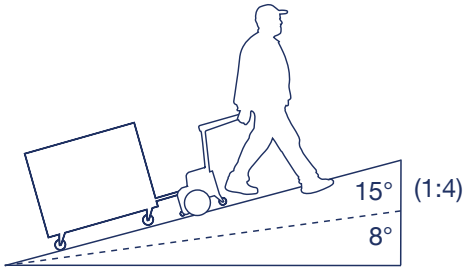
The Tug Rise pedestrian operated electric tug has been designed to tow on slopes or ramps, and is capable of towing up to 1 tonne on a 15 degree ramp with ease, or up to 5 tonne on a flat surface.

The Tug Rise is the ideal solution for moving 660 litre and 1100 litre bins on ramps with an incline of 1:4. Universal towing devices (to suit 660 and 1100 litre bins) are also available, as well as directional lock mechanisms for swivel castors to help improve your waste management.

The Tug Rise is designed to improve safety and efficiency, whilst reducing the risk of accidents that can occur when manually moving very heavy loads.

See pages 29-31 for hitch options.

MADE IN AUSTRALIA



Typical applications

Suitable for moving heavy bins or trolleys on sloped driveways/ ramps, around high-rise building basements, or caravan parks.

Features

Tow capacity	1000 kg up a 15 degree incline, (or up to 5,000 kg on a flat surface).
Max. speed	Up to 3 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Ergonomic design with folding tiller handle. • Turret with turret lock for easy reversing. • Heavy duty high-traction wheels (black). • Park brake release—to enable manual operation in the event of a flat battery. • Low maintenance
Hitching	• Wide variety of hitches available for easy attachment to trolleys. • Universal towing device to suit 660 litre and 1100 litre bins available.
Towing options	• Can tow multiple bins. • Move 660 litre and 1100 litre bins on a 15 degree ramp or incline. • Directional lock mechanism for swivel castors is available.
Dimensions (L/W/H)	1800/902/894 mm (approx.)
Battery	Two 12V 100Ah MK-gel batteries (deep cycle, long-lasting, maintenance-free) with 24V smart charger.

Safety features

- Emergency stop button; Emergency back-off button;
- Electromechanical park brake.

	ORDER CODES
Tug Rise 1 Tonne (no hitch)	TUGRISE1TNH
Pin hitch (19 mm)	EDHT1316
Auto-latching hitch	EDHT1810-024
Heavy duty clamp hitch	EDHTCLAMP002

Tug Axis 1T/2T POWERED TUG



(Pictured with Auto-latching hitch—320mm height from ground)

A powerful machine, the Tug Axis is available in one or two tonne towing capacities.

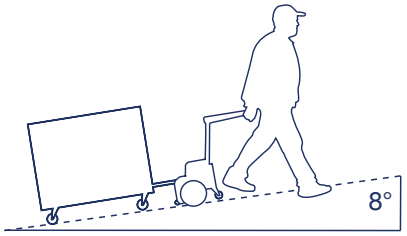
Ideal for transporting medical carts around hospitals, moving heavy specialist equipment or moving heavy trolleys.

Using the tiller handle to tow the tug, the operator is in front of the load, increasing visibility and reducing the risk of collisions.

Powered towing can eliminate push/pull injuries caused by manually moving heavy trolleys or repetitive movements.

See pages 29-31 for hitch options.

MADE IN AUSTRALIA





Typical applications

Suitable for retail and light industrial towing including airports, factories, warehouses, apartment buildings or large facilities.

Features

Tow capacity	• Tug Axis 1T: 1000 kg • Tug Axis 2T: 2000 kg (On flat ground, or with reduced towing capacity on ramps up to 8 degrees.)
Max. speed	Up to 5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Turret with turret lock for easy reversing. • Easy to use with quiet, smooth operation.
Hitching	Wide variety of hitches available for easy attachment to trolleys.
Dimensions (L/W/H)	1480/610/852 mm (handle down)
Battery	Two 12V 42Ah MK-gel batteries with 48V smart charger

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop and back-off safety buttons.

	ORDER CODES
Tug Axis 1T (no hitch)	TUGAXIS1TNH
Tug Axis 2T (no hitch)	TUGAXIS2TNH
Auto-latching hitch	EDHT1810-024
Pin hitch (16 mm)	EDHT1313
Pin hitch (19 mm)	EDHT1316
Clamp hitch	EDHTCLAMP001
Groove hitch	EDHTGROOVE001
Tow ball A-frame hitch	EDHT1810-023

Tug Axis 4T/5T POWERED TUG



[Pictured with an auto-latching hitch]

A powerful workhorse, the Tug Axis is available in four or five tonne towing capacities.

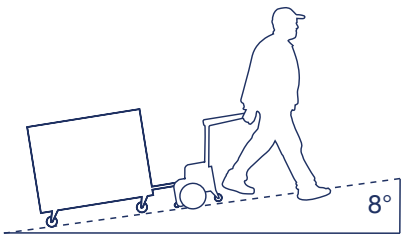
The Tug Axis is designed to improve safety and efficiency, whilst reducing the risk of accidents that can occur when manually moving very heavy loads.

Suitable for industrial towing or moving specialist equipment.

Ideal solution in helping to implement a 'no forklift zone' while protecting staff and products.

See pages 29-31 for hitch options.

MADE IN AUSTRALIA





Typical applications

Suitable for large retail/facilities, heavy industrial towing, airports or factories.

Features

Tow capacity	• Tug Axis 4T: 4000 kg • Tug Axis 5T: 5000 kg (On flat ground, or with reduced towing capacity on ramps up to 8 degrees.)
Max. speed	Up to 3 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Turret with turret lock for easy reversing. • Easy to use with quiet, smooth operation. • Zero emissions.
Hitching	Wide variety of hitches available for easy attachment to trolleys.
Dimensions (L/W/H)	• Tug Axis 4T: 1465/790/875 mm • Tug Axis 5T: 1740/900/905 mm
Battery	Two 12V 70Ah MK-gel batteries with 24V smart charger. Optional upgrade: 100Ah MK-gel batteries.
Optional	Grey wheels

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop and back-off safety buttons.

	ORDER CODES
Tug Axis 4T (no hitch)	TUGAXIS4TNH
Tug Axis 5T (no hitch)	TUGAXIS5TNH
Auto-latching hitch	EDHT1810-024
Pin hitch (16 mm)	EDHT1313
Pin hitch (19 mm)	EDHT1316
Tow ball A-frame hitch	EDHT1810-023
Hydraulic arm lift kit	EDHYDARMLIFTKIT

Tug Tough 10T POWERED TUG



The perfect heavy duty workhorse for loads up to 10 tonnes, the Tug Tough utilises a powerful 48 V drive system to allow a single operator to hitch to and move big loads.

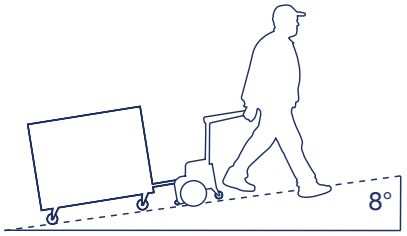
The Tug Tough can be fitted with an optional hydraulic lifting hitch available for either capacity.

It allows the operator to walk in front of the heavy load, allowing maximum forward vision and eliminating the possibility of accidents when negotiating turns.

Ideal for moving very heavy wheeled loads and equipment, heavy duty construction, vehicles and aircraft.

See pages 29-31 for hitch options.

MADE IN AUSTRALIA





Typical applications

Suitable for airports, mining, factories, railways.

Features

Tow capacity	Tow up to 10 tonnes on flat ground, with reduced towing capacity up to 8 degrees
Max. speed	Up to 2.5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Heavy duty construction, perfect for pulling very heavy equipment, vehicles and aircraft. • Fully contained unit—wheels and drive system housed within box covers. • Hazard yellow for high-visibility and industrial work areas. • Flashing amber warning light (optional).
Hitching	• Wide variety of automated hitches available. • A five tonne lifting hitch is available.
Dimensions (L/W/H)	1912/650/910 mm
Battery	Four 12V 70Ah MK-gel batteries with a 48V smart charger. Optional upgrade: 100Ah MK-gel batteries.

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.
- Emergency back-off button.

	ORDER CODES
Tug Tough 10 tonne (no hitch)	TUGTOUGH10TNH
Pin hitch (32 mm)	EDHT10TPIN
Pin hitch (50 mm)	EDHT10TPIN50
Hook hitch	EDHT10THOOK
Tow ball hitch	EDHT1352

Wheelset Mover





Traditional methods for moving rolling stock equipment are risky and time consuming, requiring large forklifts and multiple people.

Electrodrive's Wheelset Mover is a custom-engineered, battery-powered device capable of moving large cylindrical objects such as train bogies, spools and drums.

It enables a single operator to move safely and swiftly with minimal effort—saving time, increasing productivity while reducing the risk of injury.

It is the deal solution in helping to implement a 'no forklift zone', while the user has full visibility of all points and staff members in the vicinity.

MADE IN AUSTRALIA

Typical applications

Suitable for moving rail wheesets, train bogies, cylinders, pipes, spools, industrial drums.

Features

Tow capacity	Move up to 1400 kg on flat surface
Max. speed	Up to 4.1 km per hour (fully programmable)
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Battery operated and rechargeable. • Key on/off switch. • Ergonomic design with intuitive controls and tiller control handle. • Hydraulic park brake release—to enable manual operation in the event of a flat battery. • Low maintenance. • Simple to use, no licence required. • Quiet, smooth operation. • Zero emissions.
Dimensions (L/W/H)	3264/1505/869 mm 2704/1505/869 mm (will tiller arm raised)
Battery	Two 12V 73Ah MK-cyclic gel/ suspended electrolyte batteries (deep cycle, long-lasting, maintenance-free) with 24V smart charger.

Safety features

- Emergency stop and back-off safety buttons.
- Hydraulic manual override.
- Horn and warning light.

	ORDER CODE
Wheelset mover	WHEELSETMOVER

Transpak POWERED TROLLEY





Electrodrive's Transpak powered trolley is designed for carrying or towing meal delivery systems up to 500 kg.

It is completely customisable to suit any meal delivery system.

Meal deliveries in hospitals and aged care facilities can be a demanding task. Pushing and manoeuvring refrigerated and heated tray delivery units presents serious risks of manual handling injuries, including back and side strains, while obscured vision increases the risk of accidents and collisions.

Manoeuvring the Transpak is easy with its tiller style control. It effortlessly moves heavy loads up and down ramps, over carpet and in-and-out of lifts. User visibility is vastly improved with the trolley positioned behind the operator, keeping the user in front-of-the-load for maximum forward visibility.

MADE IN AUSTRALIA

Typical applications

Suitable for hospitals, hotels, aged care facitilites and function centres.

Features

Tow capacity	500 kg
Max. speed	Up to 4 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• No driver's licence required. • Simple to use. • Quiet, smooth operation. • Zero emissions.
Compatibility	• Compatible with all meal delivery systems including those from Burlodge, Socamel and Versigen. • Frame size can be built to suit your requirements.
Dimensions (L/W/H)	1802/785/895 mm
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Transpak powered trolley 500 kg	TRANSPAK500

Gzunda GZ30 PATIENT MOVER



The Gzunda GZ30 patient mover is intelligently designed for moving patients safely. It is simple-to-use and is powerful enough for one person to move hospital beds, stretchers or trolleys weighing up to 500 kg, single-handedly. Whether you're moving patients between wards, or to and from the operating theatre, The GZ30 keeps your medical staff safe from muscle and back strains.

The GZ30 has easy-to-use controls, including key start, twist grip variable speed control, horn, and emergency stop button. As with all Electrodrive equipment, the GZ30 comes with a comprehensive 12-month warranty, including parts and labour.

See pages 33-34 for hitch options.

MADE IN AUSTRALIA



Typical applications

Suitable for moving hospital beds, stretchers or trolleys.

Features

Load capacity	Move up to 500 kg
Max. speed	Up to 4.1 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Compact and easy to manoeuvre in tight spaces. • Intuitive controls with twist grip throttle and horn. • Requires 100mm of under-bed clearance (can be modified to 90mm if required). • Middle tine for easy manoeuvrability in tight spaces. • Simple to use. • Quiet, smooth operation. • Zero emissions. • Non-marking tyres.
Hitching	• Push-button hitching—silent, fast and efficient. • A variety of hitches are available.
Dimensions (L/W/H)	1670/760/1150 mm
Battery	24V Li-ion battery with smart charger.

Safety features

- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Gzunda GZ30 500 kg — no hitch	GZ30(NH)

Gzunda GZS PATIENT MOVER





Typical applications

Suitable for moving hospital beds, stretchers, treatment chairs or trolleys. No under-bed clearance is required.

Features

Load capacity	Move up to 600 kg
Max. speed	Up to 5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Highly manoeuvrable in tight spaces. • Intuitive controls with twist grip throttle and horn. • No under-bed clearance required. • No driver's licence required. • Simple to use. • Quiet, smooth operation. • Zero emissions. • Non-marking tyres.
Hitching	• Push-button hitching—silent, fast and efficient. • A variety of hitches are available.
Dimensions (L/W/H)	• GZSIN(NH): 1245/920/1230 mm • GZSUS(NH): 1245/1015/1230 mm
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger.

Safety features

- Emergency stop button.
- Emergency back-off button.

The Gzunda GZS patient mover allows one person to effortlessly move heavy hospital beds, stretchers, treatment chairs or trolleys. The motorised unit operates equally well with or without a patient, simplifying the task of moving beds or patients between wards, departments, or to and from theatre, allowing the driver to focus on the needs of the patient during transport.

With a capacity of 600 kg, the silent motorised unit is able move a hospital bed up or down ramps, over carpet, into lifts, and around tight corners with minimal effort by the operator. The GZS has easy-to-use controls, including key start, twist grip variable speed control, horn, and emergency stop button. As with all Electrodrive equipment, the GZ30 comes with a comprehensive 12-month warranty, including parts and labour.

See pages 33-34 for hitch options.

MADE IN AUSTRALIA

	ORDER CODES
Gzunda GZS 600 kg split tine — no hitch (international)	GZSIN(NH)
Gzunda GZS 600 kg split tine — no hitch US)	GZSUS(NH)

Gzunda GZBARI PATIENT MOVER



The Australian-made Gzunda GZBARI Bariatric Patient Mover is designed to move 800 kg (including the weight of the patient, the bed and accessories).

Easy to steer and rotate, its twin direction control rollers provide improved frictional ground contact for maximum manoeuvrability.

Featuring power steering, a twin motor drive and a spring-loaded hitch bar the unit can effortlessly manoeuvre up and down inclines or ramps up to six degrees).

Ergonomically designed with an adjustable-height tiller handle, the control panel features push buttons with three speed, reverse and emergency/safety buttons.

Fitting neatly under your hospital bed, it requires only 100 mm of under-bed clearance. Its compact design enables easy steering through tight corridors and in-and-out of lifts.

The tine is constructed from all steel and is lead-free.

See pages 33-34 for hitch options.

MADE IN AUSTRALIA

Typical applications

Suitable for moving hospital beds or stretchers with bariatric patients.

Features

Load capacity	Move up to 800 kg on a 6° ramp.
Max. speed	Up to 5.5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Compact and easy to manoeuvre in tight spaces. • Power steering with dual-drive hub motors. • Intuitive controls with twist grip throttle and horn. • Requires 100 mm of under-bed clearance (can be modified to 90mm if required). • Battery operated and rechargeable. • Long lasting deep-cycle gel cell batteries. • Ergonomic design with adjustable height controls. • Fold-down controller for compact storage and lift access. • Automatic park brake to anchor beds and trolleys when staff let go. • Simple to use. • Quiet, smooth operation. • Zero emissions. • Non-marking tyres.
Hitching	• Simple hitching. • A variety of hitches are available.
Dimensions (L/W/H)	1861/804/1338 mm
Battery	Four 12V 33Ah (Valen Gell 12G33) batteries with 24V smart charger.

Safety features

- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Gzunda GZBARI Bariatric patient mover 800 kg (no hitch)	GZBARI

Tug Compact LINEN MOVER





The Tug Linen Mover is a Tug Compact with a custom hitch, specially designed for attaching to linen trolleys that are 500–700 mm wide.

Ideal for towing linen trolleys fitted with **two swivel and two fixed castors**.

As with all Electrodrive Tugs, this configuration will allow a user to tow up to 500 kg safely, and because it is nimble it will allow you to effortlessly maneouver heavy linen trolleys through tight corridors, avoiding the risk of collisions.

Using the tiller handle to tow the tug, the operator is in front of the load, increasing visibility and reducing the risk of collisions.

Powered towing can eliminate push/pull injuries caused by manually moving heavy trolleys or repetitive movements.

See pages 33-34 for hitch options.

MADE IN AUSTRALIA

Typical applications

Suitable for hospitals, linen service, casinos, hospitality, warehouses, universities.
Ideal for towing linen trolleys fitted with two swivel and two fixed castors.

Features

Tow capacity	500 kg
Max. speed	Up to 5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Non-marking tyres. • Compact and easy to manoeuvre in tight corridors. • No driver's licence required. • Quiet, smooth operation. • Zero emissions.
Hitching	• Supplied with a clamp hitch. • Wide variety of hitches available for easy attachment to trolleys.
Dimensions (L/W/H)	1351/609/891 mm
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger

Safety features

- Intuitive control with standard automatic safety brake, forward and reverse drive.
- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Tug Compact linen mover 500 kg (with clamp hitch)	TUGLINENMOVER

Gzunda GZ30 LINEN MOVER



The Gzunda Linen Mover is an ergonomically designed unit ideal for towing linen or laundry trolleys around hospitals or hotels.

The central tine acts as a powered fifth wheel fitting neatly under a trolley for effortless manoeuvrability.

No modifications are required to your existing fleet of trolleys, the Gzunda Linen Mover is suitable for trolleys with **four swivel castors**.

The linen mover's compact design and folding tiller handle enables use in-and-out of lifts and in tight spaces, while keeping the user in-front-of-the-load—avoiding the risk of collisions.

The versatile hitch slides up and down providing a stable centre-of-gravity—crucial for towing tall heavy trolleys.

See pages 33-34 for hitch options.

MADE IN AUSTRALIA



Typical applications

Suitable for towing linen trolleys around hospitals or hotels.

Features

Tow capacity	Tow up to 500 kg
Max. speed	Up to 5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Compact design. (With the tiller handle folded, the unit adds only 300 mm to the length of your trolley.) • Powered fifth wheel increases manoeuvrability. • Compact and easy to manoeuvre in tight corridors. • Middle tine design—ideal for towing linen trolleys fitted with four swivel castors. • Tiller control handle for ergonomic 'front of load' operation. • Removes the risk of push/pull injuries in linen handling. Quiet, smooth operation.
Hitching	• Supplied with a clamp hitch. • Wide variety of hitches available for easy attachment to trolleys.
Hitching height (from ground)	Lowest point 630 mm (minimum) to highest point 950 mm (maximum).
Dimensions (L/W/H)	1759/676/1152 mm
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger

Safety features

- Emergency stop button.
- Emergency back-off button.

	ORDER CODE
Gzunda linen mover (with clamp hitch range 520–720 mm)	GZLINENMOVER
Gzunda linen mover (no hitch)	GZLINENMOVER(NH)

Bariatric wheelchair mover





The Bariatric Wheelchair Mover is an ergonomically designed unit which power-assists wheelchairs.

The smooth ride improves patient comfort while also reducing the risk of manual-handling injuries, strain and fatigue to patient service staff. It is ideal for workplaces who support an ageing workforce.

It is suitable for moving heavy wheelchairs, commodes and treatment chairs around hospitals (patient transportation) as well as airports (passenger transportation).

Compatible with a variety of wheelchairs, the unit is easy to hitch or unhitch with the simple push of a button.

With its compact design and easy steering, it is ideal for manoeuvring around hospitals, airports, and in-and-out of lifts.

Comprehensive 12-month warranty.
Six month warranty on battery and charger.

MADE IN AUSTRALIA

Typical applications

Suitable for power-assisting a fleet of wheelchairs in hospitals or airports. Also ideal for aged care or rehabilitation centres with large numbers of wheelchairs.

Features

Load capacity	Move up to 350 kg on a 6 degree gradient.
Max. speed	Up to 5 km/hour
Speed mode	Thumb throttle with forward, reverse and emergency stop.
Usability	• Compact and easy to steer in tight spaces. • Reduces force feedback through chair for patient comfort. • Easy to steer. • Excellent turning circle. • Simple push-button hitching/unhitching. • Quiet operation and smooth ride. • Automatic park brake. • Battery operated and rechargeable. • Non-marking tyre. • Ergonomic design. • Park brake release—to enable manual operation in the event of a flat battery.
Hitching	• Push-button—silent, fast and efficient. • Fits a variety of wheelchairs.
Hitching height	Range: 265 to 330 mm (height from ground)
Dimensions (L/W/H)	830/427/1300 mm
Battery	Two 12V 33Ah MK-gel batteries with 24V smart charger.

Safety features

- Emergency stop button.
- Emergency back-off button.
- Automatically decelerates and stops when not driving forward.

	ORDER CODE
Bariatric wheelchair mover	WHLCHAIRMOVEBARI

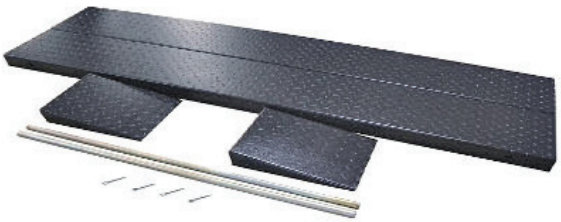
Hospital bed MAINTENANCE LIFT



The LT600HBML Hospital bed maintenance lift is designed to fit all hospital beds including bariatric beds weighing up to 600 kg.

Powered by an electric hydraulic lift, its remote control enables easy access for hospital maintenance or engineering staff to carry out servicing or maintenance repairs safely.

To prevent hospital beds from sliding off, the hospital bed maintenance lift is supplied with a 20 mm safety lip around the sides, as well as a Width Extension Kit (pictured below) for an additional 600 mm.



The Width Extension Kit.



An example of Hospital Bed Maintenance Lift with the Width Extension Kit, adding 300 mm to each side.

Please note: This is an imported product.

Typical applications

Suitable for lifting hospital beds for servicing and maintenance.

Features

Lift capacity	Up to 600 kg
Lifting time	23 seconds
Lowered height	155 mm
Raised height	1090 mm
Overall length	2755 mm
Ramp length	400 mm
Overall width	1350 mm including the 600 mm Width Extension Kit.
Deck type	Chequer plate
Usability	• Expandable table configuration. • Side table extensions. • Add-on front deck to accommodate custom length beds. • Electric hydraulic lift remote control. • Hydraulic direct-drive cylinders, designed and made on ANSI standard, utilising oil seal in cylinder. • Self-lubricating UHMW polyethylene sliders and bronze bush.
Shipping weight	290 kg
Motor	1.5 HP
Power	240V mains power operated

Safety features

- Anti-slip/non-skid chequer plate platform.
- Automatic safety release system.
- Safety lip (20 mm) on three sides of platform (excluding ramp end) to prevent hospital beds from falling off.

Note

The Hospital Bed Maintenance Lift is supplied partly flat-packed, some assembly required. Upon receipt of the unit, you will need to attach the hydraulic hoses and fill the reservoir with hydraulic oil (supplied with the unit) and bolt together the platform width extension. It is advisable that the unit is fastened to the floor before use.
Full instructions are supplied with the unit.

	ORDER CODE
Hospital bed maintenance lift	LT600HBML

P5W NON-RETRACTABLE FIFTH WHEEL



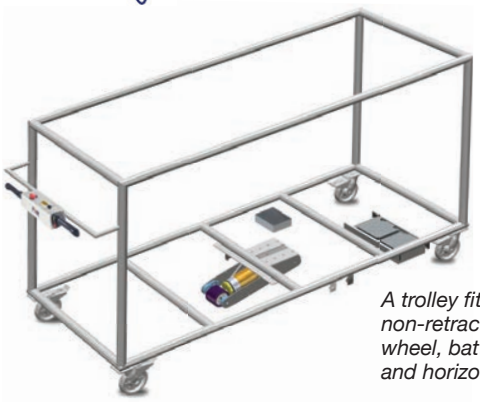
Pictured (from left to right): Hand controller (vertical); Hand controller (horizontal); Non-retractable fifth wheel (drive wheel); Slide-out battery carriage.

The Powered Fifth Wheel (P5W) is a retrofittable solution for converting your manually pushed trolleys into powered ones.

The kit consists of a powerful non-retractable drive wheel (the fifth wheel), a hand control unit (vertical or horizontal—depending on your requirements), a slide-out battery case and a charger.

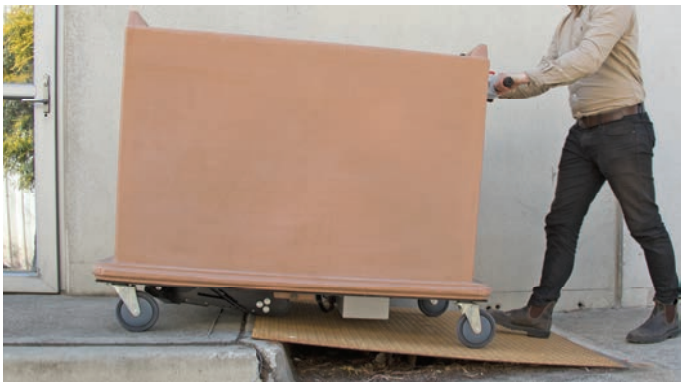
Controlled with an ergonomically designed control grip for a natural walking posture, the Powered Fifth Wheel works with your trolley's other four wheels to help you move heavy loads safely and efficiently.

MADE IN AUSTRALIA



A trolley fitted with the non-retractable fifth wheel, battery carriage and horizontal control unit

[1] *International chargers are also available. Replace "AU" at the end of the order code with "US", "EU" or "UK". For example EDCHARGER7Ah**US**.*



Typical applications

A retrofittable solution for converting trolleys into powered ones.

Features

Load capacity	Move up to 400 kg on flat ground
Max. speed	Up to 4.5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Simple control unit (mounted vertically or horizontally—adaptable to suit 20-52 mm tube). • Quiet, smooth operation.
Dimensions (L/W/H)	• Drive wheel: 511/285/150-300 mm
Battery	Two 33Ah MK-gel batteries (assembled within slide-out carriage) and 7Ah charger.

Safety features

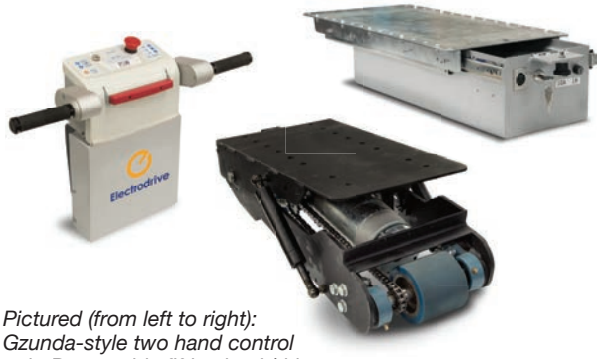
Emergency stop button.

ORDER CODES

Retrofittable kit

Non-retractable powered fifth wheel with simple control:	
Vertically mounted	P5W400VBAU
Horizontally mounted	P5W400HBAU
Items available separately:	
Control unit (vertical)	EDP5WCONTROLV
Control unit (horizontal)	EDP5WCONTROLH
Non-retractable fifth wheel in carriage	EDP5WWHEEL
Slide-out battery carriage	EDP5WBATCARRIAGE
2 x 33Ah gel batteries	EDBAT12V33AHGEL
Charger: 7Ah (AU plug)	EDCHARGER7AhAU[1]

P5W RETRACTABLE FIFTH WHEEL



Pictured (from left to right): Gzunda-style two hand control unit; Retractable fifth wheel (drive wheel); Slide-out battery carriage.

The Powered Fifth Wheel (P5W) is a retrofittable solution for converting your manually pushed trolleys or hospital beds into powered ones.

The kit consists of a powerful retractable drive wheel (the fifth wheel), a 'Gzunda' two-style hand control unit, a slide-out battery case and a charger.

The retractable fifth wheel provides maximum manoeuverability and can be lifted or lowered at the simple press of a button on the hand control unit.

Controlled with an ergonomically designed control grip for a natural walking posture, the Powered Fifth Wheel works with your trolley or bed's other four wheels to help you move heavy loads safely and efficiently.

MADE IN AUSTRALIA



The P5W (hand control unit and drive wheel) fitted to a hospital bed.

[1] *International chargers are also available. Replace "AU" at the end of the order code with "US", "EU" or "UK". For example EDCHARGER7Ah**US**.*



Typical applications

A retrofittable solution for converting hospital beds into powered ones.

Features

Load capacity	Move up to 400 kg on 6° incline
Max. speed	Up to 4.5 km/hour
Speed mode	Three speed control with forward, reverse and emergency stop.
Usability	• Intuitive controls with twist grip throttle and horn. • Quiet, smooth operation.
Dimensions (L/W/H)	• Drive wheel: 511/285/150-300 mm
Battery	Two 33Ah MK-gel batteries (assembled within slide-out carriage) and 7Ah charger.

Safety features

Emergency stop button and back-off bar.

	ORDER CODES
Retrofittable kit	
Retractable powered fifth wheel with 'Gzunda' style two-hand control	GZP5W400HBAU
Items available separately:	
Control unit	EDGZP5WCONTROL
Retractable fifth wheel in carriage	EDGZP5WWHEEL
Slide-out battery carriage	EDP5WBATCARRIAGE
2 x 33Ah gel batteries	EDBAT12V33AHGEL
Charger: 7Ah (AU plug)	EDCHARGER7AhAU[1]

Hitching FOR ELECTRODRIVE TUGS

Common hitches for the Electrodrive powered tug range

If you are looking for a custom hitch, we can design one for almost any application.

For more information, contact our experts on 1300 934 471 (within Australia) or +61 3 9300 8555 (international) or email sales@fallshaw.com.au.






HITCH	Pin hitch	Auto-latching hitch
DESCRIPTION	Typically used on trolleys with tow bars such as meal trolleys and stock trolleys, the pin hitch can also be mounted upside-down to suit spring-loaded drawbars that push upwards. These are becoming more common in workplaces, as no bending is required.	To use the auto-latching hitch, a trolley with a 25 mm diameter tow bar is needed. Electrodrive can provide a tug hitch bar (EDHT1010) which can be welded or bolted to your trolley if required (pictured). The auto-latching hitch enables limited vertical movement. Horizontal movement is provided by the Tug Axis's rotating turret. The hitch is set at 320 mm from the ground.
TUG COMPATIBILITY	For use on: • Compact Tug (16mm and 19mm). • Tug Rise 1T (19mm only). • Tug Axis 1T and 2T (16mm and 19mm). • Tug Axis 4T and 5T (19mm only). • Tug Tough 10T (32mm and 50mm). When fitted to the Tug Compact and Tug Tough, the pin hitch enables vertical and horizontal movement. *Note: When fitted to the Tug Axis, the turret must be locked to disable pivoting, otherwise uncontrolled movement will occur.*	For use on: • Tug Rise 1T. • Tug Axis range (1T, 2T, 4T and 5T models).
APPLICATIONS	Meal trolleys for hospitals, roll cages for supermarkets.	Industrial, heavier-duty trolleys with loads of 1-2 tonne.
ORDER CODES	• EDHT1810-002 (16 mm diameter) • EDHT1810-043 (19 mm diameter) • EDHT1313 (16 mm diameter) • EDHT1316 (19 mm diameter) • EDHT10TPIN (32 mm diameter) • EDHT10TPIN50 (50 mm diameter)	EDHT1810-024

Hitching FOR ELECTRODRIVE TUGS






HITCH	Hydraulic arm lift kit	Clamp hitch
DESCRIPTION	This hitch is used for moving trailers, caravans or boats which have a 50 mm tow ball coupling. The hitch arm is operated by hydraulic system running at high pressure, via a self-centering toggle switch situated near the handle. The pinch points surrounding the arm movement and must be avoided at all times during the operation of the hydraulic system.	Clamp hitches grab the trolley frame from the outside between two hooks. Commonly seen on linen trolleys in hospitals, hotels and linen companies. Each clamp hitch must be supplied with EDHT1810-006 (self-centering hitch) for the Tug Compact or EDHT1810-035 (optional skate hitch).
TUG COMPATIBILITY	For use on: Tug Axis 4T and 5T models.	• EDHTCLAMP001 is suitable for use on Tug Compact and Tug Axis 1T and 2T models. • EDHTCLAMP002 is suitable for the Tug Rise.
APPLICATIONS	Single-axle trailers or caravans fitted with a standard 50 mm tow ball coupling and a jockey wheel to safely lower the load over the tow ball.	Suitable for trolleys with no existing hitch point to connect to, such as linen trolleys, roll cages & trolleys with wire mesh sides. (Suited to a 25 mm frame and for trolleys with a width from 520 mm to 720 mm.
ORDER CODE	EDHYDARMLIFTKIT	EDHTCLAMP001 (General duty) EDHTCLAMP002 (Heavy duty)






HITCH	Groove hitch	Tow ball A-frame hitch
DESCRIPTION	Groove hitches are designed for plastic tub trolleys with slotted handles or metal linen trolleys. EDHTGROOVE0484 hitch is our new swivel mechanism which locks the tubs from inside the handle grooves. These hitches are normally used on plastic linen trolleys which don't have an exposed or open frame to grab onto from the outside.	The tow ball hitch is most commonly used for the movement of trailers, caravans or boats. The tow ball position can be adjusted manually to suit a height of 500 or 600 mm from ground.
TUG COMPATIBILITY	For use on: Tug Axis 1T and 2T models.	For use on: Tug Axis range (1T, 2T, 4T and 5T models).
APPLICATIONS	Rotomould linen trolleys with slotted handles.	Single-axle trailers or caravans fitted with a standard 50 mm tow ball coupling and a jockey wheel to safely lower the load over the tow ball.
ORDER CODE	EDHTGROOVE0484	EDHT1810-023

Hitching FOR ELECTRODRIVE TUGS

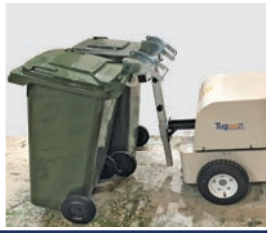




HITCH	**660 & 1100 litre bin hitches**
DESCRIPTION	Our universal hitching brackets fit underneath 660 litre or 1100 litre bins (between the castor plates and bin) to maximise strength and enable towing of multiple bins at once. The hitching brackets are suitable for ramps up to 14 degrees. The tow pins are secured by R-pins.
TUG COMPATIBILITY	For use on: Tug Rise and the Tug Axis range.
APPLICATIONS	Directional lock tabs for steering (order code LMDLSULO) for trolleys with 4 swivel castors—retrofitted on 2 x rear-mounted swivel castors to stop bins swaying side-to-side.
ORDER CODE	EDUNIBH6611F (Front hitching bracket) EDUNIBH6611R (Rear hitching bracket)

Warning: *Never tow with four swivel castors. Towing bins with four swivel castors will cause problems with trailing and 'fishtailing'—cutting corners, rather than following the unit.*
For safety purposes, directional lock tabs are fitted to your bin's existing rear swivel castors to enable controlled steering and towing in a straight line.





HITCH	**Double wheelie bin hitch**
DESCRIPTION	Move up to two wheelie bins at the same time using this hitch. To hitch or unhitch the bins, simply lift the handle. The height of the hitching point can be manually adjusted with two wing knobs located on the side of the vertical frame.
TUG COMPATIBILITY	For use on: Tug Compact and the Tug Axis range.
APPLICATIONS	Moving moulded wheelie bins ranging from 80 to 240 litres with adjustable height and width.
ORDER CODE	EDTWINBINHITCH

Tug accessories & options

ACCESSORIES	SUITABILITY	ORDER CODES
Amber strobe, 24V	Tug range	EDEL1000F
Amber beacon, 24V	Tug range	EDEL1000
Amber beacon, mounted on pole	Tug range	EDEL1000U-2
Audible beeper	Tug range	EDEL1080F
Spare key	Tug range	EDEL2710
Throttle lever guard	Tug range	EDGM2171F
Weather-resistance from above (IPX2) includes tiller component upgrade and splashguard fitted	Tug range	EDEL3970
Weather/dust-proofing (IP54) Includes electrical enclosure and tiller components upgrade	Tug range	EDEL3971
BATTERIES		
Battery pack, 2 x 44Ah lift-out	Tug Axis range	EDBA1050
Quick-change batteries, 2 x 34Ah lift-out (includes cable set)	Tug range	EDBA1050F
Quick-change batteries, 2 x 45Ah lift-out (includes cable set)	Tug Axis 1T/2T	EDBA1060F
Battery upgrade, for extended run time	Tug Axis 1T/2T	EDBA1020
TYRES		
Non-marking grey tyre upgrade (size: 410/350-6)	Tug range	EDWH1400F
Puncture-proof tyres (poly-filled, size: 410 x 350-6)	Tug range	EDWH1410F
Puncture-proof tyres (poly-filled, grey non-marking, size: 410 x 350-6)	Tug Compact	EDWH1420
Puncture-proof tyres (poly-filled, size: 13/5 x 6)	Tug Axis 1T/2T tonne	EDWH1290F
Puncture-proof tyres (poly-filled, grey non-marking, size: 13.5 x 5.5-8)	Tug Axis 4T/5T tonne	SIE0187

Hitches GZUNDA HITCHING OPTIONS

Common hitch bars

Suitable for Gzunda bed movers and the linen movers.

HITCH	SUITABILITY	APPLICATIONS	SIZE	ORDER CODES
Flex hitch kit with hitch bar 	Gzunda patient movers.	Hospital beds, stretchers, treatment chairs and low-lying trolleys/gurneys.	780 mm length	EDHTFLEX001
Ratchet hitch kit with hitch bar 	Gzunda patient movers.	Hospital beds, stretchers, treatment chairs and low-lying trolleys/gurneys.	780 mm length	EDHTRATCH001
Manual gripper hitch kit with hitch bar. 	Gzunda bariatric patient mover only.	Hospital beds, stretchers, treatment chairs and low-lying trolleys/gurneys.	780 mm length	EDHTMANGRIP001
Automatic gripper hitch kit with hitch bar. 	Gzunda patient movers (suits 20-40 mm bed frames).	Hospital beds, stretchers, treatment chairs and low-lying trolleys/gurneys. It has manual adjustment to suit any bed frame.	780 mm length	EDHTAUTOGRIP001
Groove hitch kit 	Gzunda linen mover	Moulded plastic laundry trolleys with a width of 700-720 mm. It has manual height adjustment to suit any handle height/handle slots.	650 mm (overall length of bar). Hitch range: 295–650 mm (horizontal) and 95 mm (vertical).	EDHTGROOVE001*
Clamp hitch kit. 	Tug Compact linen mover.	Metal framed trolleys, caged linen trolleys, surgical instrument Rapini trolleys and tall stock trolleys.	520-720 mm length	EDHTCLAMP001

** EDHTGROOVE001: The whole hitch bar can be manually raised up and down to suit different handle slots. The 95 mm vertical hitch range relates to the range of movement inside the hitch point to allow it to securely hold on to the trolley.*

Hitches GZUNDA HITCHING OPTIONS

Retrofittable hitch kits

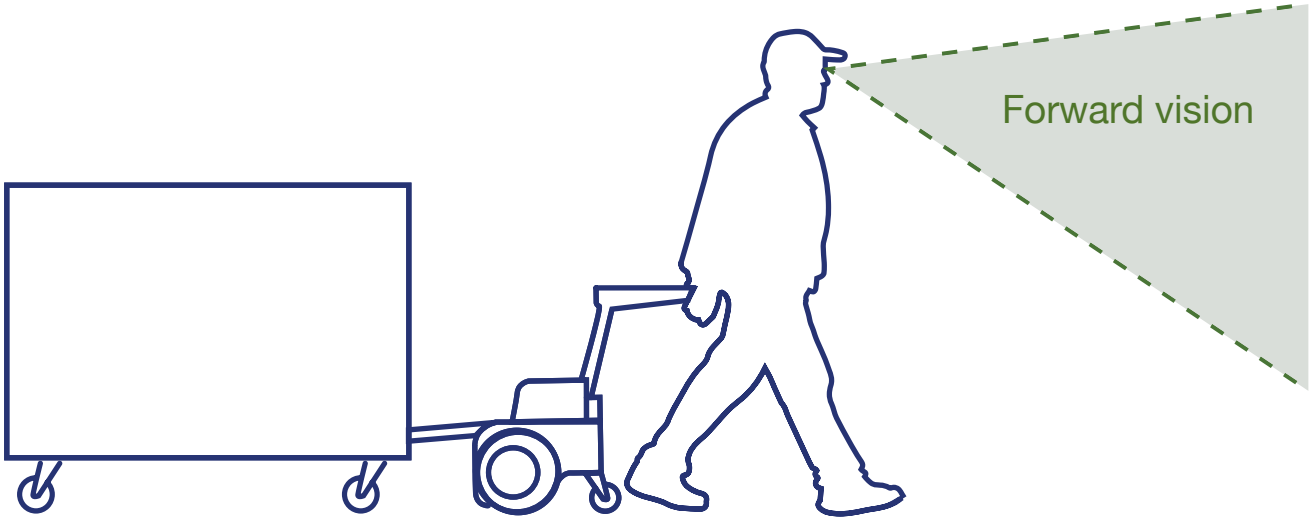
Suitable for the common hitch bars (to enable multiple hitch styles on your bed mover or linen mover).

					
HITCH UNIT KIT	Flex	Ratchet	Manual gripper	Automatic gripper	Gripper
ORDER CODES	EDHTFLEX001-001	EDHTRATCH001-001	EDHTMANGRIPPER-001	EDHTAUTOGRIPPER-001	SIE0305A

Hitch extensions

		
HITCH UNIT KIT	60 mm hitch extension suits GZ10SL and GZS.	120 mm hitch extension suits GZ10SL and GZS.
ORDER CODES	EDHTHITCHEXT60	EDHTHITCHEXT120

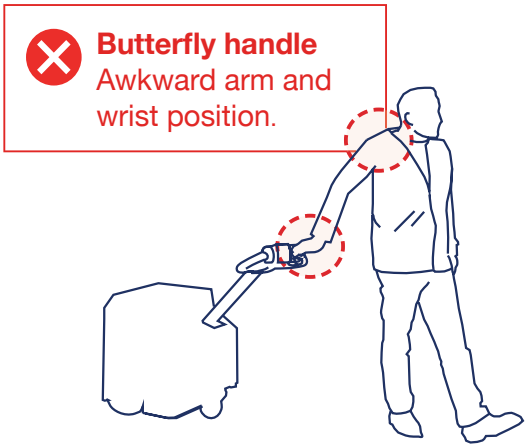
Stay in front of the load



Towing heavy loads

It is widely accepted that the best way to move a heavy load is by putting it in on wheels. What isn't commonly known is that the safest way of moving a heavy wheeled load, is by towing it with a battery powered tug.

While there are a wide variety of powered tugs on the market to choose from, only Electrodrive tugs are ergonomically designed to keep the operator in front of the load.



Maximise forward visibility

Being in front of the load provides maximum forward vision, reducing the risk of collisions with other people, equipment and structures. An Electrodrive tug features a unique tiller design that helps the operator maintain correct walking posture and reduces the risk of strains to shoulders, arms and wrists from repetitive use.

Not all electric tugs are created equal

While it is possible to stay in front of the load with other powered tugs, their butterfly shaped controllers are primarily designed for the operator to grip the handle with both hands and push the load.

If used for towing, the butterfly handle design puts the operator's shoulders, arm and wrist at a very awkward angle. Travelling over any distance in this position is not ergonomic for the operator and could increase the risk of shoulder, arm or wrist strains.



An ergonomic natural walking position

By contrast, the tiller handle drive system on Electrodrive tugs seamlessly interact with how the human body moves while walking, keeping the operator in a comfortable position.

Service and maintenance

To keep your Electrodrive equipment performing at its optimum efficiency, we recommend that it is regularly serviced by a qualified service agent. This will ensure that you get the most out of your investment and that none of the work that is carried out will void applicable warranties.

SERVICED EQUIPMENT

Phone: 1300 934 471 (within Australia)
(Mon-Fri: 7.00 am to 5.00 pm)
Email: service@fallshaw.com.au
Web: www.servicedequipment.com.au

Authorised service agent

Our authorised service agent is Serviced Equipment, a leading provider of preventative maintenance and breakdown repair services for the health and industrial sectors.

Serviced Equipment technicians are specially trained to diagnose and repair mobile materials handling equipment using original components without voiding your warranty.
The technicians are fast and reliable and can often get to you same day or next day to get your Electrodrive equipment back up and running ASAP.

If location, time commitments or complexity make this impractical, then loan equipment can be sent to you to use while your unit is returned to base for repairs.

We maintain a complete service history on your behalf. The service history will support the resale value of your asset. Our fixed price service packages are designed to give you the cover you need and give you peace of mind, not surprises.

Preventative maintenance service plans

BRONZE SERVICE

Bronze service

All materials handling equipment sold in this brochure come with our standard Bronze service package. The service intervals are specified by us and our Field Service Technician will provide the due dates for the next service using a sticker on the instrument panel.

- Six monthly call cycle.
- Online booking service.

This is a 'pay as you go' package and does not include the security of a fixed price service package. Upgrading your Bronze service will reduce service costs over the longer term and avoid downtime from a preventable breakdown.

SILVER SERVICE

Silver service

This is the minimum recommended level of service cover if you have one or more units in the field.
It includes the Bronze level service plus:

- Two scheduled services.
- Basic spare parts included—handgrips, levers, cables, springs.

GOLD SERVICE

Gold service

This is the recommended level of service cover if you have one or more units in the field.
It includes the Silver level service plus:

- Major spare parts included—gearbox, motor, chain (if applicable), switches, electronics, wheels, castors.

Warranty

Our products are warranted against defects in materials or workmanship for the following periods:

Fallshaw general castors
- 3 years

Fallshaw decorative castors
- 3 years

Fallshaw medical castors and wheels
- Trinity series (including Trinity Electronic Braking Castors)—3 years
- Central locking castors—3 years
- Conductive wheels—3 years
- Wheelchair castors—3 years

Fallshaw specialised castors
- M Stainless steel—3 years
- O Stainless steel—3 years
- M Powder-coat—12 months
- High/Low temperature—12 months
- Self-aligning—3 years
- Supermarket trolley and travelator castors —12 months

Fallshaw wheels
- Soft—3 years
- Polyurethane—3 years
- Hard—3 years
- Pneumatics and puncture-proof—12 months

Fittings and spares
- Fittings—3 years
- Spares for pneumatics and general wheels —12 months
- General spares—3 years

Electrodrive powered mobility equipment
- Unit—12 months
- Battery—6 months

Liftmaster waste handling solutions
- Unit—12 months
- Battery—6 months

Castors & Industrial materials handling equipment
- Unit—12 months
- Battery—6 months

Serviced Equipment repairs, maintenance & fitting
- Parts excluding batteries—12 months
- Battery—6 months
- Repairs—6 months

Any product that fails within the warranty period will be replaced with an equivalent product, delivered to the customer's store free of charge and freight cost. The warranty does not extend to the fitting of the product. The website, catalogue and operating manuals specify the conditions of use, installation and maintenance for our products. Customers should choose, use and maintain our product according to our recommendations, or they may become unsafe or product life could be compromised, and our liability may be voided.

This warranty excludes the effects of fair wear and tear, abuse, misuse, improper installation and inadequate maintenance. In unusual or severe applications not clearly similar to those on the website or in the catalogue, the customer is invited to submit a written description of the application against which we will make a recommendation, and which will form a part of the acceptable use conditions of the recommended product. If our catalogue is unclear, or if your application is not clearly covered by the examples given in the catalogue, we ask you to contact our staff for advice. We want to help, and we have the technical information to share if we know your needs.

Fallshaw
GROUP

MOBILITY SOLUTIONS TO HELP YOU **PUSH, PULL & LIFT WITH EASE**

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QLD 4207

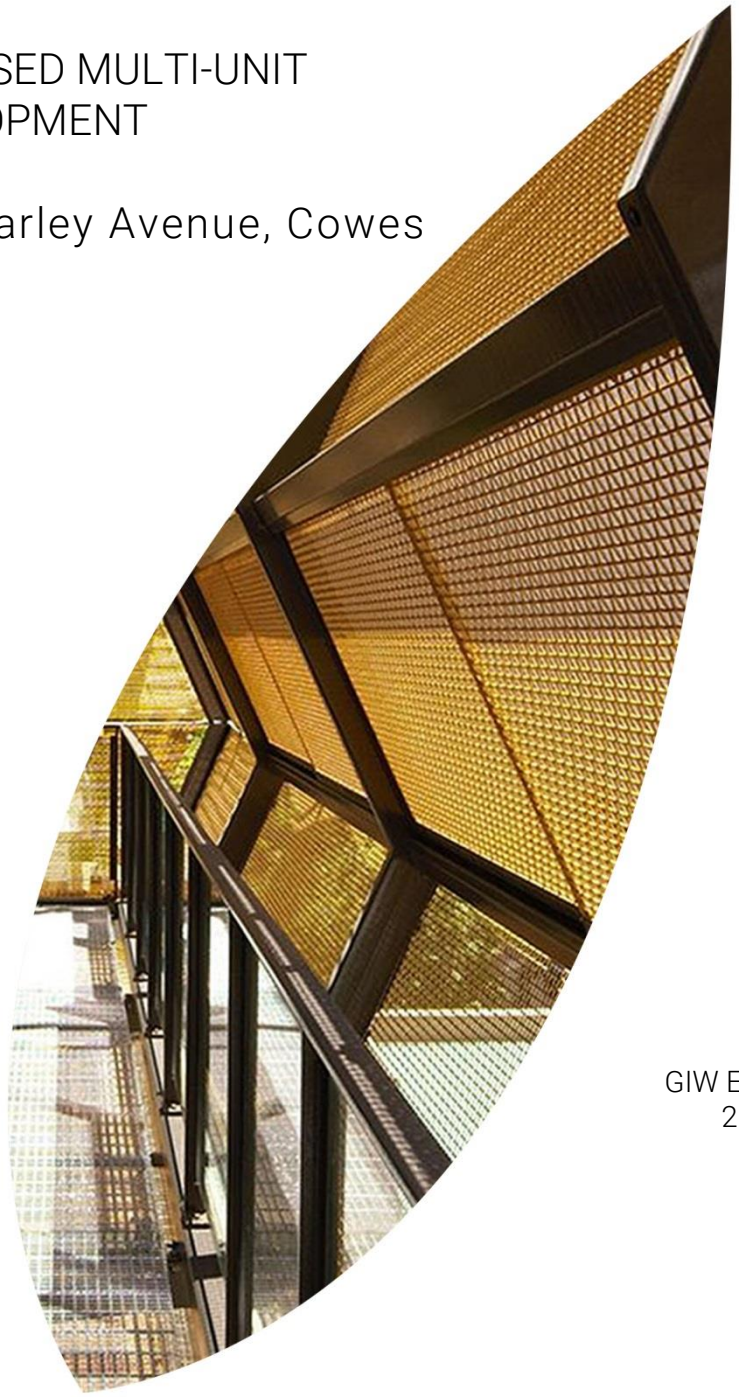
100 YEARS 1920-2020
MANUFACTURING IN AUSTRALIA

Fallshaw Electrodrive LIFTMASTER CASTORS & INDUSTRIAL SERVICED EQUIPMENT

SUSTAINABLE MANAGEMENT PLAN

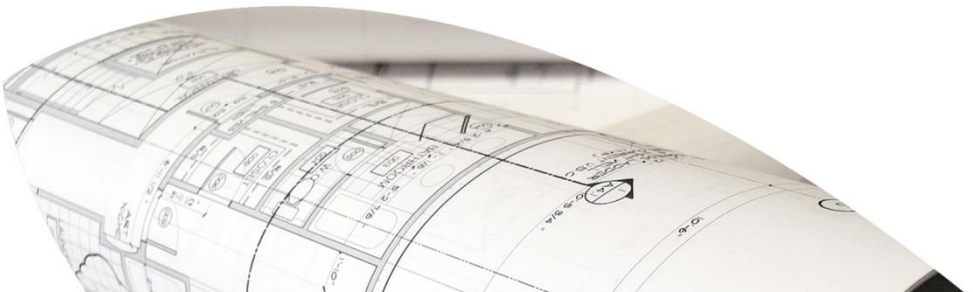
PROPOSED MULTI-UNIT DEVELOPMENT

6-12 Warley Avenue, Cowes









GIW21044
Revision C

Prepared for:
Samuel Property

5 October 2022

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Limitations

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Revision History

Revision Number	Date Issued	Author	Approved	Comments
A	28/04/2022	KE	IB	Draft
B	26/07/2022	KE	IB	Final
C	05/10/2022	KE	IB	RFI Response

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1. Introduction

Project Information

GIW Environmental Solutions Pty Ltd ("GIW") has been engaged by Samuel Property to provide Environmentally Sustainable Design (ESD) consulting services for the proposed multi-dwelling development at 6-12 Warley Avenue, Cowes.

The proposed development will include 91 apartments constructed over two buildings with 5 levels plus basement carpark and will consist of the following:

- 15 x 1-bedroom apartments
- 60 x 2-bedroom apartments
- 16 x 3-bedroom apartments

The site located at 6-12 Warley Avenue, Cowes has an approximate surface area of 4,054m^2 and is currently the location of an existing building. Distance from the site to Melbourne CBD is approximately 139km.



Figure 1 - Pre-existing sites at 6-12 Warley Avenue, Cowes.

Statutory Requirements

This Sustainable Management Plan (SMP) has been prepared to inform City of Bass Coast Shire of the proposed development's sustainability credentials and performance targets. The project team is committed to achieving a building solution which responds to the City of Bass Coast Shire sustainability objectives and obligations.

Built Environment Sustainability Scorecard (BESS)

The proposed mixed-use development will be assessed against the Built Environment Sustainability Scorecard (BESS) guidelines. The BESS tool addresses nine key environmental categories as follows:

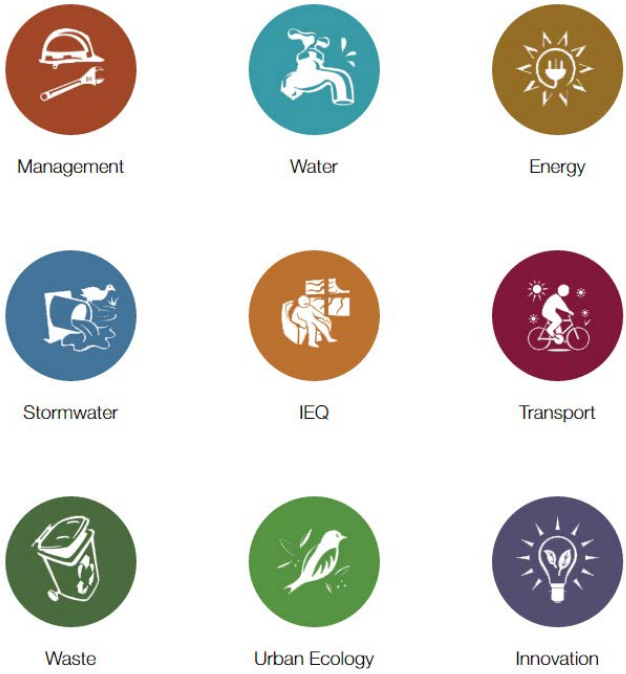


Figure 2 - BESS Environmental Categories (www.bess.net.au)

All ESD measures described under the nine key environmental categories are to be suitably incorporated into relevant project documentation at the appropriate project phase.

Responsibilities & Implementation

Samuel Property will be responsible for the suitable implementation of the requirements of this report throughout the design and development phases. Should the development be sold the responsibility will pass to the new owner. At such time as a builder is novated or a building contract is put in place the builder will be responsible for implementation during the construction phase. At occupancy, the Owners Corporation and individual lot owners and or tenants will be responsible for the correct use of installed equipment and building systems in line with the provided Building User's Guide.

Sources of Information

The following 'Sources of Information' have been used to guide the design solutions:

- Bruce Henderson Architects – Project No. 42009 – Drawing No. TP-201 Rev G, TP-202-TP-209 Rev F, TP-221–TP-240 Rev E, TP-250 Rev B, TP-301 Rev F, TP-302 Rev E, TP-303–TP-305 Rev F, TP-401 Rev F, TP-402 Rev D, TP-501-TP-502 Rev F, TP-600-TP-603 Rev E.
- Municipal Association of Victoria - SDAPP Explained; Building Design for a Sustainable Future
- Built Environment Sustainability Scorecard (BESS)
- CSIRO 1999, Urban Stormwater – Best Practise Environmental Management Guidelines

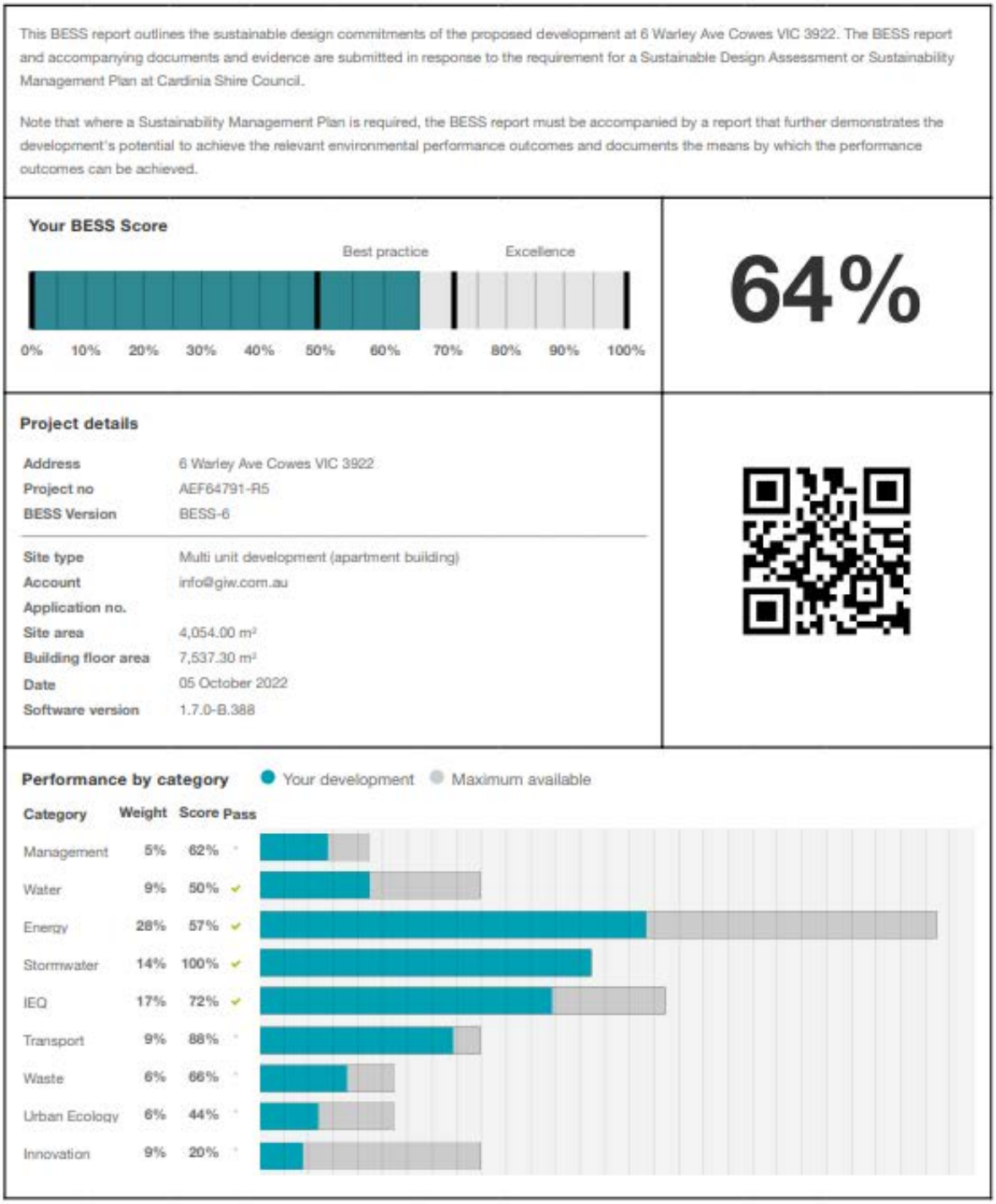
2. ESD Summary

The proposed multi-dwelling development at 6-12 Warley Avenue, Cowes will implement the following ESD initiatives:

1. The project achieves a total BESS score of 64% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%.
2. 80% (73 out of 91) of the development's apartments are naturally cross-ventilated.
3. Daylight modelling has been conducted for a representative sample of apartments. The summary result is as follows:
    - 82% of living floor area achieves >90% above DF 1
    - 100% of bedroom floor area achieves >90% above DF0.5
4. 52% (47 out of 91) of apartments achieve at least 3 hours of sunlight.
5. The development is provided with a comprehensive shading strategy.
6. The development is to achieve a 6.5 Star average NatHERS Energy Rating result.
7. The development is to utilise an electric heat pump hot water system with a minimum COP of 2.5 or electric instantaneous hot water system(s).
8. Individual cold and hot water, electricity meters will be provided to the apartments and communal areas.
9. Water efficient fittings and fixtures are applied throughout.
10. 2 x 20,000 litre rainwater tanks will harvest rainwater from the building 1 and building 2 roof areas. These tanks will be connected to all WC's and landscape irrigation.
11. A Melbourne STORM rating of 100% is achieved.
12. Landscape irrigation demand will be connected to the rainwater tanks only.
13. A 30kW Solar PV system is to be located on the roof of the proposed development.
14. In total 91 bicycle spaces are to be provided for residents.
15. In total 19 bicycle spaces are to be provided for residential visitors.
16. The development will commit to GreenPower for a minimum of 10 years.

3. BESS Performance

The project achieves a total BESS score of 64% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%. This figure represents a percentage improvement over a benchmark project. A score of 50% and higher equates to 'best practice' and is an effective pass of the BESS tool. A score of 70% and higher equates to BESS 'excellence' and exists as a higher benchmark in the tool.



4. ESD Assessment

Management

Council ESD objectives:

- To encourage a holistic and integrated design and construction process and ongoing high performance.

Council Best Practice Standard

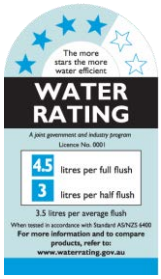
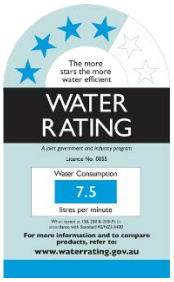
Criteria		Construction and Building Management Actions
Pre-Application Meeting	To ensure appropriate sustainable design principles and strategies are considered from the preliminary design stage of each development.	GIW has been actively involved in the preliminary design stage, but has not been involved in a pre-application meeting with Council.
Metering	To provide building users with information that allows monitoring of energy and water consumption	Electricity, cold water, and hot water is to be provided to each individual apartment. Lighting and general power to common areas is to be separately metered to quantify energy used for common areas spaces.
Building User's Guide	To encourage and recognise initiatives that will help building users to use the building more efficiently.	A Building User's Guide will be provided to all occupants explaining the correct use of installed equipment and building systems. This shall cover at a minimum: • Energy and Environmental Strategy • Options for purchasing a ≥3 Star Washing Machine • Monitoring and Targeting • Building Services • Transport Facilities • Materials and Waste Policy • Expansion/Re-fit Considerations • References and Further Information

Water

Council ESD objectives:

- To ensure the efficient use of water
- To reduce total operating potable water use
- To encourage the collection and reuse of stormwater
- To encourage the appropriate use of alternative water sources (e.g. grey water)
- To minimize associated water costs

Council Best Practice Standard

Criteria		Development Provision
Potable Water Reduction	To reduce total potable water use due through the use of efficient fixtures, appliances, and the use of rainwater.	WELS 4 Star – Toilets  WELS 5 Star - Taps  WELS 4 Star - Showerhead  WELS 5 Star - Dishwasher 
Rainwater Collection & Reuse		2 x 20,000 litre rainwater tanks will harvest rainwater from the building 1 and building 2 roof areas. These tanks will be connected to all WC's and landscape irrigation. It is estimated that this will save more than 509kL of potable water every year and meet 29.5% of the demand in these areas. Stormwater drainage mechanism is to be determined by the hydraulics services engineer at the design development phase. Refer Appendix A – WSUD Response
Landscape Irrigation	To ensure the efficient use of water and to reduce total operating potable water use through encouraging water efficient landscape design.	Landscape irrigation demand will be connected to the rainwater tanks only.

Council Best Practice Standard

Criteria		Development Provision
Building System Water Use Reduction	Ensure the efficient use of water, to reduce total operating potable water use and to encourage the appropriate use of alternative water sources for cooling and fire testing systems.	N/A

Energy

Council ESD objectives:

- To ensure the efficient use of energy
- To reduce total operating greenhouse emissions
- To reduce energy peak demand
- To reduce associated energy costs

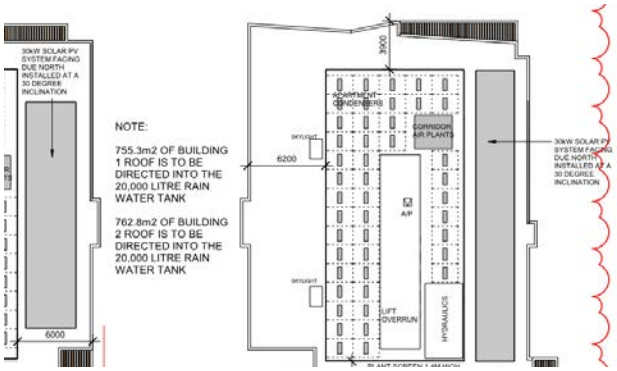
Council Best Practice Standard

Criteria		Development Provision
Thermal Performance Rating – Residential	To reduce energy needed to achieve thermal comfort in summer and winter – improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.	The National Construction Code (NCC) Class 2 – Sole Occupancy Unit(s) residential building component is to be designed in accordance with NCC Section J (2019) NatHERS requirements. The residential units must achieve an average 6.5 Star rating, with no unit achieving below 5 Stars. Further to this no dwelling is to exceed the maximum allowed cooling load of 22 MJ/m2 (Climate Zone 22 East Sale AMO) In accordance with BADS Standard B35.
Peak Energy Demand	To reduce demand on electrical infrastructure during peak cooling periods.	N/A
HVAC System	To ensure the efficient use of energy and to reduce consumption of electricity.	Inverter split systems are to be installed and sized to maintain conditions of the main living space of each apartment. The efficiency of the air conditioning system is to be within 1 star rating of best available under MEPS Post-October 2012 measurement standard.
Hot Water System	To ensure the efficient use of energy and to reduce consumption and greenhouse	The development is to utilise an electric heat pump hot water system with a minimum COP of 2.5 or electric instantaneous hot water system(s).

Council Best Practice Standard

Criteria		Development Provision
	emissions from water heating.	
Car Park Ventilation	To ensure the efficient use of energy, reduce total operating greenhouse gas emissions and to reduce energy peak demand.	Carpark ventilation fans are driven by a VSD motor connected to CO sensors within the carpark. The inclusion of CO sensor control will allow the ventilation fans to ramp down when the car park is unoccupied. The system is to be designed in accordance with AS1668.2. The mechanical services engineer is responsible for the design and specification of the system. The contractor is to procure and install the specified system. Maintenance requirements of the CO sensor system are to be included in the O&M manual.
Clothes Drying	Ensure the efficient use of energy and to reduce energy consumption and greenhouse emissions associated with clothes drying	No clothes drying facilities will be provided.
Internal Lighting – Residential	To ensure the efficient use of energy, to reduce energy consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.	The maximum illumination power density (W/sqm) is at least 20% lower than NCC 2019 requirements. Lighting power density shall be as follows: • Dwellings: No greater than average 4W/m^2 • POS: No greater than average 4W/m^2 • Back of house and indoor car parks: No greater than average 5W/m^2 All common area, external and carpark lighting is to be controlled with daylight, motion sensors or timers (whichever is deemed appropriate).
Renewable Energy Systems – Solar	To encourage on-site renewable energy generation and reduce	A 30kW Solar PV system is to be located on the roof of the proposed development. The system is expected to generate approximately 43,246kWh and will be provide 20% of common area lighting and power.

Council Best Practice Standard

Criteria	Development Provision
greenhouse emissions.	 Location Solar PV System Refer Appendix C – Renewable Energy

Stormwater

Council ESD objectives:

- To reduce the impact of stormwater run-off
- To improve the water quality of stormwater run-off
- To achieve best practice stormwater quality outcomes
- To incorporate water sensitive urban design principles

Council Best Practice Standard

Criteria		Development Provision
		The Melbourne Water – Stormwater Treatment Objective Relative Measure (STORM) tool has been applied to determine performance relative to Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999). As per City of Bass Coast Shire Planning Scheme - Clause 53.18 Stormwater Management in Urban Development, the development is required to achieve a STORM rating of 100% or greater.
Stormwater Treatment	To minimise negative environmental impacts of stormwater runoff and maximise onsite re-use of stormwater.	A Melbourne STORM rating of 100% is achieved via the following: • Rainwater is to be collected from the building 1 & building 2 roof areas and directed into 2 x 20,000 litre rainwater tanks. All WCs and landscaping irrigation are to be connected to the rainwater tanks. • Rainwater is to be collected from the west and east terraces of building 1 and directed to a total area of ≥9m2 minimum 950mm deep raingarden/s with 100mm of extended detention. • Rainwater is to be collected from the west and east terraces of building 2 and directed to a total area of ≥8m2 minimum 950mm deep raingarden/s with 100mm of extended detention. Refer Appendix A – WSUD Response.

Indoor Environment Quality

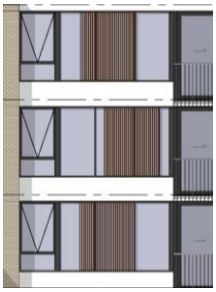
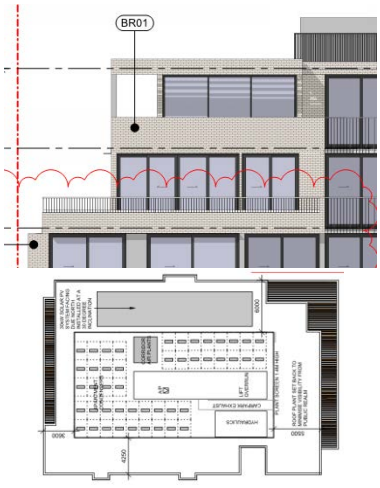
Council ESD objectives:

- to achieve a healthy indoor environment quality for the wellbeing of building occupants.
- to provide a naturally comfortable indoor environment will lower the need for building services, such as artificial lighting, mechanical ventilation and cooling and heating devices.

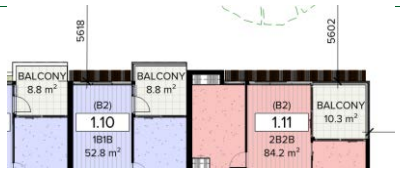
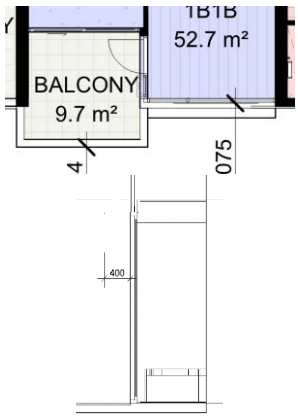
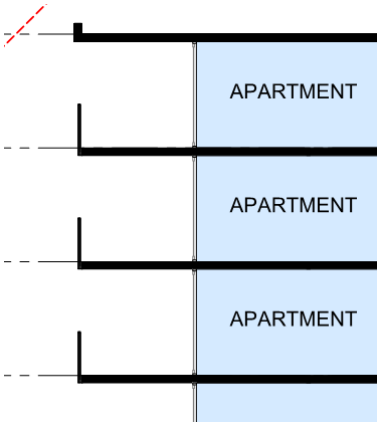
Council Best Practice Standard

Criteria		Development Provision
Daylight Access – Residential	To provide a high level of amenity and energy efficiency through design for natural light.	Daylight modelling has been conducted for a representative sample of apartments. The summary result is as follows: % of living floor area above DF 1.0: 82 % of bedroom floor area above DF 0.5: 100 Refer Appendix B – Daylight Modelling.
Winter Sunlight	To provide a high level of amenity and reduce need for artificial heating in winter.	52% (47 out of 91) of apartments achieve at least 3 hours of sunlight.
Minimal Internal Bedrooms	90% of bedrooms have an external window.	NIL internal bedrooms.
Cross Flow Ventilation	To provide fresh air and passive cooling opportunities.	80% (73 out of 91) of the development's apartments are naturally cross-ventilated. Apartments are provided with windows on opposite or adjacent facades or are effective single sided ventilated.  Typical natural cross-ventilated apartments

Council Best Practice Standard

Criteria		Development Provision
Thermal Comfort	To provide comfortable indoor spaces and reduce energy needed for heating and cooling.	The development is provided with a comprehensive shading strategy:  Shading screens are provided to the east and west oriented windows on levels 1-2.  Shading screens are provided to the north and south oriented windows on levels 2-4.  Building 1 and 2 top level apartments are provided with eaves.  Roof overhangs at Level 4 provide shading to east and west oriented windows.  North oriented windows of building 1 are shaded by the adjacent building 2.  Shading provided to the west oriented windows at Ground – level 4 of building 1 through shading structures.

Council Best Practice Standard

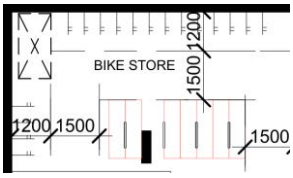
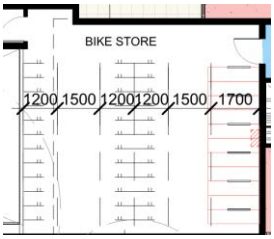
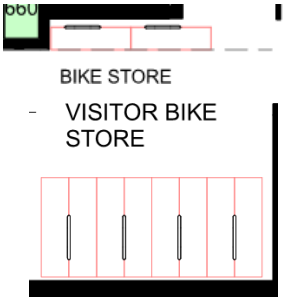
Criteria	Development Provision	
		
	Shading provided to the west oriented windows at Ground – Level 4 of building 2 through shading structures.	Shading provided to the west / east oriented windows at Ground – Level 4 of building 1 and 2 through 400mm eaves.
		ALL EXPOSED EAST AND WEST HABITABLE ROOM WINDOWS TO HAVE OPERABLE SHADING DEVICE
	Balcony overhangs provide shading to the adjacent apartments of Building 1 & 2.	All exposed east and west oriented habitable windows will be provided with manually operated shading devices.

Transport

Council ESD objectives:

- To minimise car dependency.
- To ensure that the built environment is designed to promote the use of public transport, walking and cycling.

Council Best Practice Standard

Criteria		Development Provision	
Bicycle Parking – Residential & Residential Visitors	To encourage and recognise initiatives that facilitate cycling.	   In total 91 bicycle spaces are to be provided for residents. This will provide a ratio of approximately 1 resident bicycle space for every apartment.	 In total 19 bicycle spaces are to be provided for residential visitors. This will provide a ratio of approximately 1 visitor bicycle space for every 5 apartments.
Bicycle Parking – Residential & Residential Visitors	To encourage and recognise initiatives that facilitate cycling.	6 visitor bicycle spaces are provided at entry.	

Council Best Practice Standard

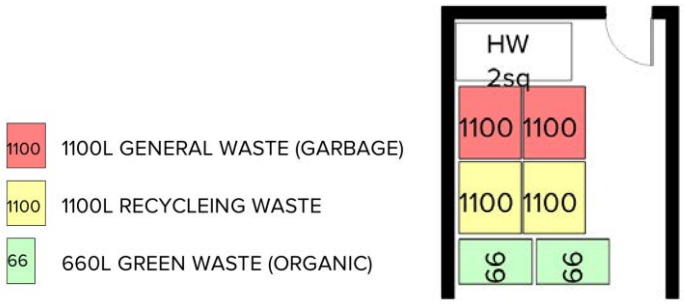
Criteria		Development Provision
Electric Vehicle Infrastructure	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	One charging point for electrical vehicles is integrated in the proposed development.
Car Share Scheme	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	N/A
Motorbikes / Mopeds	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	The proposed development will incorporate min. 5 motorbike / moped spaces in the basement carpark. This represents ≥5% of the total carparking.

Waste Management

Council ESD objectives:

- To ensure waste avoidance, reuse and recycling during the design, construction, and operation stages of development.
- To ensure long term reusability of building materials.
- To meet Councils' requirement that all multi-unit developments must provide a Waste Management Plan in accordance with the *Guide to Best Practice for Waste Management in Multi-unit Developments 2010*, published by Sustainability Victoria.

Council Best Practice Standard

Criteria		Development Provision
Building Re-use	To ensure waste avoidance, reuse, and recycling during the design.	None of the existing structure is re-used.
Food & Garden Waste	To ensure waste avoidance, reuse, and recycling during the operational life of the building.	Green waste storage is provided in the development to all occupants.
Convenience of Recycling	To ensure waste avoidance, reuse, and recycling during the operational life of the building.	 Separate general and recycling waste storage will be provided at basement.

Urban Ecology

Council ESD objectives:

- To protect and enhance biodiversity.
- To provide sustainable landscaping.
- To protect and manage all remnant indigenous plant communities.
- To encourage the planting of indigenous vegetation.

Council Best Practice Standard

Criteria		Development Provision
Communal Space	To encourage and recognise initiatives that facilitate interaction between building occupants.	NIL
Vegetation	To encourage and recognise the use of vegetation and landscaping within and around developments.	Planter boxes are to be located at apartment balconies throughout building 1 & 2. Landscaped area is to be located at ground level adjacent to entries, between building 1 and 2 and ground floor POS. The total area of vegetation is 21% of the site area.
Green Walls / Roof	To encourage the appropriate use of green roofs, walls, and facades to mitigate the impact of the urban heat island effect.	N/A
Private Open Space – Balcony / Courtyard Ecology	To encourage plants in a healthy ecological context to be grown on balconies and in courtyards.	All balconies or private open space have been provided with a tap and floor waste allowing residents to cultivate their own gardens.

Council Best Practice Standard

Criteria		Development Provision
Food Production – Residential	To encourage the production of fresh food on-site.	N/A

Innovation

Council ESD objectives:

- To encourage innovative technology, design, and processes in all development, which positively influence the sustainability of buildings.

Council Best Practice Standard

Criteria		Development Provision
GreenPower Commitment	To reduce carbon emissions, use a more sustainable energy source and create awareness around energy usage.	10-year carbon neutral power agreement between developer, owners corporation and electrical retailer to provide GreenPower to both communal areas and apartments.

Appendices

Appendix A: WSUD Response

Site layout Plan

The following architectural mark-up illustrates the rainwater collection and impervious areas of the proposed development site.

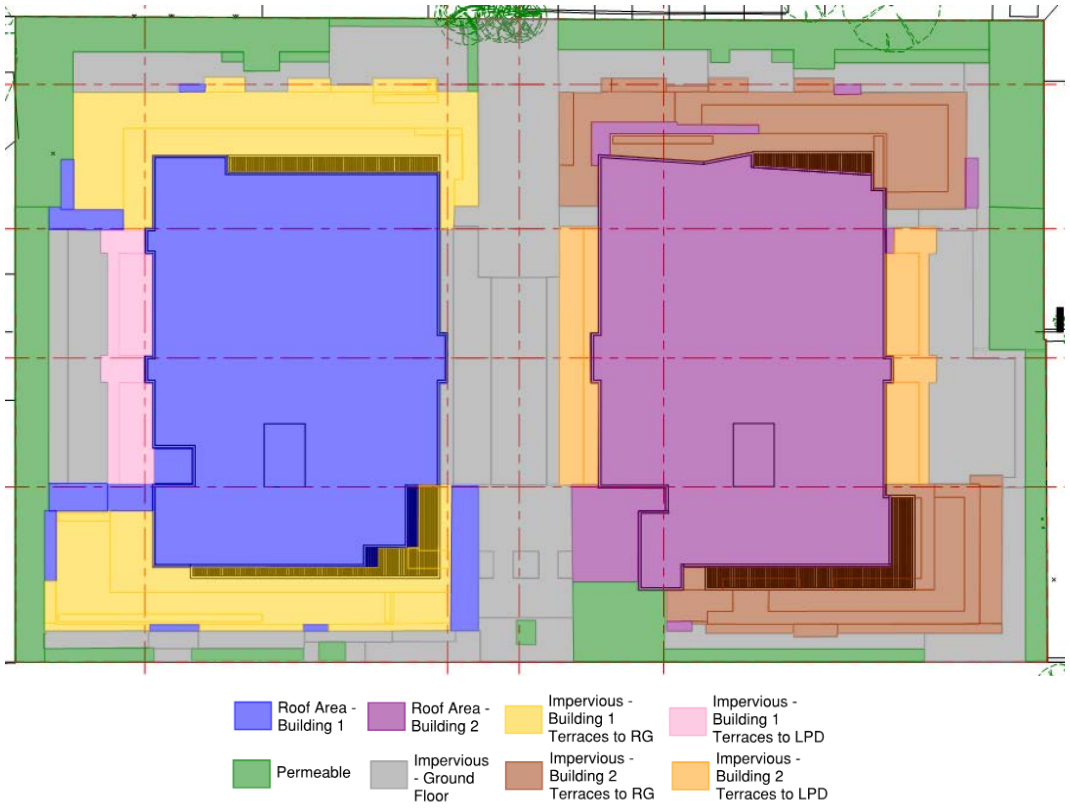


Figure 1 - Mark-up of water catchment and impervious areas

STORM Rating Report

A STORM rating of ≥100% can be achieved by implementing the following initiatives:

- Rainwater collection off the building 1 & 2 roof areas is to be directed to 2 x 20,000 litre rainwater tanks. The rainwater tanks are to be connected to all WC's and landscape irrigation.
- Rainwater is to be collected from the west and east terraces of building 1 and directed to a total area of ≥9m2 minimum 950mm deep raingarden/s with 100mm of extended detention.
- Rainwater is to be collected from the west and east terraces of building 2 and directed to a total area of ≥8m2 minimum 950mm deep raingarden/s with 100mm of extended detention.

Melbourne Water has developed the Stormwater Treatment Objective- Relative Measure (STORM) Calculator as a method of simplifying the analysis of stormwater treatment methods. The STORM Calculator displays the amount of treatment that is required to meet best practice targets, using WSUD treatment measures.

The best practice standards have been set out in the Urban Stormwater Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999) for reduction in total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN) loads.

The STORM Result is provided below:

Melbourne Water STORM Rating Report

TransactionID:	1364566
Municipality:	BASS COAST
Rainfall Station:	BASS COAST
Address:	6-12 Warley Avenue
	Cowes
	VIC 3922
Assessor:	GIW
Development Type:	Residential - Multiunit
Allotment Site (m2):	4,059.00
STORM Rating %:	100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof Area - Building 1	755.30	Rainwater Tank	20,000.00	100	156.80	80.00
Roof Area - Building 2	762.80	Rainwater Tank	20,000.00	90	156.40	80.00
Impervious - Building 1 Terraces (East and West)	444.60	Raingarden 100mm	9.00	0	130.25	0.00
Impervious - Building 2 Terraces (North & South)	126.50	None	0.00	0	0.00	0.00
Impervious - Building 2 Terraces (West & East)	399.00	Raingarden 100mm	8.00	0	130.15	0.00
Impervious - Ground Floor	921.00	None	0.00	0	0.00	0.00
Impervious - Building 1 Terraces (South)	67.00	None	0.00	0	0.00	0.00

WSUD Strategy

The development will include the provision of 2 x 20,000 litre rainwater tanks and associated pump in the basement garage. The rainwater tanks are to be connected to all WC's and landscape irrigation.

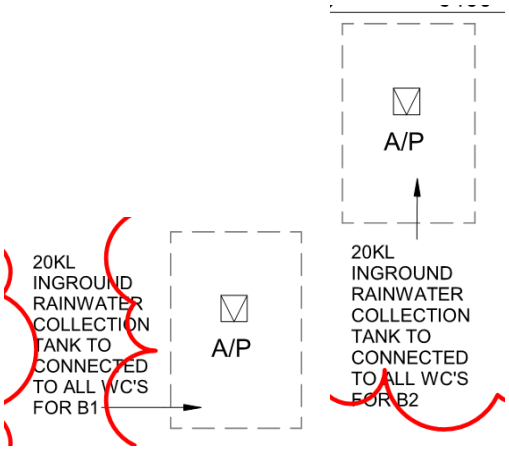


Figure 2 – Location Rainwater Tank

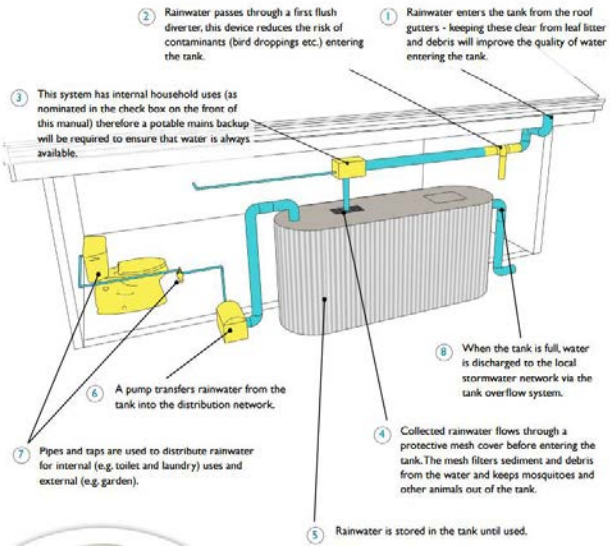


Figure 3 – Cross-section Tank
(City of Port Phillip)

Furthermore, a total ≥9m^2 (for building 1) and ≥8m^2 (for building 2) minimum 950mm deep raingarden/s with 100mm of extended detention. Rainwater collected from the respective terraces are to be directed into the raingardens for treatment prior to discharge into the stormwater system. The raingardens are to be located in communal areas that will be maintained by the owner's corporation.

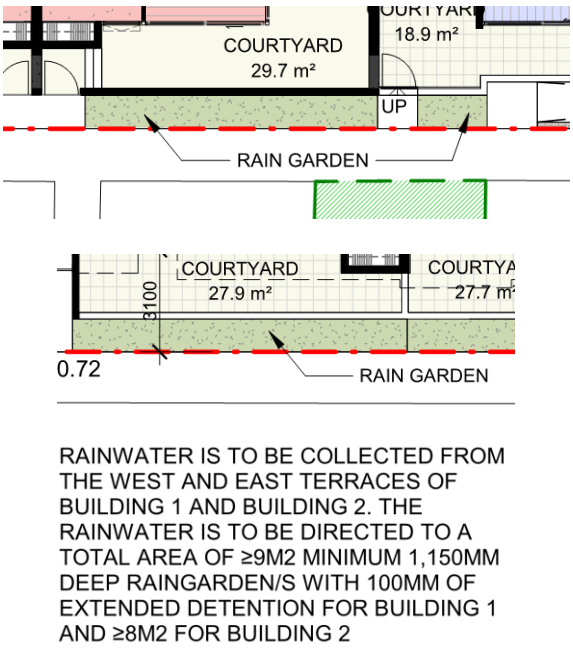


Figure 4 – Location Raingardens

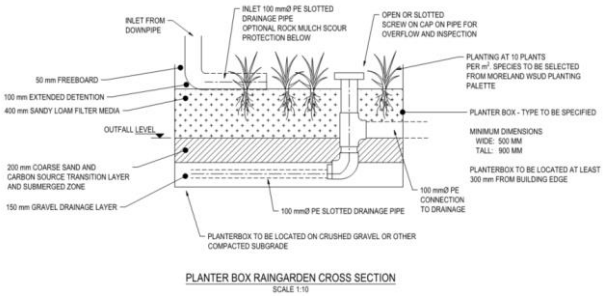


Figure 5 – Cross-section Raingarden
(City of Moreland)

Rainwater Reuse

Inputs

Catchment Area	1518	sqm
Number of Bedrooms	183	
Bin Washout	No	
Irrigation Area	486	sqm
Tank Capacity	40,000	Litre

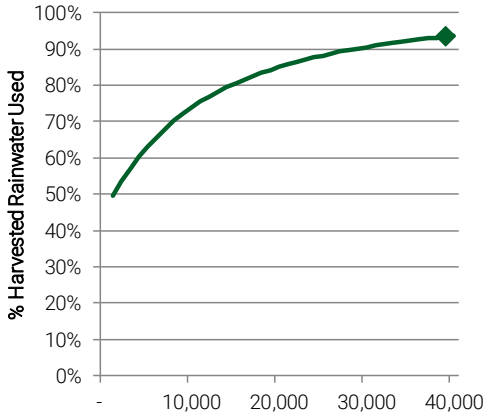
Outputs

% Served by Rainwater	29.5%	
% Harvested Rainwater Used	93.6%	
Total Potable Water Saved	508,888	Litre

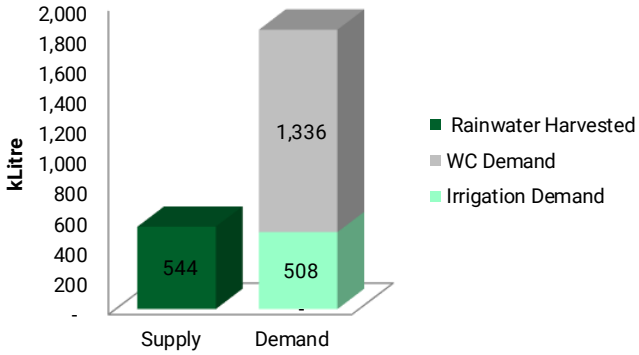
Rainwater Balance (Monthly Averages)

Month	Rainwater Harvested (L)	Irrigation Demand (L)	WC Demand (L)	Bin Washout (L)
Jan	35,295	75,193	113,460	0
Feb	44,165	68,116	102,480	0
Mar	40,748	34,941	113,460	0
Apr	48,641	33,450	109,800	0
May	42,224	34,515	113,460	0
Jun	46,084	15,728	109,800	0
Jul	33,849	16,025	113,460	0
Aug	43,760	16,025	113,460	0
Sep	45,740	45,974	109,800	0
Oct	48,541	46,842	113,460	0
Nov	66,281	45,685	109,800	0
Dec	48,248	75,775	113,460	0
Total	543,577	508,267	1,335,900	0
Equivalent STORM tool		70		0

Tank Sizing



Supply-Demand



Site Management Statement

Prevention of litter, sediments and pollution entering the stormwater system in the construction phase is to be addressed through introduction of the following initiatives:

- Buffer strips to pervert stormwater runoff.
- Gravel sausage filters at stormwater inlets to prevent silt, mud, or any other site contaminant from entering the stormwater system.
- Silt fences under grates at surface entry inlets to prevent sediment from entering the stormwater system.
- Temporary rumble grids to vibrate mud and dirt off vehicles prior to leaving the site.
- The site is to be kept clean from any loose rubbish or rubble.
- Introduction of offsite construction for building elements where deemed appropriate.

The builder is to include these initiatives in the construction management plan and address these during site induction of relevant contractors.

Maintenance Program

The following maintenance requirements are to be programmed to ensure the rainwater tank operates effectively:

Item	Description	Maintenance Interval
Gutters and downpipes	Eave and box gutters are to be inspected and cleaned to prevent large debris from being washed into rainwater tank.	3 monthly
First flush system (as applicable)	Inspect and clean excess sediment from diverter chamber to prevent blockages.	3 monthly
Tank contents	Siphon the tank to inspect contents. If sludge is present, a plumber will be required to drain tank contents and clean the tank.	2 to 3 years
Tank structure	Inspect tank externally for leaks	Yearly
Pump system	Inspect pump wiring, plumbing and check for smooth operation.	6 monthly
Plumbing	Plumbing and fixtures connected to the rainwater tank is to be inspected for leaks.	Yearly

The following maintenance requirements are to be programmed to ensure the raingarden operates effectively:

Item	Description	Maintenance Interval
Kerbing and paved area	Remove rubbish, leaves and other debris from the surrounding drainage area.	3 monthly
Ponding area	Clear inflow points of built-up sediment, rubbish and leaves. Check for erosion or gouging – repair if necessary.	3 monthly
Mulch layer (bark, pebbles, etc.)	Remove rubbish, leaves and other debris. After storm events mulch may need to be redistributed or added around inflow points.	3 monthly
Plants	Water establishing plants monthly during extended dry periods. Check plant health and replace dead plants as necessary. Use native species to suit garden conditions (e.g. full sun or shaded). Remove weeds – do not use herbicides, pesticides and fertilisers as these chemicals will pollute the stormwater runoff.	3 monthly
Rain garden soil mix	Check soil level is below surrounding hard surface level and overflow grate. Use drainage test to check soil is free draining.	Annually
Underdrain system	Use inspection well (if present) to check underdrain is working properly. Check rain garden draining freely using drainage test.	Annually

Appendix B: Daylight Modelling

Scope of Modelling

We have undertaken daylight modelling for a sample of 10 apartments to assess both living and bedroom areas. Apartments G.01, G.06, G.08, 1.04, 1.11 from building 1 and G.02, G.06, G.07, 1.09 and 2.06 from building 2 have been selected with consideration of internal layout, inherent and adjacent building shading features. These apartments reflect a representative scenario with all other units anticipated to achieve the BESS performance requirements.

The development has been modelled with existing adjacent buildings to the north, west and south boundaries.

Methodology

The daylight levels in apartments are benchmarked against the best practice requirements as set out under the Built Environment Sustainability Scorecard (BESS) tool: Indoor Environment Quality (IEQ) – Daylight Access Living Areas and Bedrooms. These levels are as follows:

> *"Dwellings should achieve the following daylight factors (DF)*
> - *80% of the total number of living rooms achieve a daylight factor greater than 1% to 90% of the floor area of each living area, including kitchens.*
> - *80% of the total number of bedrooms achieve a daylight factor greater than 0.5% to 90% of the floor area in each room."*

The daylight modelling has been completed using the Radiance software suite, an accurate computing program used to predict light levels in a space prior to construction. Scene geometric data and material properties are interfaced into the Radiance software using DesignBuilder.

Daylight Factor has been calculated using a CIE uniform cloudy sky.

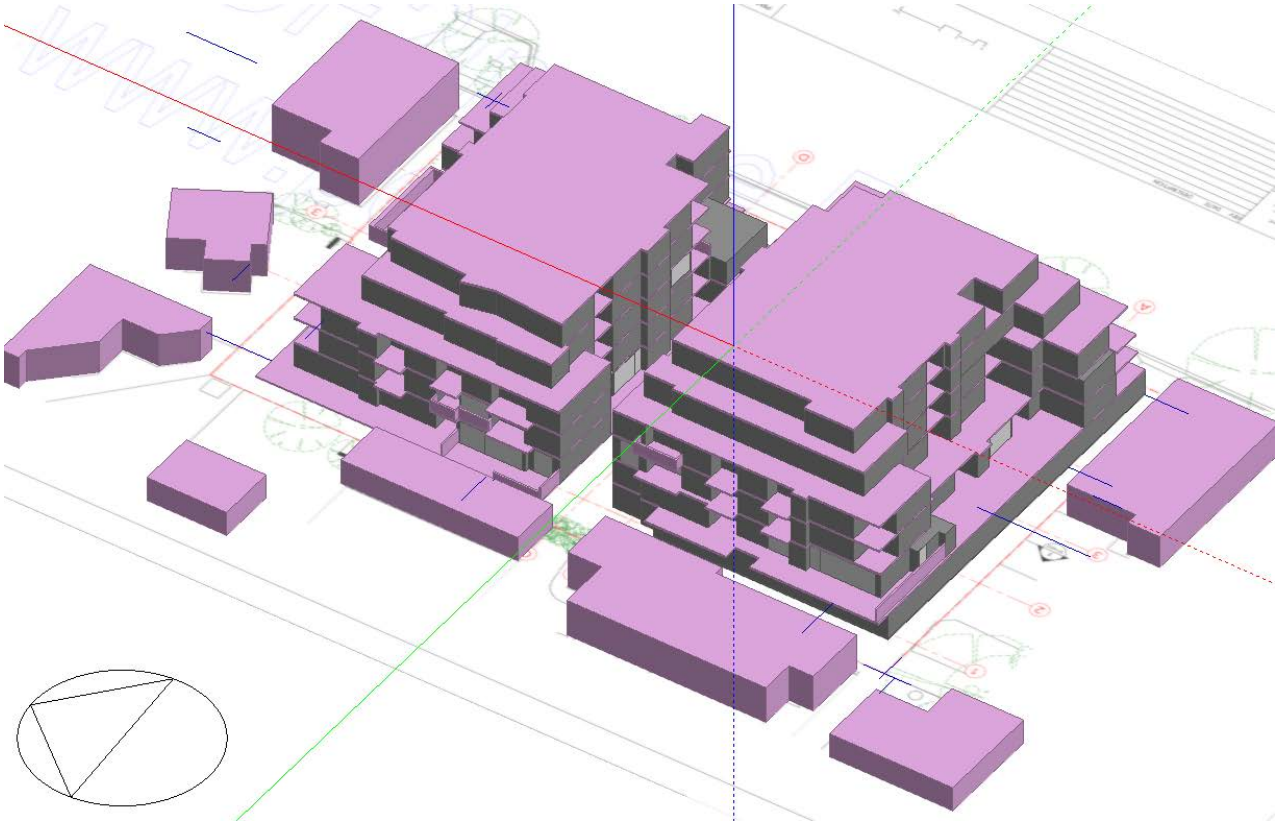


Figure 6 – DesignBuilder model of proposed and adjacent existing buildings.

Modelling Assumptions

The following assumptions have been made with respect to the modelling:

- Modelled window dimensions and shading structures are as depicted on the Architectural drawings.
- The glazing performance used for external windows is as follows:
  - Double glazed, clear window with a total system VLT of 0.59.
- The reflectance of all materials is in accordance with the below:
  - Internal Floors: 0.3 (carpet / timber)
  - External / Internal Walls: 0.8
  - Ceilings: 0.8
- Transient and unoccupied spaces such as corridors, cupboards and wardrobes have been excluded from the modelled area.
- The reflectance of structures is assumed to be 0.6 and 0.4 for adjacent buildings.

Daylight Results – Numerical

The daylight results for living areas of 6-12 Warley Avenue, Cowes can be summarised as follows:

Area	Floor Area (m2)	Floor Area above DF1 (m2)	% of floor area above DF1	Status
Building 1 G.01 Living	25.78	17.34	67.26	Non-Compliant
Building 1 G.08 Living	49.5	49.17	99.33	Compliant
Building 1 G.06 Living	27.82	27.48	98.78	Compliant
Building 1 1.04 Living	27.88	27.87	99.96	Compliant
Building 1 1.11 Living	32.91	32.7	99.36	Compliant
Building 2 G.02 Living	26.69	26.36	98.76	Compliant
Building 2 G.07 Living	43.41	43.31	99.77	Compliant
Building 2 G.06 Living	25.69	17.82	69.37	Non-Compliant
Building 2 1.09 Living	26.26	26.24	99.92	Compliant
Building 2 2.06 Living	27.48	20.53	74.71	Non-Compliant

The daylight results for bedrooms of 6-12 Warley Avenue, Cowes can be summarised as follows:

Area	Floor Area (m2)	Floor Area above DF0.5 (m2)	% of floor area above DF0.5	Status
Building 1 G.01 Bed 1	9.45	9.39	99.37	Compliant
Building 1 G.01 Bed 2	12.35	12.35	100	Compliant
Building 1 G.06 Bed 2	11.87	11.87	100	Compliant
Building 1 G.06 Bed 1	8.68	8.67	99.88	Compliant
Building 1 G.08 Bed 1	10.5	10.5	100	Compliant
Building 1 G.08 Bed 2	9.78	9.78	100	Compliant
Building 1 G.08 Bed 3	10.8	10.77	99.72	Compliant
Building 1 1.04 Bed 1	8.91	8.9	99.89	Compliant
Building 1 1.04 Bed 2	11.53	11.53	100	Compliant
Building 1 1.11 Bed 1	8.12	8.12	100	Compliant
Building 1 1.11 Bed 2	9.91	9.91	100	Compliant
Building 2 G.02 Bed 1	11.19	11.19	100	Compliant
Building 2 G.02 Bed 2	9.52	9.52	100	Compliant
Building 2 G.06 Bed 1	9.18	9.18	100	Compliant
Building 2 G.06 Bed 2	11.3	11.14	98.58	Compliant
Building 2 G.07 Bed 1	10.44	10.44	100	Compliant
Building 2 G.07 Bed 2	8.41	8.41	100	Compliant
Building 2 G.07 Bed 3	9.9	9.9	100	Compliant
Building 2 1.09 Bed 1	9.92	9.92	100	Compliant
Building 2 2.06 Bed 1	12.05	11.94	99.09	Compliant
Building 2 2.06 Bed 2	7.83	7.83	100	Compliant

Daylight Results – Visual

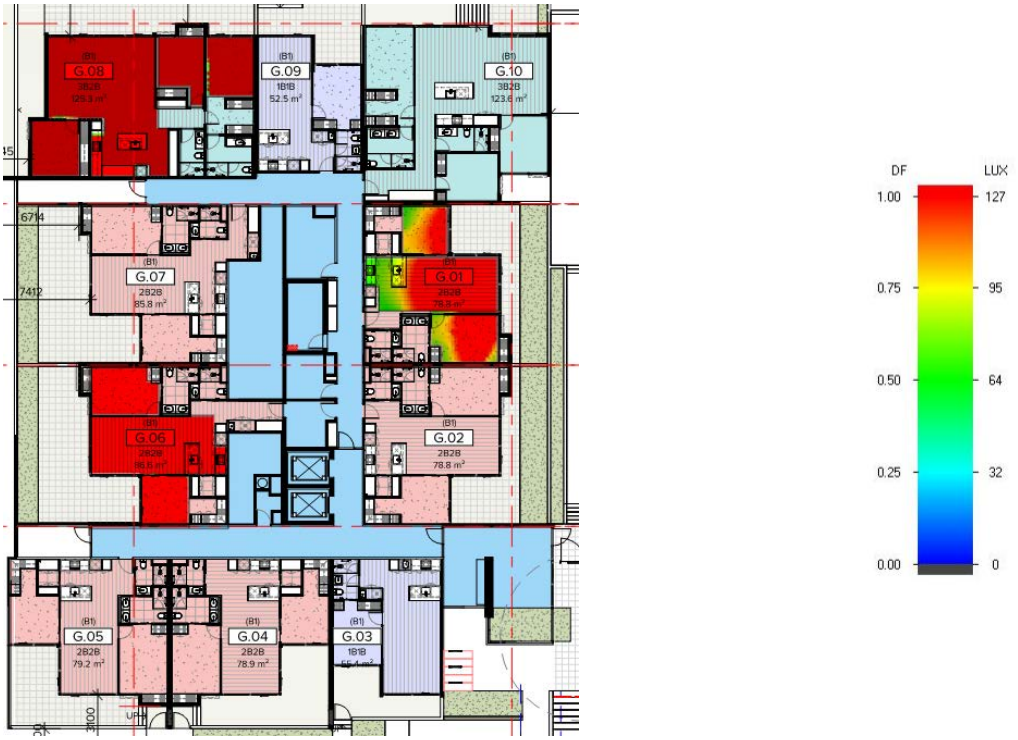


Figure 7 - Daylight Map – Ground Level Building 1

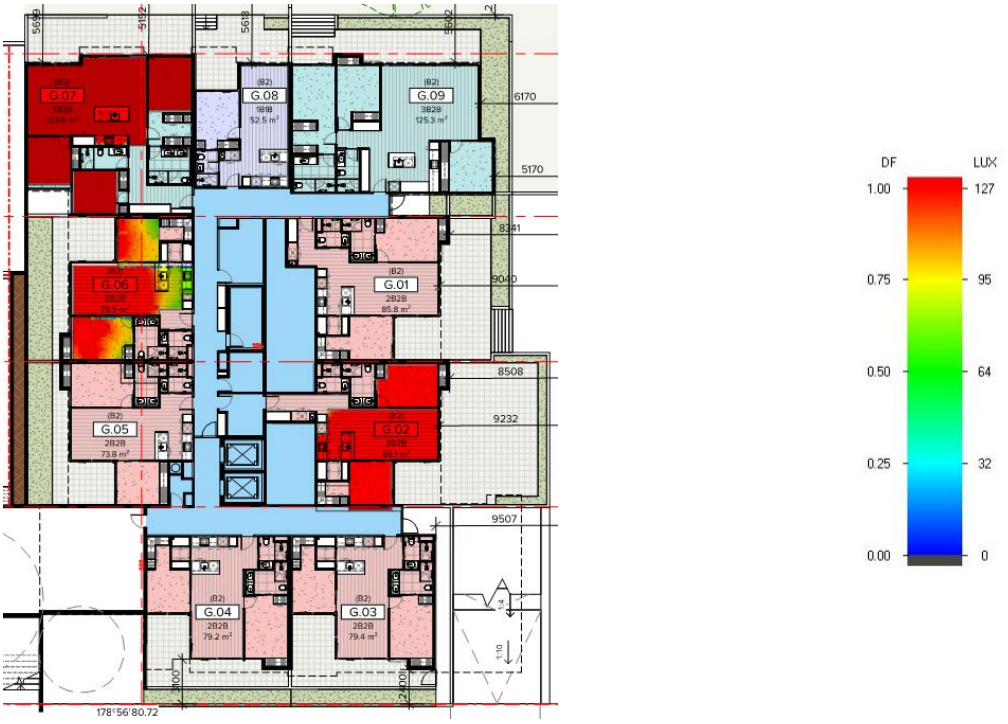


Figure 8 - Daylight Map – Ground Level Building 2

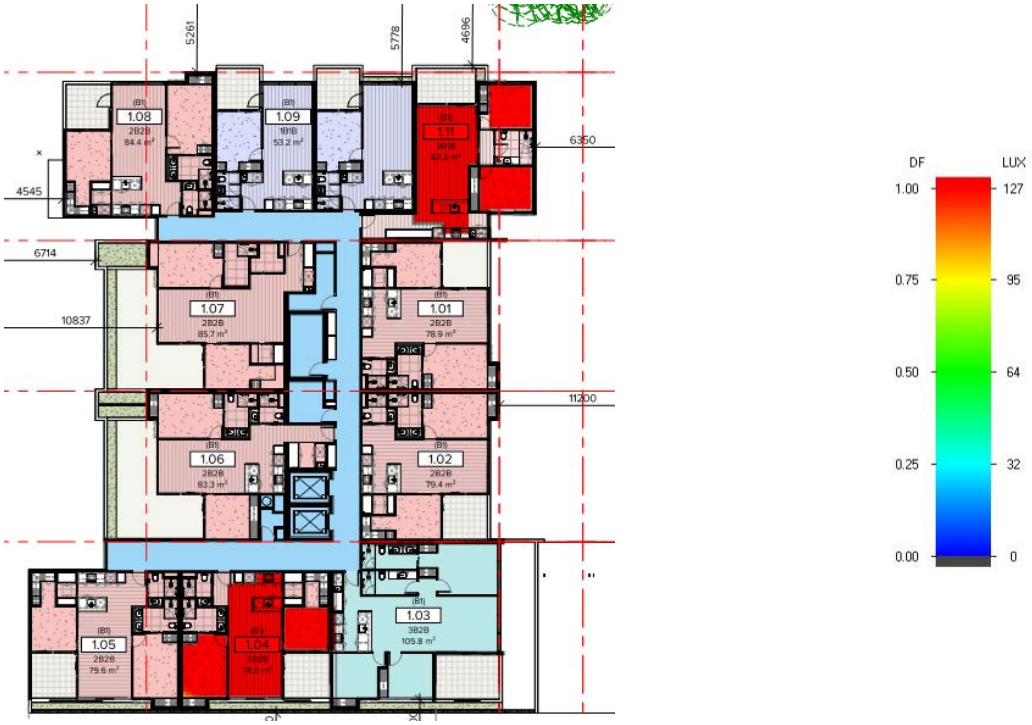


Figure 9 - Daylight Map – Level 1 Building 1

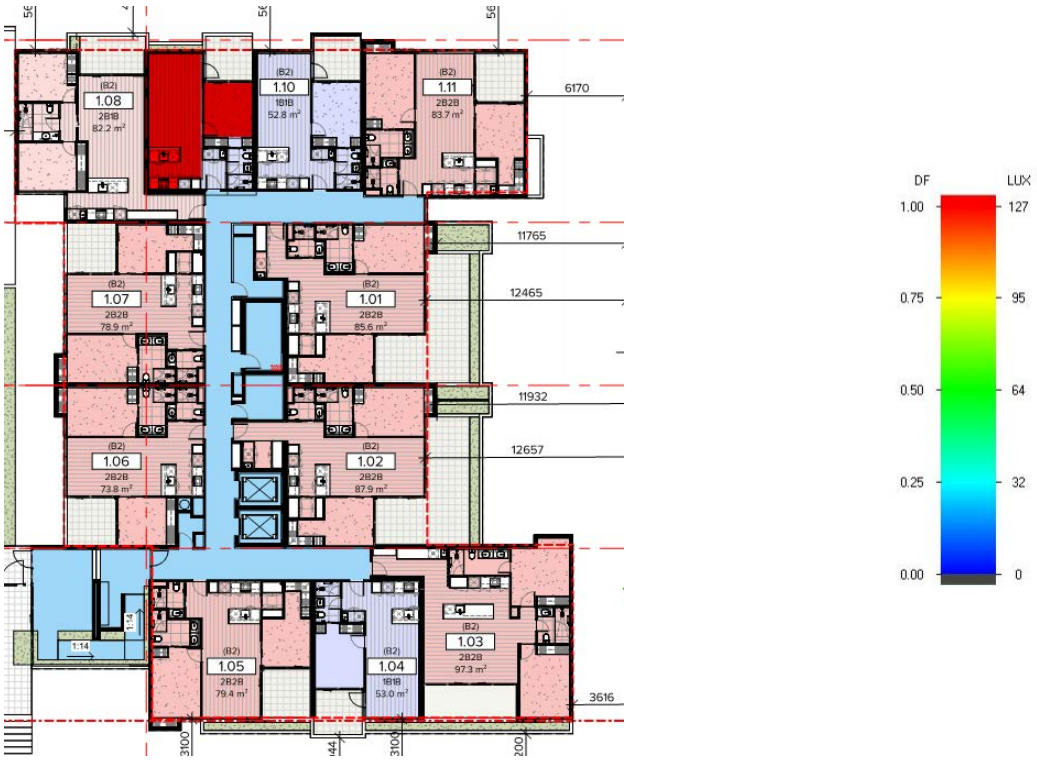


Figure 10 - Daylight Map – Level 1 Building 2

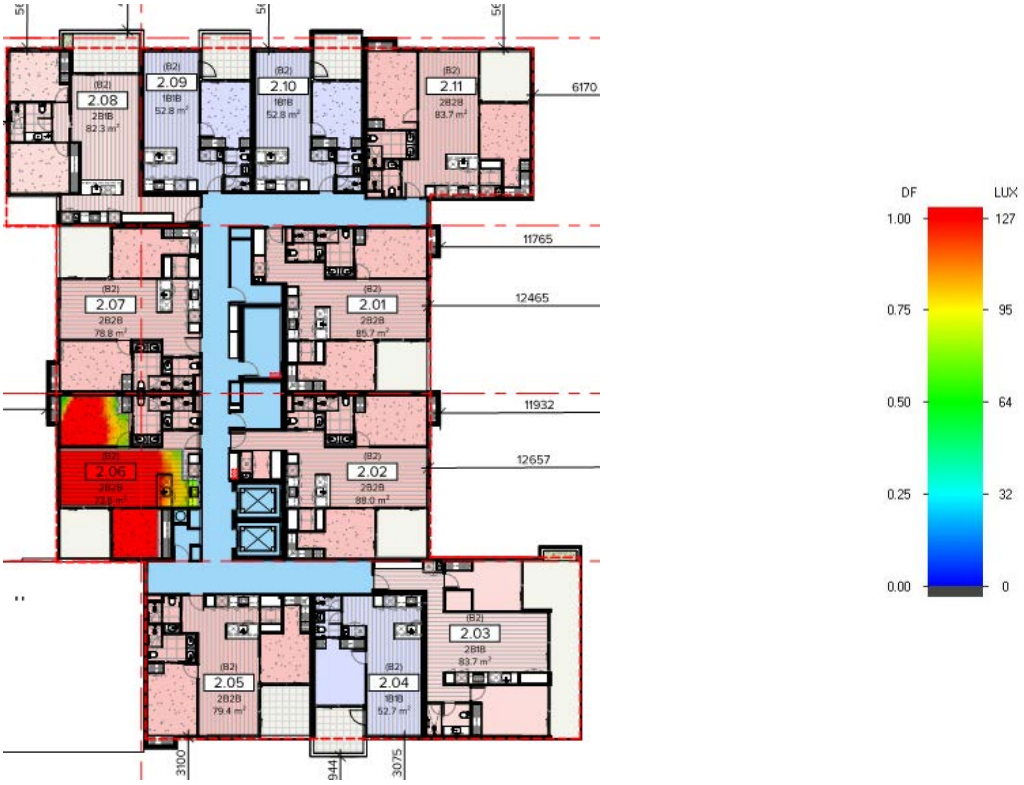


Figure 11 - Daylight Map – Level 2 Building 2

Overall Building Results

Apartment No.	Total Living Areas	Living Areas Compliant	Total Bedrooms	Bedrooms Compliant
B1 - G.01	1	0	2	2
B1 - G.02	1	0	2	2
B1 - G.03	1	1	1	1
B1 - G.04	1	1	2	2
B1 - G.05	1	1	2	2
B1 - G.06	1	1	2	2
B1 - G.07	1	1	2	2
B1 - G.08	1	1	3	3
B1 - G.09	1	1	1	1
B1 - G.10	1	1	3	3
B1 - 1.01	1	0	2	2
B1 - 1.02	1	0	2	2

Apartment No.	Total Living Areas	Living Areas Compliant	Total Bedrooms	Bedrooms Compliant
B1 - 1.03	1	1	3	3
B1 - 1.04	1	1	2	2
B1 - 1.05	1	1	2	2
B1 - 1.06	1	1	2	2
B1 - 1.07	1	1	2	2
B1 - 1.08	1	1	2	2
B1 - 1.09	1	1	1	1
B1 - 1.10	1	1	1	1
B1 - 1.11	1	1	2	2
B1 - 2.01	1	0	2	2
B1 - 2.02	1	0	2	2
B1 - 2.03	1	1	3	3
B1 - 2.04	1	1	2	2
B1 - 2.05	1	1	2	2
B1 - 2.06	1	1	2	2
B1 - 2.07	1	1	2	2
B1 - 2.08	1	1	2	2
B1 - 2.09	1	1	1	1
B1 - 2.10	1	1	1	1
B1 - 2.11	1	1	2	2
B1 - 3.01	1	0	2	2
B1 - 3.02	1	0	2	2
B1 - 3.03	1	1	3	3
B1 - 3.04	1	1	2	2
B1 - 3.05	1	1	2	2
B1 - 3.06	1	1	2	2
B1 - 3.07	1	1	3	3
B1 - 3.08	1	1	3	3
B1 - 4.01	1	1	2	2
B1 - 4.02	1	1	3	3
B1 - 4.03	1	1	3	3

Apartment No.	Total Living Areas	Living Areas Compliant	Total Bedrooms	Bedrooms Compliant
B1 - 4.04	1	1	2	2
B1 - 4.05	1	1	2	2
B1 - 4.06	1	1	3	3
B2 - G.01	1	1	2	2
B2 - G.02	1	1	2	2
B2 - G.03	1	1	2	2
B2 - G.04	1	1	2	2
B2 - G.05	1	0	2	2
B2 - G.06	1	0	2	2
B2 - G.07	1	1	3	3
B2 - G.08	1	1	1	1
B2 - G.09	1	1	3	3
B2 - 1.01	1	1	2	2
B2 - 1.02	1	1	2	2
B2 - 1.03	1	1	2	2
B2 - 1.04	1	1	1	1
B2 - 1.05	1	1	2	2
B2 - 1.06	1	0	2	2
B2 - 1.07	1	0	2	2
B2 - 1.08	1	1	2	2
B2 - 1.09	1	1	1	1
B2 - 1.10	1	1	1	1
B2 - 1.11	1	1	2	2
B2 - 2.01	1	1	2	2
B2 - 2.02	1	1	2	2
B2 - 2.03	1	1	2	2
B2 - 2.04	1	1	1	1
B2 - 2.05	1	1	2	2
B2 - 2.06	1	0	2	2
B2 - 2.07	1	0	2	2
B2 - 2.08	1	1	2	2

Apartment No.	Total Living Areas	Living Areas Compliant	Total Bedrooms	Bedrooms Compliant
B2 - 2.09	1	1	1	1
B2 - 2.10	1	1	1	1
B2 - 2.11	1	1	2	2
B2 - 3.01	1	1	2	2
B2 - 3.02	1	1	2	2
B2 - 3.03	1	1	3	3
B2 - 3.04	1	1	1	1
B2 - 3.05	1	0	2	2
B2 - 3.06	1	0	2	2
B2 - 3.07	1	1	1	1
B2 - 3.08	1	1	3	3
B2 - 4.01	1	1	2	2
B2 - 4.02	1	1	2	2
B2 - 4.03	1	1	3	3
B2 - 4.04	1	1	2	2
B2 - 4.05	1	1	2	2
B2 - 4.06	1	1	3	3
TOTAL	91	75	183	183
Percentage	82%		100%	

Conclusion

The development has been assessed and it has been determined that 80% of living areas and 100% of bedrooms will achieve the daylight factors as prescribed under BESS and therefore the development will meet the BESS IEQ guidelines for daylight.

Appendix C: Renewable Energy

Solar PV

Inputs Solar PV

Peak Wattage of System	30.0	kWp
Azimuth	0	degrees
Inclination	30	degrees

Outputs Solar PV

Electricity Produced per Year	43,249	kWh
No. Panels Required	75	
Total Roof Area Required	156	sqm
Annual Carbon Savings	48,438	kg CO2

Economic Output

Cost of System	45,000	$
Annual Savings	8,650	$
Simple Payback	5	Years

Annual Common Area Demand

Annual Demand Class 2 Non-Residential Are	40,118	kWh/year
Annual Demand Carpark / Services	176,213	kWh/year
Total Annual Demand	216,331	kWh/year

Demand / Supply

Contribution Solar PV to Communal Area Power	20%

Appendix D: BESS Assessment

This BESS report outlines the sustainable design commitments of the proposed development at 6 Warley Ave Cowes VIC 3922. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Cardinia Shire Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

Your BESS Score

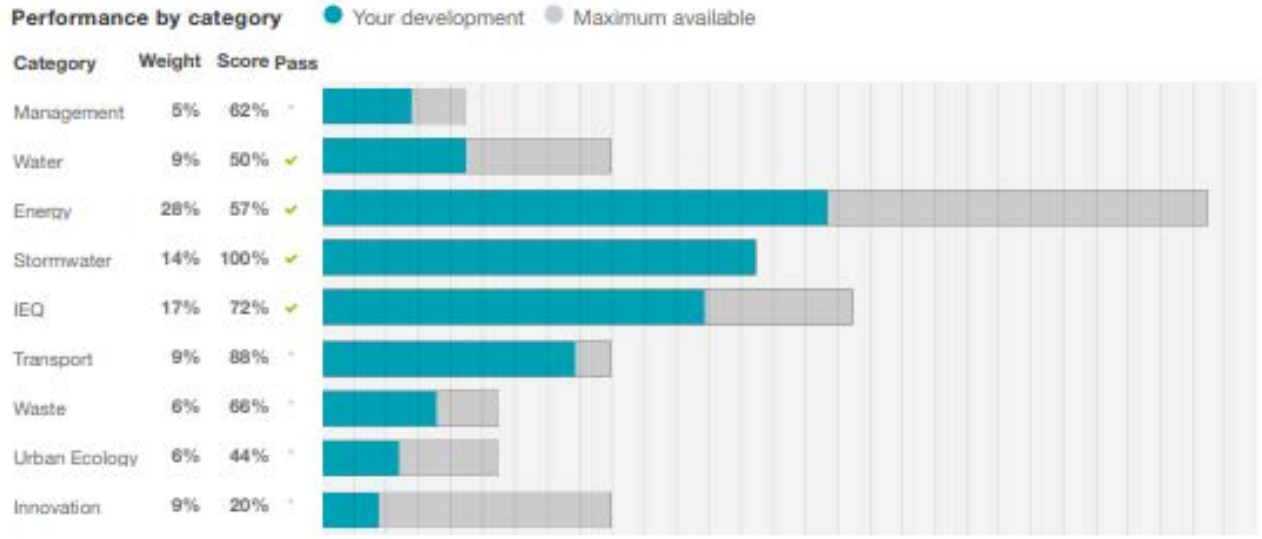


64%

Project details

Address	6 Warley Ave Cowes VIC 3922
Project no	AEF64791-R5
BESS Version	BESS-6
Site type	Multi unit development (apartment building)
Account	info@giw.com.au
Application no.	
Site area	4,054.00 m²
Building floor area	7,537.30 m²
Date	05 October 2022
Software version	1.7.0-B.388

Performance by category



BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 6 Warley Ave Cowes VIC 3922. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Cardinia Shire Council.

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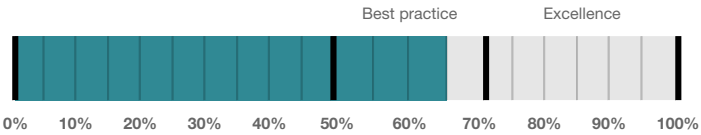
Your BESS Score



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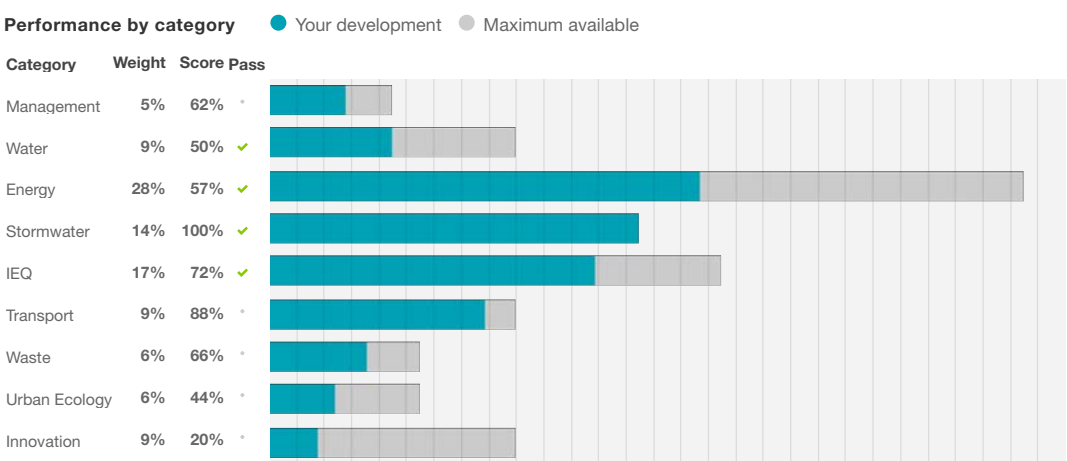
Performance by category



Buildings

Name	Height	Footprint	% of total footprint
Building 1	5	1,440 m²	55%
Building 2	5	1,165 m²	44%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
G06, G07, 106, 107, 206, 207, 305, 306, 404, 405	10	86.0 m²	Building 1	11%
G01, G02, 101, 102, 201, 202, 301, 302, 401	9	78.8 m²	Building 1	9%
G03, G04, 105, 205, 305, 404	6	79.4 m²	Building 2	6%
G04, G05, 104, 105, 204	5	79.0 m²	Building 1	5%
G08, 104, 109, 110, 204, 209, 210, 304	8	52.5 m²	Building 2	5%
G02, 102, 202, 302, 402	5	86.1 m²	Building 2	5%
G01, 101, 201, 301, 401	5	85.8 m²	Building 2	5%
G05, 106, 206, 306, 405	5	73.8 m²	Building 2	4%
G09, 109, 110, 209, 210	5	52.5 m²	Building 1	3%
403, 406	2	126 m²	Building 2	3%
111, 203, 211	3	83.7 m²	Building 2	3%
G07, G09	2	123 m²	Building 2	3%
G06, 107, 207	3	78.9 m²	Building 2	3%
402, 403	2	99.1 m²	Building 1	2%
307, 308	2	101 m²	Building 1	2%
111, 211	2	82.2 m²	Building 1	2%
108, 208	2	84.4 m²	Building 1	2%
103, 203	2	106 m²	Building 1	2%
108, 208	2	82.2 m²	Building 2	2%
406	1	107 m²	Building 1	1%
304	1	81.4 m²	Building 1	1%
303	1	111 m²	Building 1	1%
205	1	87.7 m²	Building 1	1%
G10	1	124 m²	Building 1	1%
G08	1	125 m²	Building 1	1%
308	1	117 m²	Building 2	1%
303	1	122 m²	Building 2	1%
103	1	97.3 m²	Building 2	1%
G03	1	55.4 m²	Building 1	< 1%
307	1	60.5 m²	Building 2	< 1%
Total	**91**	**7,537 m²**	**100%**	

Supporting information

Floorplans & elevation notes

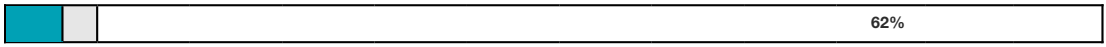
Credit	Requirement	Response	Status
Management 3.1	Individual utility meters annotated		-
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 1.1	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.5	Floor plans with compliant bedrooms marked		-
IEQ 2.1	Dwellings meeting the requirements for being 'naturally ventilated'		-
Transport 1.1	All nominated residential bicycle parking spaces		-
Transport 1.2	All nominated residential visitor bicycle parking spaces		-
Transport 1.3	Residential bicycle parking spaces at ground level		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Transport 2.3	All nominated motorbicycle parking spaces		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Vegetated areas		-
Urban Ecology 2.4	Taps and floor waste on balconies / courtyards		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.1	Provide a written explanation of either the fully natural carpark ventilation or carbon monxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.		-
Energy 3.6	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 4.2	Specifications of the solar photovoltaic system(s).		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-
IEQ 2.1	A list of naturally ventilated dwellings		-

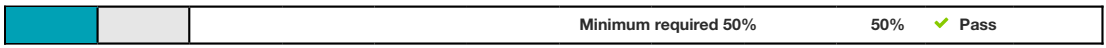
Credit summary

Management Overall contribution 4.5%



1.1 Pre-Application Meeting	0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
3.1 Metering - Residential	100%
3.3 Metering - Common Areas	100%
4.1 Building Users Guide	100%

Water Overall contribution 9.0%



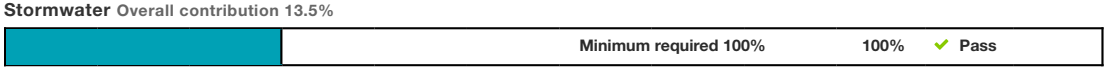
1.1 Potable water use reduction	40%	
3.1 Water Efficient Landscaping	100%	
4.1 Building Systems Water Use Reduction	N/A	Scoped Out
	Small development. Not applicable.	

Energy Overall contribution 27.5%



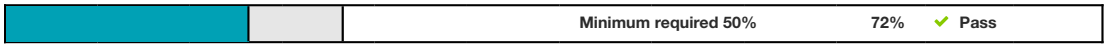
1.2 Thermal Performance Rating - Residential	16%	
2.1 Greenhouse Gas Emissions	100%	
2.2 Peak Demand	0%	
2.3 Electricity Consumption	100%	
2.4 Gas Consumption	N/A	Scoped Out
	No gas connection in use	
3.1 Carpark Ventilation	100%	
3.2 Hot Water	100%	
3.4 Clothes Drying	0%	
3.6 Internal Lighting - Residential Multiple Dwellings	100%	
4.2 Renewable Energy Systems - Solar	100%	
4.4 Renewable Energy Systems - Other	N/A	Disabled
	No other (non-solar PV) renewable energy is in use.	

Stormwater Overall contribution 13.5%



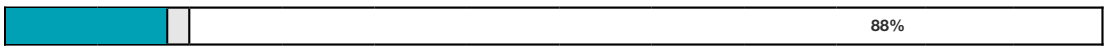
1.1 Stormwater Treatment	100%

IEQ Overall contribution 16.5%



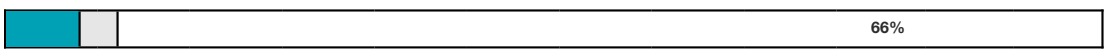
1.1 Daylight Access - Living Areas	66%
1.2 Daylight Access - Bedrooms	100%
1.3 Winter Sunlight	0%
1.5 Daylight Access - Minimal Internal Bedrooms	100%
2.1 Effective Natural Ventilation	66%

Transport Overall contribution 9.0%



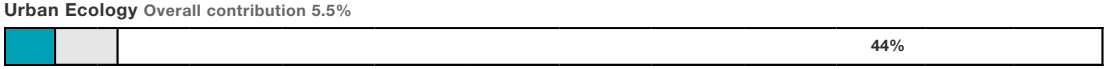
1.1 Bicycle Parking - Residential	100%
1.2 Bicycle Parking - Residential Visitor	100%
1.3 Bicycle Parking - Convenience Residential	100%
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	100%

Waste Overall contribution 5.5%



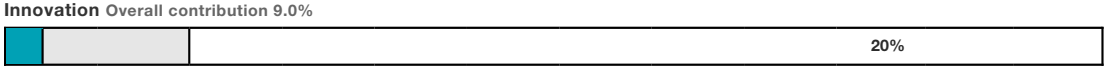
1.1 - Construction Waste - Building Re-Use	0%
2.1 - Operational Waste - Food & Garden Waste	100%
2.2 - Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%



1.1 Communal Spaces	0%
2.1 Vegetation	75%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
2.4 Private Open Space - Balcony / Courtyard Ecology	100%
3.1 Food Production - Residential	0%

Innovation Overall contribution 9.0%



1.1 Innovation	20%

Credit breakdown

Management Overall contribution 3%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 37.5% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
Score Contribution	This credit contributes 25.0% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Metering - Residential		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Apartment	Yes	
4.1 Building Users Guide		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

Water

Overall contribution 4% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Building:	
G01, 101, 201, 301, 401 G02, 102, 202, 302, 402 G03, G04, 105, 205, 305, 404 G05, 106, 206, 306, 405 G06, 107, 207 G07, G09 G08, 104, 109, 110, 204, 209, 210, 304 103 108, 208 111, 203, 211 303 307 308 403, 406	Building 2
G01, G02, 101, 102, 201, 202, 301, 302, 401 G03 G04, G05, 104, 105, 204 G06, G07, 106, 107, 206, 207, 305, 306, 404, 405 G08 G09, 109, 110, 209, 210 G10 103, 203 108, 208 111, 211 205 303 304 307, 308 402, 403 406	Building 1
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath: All	Scope out
Kitchen Taps: All	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
Dishwashers: All	>= 5 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
Washing Machine Water Efficiency: All	Occupant to Install

Which non-potable water source is the dwelling/space connected to?: All	Rainwater Tank 1
Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No

Rainwater Tank

What is the total roof area connected to the rainwater tank?: Rainwater Tank 1	1,518 m²
Tank Size: Rainwater Tank 1	40,000 Litres
Irrigation area connected to tank: Rainwater Tank 1	486 m²
Is connected irrigation area a water efficient garden?: Rainwater Tank 1	No
Other external water demand connected to tank?: Rainwater Tank 1	-

1.1 Potable water use reduction 40%

Score Contribution	This credit contributes 83.3% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	11699 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	9423 kL
Output	Proposed (including rainwater and recycled water use)
Project	8318 kL
Output	% Reduction in Potable Water Consumption
Project	28 %
Output	% of connected demand met by rainwater
Project	77 %
Output	How often does the tank overflow?
Project	Never / Rarely
Output	Opportunity for additional rainwater connection
Project	4330 kL

3.1 Water Efficient Landscaping 100%

Score Contribution	This credit contributes 16.7% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes

4.1 Building Systems Water Use Reduction N/A ◈ Scoped Out

This credit was scoped out	Small development. Not applicable.

Energy Overall contribution 16% Minimum required 50%

Dwellings Energy Approach	
What approach do you want to use for Energy?:	Use the built in calculation tools

Project Energy Profile Question	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Gas supplied into building:	No gas connection

Dwelling Energy Profiles	
Building:	
G01, 101, 201, 301, 401 G02, 102, 202, 302, 402 G03, G04, 105, 205, 305, 404 G05, 106, 206, 306, 405 G06, 107, 207 G07, G09 G08, 104, 109, 110, 204, 209, 210, 304 103 108, 208 111, 203, 211 303 307 308 403, 406	Building 2
G01, G02, 101, 102, 201, 202, 301, 302, 401 G03 G04, G05, 104, 105, 204 G06, G07, 106, 107, 206, 207, 305, 306, 404, 405 G08 G09, 109, 110, 209, 210 G10 103, 203 108, 208 111, 211 205 303 304 307, 308 402, 403 406	Building 1
Below the floor is: All	Another Occupancy

Above the ceiling is:	
G01, 101, 201, 301, 401 G02, 102, 202, 302, 402 G03, G04, 105, 205, 305, 404 G05, 106, 206, 306, 405 G06, 107, 207 G07, G09 G08, 104, 109, 110, 204, 209, 210, 304 103 108, 208 111, 203, 211 303 307 308 G01, G02, 101, 102, 201, 202, 301, 302, 401 G03 G04, G05, 104, 105, 204 G06, G07, 106, 107, 206, 207, 305, 306, 404, 405 G08 G09, 109, 110, 209, 210 G10 103, 203 108, 208 111, 211 205 303 304 307, 308	Another Occupancy
403, 406 402, 403 406	Outside
Exposed sides: All	3
NatHERS Annual Energy Loads - Heat: All	70.0 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	22.0 MJ/sqm
NatHERS star rating: All	6.5
Type of Heating System: All	D Reverse cycle space
Heating System Efficiency: All	3 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	3 Stars
Type of Hot Water System: All	C Electric Heat Pump
% Contribution from solar hot water system: All	-
Is the hot water system shared by multiple dwellings?: All	Yes
Clothes Line: All	A No drying facilities
Clothes Dryer: All	Occupant to Install
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): Solar	30.0 kW peak
Orientation (which way is the system facing)?: Solar	North
Inclination (angle from horizontal): Solar	30.0 Angle (degrees)

1.2 Thermal Performance Rating - Residential		16%
Score Contribution	This credit contributes 31.6% towards the category score.	
Criteria	What is the average NatHERS rating?	
Output	Average NATHERS Rating (Weighted)	
Apartment	6.5 Stars	

2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 10.5% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
Output	Reference Building with Reference Services (BCA only)	
Apartment	634,127 kg CO2	
Output	Proposed Building with Proposed Services (Actual Building)	
Apartment	235,174 kg CO2	
Output	% Reduction in GHG Emissions	
Apartment	62 %	

2.2 Peak Demand		0%
Score Contribution	This credit contributes 5.3% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Apartment	1,112 kW	
Output	Peak Thermal Cooling Load - Proposed	
Apartment	1,045 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Apartment	6 %	

2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 10.5% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Apartment	621,693 kWh	
Output	Proposed	
Apartment	230,563 kWh	
Output	Improvement	
Apartment	62 %	

2.4 Gas Consumption		N/A	Scoped Out
This credit was scoped out	No gas connection in use		

3.1 Carpark Ventilation	100%
Score Contribution	This credit contributes 10.5% towards the category score.
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?
Question	Criteria Achieved ?
Project	Yes

3.2 Hot Water	100%
Score Contribution	This credit contributes 5.3% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
Output	Reference
Apartment	255,575 kWh
Output	Proposed
Apartment	102,998 kWh
Output	Improvement
Apartment	59 %

3.4 Clothes Drying	0%
Score Contribution	This credit contributes 5.3% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Apartment	44,833 kWh
Output	Proposed
Apartment	44,833 kWh
Output	Improvement
Apartment	0 %

3.6 Internal Lighting - Residential Multiple Dwellings	100%
Score Contribution	This credit contributes 10.5% towards the category score.
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2019 Vol 1 (Class 2-9) and Clause 3.12.5.5 NCC 2019 Vol 2 (Class 1 & 10)?
Question	Criteria Achieved ?
Apartment	Yes

4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 5.3% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Output	Solar Power - Energy Generation per year		
Apartment	39,092 kWh		
Output	% of Building's Energy		
Apartment	16 %		
4.4 Renewable Energy Systems - Other		N/A	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool	
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	100	
Output	Min STORM Score	
Project	100	

IEQ Overall contribution 12% Minimum required 50%

IEQ DTS	
Use the BESS Deemed to Satisfy (DtS) method for IEQ?:	No

Dwellings IEQ Approach	
What approach do you want to use for dwellings?:	Provide our own calculations

1.1 Daylight Access - Living Areas	66%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of living areas achieve a daylight factor greater than 1%
Question	Percentage Achieved ?
Apartment	82 %

1.2 Daylight Access - Bedrooms	100%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%
Question	Percentage Achieved ?
Apartment	100 %

1.3 Winter Sunlight	0%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?
Question	Criteria Achieved ?
Apartment	No

1.5 Daylight Access - Minimal Internal Bedrooms	100%
Score Contribution	This credit contributes 9.1% towards the category score.
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?
Question	Criteria Achieved ?
Apartment	Yes

2.1 Effective Natural Ventilation	66%
Score Contribution	This credit contributes 27.3% towards the category score.
Criteria	What % of dwellings are effectively naturally ventilated?
Question	Percentage Achieved?
Apartment	80 %

Transport Overall contribution 8%

1.1 Bicycle Parking - Residential	100%
Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?
Question	Bicycle Spaces Provided ?
Apartment	91
Output	Min Bicycle Spaces Required
Apartment	91

1.2 Bicycle Parking - Residential Visitor	100%
Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?
Question	Visitor Bicycle Spaces Provided ?
Apartment	19
Output	Min Visitor Bicycle Spaces Required
Apartment	19

1.3 Bicycle Parking - Convenience Residential	100%
Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Are bike parking facilities for residents located at ground or entry level?
Question	Criteria Achieved ?
Apartment	Yes

2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes

2.2 Car Share Scheme	0%
Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No

2.3 Motorbikes / Mopeds	100%
Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	Yes

Waste Overall contribution 4%

1.1 - Construction Waste - Building Re-Use	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No

2.1 - Operational Waste - Food & Garden Waste	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes

2.2 - Operational Waste - Convenience of Recycling	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

Urban Ecology Overall contribution 2%

1.1 Communal Spaces		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Apartment	0.0 m²	
Output	Minimum Common Space Required	
Apartment	119 m²	
2.1 Vegetation		75%
Score Contribution	This credit contributes 44.4% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	21 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
2.4 Private Open Space - Balcony / Courtyard Ecology		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Apartment	0.0 m²	
Output	Min Food Production Area	
Apartment	48 m²	

Innovation Overall contribution 2%

Innovation	
Description: GreenPower Commitment	10 year carbon neutral power agreement between developer, owners corporation and electrical retailer to provide GreenPower to both communal areas and apartments.
Points Targeted: GreenPower Commitment	2

1.1 Innovation		20%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

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