Meander Valley Council
Working Together

PLANNING NOTICE

An application has been received for a Permit under s.57 of the Land Use Planning Approvals Act 1993:

APPLICANT:	**MZSR Developments - PA\24\0233**
PROPERTY ADDRESS:	**5 Meander Valley Road CARRICK (CT: 94801/3)**
DEVELOPMENT:	**Demolition of buildings & Multiple dwellings (6 units) - private open space, privacy, design & layout of parking areas, pedestrian access, traffic generation, attenuation distance, potentially contaminated land.**

The application can be inspected until **Monday, 29 July 2024**, at www.meander.tas.gov.au or at the Council Office, 26 Lyall Street, Westbury (during normal office hours).

Written representations may be made during this time addressed to the General Manager, PO Box 102, Westbury 7303, or by email to planning@mvc.tas.gov.au. Please include a contact phone number. Please note any representations lodged will be available for public viewing.

If you have any questions about this application please do not hesitate to contact Council's Planning Department on 6393 5320.

Dated at Westbury on 13 July 2024.

Jonathan Harmey
GENERAL MANAGER

APPLICATION FORM

PLANNING PERMIT

Land Use Planning and Approvals Act 1993

Meander Valley Council
Working Together

- Application form & details MUST be completed **IN FULL**.
- Incomplete forms will not be accepted and may delay processing and issue of any Permits.

OFFICE USE ONLY

Property No: | | | | | | **Assessment No:** | | - | | | | | - | | | | |

DA | | **PA** | | **PC** | |

- Is your application the result of an illegal building work? ☐ Yes ☐ No
- Have you already received a Planning Review for this proposal? ☐ Yes ☐ No
- Is a new vehicle access or crossover required? ☐ Yes ☐ No

Indicate by ✓ box

PROPERTY DETAILS:

Address: 5 Meander Valley Road — Certificate of Title: 94801

Suburb: Carrick — 7291 — Lot No: 3

Land area: 2108m2 *m^2 / ha*

Present use of land/building: residential *(vacant, residential, rural, industrial, commercial or forestry)*

- Does the application involve Crown Land or Private access via a Crown Access Licence: ☐ Yes ☒ No
- Heritage Listed Property: ☐ Yes ☒ No

DETAILS OF USE OR DEVELOPMENT:

Indicate by ✓ box

☒ Building work ☐ Change of use ☐ Subdivision ☒ Demolition
☐ Forestry ☐ Other

Total cost of development *(inclusive of GST):* $ 1,500,000.00 *Includes total cost of building work, landscaping, road works and infrastructure*

Description of work: Demolish existing house and shed, build 6 new dwellings

Use of building: dwelling (main use of proposed building – dwelling, garage, farm building, factory, office, shop)

New floor area: 834.2 m^2 New building height: 5370 m

Materials: External walls: Brick Colour: TBC

Roof cladding: Colourbond Colour: TBC

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
94801	3
EDITION	DATE OF ISSUE
2	23-Feb-2000

SEARCH DATE : 02-Mar-2024
SEARCH TIME : 12.54 PM

DESCRIPTION OF LAND

Parish of CARRICK, Land District of WESTMORLAND
Lot 3 on Sealed Plan 94801 (formerly being SP2499)
Derivation : Part of Lot 29 (2568 Acres) Gtd. to T. Reiby.
Prior CT 2585/22

SCHEDULE 1

C212604 TRANSFER to GRAEME JOHN LOWEN Registered
23-Feb-2000 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP 94801 EASEMENTS in Schedule of Easements
SP 94801 FENCING COVENANT in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

Owner M. CANNELL

Title Reference Conv. No. 29/2409

Areas of Parcels

Lot Number	Area	Lot Number	Area
3	0A-2R-6P		
Total		Total	

PLAN OF SURVEY

by Surveyor PAUL ANTHONY PHELPS

of land situated in the

~~LAND DISTRICT OF WESTMORLAND~~

~~PARISH~~ OF CARRICK

TOWN

Grantee : Part of Lot 29, ~~300 acs~~ 2568 4c. Thomas Reiby Pur

Scale 60feet to an inch

Registered Number

S.P.2499

For Office Use

Filed by : Board Surveyor

on 1/11/69 at 3-05

Receipt No. 00290

Receiving Clerk

Effective from 24-1-69

Recorder of Titles / Registrar of Deeds

REGISTERED NUMBER

94801

NO INFORMATION TO BE WRITTEN WITHIN THIS SPACE

HIGHWAY

to Launceston

57° 30' 30' 410 5½

193 8½'

177 - 56 '15"

(S.P. 3494)

BASS

02' 30' 120 0

57° 67 6

(S.P. 4505)

169'

183 9½'

38'

30'

237° 02' 30' 38 6½

10 FEET WIDE

DRAINAGE EASEMENT

1

2

3

359°

200 5'

20'

(1/6 west)

(0.17023)

(69 0.1 p.o.)

156 0'

02'

30'

237°

(P. 1 1 2 4 6 6)

(4 4/10 p)

Plan of Survey

(1)

RECORDER OF TITLES TASMANIA

SCHEDULE OF EASEMENTS **PLAN NO.** S.P.2499

NOTE:—The Town Clerk or Council Clerk must sign the certificate on the back page for the purpose of identification.

The Schedule must be signed by the owners and mortgagees of the land affected. Signatures should be attested.

EASEMENTS: Lot 3 is together with a right of drainage over the Drainage Easement shown hereon

~~Each Lot in Column A is:~~

~~1. Together with a right of drainage over the drainage easement shown hereon, passing through the Lot specified opposite thereto in Column B and~~

~~2. Subject to a right of drainage over the drainage easement passing through that Lot as appurtenant to the Lot shown hereon and specified opposite thereto in Column C.~~

Deleted

~~COLUMN A~~	~~COLUMN B~~	~~COLUMN C~~
~~Lot 3~~	~~un-subdivide balance~~	~~nil.~~

COVENANTS:

The Owner of Lot 3 ~~Purchaser of Lot 1~~ covenants with the Vendor (Myrtle Cannell) that the said Vendor shall not be required to fence.

Dated this 4TH day of JUNE 1969

SIGNED by the Vendor (MYRTLE CANNELL) in the presence of } M Cannell

[signature]

Solr Launceston

Certified correct for the purposes of the Real Property Act 1862 as amended.

[signature]

Solicitor

This is the schedule of easements attached to the plan of .....

Lot 3 **comprising part of the land in**

Conveyance No. 29/2409
(Insert Title Reference)

Sealed by THE CORPORATION OF THE MUNICIPALITY OF WESTBURY **on** 9TH JUNE **19** 69

.....
Council Clerk/Town Clerk

21028

Mail: 202 Wellington Street, South Launceston 7249
A.B.N: 71 615 812 747
Phone: 6344 7319
Email: info@designtolive.com.au

10 May 2024

Planning Application Cover Letter

Development: Proposed Multiple Dwellings x 6
Owner: MZSR Developments
Address: 5 Meander Valley Road, Carrick
Council: Meander Valley
Zone: General Residential

Please find below further information for the proposed Development at the above address.

1. Report to address TasWater Further Information Request & written permission from the Department of State Growth in progress.
2. a) Refer amended plans.
   b) Refer amended plans.
   c) Refer Landscape and Strata Plans. Area in front of Unit 1 is part of the strata site for Unit 1.
   d) Refer amended shadow diagrams.
   e) Refer Landscape Plan.
   f) Exemption applies. Brick mailbox will be a maximum height of 1.2m.
   g) Refer amended parking and turning plan.
   h) Refer amended plans.
   i) Refer amended plans.
   j) Refer amended plans.
   k) An On-Site Detention assessment from a suitably qualified consultant in progress.
3. Will be addressed in Traffic Impact Assessment.
4. Refer Page 2 for Site Photos.
5. The land is not identified by council mapping as potentially contaminated land, nor is it anything other than speculation that the land was used for any potentially contaminating uses. When completing due diligence on this property prior to our clients purchase, we were advised verbally by council this would not be applicable to this property and it was not identified as Potentially Contaminated Land. We don't believe the storage of project cars on site fits into any use listed in Table C14.2 Potentially Contaminating Activities, therefore we will not be providing any subconsultant reports to address this as we believe this is not enforceable.
6. Verbal advice from Vili Sale (Department of State Growth) advised that the municipal standard (refer Table C2.2 Internal Access Way Widths for Vehicles) overruled the preference of the Department of State Growth. In accordance with Table C2.2 the crossover width is proposed to be increased to 4.5m.
7. Permit will be obtained prior to work commencing in the State Road Reservation.

Regards,
Denika McDonald-Hodges
(BEnvDes, MArch)

Site Photos – House and Outbuilding to be demolished.









Mail: 202 Wellington Street, South Launceston 7249
A.B.N: 71 615 812 747
Phone: 6344 7319
Email: info@designtolive.com.au

24 April 2024

Planning Application Cover Letter

Development: Proposed Multiple Dwellings
Owner: MZSR Developments
Address: 5 Meander Valley Road, Carrick
Council: Meander Valley
Zone: General Residential

Please find below further information for the proposed development at the above address.

8.4.1. Residential Standards for Multiple Dwellings
A1. Meets acceptable solution. 2108 (Lot size) / 6 (number of dwellings) = 351.33m²

8.4.2. Setbacks and building envelope for all dwellings
A1. Meets acceptable solution.
A2. Meets acceptable solution.
A3. Meets acceptable solution.

8.4.3. Site Coverage and private open space for all dwellings
A1. Meets acceptable solution.
A2. Meets acceptable solution.

8.4.4. Sunlight to private open space of multiple dwellings
A1. Meets acceptable solution (b).

8.4.5. Width of openings for garages and carports for all dwellings
A1. Meets acceptable solution.

8.4.6. Privacy for all dwellings
A1. Meets acceptable solution.
A2. Meets acceptable solution.
A3. Meets acceptable solution.

8.4.7. Frontage fences for all dwellings
A1. Meets exemption requirements.

8.4.8. Waste storage for multiple dwellings
A1. Meets acceptable solution.

Regards,
Denika McDonald-Hodges (BEnvDes, MArch)

PROPOSED MULTIPLE DWELLINGS
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING #	DRAWING
MNDR05-1	COVER PAGE
MNDR05-2	SITE PLAN
MNDR05-3	LANDSCAPE PLAN
MNDR05-4	STRATA PLAN
MNDR05-5	PARKING AND TURNING
MNDR05-6	PARKING AND TURNING
MNDR05-7	EXTERNAL SERVICES
MNDR05-8	EXTERNAL SERVICES NOTES
MNDR05-9	UNIT 1 FLOOR PLAN
MNDR05-10	UNIT 1 ELEVATIONS NE/NW
MNDR05-11	UNIT 1 ELEVATIONS SE/SW
MNDR05-12	UNIT 2 FLOOR PLAN
MNDR05-13	UNIT 2 ELEVATIONS NE/NW
MNDR05-14	UNIT 2 ELEVATIONS SE/SW
MNDR05-15	UNITS 3 & 5 FLOOR PLAN
MNDR05-16	UNIT 3 & 5 ELEVATIONS NTH/STH
MNDR05-17	UNIT 3 & 5 ELEVATIONS EST/WST
MNDR05-18	UNITS 4 & 6 FLOOR PLAN
MNDR05-19	UNIT 4 & 6 ELEVATIONS NTH/STH
MNDR05-20	UNIT U4 & 6 ELEVATIONS EST/WST
MNDR05-21	SHADOW DIAGRAMS
MNDR05-22	SHADOW DIAGRAMS

ATTACHMENTS

AREAS	(m²)
UNIT 1	180.70
UNIT 2	168.08
UNIT 3	119.79
UNIT 4	122.98
UNIT 5	119.79
UNIT 6	122.86

COUNCIL	MEANDER VALLEY	ZONE	GENERAL RESIDENTIAL
LAND TITLE REFERENCE	94801/3	ENERGY STAR RATING	TBC
PROPERTY ID	7018748	CLIMATE ZONE	7
LOT SIZE (M²)	2108	ALPINE AREA	N/A
BAL RATING	TBC	CORROSION ENV'	N/A
DESIGN WIND CLASS	TBC	SITE HAZARDS	N/A
SOIL CLASSIFICATION	TBC		
PLANNING OVERLAY	BUSHFIRE PRONE AREA		

DESIGN TO LIVE
ACC # 371799313
ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
COVER PAGE

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.
SIGNATURE: DATE:
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	1/22
CHECKED	M.L.	SCALE (@A3)	NTS

AREA	m²
UNIT 1	180.70
UNIT 2	168.08
UNIT 3	119.79
UNIT 4	122.98
UNIT 5	119.79
UNIT 6	122.86

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DRAWING
SITE PLAN

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	2/22
CHECKED	M.L.	SCALE (@A3)	1:200

TITLE BOUNDARY - 56.026m

TITLE BOUNDARY - 36.576m

TITLE BOUNDARY - 47.549m

TITLE BOUNDARY - 61.087m

MEANDER VALLEY ROAD

EX. CROSSOVER

UNIT 1-6 LETTER BOX (BRICK) MAX. HEIGHT 1.2m

UNIT 1
U1 P1
U1 P2
P.O.S. 34.71 m²
6.313
PEDESTRIAN ACCESS (KERBED)
PRIV. SCREEN
MULCH
GATE

UNIT 2
P1
P2
U2 P1
U2 P2
P.O.S. 32.59 m²
4.000
3.000
PRIV. SCREEN
MULCH
GATE

UNIT 3
U3 P1
U3 P2
P.O.S. 25.05 m²
4.195
PRIV. SCREEN
MULCH
GATE

UNIT 4
U4 P1
U4 P2
P.O.S. 27.88 m²
4.000
PRIV. SCREEN
MULCH
GATE

UNIT 5
U5 P1
U5 P2
GUEST
P.O.S. 26.64 m²
4.843
PRIV. SCREEN
MULCH
GATE

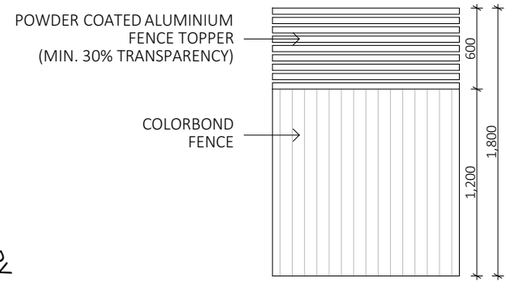
UNIT 6
U6 P1
U6 P2
GUEST
P.O.S. 25.00 m²
5.000
PRIV. SCREEN
MULCH
GATE

0 1 2 3 4 5 6 7 8 9 10m

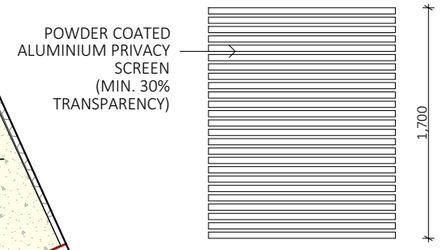
KEY

N

- 1.2m COLORBOND FENCE WITH 0.6m PWD. COATED ALUMINIUM FENCE TOPPER (SEE TYP. ELEVATION BELOW)
- 1.8m COLORBOND FENCE
- GRASS
- CONCRETE
- MULCH
- LOW LYING SHRUB
  MAX MATURE HEIGHT 0.5m
  SPECIES SELECTION BY CLIENT
- MEDIUM SHRUB
  MAX MATURE HEIGHT 1m
  SPECIES SELECTION BY CLIENT



FRONT BOUNDARY FENCE TYP. ELEVATION



PRIVACY SCREEN TYP. ELEVATION

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DRAWING
LANDSCAPE PLAN

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DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	3/22
CHECKED	M.L.	SCALE (@A3)	1:200


N
TITLE BOUNDARY - 56.026m
TITLE BOUNDARY - 36.576m
TITLE BOUNDARY - 47.549m
TITLE BOUNDARY - 61.087m
UNIT 1
STRATA SITE AREA: 328.56m²
UNIT FOOTPRINT: 180.70m²
IMPERVIOUS SURFACES: 225.10m² (68.51%)
PERVIOUS SURFACES: (31.49%)
UNIT 3
STRATA SITE AREA: 200.32m²
UNIT FOOTPRINT: 119.86m²
IMPERVIOUS SURFACES: 173.53m²(86.63%)
PERVIOUS SURFACES: (13.37%)
UNIT 5
STRATA SITE AREA: 281.74m²
UNIT FOOTPRINT: 119.86m²
IMPERVIOUS SURFACES: 182.85m²(64.90%)
PERVIOUS SURFACES: (35.10%)
COMMON PROPERTY: 482.83m²
UNIT 2
STRATA SITE AREA: 305.40m²
UNIT FOOTPRINT: 168.08m²
IMPERVIOUS SURFACES: 223.43m²(73.16%)
PERVIOUS SURFACES: (26.84%)
UNIT 4
STRATA SITE AREA: 220.39m²
UNIT FOOTPRINT: 122.88m²
IMPERVIOUS SURFACES: 170.95m² (77.57%)
PERVIOUS SURFACES: (22.43%)
UNIT 6
STRATA SITE AREA: 353.68m²
UNIT FOOTPRINT: 122.88m²
IMPERVIOUS SURFACES: 171.49m² (48.49%)
PERVIOUS SURFACES: (51.51%)
EX.
CROSSOVER
24,716
15,956
15,353
12,169
15,651
11,989
14,306
5,220
5,600
17,450
3,121
2,641
17,591
888
2,665
1,669
5,570
4,239
801
1,000
1,000
1,363
5,570
4,239
4,343
13,104
1,287
15,640
619
5,725
4,580
2,500
800
7,823
11,645
20,194
4,600
5,582
4,240
5,437
1,000
7,288
7,774
6,587
3,004
12,736
15,862
25,134
18,135

OVERALL SITE IMPERVIOUS SURFACES: 1558.05m (73.88%)
OVERALL SITE PERVIOUS SURFACES: 26.12%

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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
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CARRICK TAS, 7291.

DRAWING
STRATA PLAN

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

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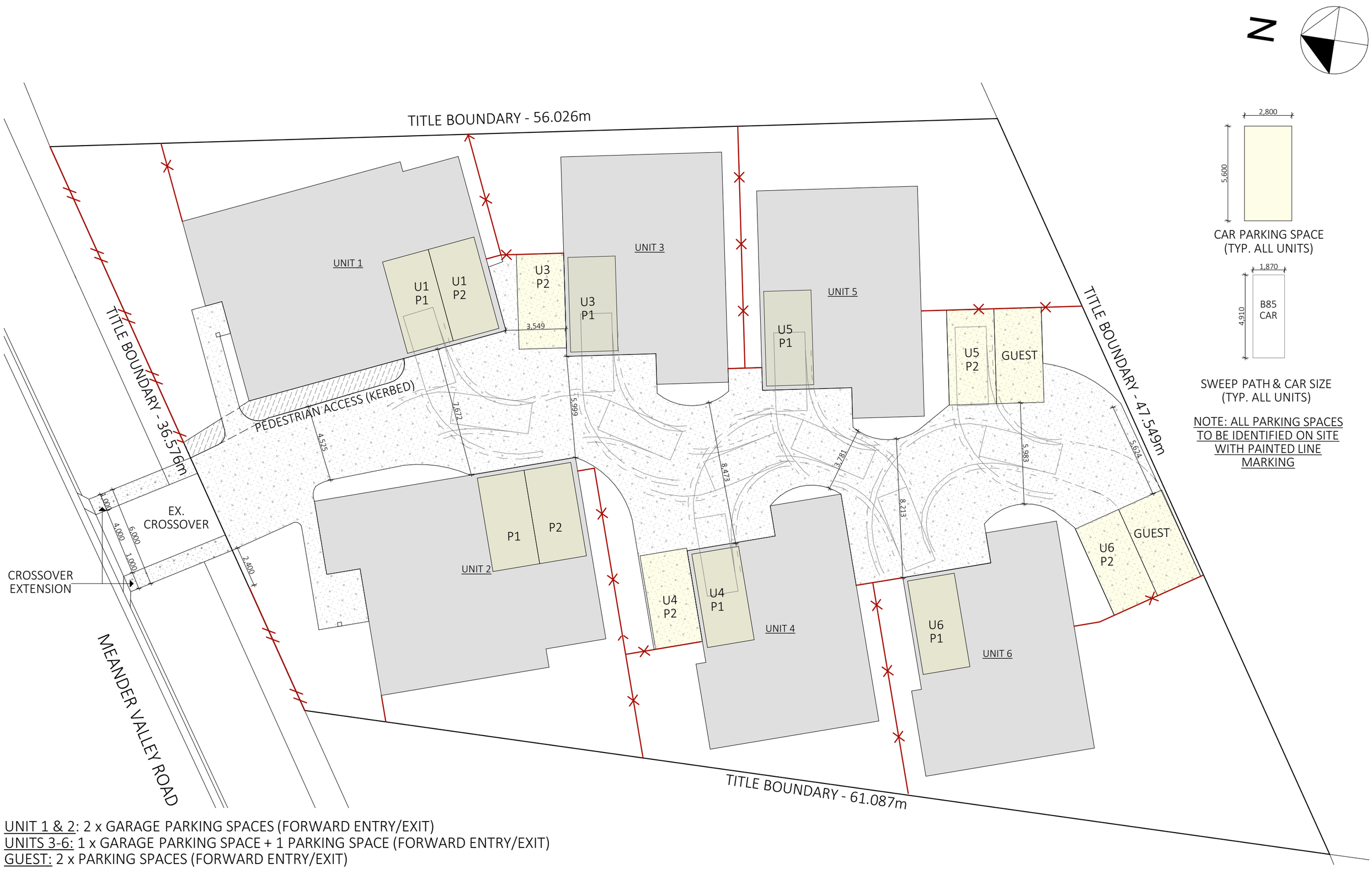
REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	4/22
CHECKED	M.L.	SCALE (@A3)	1:200



NOTE: ALL PARKING SPACES TO BE IDENTIFIED ON SITE WITH PAINTED LINE MARKING

UNIT 1 & 2: 2 x GARAGE PARKING SPACES (FORWARD ENTRY/EXIT)
UNITS 3-6: 1 x GARAGE PARKING SPACE + 1 PARKING SPACE (FORWARD ENTRY/EXIT)
GUEST: 2 x PARKING SPACES (FORWARD ENTRY/EXIT)

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DRAWING
PARKING AND TURNING

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DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	5/22
CHECKED	M.L.	SCALE (@A3)	1:200

N

CAR PARKING SPACE
(TYP. ALL UNITS)

SWEEP PATH & CAR SIZE
(TYP. ALL UNITS)

NOTE: ALL PARKING SPACES TO BE IDENTIFIED ON SITE WITH PAINTED LINE MARKING

UNIT 1 & 2: 2 x GARAGE PARKING SPACES (FORWARD ENTRY/EXIT)
UNITS 3-6: 1 x GARAGE PARKING SPACE + 1 PARKING SPACE (FORWARD ENTRY/EXIT)
GUEST: 2 x PARKING SPACES (FORWARD ENTRY/EXIT)

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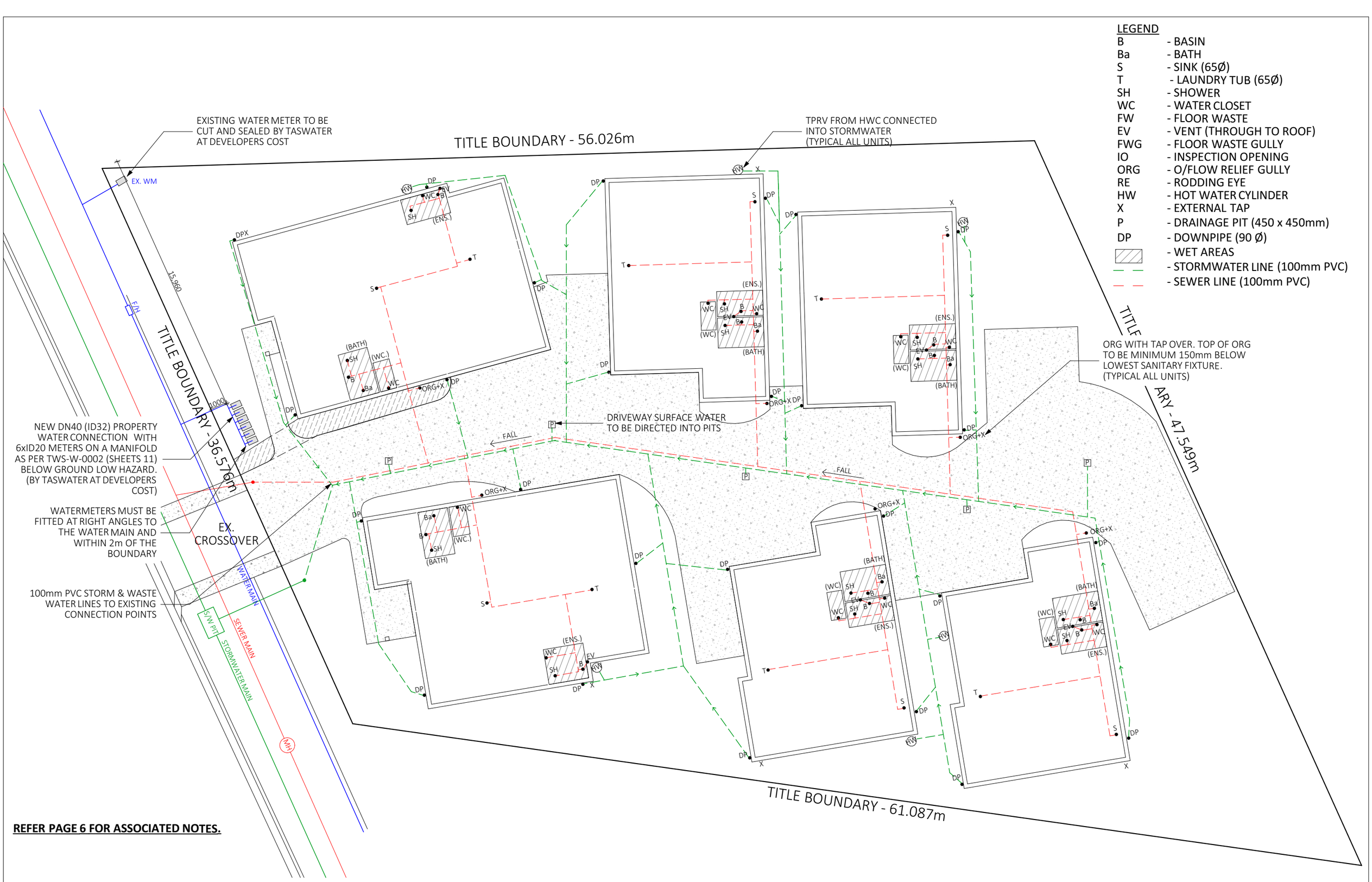

REFER PAGE 6 FOR ASSOCIATED NOTES.

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DRAWING
EXTERNAL SERVICES

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DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	7/22
CHECKED	M.L.	SCALE (@A3)	1:200

INSTALL INSPECTION OPENINGS AT MAJOR BENDS FOR STORMWATER AND ALL LOW POINTS OF DOWNPIPES.

PROVIDE SURFACE DRAIN TO BACK OF BULK EXCAVATION TO DRAIN LEVELLED PAD PRIOR TO COMMENCING FOOTING EXCAVATION.

SERVICES

THE HEATED WATER SYSTEM MUST BE DESIGNED AND INSTALLED WITH PART B2 OF THE NCC VOLUME THREE- PLUMBING CODE OF AUSTRALIA.

THERMAL INSULATION FOR HEATED WATER PIPING MUST:
A) BE PROTECTED AGAINST THE EFFECTS OF WEATHER AND SUNLIGHT; AND
B) BE ABLE TO WITHSTAND THE TEMPERATURES WITHIN THE PIPING ; AND
C) USE THERMAL INSULATION IN ACCORDANCE WITH AS/NZS 4859.1

HEATED WATER PIPING THAT IS NOT WITHIN A CONDITIONED SPACE MUST BE THERMALLY INSULATED AS FOLLOWS:

1. INTERNAL PIPING

a) ALL FLOW AND RETURN INTERNAL PIPING THAT IS-
i)WITHIN AN UNVENTILATED WALL SPACE
ii)WITHIN AN INTERNAL FLOOR BETWEEN STOREYS: OR
iii) BETWEEN CEILING INSULATION AND A CEILING
MUST HAVE A MINIMUM R-VALUE OF 0.2

2.PIPING LOCATED WITHIN A VENTILATED WALL SPACE, AN ENCLOSED BUILDING SUBFLOOR OR A ROOF SPACE

a) ALL FLOW AND RETURN PIPING
b)COLD WATER SUPPLY PIPING AND RELIEF VALVE PIPING WITHIN 500mm OF THE CONNECTION TO CENTRAL WATER HEATING SYSTEM,
MUST HAVE A MINIMUM R-VALUE OF 0.45

3. PIPING LOCATED OUTSIDE THE BUILDING OR IN AN UNENCLOSED BUILDING SUB FLOOR OR ROOF SPACE

a)ALL FLOW AND RETURN PIPING
b)COLD WATER SUPPLY PIPING AND RELIEF VALVE PIPING WITHIN 500mm OF THE CONNECTION TO CENTRAL WATER HEATING SYSTEM
MUST HAVE A MINIMUM R-VALUE OF 0.6

PIPING WITHIN AN INSULATED TIMBER FRAMED WALL, SUCH AS THAT PASSING THROUGH A WALL STUD, IS CONSIDERED TO COMPLY WITH THE ABOVE INSULATION REQUIREMENTS.

ALL WORKS ARE TO BE IN ACCORDANCE WITH THE WATER SUPPLY CODE OF AUSTRALIA MELBOURNE RETAIL WATER AGENCIES INTERGRATED CODE (WSA 03-2011-3.1 VERSION 3.1 MRWA VERSION 2.0) AND THE SEWERAGE CODE OF AUSTRALIA MELBOURNE RETAIL WATER AGENCIES INTERGRATED CODE (WSA 02-2014-3.1 MRWA VERSION 2.0) AND TASWATER'S SUPPLEMENTS TO THESE CODES.

ALL DRAINAGE WORK SHOWN IS PROVISIONAL ONLY AND IS SUBJECT TO AMENDMENT TO COMPLY WITH LOCAL AUTHORITIES. ALL WORK IS TO COMPLY WITH AS-3500 AND LOCAL PLUMBING CODE AND SHOULD BE CARRIED OUT BY A LICENSED PLUMBER.

DESIGN TO LIVE
ACC # 371799313
ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

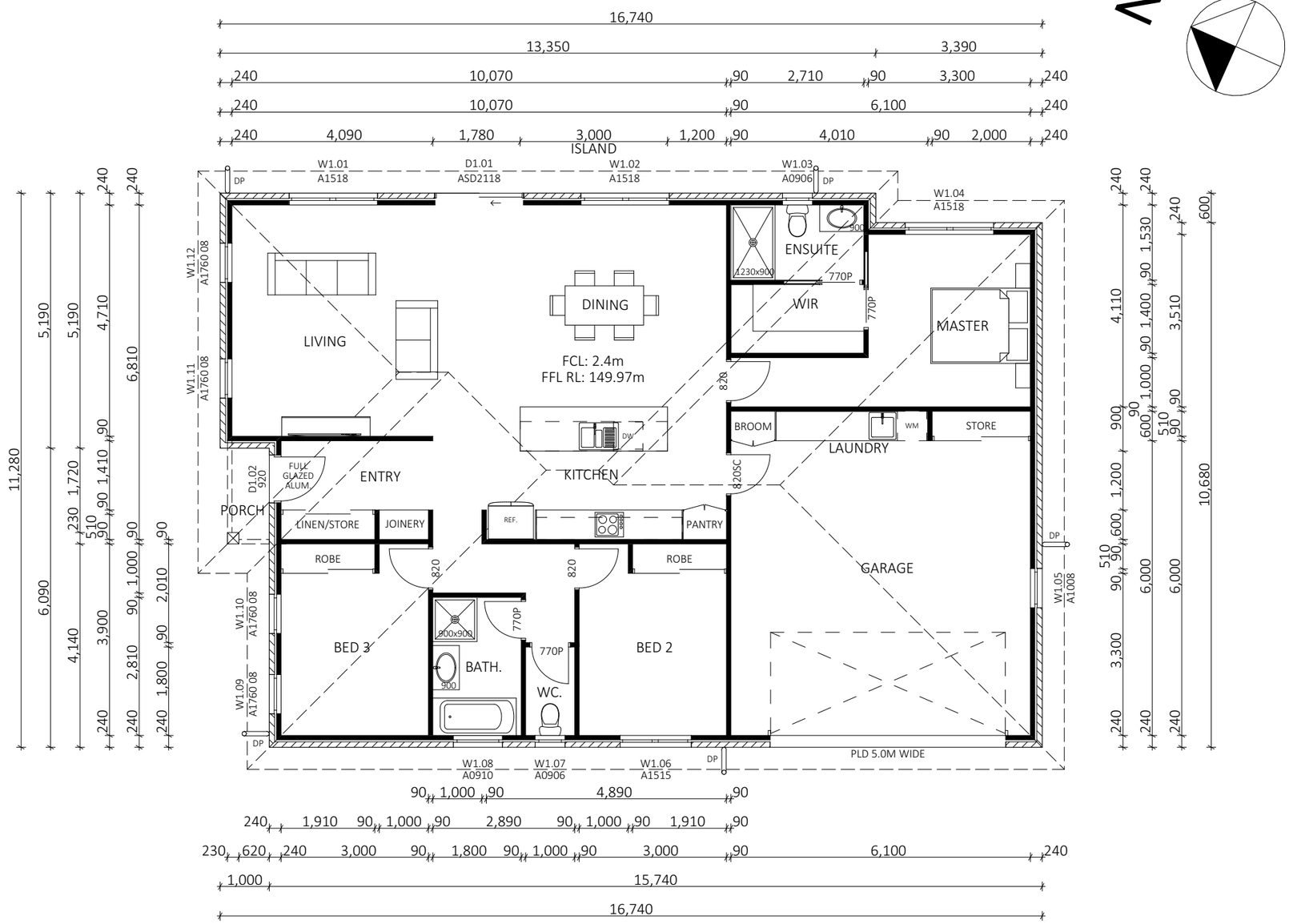
SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
EXTERNAL SERVICES NOTES

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.
SIGNATURE: DATE:
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	8/22
CHECKED	M.L.	SCALE (@A3)	1:200



0 1 2 3 4 5m

DESIGN TO LIVE

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W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNIT 1 FLOOR PLAN

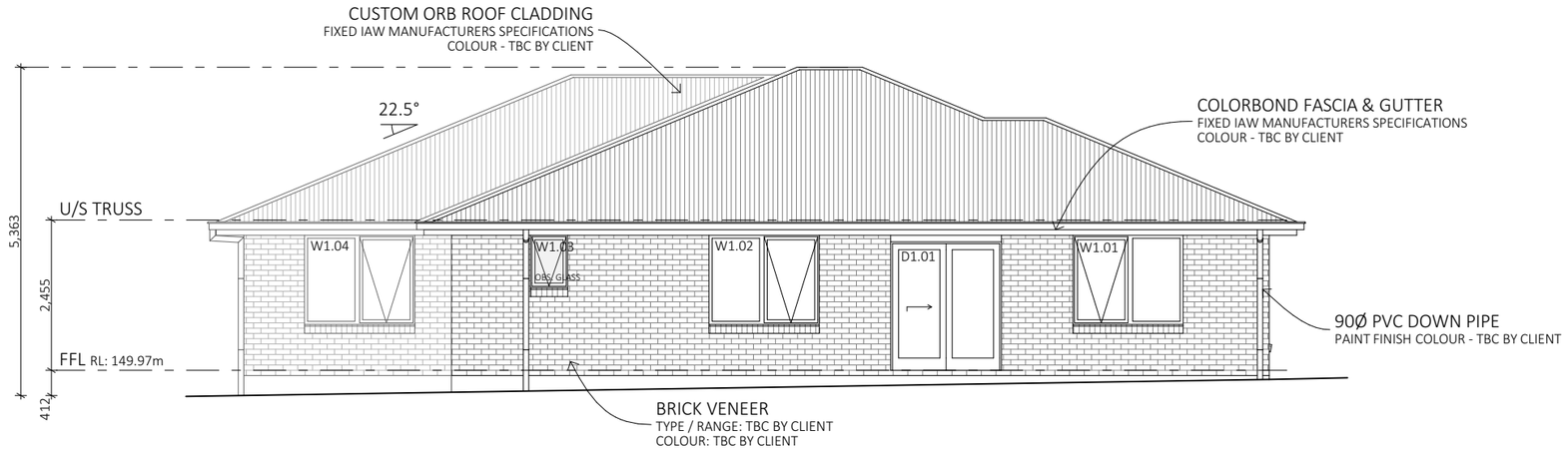
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

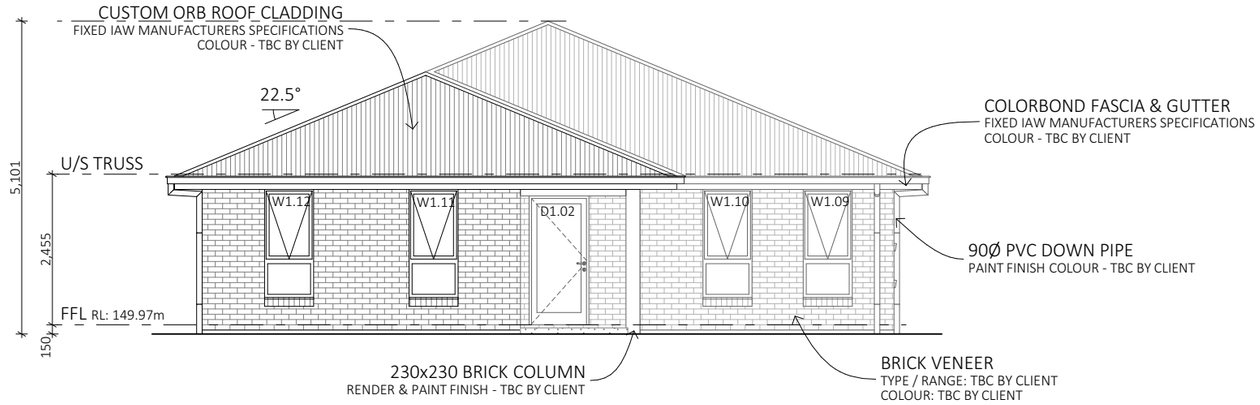
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	9/22
CHECKED	M.L.	SCALE (@A3)	1:100



NORTH EASTERN ELEVATION



NORTH WESTERN ELEVATION

0 1 2 3 4 5m

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ABN. 71 615 812 747
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E. info@designtolive.com.au
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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNIT 1
ELEVATIONS
NE/NW

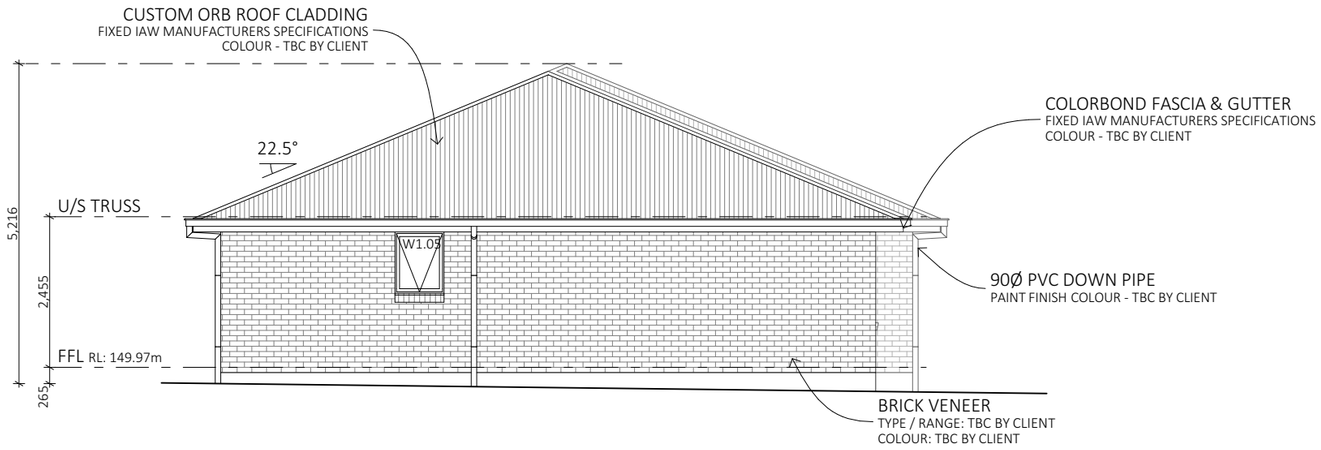
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

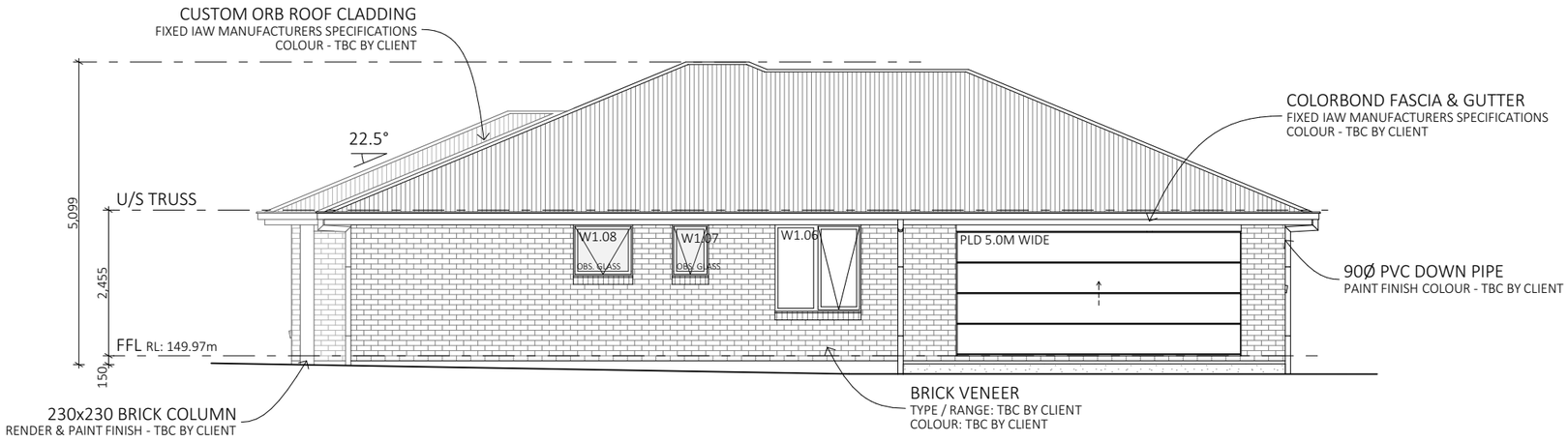
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	10/22
CHECKED	M.L.	SCALE (@A3)	1:100



SOUTH EASTERN ELEVATION



SOUTH WESTERN ELEVATION

0 1 2 3 4 5m

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ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
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CARRICK TAS, 7291.

DRAWING
UNIT 1
ELEVATIONS
SE/SW

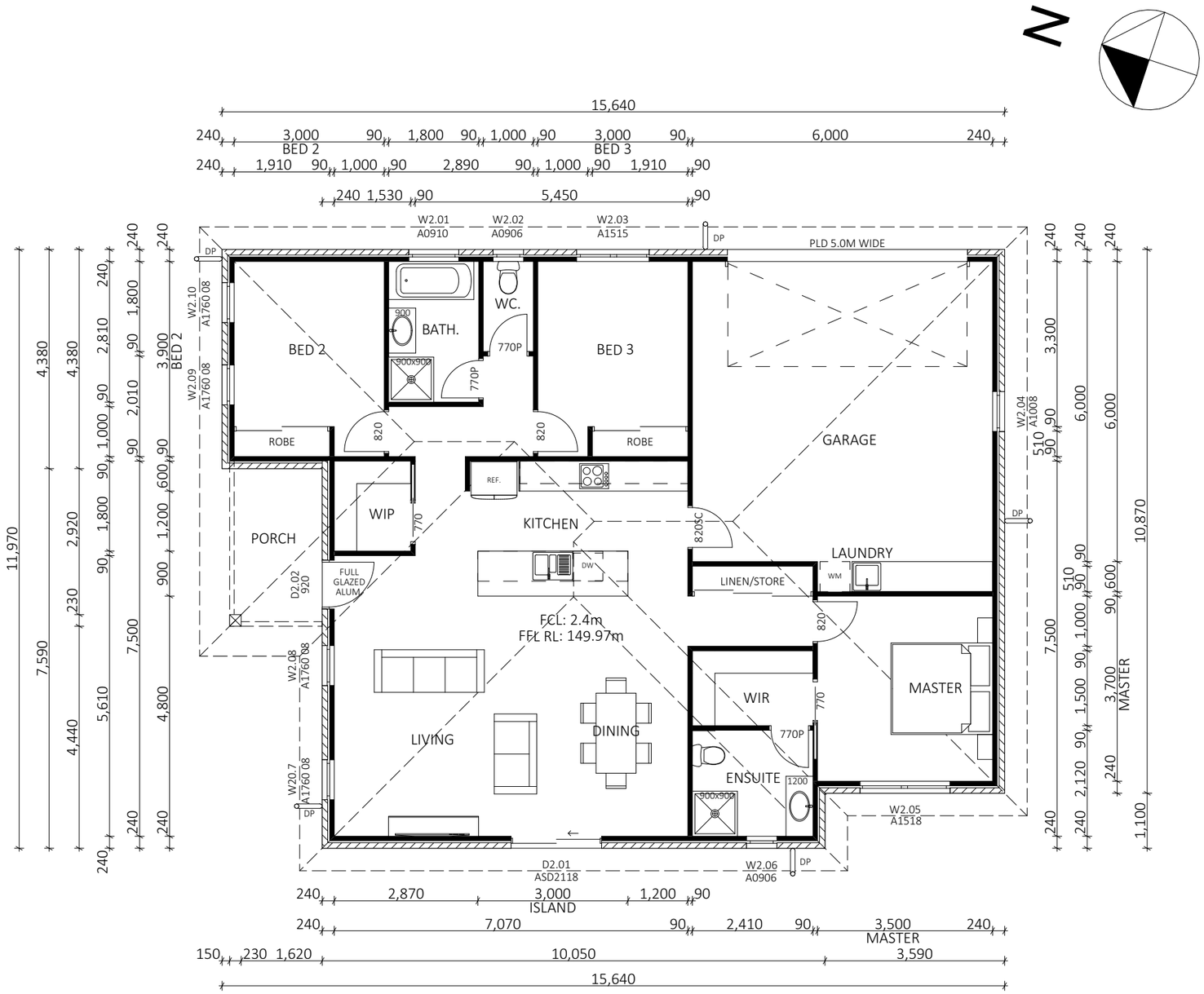
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	11/22
CHECKED	M.L.	SCALE (@A3)	1:100



0 1 2 3 4 5m

DESIGN TO LIVE

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W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNIT 2 FLOOR PLAN

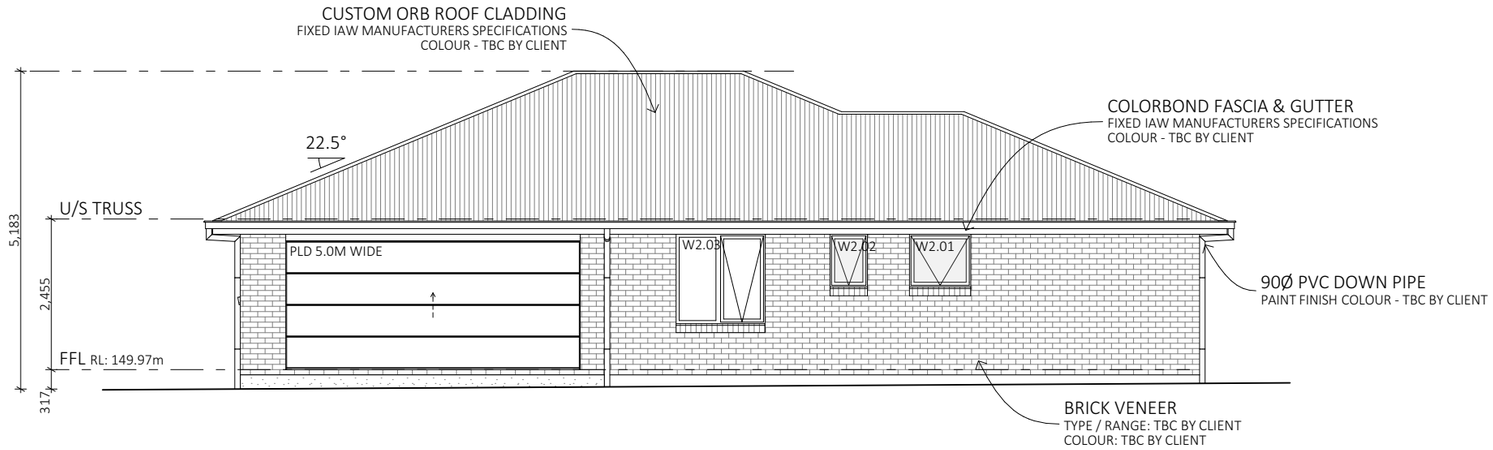
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

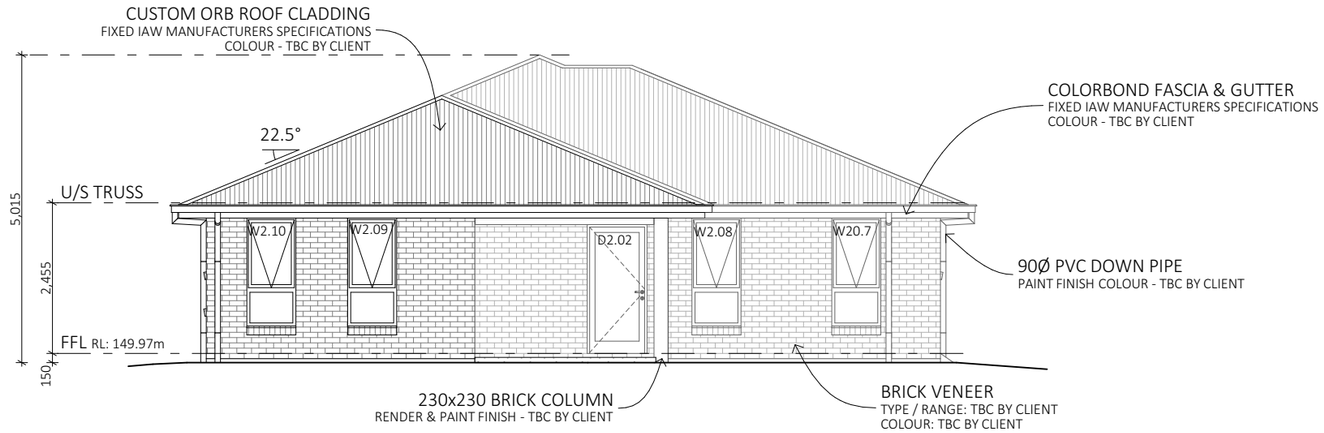
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	12/22
CHECKED	M.L.	SCALE (@A3)	1:100



NORTH EASTERN ELEVATION



NORTH WESTERN ELEVATION

0 1 2 3 4 5m

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DRAWING
UNIT 2
ELEVATIONS
NE/NW

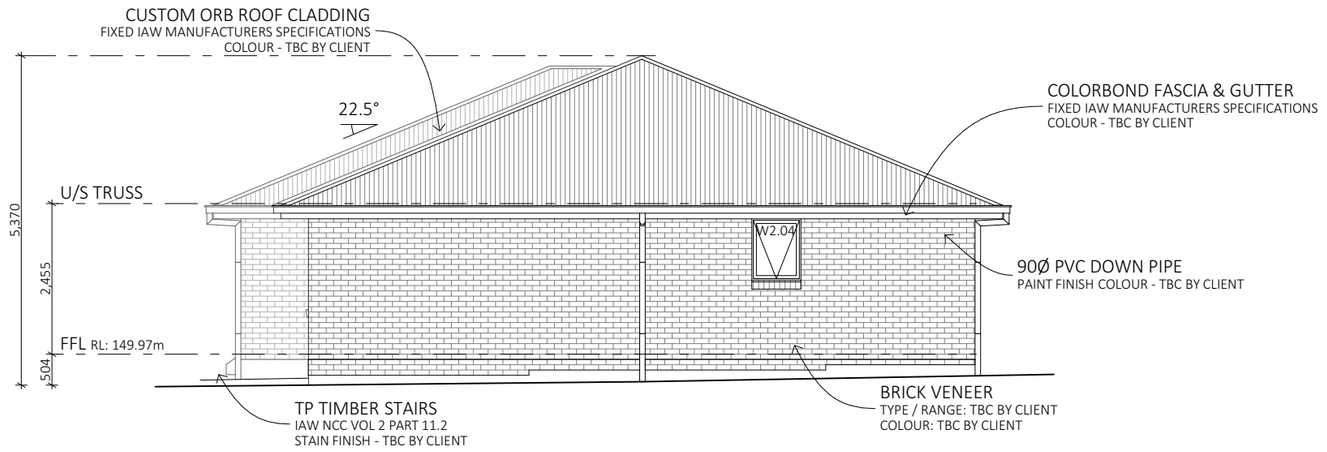
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

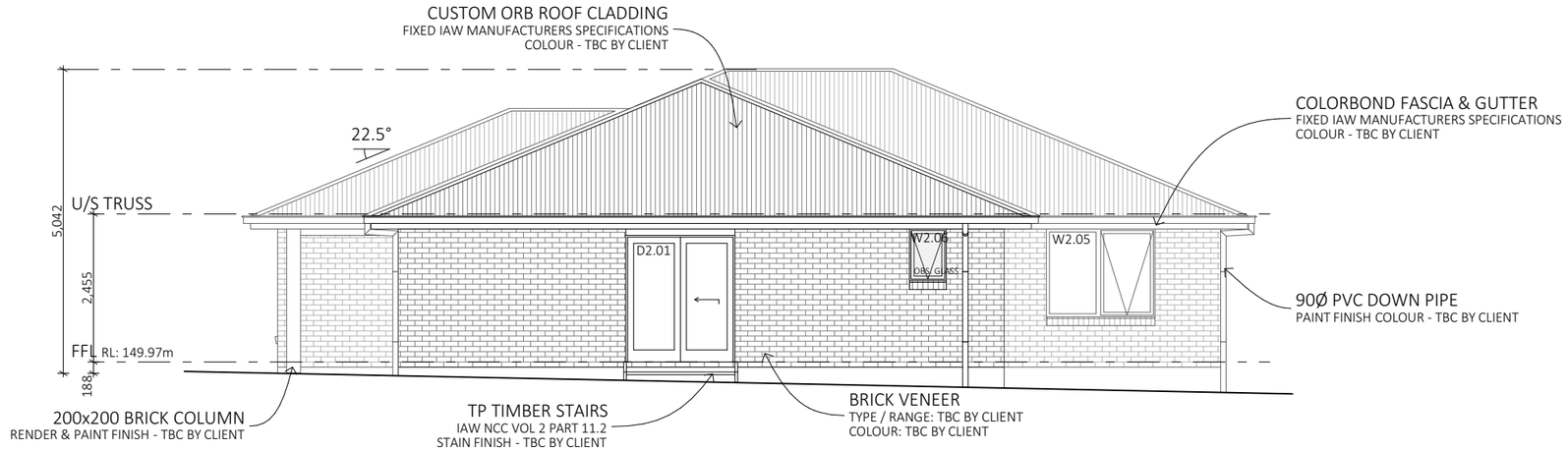
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	13/22
CHECKED	M.L.	SCALE (@A3)	1:100



SOUTH EASTERN ELEVATION



SOUTH WESTERN ELEVATION

0 1 2 3 4 5m

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CLIENT/S:
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SITE ADDRESS:
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CARRICK TAS, 7291.

DRAWING
UNIT 2
ELEVATIONS
SE/SW

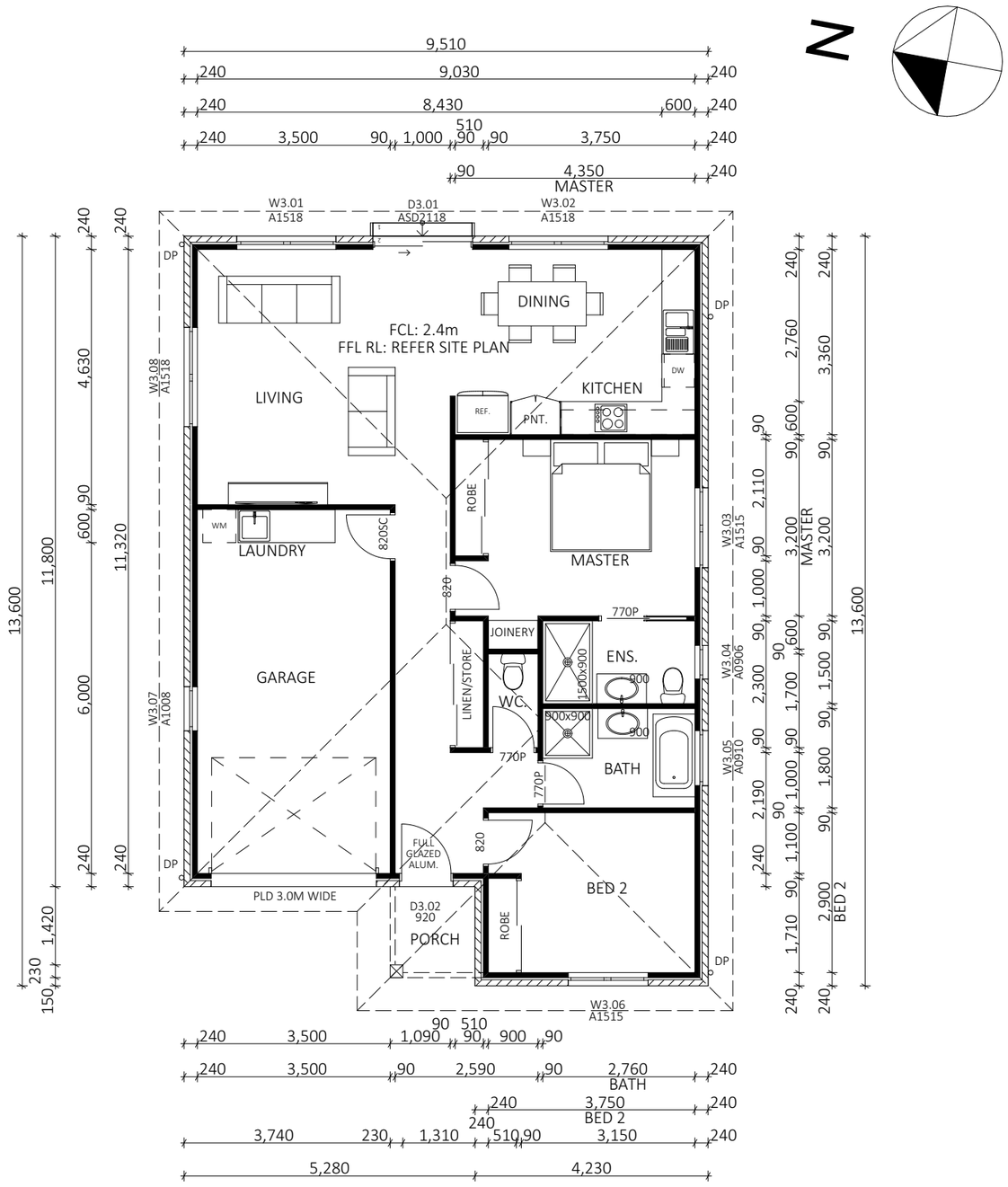
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	14/22
CHECKED	M.L.	SCALE (@A3)	1:100



UNIT 3 & 5

0 1 2 3 4 5m

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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNITS 3 & 5
FLOOR PLAN

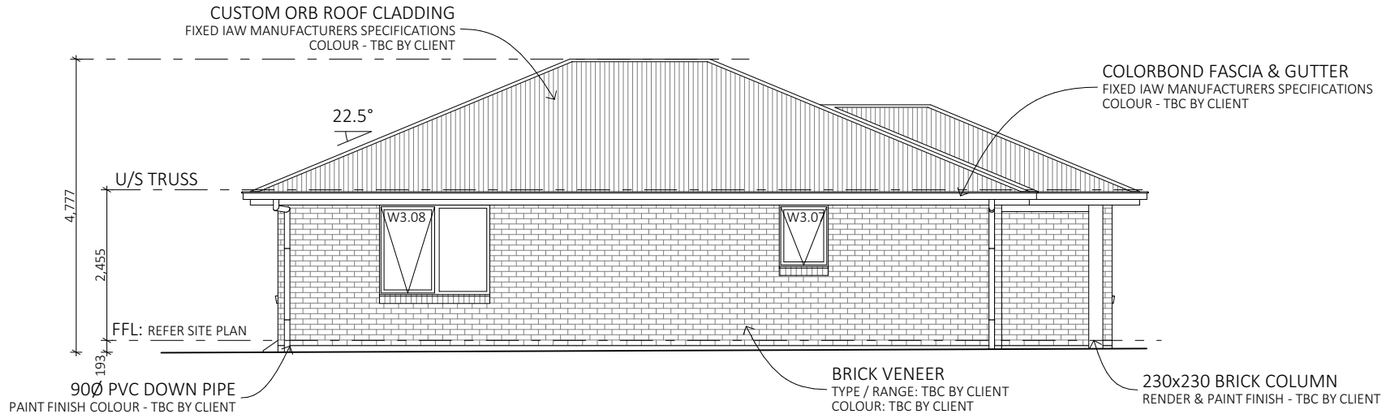
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

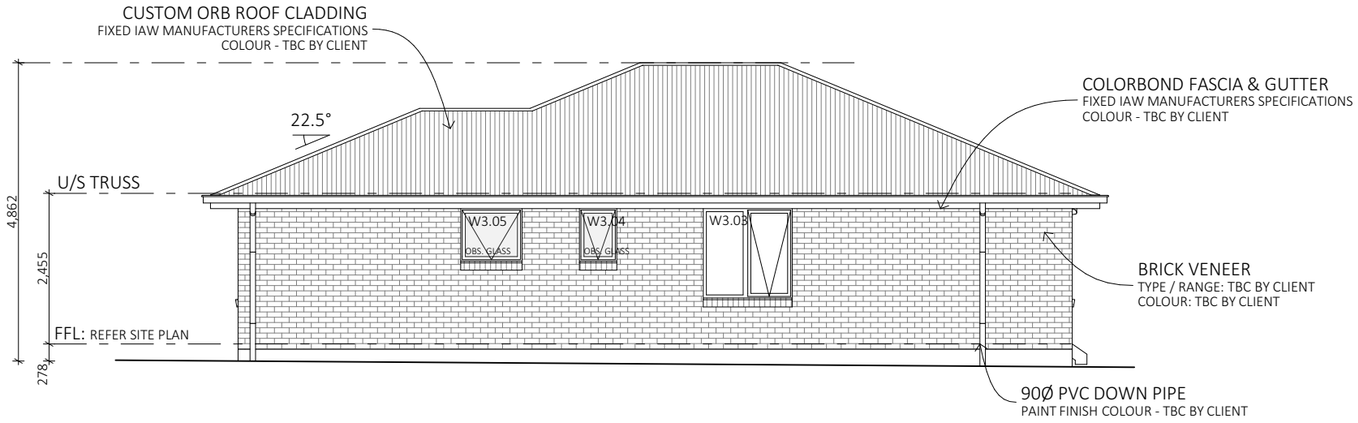
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	15/22
CHECKED	M.L.	SCALE (@A3)	1:100



NORTH ELEVATION



SOUTH ELEVATION

0 1 2 3 4 5m

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E. info@designtolive.com.au
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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
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DRAWING
UNIT 3 & 5
ELEVATIONS
NTH/STH

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

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R1	16/04/2024	FOR REVIEW
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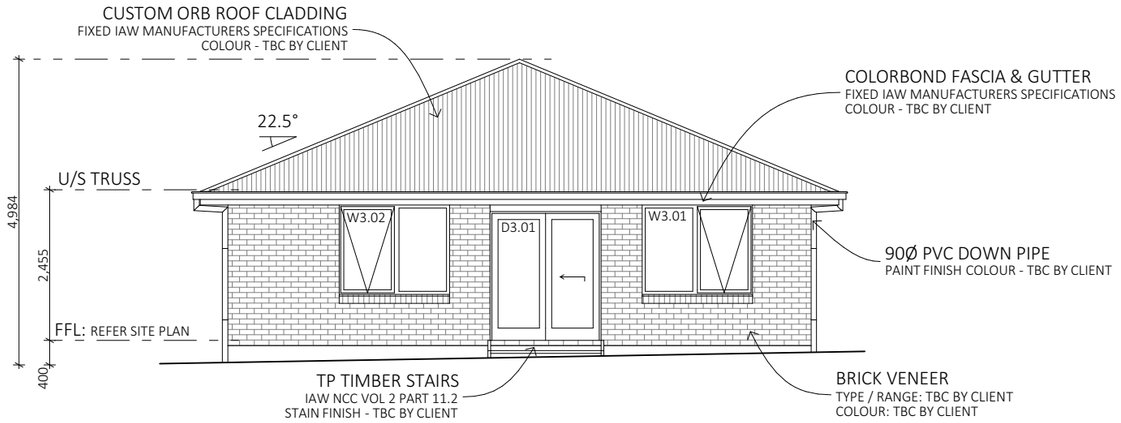
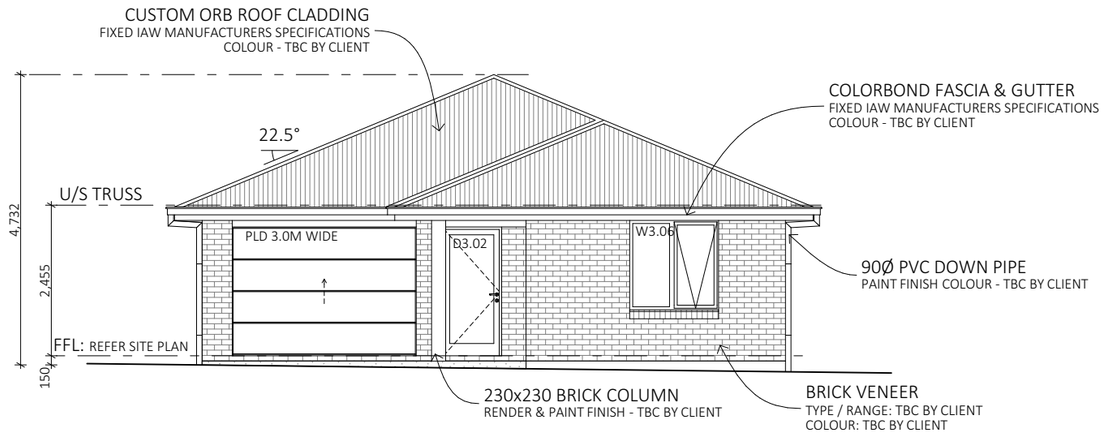
DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	16/22
CHECKED	M.L.	SCALE (@A3)	1:100



EAST ELEVATION



WEST ELEVATION

0 1 2 3 4 5m

DESIGN TO LIVE
ACC # 371799313
ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

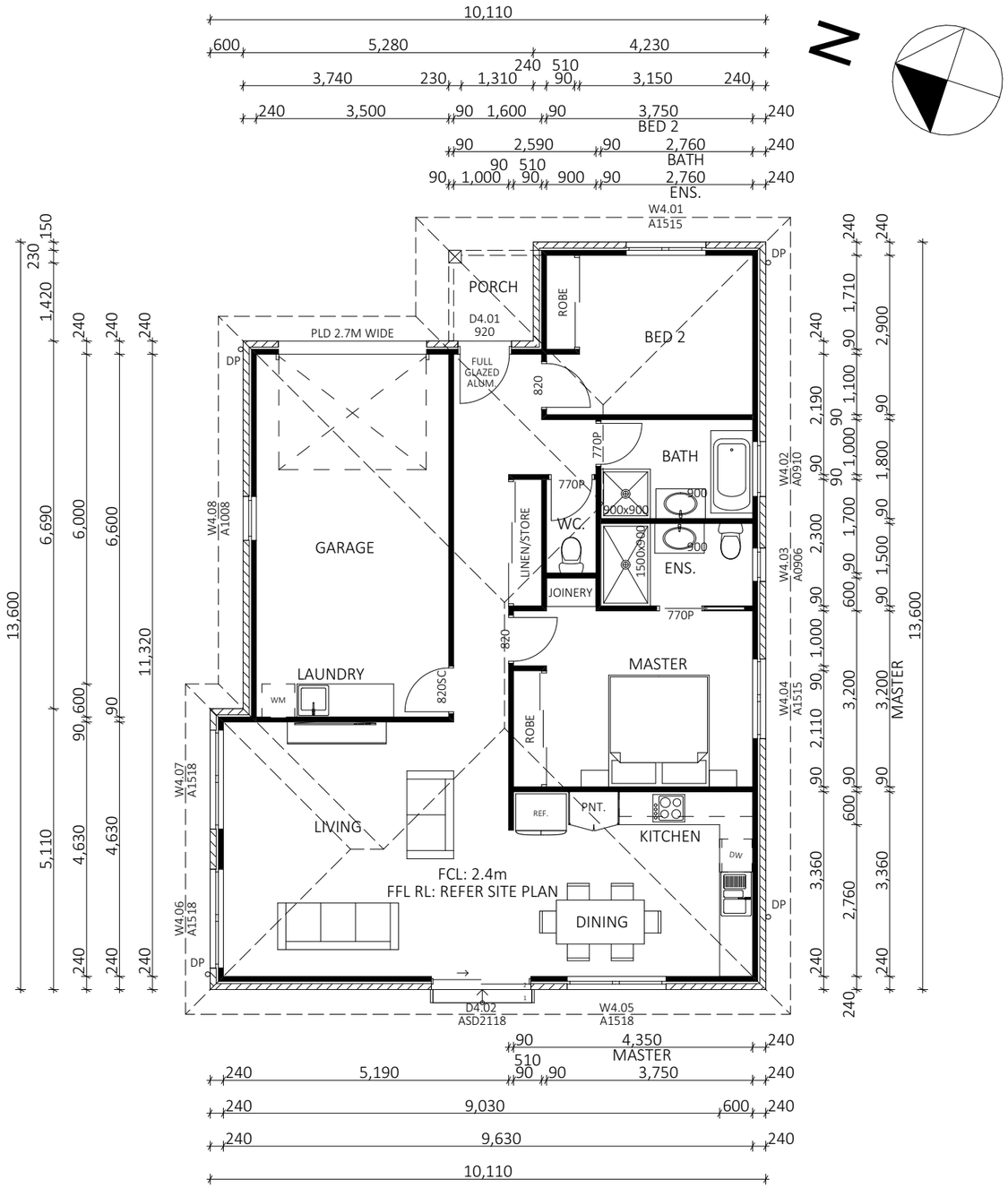
SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD,
CARRICK TAS, 7291.

DRAWING
UNIT 3 & 5
ELEVATIONS
EST/WST

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.
SIGNATURE: DATE:
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	17/22
CHECKED	M.L.	SCALE (@A3)	1:100



UNIT 4 & 6

0 1 2 3 4 5m

DESIGN TO LIVE

ACC # 371799313
ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNITS 4 & 6
FLOOR PLAN

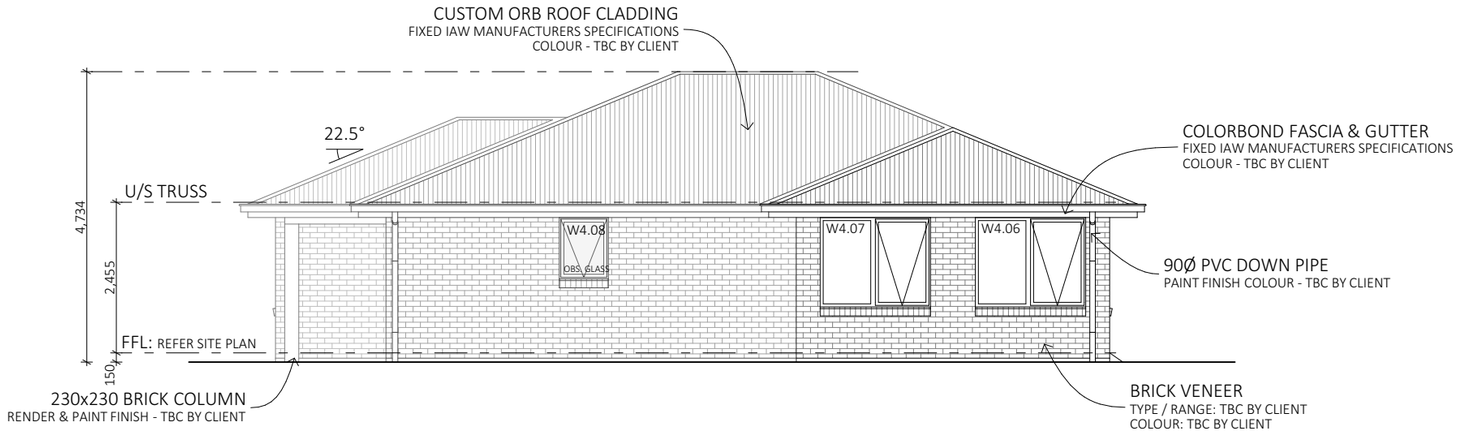
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

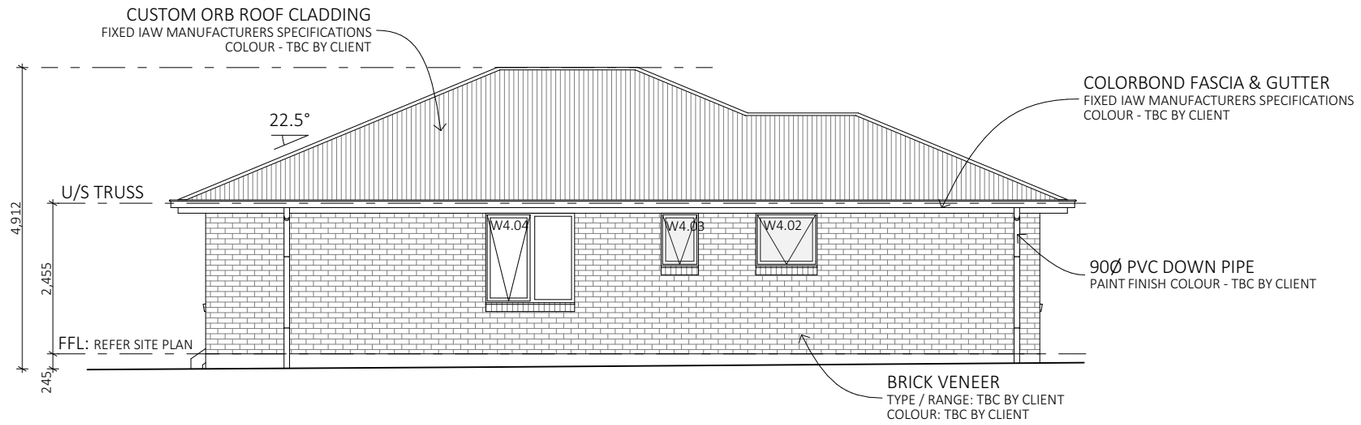
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	18/22
CHECKED	M.L.	SCALE (@A3)	1:100



NORTH ELEVATION



SOUTH ELEVATION

0 1 2 3 4 5m

DESIGN TO LIVE
ACC # 371799313
ABN. 71 615 812 747
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E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD,
CARRICK TAS, 7291.

DRAWING
UNIT 4 & 6
ELEVATIONS
NTH/STH

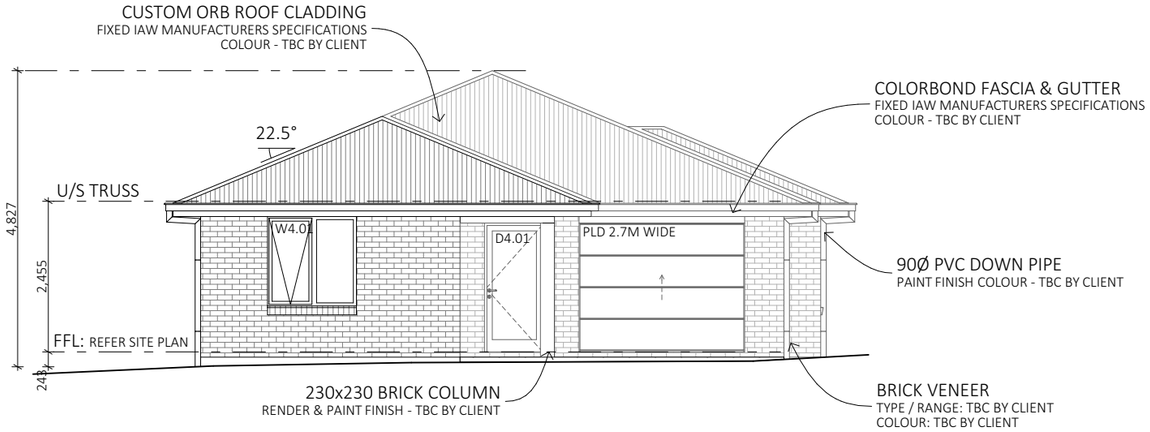
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

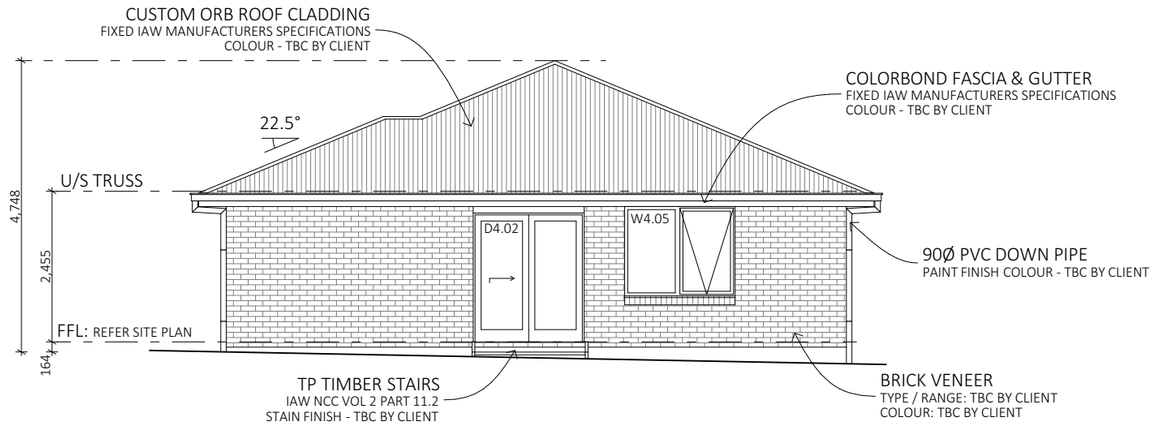
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	19/22
CHECKED	M.L.	SCALE (@A3)	1:100



EAST ELEVATION



WEST ELEVATION

0 1 2 3 4 5m

DESIGN TO LIVE
ACC # 371799313
ABN. 71 615 812 747
PH. 6344 7319
E. info@designtolive.com.au
W. designtolive.com.au

CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
UNIT U4 & 6
ELEVATIONS
EST/WST

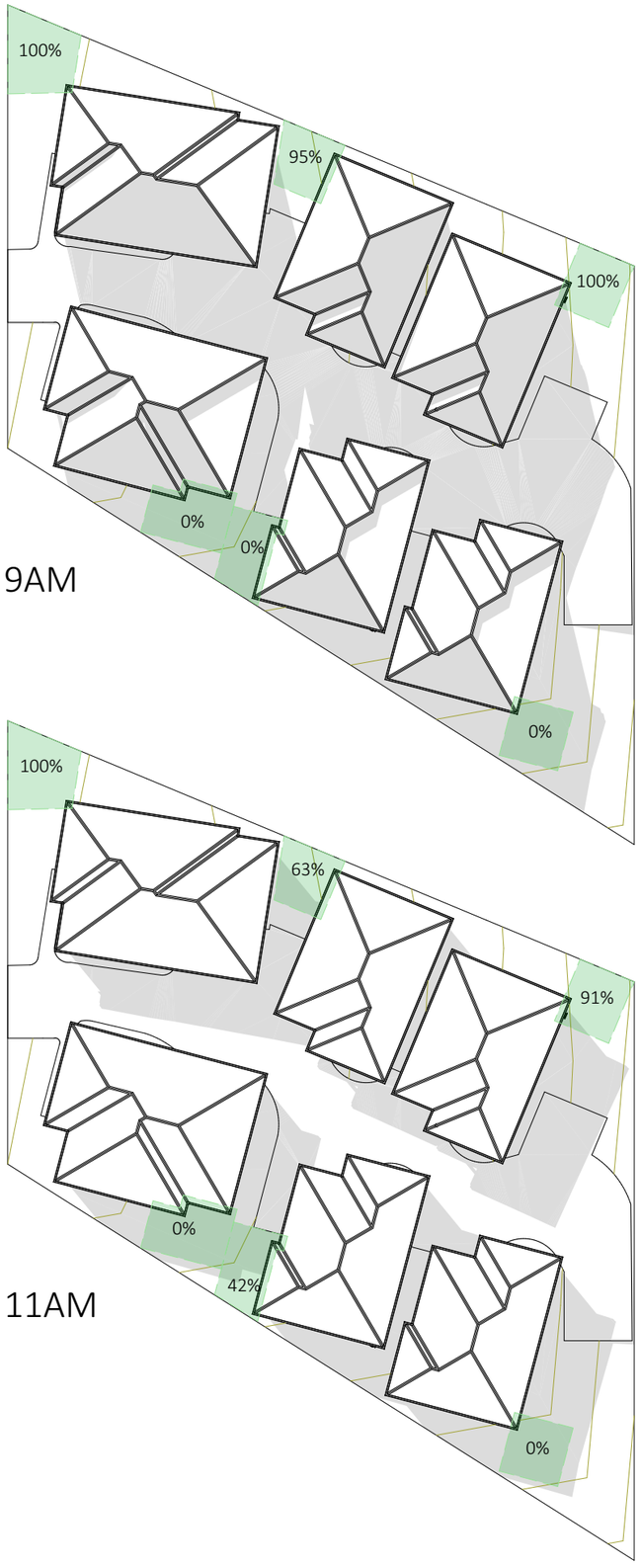
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

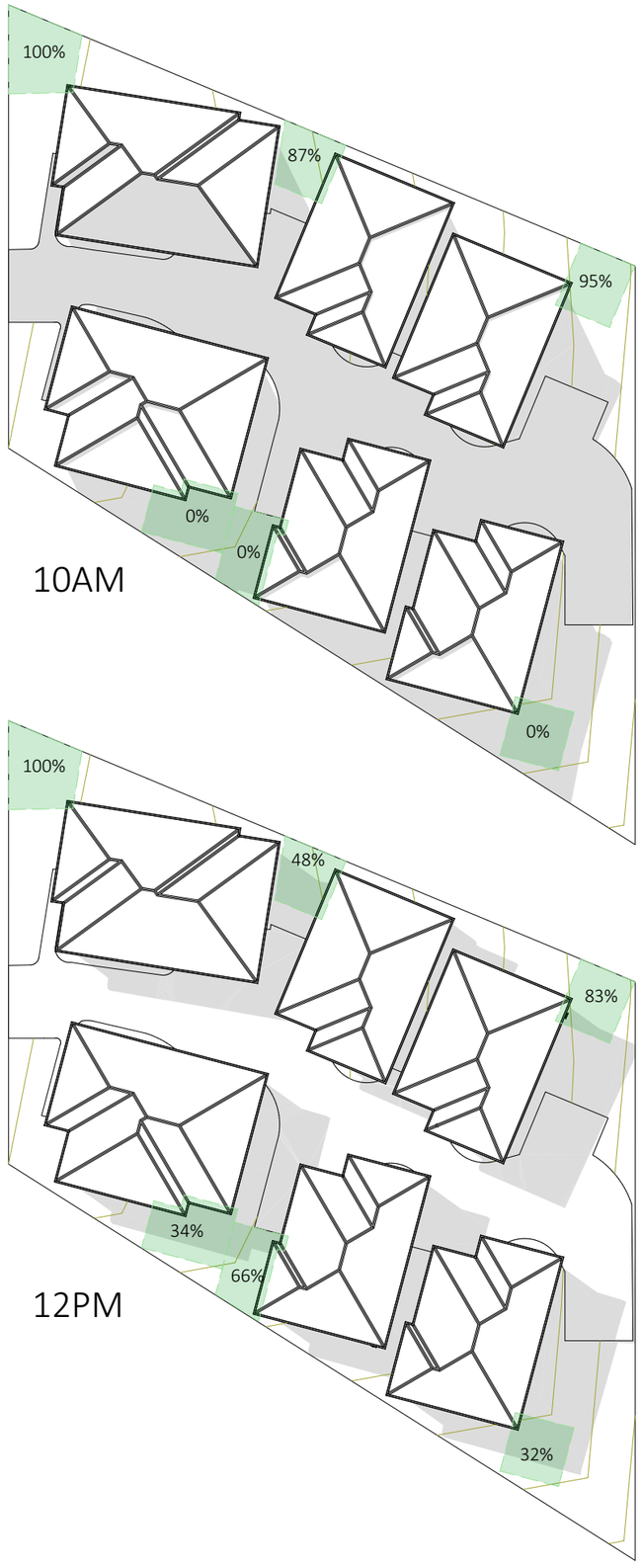
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	20/22
CHECKED	M.L.	SCALE (@A3)	1:100



9AM



10AM

11AM

12PM

N

- PRIVATE OPEN SPACE

NOTE:
PERCENTAGE SHOWN REPRESENTS AREA OF DEDICATED PRIVATE OPEN SPACE WITH DIRECT SUNLIGHT ACCESS.

DESIGN TO LIVE
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CLIENT/S:
MZSR DEVELOPMENTS

SITE ADDRESS:
LOT 3 (5) MEANDER VALLEY ROAD, CARRICK TAS, 7291.

DRAWING
SHADOW DIAGRAMS

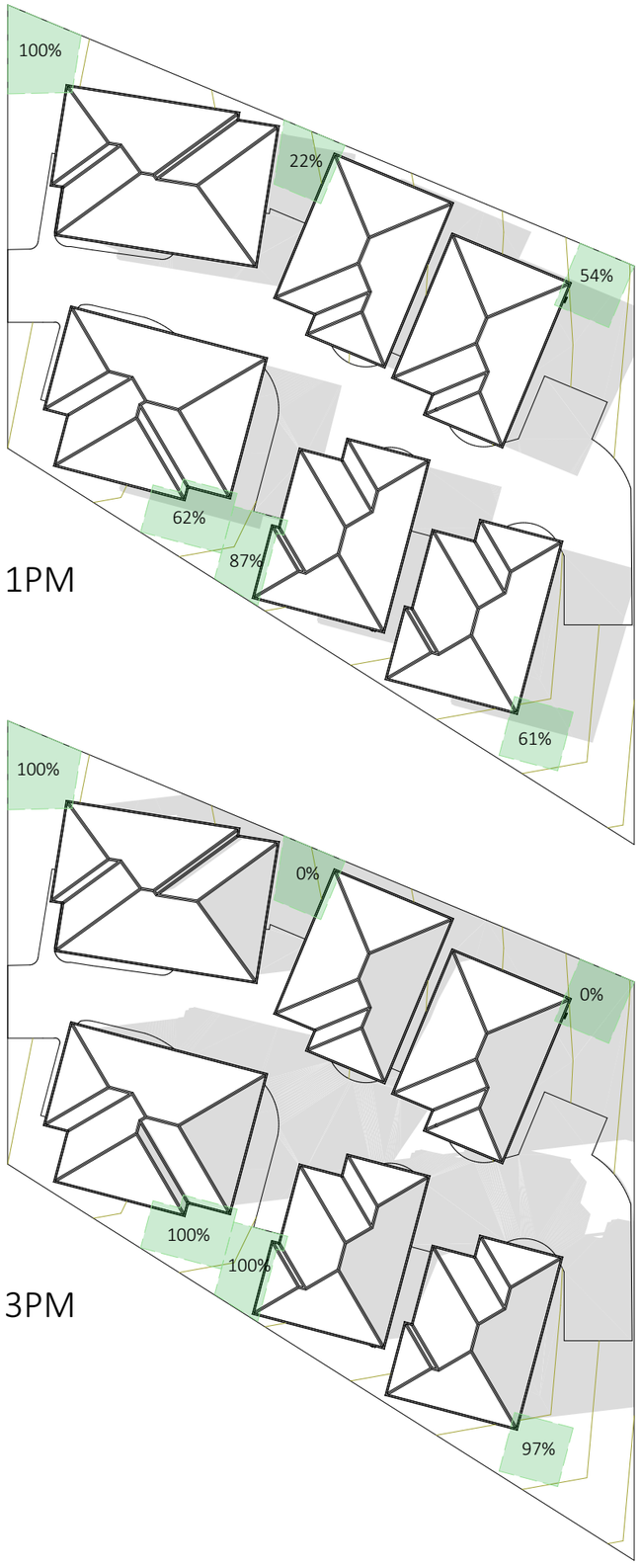
I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.

SIGNATURE: DATE:

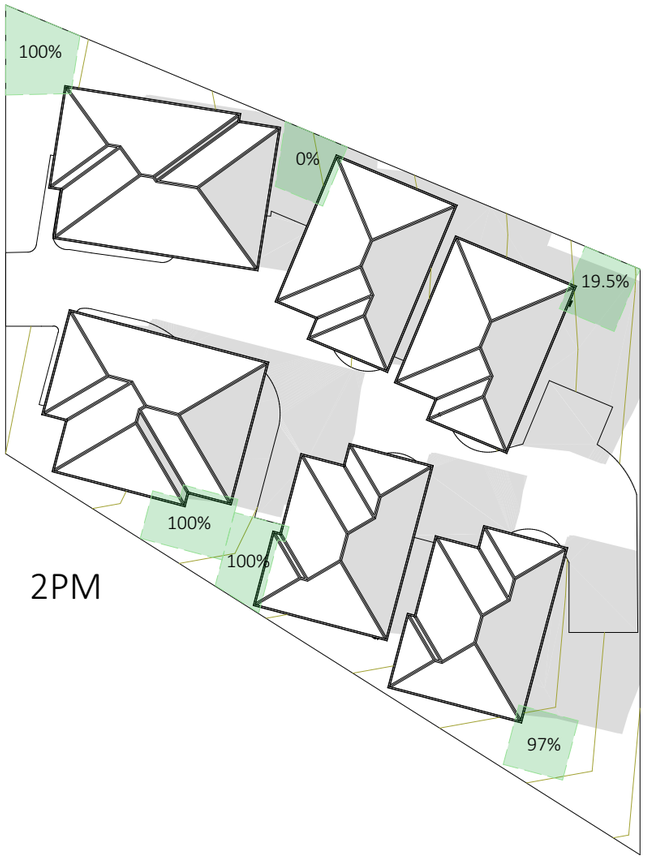
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	21/22
CHECKED	M.L.	SCALE (@A3)	1:500



1PM



2PM

3PM

N

- PRIVATE OPEN SPACE

NOTE:
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DRAWING
SHADOW DIAGRAMS

I/WE APPROVE THESE DRAWING TO BE CORRECT PER CONTRACT.
SIGNATURE: DATE:
SIGNATURE: DATE:

REV.	DATE	DESCRIPTION
R1	16/04/2024	FOR REVIEW
R2	24/04/2024	FOR DA

DESIGNER	M.L.	JOB NUMBER	MNDR05
DRAWN	D.M.	DRAWING	22/22
CHECKED	M.L.	SCALE (@A3)	1:500

SAFETY IN DESIGN REPORT PER WHS REGULATIONS

The following risks which are unique to this design have been identified:	NIL
This report does not relieve contractors from their responsibilities under the Act to identify, report, mitigate and manage all aspects of risk and safety.	

N

0 2 4 6 8 10m
SCALE 1:200

ON-SITE STORMWATER DETENTION (OSD) SUMMARY

- REQUIRED OSD STORAGE (1%AEP): 12.5m³
- PERMITED SITE DISCHARGE (20% AEP): 10.0L/s
- SITE OSD STORAGE: 12.5m³

TITLE BOUNDARY - 56.026m

149.83 149.63 149.43 149.23 149.03 148.83 148.63

TITLE BOUNDARY - 36.576m

F/H

34.71 m²

25.05 m²

26.64 m²

UNIT 1
FFL: (TBC)

UNIT 3
FFL: (TBC)

UNIT 5
FFL: (TBC)

DN150 RISER TO SURFACE
WITH GRATE TO CAPPED
END OSD STORAGE PIPES

SW PIT 1
SL:149.80
TWL:149.23
IL:148.76

SW PIT 2
SL:149.44 (TBC)
IL:148.83

NEW DN225 uPVC PIPE TO
NEW GRATED PIT
MINIMUM GRADIENT 1 IN 200

MIN 18.3m

MIN 22.5m x4

FALL

ORIFICE BAFFLE PLATE
TO SW PIT 1
REFER TO DETAIL ON C02

SW PIT 3
SL:149.33 (TBC)
TWL: 149.23
IL:148.95

TITLE BOUNDARY - 47.549m

EX.
CROSSOVER

OSD STORAGE
DN375 (BLACKMAX) RRJ SN8 PIPES
MINIMUM GRADIENT 1 IN 300
AS SHOWN

NEW DN150 uPVC STORMWATER
CONNECTION TO EXISTING PIT
MINIMUM GRADIENT 1 IN 100

UNIT 2
FFL: (TBC)

S/W PIT

STORMWATER MAIN

SEWER MAIN

WATER MAIN

MEANDER VALLEY ROAD

MH

UNIT 4
FFL: (TBC)

UNIT 6
FFL: (TBC)

32.59 m²

27.88 m²

25.00 m²

149.83 149.63 149.43 149.23 149.03 148.83 148.63

TITLE BOUNDARY - 61.087m

REV	DATE	REMARK
DA	31.05.24	DEVELOPMENT APPROVAL

Accepted CJM (Discipline Head)		Date 31/05/2024
Accepted JAL (Team Leader)		Date 31/05/2024
Approved NFA (Principal)		Date 31/05/2024

This document must be signed "Approved" by JMG to authorise it for use. JMG accept no liability whatsoever for unauthorised or unlicensed use.

SCALES @ A3	DESIGNED BY	DRAWN BY
AS SHOWN	DCW	CJH
	PLOT DATE	31/05/2024

DO NOT SCALE. Use only figured dimensions. Locations of structure, fittings, services etc on this drawing are indicative only. CONTRACTOR to check Architects & other project drawings for co-ordination between structure, fabric, fixtures, fittings, services etc. CONTRACTOR to site check all dimensions and exact locations of all items. JMG accepts no responsibility for dimensional information scaled or digitally derived from this document.

Johnstone McGee & Gandy Pty. Ltd.
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PROJECT
CHRIS REISSIG BUILDERS Pty Ltd
LOT 3, 5 MEANDER VALLEY RD
CARRICK

TITLE
ON-SITE STORMWATER
DETENTION (OSD) PLAN

PROJECT NO. 240340LO
DWG NO. C01
REVISION DA
PLOT DETAILS 240340LO.DWG

SAFETY IN DESIGN REPORT PER WHS REGULATIONS

The following risks which are unique to this design have been identified:	NIL
This report does not relieve contractors from their responsibilities under the Act to identify, report, mitigate and manage all aspects of risk and safety.	

0 0.2 0.4 0.6 0.8 1m

SCALE 1:20

GENERAL

1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ENGINEERING AND OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT PRIOR TO COMMENCEMENT OF WORK.

2 ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK AND ANY DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT.
THE ENGINEERS DRAWINGS SHALL NOT BE SCALED.

3 THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ANY STRUCTURES IN A STABLE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD AND ENSURING NO PART SHALL BE OVERSTRESSED DURING CONSTRUCTION ACTIVITIES.

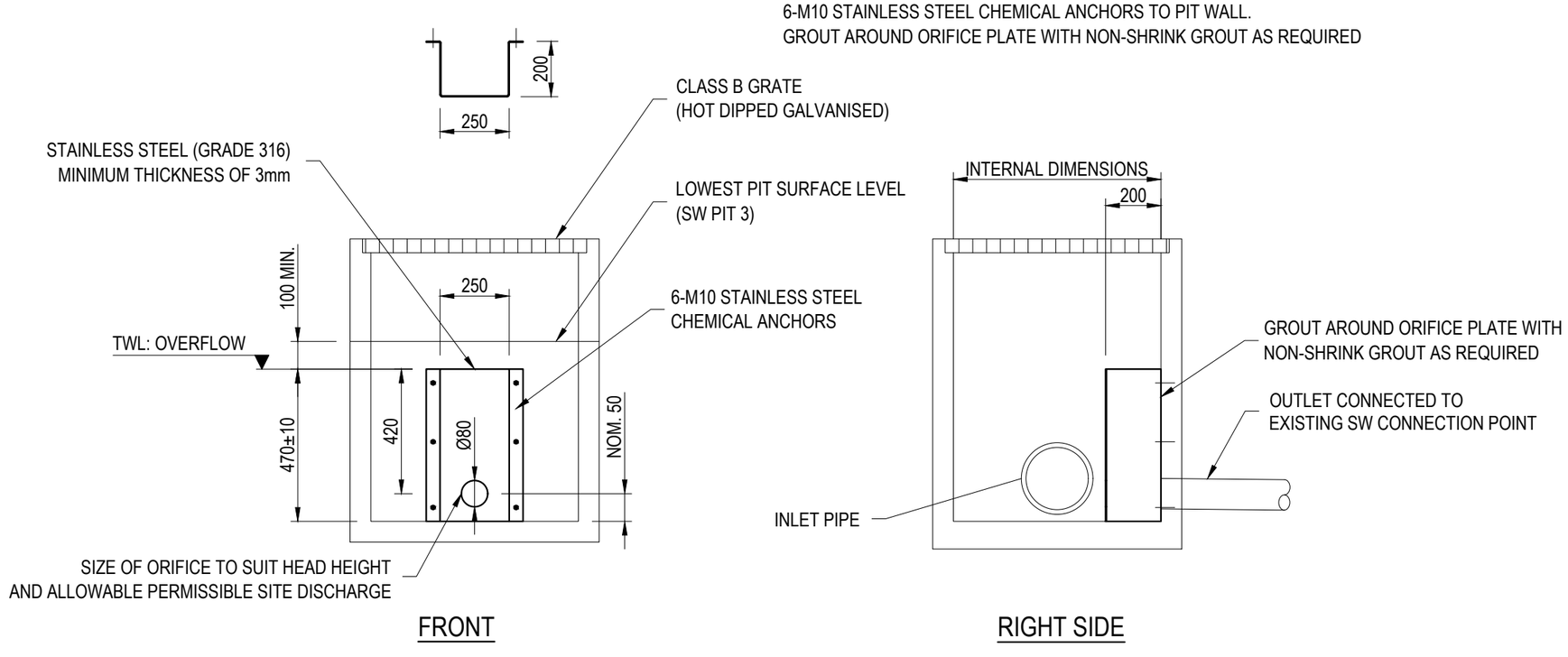
4 WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT AUSTRALIAN STANDARDS INCLUDING ALL AMENDMENTS, AND THE LOCAL STATUTORY AUTHORITIES.

5 THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO ESTABLISH THE LOCATION OF AND PROTECT EXISTING SERVICES AT THE SITE. SERVICES SHOWN ON THE DRAWINGS ARE IN APPROXIMATE LOCATIONS ONLY. SERVICES OTHER THAN THOSE SHOWN MAY EXIST ON THE SITE.

ON-SITE STORMWATER DETENTION (OSD)

- PRE-DEVELOPMENT PERMITTED SITE DISCHARGE
  - 20% AEP, BASED ON 50% IMPERVIOUS SURFACE, 15 MINS BURST DURATION = 10.0L/s
- POST-DEVELOPMENT FLOWS TO BE RESTRICTED TO PRE-DEVELOPMENT SITE DISCHARGE
- POST DEVELOPMENT SITE DISCHARGE
  - 1% AEP, BASED ON 74% IMPERVIOUS SURFACE = 31.0L/s
  - REQUIRED OSD STORAGE (1% AEP), 34mins BURST DURATION = 12.5m³
- SITE OSD STORAGE: 12.5m³
- PROVIDE PRECAST CONCRETE PITS (SW PIT 1 TO SW PIT 2)
  MINIMUM INTERNAL DIMENSIONS 750'W'x750'L'x600'D'
  CLASS B GRATE (HOT DIPPED GALVANISED).
  PRECAST CONCRETE PIT RISER MAY BE REQUIRED TO PROVIDE ADJUSTMENT WITH FINISHED SURFACE LEVEL
- INSTALL ORIFICE BAFFLE PLATE WITH CIRCULAR OPENING.
  ORIFICE DIAMETER = 80mm WITH THE CENTRE 50mm ABOVE THE INVERT.

  ORIFICE BAFLE PLATE TO BE MANUFACTURED FROM STAINLESS STEEL (GRADE 316) TO A MINIMUM THICKNESS OF 3mm WITH A CLEAN-CUT OPENING AND SECURELY FITTED WITH 6-M10 STAINLESS STEEL CHEMICAL ANCHORS TO PIT WALL.
  GROUT AROUND ORIFICE PLATE WITH NON-SHRINK GROUT AS REQUIRED



FRONT

RIGHT SIDE

ORIFICE PLATE DETAIL FOR OSD

SCALE 1:20

REV	DATE	REMARK
DA	31.05.24	DEVELOPMENT APPROVAL

Accepted CJM (Discipline Head)		Date 31/05/2024
Accepted JAL (Team Leader)		Date 31/05/2024
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SCALES @ A3	DESIGNED BY	DRAWN BY
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www.jmg.net.au infohbt@jmg.net.au infoltn@jmg.net.au

PROJECT
CHRIS REISSIG BUILDERS Pty Ltd
LOT 172, SANDSCAPE COURT
HADSPEN

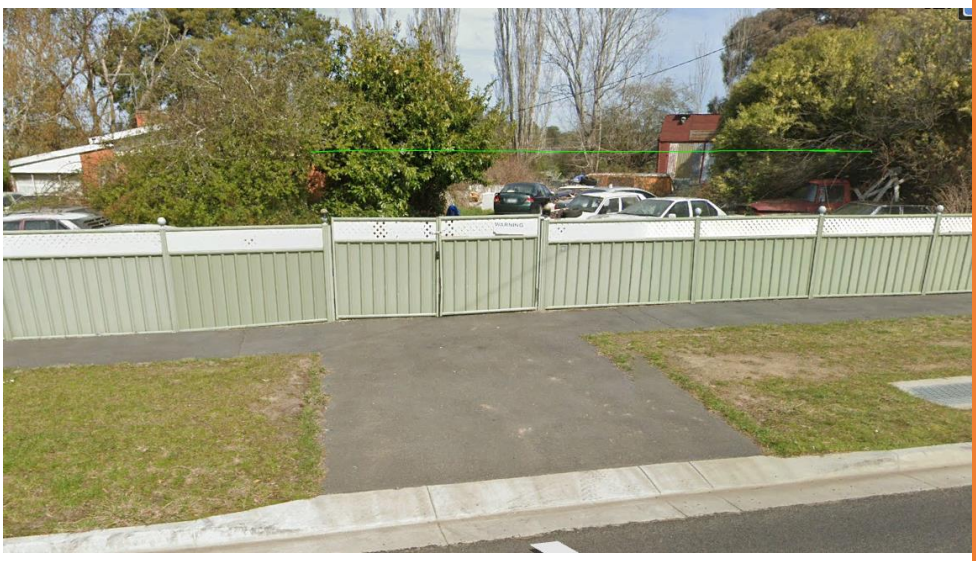
TITLE
ON-SITE STORMWATER DETENTION (OSD)
NOTES & ORIFICE PLATE

PROJECT NO. 240340LO

DWG NO. C02

REVISION DA

PLOT DETAILS 240340LO.DWG



TRAFFIC IMPACT ASSESSMENT

Hubble Traffic

May 2024

SIX RESIDENTIAL UNITS, LOT 3 (5) MEANDER VALLEY ROAD, CARRICK

Hubble Traffic
T: 0416 064 755
E: Hubbletraffic@outlook.com
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Version	Date	Reason for Issue
Draft	May 2024	Draft issued for client feedback
Final	May 2024	Final issued

Table of Contents

1. Introduction

JMG Engineers has engaged Hubble Traffic to prepare an independent Traffic Impact Assessment, to consider the traffic impacts from the provision of six new residential units at 5 Meander Valley Road (development site), Carrick.

This assessment has considered the amount of traffic this unit development is likely to generate, how the additional traffic movements will integrate into the existing road network and enter and leave the development site using the existing vehicular access with Meander Valley Road.

An on-site inspection was not undertaken, with site information gained from Google Earth, and traffic data obtained from a Department of State Growth Traffic Station within close proximity to the development site.

This multi-unit development has been assessed against the Tasmanian Planning Scheme C2 Parking and Sustainable Transport Code, C3 Road and Railway Assets Code, and the Australian Standard 2890.1:2004.

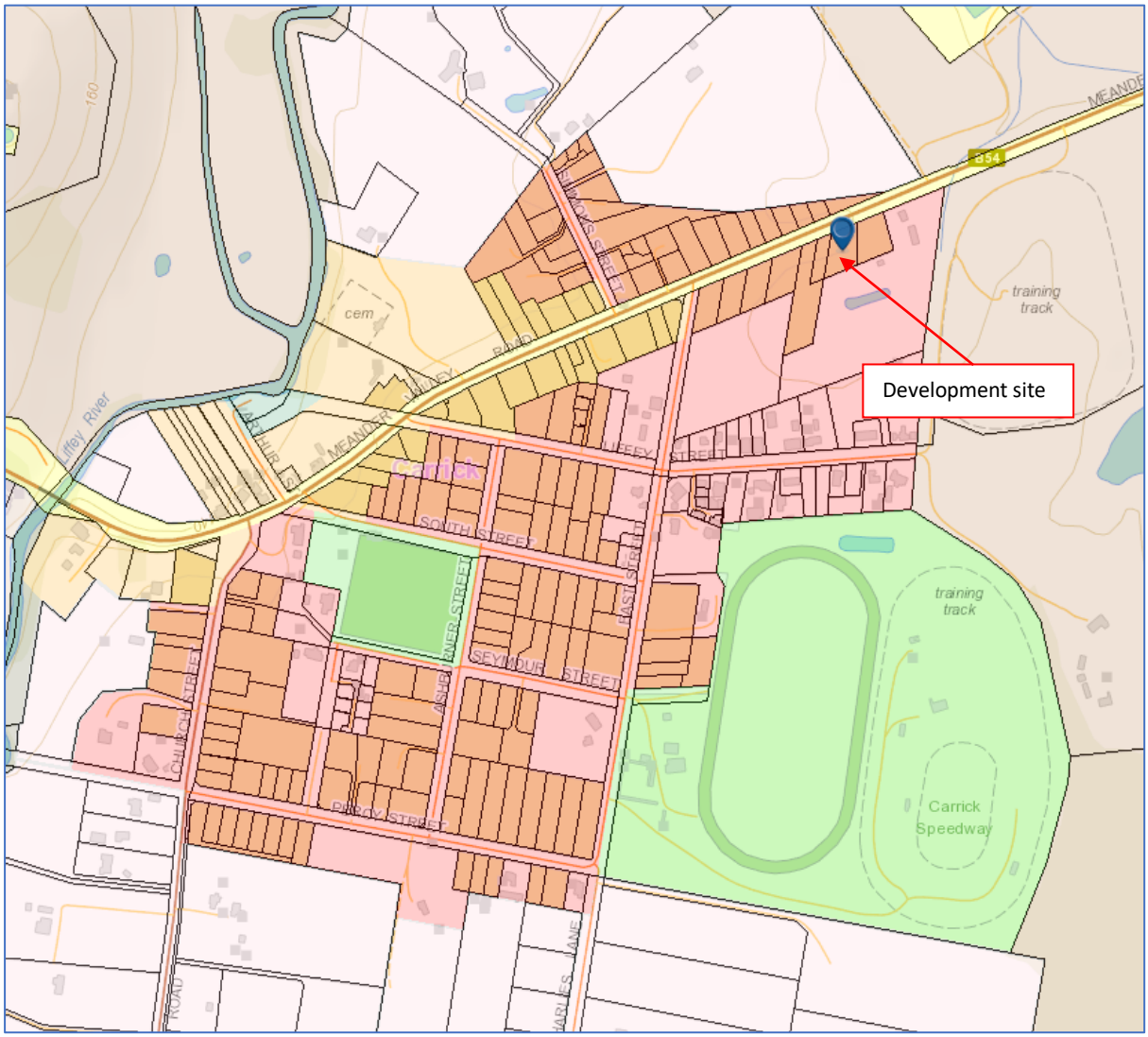
This report has been prepared to satisfy the requirements of Austroads, Guide to Traffic Management Part 12: Traffic Impacts of Developments, 2019, and referred to the following information and resources:

- Tasmanian Planning Scheme (Meander Valley Council)
- Road Traffic Authority NSW (RTA) Guide to Traffic Generating Developments
- Australian Standards AS2890 parts 1, 2 and 6
- Austroads series of Traffic Management and Road Design
  - Part 4: Intersection and crossings, General
  - Part 4a: Unsignalised and Signalised Intersections
  - Part 12: Traffic Impacts of Development
- Department of State Growth crash and traffic databases
- Vehicle swept path software
- LIST – Land Information Database

2. Site Description

Located at 5 Meander Valley Road, Carrick, the development site is occupied by an existing residential dwelling with a vehicular access onto Meander Valley Road. The site is located within an established residential area and within close proximity to the town centre.

Diagram 2.0 – Extract from LIST Land Information Database – Land title 94801/3



3. Development proposal

As advised by the developer, the existing dwelling and outbuilding will be removed for the construction of six new residential units, which will consist of four two-bedroom and two three-bedroom units.

Each of the units will have two dedicated parking spaces, with the two bedroom units having a single garage and an uncovered parking space, while the three bedroom units will have a double garage. Two visitor parking spaces will be provided to support the development.

The existing concrete crossover will be modified to 6 metres to accommodate two-way traffic flow to minimise impact to Meander Valley Road users.

Diagram 3.0 – Development proposal

4. Trip generation by this development

A trip in this report is defined as a one-way vehicular movement from one point to another, excluding the return journey. Therefore, a return trip to and from a land use is counted as two trips.

To determine the number of trips likely to be generated by this development, reference has been taken from the RTA Guide to Traffic Generating Developments (RTA Guide), section 3.3 residential housing.

This Guide recommends for low density residential dwellings in regional areas (RTA update 4a - August 2013) for:

- Daily vehicle trips of 7.4 per dwelling, and
- Weekday peak trips of 0.78 per dwelling.

The Guide recommends for medium density residential units, smaller units (up to two bedrooms):

- Daily vehicle trips of 5 per unit, and
- Weekday peak trips of 0.5 per unit.

The Guide recommends for medium density residential units, larger units (three or more bedrooms):

- Daily vehicle trips of 6.5 per unit, and
- Weekday peak trips of 0.65 per unit.

From the RTA Guide the six new units are predicted to generate 33 daily trips, with three of these trips likely to occur during the morning and evening peak periods. Considering the site is already generating trips from the existing dwelling, the number of new trips is reduced to 26 daily trips, with two of these operating in the peak hour periods.

Table 4.0 – Predicted number of trips to be generated from the six units and existing dwelling

Dwelling Type	RTA Generation rate	Number of units/dwellings	Daily trips	Peak trips
2-Bedroom unit	5 per day 0.5 per peak	4	20	2
3-Bedroom unit	6.5 per day 0.65 per peak	2	13	1
Unit trips		6	33	3
Existing dwelling	7.4 per day 0.78 per peak	1	7.4	1
Existing trips		1	7	1
New trips			**26**	**2**

5. Existing traffic conditions

Meander Valley Road is part of the State Road network and functions as a collector road connecting the surrounding areas to the Bass Highway.

5.1 Meander Valley Road characteristics

For the purpose of this assessment, Meander Valley Road runs in an east to west orientation past the development site, with a generally straight horizontal road alignment and a reasonably flat vertical grade. The road adjacent to the development site has been built to an urban standard, with a sealed bitumen surface, concrete kerb and guttering, footpaths along both sides, and street lighting. Along the southern side is a wide grassed nature strip and footpath situated adjacent to the property boundary.

Adjacent to the development site, the road is approximately 10 metres wide from kerb face to kerb face, with one traffic lane in each direction. The centreline markings are off-set to the north to allow for on-street parking along the southern kerb, while the solid continuous centreline restricts on-street parking along the northern kerb.

When the on-street parking lane along the southern side is not in use, vehicles can turn into the site from the parking lane, minimising the traffic flow impact.

Photograph 5.1A – Image from Google Earth of Meander Valley Road

5.2 Traffic activity on the surrounding road network

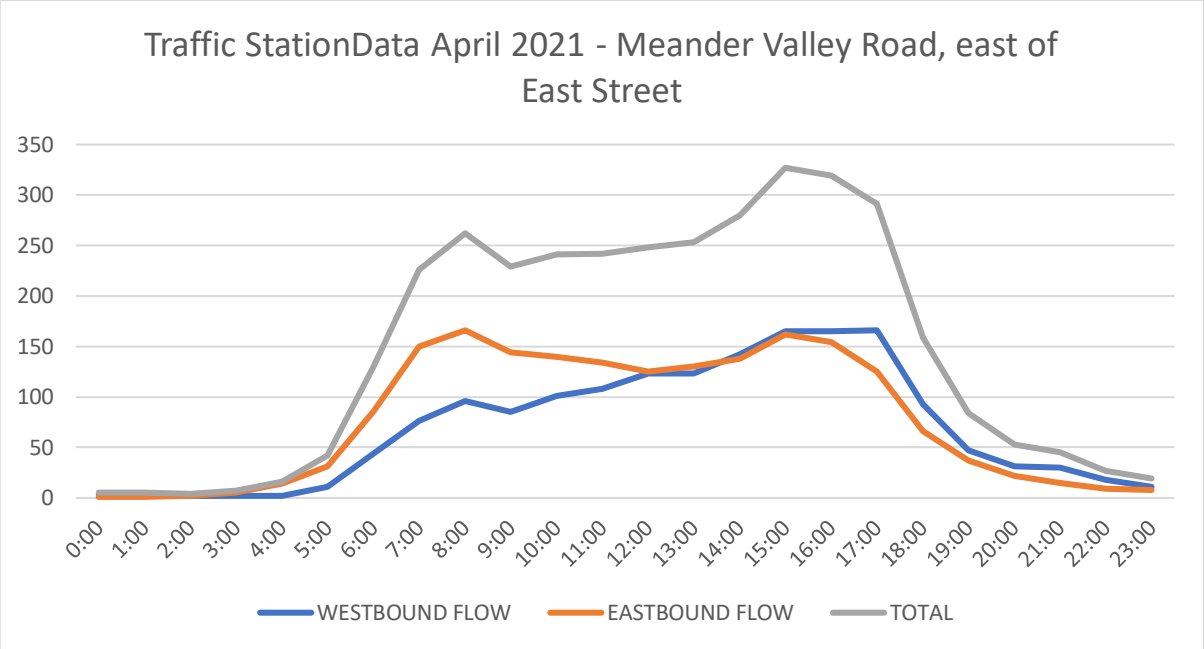
The Department's nearest traffic station is located 270 metres east of East Street, which is within 100 metres of the development site. The available data is for one week in April 2021, and shows an average traffic data total of 3,514 vehicles.

Graph 5.2 is a data extract from the traffic database showing both the morning and evening peak commuting periods. The two-way traffic flow for the morning peak hour is 262 vehicles, with 96 vehicles travelling westbound and 166 eastbound.

In the afternoon, the highest two-way traffic flow of 327 occurred between 3:00pm and 4:00pm, while between 5:00pm to 6:00pm there were 319 vehicles, with 165 westbound and 154 eastbound. Between the morning and evening periods, the average two-way traffic flow was 250 vehicles.

Overall, traffic flow on Meander Valley Road pass the development site is reasonably low for a collector road.

Graph 5.2 – Department of State Growth Traffic Station Data



5.3 Speed limit

Based on the LIST database, this section of the Meander Valley Road has a posted 60 km/h speed limit, in recognition of being a local collector road, within an urban environment.

5.4 Traffic safety

The Department maintains a database of reported road crashes. A check of this database for the last five years found one crash occurred on Meander Valley Road in May 2023, at 5:05pm in the 100km speed limit zone, prior to reaching the 60km zone near the development site. The single vehicle crash resulted in property damage.

There have been no reported crashes within 500 metres of the development site.

6. Impact from traffic generated by this development

As determined by section 4 of this report, the development site is estimated to generate up to an additional 26 daily trips, with two of these trips likely to occur during the morning and evening peak periods. It is common with residential properties, that 90 percent of the trips leave the site during the morning peak, with the opposite occurring in the evening peak.

6.1 Lane capacity and level of service on Meander Valley Road

In evaluating the impact of additional vehicle movements on Meander Valley Road users, it is important to understand the Level of Service (LOS) motorists are currently receiving. The RTA Guide provides guidance for urban roads, based on peak hour directional traffic flows.

Diagram 6.1 – Extract from the RTA Guide on level of service for traffic lanes

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Based on the directional traffic flows obtained from the Department's traffic station, the RTA criteria indicates that all traffic lanes on Meander Valley Road are operating at LOS A, during peak hour periods. Table 6.1 demonstrates that all traffic lanes are operating with less than 200 vehicles per hour.

Additional vehicles generated by the development have been assigned to Meander Valley Road, with table 6.1 demonstrating there is no deterioration in level of service, as motorists will continue to operate at LOS A.

Table 6.1 – Directional Lane flows and level of service for Meander Valley Road

Scenario	Criteria	Morning Peak Hour			Evening Peak Hour		
		Westbound	Eastbound	Two-way	Westbound	Eastbound	Two-way
Existing conditions	Flows	96	166	262	165	154	319
	LOS	A	A		A	A	
Development operating	Flows	98	168	266	167	156	323
	LOS	A	A		A	A	

Level of service A means that the traffic flow is stable, motorists have freedom to select their own operating speed, and there should be sufficient gaps in the traffic stream to enable vehicles to enter and leave without causing any adverse impacts.

6.2 Need for dedicated turning treatment

The development is predicted to generate three trips in the peak hour periods, with the potential for vehicles to turn right into the site during the evening peak.

Traffic flows in the evening peak are low at 154 eastbound and 165 westbound, which equates to one vehicle passing the development site on average every 23 seconds. There is a low probability of a right turning vehicle being delayed by an oncoming vehicle, and low risk of a right turning vehicle delaying following traffic.

There is no justification for a dedicated turning treatment, and this would be consistent with this section of Meander Valley Road.

7. Development layout and driveway arrangements

7.1 Existing vehicular access with Meander Valley Road

The existing vehicular access onto Meander Valley Road will be upgraded to 6.0 metres wide, to accommodate two-way traffic flow, enabling a B85 vehicle to enter and leave at the same time.

Photograph 7.1 – Existing vehicular access with Meander Valley Road

7.2 Sight distance from the development access

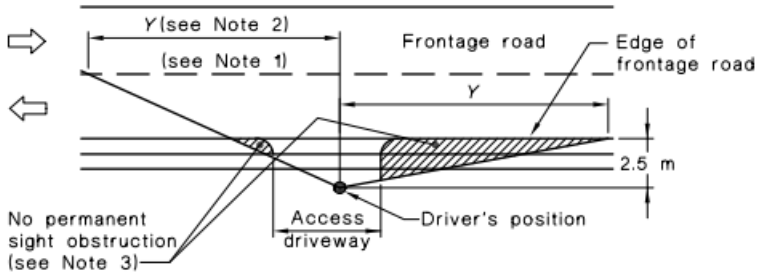
Drivers leaving the development site need to have suitable sight distance to undertake turning manoeuvres in a safe manner, without impacting motorists travelling along Meander Valley Road.

SISD (Safe Intersection Sight Distance) is based on the operating speed of approaching vehicles to the access and the gradient of the approach, with the approach speed normally taken as the posted speed limit. It is important to recognise that SISD is the highest sight distance parameter, suitable for public road intersections where there are significant traffic movements, with an expectation that many of the users would be unfamiliar with the intersection.

The sight distance requirement for a residential driveway is less than the SISD requirement, as the number of daily traffic movements are estimated to be significantly lower, with users being familiar with the access configuration. For these reasons, the Australian Standards 2890.1:2004 (the Standard) allows for a lower sight distance requirement to be used at residential driveways, indicating minimum gap sight distance is applicable.

Minimum gap sight distance is specified in the Standard, section 3.2.4, which indicates that for a residential driveway access with vehicles travelling in a 60 km/h speed environment, the minimum sight distance should be 65 metres, with a desirable sight distance of 83 metres.

Extract 7.2 – AS 2890.1:2004 – Sight distance



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Sight distance has been taken from Google Earth imaging, and it is evident that in both directions the available sight distance exceeds 83 metres, meeting the SISD requirement for the operating speed of approaching vehicles. This demonstrates that vehicles will be able to enter and leave the development site in a safe and efficient manner, without impacting other road users.

Photograph 7.2A – Available sight distance to the right

Photograph 7.2B - Available sight distance to the left

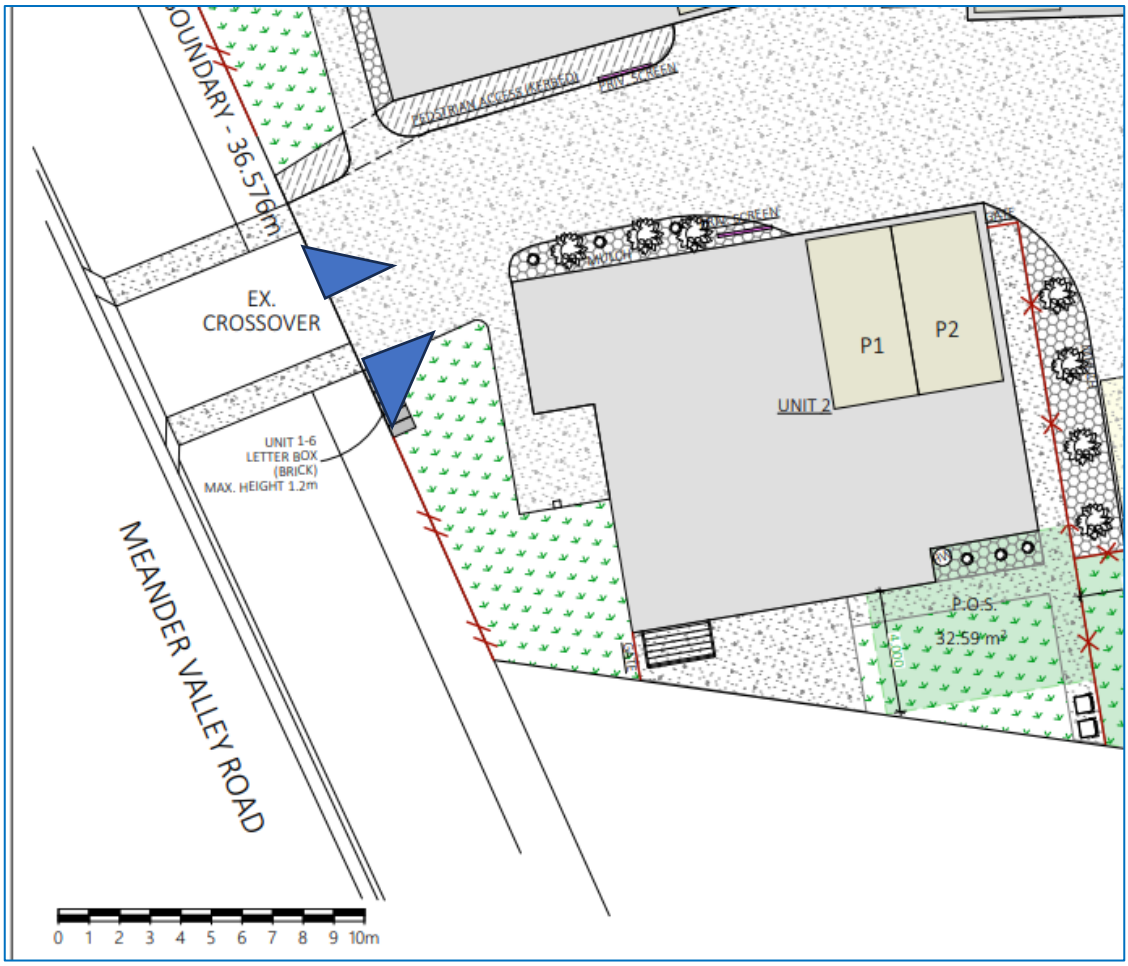
7.3 Pedestrian sight distance

It is important for drivers leaving the development site to have adequate sight lines to pedestrians and cyclists using the public footpath along Meander Valley Road.

The existing footpath is located adjacent to the property boundary, along the eastern side of the driveway there will be a minimum one metre concrete pathway connecting to the public footpath, this ensures the fence line stops prior to the driveway, allowing for adequate pedestrian sight lines.

Similarly, on the western side the fence line will stop at least two metres prior to the driveway to ensure adequate pedestrian sight lines are provided. The blue triangles within diagram 7.3 demonstrate the pedestrian sight lines of 2 metres wide x 2.5 metres deep, as specified in the Standard figure 3.3m. This means there will be adequate sight lines between pedestrians, cyclists, and drivers leaving the development site.

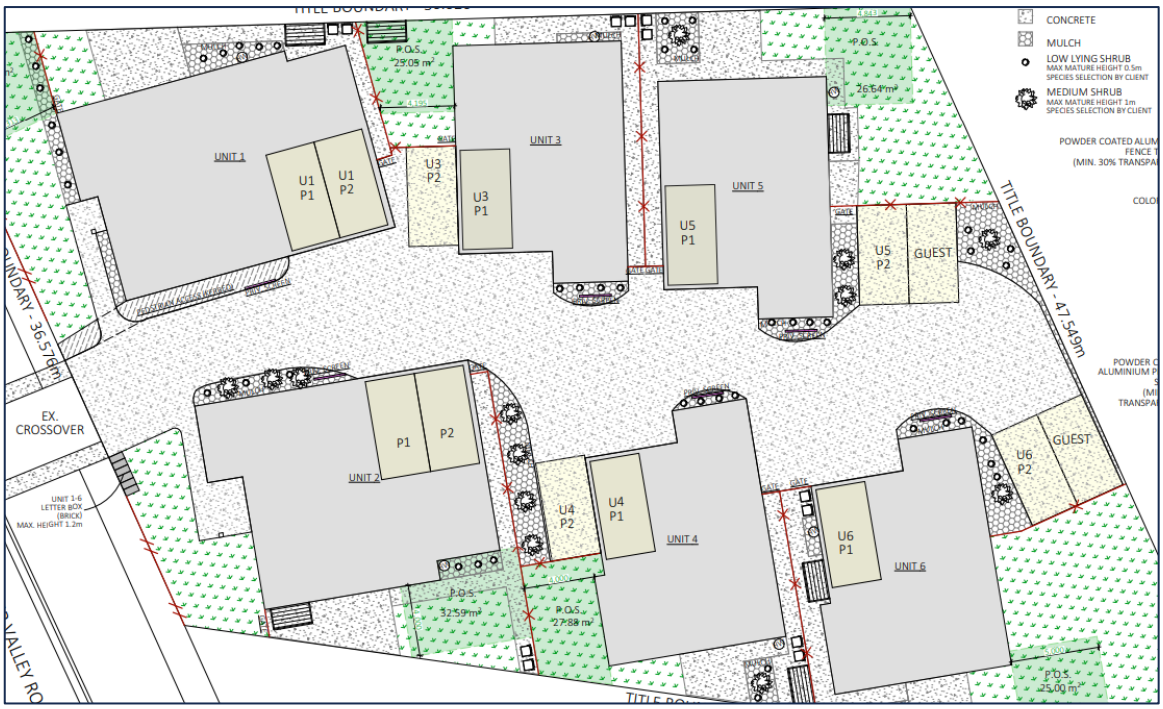
Diagram 7.3 – Pedestrian sight lines



7.4 Number and location of parking spaces

Each of the six units will be provided with two dedicated parking spaces located within close proximity to each unit, plus two on-site visitor parking spaces. In total the development site will provide 14 on-site parking spaces to meet the reasonable parking demand

Diagram 7.4 – Location of car parking spaces



7.5 Dimensions of parking spaces

Parking spaces within the development site have been designed to comply with both the dimensions specified in the planning scheme table C2.3, and the Standard as user class 1A suitable for residential or domestic use.

The single enclosed garages have been designed to comply with section 5.4 and figure 5.4 of the Standard. The Standard allows for the width of the garage to be made wider, which allows for the reduction of the manoeuvring area behind the garage, as the vehicle can commence to turn within the garage.

The single garage openings for units 3 and 5 have been designed at three metres wide, reducing the manoeuvring area to 5.6 metres. The width of the single enclose garage for units 4 and 6 will be 2.7 metres, reducing the manoeuvring area to 6.3 metres.

Where a parking space is located adjacent to a vertical obstruction higher than 150 millimetres, an additional 0.3 metres of width will be provided between the space and the obstruction. If there is a vertical obstruction on both sides, 0.3 metres will be provided on each side of the space.

The uncovered parking spaces associated with each unit will be designed as User Class 1A under the Standard, suitable for residential and domestic users. With the parking spaces being ninety degrees to the parking aisle, the spaces will be a minimum 2.4 metres wide, 5.4 metres long, and supported with a minimum parking aisle width of 5.8 metres.

Due to the constraint site, the dimensions of the visitor parking spaces will be provided with additional width, with these spaces measuring 2.8 metres wide, 5.4 metres long, and a minimum manoeuvring area of 5.8 metres, which complies with the dimensions specified in planning scheme table C2.3.

Two or more uncovered parking spaces will be delineated with pavement markings and supported with wheel stops where applicable.

7.6 Car parking manoeuvrability

Although the development site is constrained, the design provides sufficient manoeuvring area behind all car parking spaces to allow for vehicles to enter and leave in an efficient manner.

Vehicle swept path software has been used to demonstrate the swept path of a B85 vehicle entering and leaving all parking spaces, including visitor spaces, with the swept paths available in Appendix A.

The Standard acknowledge that a residential unit development generates a low turnover, with users generally prepared to accept some inconvenience when entering and leaving the parking spaces, and where necessary it is acceptable for vehicles to undertake a three point turn.

7.7 Gradient of parking spaces

The parking spaces will have grades that complies with Section 2.4.6 of the Standard and shall not exceed five percent.

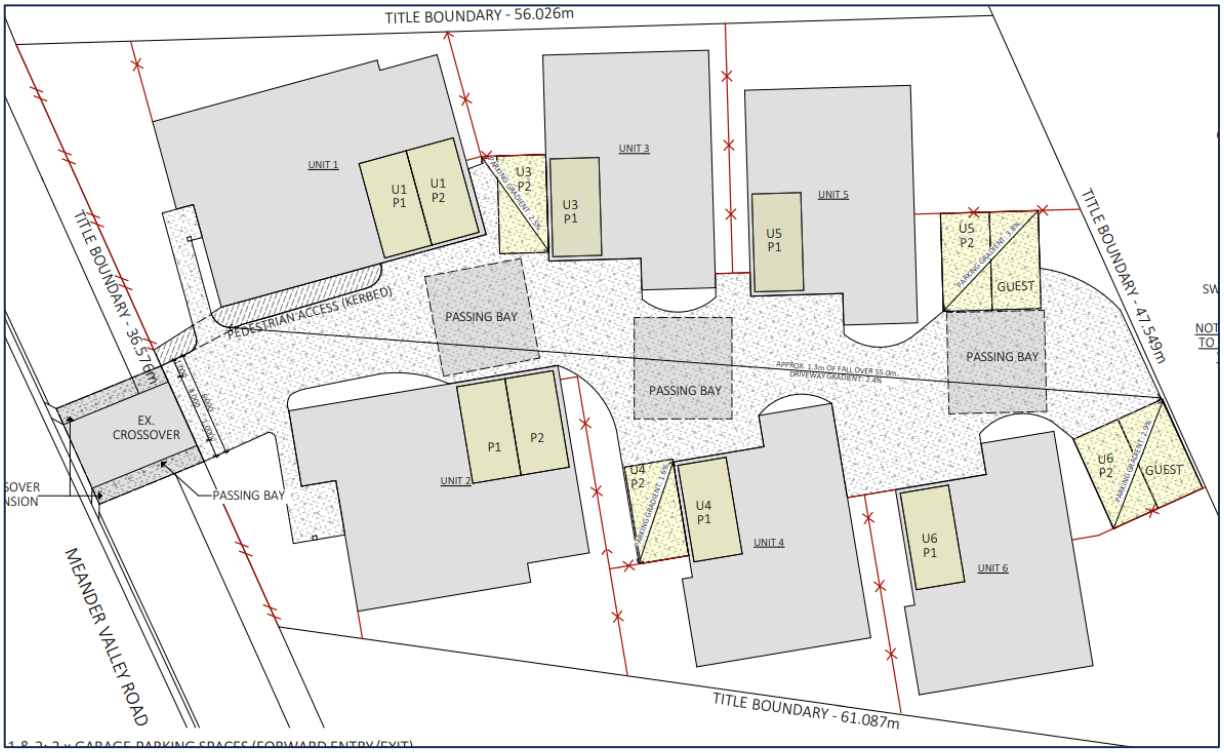
7.8 Internal driveway layout

The driveway extends from Meander Valley Road and serves the 14 parking spaces. At the road kerb the driveway will be widened to six metres for the first eight metres, then the width will reduce to operate a single lane with passing bays. This complies with table C2.2 of the planning scheme as the driveway serves less than 20 parking spaces.

7.9 Passing bays

The driveway incorporates three passing bays located within 30 metres of each other, with the passing bays to be a minimum of 5.5 metres wide and 6 metres long. Drivers will have unrestricted visibility to the next passing bay, to ensure efficient traffic flow for opposing vehicles, complying with table C2.3. Swept path diagrams in appendix A will demonstrate how opposing vehicles can pass within the passing bays.

Diagram 7.9 – Location of passing bays

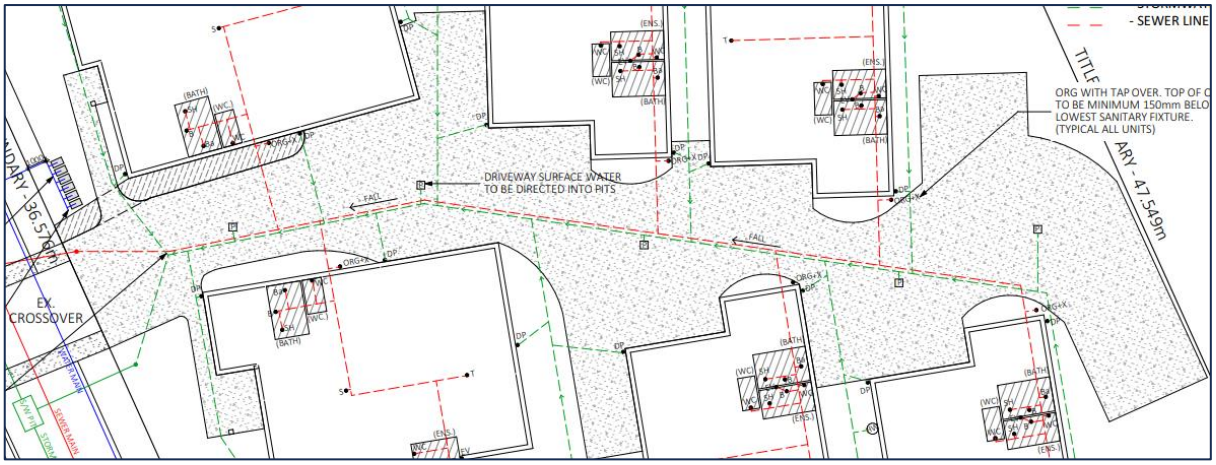


7.10 Driveway gradients and collection of surface water

The development site is reasonably flat and of a similar level to Meander Valley Road, with the driveway gradient expected to be relatively low, and unlikely to cause any ground clearance issues for vehicles arriving and leaving.

The driveway will have a concrete surface with ground pits centrally located, with the driveway camber to direct surface water from the units into the ground pits, which will be connected to an approved stormwater system. The design plans indicate 2.4 percent gradient on the driveway.

Diagram 7.10 – Management of surface water



7.11 Pedestrian access – internal pathways

The development includes a kerbed pedestrian access to unit 1, however due to the constrained site it is not possible to continue the pathway to the other units and will operate a shared zone. A 10 km/h shared zone speed limit will be implemented at the beginning of the driveway within the property, and under the Australian Road Rules this sign provides priority to pedestrians.

The six residential units are predicted to generate a low number of vehicle movements, with an average of 33 daily trips with three of these occurring in the busiest hour period, which is an average of one vehicle using the driveway every 20 minutes, representing a low risk for pedestrians.

The distance between the rear units and the public footpath is less than 50 metres, with a pedestrian walking at a standard walking pace of 1.2 metres per second, the time taken to walk the 50 metres is less than 42 seconds. There is no restriction on the line of sight within the driveway, these two factors further demonstrate the risk to pedestrians using the shared driveway is low.

7.12 Waste collection

The waste from the units will be collected from the side of the Meander Valley Road, the bins will be placed behind the kerb the night prior to collection, and are not expected to cause adverse impact to pedestrians, as there is a wide grassed verge as shown in photographs 7.2.

7.13 Access for emergency service vehicles

It is important that all buildings are accessible to fire emergency vehicles and according to Tasmania Fire Service, their heavy pump vehicle has similar vehicle dimensions to a medium rigid vehicle. The fire emergency vehicle has a slightly shorter wheel base than a medium rigid vehicle, which should provide better manoeuvring capabilities.

The six metre wide driveway will enable a fire service vehicle to enter and park in the first passing bay, where fire hoses can be laid out reaching all units. Due to site constraints the fire service vehicle will need to reverse out of the site, which is acceptable given the likelihood of this movement to be very low. Vehicle software is used to demonstrate the swept path of a medium rigid vehicle entering to unit 2, best representing a fire emergency vehicle, and is available in Appendix A.

8. Planning scheme

8.1 C2.0 Parking and Sustainable Transport Code

C2.5.1 Car parking numbers

The development will provide each of the six residential units with two dedicated parking spaces, plus two visitor parking spaces, minimising parking overflow, and complying with the acceptable solution.

C2.5.2 Bicycle parking numbers

Not applicable for a residential development.

C2.5.3 Motorcycle parking numbers

There is no requirement for motorcycle parking under planning scheme table C2.4 for a development with less than twenty parking spaces.

C2.5.4 Loading bays

Not applicable for a residential development.

C2.6. Development standards

C2.6.1 Construction of parking areas.	The parking spaces and internal driveway will be a hard wearing concrete surface, with stormwater pits centrally located and driveway camber directing surface water to the pits, which will be connected to an approved stormwater drainage system. The design complies with the acceptable solution A1.
C2.6.2 Design and layout of parking areas.	The internal layout and parking areas have been designed to comply with both the Australian Standard 2890.1:2004 for user class 1A, and the planning scheme, to ensure vehicles can easily enter, manoeuvre, and leave in a forward-driving direction. There will be sufficient manoeuvring areas adjacent to all the parking spaces to enable vehicles to enter and leave the spaces efficiently. The opening width of the single enclosed garages of units have been made wider to reduce the manoeuvring area and comply with section 5.4 of the Australian Standard 2890.1:2004. Uncovered parking spaces located adjacent to a vertical obstruction greater than 150 millimetres in height, will have an additional 0.3 metres width on either side to assist with

	manoeuvring. The parking spaces will be located on a gradient less than five percent. The width of the driveway will comply with dimensions specified in the planning scheme table C2.3, based on the number of car parking spaces the driveway serves, and the single lane sections will be supported with appropriate passing bays. Where two or more parking spaces are located together, they will be delineated by line markings, and supported with wheel stops where appropriate. Overall, the parking spaces and internal layout complies with the acceptable solution A1.1 (a) and (b).
C2.6.3 Number of accesses for vehicles.	The development will operate with an existing vehicular access onto Meander Valley Road that will be widened to provide for two way traffic, and this complies with the acceptable solution A1 (a) and (b).
C2.6.4 lighting of parking areas within the general business zone and central business zone	Not applicable
C2.6.5 Pedestrian access.	Addressed under the performance criteria
C2.6.6 Loading bays.	A residential development does not require loading bays.
C2.6.7 Bicycle parking and storage facilities	Not applicable for a residential development.
C2.6.8 Siting of parking and turning areas.	Not applicable for a general residential zone.

C2.6.5 Pedestrian access

Performance criteria	Assessment
Safe and convenient pedestrian access must be provided within parking areas, having regard to:	
(a) the characteristics of the site;	The size of the development site is limited, in optimising the number of units the driveway will operate with a single lane supported with passing bays, and there is inadequate width to accommodate separated pathways.
(b) the nature of the use;	Residential development to provide for six units.
(c) the number of parking spaces;	Two parking spaces have been provided for each unit and two visitor parking spaces, a total of 14 car parking spaces.
(d) the frequency of vehicle movements;	The six residential units are predicted to generate a low number of vehicle movements, with an average of 33 daily trips with three of these occurring in the busiest hour period, which is an average of one vehicle using the driveway every 20 minutes, representing a low risk for pedestrians.
(e) the needs of persons with a disability;	Each unit is provided with two parking spaces, with a minimum of one space as an enclosed garage, and the second space located as close as practical to the unit.
(f) the location and number of footpath crossings;	Shared zone, with no formal crossing points.
(g) vehicle and pedestrian traffic safety;	The distance between the rear units and the public footpath is less than 50 metres, with a pedestrian walking at standard walking pace of 1.2 metres per second, the time taken to walk the 50 metres is less than 42 seconds. There is no restriction on the line of sight within the driveway, demonstrating the risk to pedestrians using the shared driveway is low.
(h) the location of any access ways or parking aisles; and	Units served by a single driveway.
(i) any protective devices proposed for pedestrian safety.	To enhance pedestrian safety, the operating speed of vehicles within the driveway will be moderated by a 10 km/h shared zone sign.

8.2 C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction

The development will increase the use of the existing access by more than 20 percent per day, and as such will need to be assessed against the performance criteria P1, ensuring that it can operate safely and efficiently.

Performance criteria	Assessment
To ensure that the safety and efficiency of roads is not reduced by the creation of a new access and junctions.	
a) Any increase in the traffic caused by the use;	The six new units are estimated to generate an additional 26 daily vehicle movements, with two of these movements likely to occur during the morning and evening peak periods. The existing residential dwelling is already generating 7 daily vehicle movements, with one of these movements occurring during the morning and evening peak periods.
b) The nature and frequency of the traffic generated by the use;	The development is for residential units and is expected to generate light vehicles less than 5.5 metres in length. These types of vehicles are associated with urban residential living, have good manoeuvrability, and are compatible with the existing vehicles using the surrounding local road network.
c) The nature of the road;	Meander Valley Road is a collector road, adjacent to the development site the road has an urban standard, with sufficient road width to accommodate two-way traffic movements, while supporting kerbside parking on the development side. The road standard is suitable to accommodate additional traffic movements. There is sufficient sight distance at the existing vehicular access to enable vehicles to enter and leave the development site in a safe and efficient manner, without impacting other users.
d) The speed limit and traffic flow of the road;	Meander Valley Road has a posted 60 km/h speed limit. Department of State Growth traffic data indicates that Meander Valley Road is moderately trafficked, with motorists in the morning and evening peak hours currently receiving the highest level of service (LOS A). The minor increase in traffic generated by the development is not expected to cause a deterioration in traffic efficiency, or impact traffic safety.
e) Any alternative access;	None.
f) The need for the access or junction;	Infill development in established residential areas is an excellent way to meet the housing shortage, while optimising the existing infrastructure and community services.
g) Any traffic impact assessment; and	An independent traffic assessment found no reason for this development not to proceed.
h) Any written advice received from the road authority.	Aware of none.

9. Conclusion

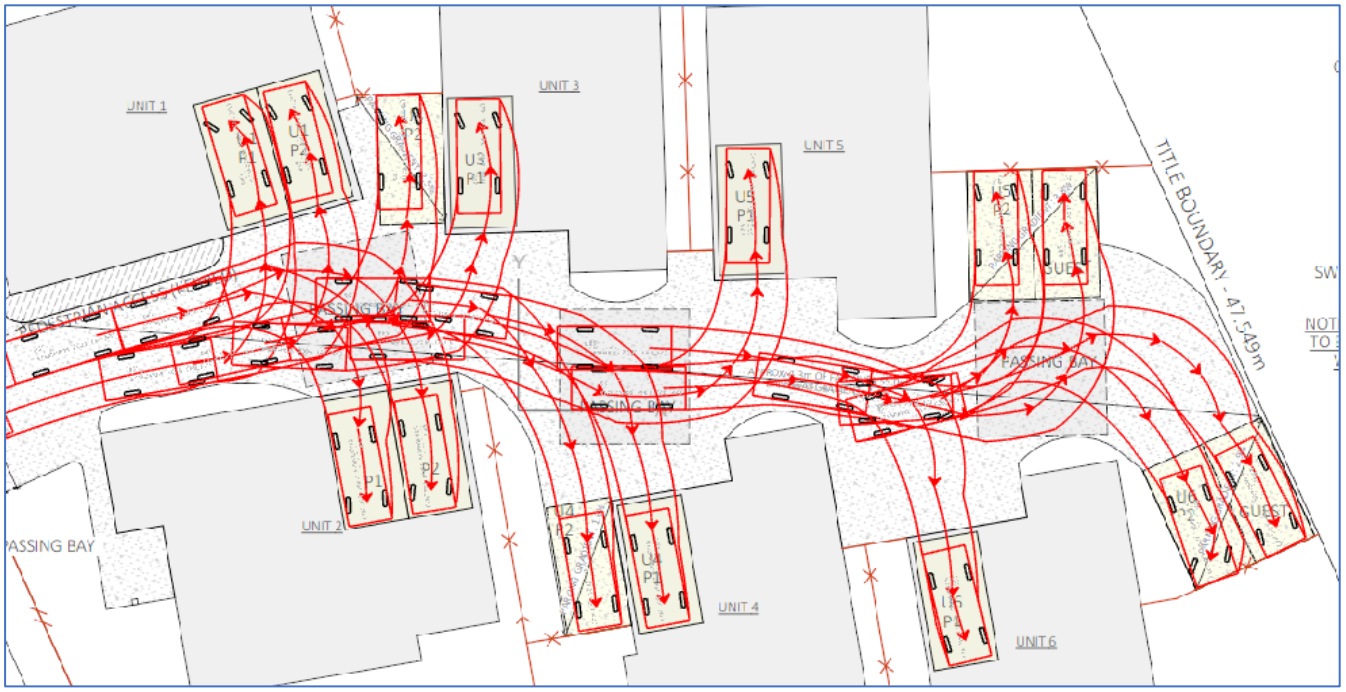
This traffic assessment found from a traffic engineering and road safety perspective, additional traffic generated from the development site is not expected to cause any adverse safety, or traffic efficiency issues, as:

- the amount of traffic generated by the development is considered to be low and there is sufficient capacity in the surrounding road network to absorb these movements,
- the existing vehicular access with Meander Valley Road has sufficient sight distance enabling vehicles to enter and leave the development site in a safe and efficient manner,
- there will be a sufficient number of on-site car parking spaces to meet the reasonable demand and minimise overflow parking,
- there will be sufficient driveway width to meet the vehicle demand, with appropriate passing bays used to support the sections operating with a single traffic lane,
- pedestrians accessing the units will share the driveway, the low traffic flow with the unrestricted line of sight minimises the conflict risk, and the 10 km/h shared zone will enhance pedestrian safety,
- the waste will be collected from the side of Meander Valley Road, the wide grassed verge will ensure the bins will not cause adverse impact to pedestrians, and
- the driveway width should enable a fire emergency vehicle to reach all the units.

This Traffic Impact Assessment found no reason for this development not to proceed.

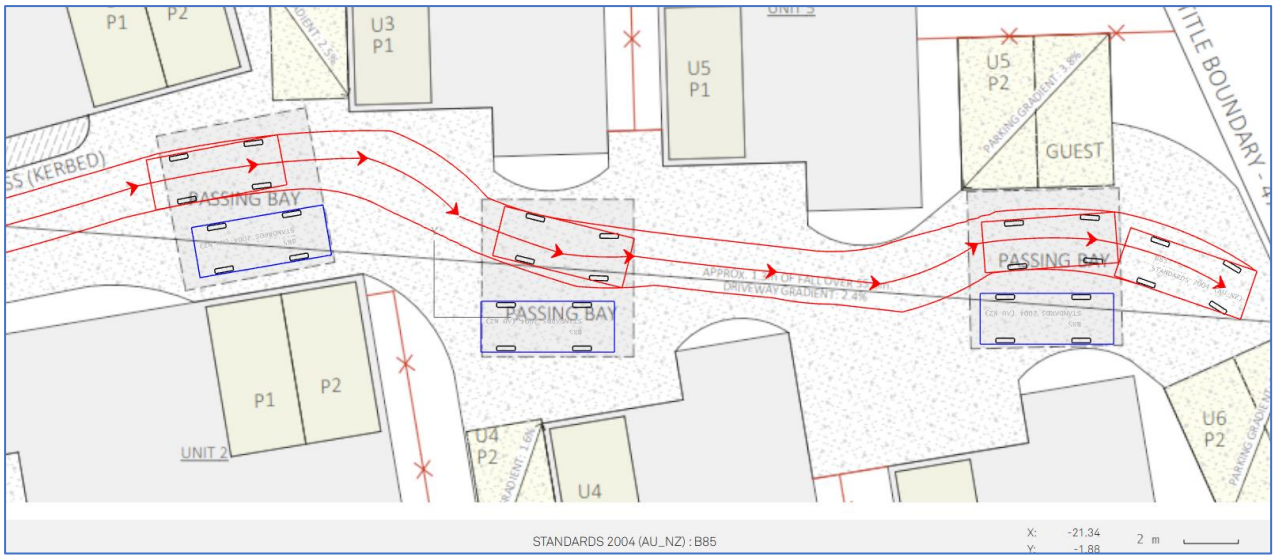
10. Appendix A – Vehicle swept paths

B85 vehicles entering the parking spaces

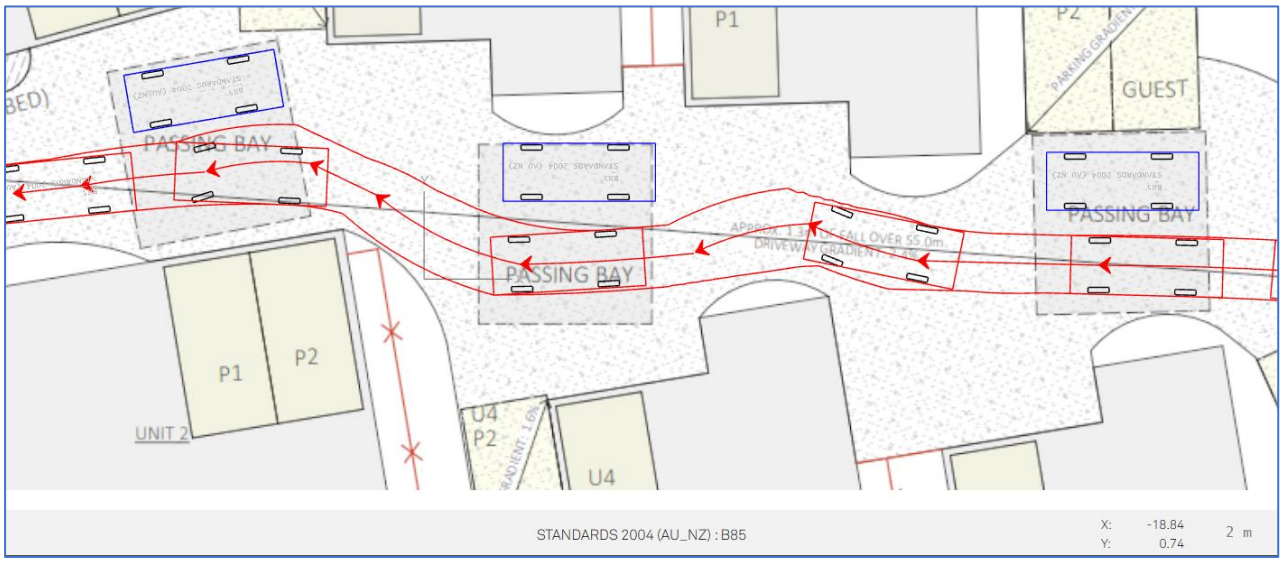


B85 vehicles leaving the parking spaces

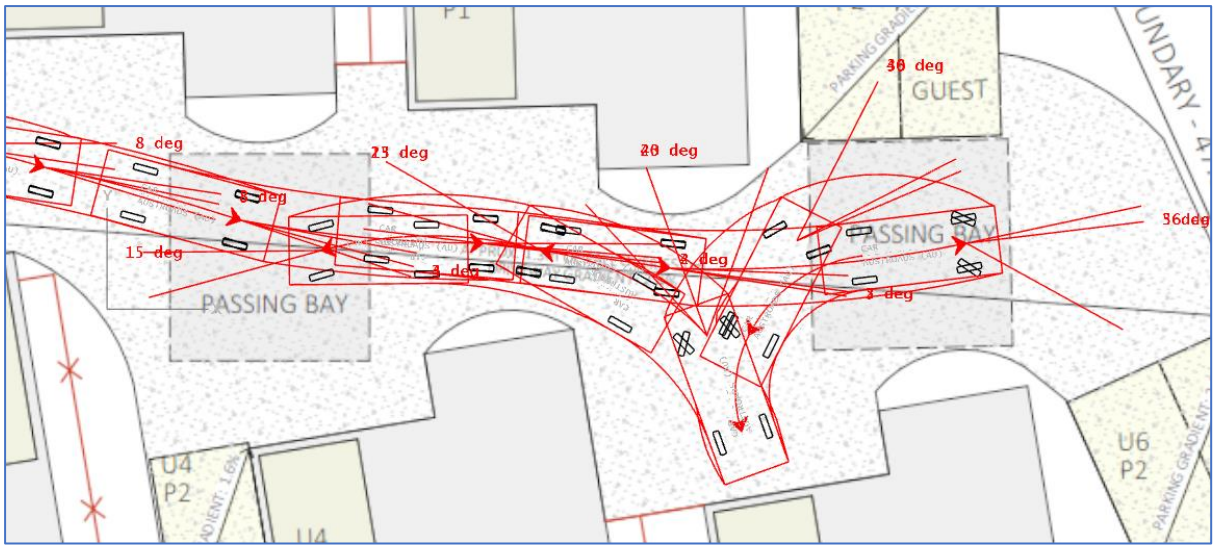
B85 vehicles using the passing bays - inbound



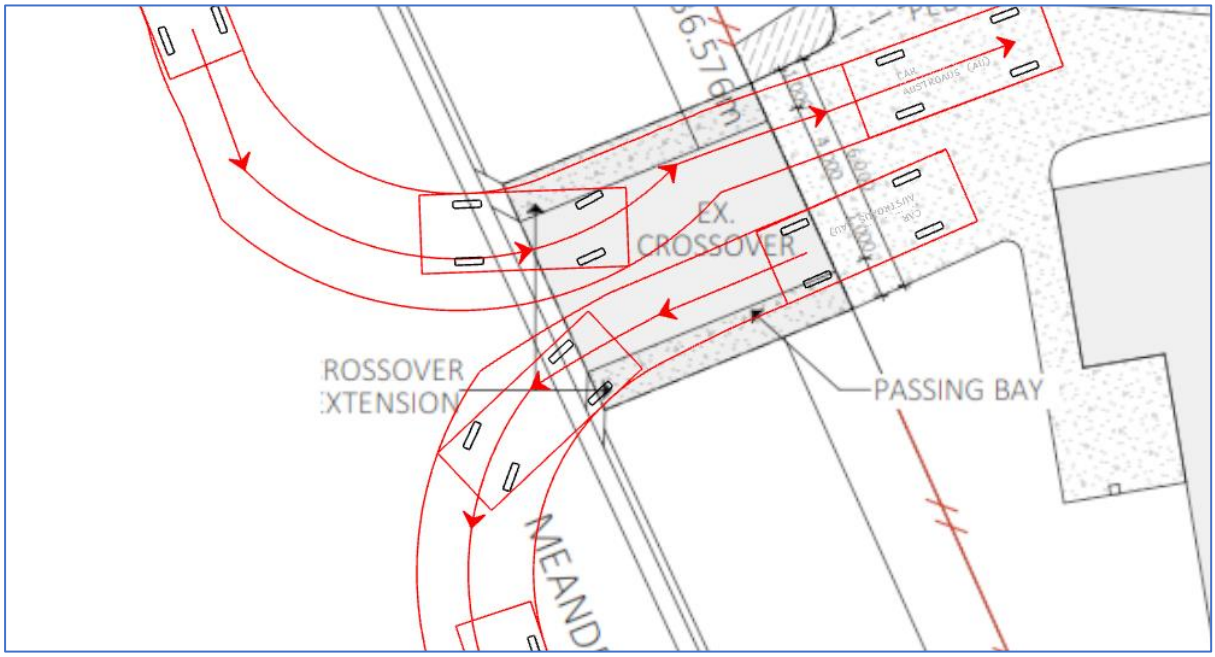
B85 vehicles using passing bays - outbound



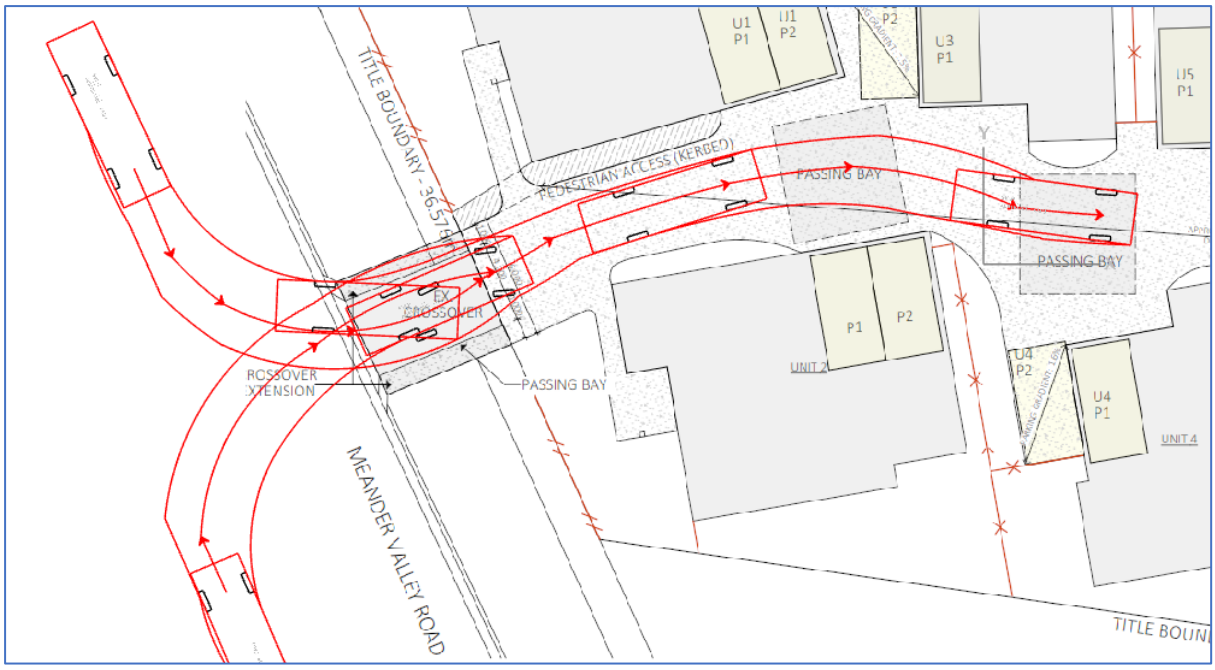
B99 vehicle turning around



Vehicles entering and leaving at the same time



Fire emergency vehicle entering



Environmental Site Assessment

5 Meander Valley Road, Carrick, Tasmania

Prepared for:
Chris Reissig Builders Pty Ltd

Prepared by:
Abacus Environmental
2/209 Nepean Highway
Mentone, Victoria 3194

Date: **3 July 2024**

Reference: **ABE0083**

Document Details and Control

Genesis and Approval		
Company	**Author and Credentials**	**Author Approval**
Abacus Environmental	Richard H Evans Principal Geologist / Director **Certified Environmental Practitioner (Site Contamination)**	

Revisions			
Amendment Number	**Amended By**	**Date**	**Distributed To**
Draft	C. Parker	28/06/2024	R. Evans
Final	R. Evans	3/07/2024	Chris Reissig Builders Pty Ltd

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Executive Summary

An Environmental Site Assessment (ESA) has been completed at the Site for the purpose of understanding environmental risk and assisting the developer with a proposed redevelopment of the land for continued low density residential (i.e., Residential A) use.

The land has been used for low density residential use, as well as mechanical repairs and scrap metal yard (wrecking and storage of car bodies) which has triggered this assessment under the Potentially Contaminated Land Code of the Tasmanian Planning Scheme.

The assessment has included a review of past land use and surrounding land use, development of a preliminary conceptual site model (CSM) and sampling plan based on environmental setting and site history and finalisation of the CSM based on the laboratory results of soil samples and finally interpretation of results, and determination of suitable future land use.

The assessment has revealed that soil conditions at the Site do not present an unacceptable risk to future residential land users. The risk to groundwater is low and direct groundwater assessment is not required.

ESA Outcome - Overall Risk and Site Suitability for Proposed Use

The Site is considered suitable for the proposed continued low density residential use.

1. Introduction

Abacus Environmental Pty Ltd (Abacus) was engaged by Environmental Assessment Tasmania (EA Tas) on behalf of the developer Chris Reissig Builders Pty Ltd, to undertake an Environmental Site Assessment (ESA) of 5 Meander Valley Road, Carrick Tasmania (the Site).

The ESA has been requested to facilitate planning requirements for a pending redevelopment of the Site for continued low density residential use.

Site layout and location are illustrated in **Figure 1** while pertinent Site information is provided in **Table 1**.

Figure 1: **Site and Surroundings**
(Source: Google 2024)

Table 1: Site Information	
Category	**Description**
Address	5 Meander Valley Road Carrick
Current Landowner	Chris Reissig
Lot on Plan	94801/3
Municipality	Meander Valley
Approximate Area	0.2175 hectares
Current Use	Vacant
Current Occupier	Vacant
Zoning	General Residential
Proposed Use	Low Density Residential

2. Project Details

This section presents the drivers and purpose of the ESA and the scope, methodologies and qualifications employed to achieve the project goals.

2.1. Identified Risk

In a letter dated 20 April 2000, Meander Valley Council (Council) identifies 'storage and wrecking of vehicles' activities occurring at the site. The current landowner advised that a site shed situated near the boundary with 7 Meander Valley Road was used to house restored vehicles. It is possible that mechanical works were undertaken in the shed.

Storage and wrecking of vehicles and mechanical repairs pose a potential risk of petroleum-based products and metals impacting soil through spillage and leakage from car engines and parts onto the unpaved surfaces of the Site.

The Council letter is provided as **Appendix A.**

2.2. Planning Authority Requirements

In accordance with the *Potentially Contaminated Land Code* (PCLC) of the *Tasmanian Planning Scheme 2015*, the land has been used for a potentially contaminating activity, namely 'Scrap yard' and 'machinery repair' and an assessment has been triggered under Clause 14.2.

To satisfy Council requirements, the assessment will address the applicable part of Clause 14.5.1 (P1) of PCLC which states:

> *"For a sensitive use, or a specified use listed in Table C14.1, the land is suitable for the intended use, having regard to:*
>
> *(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated;*
> *(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or*
> *(c) an environmental site assessment that includes a plan, to manage contamination and associated risk to human health or the environment that includes:*
>
> *i. any specific remediation and protection measures required to be implemented before any use commences; and*
> *ii. a statement that the land will be suitable for the intended use."*

2.3. Purpose and Objectives

The purpose of the ESA is to understand environmental risk presented to future users of the Site, and therefore the suitability of the Site for its proposed residential use.

The objectives of the ESA to meet the purpose were therefore to:

- Understand the historical land uses of the Site and adjoining properties.
- Identify potential sources, areas and types of contamination and potentially impacted media.
- Collect reliable data.
- Identify potential environmental risk.
- Identify future works or controls required to manage risk.

Discussion of outcomes from this ESA will refer directly to the requirements of Clause 14.5.1 of the PCLC.

2.4. Scope of Work

The following scope of work was completed:

- Desktop study including review of:
  - Site history, environmental setting and surrounding land uses.
  - Geology, elevations, water courses, drainage, slope.
- Site visit to identify potential sources.
- On-site soil sampling.
- Comparison of results to applicable residential screening criteria.
- Assessment of risk.
- Producing this ESA report summarising works, presenting data and outcomes, and providing an opinion on suitability of the Site for the proposed use.

2.5. Qualifications

The ESA was completed by Environmental Assessment Tasmania director Carmel Parker with the following qualifications:

- Environmental scientist with 13 years' experience in contaminated land assessment in Tasmania and 15 years working as a consultant.

The ESA was reviewed and approved by Abacus Director Richard Evans with the following qualifications:

- Geologist with 26 years of experience in contaminated land, including scores of ESAs across Australia.
- Certified Environmental Professional (No. 1081) / Contaminated Land Specialist (No. SC41068).

2.6. Assessment Methodology

All works were conducted in accordance with the following legislation and guidelines:

- EPA Tasmania, *Environmental Management and Pollution Control Act* 1994 (EMPCA).
- Australian Standard AS4482.1: *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, 2005.
- Australian Standard AS4482.2: *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 2: Volatile substances*, 1999.
- National Environment Protection Council: *National Environment Protection (Assessment of Site Contamination) Measure*, as amended 2013 (ASC NEPM).

In the author's opinion, all ESA works were conducted in accordance with reasonable best industry practice. A more comprehensive list of resources or guidelines considered during the assessment are provided in **Section 13.0**.

3. Site and Surrounding Use History

This section presents a summary of the Site and surrounding historical uses based on publicly available records sourced through the Tasmanian Government *Land Information System Tasmania* (LIST) website.

3.1. Historical Aerial Photographs

Historical aerial photographs from 1969 to 2024 were reviewed from Google Earth and the LIST Map. Buildings are visible on the Site from 1970 onwards which is consistent with the LIST Map Property Report advising house construction in 1970. Surrounding land use have been farmland and residential since 1970.

Historical aerial photographs are provided as **Appendix B**.

3.2. Land Ownership

The LIST Map Property Report provides a summary of previous landowners between 1982 and 2024. Land ownership prior to 1982 is not listed provided in the Report. The lot was part of former title 2585/22 prior to subdivision, most likely part of farmland. Aerial photographs confirm the existing dwelling was the only building on the Site prior to 1982 and that there were no buildings on the Site prior to 1969/70.

Ownership history is summarised in **Table 2**

Table 2: Site Ownership

Years in Ownership (approx.)	Landowner	Occupier / Activities
Prior to 1982	Unknown	Unknown
1982 - 1991	E. Chappell	Unknown
1991 - 2000	G. & L. Viney	Unknown
2000 - 2024	G. Lowen	Mechanical works and scrap metal yard. Car body storage in yard.
4 June 2024	C. Reissig & P. Degetto	Vacant. Car bodies removed. Shed and house remain.

Relevant sections of the Property Report are provided as **Appendix C**.

3.3. Business Directory

Business directories searched by the State Library did not identify any commercial/business listings at the Site.

3.4. Anecdotal

The current landowner has advised that the previous landowner stored car bodies on the Site and restored cars were housed in the shed.

3.5. Historical Land Use Summary

The earliest aerial photographs and LIST Map records indicate a house was present on the Site from 1970. These early aerial photographs also show sparse housing and rural/farmland surrounding the Site. Therefore, the earliest known use of the Site was residential, and the surrounding land use was farmland and residential.

4. Regulatory Databases

This section presents a summary of Site and surrounding regulated or licensed activities based on a review of public records sourced through LIST Map databases.

4.1. Site Dangerous Goods Records

There are no available records indicating dangerous good storage at the Site. This suggests there is no underground petroleum storage at the Site.

4.2. Off-site Potential Sources

The nearest identified underground petroleum storage systems (UPSS) and EPA Regulated Premises are summarised in **Table 3**.

Table 3: Off-site Database Records

Potential Contaminating Source or Activity	Address	Location Relative to Site		Potential Risk
		Direction	Distance (m)	
Active service station	45 Meander Valley Road	WSW	480	Low risk given distance.
Extractive industry	1521 Illawarra Road Carrick	East	655	Low risk given distance and direction.

4.3. Database Summary

A review of LIST Map database of dangerous goods and regulated activities indicate that there are no off-site activities likely to impact the Site.

5. Existing Site and Surrounding Conditions

This section summarises existing conditions based on current maps, local knowledge and direct Site observations.

5.1. Site Inspection

EA Tas personnel inspected the Site and surroundings on 6 and 11 June 2024.

5.1.1. Site Observations

The inspection revealed the following Site conditions and environmental setting factors:

- The Site is relatively flat with a slight fall to the south.
- A house and shed are present on the Site.
- No car bodies were stored on the Site.
- A few items such as engine parts were present in the shed.
- A stockpile of vegetation and general waste was present south of the shed. Rubbish included plastic, metal, timber and 20L fuel cans.

No obvious signs of surface spillage were observed.

Photographs taken during the inspection are provided as **Appendix D**.

5.1.2. Adjoining Land Uses

Surrounding land use is residential and agricultural. No potential contaminating activities were identified on adjoining properties.

5.2. Topography

The Site slopes from north to south.

5.3. Land Use Zoning

The Site is located within the 'General Residential' zone, adopted under the Tasmanian Planning Scheme. Refer to **Figure 2**.

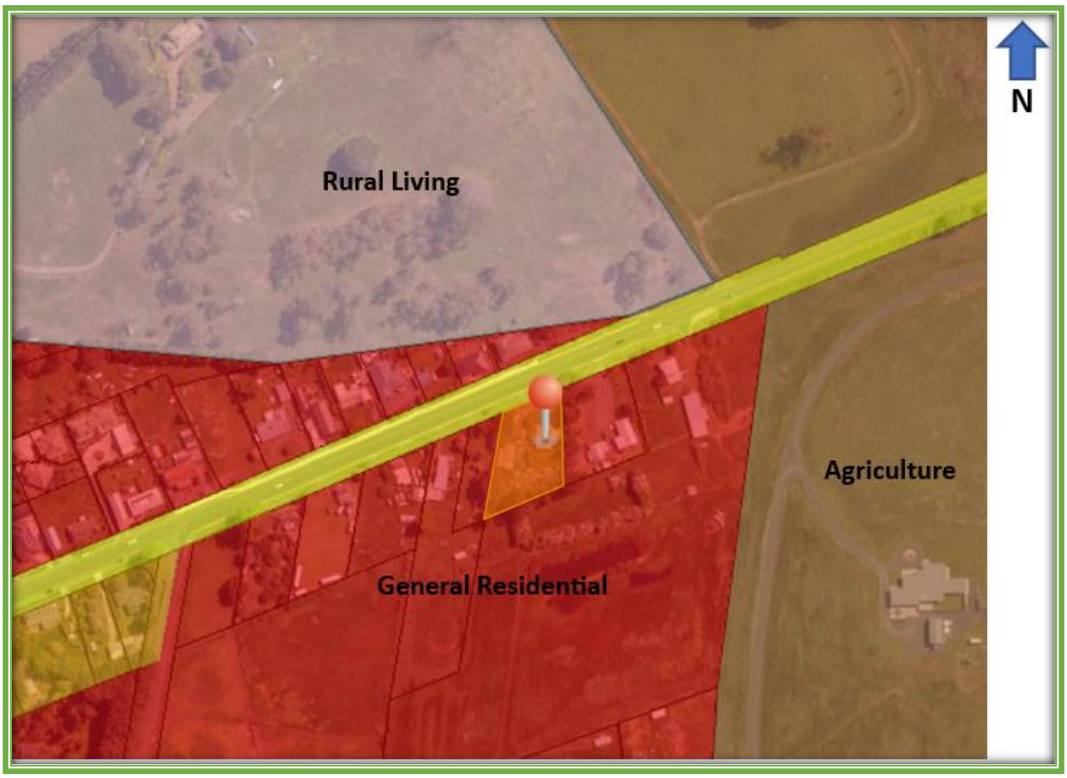


Figure 2: **Surrounding Land Uses and Land Use Zoning**
(Source NRE Tas, LIST Map)

5.4. Stormwater, Sewer and Drainage

The Site drains to mains stormwater located along Meander Valley Road and overland surface drainage will also flow towards the southern boundary following surface topography.

6. Geological Setting

Geological and hydrogeological setting, based on a combination of Site sampling observations and published data is presented herein.

6.1. Geology

Geological logging conducted during Site sampling works identified the following geological and hydrogeological characteristics:

- The upper 1.0 mBGS soil layers consists predominantly of sands and sandy gravels.
- Moderate to high density yellow clay is present from 0.4 m, and mostly beyond 1.0 mBGS.
- No water was observed in any of the soil bores to the maximum drill depth of 1.5 mBGS.
- Sandy soil was moist and clay layers were dry.
- No staining/colouration of or odours such as hydrocarbon odours were observed in soil.

Photographs of soil cores are provided as **Appendix E**.

6.2. Groundwater

The nearest surface water identified is:

- Farm dam located 37 m to the south.
- Minor tributary located 108 m to the east.
- Liffey River to the west.

Groundwater at the Site inferred to flow to the tributaries to the east, which flow to the Liffey River north of the Site or Liffey River to the east. The river is at elevation of less than 140m AHD and the Site is at elevation 150 m. Therefore, groundwater depth under the Site is likely to be greater than 10 metres. Refer to **Figure 3**.

A more detailed groundwater assessment was no completed based on the finding that soil on the Site has not been impacted by the activity.

Figure 3: **Elevations (m AHD)**
(Source NRE Tas, LIST Map)

6.3. Acid Sulphate Soil

Based on mapping provided by LIST Map there is a low risk of acid sulphate soils. Acid sulfate management planning is not required for future development.

7. Preliminary Conceptual Site Model

A CSM is a tool that helps stakeholders identify potential risk. For there be a risk there must be a contamination source, receptor (i.e., future residents), and a pathway that could connect the two.

Where all three exist there is a pollution linkage that could present an unacceptable risk requiring further study or mitigation measures. If any of the three is absent, then there is no likely unacceptable risk. That is, contamination is not a risk if receptors cannot access it.

7.1. Site Summary

The Site use has predominantly been residential, which does not present a likely risk of contamination. However, between circa 2000 and 2024, the commercial activities of vehicle storage, wrecking and restoration have also been conducted at the Site.

The following sections further explore potential risk associated with these activities and with off-site land uses.

7.2. Sources

Potential sources and associated contaminants are summarised in **Table 4**.

Table 4: Potential Sources

Source	Contaminants of Potential Concern (COPC)	Potentially Impacted Media
On-site		
Storage of car bodies and engine parts Vehicle wrecking Mechanics workshop (vehicle restoration)	Metals. Petroleum hydrocarbons measured as: • Total recoverable hydrocarbons (TRH) • Polycyclic aromatic hydrocarbons (PAH) • Benzene, toluene, ethylbenzene, xylenes (BTEX)	Soil, soil vapour
Off-site		
No likely sources	Not applicable	Not applicable

7.3. Receptors

Potential receptors based the proposed development and future use summarised in **Table 5**.

Table 5: Potential Receptors

Human Receptors	Ecological Receptors
On-site	
Construction workers during development	Flora and fauna of the shallow on-site soil
Future residents	

Table 5: Potential Receptors	
Human Receptors	**Ecological Receptors**
On-site	
Future maintenance workers	
Off-site	
Residents, maintenance workers and visitors at nearby residential properties	Flora and fauna of downgradient surface water bodies

7.4. Pathways

Potential receptors based the proposed development and future use summarised in **Table 6**.

Table 6: Potential Pathways	
Pathway	**Medium**
Human Receptors	
Dermal contact	Impacted soil and groundwater
Ingestion	Impacted soil and groundwater
Consumption	Vegetables grown in impacted soil and groundwater
Inhalation	Impacted dust and/or vapours from soil
Ecological Receptors	
Direct contact	Impacted on-site soil

7.5. Summary

There is potential for past Site activities to have resulted in metal and petroleum hydrocarbon impacts to soil through surface spills. If these spills occurred, it is unlikely but possible that they could migrate to groundwater.

Soil sample is required to assess the potential for contamination to be present. Soil sampling results will inform the need for further groundwater sampling.

8. Structure of Applicable Environmental Criteria

Analytical data collected during an environmental investigation is compared against relevant Tier 1 criteria as a baseline for understand conditions and risk.

8.1. Legislation, Policies and Measures

Environmental protection in Tasmania is legislated through the EMPCA which focusses on avoiding harm from pollution through preventing, reducing and remediating environmental impacts.

In accordance with the EMPCA, Tasmania adopts the National Environment Protection Council (NEPC) National Environmental Protection Measures (NEPMs) as State Policy for guiding environmental management.

The NEPMs are a suite of measures addressing a range of environmental concerns. This ESA considers soil and groundwater conditions and risk. As such, the appropriate NEPM guideline, as presented in **Section 2.6**, is:

- National Environment Protection Council: *National Environment Protection (Assessment of Site Contamination) Measure*, as amended 2013 (ASC NEPM).

8.2. NEPM Structure

ASC NEPM outlines criteria for various media and receptors on different land use scenarios to ensure relevant receptors are considered in assessing conditions and risk.

Ultimately, conditions must:

- Be protective of current and future beneficial uses by preventing, remediating or managing contamination risk posed to human health and the environment.
- Not adversely affect the maintenance of relevant ecosystems or human health.

8.2.1. Land Use Scenarios

The ASC NEPM includes a range of land use scenarios to consider when assessing media. Given the proposed use, data is most appropriately compared against low density residential which ASM NEPM refers to as:

- Residential A for human health risk.
- Urban residential and public open space for ecological risk.

Both human and ecosystem health must be protected.

8.3. Soil Criteria

Applicable NEPM derived soil criteria are:

- Health-based Investigation levels (HILs) for Residential A.
- Health Screening Levels (HSLs) for Residential A.
- Generic Ecological Investigation Levels (EIL) - Urban Res and Public Open Space.
- Ecological Screening Levels (ESL) - Urban Residential and Public Open Space.

9. Soil Assessment and Results

To assess actual soil conditions, a targeted and non-judgemental soil sampling program was completed. The scope and methodology are detailed in this section. Soil sampling locations are illustrated in **Figure 4** which illustrates former vehicle storage.

Figure 4: Soil Sampling Locations

			BTEX							
			Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand			3	0.5 | 0.5 | 0.5 | 0.5	160 | 220 | 310 | 540	55			40 | 60 | 95 | 170	
NEPM 2013 Table 1A(1) HILs Res A Soil										
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space			170							
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil				50	85	70			105	
Location	Sample ID Depth (mBGS)	Date								
SB01	0.1 to 0.3	12 Jun 2024								
SB01	1.4	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB02	0.5 to 0.6	12 Jun 2024								
SB02	0 to 0.3	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB03	0.2	12 Jun 2024								
SB03	0.6	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB04	0.7 to 0.9	12 Jun 2024								
SB04	0 to 0.3	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB05	0.3 to 0.5	12 Jun 2024								
SB05	0.5 to 0.7	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB06	0.3 to 0.6	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB06	0.5 to 0.7	12 Jun 2024								
SB07	0.9 to 1.1	12 Jun 2024								
SB07	0 to 0.3	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB08	0.4 to 0.6	12 Jun 2024	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2
SB08	0 to 0.3	12 Jun 2024								
SX	SX	12 Jun 2024								
SY	SY	12 Jun 2024								

Environmental Standards
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

			TRH							TPH				
			C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand				45 | 70 | 110 | 200		110 | 240 | 440								
NEPM 2013 Table 1A(1) HILs Res A Soil														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil				180	120	120	300	2,800						
Location	Sample ID Depth (mBGS)	Date												
SB01	0.1 to 0.3	12 Jun 2024												
SB01	1.4	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB02	0.5 to 0.6	12 Jun 2024												
SB02	0 to 0.3	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB03	0.2	12 Jun 2024												
SB03	0.6	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB04	0.7 to 0.9	12 Jun 2024												
SB04	0 to 0.3	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB05	0.3 to 0.5	12 Jun 2024												
SB05	0.5 to 0.7	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB06	0.3 to 0.6	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB06	0.5 to 0.7	12 Jun 2024												
SB07	0.9 to 1.1	12 Jun 2024												
SB07	0 to 0.3	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB08	0.4 to 0.6	12 Jun 2024	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100	<50
SB08	0 to 0.3	12 Jun 2024												
SX	SX	12 Jun 2024												
SY	SY	12 Jun 2024												

Environmental Standards
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

			Metals														
			Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium (III+VI)	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Vanadium	Zinc
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																	
NEPM 2013 Table 1A(1) HILs Res A Soil			100		60	4,500	20		100	6,000	300	3,800	40	400	200		7,400
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space			100														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																	
Location	**Sample ID Depth (mBGS)**	**Date**															
SB01	**0.1 to 0.3**	**12 Jun 2024**	<5	40	<1	<50	<1	42	14	19	37	380	<0.1	9	<5	132	30
SB01	**1.4**	**12 Jun 2024**															
SB02	**0.5 to 0.6**	**12 Jun 2024**	<5	20	<1	<50	<1	6	<2	<5	22	71	<0.1	<2	<5	12	12
SB02	**0 to 0.3**	**12 Jun 2024**															
SB03	**0.2**	**12 Jun 2024**	6	80	<1	<50	<1	29	<2	10	85	142	0.1	3	<5	62	73
SB03	**0.6**	**12 Jun 2024**															
SB04	**0.7 to 0.9**	**12 Jun 2024**	<5	30	<1	<50	<1	40	<2	<5	8	<5	<0.1	8	<5	92	6
SB04	**0 to 0.3**	**12 Jun 2024**															
SB05	**0.3 to 0.5**	**12 Jun 2024**	<5	30	<1	<50	<1	3	<2	<5	6	6	<0.1	<2	<5	5	14
SB05	**0.5 to 0.7**	**12 Jun 2024**															
SB06	**0.3 to 0.6**	**12 Jun 2024**															
SB06	**0.5 to 0.7**	**12 Jun 2024**	<5	<10	<1	<50	<1	6	<2	<5	<5	20	<0.1	2	<5	9	<5
SB07	**0.9 to 1.1**	**12 Jun 2024**	<5	<10	<1	<50	<1	3	<2	<5	<5	30	<0.1	<2	<5	6	<5
SB07	**0 to 0.3**	**12 Jun 2024**															
SB08	**0.4 to 0.6**	**12 Jun 2024**															
SB08	**0 to 0.3**	**12 Jun 2024**	<5	270	<1	<50	<1	10	2	53	234	553	0.9	4	<5	11	122
SX	**SX**	**12 Jun 2024**	<5	30	<1	<50	<1	42	<2	<5	8	6	0.2	10	<5	79	6
SY	**SY**	**12 Jun 2024**	6	30	<1	<50	<1	46	<2	<5	6	<5	0.1	9	<5	90	5

Environmental Standards
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

			PAH																
			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																3			
NEPM 2013 Table 1A(1) HILs Res A Soil																			300
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																170			
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil							0.7												
Location	Sample ID Depth (mBGS)	Date																	
SB01	0.1 to 0.3	12 Jun 2024																	
SB01	1.4	12 Jun 2024																	
SB02	0.5 to 0.6	12 Jun 2024																	
SB02	0 to 0.3	12 Jun 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB03	0.2	12 Jun 2024																	
SB03	0.6	12 Jun 2024																	
SB04	0.7 to 0.9	12 Jun 2024																	
SB04	0 to 0.3	12 Jun 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB05	0.3 to 0.5	12 Jun 2024																	
SB05	0.5 to 0.7	12 Jun 2024																	
SB06	0.3 to 0.6	12 Jun 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB06	0.5 to 0.7	12 Jun 2024																	
SB07	0.9 to 1.1	12 Jun 2024																	
SB07	0 to 0.3	12 Jun 2024	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB08	0.4 to 0.6	12 Jun 2024																	
SB08	0 to 0.3	12 Jun 2024																	
SX	SX	12 Jun 2024																	
SY	SY	12 Jun 2024																	

Environmental Standards
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

9.1. Soil Assessment Scope and Methodology

On 12 June 2024, EA Tas personnel attended Site with an environmental driller to collect soil samples from sampling locations using a truck mounted direct push drilling rig. The following work was completed:

- Eight soil bores (SB01 to SB08) were drilled to a maximum of 1.5 mBGS and samples collected. Soil bores were located as follows:
    - Grid based locations (SB01 , SB02 and SB04 to SB06) to complete statistical coverage of the Site.
    - Targeted locations (SB03, SB07 and SB08) to assess likely spillages from mechanical operations near the shed. Bore SB03 was completed inside the shed while SB07 and SB08 were completed downslope and near the walls of the shed to assess any spillages or flows off the concrete slab.
- At each location, an environmental drilling rig equipped with direct push sampling technology was used to access soil at depth and collect samples within clean plastic liners. The method allows for continuous geological logging and collection of samples from discrete depths while the plastic liners minimise potential for cross-contamination between holes.
- Soil was removed from the plastic sleeve and placed directly into clean laboratory provided jars, foregoing the need for trowels or other equipment that would necessitate rinsate blanks.
- Soil at each location was logged in accordance with the United Soil Classification System (USCS), while also making note of contamination, fill and anthropogenic material. Soil bore logs are provided as **Appendix E**.
- Samples collected for analysis were labelled, stored on ice, and delivered under chain-of-custody documentation to National Association of Testing Authorities (NATA) accredited analytical laboratory ALS Global Pty Ltd (ALS) for analysis.
- A quality control blind duplicate sample was collected from one bore for analysis.
- Soil cuttings were placed back in each hole or left at the surface to manage during development works.

Soil samples were analysed for metals, TRH, PAH and BTEX as per the Preliminary CSM.

9.2. Analytical Results

Soil analytical results are summarised and compared against adopted criteria in the appended **Analytical Tables**. Laboratory reports are provided as **Appendix G**.

9.2.1. Petroleum Hydrocarbons

All TRH, PAH and BTEXN results were below laboratory reporting limits and/or screening criteria.

9.2.2. Metals

All metals results were below laboratory reporting limits and/or screening criteria.

10. Quality Program

A quality assurance/quality control (QA/QC) program was implemented to ensure the collection of accurate samples and data that could be relied upon for making conclusions regarding health risk.

10.1. Quality Assurance

The following QA measures were followed to ensure consistency and accuracy:

- Consistent field operating procedures including industry standard methodologies for sample collection, labelling and preservation.
- Competent field personnel oversaw the field sampling program.
- Licensed drillers knowledgeable in local conditions and environmental sampling was used.
- Calibrated field equipment sourced from established environmental equipment companies was use.
- A NATA accredited laboratory was used to supply sample containers and complete testing.

10.2. Quality Control

Field QC samples consisted of 1 blind duplicate soil sample. Blind duplicates are intra-laboratory samples analysed as a check against field and laboratory procedures.

Based on the scope of the ESA and the sampling techniques employed, inter-laboratory and blank samples were not considered necessary for the QC program.

10.2.1. Blind Duplicate Results

Blind duplicate results are compared to the primary sample and precision is measured through calculating the relative percent difference (RPD) between the two. RPD is calculated according to the following equation:

$$\%\ Difference = 100\ x \left(\frac{sample\ 1 - sample\ 2}{\left(\frac{sample\ 1 + sample\ 2}{2}\right)} \right)$$

In general, an RPD below <50% is considered an acceptable result. However, there are many instances where this does not apply including:

- Soil samples as soil can display natural heterogeneity.
- Comparing samples with different laboratory reporting limits.
- Low concentrations, which tends to exaggerate RPD.

Further, a high RPD for concentrations below criteria do not typically indicate a risk.

All RPDs are provided in the appended **Analytical Tables**. A review of the results shows that most RPDs are <50% and where RPD is >50% one of the above applies.

QC sampling has confirmed reliability of primary results. The highest relative percentage difference between quality control samples was 13 %. Hence, quality control samples returned an acceptable consistency in results.

10.2.2. Laboratory QC

The laboratory provides its own report on quality achieved during analysis of samples provided as part of the ESA. Controls implemented by the laboratory include:

- Laboratory duplicate: DQI is laboratory determined per analyte and sample and dependent on the magnitude of results in comparison to the level of reporting.
- Matrix spike: DQI is laboratory determined per analyte and sample.
- Surrogate spike: DQI is laboratory determined per analyte and sample.
- Laboratory control sample: DQI is laboratory determined per analyte and sample.
- Method blank: DQI is <laboratory reporting limit.
- Holding time: DQI is laboratory determined for each analyte and media.

Laboratory quality reports are included as part of **Appendix G**.

Review of these reports identified minor outliers. None of the identified outliers are considered to negatively impact the overall data set or ESA conclusions.

10.3. Quality Control

A review of sampling density, field procedures, laboratory primary and QC results, indicates that the results may be relied upon to draw conclusions regarding risk posed under the proposed Site use.

11. Conclusions

Although the Site is a residential property, between circa 2000 and 2024 the commercial activities of vehicle storage, wreckage and restoration were conducted. These present a risk of contamination of metals and various petroleum hydrocarbon products.

A soil assessment completed across the Site did not uncover any evidence of this soil contamination. There were also no indications, such as surface staining, odours, or stressed vegetation at the Site that would indicate spills. As there was no observation or analytical evidence of spills or contamination, and spills would likely only ever occur at the surface, the potential for groundwater impacts are low and groundwater was not sampled directly.

As all activities have ceased, and all vehicles have been removed, the potential for future impacts associated with the activity have been removed.

Based on the outcome of this assessment the site is considered suitable for ongoing residential use.

Refer to **Section 12** for a consideration of Site conditions and requirements against the PLCL,

11.1. Environmental Requirements

The current landowner is responsible for ensuring:

1. As this is a Site for future residential use, all residual amounts of fuels and oil and mechanical chemicals must be removed from Site prior to commencement of construction works. Care must be taken to ensure that no residual amounts of oils or fuels are spilt on the Site during disposal or removal from the Site.

2. The waste stockpile identified at the site must be managed in accordance with the Tasmanian *Environmental Management and Pollution Control (Waste Management) Regulations 2020.*

12. Council Planning Scheme Compliance

In addition to assessing potential risk, this ESA also serves to address the following two clauses of the PLCL:

- Clause E2.5.1 (P1) – Use Standard.
- Clause E2.6.2 (P1) – Excavation Standard

This is a necessary step within the planning scheme. Each clause is presented below and compared against the outcomes of the assessment.

4.1. Clause E2.5.1 (P1)

The Clause states:

"Land is suitable for the intended use, having regard to:

(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or

(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or

(c) a plan to manage contamination and associated risk to human health or the environment that includes:

(i) an environmental site assessment;

(ii) any specific remediation and protection measures required to be implemented before any use commences; and

(iii) a statement that the land is suitable for the intended use."

4.1.1. Assessment Against Clause E2.5.1 (P1)

An environmental site assessment has been completed, concluding that the Site is not contaminated. In addition, the land is suitable for Residential A use. Waste items remaining after clean up from the past activity must be disposed of in accordance with Tasmanian waste management legislation.

4.2. Clause E2.6.2 (P1)

The Clause states:

"Excavation does not adversely impact on health and the environment, having regard to:

(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or

(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or

(c) a plan to manage contamination and associated risk to human health and the environment that includes:

(i) an environmental site assessment;

(ii) any specific remediation and protection measures required to be implemented before excavation commences; and

(iii) a statement that the excavation does not adversely impact on human health or the environment."

4.2.1. Assessment Against Clause E2.6.2 (P1)

The existing conditions do not pose a risk for future residential land use or construction workers. Soil excavated from the Site is likely to meet Level 1 classification under IB105. It is understood that soil is not intended to be taken off the Site. However, no further testing of excavated soil is required prior to disposal as this assessment has determined that the Site is not contaminated.

13. References

Legislation, Regulations, Guidelines, Policies

I. ANZECC, *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, Australian and New Zealand Environment and Conservation Council / National Health and Medical Research Council (ANZECC Guidelines), 1992.

II. ANZECC/ARMCANZ, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, October 2000.

III. ANZECC/ARMCANZ, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 1992.

IV. ANZG, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 2018.

V. Australian Standard AS4482.1: *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, 2005.

VI. Australian Standard AS4482.2: *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 2: Volatile substances*, 1999.

VII. EPA Tasmania, *Environmental Management and Pollution Control Act 1994* (EMPCA).

VIII. National Environment Protection Council: *National Environment Protection (Assessment of Site Contamination) Measure*, as amended 2013 (ASC NEPM).

IX. NHMRC (2011) *Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy.* National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra. Version 3.5 Updated August 2018

14. Limitations

Abacus Environmental has used a level of skill and care consistent with the expected current state of local professional practice. Abacus Environmental does not make any representation or warranty that the conclusions in this report will be applicable in future as there may be changes to legislation, industry best practice, land uses and/or conditions, or other unforeseen changes. This report does not purport to provide legal advice.

This report has been prepared for Chris Reissig Builders Pty Ltd and must be considered in its entirety.

This report has been prepared in accordance with generally accepted industry practices and standards prevailing at the time of preparation.

Appendix A – Meander Valley Council

CHRIS REISSIG BUILDERS PTY. LTD.

From: Chris Wicks <chris.wicks@mvc.tas.gov.au>
Sent: Friday, June 14, 2024 1:52 PM
To: Info | CRB Builders <info@crbbuilders.com.au>
Subject: RE: No 5 - Lot 3 Meander Valley Road Carrick

Hi Chris

Thank you for your email. Council records include correspondence about the storage and wrecking of vehicles and also, correspondence relating to the location of a shed. I have included copies of some of the correspondence for your information. Other than that, the primary use of the property has been as a residence. I found no records of any other specific uses that have been carried out at the property.

Please contact me if you would like further assistance.

Regards

Chris Wicks

Meander Valley Council
Working Together

Chris Wicks, Environmental Health Officer
P: 03 6393 5355 | M: 0409 516 702 | E: Chris.Wicks@mvc.tas.gov.au
26 Lyall Street Westbury, TAS 7303 | PO Box 102, Westbury Tasmania 7303
www.meander.tas.gov.au

MEANDER VALLEY COUNCIL

P.O. BOX 102
WESTBURY
TASMANIA 7303

TELEPHONE (03) 6393 5300
FACSIMILE (03) 6393 1474

OUR REF: 20 April 2000 TOWN PLANNING DEPARTMENT

YOUR REF: G J Lowen
5 Meander Valley Highway
Carrick TAS 7291

Dear Sir

STORAGE AND WRECKING OF VEHICLES
5 MEANDER VALLEY HIGHWAY, CARRICK

Recently, it has come to the attention of Council that your property at 'Crai-jen lodge', 7 Meander Valley Highway is being used to store, and wreck motor vehicles. This land is zoned Residential as such these activities are prohibited by the Meander Valley Planning Scheme 1995.

Under the Land Use Planning and Approvals Act 1993 the Council has a duty to investigate and rectify known breaches of its Planning Scheme. To assist Council in this regard I would ask you to clarify the present use of the land and your intentions for any future uses of the land. Specifically, whether you intend to continue the present use in the long term or whether the current activities are a temporary measure.

I understand you have recently purchased the property and as such may not be fully aware of the restrictions on the use of the land particularly those restriction on commercial enterprises.

There are a number of options open to Council in the long term to rectify this breach of the Scheme should it be necessary. Specifically an application could be made to the Resource Management and Appeal Tribunal for an order to require you to comply with the Planning Scheme. Any such action would of course be a last resort and would hopefully not be necessary. It is my experience that matters such as this can be resolved amicably without resort to any further action.

I look forward to hearing from you. If you should have any queries, or require further clarification please contact the Planning Department on 6393 5320.

Yours sincerely

Richard Jamieson
Town Planner

Appendix B –Historical Aerial Photographs

2024 (Source: Google Earth)

September 2023 - (Source: Google Earth) Street View

2022 (Source: Google Earth)

2009 (Source: Google Earth)

2011 (Source: Google Earth)

2016 (Source: Google Earth)

2022 (Source: Google Earth)

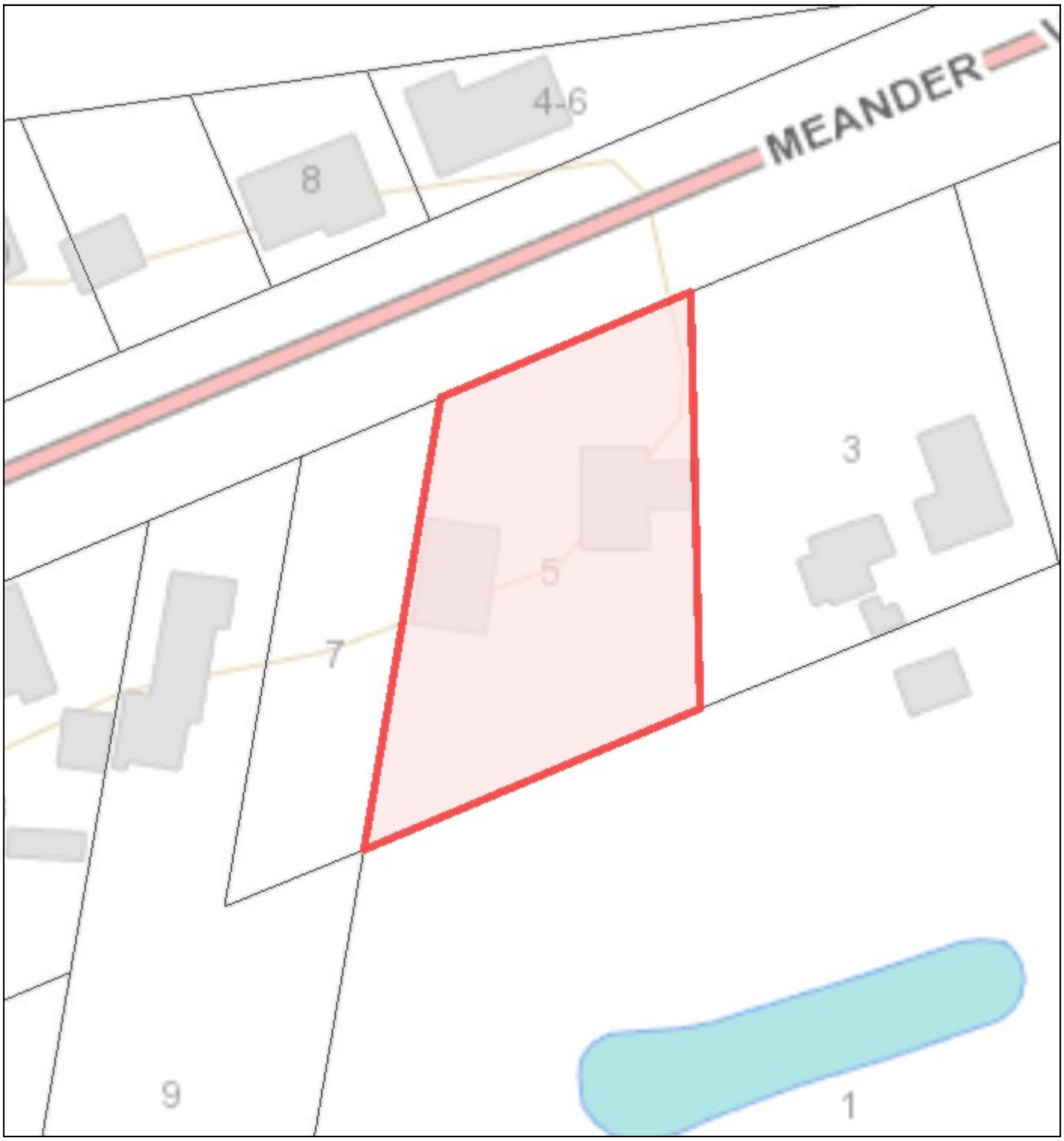
1984 LIST Map (Source: NRE Tasmania)

1982 LIST Map (Source: NRE Tasmania)

1969 LIST Map (Source: NRE Tasmania)

Appendix C – Property Report

PROPERTY ID:	**7018748**
PROPERTY ADDRESS:	**5 MEANDER VALLEY ROAD CARRICK TAS 7291**
CONSTRUCTION YEAR:	**1970**



PROPERTY DETAILS - 5 MEANDER VALLEY RD CARRICK

Property Name:		
Land Use:	Residential - DWELLING (valuation purposes only)	
Improvements:	DWELLING	
Improvement Sizes (Top 3 by Size):	**Improvement:**	**Area:**
	DWELLING	119.0 square metres
	WORKSHOP	
	FENCING & PAVING	
Number of Bedrooms:	2	
Construction Year of Main Building:	1970	
Roof Material:	Galvanised Iron	
Wall Material:	Brick Veneer	
Land Area:	0.2175 hectares	
Title References:	94801/3	
Municipality:	MEANDER VALLEY View Municipality Information Report	
Title owner:	94801/3 : GRAEME JOHN LOWEN	
Interested parties:	GRAEME JOHN LOWEN	
Postal address: (Interested Parties)	5 MEANDER VALLEY RD CARRICK TAS 7291	

OWNERSHIP HISTORY - 5 MEANDER VALLEY RD CARRICK

TYPE	NAME	ADDRESS	FROM	TO
Ownership	GRAEME JOHN LOWEN	5 MEANDER VALLEY RD CARRICK TAS 7291	11/02/2000	
Ownership	GWENDOLINE MYRTLE VINEY, LINDSAY THOMAS VINEY	5 MEANDER VALLEY ROAD CARRICK TAS 7291	15/04/1991	11/02/2000
Ownership	EDITH MARION CHAPPELL	5 MEANDER VALLEY ROAD CARRICK TAS 7291	01/07/1982	15/04/1991

PROPERTY SALES - 5 MEANDER VALLEY RD CARRICK

CONTRACT DATE	REAL ESTATE	CHATTELS	OTHER	SETTLEMENT DATE
20/01/2000	$86,000			11/02/2000
15/03/1991	$59,000			15/04/1991

SALES STATISTICS - (Residential - DWELLING) - CARRICK (Last 12 Months)

Number of Sales:	5
Highest Sales Price:	$810,000
Median Sales Price:	$625,000
Mean Sales Price:	$655,000
Lowest Sales Price:	$500,000

AERIAL IMAGERY

Explanation of Terms

Property ID	A unique number used for Valuation purposes.
Date Inspected	The date the property was inspected for the valuation.
Levels At	Levels At - or Levels of Valuation Date means the date at which values of properties are determined for all valuations in a Municipal Area.
Land Value	Land Value is the value of the property including drainage, excavation, filling, reclamation, clearing and any other invisible improvements made to the land. It excludes all visible improvements such as buildings, structures, fixtures, roads, standings, dams, channels, artificially established trees and pastures and other like improvements.
Capital Value	Capital Value is the total value of the property (including the land value), excluding plant and machinery.
AAV	Assessed Annual Value. AAV is the gross annual rental value of the property excluding GST, municipal rates, land tax and fixed water and sewerage, but cannot be less than 4% of the capital value.
Interested Parties	This is a list of persons who have been recorded by the Valuer-General as having interest in the property (ie owner or Government agency).
Postal Address	This is the last advised postal address for the interested parties.
Multiple Tenancies	Properties that have multiple tenants are assessed for separate AAV's. e.g. a house and flat.
Similar Criteria	Properties in the same locality with a Capital Value within a range of 10% of the property.

Appendix D – Site Photographs

***Photograph 1**: Inside the Shed/Mechanical workshop*

Photograph 2: Stockpile of vegetation and rubbish items

***Photograph 3**: South -east yard*

***Photograph 4**: South -west yard*

***Photograph 5**: Stockpile of rubbish items*

Photograph 6: North – east corner

***Photograph 7**: North – west corner*

Appendix E – Photos of Soil Bore Cores

0161 - Photos of Soil Bore cores

0161 - Photos of Soil Bore cores

0161 - Photos of Soil Bore cores

0161 - Photos of Soil Bore cores

Appendix F – Field Sheets – Soil Bore Logs

SOIL BORELOG SB01

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.4

COORDINATES 501265E, 5402444N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS North yard (adjacent to MV Rd)

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB01 - 0.1 to 0.3	0.1			SANDY Loam, dark brown	SM	L	No odour or staining
	0.2						
	0.3		D	SANDY Loam with pebbles (0.5-1.0 mm)			
	0.4						
	0.5			SAND with ironstone, pebbles, brown	GM		
	0.6						
	0.7						
	0.8						
	0.9						
	1			White SAND with pebbles		L - MD	
	1.1						
	1.2			Hardpan SAND with pebbles			
	1.3			refusal at 1.4 , SAND with pebbles			
SB01 - 1.4	1.4			Termination Depth at:1.4 m			
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB02

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.4

COORDINATES 501247E, 5402432N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS North yard (adjacent to MV Rd)

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB01 - 0.1 to 0.3	0.1		M	SANDY Loam, dark brown	SM	L	No odour or staining
	0.2						
	0.3						
	0.4			light grey SAND			
SB01 - 0.5 to 0.6	0.5			white SAND			
	0.6			Yellow SANDY gravel with pebbles	GW		
	0.7						
	0.8						
	0.9		D	Yellow CLAY with pebbles	SC	L - MD	
	1						
	1.1			Yellow SAND with pebbles	GW	L	
	1.2						
	1.3			Hard Yellow CLAY with white pebbles	CH	VSt	
	1.4			Termination Depth at:1.4 m			
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB03

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Hand Auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 0.8

COORDINATES 501242E, 5402412N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTSShed/Workshop

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB03 - 0.2	0.1		D	Concrete		L	No odour or staining
	0.2			brick, pebbles, sand			
SB03 - 0.4	0.3						
	0.4			black SAND	SM		
SB03 - 0.6	0.5						
	0.6			grey SANDY gravel with pebbles			
	0.7						
	0.8			Termination Depth at:0.8m refusal on rock			
	0.9						
	1						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5						
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB04

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Push tube - hollow auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.5

COORDINATES 501239E, 5402398N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS south (downslope of shed)

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB04 - 0 to 0.3	0.1		M	Black /dark grey SAND	SW	L	No odour or staining
	0.2						
	0.3		D	yellow SAND			
	0.4						
	0.5						
	0.6						
	0.7			yellow, stiff CLAY	CH	VSt	
SB04 - 0.7 to 0.9 SX SY	0.8						
	0.9						
	1						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5			Termination Depth at: 1.5 m			
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB05

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Push tube - hollow auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.5

COORDINATES 501258E, 5402400N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS south east yard

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
	0.1		M	dark grey, SAND	GM	L	No odour or staining
	0.2						
	0.3						
SB05 - 0.3 to 0.5	0.4			black, SAND, some white pebbles			
	0.5						
SB05 - 0.5 to 0.7	0.6			light grey, SAND			
	0.7		D	white, SAND			
	0.8			yellow, SAND with pebbles			
	0.9						
	1						
SB05 - 1.0 to 1.3	1.1			yellow, CLAY crumbly , with pebbles, ironstone	GC	MD	
	1.2						
	1.3						
	1.4						
	1.5			Termination Depth at: 1.5 m			
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB06

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Push tube - hollow auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.5

COORDINATES 501239E, 5402389N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS south yard

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
	0.1		M	dark grey, SAND	GM	L	No odour or staining
	0.2						
	0.3						
SB06 - 0.3 to 0.6	0.4		D	grey, SAND			
SB06 - 0.5 to 0.7	0.5						
	0.6			yellow, SAND			
	0.7						
	0.8						
	0.9						
SB06 - 1.0 to 1.1	1			yellow, CLAY stiff, some pebbles	GC	VSt	
	1.1						
	1.2						
	1.3						
	1.4						
	1.5			Termination Depth at: 1.5 m			
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB07

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Push tube - hollow auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.5

COORDINATES 501249E, 5402413N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS beside eastern wall of shed

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB07 - 0 to 0.3	0.1		M , wet from 0.9	dark grey, SAND with pebbles	GM	L	No odour or staining
	0.2						
	0.3						
	0.4						
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
SB07 - 0.9 to 1.1	1			grey, SAND			
	1.1		M	white, SAND with pebbles			
	1.2		D	yellow, CLAY stiff, some pebbles	GC	VSt	
	1.3						
	1.4						
	1.5			Termination Depth at: 1.5 m			
	1.6						
	1.7						
	1.8						
	1.9						

SOIL BORELOG SB08

PROJECT NUMBER EA 0161
PROJECT ADDRESS 5 Meander Valley Road
CLIENT Chris Reissig Builders
Drill Method Push tube - hollow auger

DRILLING DATE 12/06/2024
TOTAL DEPTH mBGS 1.5

COORDINATES 501242E, 5402406N
COORD SYS GDA94
PROJECT NAME ENVIRO. ASSESSMENT

COMMENTS beside southern wall of shed (downslope of shed)

LOGGED BY CARMEL PARKER
CHECKED BY

Samples	Depth (m)	Graphic Log	Moisture	Material Description	USCS	Consistency	Additional Observations
SB08 - 0 to 0.3	0.1		M	dark grey, SAND with pebbles	SM	L	No odour or staining
	0.2						
	0.3			yellow SANDY clay	SC	L-M	
SB08 - 0.4 to 0.6	0.4		D	orange, CLAY with white pebbles	GC	VSt	
	0.5						
	0.6						
	0.7						
	0.8						
	0.9						
	1						
	1.1						
	1.2						
	1.3						
	1.4						
	1.5			Termination Depth at: 1.5 m			
	1.6						
	1.7						
	1.8						
	1.9						

Appendix G – Laboratory Reports

CERTIFICATE OF ANALYSIS

Work Order	: **EM2409861**	Page	: 1 of 14
Client	: **Environmental Assessment Tasmania**	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Contact	: Customer Services EM
Address	: 18 KENSINGTON GARDENS NORWOOD 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: EA0161	Date Samples Received	: 13-Jun-2024 11:10
Order number	: EA0161	Date Analysis Commenced	: 17-Jun-2024
C-O-C number	: ----	Issue Date	: 20-Jun-2024 15:59
Sampler	: CARMEL PARKER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 21		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG005-T : EM2409803 #1 Poor duplicate precision for total copper due to sample matrix. Confirmed by re-digestion and re-analysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01-0.1 to 0.3	SB01-1.4	SB02-0 to 0.3	SB02-0.5 to 0.6	SB03-0.2
			Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit	EM2409861-001	EM2409861-002	EM2409861-003	EM2409861-004	EM2409861-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	14.5	----	----	----
Moisture Content	----	1.0	%	11.7	----	13.5	6.4	3.7
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	<5	6
Barium	7440-39-3	10	mg/kg	40	----	----	20	80
Beryllium	7440-41-7	1	mg/kg	<1	----	----	<1	<1
Boron	7440-42-8	50	mg/kg	<50	----	----	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg	42	----	----	6	29
Cobalt	7440-48-4	2	mg/kg	14	----	----	<2	<2
Copper	7440-50-8	5	mg/kg	19	----	----	<5	10
Lead	7439-92-1	5	mg/kg	37	----	----	22	85
Manganese	7439-96-5	5	mg/kg	380	----	----	71	142
Nickel	7440-02-0	2	mg/kg	9	----	----	<2	3
Selenium	7782-49-2	5	mg/kg	<5	----	----	<5	<5
Vanadium	7440-62-2	5	mg/kg	132	----	----	12	62
Zinc	7440-66-6	5	mg/kg	30	----	----	12	73
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	<0.1	0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01-0.1 to 0.3	SB01-1.4	SB02-0 to 0.3	SB02-0.5 to 0.6	SB03-0.2
			Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit	EM2409861-001	EM2409861-002	EM2409861-003	EM2409861-004	EM2409861-005
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	----	----	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	----	----	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	----	----	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	----	----	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	----	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	----	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	----	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	<50	<50	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB01-0.1 to 0.3	SB01-1.4	SB02-0 to 0.3	SB02-0.5 to 0.6	SB03-0.2
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EM2409861-001	EM2409861-002	EM2409861-003	EM2409861-004	EM2409861-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	92.3	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	84.9	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	87.4	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	80.2	----	----
Anthracene-d10	1719-06-8	0.5	%		----	----	107	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	124	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	85.0	82.2	----	----
Toluene-D8	2037-26-5	0.2	%		----	87.8	81.0	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	107	103	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB03-0.6	SB04-0 to 0.3	SB04-0.7 to 0.9	SX	SY
			Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit	EM2409861-007	EM2409861-008	EM2409861-009	EM2409861-010	EM2409861-011
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**2.6**	----	----	----	----
Moisture Content	----	1.0	%	----	**13.1**	**21.6**	**19.8**	**16.1**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	<5	**6**
Barium	7440-39-3	10	mg/kg	----	----	**30**	**30**	**30**
Beryllium	7440-41-7	1	mg/kg	----	----	<1	<1	<1
Boron	7440-42-8	50	mg/kg	----	----	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	**40**	**42**	**46**
Cobalt	7440-48-4	2	mg/kg	----	----	<2	<2	<2
Copper	7440-50-8	5	mg/kg	----	----	<5	<5	<5
Lead	7439-92-1	5	mg/kg	----	----	**8**	**8**	**6**
Manganese	7439-96-5	5	mg/kg	----	----	<5	**6**	<5
Nickel	7440-02-0	2	mg/kg	----	----	**8**	**10**	**9**
Selenium	7782-49-2	5	mg/kg	----	----	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	----	----	**92**	**79**	**90**
Zinc	7440-66-6	5	mg/kg	----	----	**6**	**6**	**5**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	**0.2**	**0.1**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB03-0.6	SB04-0 to 0.3	SB04-0.7 to 0.9	SX	SY
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EM2409861-007	EM2409861-008	EM2409861-009	EM2409861-010	EM2409861-011
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		----	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		----	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		----	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		----	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB03-0.6	SB04-0 to 0.3	SB04-0.7 to 0.9	SX	SY
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EM2409861-007	EM2409861-008	EM2409861-009	EM2409861-010	EM2409861-011
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	87.2	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	82.1	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	85.6	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	78.8	----	----	----
Anthracene-d10	1719-06-8	0.5	%		----	104	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		----	120	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		95.9	86.6	----	----	----
Toluene-D8	2037-26-5	0.2	%		96.5	88.9	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		114	104	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB05-0.3 to 0.5	SB05-0.5 to 0.7	SB06-0.3 to 0.6	SB06-0.5 to 0.7	SB07-0 to 0.3
			Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit	EM2409861-012	EM2409861-013	EM2409861-015	EM2409861-016	EM2409861-018
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	7.8	----	----	----
Moisture Content	----	1.0	%	7.9	----	5.3	4.6	8.4
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	<5	----
Barium	7440-39-3	10	mg/kg	30	----	----	<10	----
Beryllium	7440-41-7	1	mg/kg	<1	----	----	<1	----
Boron	7440-42-8	50	mg/kg	<50	----	----	<50	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	----
Chromium	7440-47-3	2	mg/kg	3	----	----	6	----
Cobalt	7440-48-4	2	mg/kg	<2	----	----	<2	----
Copper	7440-50-8	5	mg/kg	<5	----	----	<5	----
Lead	7439-92-1	5	mg/kg	6	----	----	<5	----
Manganese	7439-96-5	5	mg/kg	6	----	----	20	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	2	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	<5	----
Vanadium	7440-62-2	5	mg/kg	5	----	----	9	----
Zinc	7440-66-6	5	mg/kg	14	----	----	<5	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB05-0.3 to 0.5	SB05-0.5 to 0.7	SB06-0.3 to 0.6	SB06-0.5 to 0.7	SB07-0 to 0.3
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EM2409861-012	EM2409861-013	EM2409861-015	EM2409861-016	EM2409861-018
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Pyrene	129-00-0	0.5	mg/kg		----	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		----	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	<0.5	----	<0.5
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		----	----	<0.5	----	<0.5
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		----	----	<0.5	----	<0.5
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		----	----	**0.6**	----	**0.6**
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		----	----	**1.2**	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		----	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		----	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		----	<100	<100	----	<100
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		----	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	<10	----	<10
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		----	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		----	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		----	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		----	<100	<100	----	<100
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		----	<50	<50	----	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB05-0.3 to 0.5	SB05-0.5 to 0.7	SB06-0.3 to 0.6	SB06-0.5 to 0.7	SB07-0 to 0.3
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00
Compound	CAS Number	LOR	Unit		EM2409861-012	EM2409861-013	EM2409861-015	EM2409861-016	EM2409861-018
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	<0.2	----	<0.2
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		----	<1	<1	----	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	**88.4**	----	**88.5**
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	**80.8**	----	**81.2**
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	**84.6**	----	**84.6**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	**73.9**	----	**75.9**
Anthracene-d10	1719-06-8	0.5	%		----	----	**104**	----	**104**
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	**115**	----	**117**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	**96.5**	**94.3**	----	**97.4**
Toluene-D8	2037-26-5	0.2	%		----	**94.7**	**94.3**	----	**95.2**
4-Bromofluorobenzene	460-00-4	0.2	%		----	**115**	**109**	----	**117**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB07-0.9 to 1.1	SB08-0 to 0.3	SB08-0.4 to 0.6	----	----
			Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2409861-019	EM2409861-020	EM2409861-021	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	----	----	3.0	----	----
Moisture Content	----	1.0	%	8.3	13.9	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Barium	7440-39-3	10	mg/kg	<10	270	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	<1	----	----	----
Boron	7440-42-8	50	mg/kg	<50	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	3	10	----	----	----
Cobalt	7440-48-4	2	mg/kg	<2	2	----	----	----
Copper	7440-50-8	5	mg/kg	<5	53	----	----	----
Lead	7439-92-1	5	mg/kg	<5	234	----	----	----
Manganese	7439-96-5	5	mg/kg	30	553	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	4	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg	6	11	----	----	----
Zinc	7440-66-6	5	mg/kg	<5	122	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.9	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	----	----
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	SB07-0.9 to 1.1	SB08-0 to 0.3	SB08-0.4 to 0.6	----	----
				Sampling date / time	12-Jun-2024 00:00	12-Jun-2024 00:00	12-Jun-2024 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2409861-019	EM2409861-020	EM2409861-021	--------	--------
					Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		----	----	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	----	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		----	----	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		----	----	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		----	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		----	----	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg		----	----	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		----	----	<1	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	**96.8**	----	----
Toluene-D8	2037-26-5	0.2	%		----	----	**95.2**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	**117**	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

QUALITY CONTROL REPORT

Work Order	: **EM2409861**	Page	: 1 of 10
Client	: **Environmental Assessment Tasmania**	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Contact	: Customer Services EM
Address	: 18 KENSINGTON GARDENS NORWOOD 7250	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61-3-8549 9600
Project	: EA0161	Date Samples Received	: 13-Jun-2024
Order number	: EA0161	Date Analysis Commenced	: 17-Jun-2024
C-O-C number	: ----	Issue Date	: 20-Jun-2024
Sampler	: CARMEL PARKER		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 21		
No. of samples analysed	: 18		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5861684)									
EM2409803-001	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	32	32	0.0	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	240	# 333	32.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	38	30	25.2	No Limit
EM2409803-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	60	70	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	14	12	14.6	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	56	49	14.5	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	267	227	16.3	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	21	20	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	150	126	17.3	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2409803-017	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	50	80	36.7	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	36	28	28.1	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	20	19	6.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	34	29	16.1	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5861684) - continued									
EM2409803-017	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	8	6	19.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	7	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	71	57	21.4	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	26	26	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	8	38.2	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5861686)									
EM2409921-001	Anonymous	EG005T: Chromium	7440-47-3	2	mg/kg	26	33	22.4	0% - 50%
		EG005T: Manganese	7439-96-5	5	mg/kg	184	178	3.1	0% - 20%
EM2409861-004	SB02-0.5 to 0.6	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	20	30	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	7	0.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	22	30	28.4	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	71	99	33.4	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	12	13	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	14	19.2	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EM2409921-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	90	110	20.8	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	9	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	28	30	7.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	19	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	22	4.9	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	36	37	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	69	77	10.6	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5861803)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5861803) - continued									
EM2409366-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	17.2	17.0	1.3	0% - 50%
EM2409861-001	SB01-0.1 to 0.3	EA055: Moisture Content	----	0.1 (1.0)*	%	11.7	14.4	20.6	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5861804)									
EM2409861-012	SB05-0.3 to 0.5	EA055: Moisture Content	----	0.1 (1.0)*	%	7.9	7.3	8.5	No Limit
EM2409998-003	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	33.1	27.4	18.8	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5861685)									
EM2409803-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2409803-017	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5861688)									
EM2409861-004	SB02-0.5 to 0.6	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM2409921-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5861294)									
EM2409366-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM2409861-018	SB07-0 to 0.3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5861294) - continued									
EM2409861-018	SB07-0 to 0.3	EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5858686)									
EM2409861-002	SB01-1.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM2409938-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5861295)									
EM2409366-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2409861-018	SB07-0 to 0.3	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5858686)									
EM2409861-002	SB01-1.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EM2409938-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5861295)									
EM2409366-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM2409861-018	SB07-0 to 0.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 5858686)									
EM2409861-002	SB01-1.4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 5858686) - continued									
EM2409938-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5861684)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	110	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	108	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	124	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	93.8	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	115	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	104	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	106	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	104	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	102	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	106	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	110	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	84.0	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5861686)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	123 mg/kg	109	70.0	130
EG005T: Barium	7440-39-3	10	mg/kg	<10	99.3 mg/kg	105	70.0	130
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.67 mg/kg	116	70.0	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.23 mg/kg	88.6	50.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	20.2 mg/kg	113	70.0	130
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	11.2 mg/kg	103	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.9 mg/kg	104	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	62.4 mg/kg	102	70.0	130
EG005T: Manganese	7439-96-5	5	mg/kg	<5	590 mg/kg	100	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.4 mg/kg	105	70.0	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	61.3 mg/kg	108	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	162 mg/kg	82.7	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5861685)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5861685) - continued								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	97.6	69.0	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5861688)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.64 mg/kg	102	69.0	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5861294)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	96.0	85.7	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	96.0	81.0	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	95.7	83.6	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	93.6	81.3	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	103	79.4	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	103	81.7	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	94.8	78.3	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	93.0	79.9	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	119	76.9	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	120	80.9	130
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	115	70.0	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	119	80.4	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	118	70.2	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	115	67.9	122
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	118	65.8	123
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	119	65.8	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5858686)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	111	58.6	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5861295)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	820 mg/kg	106	75.0	128
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	2910 mg/kg	103	82.0	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1550 mg/kg	103	82.4	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5858686)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	106	59.3	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5861295)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1180 mg/kg	103	77.0	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3840 mg/kg	103	81.5	120
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	280 mg/kg	105	73.3	137
EP080: BTEXN (QCLot: 5858686)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080: BTEXN (QCLot: 5858686) - continued								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	99.2	61.6	117
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	108	65.8	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	108	65.8	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	115	64.8	134
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	116	68.7	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	102	61.8	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5861684)							
EM2409803-003	Anonymous	EG005T: Nickel	7440-02-0	50 mg/kg	99.9	78.0	120
EM2409803-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	95.7	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	89.2	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	89.5	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	91.7	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	91.6	80.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	82.6	80.0	120
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5861686)							
EM2409861-005	SB03-0.2	EG005T: Arsenic	7440-38-2	50 mg/kg	86.6	78.0	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.3	79.7	116
		EG005T: Chromium	7440-47-3	50 mg/kg	80.4	79.0	121
		EG005T: Copper	7440-50-8	250 mg/kg	94.9	80.0	120
		EG005T: Lead	7439-92-1	250 mg/kg	94.7	80.0	120
		EG005T: Nickel	7440-02-0	50 mg/kg	94.9	78.0	120
		EG005T: Zinc	7440-66-6	250 mg/kg	94.6	80.0	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5861685)							
EM2409803-003	Anonymous	EG035T: Mercury	7439-97-6	0.5 mg/kg	96.4	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5861688)							
EM2409861-005	SB03-0.2	EG035T: Mercury	7439-97-6	0.5 mg/kg	99.2	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5861294)							
EM2409366-029	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	103	77.2	116

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5861294) - continued							
EM2409366-029	Anonymous	EP075(SIM): Pyrene	129-00-0	3 mg/kg	97.2	65.5	136
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5858686)							
EM2409861-002	SB01-1.4	EP080: C6 - C9 Fraction	----	28 mg/kg	86.2	33.4	124
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5861295)							
EM2409803-021	Anonymous	EP071: C10 - C14 Fraction	----	820 mg/kg	110	71.2	125
		EP071: C15 - C28 Fraction	----	2910 mg/kg	105	75.6	122
		EP071: C29 - C36 Fraction	----	1550 mg/kg	105	78.0	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5858686)							
EM2409861-002	SB01-1.4	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	83.8	30.8	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5861295)							
EM2409803-021	Anonymous	EP071: >C10 - C16 Fraction	----	1180 mg/kg	106	72.2	128
		EP071: >C16 - C34 Fraction	----	3840 mg/kg	105	76.5	119
		EP071: >C34 - C40 Fraction	----	280 mg/kg	108	66.8	138
EP080: BTEXN (QCLot: 5858686)							
EM2409861-002	SB01-1.4	EP080: Benzene	71-43-2	2 mg/kg	91.8	54.4	127
		EP080: Toluene	108-88-3	2 mg/kg	99.9	57.1	131

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2409861**	Page	: 1 of 5
Client	: **Environmental Assessment Tasmania**	Laboratory	: Environmental Division Melbourne
Contact	: CARMEL PARKER	Telephone	: +61-3-8549 9600
Project	: EA0161	Date Samples Received	: 13-Jun-2024
Site	: ----	Issue Date	: 20-Jun-2024
Sampler	: CARMEL PARKER	No. of samples received	: 21
Order number	: EA0161	No. of samples analysed	: 18

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EM2409803--001	Anonymous	**Copper**	7440-50-8	32.5 %	0% - 20%	**RPD exceeds LOR based limits**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
SB01-0.1 to 0.3,	SB01-1.4,	**12-Jun-2024**	**----**	----	**----**	**17-Jun-2024**	26-Jun-2024	✓
SB02-0 to 0.3,	SB02-0.5 to 0.6,							
SB03-0.2,	SB03-0.6,							
SB04-0 to 0.3,	SB04-0.7 to 0.9,							
SX,	SY,							
SB05-0.3 to 0.5,	SB05-0.5 to 0.7,							
SB06-0.3 to 0.6,	SB06-0.5 to 0.7,							
SB07-0 to 0.3,	SB07-0.9 to 1.1,							
SB08-0 to 0.3,	SB08-0.4 to 0.6							
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
SB01-0.1 to 0.3,	SB02-0.5 to 0.6,	**12-Jun-2024**	**19-Jun-2024**	09-Dec-2024	✓	**19-Jun-2024**	09-Dec-2024	✓
SB03-0.2,	SB04-0.7 to 0.9,							
SX,	SY,							
SB05-0.3 to 0.5,	SB06-0.5 to 0.7,							
SB07-0.9 to 1.1,	SB08-0 to 0.3							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
SB01-0.1 to 0.3,	SB02-0.5 to 0.6,	**12-Jun-2024**	**19-Jun-2024**	10-Jul-2024	✓	**19-Jun-2024**	10-Jul-2024	✓
SB03-0.2,	SB04-0.7 to 0.9,							
SX,	SY,							
SB05-0.3 to 0.5,	SB06-0.5 to 0.7,							
SB07-0.9 to 1.1,	SB08-0 to 0.3							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SB02-0 to 0.3, SB04-0 to 0.3, SB06-0.3 to 0.6, SB07-0 to 0.3	**12-Jun-2024**	**18-Jun-2024**	26-Jun-2024	✓	**19-Jun-2024**	28-Jul-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
SB01-1.4, SB02-0 to 0.3, SB03-0.6, SB04-0 to 0.3, SB05-0.5 to 0.7, SB06-0.3 to 0.6, SB07-0 to 0.3, SB08-0.4 to 0.6	**12-Jun-2024**	**17-Jun-2024**	26-Jun-2024	✓	**19-Jun-2024**	26-Jun-2024	✓
Soil Glass Jar - Unpreserved (EP071)							
SB01-1.4, SB02-0 to 0.3, SB03-0.6, SB04-0 to 0.3, SB05-0.5 to 0.7, SB06-0.3 to 0.6, SB07-0 to 0.3, SB08-0.4 to 0.6	**12-Jun-2024**	**18-Jun-2024**	26-Jun-2024	✓	**18-Jun-2024**	28-Jul-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
SB01-1.4, SB02-0 to 0.3, SB03-0.6, SB04-0 to 0.3, SB05-0.5 to 0.7, SB06-0.3 to 0.6, SB07-0 to 0.3, SB08-0.4 to 0.6	**12-Jun-2024**	**17-Jun-2024**	26-Jun-2024	✓	**19-Jun-2024**	26-Jun-2024	✓
Soil Glass Jar - Unpreserved (EP071)							
SB01-1.4, SB02-0 to 0.3, SB03-0.6, SB04-0 to 0.3, SB05-0.5 to 0.7, SB06-0.3 to 0.6, SB07-0 to 0.3, SB08-0.4 to 0.6	**12-Jun-2024**	**18-Jun-2024**	26-Jun-2024	✓	**18-Jun-2024**	28-Jul-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
SB01-1.4, SB02-0 to 0.3, SB03-0.6, SB04-0 to 0.3, SB05-0.5 to 0.7, SB06-0.3 to 0.6, SB07-0 to 0.3, SB08-0.4 to 0.6	**12-Jun-2024**	**17-Jun-2024**	26-Jun-2024	✓	**19-Jun-2024**	26-Jun-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	6	40	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

abacus
environmental

Submission to Planning Authority Notice

Council Planning Permit No.	PA\24\0233		**Council notice date**	26/04/2024
TasWater details				
TasWater Reference No.	TWDA 2024/00499-MVC		**Date of response**	17/05/2024
TasWater Contact	Jake Walley	**Phone No.**	0467 625 805	
Response issued to				
Council name	MEANDER VALLEY COUNCIL			
Contact details	planning@mvc.tas.gov.au			
Development details				
Address	5 MEANDER VALLEY RD, CARRICK		**Property ID (PID)**	7018748
Description of development	Demolsh Dwelling & Multiple Dwellings x 6			

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Design to Live	MNDR05 All sheets	2	24/04/2024

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connection and sewerage system and connection to the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.
3. Prior to commencing construction/use of the development, any water connection utilised for construction/the development must have a backflow prevention device and water meter installed, to the satisfaction of TasWater.

DEVELOPER CHARGES

4. Prior to TasWater issuing a Certificate(s) for Certifiable Work (Building) and/or (Plumbing), the applicant or landowner as the case may be, must pay a developer charge totalling $5,271.00 to TasWater for water infrastructure for 3 additional Equivalent Tenements, indexed by the Consumer Price Index All groups (Hobart) from the date of this Submission to Planning Authority Notice until the date it is paid to TasWater.
5. Prior to TasWater issuing a Certificate(s) for Certifiable Work (Building) and/or (Plumbing), the applicant or landowner as the case may be, must pay a developer charge totalling $7,028.00 to TasWater for sewerage infrastructure for 4 additional Equivalent Tenements, indexed by the Consumer Price Index All groups (Hobart) from the date of this Submission to Planning Authority Notice until the date it is paid to TasWater.
6. In the event Council approves a staging plan, prior to TasWater issuing a Certificate(s) for Certifiable Work (Building) and/or (Plumbing) for each stage, the developer must pay the developer charges commensurate with the number of Equivalent Tenements in each stage, as approved by Council.

DEVELOPMENT ASSESSMENT FEES

7. The applicant or landowner as the case may be, must pay a development assessment fee of $389.86 to TasWater, as approved by the Economic Regulator and the fee will be indexed, until the date paid to TasWater.

   The payment is required within 30 days of the issue of an invoice by TasWater.

8. In the event Council approves a staging plan, a Consent to Register a Legal Document fee for each stage, must be paid commensurate with the number of Equivalent Tenements in each stage, as approved by Council.

Advice

General

For information on TasWater development standards, please visit https://www.taswater.com.au/building-and-development/technical-standards

For application forms please visit https://www.taswater.com.au/building-and-development/development-application-form

Developer Charges

For information on Developer Charges please visit the following webpage - https://www.taswater.com.au/building-and-development/developer-charges

Water Submetering

As of July 1 2022, TasWater's Sub-Metering Policy no longer permits TasWater sub-meters to be installed for new developments. Please ensure plans submitted with the application for Certificate(s) for Certifiable Work (Building and/or Plumbing) reflect this. For clarity, TasWater does not object to private sub-metering arrangements. Further information is available on our website (www.taswater.com.au) within our Sub-Metering Policy and Water Metering Guidelines.

Service Locations

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.

(a) A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater.

(b) TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit https://www.taswater.com.au/building-and-development/service-locations for a list of companies.

(c) Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

NOTE: In accordance with the WATER AND SEWERAGE INDUSTRY ACT 2008 - SECT 56ZB A regulated entity may charge a person for the reasonable cost of –

(a) a meter; and

(b) installing a meter.

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

TasWater Contact Details

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