

To Mr Stuart Jackson - Myriad

Pages 32

CC

Subject 121 Link Street and 25 Flierl Street Flooding and Stormwater Assessment

From Brett Langtree

Ref No./File 1613/TM-AR0356

Date 5/06/2026

1.0 INTRODUCTION

Langtree Consulting have been engaged by Myriad to complete a Flooding and Stormwater assessment for the two proposed housing sites. One site is located at 121 Link Road and the other at 25 Flierl Street, Hope Vale.

2.0 THE SITE

The sites are located within Hope Vale. Refer to **Figure 1** below for the site locality.

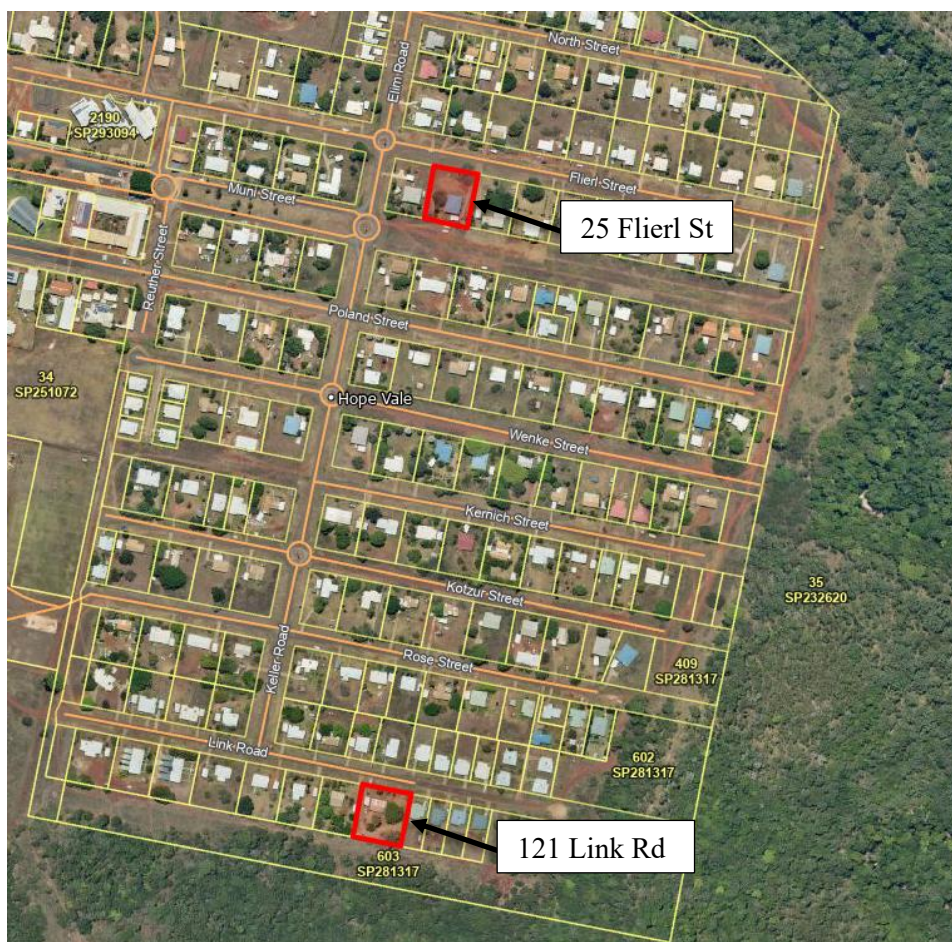


Figure 1: Site Locality

3.0 PROPOSED DEVELOPMENT

It is proposed that the existing dwellings on the sites are to remain with an additional new dwellings being located on both housing sites. Refer to **Figure 2** and **Figure 3** for the proposed development plans. Refer to **Appendix A** for the 25 Flierl Street Development Plans and **Appendix B** for the 121 Link Road Development Plans.

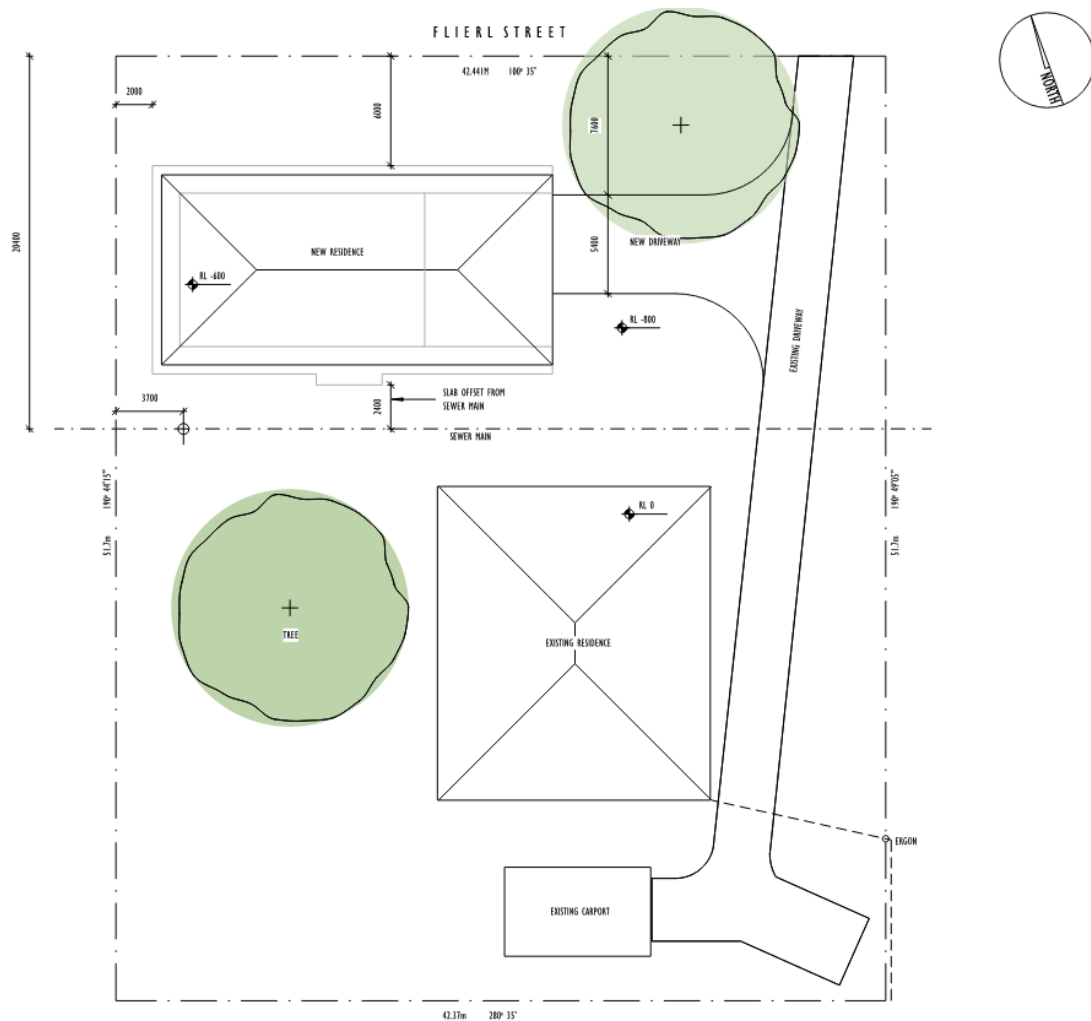


Figure 2: 25 Flierl St Development Plans

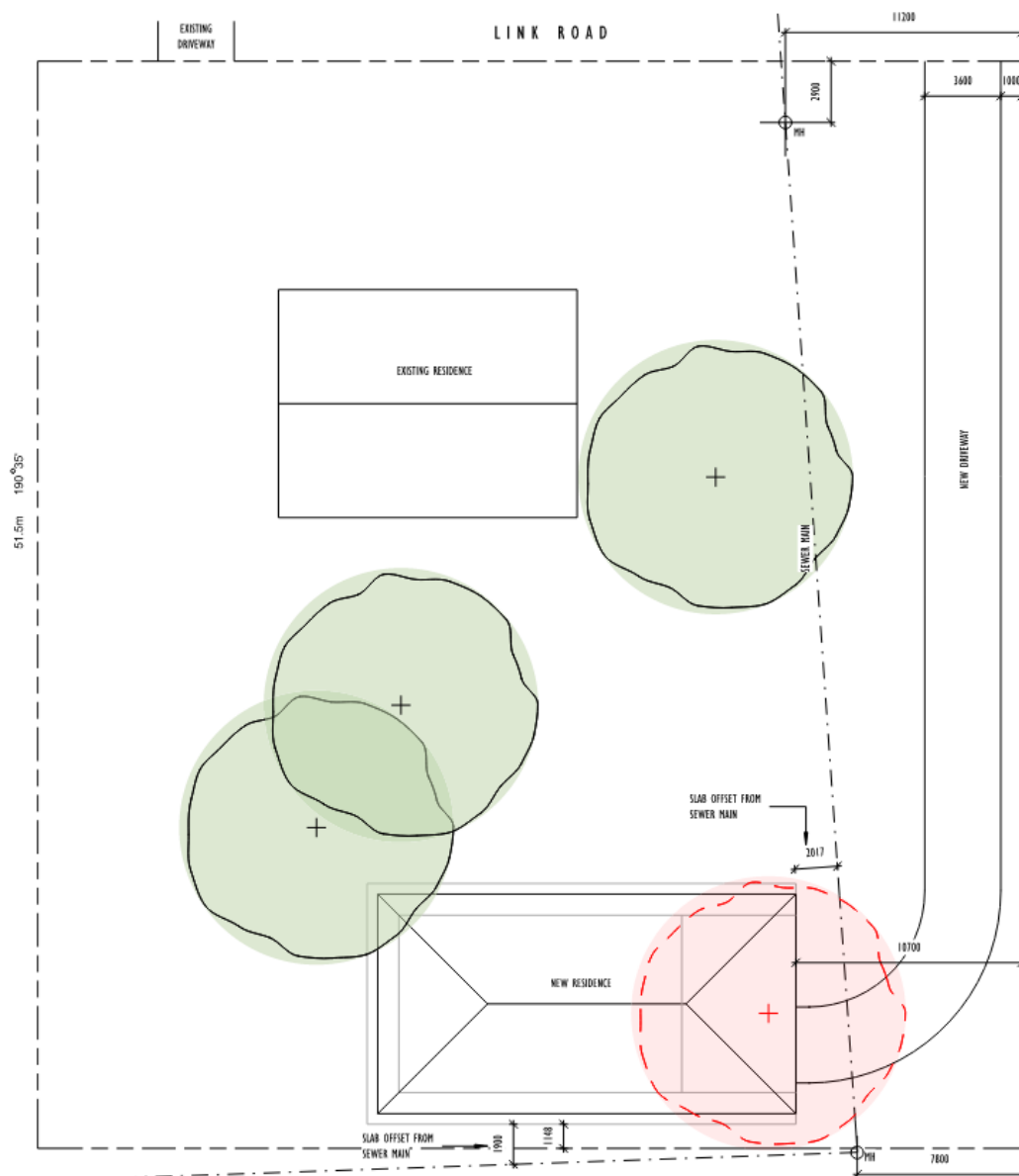


Figure 3: 121 Link Road Development Plans

4.0 STORMWATER ASSESSMENT

4.1 HYDRAULIC ASSESSMENT

Hydraulic assessment of the site has been undertaken in accordance with the Queensland Urban Drainage Manual (QUDM) 2017. The rational method equations have been adopted:

$$Q_y = (C_y \cdot i_y \cdot A) / 360$$

Where: Q_y = peak flow rate (m³/s) for average recurrence interval (ARI) of 'y' years

C_y = coefficient of discharge (dimensionless) for ARI of 'y' years

A = area of catchment (Hectares)

i_y = average rainfall intensity (mm/h) for a design duration of 't' hours and an ARI of 'y' years

t = the nominal design storm duration as defined by the time of concentration

4.2 25 FLIERL STREET STORMWATER ASSESSMENT

The site falls from southwest to the northeast of the site. The development catchment area is shown in blue in **Figure 4**. The catchment area is 2,225m² with an impervious area of 250m². This catchment discharges to the table drain within Flierl Street. The area within the lot not in the catchment area is not impacted by the proposed development.

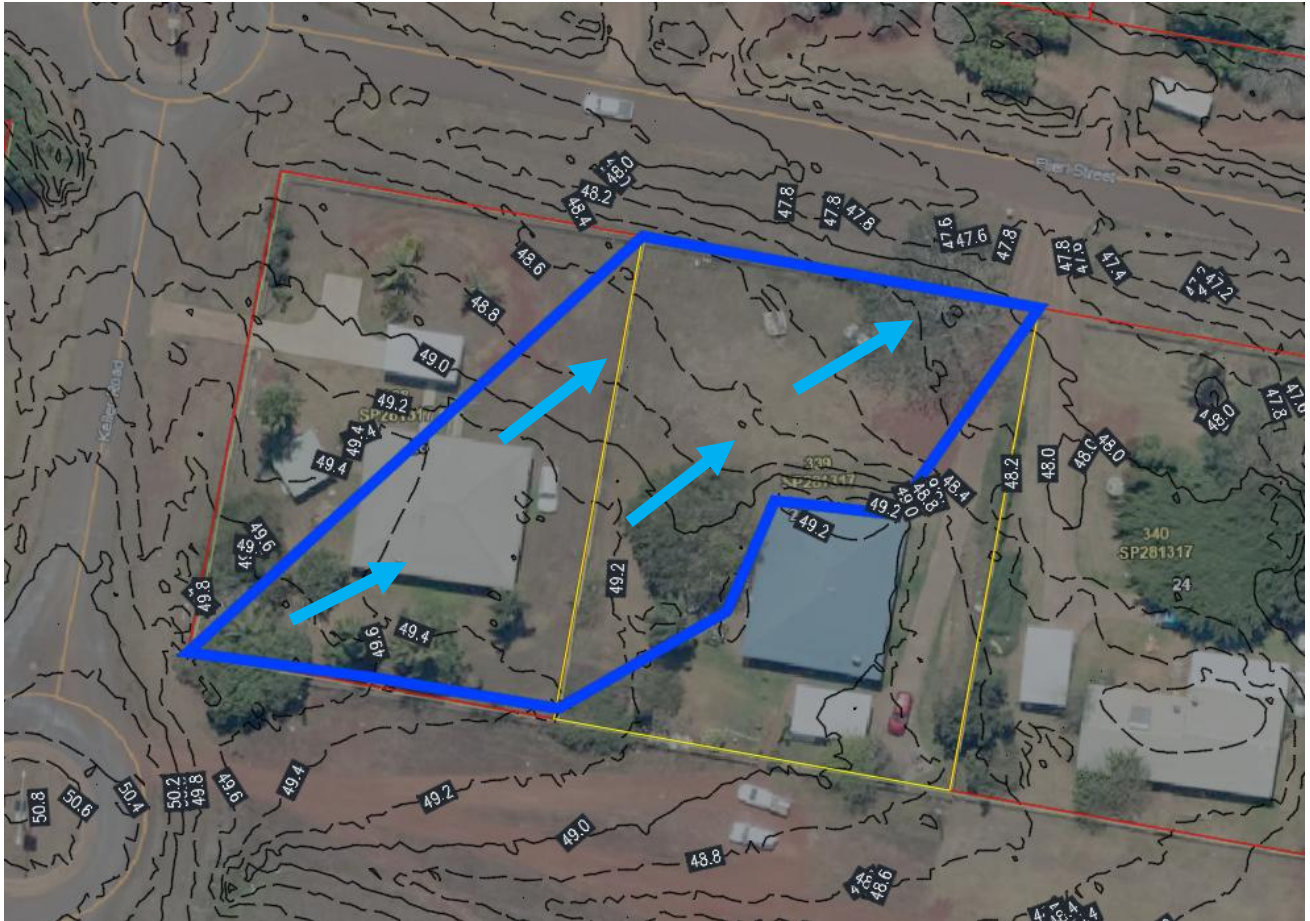


Figure 4: 25 Flierl St Development Catchment Area

The predevelopment flow is $0.027\text{m}^3/\text{s}$. The impervious area has increased by 328m^2 (total = 578m^2) due to the house and the driveway. Based on this increase the post development flow is $0.028\text{m}^3/\text{s}$ which is an increase of $0.001\text{m}^3/\text{s}$. This increase is negligible and as such does not impact the downstream properties. Refer to **Appendix C** for the calculations.

4.3 121 LINK ROAD STORMWATER ASSESSMENT

The site falls from southwest to the northeast of the site. The predevelopment catchment area is shown in blue in **Figure 4** **Figure 5**. The catchment area is 6.7ha with an impervious area of $3,055\text{m}^2$. This catchment discharges through the properties to the east of the development site.

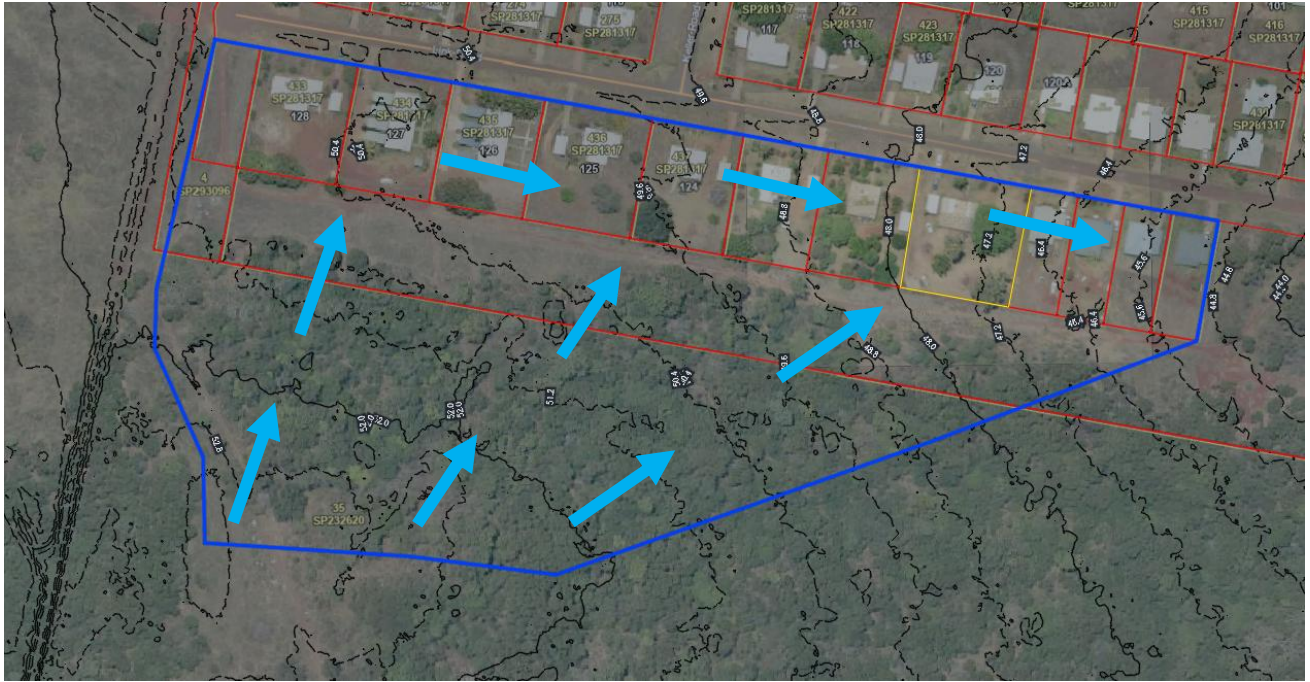


Figure 5: 121 Link Road Catchment Area

The predevelopment flow is $1.313\text{m}^3/\text{s}$. The impervious area has increased by 417m^2 (total = $3,472\text{m}^2$) due to the house and the driveway. Based on this increase the post development flow is $1.316\text{m}^3/\text{s}$ which is an increase of $0.003\text{m}^3/\text{s}$. This increase is negligible and as such does not impact the downstream properties. Refer to **Appendix D** for the calculations.

5.0 FLOOD ASSESSMENT

Venant Solutions have provided flood levels for both properties. These flood levels have been used to determine the floor levels of the proposed residential dwellings.

As outlined in Venants Flood Advice, 25 Flierl Street is not subject to flooding as it has approximately 50mm depth of overland flow. The flood level at 25 Flierl Street is **48.7m AHD**. Therefore, using a 300mm freeboard the **minimum floor level is 49.0m AHD**. Refer to **Appendix E** for Venants Flood Advice.

As outlined in Venants Flood Advice, 121 Link Road is flooded by a typical depth of 300mm giving a flood level of **48.05m AHD**. Therefore, using a 300mm freeboard the **minimum floor level is 48.35m AHD**. Refer to **Appendix F** for Venants Flood Advice.

6.0 LOCAL STOMRWATER ASSESSMENT

6.1 25 FLIERL STREET

As seen in **Figure 6** below, the stormwater flows directly through the proposed building location. As such the local stormwater is required to be directed around the building via a small bund or drainage swale and into the Flierl Street table drain.

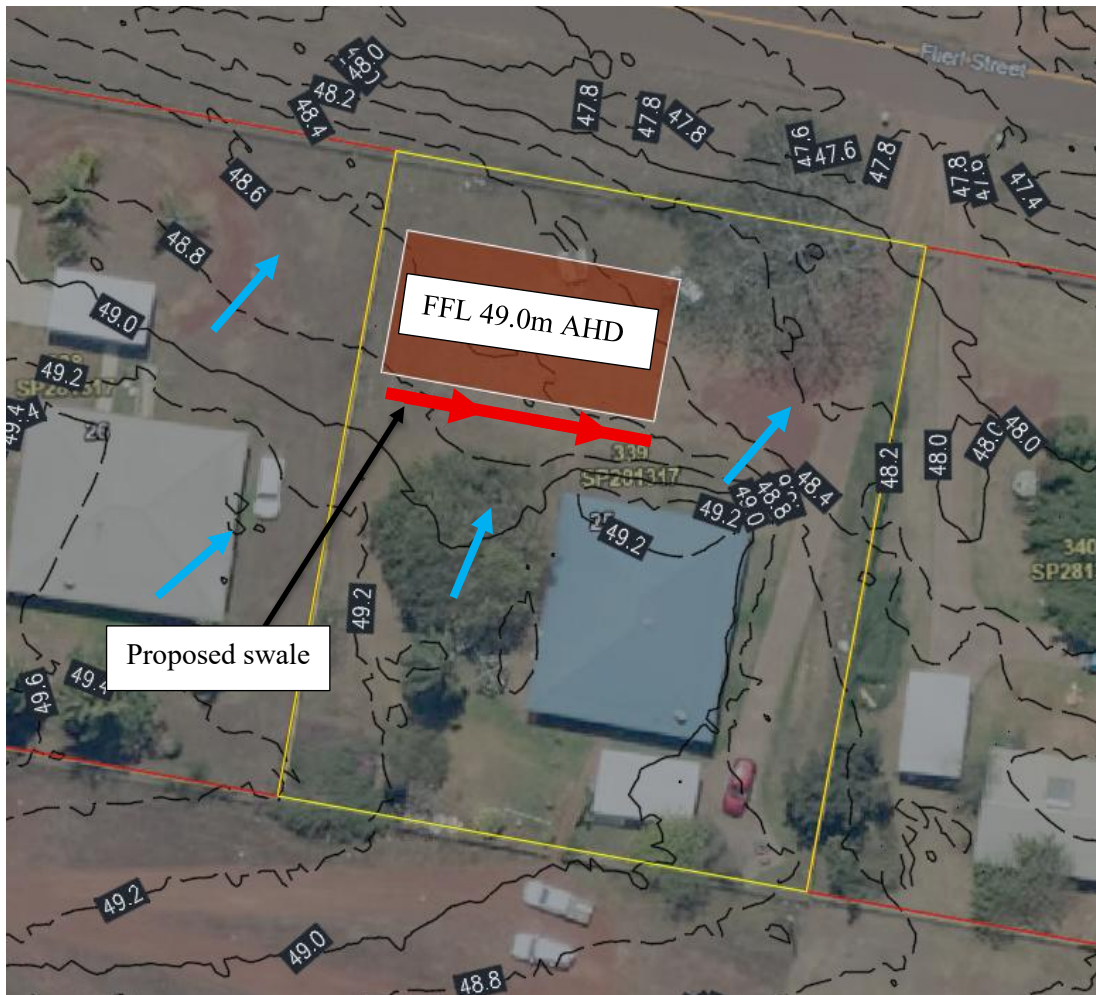


Figure 6: 25 Flierl Street Local Stormwater

6.2 121 LINK ROAD

As seen in **Figure 7**, the stormwater flows directly through the proposed building location. As such the local stormwater is required to be directed around the building via a small bund or drainage swale. They will direct stormwater to the southern side of the lots to the east as the dwellings are on the northern side.

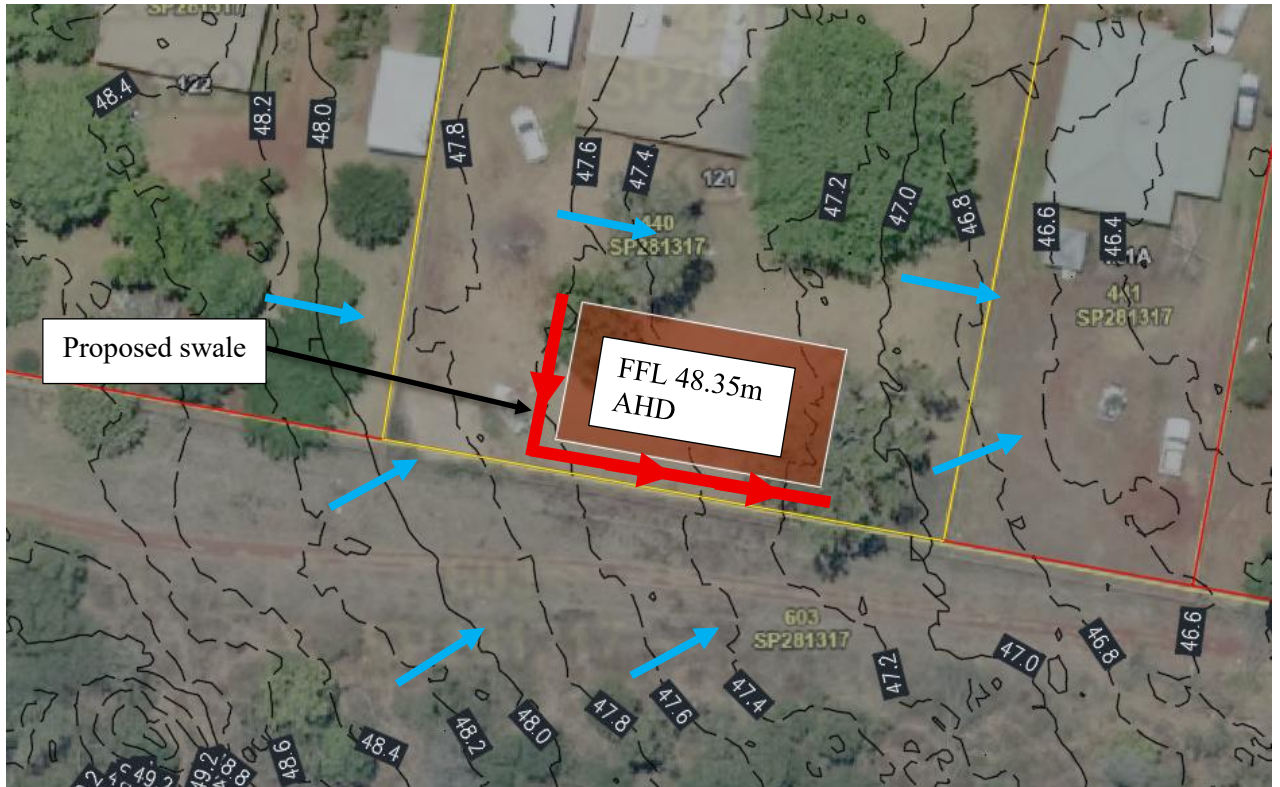


Figure 7: 121 Link Road Local Stormwater

7.0 SUMMARY

In summary, the two development sites have a negligible impact on surrounding properties in terms of stormwater increase due to the developments. The flood levels have also been checked and the minimum floor levels have been provided.

8.0 CERTIFICATION STATEMENT AND AUTHORISATION

This Engineering Services Report has been prepared under the direction of Brett Langtree (RPEQ No 11932), a civil engineer with 27 years' experience in the planning, design and implementation of civil infrastructure.

B. Langtree

Brett Langtree – Principal Civil Engineer (RPEQ No 11932), Langtree Consulting

Date: 5 June 2026

APPENDIX A

25 FLIERL STREET DEVELOPMENT PLANS

DRAWING LIST				
SHEET NUMBER	SHEET NAME	SHEET ISSUE DATE	CURRENT REVISION	CURRENT REVISION DESCRIPTION
1.1	COVER PAGE	14.05.26	RI	REVIEW
1.2	GENERAL NOTES	14.05.26		
1.3	PLUMBING NOTES	14.05.26		
1.4	ENGINEERING NOTES	14.05.26		
1.5	ENGINEERS NOTES 2	14.05.26		
2.1	SITE PLAN	14.05.26	RI	REVIEW
3.1	FLOOR PLAN	14.05.26	RI	REVIEW
3.2	DIMENSION PLAN	14.05.26		
3.3	DOOR AND WINDOW NOTES	14.05.26		
4.1	SLAB PLAN	14.05.26		
4.2	SLAB DETAILS	14.05.26		
4.3	SLAB DETAILS	14.05.26		
4.4	BLOCKWALL DETAILS	14.05.26		
5.1	ROOF FRAMING PLAN	14.05.26		
5.2	ROOF DETAILS	14.05.26		
6.1	ELECTRICAL PLAN	14.05.26		
6.2	ELECTRICAL PLAN	14.05.26		
6.3	SCHEMATIC HYDRAULICS PLAN	14.05.26		
7.1	ELEVATIONS	14.05.26	RI	REVIEW
7.3	SECTIONS	14.05.26		
8.1	KITCHEN DETAILS	14.05.26		
8.2	VANITY DETAILS	14.05.26		
9.1	3D VIEWS	14.05.26		

REVIEW

DRAWING STATUS:

REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 14.05.26
---------------------	-------------------------------	-------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.

PROJECT NAME:
SECOND DWELLING

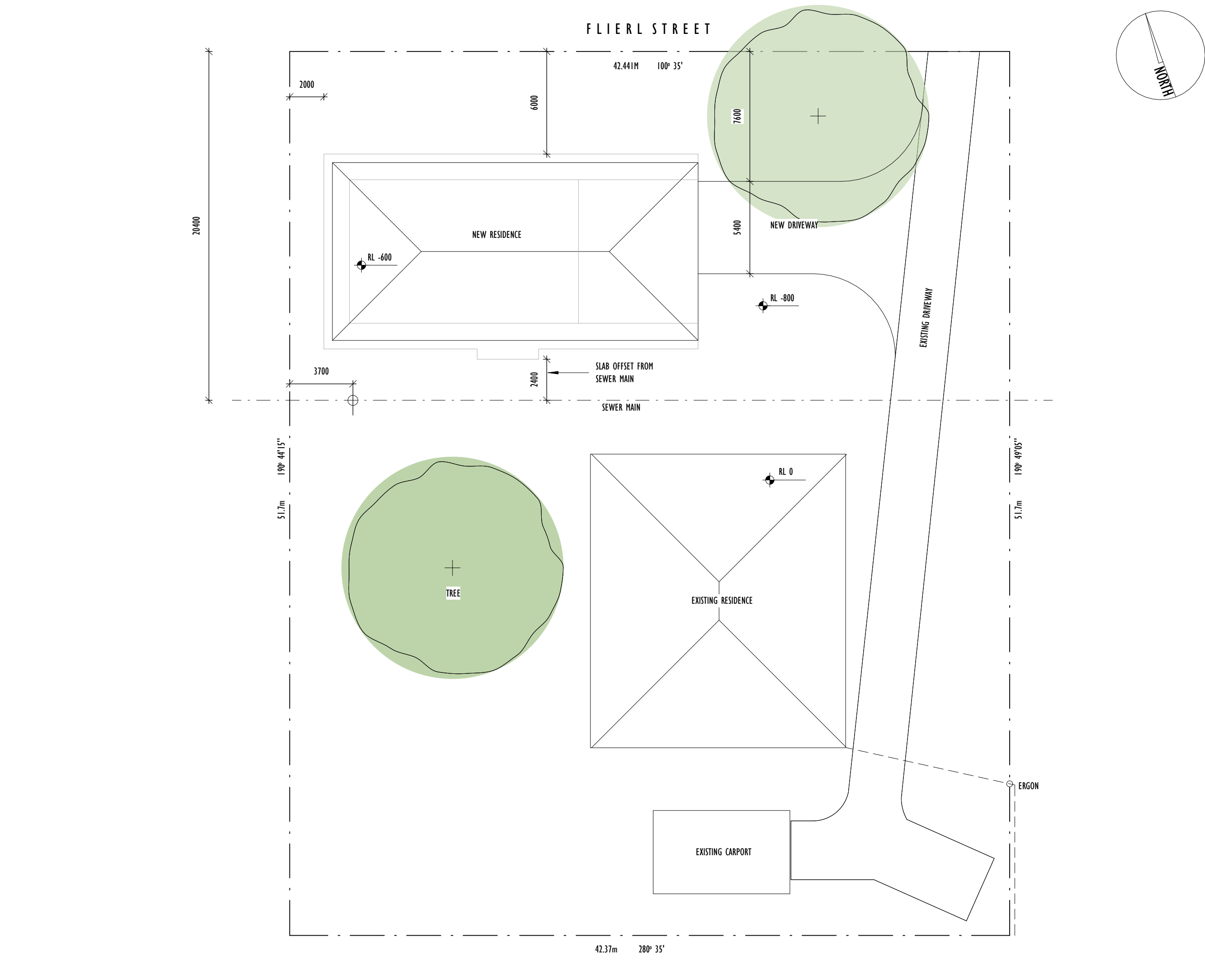
PROJECT ADDRESS:
25 FLIERL ST, HOPEVALE

CLIENT:
HVASC

COVER PAGE

SCALE @ A3
ISSUE DATE 14.05.26

SHEET NUMBER 3007 - 1.1

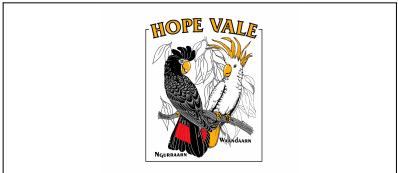


REVIEW

DRAWING STATUS:		
REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY:	CHECKED BY:	CHECKED ON:
MYRIAD	STUART JACKSON	14.05.26

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

tapitor pty ltd trading as myriad design abn 23 055 558 659

176 buchan street, cairns qld 4870

07 4041 7258 QBSA 1164388

PROJECT NAME:
SECOND DWELLING
PROJECT ADDRESS:
25 FLIERL ST, HOPEVALE
CLIENT:
HVASC

SITE PLAN	
SCALE	I : 200@ A3
ISSUE DATE	14.05.26

SHEET NUMBER	3007 - 2.1
--------------	------------

DRAWING STATUS:

REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 14.05.26
---------------------	-------------------------------	-------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

tapitor pty ltd trading as myriad design abn 23 055 558 659
a. 176 buchan street, cairns qld 4870
t. 07 4041 7258 QBSA 1164388

PROJECT NAME:
SECOND DWELLING

PROJECT ADDRESS:
25 FLIERL ST, HOPEVALE

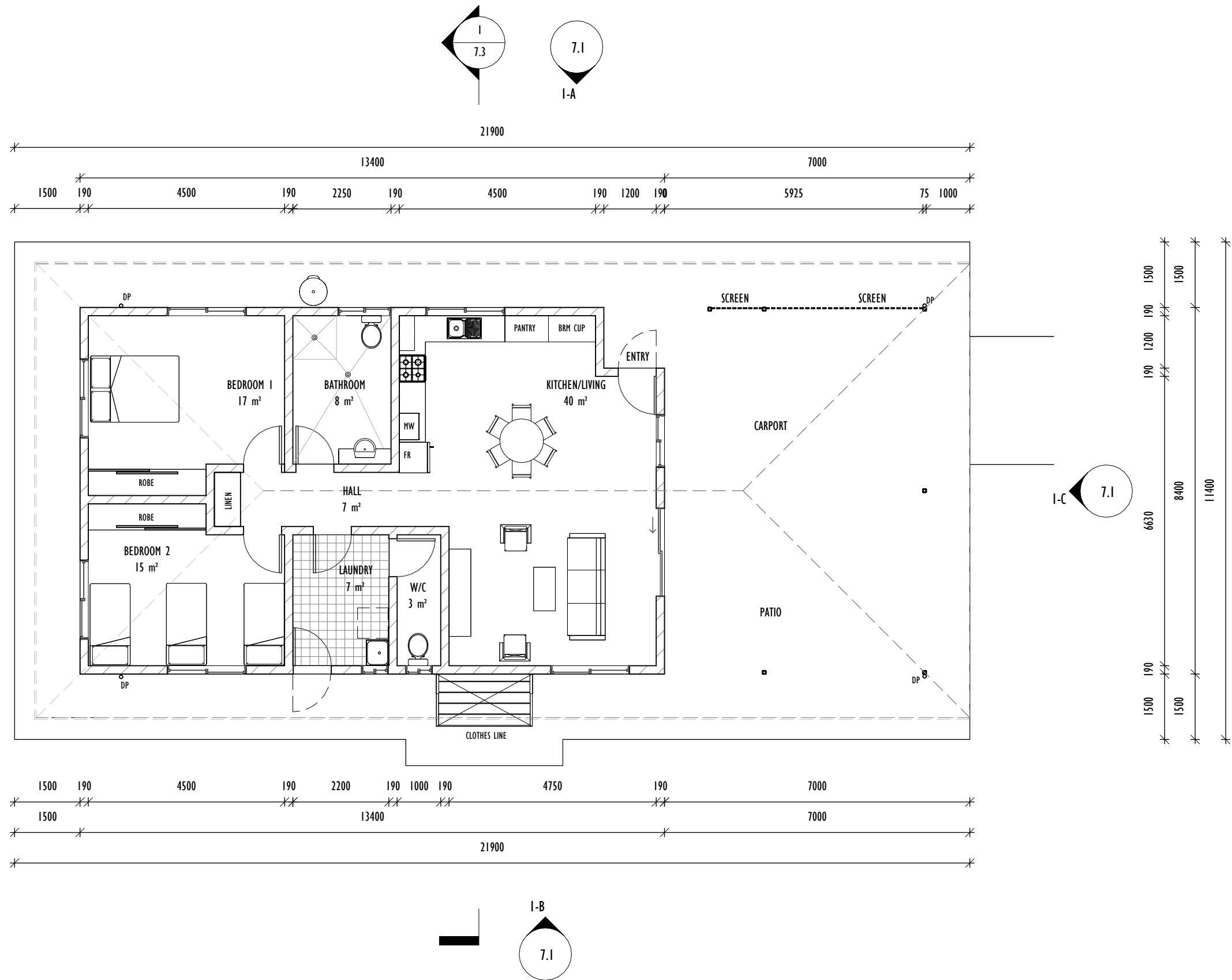
CLIENT:
HVASC

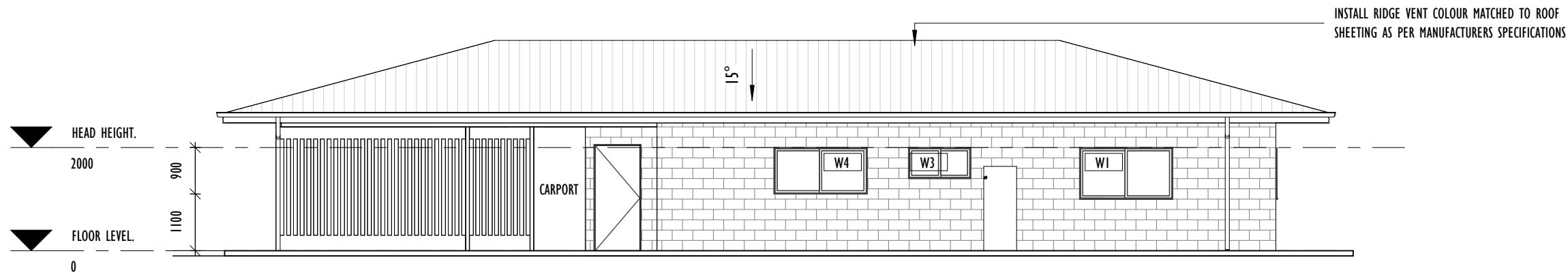
FLOOR PLAN

SCALE
ISSUE DATE

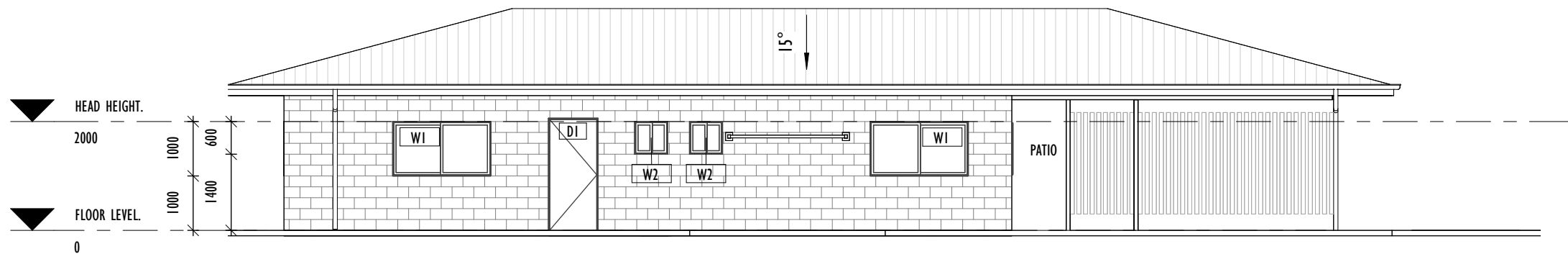
1 : 100@ A3
14.05.26

SHEET NUMBER
3007 - 3.1

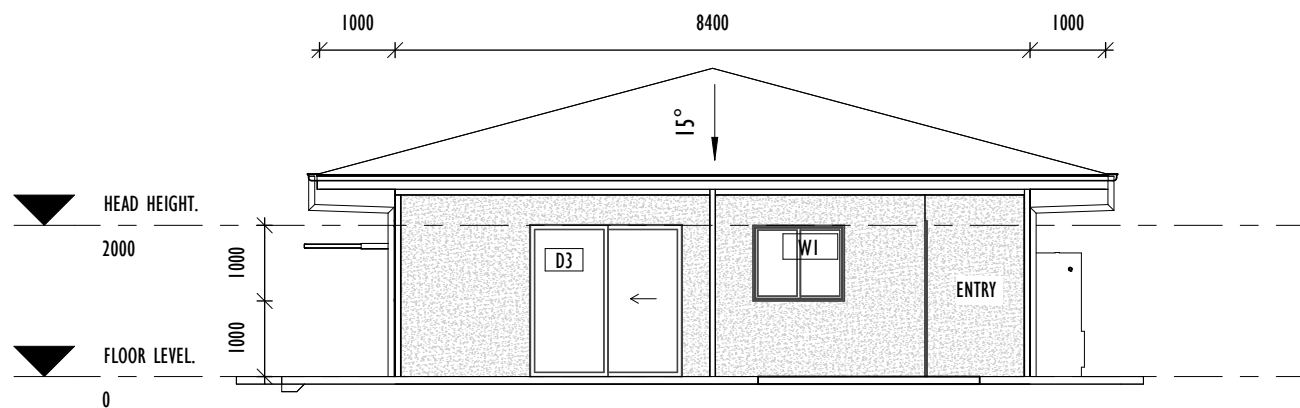




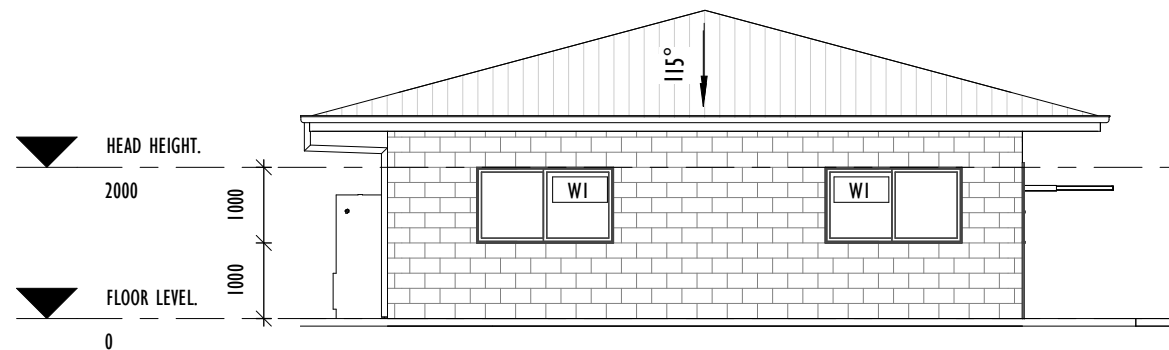
I-A
3.1 7.1
ELEVATION I-A
1 : 100



I-B
3.1 7.1
ELEVATION I-B
1 : 100



I-C
3.1 7.1
ELEVATION I-C
1 : 100



I-D
3.1 7.1
ELEVATION I-D
1 : 100

REVIEW

DRAWING STATUS:

REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 14.05.26
---------------------	-------------------------------	-------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

tapitor pty ltd trading as myriad design abn 23 055 558 659
a 176 buchan street, cairns qld 4870
t 07 4041 7258 QBSA 1164388

PROJECT NAME:
SECOND DWELLING

PROJECT ADDRESS:
25 FLIERL ST, HOPEVALE

CLIENT:
HVASC

ELEVATIONS

SCALE
ISSUE DATE

1 : 100@ A3
14.05.26

SHEET NUMBER
3007 - 7.1

APPENDIX B

121 LINK ROAD DEVELOPMENT PLANS

DRAWING LIST				
SHEET NUMBER	SHEET NAME	SHEET ISSUE DATE	CURRENT REVISION	CURRENT REVISION DESCRIPTION
1.1	COVER PAGE	14.05.26	RI	REVIEW
1.2	GENERAL NOTES	14.05.26		
1.3	PLUMBING NOTES	14.05.26		
1.4	ENGINEERING NOTES	14.05.26		
1.5	ENGINEERS NOTES 2	14.05.26		
2.1	SITE PLAN	14.05.26	RI	REVIEW
3.1	FLOOR PLAN	14.05.26	RI	REVIEW
3.2	DIMENSION PLAN	14.05.26		
3.3	DOOR AND WINDOW NOTES	14.05.26		
4.1	SLAB PLAN	14.05.26		
4.2	SLAB DETAILS	14.05.26		
4.3	SLAB DETAILS	14.05.26		
4.4	BLOCKWALL DETAILS	14.05.26		
5.1	ROOF FRAMING PLAN	14.05.26		
5.2	ROOF DETAILS	14.05.26		
6.1	ELECTRICAL PLAN	14.05.26		
6.2	ELECTRICAL DETAILS AND LEGEND	14.05.26		
6.3	SCHEMATIC HYDRAULICS PLAN	14.05.26		
7.1	ELEVATIONS	14.05.26	RI	REVIEW
7.2	SECTIONS	14.05.26		
8.1	KITCHEN DETAILS	14.05.26		
8.2	VANITY DETAILS	14.05.26		
9.1	3D VIEWS	14.05.26		

REVIEW

DRAWING STATUS:

REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 14.05.26
---------------------	-------------------------------	-------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.

PROJECT NAME:
SECOND DWELLING

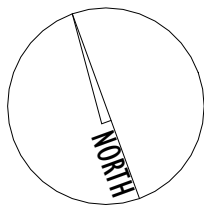
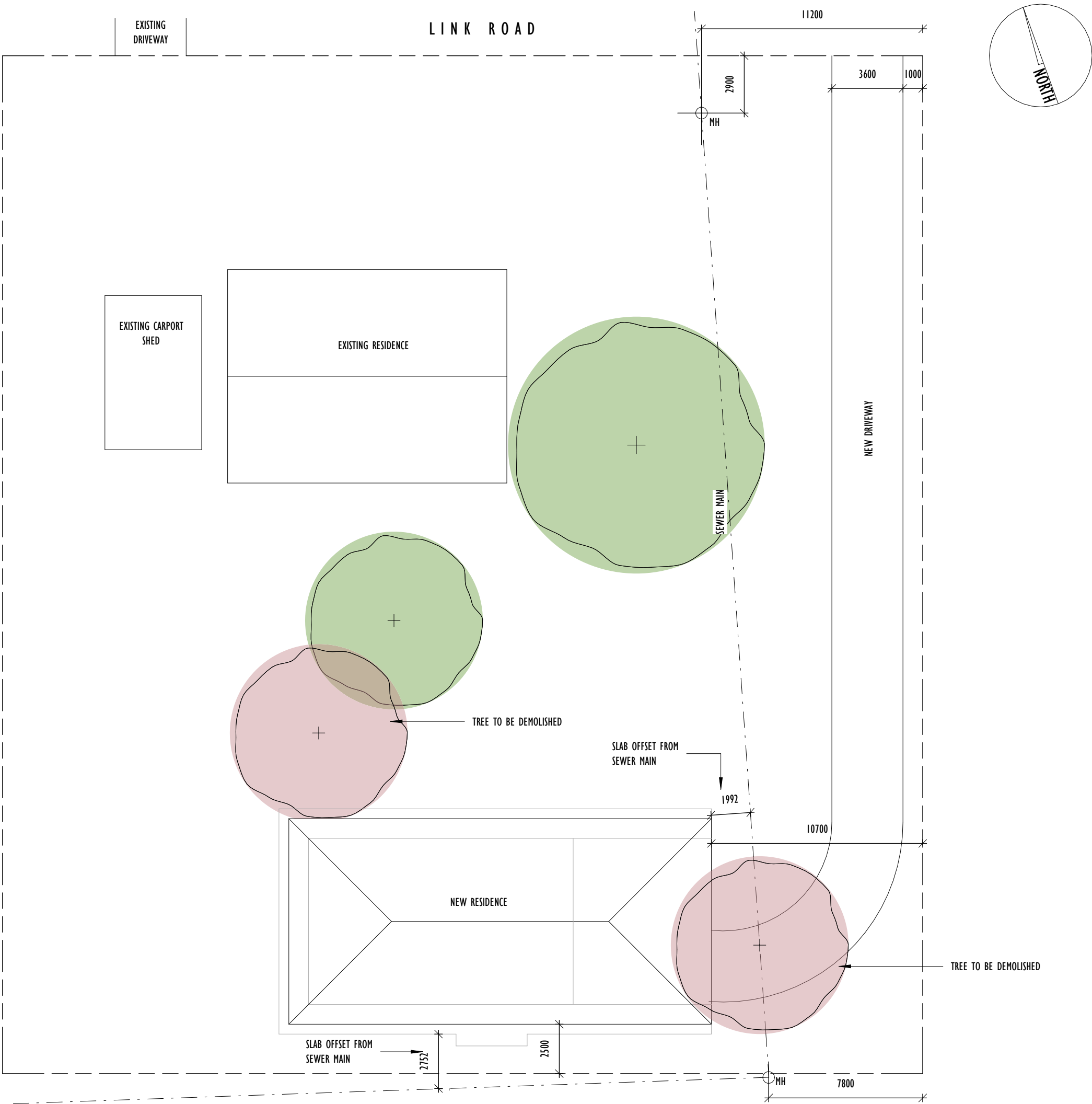
PROJECT ADDRESS:
121 LINK RD, HOPEVALE

CLIENT:
HVASC

COVER PAGE

SCALE @ A3
ISSUE DATE 14.05.26

SHEET NUMBER 3007 - 1.1



REVIEW

DRAWING STATUS:		
REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY:	CHECKED BY:	CHECKED ON:
MYRIAD	STUART JACKSON	14.05.26

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.





tapitor Pty Ltd trading as myriad design abn 23 055 558 659
a. 176 buchan street, cairns qld 4870
t. 07 4041 7258 QBSA 1164388

PROJECT NAME: SECOND DWELLING
PROJECT ADDRESS: 121 LINK RD, HOPEVALE
CLIENT: HVASC

SITE PLAN	
SCALE ISSUE DATE	1 : 200@ A3 14.05.26
SHEET NUMBER	3007 - 2.1

DRAWING STATUS:		
REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY:	CHECKED BY:	CHECKED ON:
MYRIAD	STUART JACKSON	14.05.26

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

tapitor pty ltd trading as myriad design abn 23 055 558 659
a 176 buchan street, cairns qld 4870
t 07 4041 7258 QBSA 1164388

PROJECT NAME:
SECOND DWELLING

PROJECT ADDRESS:
121 LINK RD, HOPEVALE

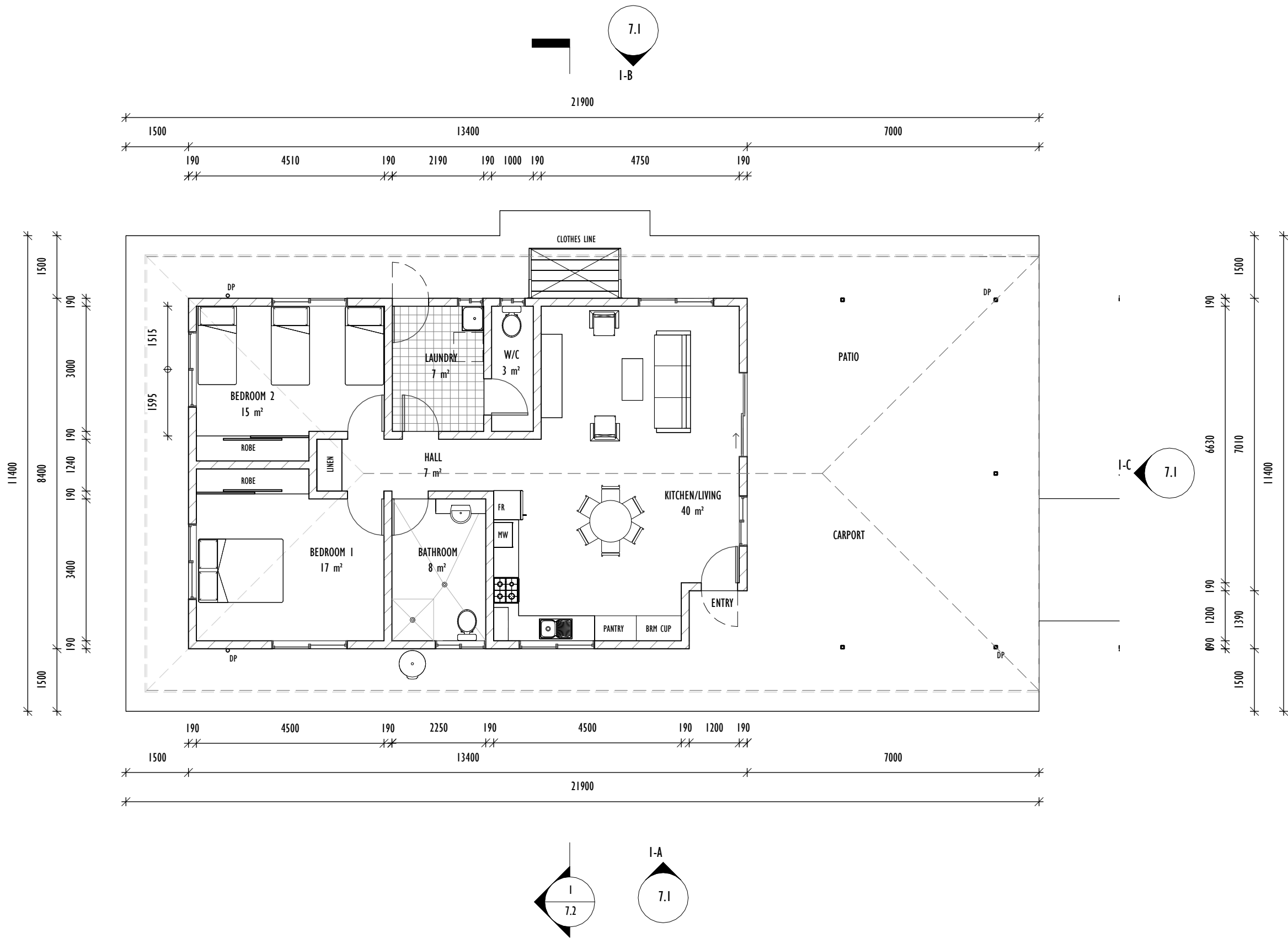
CLIENT:
HVASC

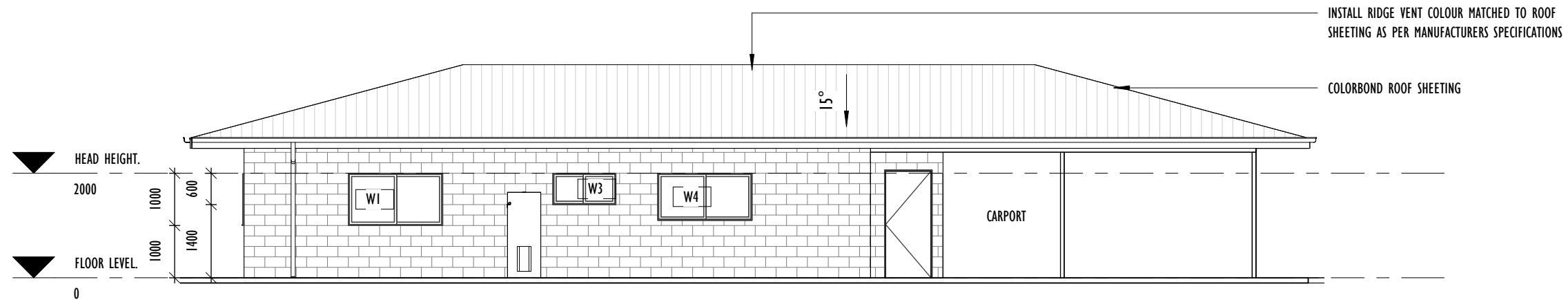
FLOOR PLAN

SCALE
ISSUE DATE

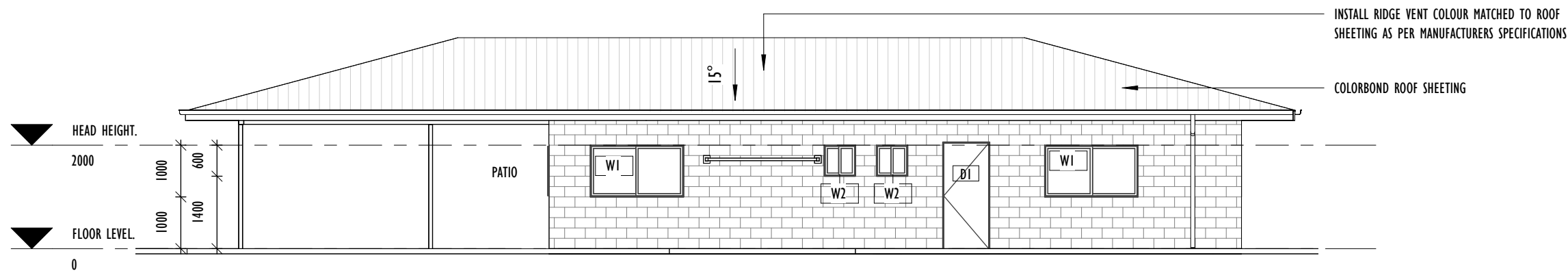
1 : 100@ A3
14.05.26

SHEET NUMBER
3007 - 3.1

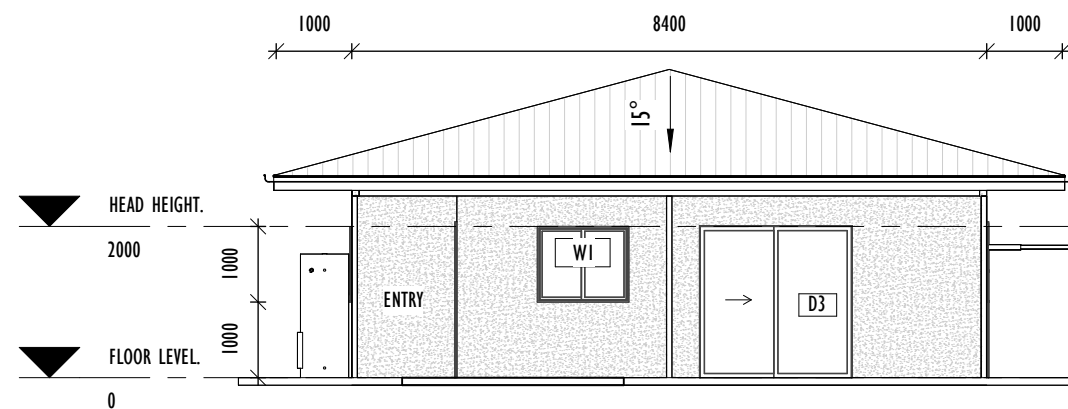




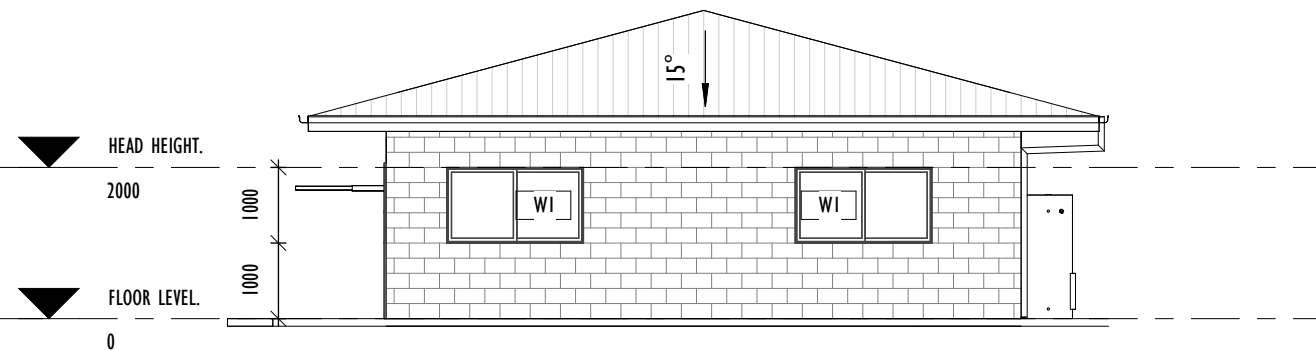
ELEVATION I-A
I : 100



ELEVATION I-B
I : 100



ELEVATION I-C
I : 100



ELEVATION I-D
I : 100

REVIEW

DRAWING STATUS:

REV.	DESCRIPTION	DATE
R1	REVIEW	14.05.26

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 14.05.26
---------------------	-------------------------------	-------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

tapitor pty ltd trading as myriad design abn 23 055 558 659
a. 176 buchan street, cairns qld 4870
t. 07 4041 7258 QBSA 1164388

PROJECT NAME:
SECOND DWELLING

PROJECT ADDRESS:
121 LINK RD, HOPEVALE

CLIENT:
HYASC

ELEVATIONS

SCALE I : 100@ A3
ISSUE DATE 14.05.26

SHEET NUMBER 3007 - 7.1

APPENDIX C

25 FLIERL STREET STORMWATER CALCULATIONS

CATCHMENT HYDROLOGY

(RATIONAL METHOD)

PROJECT No.		
CALCULATION BY		DATE
CHECKED BY		DATE
SHEET		OF

Project Name:

Project Location:

(1) Guidelines	Flierl St Pre Catchment Area	Input	Output																																						
- Queensland Urban Drainage Manual (QUDM) 2017 - Bureau of Meteorology (BOM)																																									
(2) Time of Concentration (t_c) a) Overland Flow (Friend's equation) $t = (107 n L^{0.333}) / S^{0.2}$ where: - t = overland sheet flow travel time (min) - L = overland sheet flow path length (m) - n = Horton's surface roughness factor - S = slope of surface (%) <table> <tr> <td>L (m) =</td> <td>85.0</td> </tr> <tr> <td>U/S RL (m) =</td> <td>49.83</td> </tr> <tr> <td>D/S RL (m) =</td> <td>48.17</td> </tr> <tr> <td>S (%) =</td> <td>1.95</td> </tr> <tr> <td>n =</td> <td>0.0350</td> </tr> </table> - refer QUDM 2017, Figure 4.4, assumed poorly grassed <table> <tr> <td>t (mins) =</td> <td>14.4</td> </tr> </table>	L (m) =	85.0	U/S RL (m) =	49.83	D/S RL (m) =	48.17	S (%) =	1.95	n =	0.0350	t (mins) =	14.4																													
L (m) =	85.0																																								
U/S RL (m) =	49.83																																								
D/S RL (m) =	48.17																																								
S (%) =	1.95																																								
n =	0.0350																																								
t (mins) =	14.4																																								
b) Total t_c <table> <tr> <td>t_c (mins) =</td> <td>14.4</td> </tr> </table>	t _c (mins) =	14.4																																							
t _c (mins) =	14.4																																								
(3) Design Flow (Q) $Q_y = 0.00278 \times C_y \times I_y \times A$ - refer QUDM 2017, Section 4.3 where: - Q_y = peak flow rate (m³/s) for annual exceedence probability (AEP) of 1 in 'y' years - C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years - A = area of catchment (ha) - I_y = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years - t = the nominal design storm duration as defined by the time of concentration (t_c) <table> <tr> <td>Design ARI, y =</td> <td>100</td> </tr> </table> <table> <tr> <td>A (ha) =</td> <td>0.2225</td> <td>=</td> <td>2225</td> <td>m²</td> </tr> <tr> <td>t_c (mins) =</td> <td>14.4</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rainfall intensity, I (mm/hr) =</td> <td>50.7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>I₁₀ (mm/hr) =</td> <td>82.1</td> <td></td> <td></td> <td></td> </tr> </table> <table> <tr> <td>Catchment Area (m²) =</td> <td>2225</td> </tr> <tr> <td>Impervious Area (m²) =</td> <td>250</td> </tr> <tr> <td>Fraction Impervious =</td> <td>0.11</td> </tr> </table> <table> <tr> <td>Fraction impervious, f_i =</td> <td>0.11</td> </tr> <tr> <td>Frequency Factor, F =</td> <td>1.20</td> </tr> </table> - refer QUDM 2017, Table 4.5.1 - refer QUDM 2017, Table 4.5.2 <table> <tr> <td>C₁₀ =</td> <td>0.72</td> </tr> <tr> <td>C_y =</td> <td>0.87</td> </tr> </table> - refer QUDM 2017, Table 4.5.3 & 4.5.4 <table> <tr> <td>Q (m³/s) =</td> <td>0.027</td> </tr> </table>	Design ARI, y =	100	A (ha) =	0.2225	=	2225	m ²	t _c (mins) =	14.4				Rainfall intensity, I (mm/hr) =	50.7				I ₁₀ (mm/hr) =	82.1				Catchment Area (m ²) =	2225	Impervious Area (m ²) =	250	Fraction Impervious =	0.11	Fraction impervious, f _i =	0.11	Frequency Factor, F =	1.20	C ₁₀ =	0.72	C _y =	0.87	Q (m ³ /s) =	0.027			
Design ARI, y =	100																																								
A (ha) =	0.2225	=	2225	m ²																																					
t _c (mins) =	14.4																																								
Rainfall intensity, I (mm/hr) =	50.7																																								
I ₁₀ (mm/hr) =	82.1																																								
Catchment Area (m ²) =	2225																																								
Impervious Area (m ²) =	250																																								
Fraction Impervious =	0.11																																								
Fraction impervious, f _i =	0.11																																								
Frequency Factor, F =	1.20																																								
C ₁₀ =	0.72																																								
C _y =	0.87																																								
Q (m ³ /s) =	0.027																																								

CATCHMENT HYDROLOGY

(RATIONAL METHOD)

PROJECT No.		
CALCULATION BY		DATE
CHECKED BY		DATE
SHEET		OF

Project Name:

Project Location:

(1) Guidelines	Flierl St Post Catchment Area	Input	Output																																						
- Queensland Urban Drainage Manual (QUDM) 2017 - Bureau of Meteorology (BOM)																																									
(2) Time of Concentration (t_c) a) Overland Flow (Friend's equation) $t = (107 n L^{0.333}) / S^{0.2}$ where: - t = overland sheet flow travel time (min) - L = overland sheet flow path length (m) - n = Horton's surface roughness factor - S = slope of surface (%) <table> <tr> <td>L (m) =</td> <td>85.0</td> </tr> <tr> <td>U/S RL (m) =</td> <td>49.83</td> </tr> <tr> <td>D/S RL (m) =</td> <td>48.17</td> </tr> <tr> <td>S (%) =</td> <td>1.95</td> </tr> <tr> <td>n =</td> <td>0.0350</td> </tr> </table> - refer QUDM 2017, Figure 4.4, assumed poorly grassed <table> <tr> <td>t (mins) =</td> <td>14.4</td> </tr> </table>	L (m) =	85.0	U/S RL (m) =	49.83	D/S RL (m) =	48.17	S (%) =	1.95	n =	0.0350	t (mins) =	14.4																													
L (m) =	85.0																																								
U/S RL (m) =	49.83																																								
D/S RL (m) =	48.17																																								
S (%) =	1.95																																								
n =	0.0350																																								
t (mins) =	14.4																																								
b) Total t_c <table> <tr> <td>t_c (mins) =</td> <td>14.4</td> </tr> </table>	t _c (mins) =	14.4																																							
t _c (mins) =	14.4																																								
(3) Design Flow (Q) $Q_y = 0.00278 \times C_y \times I_y \times A$ - refer QUDM 2017, Section 4.3 where: - Q_y = peak flow rate (m³/s) for annual exceedence probability (AEP) of 1 in 'y' years - C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years - A = area of catchment (ha) - I_y = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years - t = the nominal design storm duration as defined by the time of concentration (t_c) <table> <tr> <td>Design ARI, y =</td> <td>100</td> </tr> </table> <table> <tr> <td>A (ha) =</td> <td>0.2225</td> <td>=</td> <td>2225</td> <td>m²</td> </tr> <tr> <td>t_c (mins) =</td> <td>14.4</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Rainfall intensity, I (mm/hr) =</td> <td>50.7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>I₁₀ (mm/hr) =</td> <td>82.1</td> <td></td> <td></td> <td></td> </tr> </table> <table> <tr> <td>Catchment Area (m²) =</td> <td>2225</td> </tr> <tr> <td>Impervious Area (m²) =</td> <td>578</td> </tr> <tr> <td>Fraction Impervious =</td> <td>0.26</td> </tr> </table> <table> <tr> <td>Fraction impervious, f_i =</td> <td>0.26</td> </tr> <tr> <td>Frequency Factor, F =</td> <td>1.20</td> </tr> </table> - refer QUDM 2017, Table 4.5.1 - refer QUDM 2017, Table 4.5.2 <table> <tr> <td>C₁₀ =</td> <td>0.75</td> </tr> <tr> <td>C_y =</td> <td>0.90</td> </tr> </table> - refer QUDM 2017, Table 4.5.3 & 4.5.4 <table> <tr> <td>Q (m³/s) =</td> <td>0.028</td> </tr> </table>	Design ARI, y =	100	A (ha) =	0.2225	=	2225	m ²	t _c (mins) =	14.4				Rainfall intensity, I (mm/hr) =	50.7				I ₁₀ (mm/hr) =	82.1				Catchment Area (m ²) =	2225	Impervious Area (m ²) =	578	Fraction Impervious =	0.26	Fraction impervious, f _i =	0.26	Frequency Factor, F =	1.20	C ₁₀ =	0.75	C _y =	0.90	Q (m ³ /s) =	0.028			
Design ARI, y =	100																																								
A (ha) =	0.2225	=	2225	m ²																																					
t _c (mins) =	14.4																																								
Rainfall intensity, I (mm/hr) =	50.7																																								
I ₁₀ (mm/hr) =	82.1																																								
Catchment Area (m ²) =	2225																																								
Impervious Area (m ²) =	578																																								
Fraction Impervious =	0.26																																								
Fraction impervious, f _i =	0.26																																								
Frequency Factor, F =	1.20																																								
C ₁₀ =	0.75																																								
C _y =	0.90																																								
Q (m ³ /s) =	0.028																																								

APPENDIX D

121 LINK ROAD STORMWATER CALCULATIONS

CATCHMENT HYDROLOGY

(RATIONAL METHOD)

PROJECT No. _____

CALCULATION BY _____

DATE _____

CHECKED BY _____

DATE _____

SHEET _____

OF _____

Project Name:

Project Location:

(1) Guidelines

- Queensland Urban Drainage Manual (QUDM) 2017
- Bureau of Meteorology (BOM)

Link St Pre Catchment Area

(2) Time of Concentration (t_c)

a) Overland Flow (Friend's equation)

$$t = (107 n L^{0.333}) / S^{0.2}$$

where:

t = overland sheet flow travel time (min)

L = overland sheet flow path length (m)

n = Horton's surface roughness factor

S = slope of surface (%)

L (m) =	496.0
U/S RL (m) =	53.99
D/S RL (m) =	44.95
S (%) =	1.82
n =	0.0450

- refer QUDM 2017, Figure 4.4, assumed average grassed

t (mins) = 33.7

b) Total t_c

t_c (mins) = 33.7

(3) Design Flow (Q)

$$Q_y = 0.00278 \times C_y \times I_y \times A$$

- refer QUDM 2017, Section 4.3

where:

Q_y = peak flow rate (m³/s) for annual exceedence probability (AEP) of 1 in 'y' years

C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years

A = area of catchment (ha)

I_y = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years

t = the nominal design storm duration as defined by the time of concentration (t_c)

Design ARI, y = 100

A (ha) = 6.7091

= 67091 m²

t_c (mins) = 33.7

Rainfall intensity, I (mm/hr) = 82.8

I₁₀ (mm/hr) = 82.1

Catchment Area (m²) = 67091

Impervious Area (m²) = 3055

Fraction Impervious = 0.05

Fraction impervious, f_i = 0.05

- refer QUDM 2017, Table 4.5.1

Frequency Factor, F = 1.20

- refer QUDM 2017, Table 4.5.2

C₁₀ = 0.71

- refer QUDM 2017, Table 4.5.3 & 4.5.4

C_y = 0.85

Q (m³/s) = 1.313

Input

Output

CATCHMENT HYDROLOGY

(RATIONAL METHOD)

PROJECT No. _____

CALCULATION BY _____ DATE _____

CHECKED BY _____ DATE _____

SHEET _____ OF _____

Project Name:

Project Location:

(1) Guidelines	Link St Post Catchment Area	Input	Output
- Queensland Urban Drainage Manual (QUDM) 2017 - Bureau of Meteorology (BOM)			
(2) Time of Concentration (t_c) a) Overland Flow (Friend's equation) $t = (107 n L^{0.333}) / S^{0.2}$ where: t = overland sheet flow travel time (min) L = overland sheet flow path length (m) n = Horton's surface roughness factor S = slope of surface (%) L (m) = 496.0 U/S RL (m) = 53.99 D/S RL (m) = 44.95 S (%) = 1.82 n = 0.0450 - refer QUDM 2017, Figure 4.4, assumed average grassed t (mins) = 33.7			
b) Total t_c t_c (mins) = 33.7			
(3) Design Flow (Q) $Q_y = 0.00278 \times C_y \times I_y \times A$ - refer QUDM 2017, Section 4.3 where: Q_y = peak flow rate (m³/s) for annual exceedence probability (AEP) of 1 in 'y' years C_y = coefficient of discharge (dimensionless) for AEP of 1 in 'y' years A = area of catchment (ha) I_y = average rainfall intensity (mm/h) for a design duration of 't' hours and an AEP of 1 in 'y' years t = the nominal design storm duration as defined by the time of concentration (t_c) Design ARI, y = 100 A (ha) = 6.7091 = 67091 m² t_c (mins) = 33.7 Rainfall intensity, I (mm/hr) = 82.8 I₁₀ (mm/hr) = 82.1 Catchment Area (m²) = 67091 Impervious Area (m²) = 3472 Fraction Impervious = 0.05 Fraction impervious, f_i = 0.05 - refer QUDM 2017, Table 4.5.1 Frequency Factor, F = 1.20 - refer QUDM 2017, Table 4.5.2 C₁₀ = 0.71 - refer QUDM 2017, Table 4.5.3 & 4.5.4 C_y = 0.85 Q (m³/s) = 1.316			

APPENDIX E

VENANAT SOLUTIONS - 25 FLIERL STREET FLOOD ADVICE

Our Ref: L.M00605.002.00.docx

04 June 2026

Langtree Consulting Pty Ltd
Level 1, 14 Ingham Road
West End QLD 4810

Attention: Mr Brett Langtree

Dear Brett

RE: Flood Level Advice - 25 Flierl Street, Hope Vale

The proposed house footprint is in the northwest corner of the lot as shown on the attached proposed layout plan. Data from the Hope Vale Flood Study indicates that this lot is not subject to flooding, but there will be shallow overland flow with maximum depth of 50 mm. Based on the LiDAR data this gives a flood level of 48.7 m AHD. The attached figure shows the depth mapping at and surrounding the lot.

Please do not hesitate to contact me should you require any further information.

Yours sincerely,



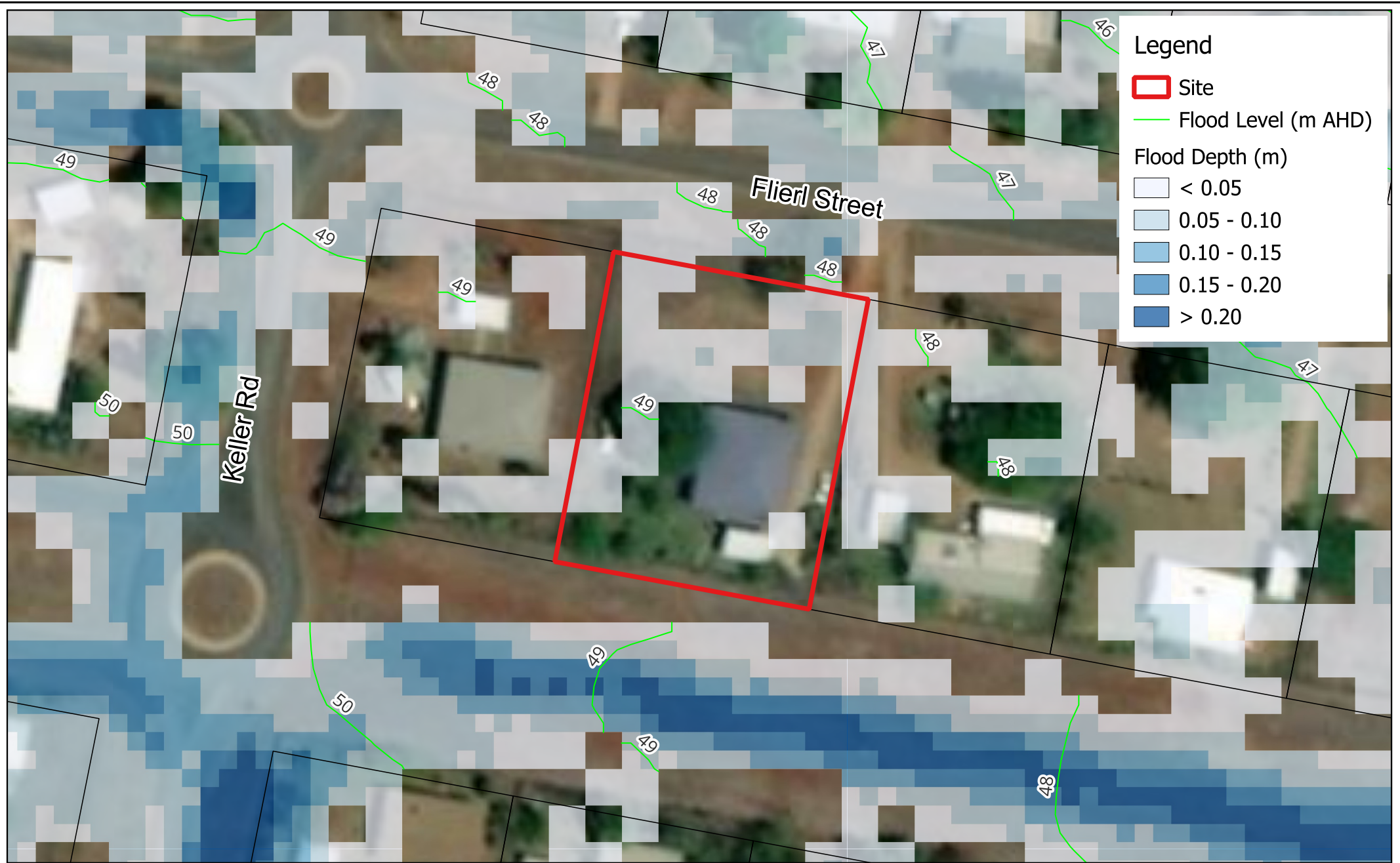
Theo Liu

Project Engineer



Dr Mark Jempson

Director (RPEQ 11111)



Legend

Site

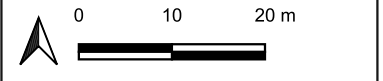
Flood Level (m AHD)

Flood Depth (m)

- < 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- > 0.20

Title: Hope Vale Flood Study - 25 Flierl Street
Existing Case Flood Depth - 1% AEP

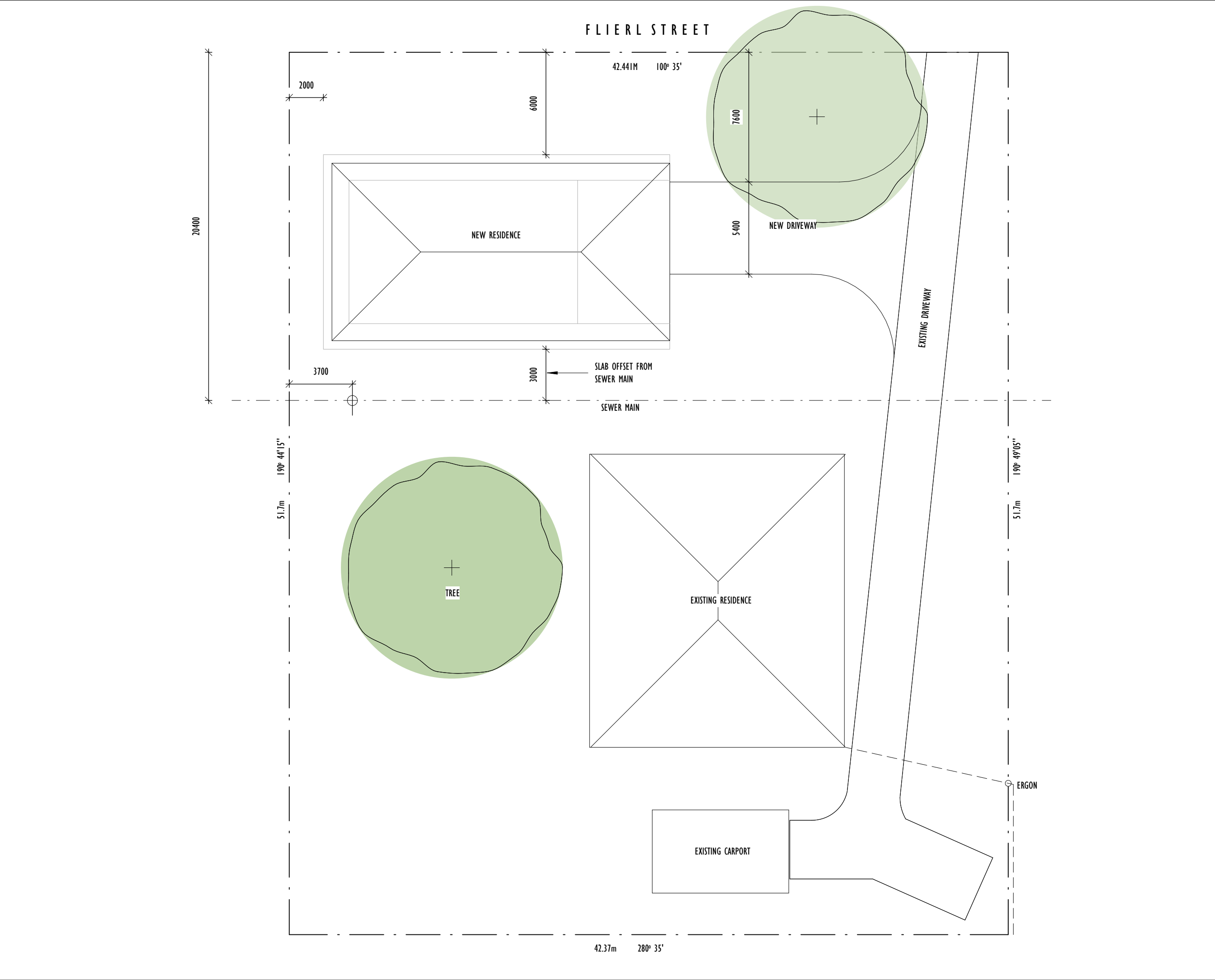
Figure: 1 Rev: A



This mapping product is based on techniques and data in accordance with the study scope. Users should consider the mapping in the context of the report. No two floods are the same and care should be taken in the use and interpretation of the results presented.

VENANT
SOLUTIONS

www.venantsolutions.com.au



REVIEW

DRAWING STATUS:

REV.	DESCRIPTION	DATE

DRAWN BY:
MYRIAD

CHECKED BY:
STUART JACKSON

CHECKED ON:
21.04.26

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.





tapitor pty ltd trading as myriad design abn 23 055 558 659
a. 176 buchan street, cairns qld 4870
t. 07 4041 7258 QBSA 1164388

PROJECT NAME:
NEW 2 BED HOUSE

PROJECT ADDRESS:
25 FLIERL ST, HOPEVALE

CLIENT:
HVASC

SITE PLAN

SCALE

I : 200@ A3

ISSUE DATE

21.04.26

SHEET NUMBER3007 - 2.1

APPENDIX F

VENANAT SOLUTIONS - 121 LINK ROAD FLOOD ADVICE

Our Ref: L.M00605.003.00.docx

04 June 2026

Langtree Consulting Pty Ltd
Level 1, 14 Ingham Road
West End QLD 4810

Attention: Mr Brett Langtree

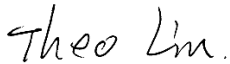
Dear Brett

RE: Flood Level Advice - 121 Link Road, Hope Vale

The proposed house footprint is on the south side of the lot as shown on the attached proposed layout plan. Data from the Hope Vale Flood Study indicates that this lot is subject to flooding coming on to the lot from the west. At the location of the proposed house the flood level is 48.05 m AHD with typical depth of about 300 mm. The attached figure shows the depth mapping at and surrounding the lot.

Please do not hesitate to contact me should you require any further information.

Yours sincerely,



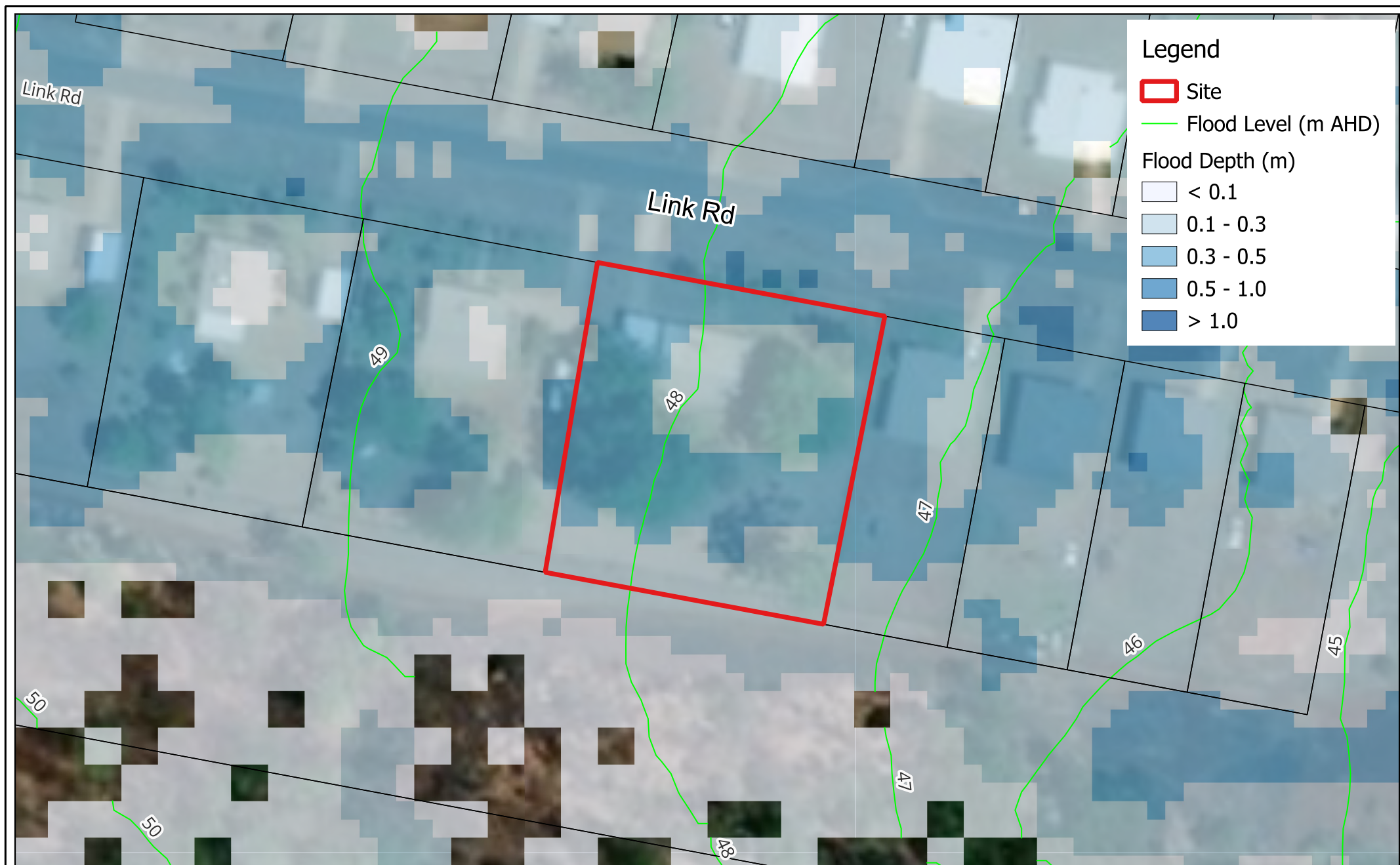
Theo Liu

Project Engineer



Dr Mark Jempson

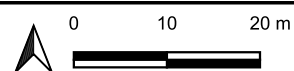
Director (RPEQ 11111)



Title: Hope Vale Flood Study - 121 Link Road
Existing Case Flood Depth - 1% AEP

Figure:
1

Rev:
A



This mapping product is based on techniques and data in accordance with the study scope. Users should consider the mapping in the context of the report. No two floods are the same and care should be taken in the use and interpretation of the results presented.



www.venantsolutions.com.au

Filename: S:\Projects\M00605.MJ.HopeValeFloodStudy\GIS\Drawings\L.M00605.003.00\Fig1_HVFS_Near-term_SSP5-8.5_100y_005_d_MaxMax.qgz

By: TL

Jun 2026

REVIEW

DRAWING STATUS:

[illegible]

DRAWN BY: MYRIAD	CHECKED BY: STUART JACKSON	CHECKED ON: 21.04.26
----------------------------	--------------------------------------	--------------------------------

DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALING. CONTRACTOR TO VERIFY ALL DIMENSIONS AND APPLIANCES SETOUT ON SITE BEFORE CONSTRUCTION. INCONSISTENCIES SHALL BE REPORTED TO THE DESIGNER IMMEDIATELY. THIS DRAWING IS SUBJECT TO COPYRIGHT AND REMAINS THE PROPERTY OF MYRIAD DESIGN.



myriad

a. 176 buchan street, cairns qld 4870
t. 07 4041 7258 QBSA 1164388

PROJECT NAME:
NEW 2 BED HOUSE

PROJECT ADDRESS:
121 LINK ROAD

CLIENT:
HVASC

SITE PLAN

SCALE I : 200@ A3
ISSUE DATE 21.04.20

SHEET NUMBER **3005 - 2.1**

