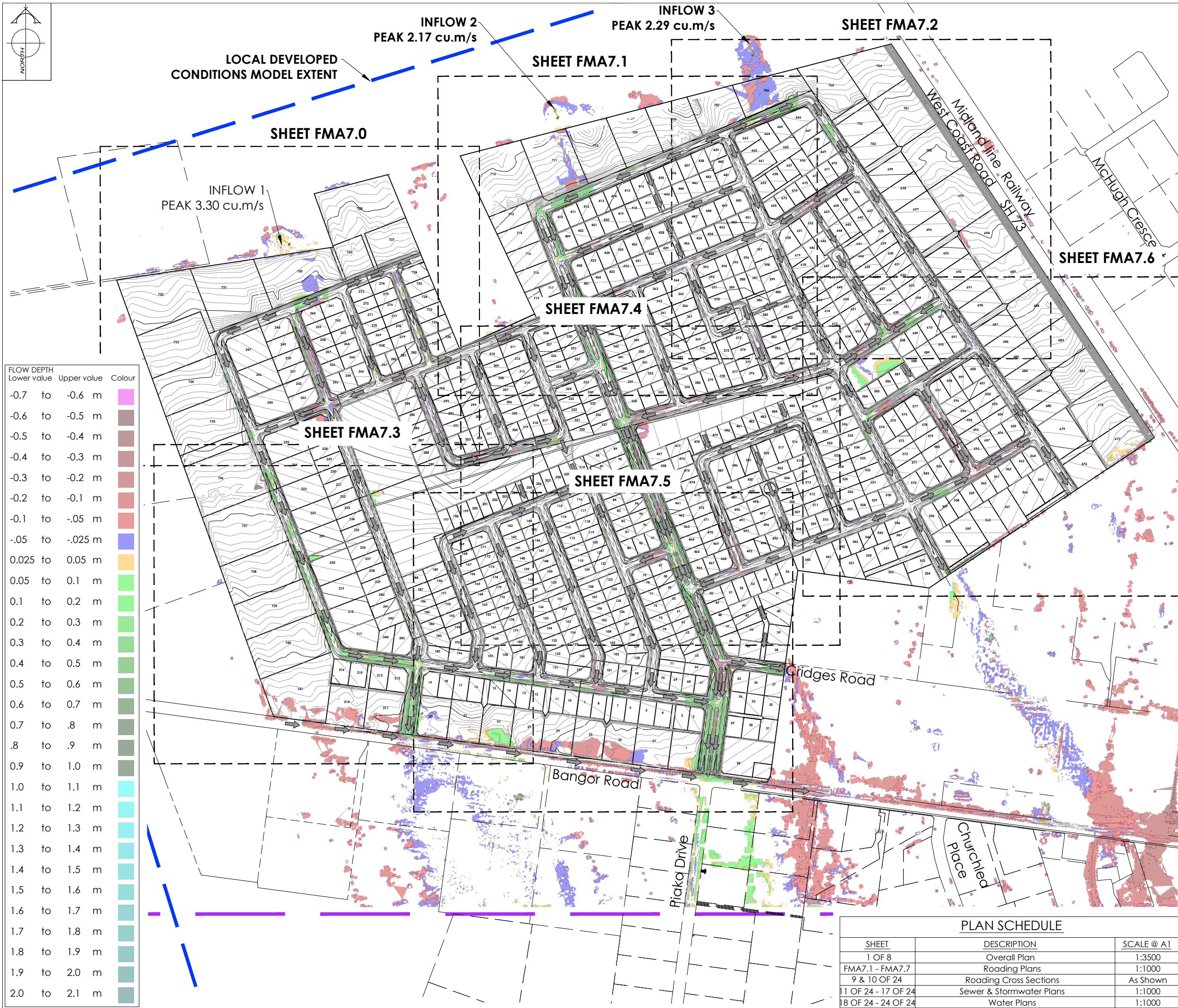




FLOW DEPTH			Colour
Lower value	Upper value		
-0.7	to -0.6	m	
-0.6	to -0.5	m	
-0.5	to -0.4	m	
-0.4	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to -0.05	m	
-0.05	to -0.025	m	
0.025	to 0.05	m	
0.05	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.3	m	
0.3	to 0.4	m	
0.4	to 0.5	m	
0.5	to 0.6	m	
0.6	to 0.7	m	
0.7	to .8	m	
.8	to .9	m	
0.9	to 1.0	m	
1.0	to 1.1	m	
1.1	to 1.2	m	
1.2	to 1.3	m	
1.3	to 1.4	m	
1.4	to 1.5	m	
1.5	to 1.6	m	
1.6	to 1.7	m	
1.7	to 1.8	m	
1.8	to 1.9	m	
1.9	to 2.0	m	
2.0	to 2.1	m	

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

NOTES:

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ORIGIN OF LEVELS.

LEVELS ARE IN TERMS OF NZVD 2016.

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- DESIGN STORMWATER NETWORK (12D DESIGN)
- INFILTRATION RATES (WWDG TABLE 21-10)
- PONDING DEPTHS (WWDG TABLE 21-7)

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ASBUILT CONTOUR INTERVAL: MAJOR 1.0m MINOR 0.1m.

LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICES

PROPOSED SERVICES

KERB	NAME	SIGNED	DATE
DESIGNED BY	DEEPANSHU GROVER	DEEPANSHU GROVER	
CHECKED BY	JAMIE VERSTAPPEN	JAMIE VERSTAPPEN	

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

116 Wrights Road
Telephone: 03 379-0793

P O Box 679
Website: www.dls.co.nz

Christchurch 8140, New Zealand
E-mail: office@dls.co.nz

JOB TITLE:

Bangor Road, Darfield
Pre/Post Development Difference

SHEET TITLE:

120 Mins 200 Years
Flood Modelling & Water Levels

DRAWING STATUS

For Concept Purposes

SCALE: 1:3000@A1
1:6000@A3

DATE: August 2026

CAD FILE: \\21112\ENG\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWING No: H21112

SHEET No: FMA7.0

DRAWN: DG

REVISION: R2

PLAN SCHEDULE

SHEET	DESCRIPTION	SCALE @ A1
1 OF 8	Overall Plan	1:3500
FMA7.1 - FMA7.7	Roading Plans	1:1000
9 & 10 OF 24	Roading Cross Sections	As Shown
11 OF 24 - 17 OF 24	Sewer & Stormwater Plans	1:1000
18 OF 24 - 24 OF 24	Water Plans	1:1000



FLOW DEPTH		Upper value	Colour
Lower value			
-0.7	to	-0.6 m	
-0.6	to	-0.5 m	
-0.5	to	-0.4 m	
-0.4	to	-0.3 m	
-0.3	to	-0.2 m	
-0.2	to	-0.1 m	
-0.1	to	-0.05 m	
-0.05	to	-0.025 m	
0.025	to	0.05 m	
0.05	to	0.1 m	
0.1	to	0.2 m	
0.2	to	0.3 m	
0.3	to	0.4 m	
0.4	to	0.5 m	
0.5	to	0.6 m	
0.6	to	0.7 m	
0.7	to	.8 m	
.8	to	.9 m	
0.9	to	1.0 m	
1.0	to	1.1 m	
1.1	to	1.2 m	
1.2	to	1.3 m	
1.3	to	1.4 m	
1.4	to	1.5 m	
1.5	to	1.6 m	
1.6	to	1.7 m	
1.7	to	1.8 m	
1.8	to	1.9 m	
1.9	to	2.0 m	
2.0	to	2.1 m	

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

NOTES:

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ORIGIN OF LEVELS.

LEVELS ARE IN TERMS OF NZVD 2016.

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ASBUILT CONTOUR INTERVAL: MAJOR 1.0m MINOR 0.1m.

LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.72

50min 200 YEARS WATER LEVELS

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICES

PROPOSED SERVICES

KERB

KERB

DESIGNED BY	CHECKED BY	NAME	SIGNED	DATE
DEEPAISHU GROVER	JAMIE VERSTAPPEN	DEEPAISHU GROVER	JAMIE VERSTAPPEN	

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

Bangor Road, Darfield

SHEET TITLE:

**Bangor Road, Darfield
Pre/Post Development Difference**

DRAWING STATUS

For Concept Purposes

SCALE: 1:1000@A1
1:2000@A3

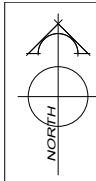
DATE: August 2026

CAD FILE: J:\21112\ENG\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWING No: **H21112**

SHEET No: **FMA7.1**

DRAWN: DG
REVISION: **R2**



INFLOW 2
PEAK 2.17 cu.m/s

FLOW DEPTH			Colour
Lower value	Upper value		
-0.7	to -0.6	m	
-0.6	to -0.5	m	
-0.5	to -0.4	m	
-0.4	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to -0.05	m	
-0.05	to -0.025	m	
0.025	to 0.05	m	
0.05	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.3	m	
0.3	to 0.4	m	
0.4	to 0.5	m	
0.5	to 0.6	m	
0.6	to 0.7	m	
0.7	to .8	m	
.8	to .9	m	
0.9	to 1.0	m	
1.0	to 1.1	m	
1.1	to 1.2	m	
1.2	to 1.3	m	
1.3	to 1.4	m	
1.4	to 1.5	m	
1.5	to 1.6	m	
1.6	to 1.7	m	
1.7	to 1.8	m	
1.8	to 1.9	m	
1.9	to 2.0	m	
2.0	to 2.1	m	



AMENDMENTS:		
AMENDMENT	DATE	DESCRIPTION

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ASBUILT CONTOUR INTERVAL: MAJOR 1.0m MINOR 0.1m.

LEVELS ARE IN TERMS OF NZVD 2016

LEGEND :			
40.04		PROPOSED LOT LEVELS	
WL40.72		50min 200 YEARS WATER LEVELS	
SEC. FLOW		DIRECTION OF FLOW	
EXISTING SERVICES		PROPOSED SERVICES	
KERB		KERB	
NAME	SIGNED	DATE	
DESIGNED BY DEEPANSHU GROVER	DEEPANSHU GROVER		
CHECKED BY JAMIE VERSTAPPEN	JAMIE VERSTAPPEN		



DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

**Bangor Road, Darfield
Pre/Post Development Difference**

SHEET TITLE:

**120 Mins 200 Years
Flood Modelling & Water Levels**

DRAWING STATUS

For Information

SCALE: 1:1000@A1 1:2000@A3	DATE: August 2026
CAD FILE: \\J21112\ENGIN\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg	DRAWN: DG
DRAWING No: H21112	SHEET No: FMA7.2
	REVISION: R2



AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

NOTES:

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ORIGIN OF LEVELS:

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ASBUILT CONTOUR INTERVAL: MAJOR 1.0m MINOR 0.1m.

LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.72

50min 200 YEARS WATER LEVELS

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICES

PROPOSED SERVICES

KERB

KERB

NAME	SIGNED	DATE
DESIGNED BY DEEPANSHU GROVER	DEEPANSHU GROVER	
CHECKED BY JAMIE VERSTAPPEN	JAMIE VERSTAPPEN	

DAVIE LOVELL-SMITH
PLANNING SURVEYING ENGINEERING

116 Wrights Road P O Box 679 Christchurch 8140. New Zealand
Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:
**Bangor Road, Darfield
Pre/Post Development Difference**

SHEET TITLE:
**120 Mins 200 Years
Flood Modelling & Water Levels**

DRAWING STATUS:
For Information

SCALE: 1:1000@A1
1:2000@A3

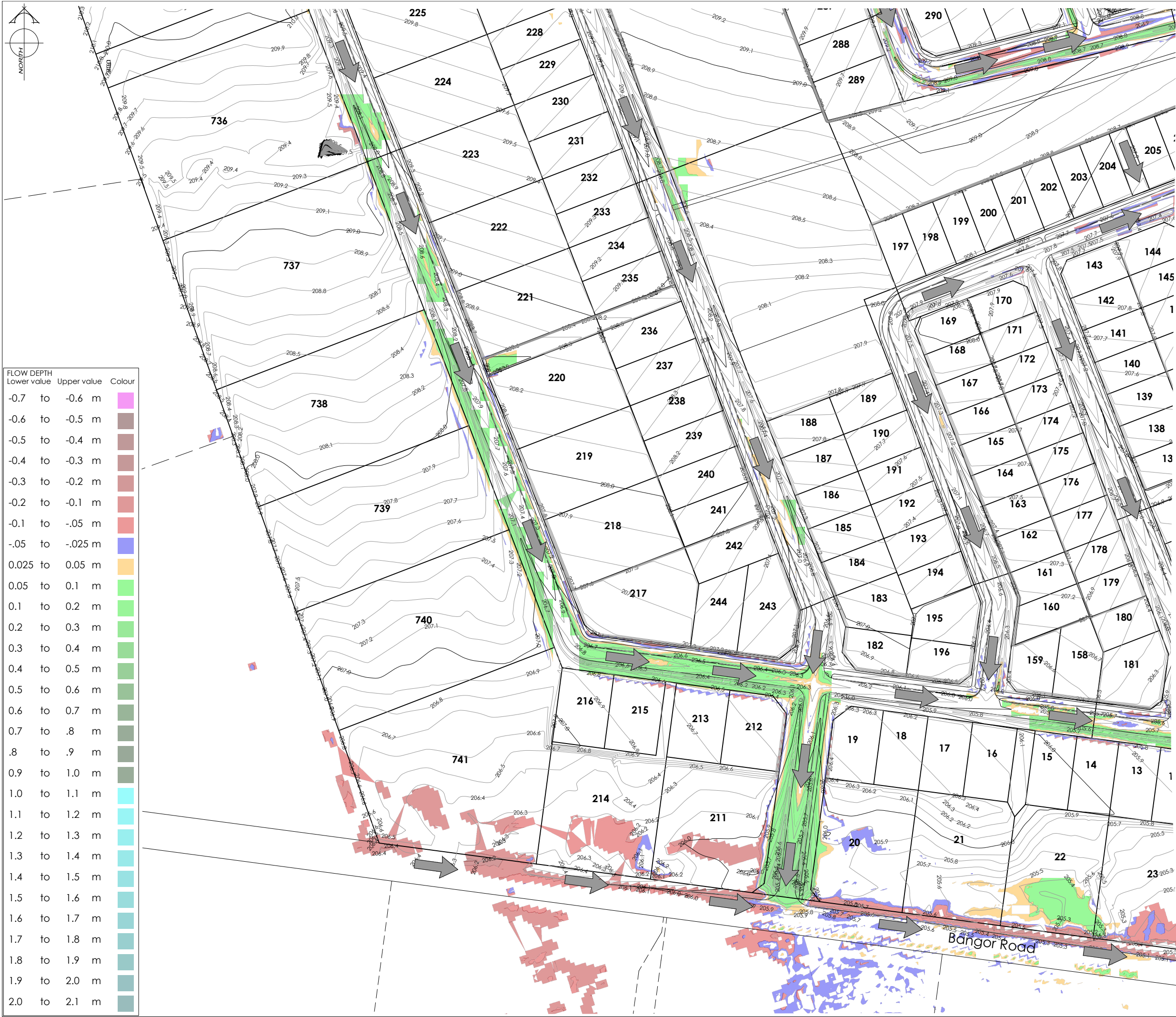
DATE: August 2026

CAD FILE: \\21112\ENGIN\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWING No: H21112

SHEET No: FMA7.3

DRAWN: DG
REVISION: R2



FLOW DEPTH			
Lower value	Upper value		Colour
-0.7	to -0.6	m	
-0.6	to -0.5	m	
-0.5	to -0.4	m	
-0.4	to -0.3	m	
-0.3	to -0.2	m	
-0.2	to -0.1	m	
-0.1	to -0.05	m	
-0.05	to -0.025	m	
0.025	to 0.05	m	
0.05	to 0.1	m	
0.1	to 0.2	m	
0.2	to 0.3	m	
0.3	to 0.4	m	
0.4	to 0.5	m	
0.5	to 0.6	m	
0.6	to 0.7	m	
0.7	to .8	m	
.8	to .9	m	
0.9	to 1.0	m	
1.0	to 1.1	m	
1.1	to 1.2	m	
1.2	to 1.3	m	
1.3	to 1.4	m	
1.4	to 1.5	m	
1.5	to 1.6	m	
1.6	to 1.7	m	
1.7	to 1.8	m	
1.8	to 1.9	m	
1.9	to 2.0	m	
2.0	to 2.1	m	

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

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LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.7250min 200 YEARS WATER LEVELS

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICESPROPOSED SERVICES

KERBKERB

DESIGNED BY	NAME	SIGNED	DATE
DEEPAISHU GROVER <td>DEEPAISHU GROVER<td></td><td></td></td>	DEEPAISHU GROVER <td></td> <td></td>		
CHECKED BY	JAMIE VERSTAPPEN	JAMIE VERSTAPPEN	

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

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JOB TITLE:

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Pre/Post Development Difference

SHEET TITLE:

120 Mins 200 Years
Flood Modelling & Water Levels

DRAWING STATUS

For Information

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DATE: August 2026

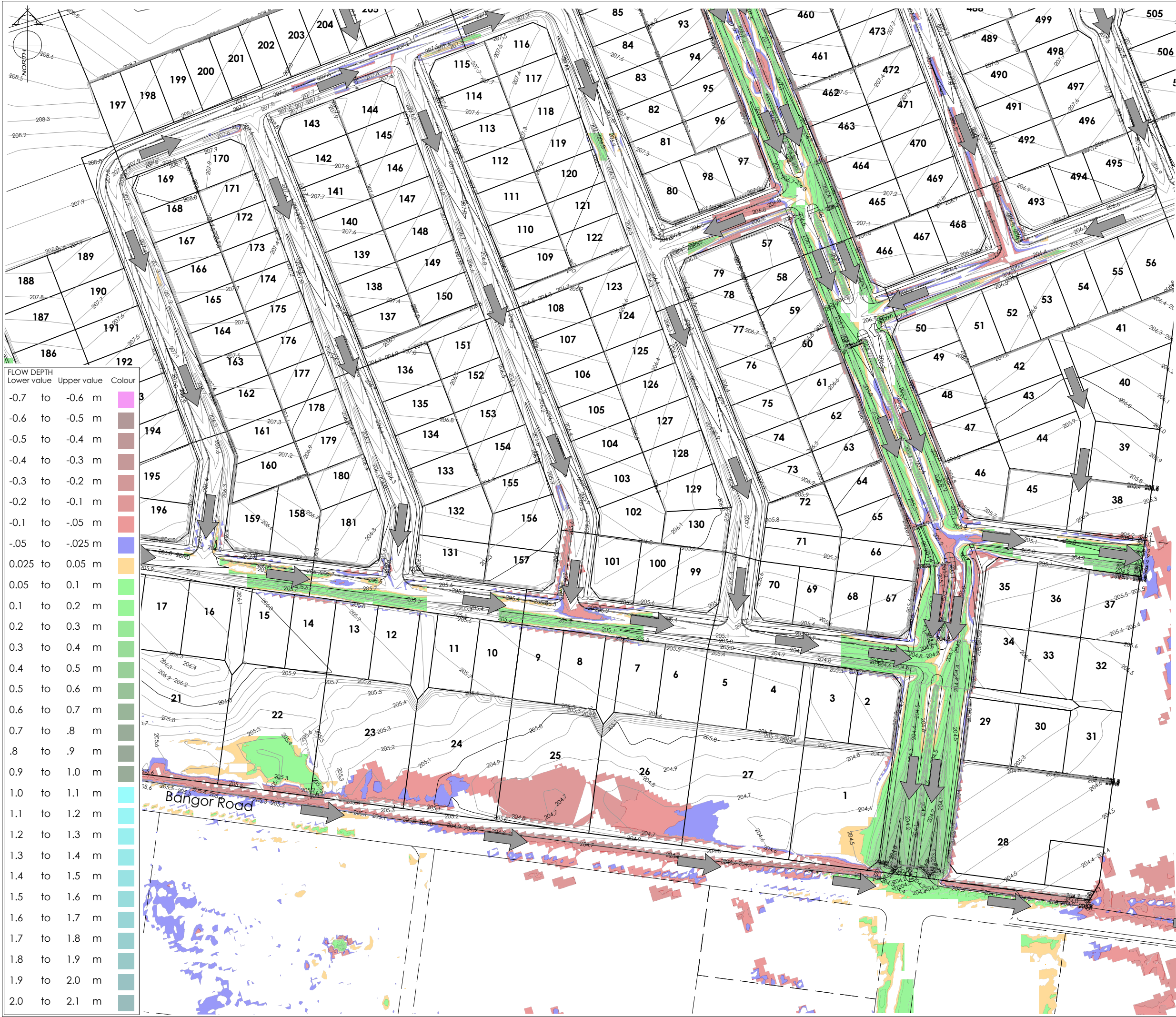
CAD FILE: J:\21112\ENG\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWN: DG

DRAWING No: H21112

SHEET No: FMA7.4

REVISION: R2



FLOW DEPTH		
Lower value	Upper value	Colour
-0.7	to -0.6 m	3
-0.6	to -0.5 m	194
-0.5	to -0.4 m	195
-0.4	to -0.3 m	196
-0.3	to -0.2 m	197
-0.2	to -0.1 m	198
-0.1	to -0.05 m	199
-0.05	to -0.025 m	200
0.025	to 0.05 m	201
0.05	to 0.1 m	202
0.1	to 0.2 m	203
0.2	to 0.3 m	204
0.3	to 0.4 m	205
0.4	to 0.5 m	206
0.5	to 0.6 m	207
0.6	to 0.7 m	208
0.7	to .8 m	209
.8	to .9 m	210
0.9	to 1.0 m	211
1.0	to 1.1 m	212
1.1	to 1.2 m	213
1.2	to 1.3 m	214
1.3	to 1.4 m	215
1.4	to 1.5 m	216
1.5	to 1.6 m	217
1.6	to 1.7 m	218
1.7	to 1.8 m	219
1.8	to 1.9 m	220
1.9	to 2.0 m	221
2.0	to 2.1 m	222

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

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-PONDING IN PERVIOUS AREAS HAS BEEN SET AT 5MM AND IN IMPERVIOUS AREAS 2.5MM AS DEFINED BY TABLE 21-7 IN THE WWDG.

ASBUILT CONTOUR INTERVAL: MAJOR 1.0m MINOR 0.1m.

LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.72

50min 200 YEARS WATER LEVELS

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICES

PROPOSED SERVICES

KERB

KERB

NAME	SIGNED	DATE
DESIGNED BY DEEPANSHU GROVER	DEEPANSHU GROVER	
CHECKED BY JAMIE VERSTAPPEN	JAMIE VERSTAPPEN	

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

116 Wrights Road

P O Box 679 Christchurch 8140. New Zealand

Telephone: 03 379-0793 Website: www.dls.co.nz E-mail: office@dls.co.nz

JOB TITLE:

Bangor Road, Darfield
Pre/Post Development Difference

SHEET TITLE:

120 Mins 200 Years
Flood Modelling & Water Levels

DRAWING STATUS

For Information

SCALE: 1:1000@A1
1:2000@A3

DATE: August 2026

CAD FILE: \\21112\ENGIN\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWN: DG

DRAWING No: H21112

SHEET No: FMA7.5

REVISION: R2



AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

NOTES:

THIS PLAN HAS BEEN PREPARED FOR THE USE OF SELWYN DISTRICT COUNCIL AND IS NOT TO BE PROVIDED TO ANY OTHER PARTIES. NO LIABILITY IS ACCEPTED IN RELATION TO ANY OTHER PARTIES.

ORIGIN OF LEVELS:
EJBW (CC 370 NO 2)
LOCATED INTERSECTION OF RAILWAY ROAD, TWO CHAIN ROAD & JONES ROAD.
RL=57.837m.

LEVELS ARE IN TERMS OF NZVD 2016.

THIS FLOOD ANALYSIS HAS BEEN COMPLETED USING THE 2D ROADFLOW SURFACE FLOW MODULE IN THE 12D DESIGN SOFTWARE. 2D ROADFLOW IS BASED ON RAIN ON GRID ANALYSIS AND ALLOWS MODELLING OF COMBINED DRAINAGE NETWORK FLOWS AND SURFACE FLOWS.

PARAMETERS HAVE BEEN SET IN ACCORDANCE WITH WATERWAY, WETLANDS, AND DRAINAGE GUIDE (WWDG) 21-4, ADVANCED ANALYSIS.

THE INPUTS REQUIRED FOR THIS PROGRAMME ARE:
MANNING'S N VALUE (WWDG TABLE 22-1)
RAINFALL INTENSITY (HIRDS V4)
DESIGN & ASBUILT SURFACE MODEL (12D TIN)
DESIGN STORMWATER NETWORK (12D DESIGN)
INFILTRATION RATES (WWDG TABLE 21-10)
PONDING DEPTHS (WWDG TABLE 21-7)

USING THESE INPUTS, THE ANALYSIS SOFTWARE CREATES A SURFACE OF SQUARE CELLS (GRID TIN) THAT HAVE A DEPTH AND SLOPE. THIS ALLOWS FOR FLOW TO PASS TO ADJACENT LOWER CELLS. THE DRAINAGE NETWORK IS HYDRAULICALLY LINKED TO THE GRID TIN ALLOWING SURCHARGING OF THE PIPED NETWORK IN ADDITION TO FLOW THROUGH THE SURFACE CELLS.

-A RAINFALL HYETOGRAPH HAS BEEN FORMED IN ACCORDANCE WITH FIGURE 21-6 WITH A MAXIMUM INTENSITY OF TWO TIMES THE AVERAGE INTENSITY OCCURRING AT 70% OF THE STORM DURATION.
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LEVELS ARE IN TERMS OF NZVD 2016

LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.72

50min 200 YEARS WATER LEVELS

SEC. FLOW

DIRECTION OF FLOW

EXISTING SERVICES

PROPOSED SERVICES

KERB

KERB

NAME	SIGNED	DATE
DESIGNED BY DEEPANSHU GROVER	DEEPANSHU GROVER	
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DAVIE LOVELL-SMITH

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SHEET TITLE:

120 Mins 200 Years
Flood Modelling & Water Levels

DRAWING STATUS

For Information

SCALE: 1:1000@A1
1:2000@A3

DATE: August 2026

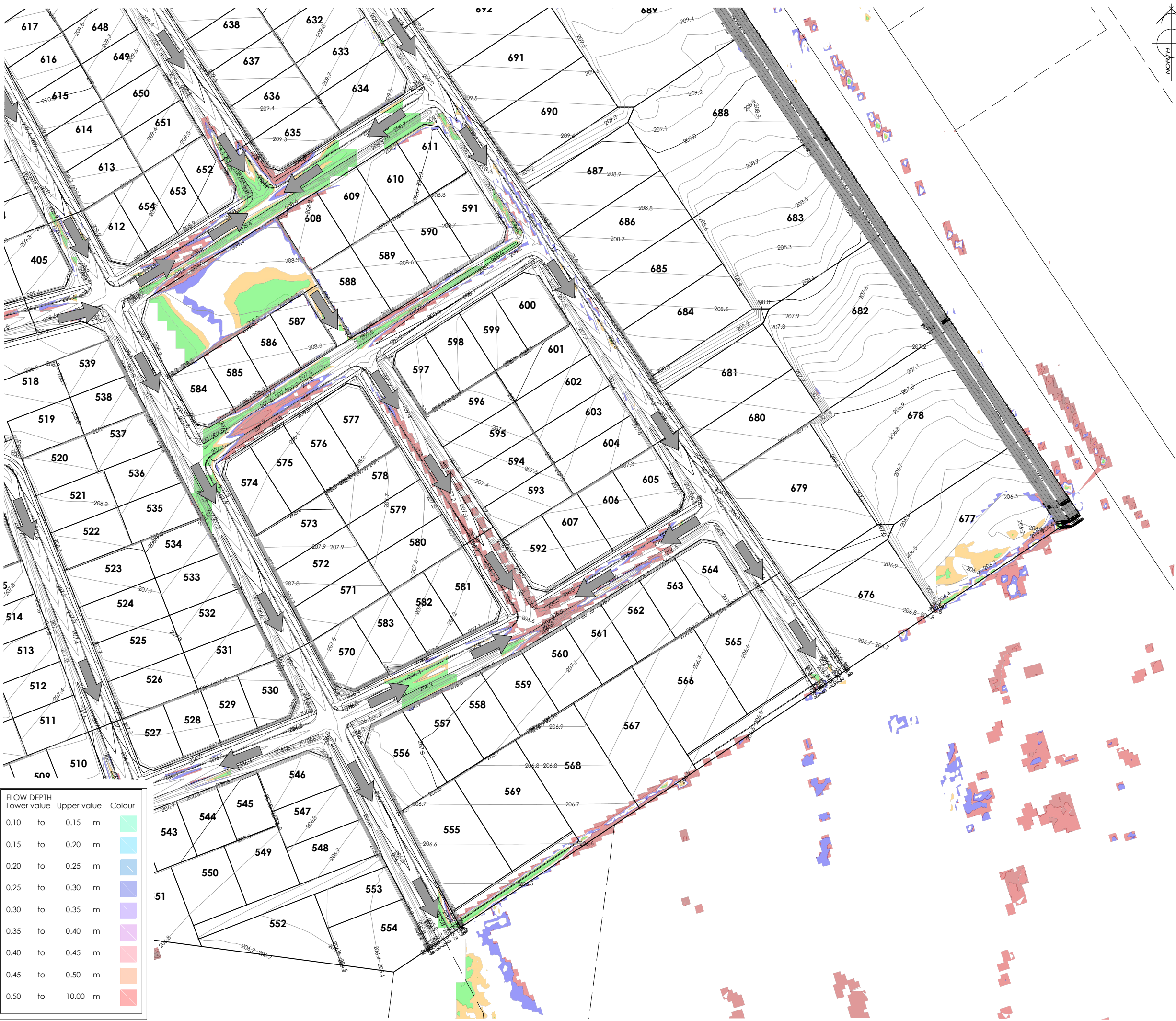
CAD FILE: J:\21112\ENVC\Drawings\Flood Management\H21112_FMA_PRE-POST DEVELOPMENT DIFFERENCE_R0.dwg

DRAWN: DG

DRAWING No: H21112

SHEET No: FMA7.6

REVISION: R2



FLOW DEPTH			Colour
Lower value	Upper value	m	
0.10	to	0.15	Light Green
0.15	to	0.20	
0.20	to	0.25	Light Blue
0.25	to	0.30	
0.30	to	0.35	Medium Blue
0.35	to	0.40	
0.40	to	0.45	Dark Blue
0.45	to	0.50	
0.50	to	10.00	Red

AMENDMENTS:

AMENDMENT	DATE	DESCRIPTION

NOTES:

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LEGEND:

40.04

PROPOSED LOT LEVELS

WL40.72

50min 200 YEARS WATER LEVELS

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DRAWN: DG

DRAWING No: H21112

SHEET No: FMA7.7

REVISION: R2