C&M CONSULTING ENGINEERS

FLOODING ASSESSMENT REPORT

FOR

11-17 COLUMBIA LANE
HOMEBUSH

RESIDENTIAL APARTMENT DEVELOPMENT

REPORT NO. R01866-F
REVISION A

AUGUST 2017

C&M Consulting Engineers Pty Ltd
Suite 26, 11-13 Brookhollow Avenue, Baulkham Hills, NSW, 2153
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PROJECT DETAILS

Property Address: 11-17 Columbia Lane, Homebush

Development Proposal: Residential Apartment Development

REPORT CERTIFICATION

Report prepared by:

EDWARD SHIN
Civil Engineer - Director
B.E.(Civil), MIEAust, CPEng,
NER (Civil), RPEQ

Report reviewed by:

ANTHONY MANCONE
Civil Engineer – Director
B.E.(Civil),Hons., MIEAust, CPEng,
NER (Civil), NER (Building Services)

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DOCUMENT CONTROL

REVISION	ISSUE DATE	ISSUED TO	ISSUED FOR
A	August 2017	Client	Information
		Strathfield City Council	Approval

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1. INTRODUCTION

This report has been prepared to supplement the Development Application to Strathfield City Council for the proposed development at 11-17 Columbia Lane, Homebush.

The scope of this report is to carry out a hydraulic assessment of the flows from the Sydney Water drainage channel, Powells Creek, adjacent to the development site and identify any impacts on the proposed development due to the flooding in the channel.

The following information and documents were used for this investigation:

- Architectural Drawings prepared by Mosca Pserras Architects;
- Concept Civil Engineering Drawings prepared by C&M Consulting Engineers;
- Flood Assessment for 6-18 Parramatta Road, Homebush prepared by C&M Consulting Engineers, 2014;
- Powells Creek and Saleyards Creek Flood Study prepared by WMAWater (formerly Webb, McKeown & Associates);
- Flood Study for 6-18 Parramatta Rd (September 2007) prepared by Brown Consulting;

1.1 THE SITE

The site is located at 11-17 Columbia Lane, Homebush. The site is currently industrial with existing buildings. The majority of the site is impervious (refer Figure 1).

Figure 1 - Aerial Photo of Existing Site (source Nearmap.com)

The proposed development includes the development of the land for two (2) apartment buildings and associated works.

2. FLOOD INVESTIGATION

2.1 DESIGN FLOWRATES

Previous flow data from the Powells Creek and Salesyard Creek Flood Study prepared by WMAWater has been adopted as the design flow rates for the channel to determine the impacts on flood levels by the proposed development.

Table 1 – Powells Creek Flows

HEC-RAS SECTION	WMA Water SECTION	1% AEP FLOW RATE (m^3/s)
300	14.5	48.81
161.079	13	48.81
39.861	11.5	49.80
10.491	11	50.04

2.2 MODEL CALIBRATION

The pre-development condition of the HEC-RAS model was prepared as part of this flood impact assessment to approximate the WMAWater flood study[1].

We have used detailed topographic survey of the creek for both channel and overbanks. Previous report[2] used LiDAR survey information for the overbank areas, and detailed site survey for the main channel. It is prudent to note that channel levels used by WMAWater are different to ours which indicates WMAWater have used similar to LiDAR survey for the channel.

The HEC-RAS model has adopted the Mannings roughness parameters used in the WMAWater model for the main channel and overbanks.

The downstream boundary condition for the model is based on the water surface elevation from the WMAWater flood study.

The result of flood levels in the creek is shown below:

Table 2 – Powells Creek Chainage Comparison

CHANNEL STATIONS			EXISTING FLOOD LEVELS		
WMA	CMCE	Q	WMA	CMCE	Change
14.5	285.5	48.81	5.5	5.57	0.07
14	278	48.81	5.46	5.59	0.13
13	161.079	48.81	5.37	5.5	0.13
12	79.862	48.81	5.26	5.33	0.07

[1] Powells Creek and Saleyards Creek Flood Study

[2] 6-18 Parramatta Rd Homebush, 2014

The existing condition model provides in this report is more refined model than WMAWater as explained above. For that the results of the estimated flood levels in the creek are slightly higher than WMAWater's.

2.3 HYDRAULIC MODELLING

The HEC-RAS model for the existing condition has been used for the comparison of the pre and post development conditions.

Flood extents for the pre- and post-development conditions of the site have been included with the HEC-RAS results in Appendices A & B.

2.3.1 Comparison of Results

The HEC-RAS models for the post-developed state of the site has been modelled with identical parameters as the pre-development scenario, however the obstructions have been adjusted to represent the proposed development case.

The following table is a summary of the model results for the developed site conditions which are included in Appendix B.

Table 3 – Comparison of Flood levels

RIVER STATION	FLOWRATE	TOP WATER LEVEL		LEVEL DIFFERENCE
		PRE-DEVELOPED	POST-DEVELOPED	
	m^3/s	(mAHD)	(mAHD)	(m)
300	48.81	5.67	5.66	-0.01
290		5.58	5.57	-0.01
285.5		5.57	5.57	0
280		BRIDGE	BRIDGE	
278		5.59	5.59	0
270		5.59	5.58	-0.01
260		5.57	5.56	-0.01
250		5.55	5.54	-0.01
240		5.54	5.53	-0.01
230		5.54	5.53	-0.01
220		5.5	5.49	-0.01
210		5.47	5.47	0
200		5.47	5.46	-0.01
190		5.46	5.46	0
180		5.46	5.44	-0.02
170		5.46	5.43	-0.03
161.079		5.5	5.48	-0.02
150		5.52	5.49	-0.03
140		5.53	5.5	-0.03
130		5.56	5.53	-0.03
120		5.31	5.31	0
110		5.33	5.33	0
100		5.24	5.24	0
90		5.3	5.3	0
79.862		5.33	5.33	0
70		5.36	5.36	0
60		5.37	5.37	0
50		5.35	5.35	0
39.861	49.8	5.41	5.41	0
39.86		CULVERT	CULVERT	
10.491	50.04	4.91	4.91	0
0.31		4.91	4.91	0

A comparison of the results between the pre-development site conditions and the post-development site conditions show that the development has no impact on the 1% AEP flood levels.

2.4 FLOOD PLANNING LEVELS

In accordance with the NSW Floodplain Management Manual and Council's Stormwater Management Code, the finished floor levels for the proposed residential buildings should provide +500mm for the habitable floor level and +300mm for the basement driveway ramps above the adopted flood levels.

The proposed development is located between Chainages 130 and 280. The highest water surface elevation between these two chainages is RL 5.59 at chainage 280. Therefore it is recommended that a flood planning level of RL6.09 is adopted for the development site for habitable floors.

The driveway entry is proposed to be located in Gramophone Lane at HECRAS chainage 140. The 1% AEP flood level at chainage 1240 is 5.5m AHD. Therefore it is recommended that a flood planning level of RL5.8m AHD is adopted for the crest in the driveway.

The proposed finished building level is 7.0m AHD which is above the recommended Flood Planning Level.

The proposed finished floor level for the development is RL7.00 which is higher than the flood planning level and is deemed suitable for the development. The basement ramp crest is set at RL5.80 which is the flood planning level for basement ramp crests.

3. RECOMMENDATIONS

We recommend that the following be adopted for the proposed development:

1. The 1% AEP flood level of RL 5.59 be adopted for the proposed development;

2. The minimum finished floor level for the development is RL6.09 which provides minimum 500mm freeboard above the flood level;

3. The floor levels on the architectural drawings (RL7.00) shall be adopted for the development as this provides more than the minimum 500mm freeboard;

4. The basement ramp crest levels on the architectural drawings (RL5.80) shall be adopted for the development as this provides more than the minimum 300mm freeboard for basement ramps;

5. Building materials below the minimum finished floor level shall be building from flood compatible materials and designed to withstand impact from debris carried in flood waters;

6. The proposed architectural have no impacts on flooding within Powells Creek.

APPENDIX A

PRE-DEVELOPMENT FLOOD RESULTS

A3

Ch 300
Ch 290
Ch 285.5
Ch 278
Ch 270
Ch 260
Ch 250
Ch 240
Ch 230
Ch 220
Ch 210
Ch 200
Ch 190
Ch 180
Ch 170
Ch 161.079
Ch 150
Ch 140
Ch 130
Ch 120
Ch 110
Ch 100
Ch 90

0 10 20 30 40 50m

10 5

SCALE 1:500

CAD FILENAME: Q:\C&M\PROJECTS\01801-01900\PN-01866 - STAGE 2, 11-17 COLUMBIA LANE, HOMEBUSH\ACAD\FLOODING\01866_FLOOD-PRE.DWG

C&M CONSULTING ENGINEERS

CIVIL AND HYDRAULIC ENGINEERING DESIGN AND PROJECT MANAGEMENT

SUITE 2
241-245 PENNANT HILLS RD
CARLINGFORD NSW 2118

PHONE: (02) 8209 3846
FAX: (02) 9687 9393

ABN 21 118 134 240

6-20 PARRAMATTA ROAD, HOMEBUSH - FLOOD MODELLING

DESIGNED	E. SHIN	DATE	21/08/17
VERIFIED	E. SHIN	DATE	21/08/17
DRAWING No.	01866_PRE	REVISION	01

FLOOD EXTENTS - PRE DEVELOPMENT

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Br-1	300	48.81	3.53	5.67		6.32	0.002389	3.58	13.94	7.79	0.82
Br-1	290	48.81	3.5	5.58	5.41	6.29	0.002586	3.74	13.31	7.65	0.86
Br-1	285.5	48.81	3.46	5.57	5.38	6.26	0.002481	3.68	13.6	8.01	0.85
Br-1	280	Bridge									
Br-1	278	48.81	3.41	5.59	5.33	6.22	0.002211	3.53	14.32	8.67	0.8
Br-1	270	48.81	3.39	5.59		6.2	0.002068	3.48	14.42	8.36	0.78
Br-1	260	48.81	3.4	5.57	5.28	6.18	0.002048	3.49	14.65	8.86	0.79
Br-1	250	48.81	3.37	5.55	5.25	6.16	0.001995	3.46	14.91	9.13	0.78
Br-1	240	48.81	3.34	5.54		6.13	0.001913	3.42	15.17	9.37	0.76
Br-1	230	48.81	3.28	5.54		6.11	0.001913	3.36	14.85	9.02	0.75
Br-1	220	48.81	3.27	5.5		6.09	0.002014	3.4	14.65	8.05	0.76
Br-1	210	48.81	3.25	5.47		6.07	0.002058	3.42	14.66	8.52	0.77
Br-1	200	48.81	3.22	5.47		6.04	0.001924	3.35	15.09	9.35	0.75
Br-1	190	48.81	3.18	5.46		6.02	0.001844	3.3	15.22	8.72	0.73
Br-1	180	48.81	3.15	5.46	5.04	6	0.001666	3.24	17.26	16.1	0.71
Br-1	170	48.81	3.12	5.46	5.01	5.97	0.001575	3.2	19.17	23.32	0.69
Br-1	161.079	48.81	3.1	5.5	4.91	5.94	0.001064	2.95	22.08	28.33	0.63
Br-1	150	48.81	3.06	5.52	4.89	5.92	0.000904	2.84	25.73	27.38	0.59
Br-1	140	48.81	3.04	5.53	4.8	5.9	0.00079	2.75	29.21	33.78	0.57
Br-1	130	48.81	3	5.56	4.79	5.88	0.00069	2.57	36.83	41.71	0.53
Br-1	120	48.81	2.91	5.31		5.84	0.001561	3.25	16.58	9.88	0.69
Br-1	110	48.81	2.9	5.33		5.82	0.001071	3.1	17.09	8.39	0.66
Br-1	100	48.81	2.9	5.24		5.8	0.001505	3.3	15.85	9.5	0.75
Br-1	90	48.81	2.83	5.3		5.75	0.001129	2.98	17.25	9.17	0.64
Br-1	79.862	48.81	2.8	5.33		5.72	0.000974	2.78	18.25	9.16	0.59
Br-1	70	48.81	2.76	5.36		5.7	0.000777	2.61	19.65	9.52	0.54
Br-1	60	48.81	2.73	5.37		5.68	0.000813	2.49	21.57	12.46	0.52
Br-1	50	48.81	2.68	5.35		5.68	0.000858	2.52	19.93	9.62	0.53
Br-1	39.861	49.8	2.45	5.41	4.12	5.64	0.000506	2.1	24.1	8.94	0.4
Br-1	39.86	Culvert									
Br-1	10.491	50.04	2.31	4.91		5.17	0.00063	2.28	22.73	9.83	0.47
Br-1	0.31	50.04	2.31	4.91	3.91	5.17	0.00064	2.24	22.35	9.29	0.46

APPENDIX B

POST-DEVLOPMENT FLOOD RESULTS

A3

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Ch 300
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Ch 200
Ch 190
Ch 180
Ch 170
Ch 161.079
Ch 150
Ch 140
Ch 130
Ch 120
Ch 110
Ch 100
Ch 90

SHARED ZONE
15.000
ENTRY GATE
MAIL
BICYCLES
SERVICES LOADING AREA
GATE
STORMWATER DRAIN
LANE
CONCRETE CARPARK
2 STOREY BRICK & CLADDED WAREHOUSE
DP 261926
DP 814227
"SIGNAL COMPLEX" 1 AND 2 STOREY BRICK BUILDING
MULTI STOREY BRICK APARTMENTS "CAMELLIA"
HIGH VOLTAGE SWITCH YARD

0 10 20 30 40 50m
10 5
SCALE 1:500

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DESIGNED	E. SHIN	DATE	21/08/17
VERIFIED	E. SHIN	DATE	21/08/17
DRAWING No.	01866_POST	REVISION	01

FLOOD EXTENTS - POST DEVELOPMENT

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Br-1	300	48.81	3.53	5.66		6.32	0.002405	3.59	13.91	7.79	0.82
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Br-1	285.5	48.81	3.46	5.57	5.38	6.26	0.00251	3.69	13.55	8.01	0.85
Br-1	280	Bridge									
Br-1	278	48.81	3.41	5.59	5.33	6.22	0.002236	3.54	14.27	8.65	0.81
Br-1	270	48.81	3.39	5.58		6.2	0.002091	3.49	14.36	8.35	0.79
Br-1	260	48.81	3.4	5.56	5.28	6.18	0.002072	3.5	14.59	8.85	0.79
Br-1	250	48.81	3.37	5.54	5.25	6.16	0.00202	3.48	14.84	9.12	0.78
Br-1	240	48.81	3.34	5.53		6.13	0.001937	3.43	15.1	9.36	0.77
Br-1	230	48.81	3.28	5.53		6.11	0.001936	3.37	14.78	8.82	0.75
Br-1	220	48.81	3.27	5.49		6.09	0.00204	3.41	14.59	8.04	0.77
Br-1	210	48.81	3.25	5.47		6.07	0.00209	3.44	14.58	8.48	0.77
Br-1	200	48.81	3.22	5.46		6.04	0.001955	3.37	15	9.23	0.75
Br-1	190	48.81	3.18	5.46		6.02	0.001874	3.32	15.14	8.68	0.74
Br-1	180	48.81	3.15	5.44		5.99	0.001743	3.3	15.29	8.45	0.72
Br-1	170	48.81	3.12	5.43		5.98	0.001691	3.29	15.45	8.54	0.72
Br-1	161.079	48.81	3.1	5.48		5.94	0.001132	3.01	17.49	9.03	0.65
Br-1	150	48.81	3.06	5.49		5.91	0.000965	2.91	20.73	12.78	0.61
Br-1	140	48.81	3.04	5.5		5.9	0.000858	2.84	21.57	12.21	0.59
Br-1	130	48.81	3	5.53	4.77	5.87	0.000751	2.66	32.69	41.11	0.55
Br-1	120	48.81	2.91	5.31		5.84	0.001561	3.25	16.58	9.88	0.69
Br-1	110	48.81	2.9	5.33		5.82	0.001071	3.1	17.09	8.39	0.66
Br-1	100	48.81	2.9	5.24		5.8	0.001505	3.3	15.85	9.5	0.75
Br-1	90	48.81	2.83	5.3		5.75	0.001129	2.98	17.25	9.17	0.64
Br-1	79.862	48.81	2.8	5.33		5.72	0.000974	2.78	18.25	9.16	0.59
Br-1	70	48.81	2.76	5.36		5.7	0.000777	2.61	19.65	9.52	0.54
Br-1	60	48.81	2.73	5.37		5.68	0.000813	2.49	21.57	12.46	0.52
Br-1	50	48.81	2.68	5.35		5.68	0.000858	2.52	19.93	9.62	0.53
Br-1	39.861	49.8	2.45	5.41	4.12	5.64	0.000506	2.1	24.1	8.94	0.4
Br-1	39.86	Culvert									
Br-1	10.491	50.04	2.31	4.91		5.17	0.00063	2.28	22.73	9.83	0.47
Br-1	0.31	50.04	2.31	4.91	3.91	5.17	0.00064	2.24	22.35	9.29	0.46