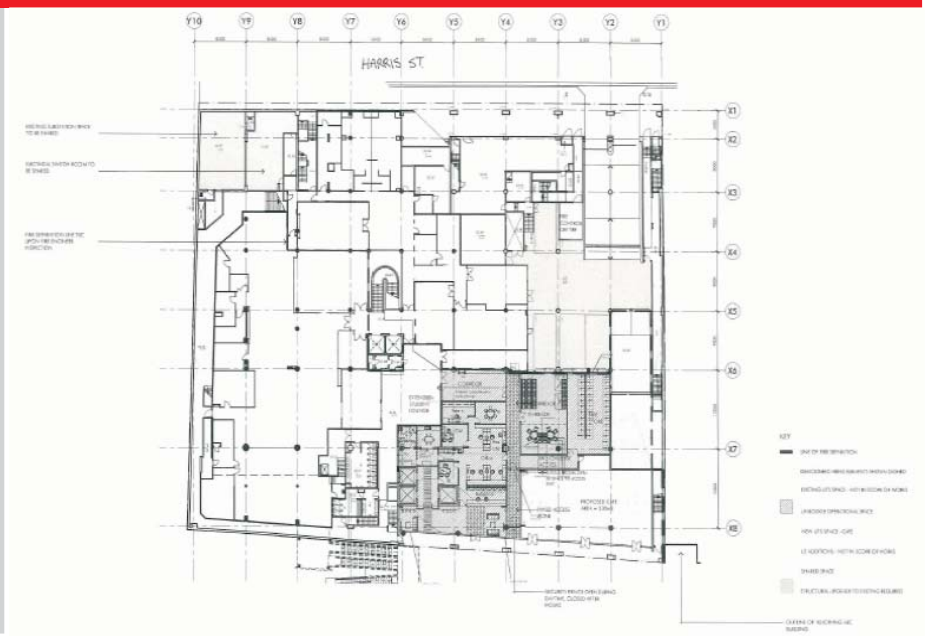
Stormwater Drainage Report for DA Application February 2009

Prepared for:
Hutchinson Builders
23 Dunning Avenue
ROSEBERY NSW 2018

18 February 2009

Ref: S08032

PETER JOHNSON BUILDING



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DOCUMENT CONTROL

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Revision	Date	Description	Prepared by	Reviewed by	Approved by
A	18/02/2009	Issued for DA	V Betro		

1 INTRODUCTION

BG&E Pty Limited has been engaged by Hutchinson Builders to provide engineering services associated with a Development Application (DA) for the proposed Peter Johnson Building located at 702-730 Harris Street, Ultimo, Sydney.

The proposed development includes a site of approximately 5,000 m^2 in area. The building is currently being used by the University of Technology. Sydney and housing the Faculty of Design, Architecture and Building. The existing building consists of 6 levels and a basement. It accommodates car parking, lecture theatres, workshops, offices and a café.

The proposed development involves –

- Extension of existing eastern podium up to level 7.
- Adding 13 new levels of student accommodation above part of the existing podium and new eastern podium.
- Adding a student roof top terrace on level 21.
- Adding a new student roof top terrace on level 8.

A Council code compliant system of stormwater drainage is required for the proposed development to ensure there are no adverse impacts on adjacent or downstream properties. To achieve this it will be necessary to analyse the existing on-site stormwater detention (OSD) and to ensure that proposed development does not exceed the capacity of the existing stormwater drainage system.

Based on existing hydraulic drawings provided to us, it appears that the building has on-site detention tank located below level 1. Drawings indicate that the storage capacity of the OSD tank is approximately 330 m3, which is then discharged into the City of Sydney's network on Harris Street via 3-submersible sumps pumps located within the OSD tank.

This report is submitted to Council to accompany the Development Application, which is being prepared by Hutchinson Builders and the architect Nettleton Tribe Pty Ltd.

2 DESIGN CRITERIA

Design criteria for the stormwater drainage system is derived from City Of Sydney Councils Stormwater drainage connection information Rev02 July 2006.

2.1 GENERAL

The proposed development must be provided with a drainage system to collect all stormwater runoff from roofs and paved areas and discharge it via a private connection(s) to the council's existing mains.

The stormwater storage system must be designed for a minimum 100 year ARI (Average Recurrence Interval) storm event. Overland flow paths must also be provided internally and fall to catchment low points and designed for a 100 year ARI storm event.

On-site stormwater detention (OSD) is required for the development with the following criteria being required.

Permissible site discharge is to be limited to the peak 5 year ARI storm event for the predevelopment site.

2.2 OSD REQUIREMENTS FOR THE SITE

Council's Drainage Code stipulates that developed site discharge from an OSD (Permissible Site Discharge) must be limited to a maximum discharge rate calculated as the 5 year ARI site runoff derived using a runoff coefficient of 0.5.

The on-site detention storage must contain the developed site runoff for the 100 year ARI storm event, for all durations up to 12 hours, less the Permissible Site Discharge as calculated above.

The existing location of the stormwater on-site detention tank is under ramp to level 1 between grids X5/X6 and Y1/Y3, with approximately 330 m3 of stormwater detention volume.

The existing tank storage capacity is sufficient to cater for a pump rate of approximately 48 l/sec which is equivalent to effective catchment area of 1200m2 as per the maximum discharge rate for the 5 year ARI storm event. The 1200m2 is well below the 50% of the overall 5000 m2, and therefore appears to be very conservative. Therefore based on the above assumptions the existing OSD tanks are of sufficient capacity to cater for the maximum 100year AFI storm event, based on a minimum pumping rate of 48 l/sec.

2.3 DISCHARGE TO COUNCIL'S STORMWATER SYSTEM

Stormwater from the site will discharge via the existing submersible pumps to the councils existing stormwater line.. Based on drawings received it appears that the council stormwater main is 450mm in diameter.

3 STORMWATER RUNOFF RATES

The peak design discharge rate for each of the sites was calculated using the City Of Sydney Councils Stormwater drainage connection information Rev02 July 2006.

The existing internal private stormwater system for the building will remain as currently installed.

4 ON-SITE STORMWATER DETENTION

As indicated in Section 2, Council requires on-site stormwater detention (OSD) for the site. The OSD is to be designed for the 100 year ARI storm for all events up to a 12 hour duration, with a permissible site discharge limited to the 5 year ARI site runoff assuming a runoff coefficient of 0.5. All additional roof and site drainage will therefore be designed to a 100 year ARI capacity.

The existing OSD tank is of sufficient capacity to cater for this additional development and therefore it is anticipated that no changes will be made to the current tank and pumped discharge .

5 REFERENCES

- Stormwater drainage connection information – Rev02 July 2006.
- City Of Sydney – Standard Conditions of Development Consent – Revised 1 September 2008.

6 SUBMITTED PLANS

Refer to Appendix A.

7 CALCULATIONS

Refer to Appendix B.

8 CONCLUSION

The plans and calculations for the proposed development are in accordance with City Of Sydney requirements and satisfy required engineering standards.

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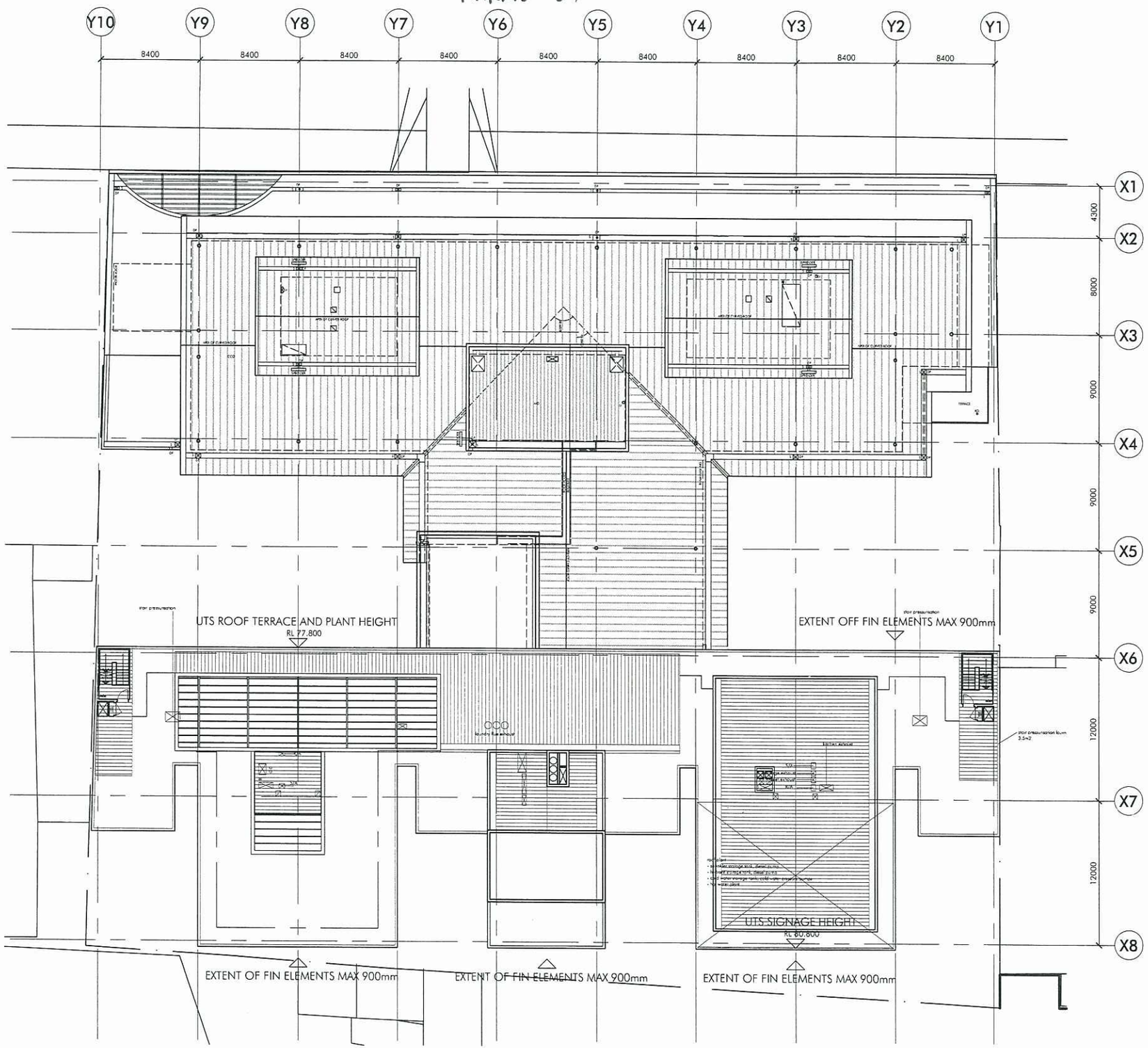
Appendix A

Submitted Plan

HARRIS ST



Appendix B

Calculations

Tank Storage Spreadsheet- Sydney Region

Impervious Catchment Area (Ha) **0.5000**
Allowable Outflow (l/sec) **48** (Based on assumed Pumping Rate))
Return Period **20**

Where S=I*(1-(Qo/Qi))

Time **Mins**	Intensity 20yr Return **mm/hr**	***Qi*** Inflow **m3/sec**	***Qo*** OutFlow **m3/sec**	***I*** Total volume of inflow **m3**	Cumulative Outflow ***m3***	***Qo/Qi***	***Tank Storage S m3***
5	204	0.283	0.048	85.0	14.4	0.1694	70.60
6	192	0.267	0.048	96.0	17.3	0.1800	78.72
10	160	0.222	0.048	133.3	28.8	0.2160	104.53
15	136	0.189	0.048	170.0	43.2	0.2541	126.80
20	120	0.167	0.048	200.0	57.6	0.2880	142.40
25	108	0.150	0.048	225.0	72.0	0.3200	153.00
30	99	0.138	0.048	247.5	86.4	0.3491	161.10
45	81	0.113	0.048	303.8	129.6	0.4267	174.15
55	73	0.101	0.048	334.6	158.4	0.4734	176.18
60	70	0.097	0.048	350.0	172.8	0.4937	177.20
75	61	0.085	0.048	381.3	216.0	0.5666	165.25
90	55	0.076	0.048	412.5	259.2	0.6284	153.30
105	50	0.069	0.048	437.5	302.4	0.6912	135.10

Time **Mins**	Intensity 50yr Return **mm/hr**	***Qi*** Inflow **m3/sec**	***Qo*** OutFlow **m3/sec**	***I*** Total volume of inflow **m3**	Cumulative Outflow ***m3***	***Qo/Qi***	***Tank Storage S m3***
5	239	0.332	0.048	99.6	14.4	0.1446	85.18
6	226	0.314	0.048	113.0	17.3	0.1529	95.72
10	189	0.263	0.048	157.5	28.8	0.1829	128.70
15	161	0.224	0.048	201.3	43.2	0.2147	158.05
20	142	0.197	0.048	236.7	57.6	0.2434	179.07
25	128	0.178	0.048	266.7	72.0	0.2700	194.67
30	118	0.164	0.048	295.0	86.4	0.2929	208.60
45	97	0.135	0.048	363.8	129.6	0.3563	234.15
55	87	0.121	0.048	398.8	158.4	0.3972	240.35
60	84	0.117	0.048	420.0	172.8	0.4114	247.20
75	73	0.101	0.048	456.3	216.0	0.4734	240.25
90	65	0.090	0.048	487.5	259.2	0.5317	228.30
105	59	0.082	0.048	516.3	302.4	0.5858	213.85

Time **Mins**	Intensity 100yr Return **mm/hr**	***Qi*** Inflow **m3/sec**	***Qo*** OutFlow **m3/sec**	***I*** Total volume of inflow **m3**	Cumulative Outflow ***m3***	***Qo/Qi***	***Tank Storage S m3***
5	266	0.369	0.048	110.8	14.4	0.1299	96.43
6	252	0.350	0.048	126.0	17.3	0.1371	108.72
10	211	0.293	0.048	175.8	28.8	0.1638	147.03
15	163	0.226	0.048	203.8	43.2	0.2120	160.55
20	160	0.222	0.048	266.7	57.6	0.2160	209.07
25	145	0.201	0.048	302.1	72.0	0.2383	230.08
30	133	0.185	0.048	332.5	86.4	0.2598	246.10
45	109	0.151	0.048	408.8	129.6	0.3171	279.15
55	99	0.138	0.048	453.8	158.4	0.3491	295.35
60	95	0.132	0.048	475.0	172.8	0.3638	302.20
75	83	0.115	0.048	518.8	216.0	0.4164	**302.75**
90	74	0.103	0.048	555.0	259.2	0.4670	295.80
105	67	0.093	0.048	586.3	302.4	0.5158	283.85









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