



FLOOD IMPACT ASSESMENT & RISK MANAGEMENT REPORT

Franpina Developments Pty Ltd

366-372 Lane Cove Road / 124a-126 Epping Road
/ 1 Paul Street, NORTH RYDE NSW

Job No. 150106
Revision B – 4th February 2015

Prepared for: Murdocca & Associates Pty Ltd

Prepared by: Rhys Mikhail

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FLOOD RISK MANAGEMENT REPORT

DATE 4th February 2015

SITE 366-372 Lane Cove Road / 124a-126 Epping Road
/ 1 Paul Street, NORTH RYDE NSW

ENGINEER Rhys Mikhail

DRAWINGS Franpina Development Pty Ltd

JOB No 150106

INTRODUCTION

Northern Beaches Consulting Engineers Pty Ltd have reviewed the preliminary concept design (prepared by Bates Smart) for the above site address in reference to potential flooding issues. The proposal has been assessed utilising Ryde Councils Stormwater Management Technical Material manual, Council supplied flood information, Macquarie Park Floodplain Risk Management Study & Plan (Bewsher – 2011) and the NSW Government Floodplain Management Manual (2005).

The site consists of seven (7) properties located on the corners of Paul Street, Lane Cove Road and Epping Road in North Ryde. Six (6) of the existing properties contain single dwellings and the other property is a Medical Centre consisting of two separate buildings and car park. The development site is located within the vicinity of overland flow extents (for the 1 in 100 year flood event) of a flood as predicted by the Macquarie Park Floodplain Risk Management Study & Plan.

It should be noted that council flood information predicts that the 1% AEP flood extents will inundate part of the development site. These levels vary throughout the development site. Based on the existing site conditions this flood level is envisaged to enter the development site and inundate approximately 60% of the site.



Below is a summary of flood information in reference to City of Ryde DCP requirements and the NSW Government Floodplain Management Manual with reference to the 1 in 100 year storm event.

FLOOD RISK REPORT:

- Hazard classification Medium
- Average 100 Year Flood Level (1% AEP) See Table 1 below:

Table 1 – Associated 1% AEP Flood Levels from Ryde Council Supplied
Flood Information

Building	Proposed FFL (AHD)	Associated 1% AEP Level (AHD)	Freeboard (mm)	Ryde DCP Check
A*	67.20m	66.63m	570	OK
B	69.00m	66.63m	2,370	OK
C	69.00m	N/A	N/A	OK
D	67.20m	65.74m	1,460	OK
E	69.00m	65.74m	3,260	OK
F	68.00m	N/A	N/A	OK
G	66.00m	64.74m	1,260	OK
H	66.00m	64.74m	1,260	OK
I	67.00m	N/A	N/A	OK

*NOTE: Refer appendix B for Building Locations

- Flood Plane Level (FPL) 500mm above 1% AEP level
- Probable Maximum Flood Level (PMF) 66.01m to 66.68m AHD
- Existing Ground Floor Level See Table 2 below:



Table 2 – Existing Ground Floor Levels from Supplied Survey Information

Property Lot & DP number	Existing FFL (AHD)	Associated 1% AEP Level (AHD)
<i>5 D.P 23568</i>	66.52m	66.63m
<i>1 D.P 1134154</i>	68.98m	66.63m
<i>1 D.P 1134153</i>	68.55m	66.63m
<i>1 D.P 1134150</i>	68.23m	65.74m
<i>1 D.P 1133943</i>	67.68m	65.74m
<i>11 D.P 1013188</i>	67.17m & 64.86m	64.74m
<i>1 D.P 1087457</i>	64.05m	64.74m

- Degree of inundation 60%
- Hazard Level Medium
- Impacts of waterborne objects Medium
- Buoyancy Medium

- Evacuation and emergency issues

Should flood waters begin to inundate the western and eastern kerb and path ways all occupants are directed to assemble at the Main Foyer of each building and to contact emergency services and adhere to their instructions. All residence above ground level are to remain in doors. Should flood waters continue to inundate the property all occupants are to evacuate the property (subject to emergency services instructions) via the south western car park to Paul Street and proceed towards higher ground to the west.

- Impact on surrounding properties Insignificant envisaged
- Flood levels Insignificant increase



- **Recommendations for structural design**
All structural elements located below the 1% AEP flood levels are to be designed to withstand floodwaters.
- **Waterproofing methods**
All electrical equipment is to be fitted with circuit breakers. Switchboard and main circuit unit is to be fitted above the 1% AEP flood level for each building. Other valuable materials or possessions are to be stored above this level and it should be acknowledged by the owner and occupants that a reasonable extent of damage to fittings below this level is to be expected during the 1% AEP storm event.
- **Flood Warning**
Clear signage is to be displayed in the Main Foyer areas of the buildings indicating the extent of possible flooding, assembly points, evacuation procedures / strategy and recommendations for the storage of electrical and valuable goods above the PMF level. All permanent and temporary occupants of the building are to be informed of the extent of possible flooding, assembly points, evacuation procedures / strategy and recommendations for the storage of electrical and valuable goods above the PMF level.
- **Flood Storage Area and Volume**
The Macquarie Park Floodplain Risk Management Study was used to predict the overall effect to the flood storage area in relation to the development. The dwellings and buildings have been considered as blockage areas for both the existing and proposed development scenario. The blockages are considered to be a reduction in flood storage volume.

As a result of the development there is an approximate 15% reduction in flood storage area for the proposed development. This is considered to have an insignificant effect of the existing flood levels for storms up to and including the 1%AEP flood. Should a more accurate assessment be required, we recommend the council TUFLOW Model (July 2010) be updated to incorporate the proposed development.



- **Car Parking and Driveway Access**

The driveway entrance locations are to ensure a minimum freeboard of 500mm is achieved for the associated 1% AEP flood level. Refer Table 3 for a summary of the basement entrance levels.

Table 3 – Driveway Levels / Basement Freeboard Achieved

Driveway Location	High Point (AHD)	1% AEP Flood Level (AHD)	Freeboard Achieved (mm)
Paul Street	67.20m	66.63m	570
Epping Road	66.00m	64.74m	1,260

The proposed driveway is to incorporate a high point on or near the development boundary to achieve the council required freeboard of 500mm. This has been adequately satisfied within the development. All driveways and car parking areas are to be designed in general accordance with City of Ryde Councils DCP and AS2890 requirements.

- **Hazardous Material Storage**

Hazardous chemicals are not to be stored in areas under the the 1% AEP flood level for each building. This should be acknowledged by the owner and staff.

- **Preliminary concept design reviewed**

The preliminary concept design is not envisaged to have an adverse effect on surrounding properties.

- **Authors qualifications / experience**

Rick Wray
 Director NBConsulting,
 BE(Civil), MIEAust, CPEng, NPER,
 Over 30years professional
 experience



CONCLUSION

The proposed development generally meets the requirements of City of Ryde's DCP. We trust that this report meets with Council requirements for flood risk management analysis. Please contact the author if further clarification is required.

NORTHERN BEACHES CONSULTING ENGINEERS P/L

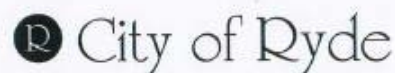
Rick Wray

B.E. CPEng NPER Director

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APPENDIX A – COUNCIL FLOOD INFORMATION



Lifestyle and opportunity @ your doorstep

Murdocca & Associates P/L
PO Box 643
NORTH RYDE BC NSW 1670

8 August 2014

Our ref: D14/74896

Dear Sir

RE: Request for Flood Information – No 126 Epping Road, North Ryde

Reference is made to your application received on 7 August 2014 seeking flood level information pertaining to the above-mentioned address.

Please find attached flood level data sheet providing flood levels for the 20 year and 100 year ARI (Average Recurrence Interval) flood events as well as the PMF (Probable Maximum Flood) event.

Please be advised that flood models only approximate flood behaviour. Care and expertise is required in the interpretation of these flood levels. In addition, this flood information does not take into account any local overland flow issues.

Any person or organisation who acts on the information provided does so at his / her / its own risk. To the extent permitted by law, the City of Ryde accepts no responsibility and excludes all liability whatsoever in respect of any use of or reliance upon this information.

Should you require any further information, please feel free to contact Stormwater and Catchments Section on (02) 9952 8222.

Yours sincerely,

Guna Veerasingham
Team Manager, Stormwater and Catchments

Civic Centre 1 Devlin Street, Ryde NSW
Ryde Planning and Business Centre
1 Pope Street, Ryde (Below Ryde Library)

Post Locked Bag 2069, North Ryde NSW 1670
Email cityofryde@ryde.nsw.gov.au
www.ryde.nsw.gov.au

Customer Service (02) 9952 8222
TTY (02) 9952 8470 Fax (02) 9952 8070
Translating and Interpreting Service 131 450

City of Ryde



FLOOD INFORMATION REQUEST

Property Address: No. 126 Epping Road, North Ryde
Issue Date: 8 August 2014
Flood Study Reference: Macquarie Park Flood Study Report (April 2010)
Flood Model Reference: TUFLOW Model (July 2010)

Flood Level Location Map



Flood Level Data Table

Location	20 Year ARI Flood (m AHD)	100 Year ARI Flood (m AHD)	Probable Maximum Flood (m AHD)
A	64.49	64.74	66.01
B	64.47	64.74	66.01
C	64.42	64.73	66.01
D	64.43	64.73	66.01
E	64.42	64.73	66.01
F	64.42	64.73	66.01

Notes:

- All levels are based on Australian Height Datum (AHD).
- This flood level information is for existing site conditions only.
- A site specific flood study / risk assessment may be required for any future development. Engage a suitably qualified engineer to assist you in this matter. Any study or assessment shall be in accordance with the NSW Government's Floodplain Development Manual 2005 and the City of Ryde Development Control Plan 2010.
- Site specific ground and building survey levels should be used to relate flood levels and to assess the impact of flooding.



City of Ryde



Flood Risk: Medium to High





Lifestyle and opportunity @ your doorstep

Murdocca & Associates P/L
PO Box 643
NORTH RYDE BC NSW 1670

8 August 2014

Our ref: D14/74725

Dear Sir

RE: Request for Flood Information – No 1 Paul Street, North Ryde

Reference is made to your application received on 7 August 2014 seeking flood level information pertaining to the above-mentioned address.

Please find attached flood level data sheet providing flood levels for the 20 year and 100 year ARI (Average Recurrence Interval) flood events as well as the PMF (Probable Maximum Flood) event.

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City of Ryde



FLOOD INFORMATION REQUEST

Property Address: No. 1 Paul Street North Ryde
Issue Date: 8 August 2014
Flood Study Reference: Macquarie Park Flood Study Report (April 2010)
Flood Model Reference: TUFLOW Model (July 2010)

Flood Level Location Map



Flood Level Data Table

Location	20 Year ARI Flood (m AHD)	100 Year ARI Flood (m AHD)	Probable Maximum Flood (m AHD)
A	66.17	66.18	66.33
B	66.62	66.63	66.68
C	65.66	65.70	66.13
D	66.16	66.16	66.21
E	65.32	65.34	66.02
F	65.32	65.33	66.01
G	65.74	65.74	66.01
H	Nil	Nil	66.01

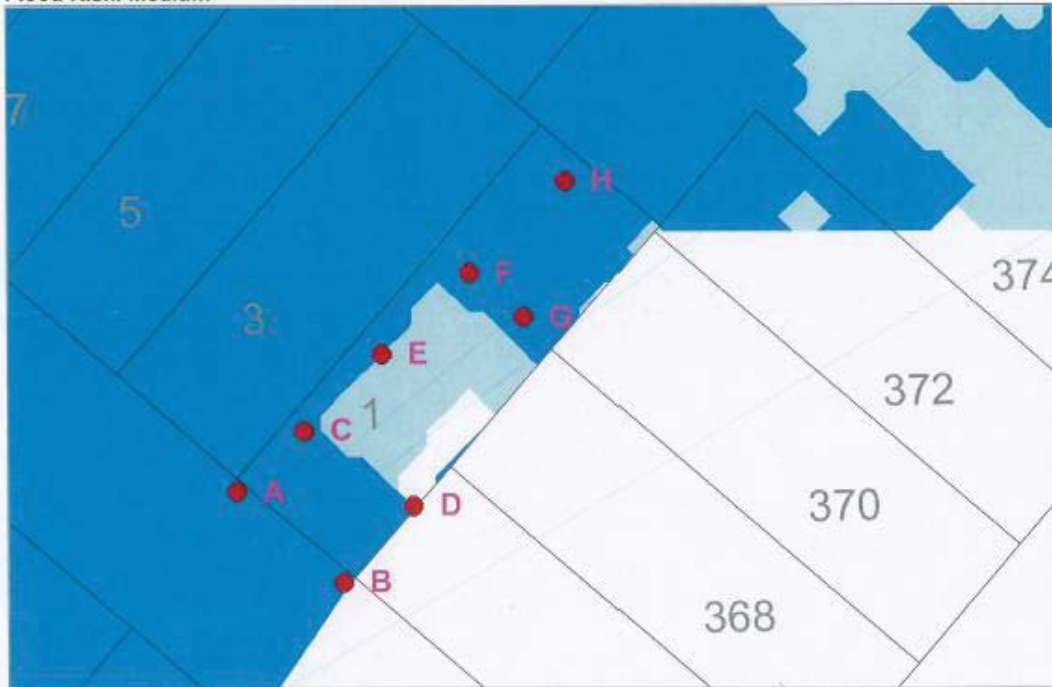
Notes:

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- Site specific ground and building survey levels should be used to relate flood levels and to assess the impact of flooding.

City of Ryde



Flood Risk: Medium





APPENDIX B – BUILDING LOCATIONS

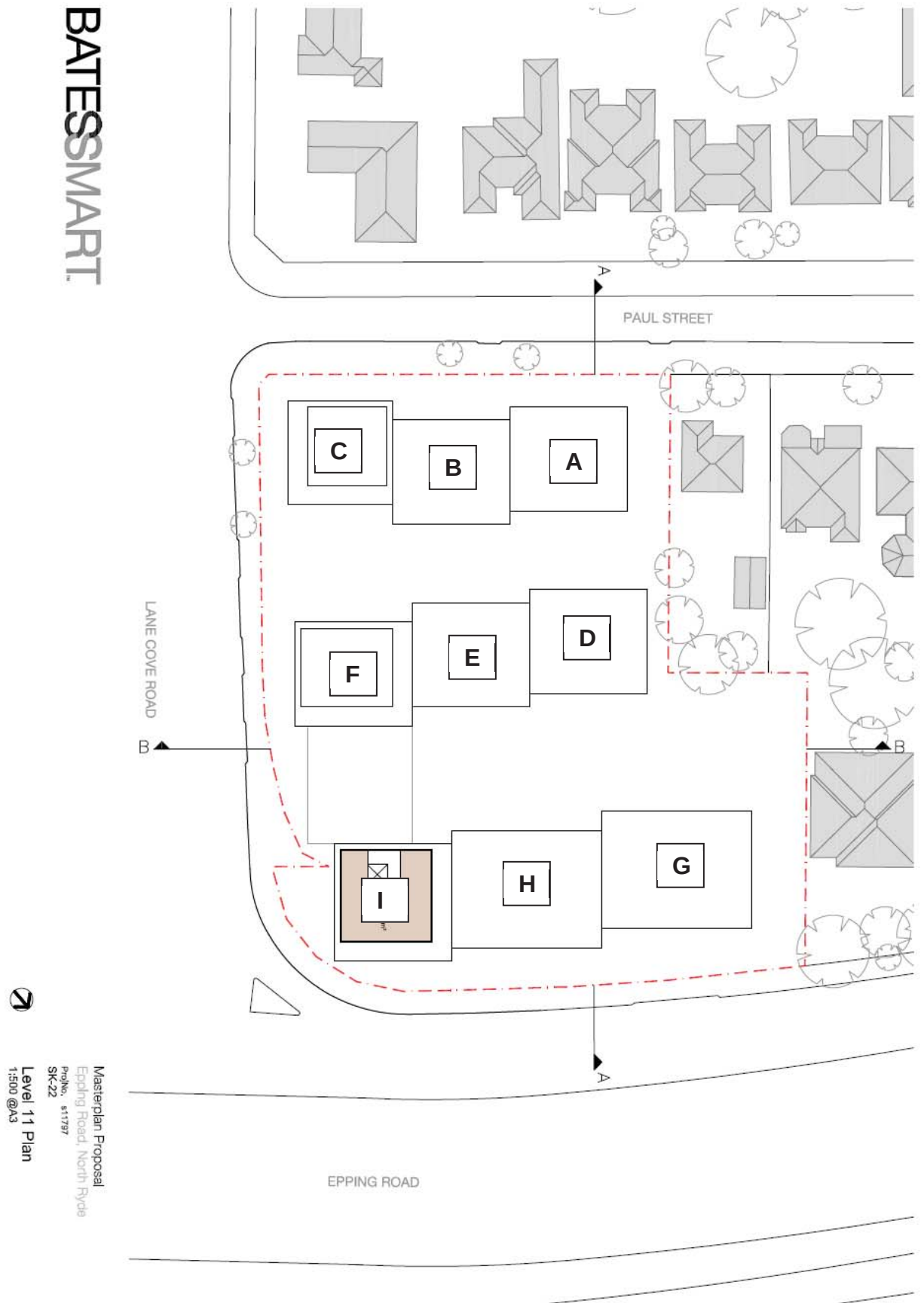


Figure 1 – Building Locations in Relation to 1% AEP Flood Level (Table 1)



APPENDIX C – FLOOD STORAGE AREAS



Figure 2 – Existing Flood Storage Area

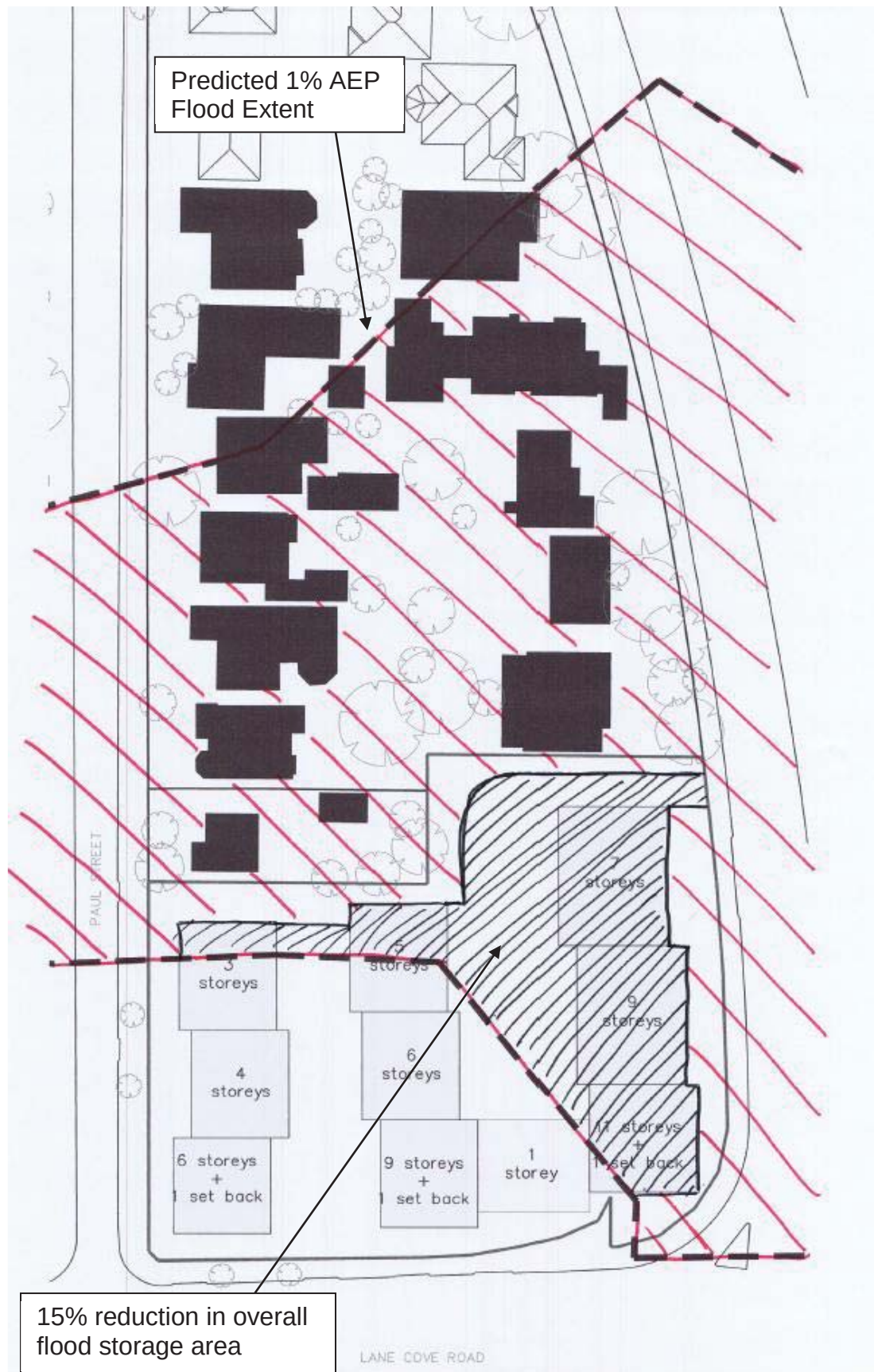


Figure 3 – Proposed Flood Storage Area



APPENDIX D – ARCHITECTURAL PLAN & SURVEY

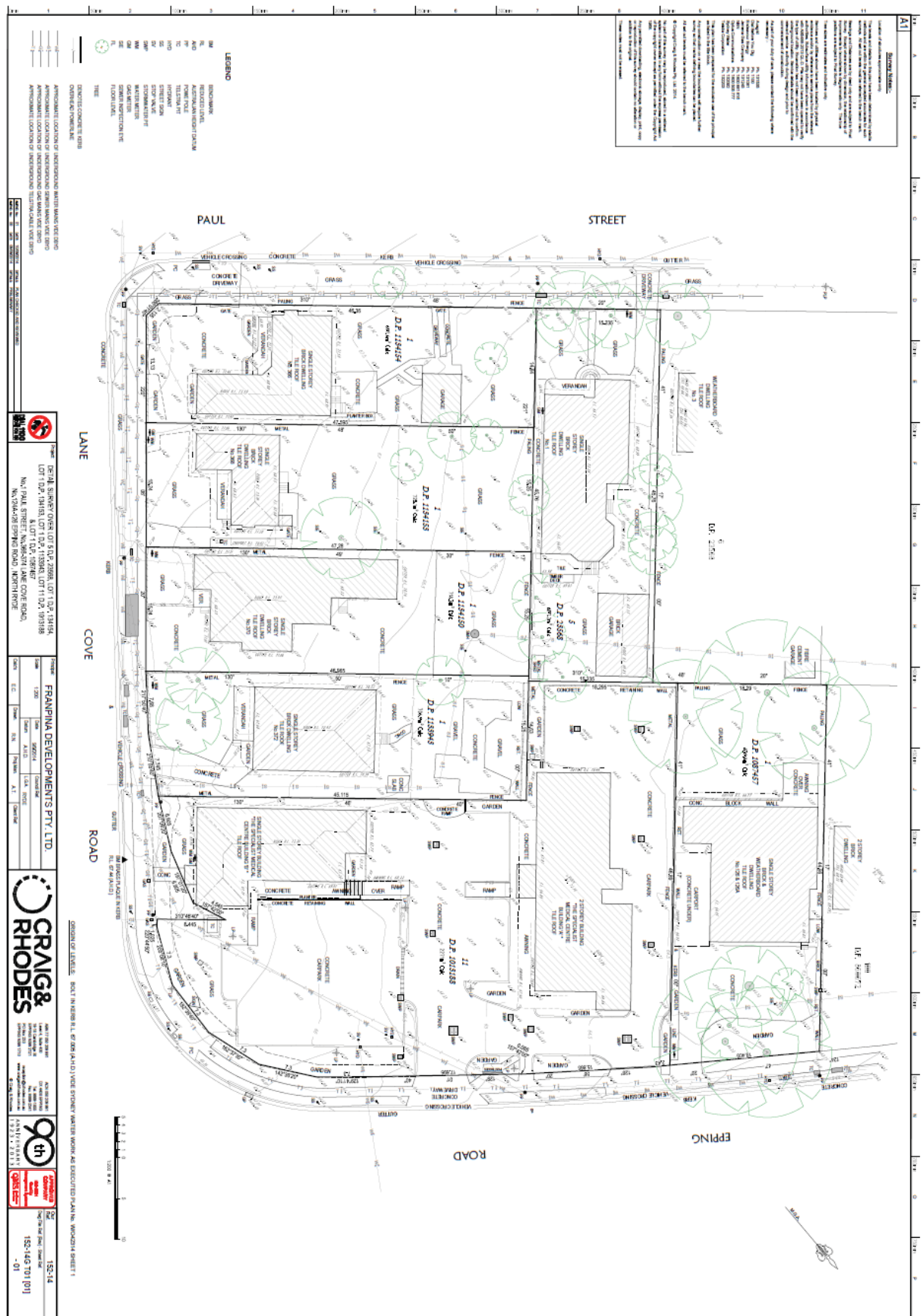


Figure 4 – Existing Survey Plan (Craig & Rhodes)

BATESSMART.



Figure 5 – Proposed Lower Ground Plan (BatesSmart)