Ibrahim Stormwater Consultants

ABN: 37 116 185 516

PROPOSED DEVELOPMENT AT 5 KILLARA AVENUE PANANIA

FLOOD IMPACT & RISK ASSESSMENT

August 2024

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Castle Hill NSW 2154
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FLOOD IMPACT & RISK ASSESSMENT

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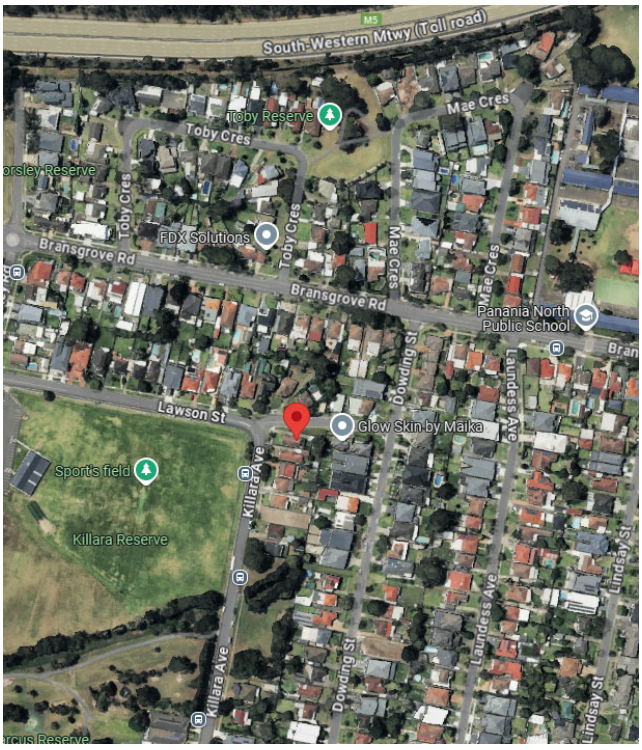
1 INTRODUCTION

A development application proposing a, new single detached residential dwelling for the subject site at 5 Killara Avenue, PANANIA, is to be lodged with council. Subsequently, this report is to provide information with regard to council flood risk policy.

Ibrahim Stormwater Consultants were commissioned to undertake this assessment of the site and proposed development.

The assessment is based on council's Stormwater System Report dated 15-2-21, Kelso Swamp Catchment Study prepared by council Dec. 2009, councils Flood Risk Management Policy and the following list of documents:

1. Architectural drawings 0028180 dated 6-8-24
2. Title Searches



Locality plan.

The results of this report are for the purposes of assessing this proposed development only, in its current form and is not to be used for any other purposes or developments on this property or adjoining ones.

2 AIM OF ASSESSMENT

The objectives of this assessment is to address council's Flood Risk Management Policy of DCP 2021 Part 2.2 and

• Schedule 5–Catchments affected by Stormwater Flooding. This schedule defines development controls for flood liable land in catchments affected by stormwater flooding, as follows:

a) Identify the Flood Risk Precinct

b) Identify Minimum Floor levels required for habitable areas.

c) Identify Building Component Requirements

d) Identify Structural Soundness Requirements

e) Identify Flood Effects

f) Identify Minimum Car Parking and Driveway Levels and access requirements.

g) Identify Evacuation Requirements.

3 SUMMARY OF ASSESSMENT

The property is identified as being in a overland flow risk , Low Flood Risk Precinct, as a result of overland flow along the frontage of the site.

Accordingly the following relevant parameters will need to be followed as per Schedule 5:

Planning Consideration	Residential	
Floor Levels	1, 2, 6	2-Habitable Floor levels to be 500mm above the 100yr flood level. 6-Non habitable levels to be no lower than the 20yr flood level by site specific assessment. 7-A restriction is to be placed on the title of the land, pursuant to S.88B of the Conveyancing Act, where the lowest habitable floor area is elevated more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed. The use of roller shutters or similar measures (such as hit and miss brickwork) to enclose this area is however permissible.
Building Components	1	All Buildings to be flood compatible building components below the 100yr flood level plus 500mm. per Schedule 6 of the DCP
Structural Soundness	1 (Medium Risk only)	Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100-year flood plus freeboard.
Flood Effects	2 , (3 for Medium Risk)	The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (i) loss of flood storage; (ii) changes in flood levels and velocities caused by alterations to the flood conveyance and (iii) the cumulative impacts of multiple potential developments in the floodplain. An engineer's report may be required.
Car Parking & Driveway Access	3,4,5,6, (Low riks 9) (Medium Risk 2)	The minimum surface level of open car parking spaces or carports shall be as high as practical, but no lower than the 20-year flood or the level of the crest of the road at the location where the site has access. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20-year flood. -Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or enclosed car parking, must be protected from inundation by floods up to the 100-year flood. -The level of the driveway providing access between the road and parking space shall be no lower than 0.3m below the 100-year flood or such that the depth of inundation during a 100-year flood is not greater than either the depth at the road or the depth at the car parking space. A lesser standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.. -Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land), with a floor level below the 20-year flood or more than 0.8m below the 100-year flood level, shall have adequate warning systems, signage and exits.. -Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100-year flood.

Evacuation	Medium Risk 2,6	-Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel. -The development is to be consistent with any relevant flood evacuation strategy, Flood Plan adopted by Council or similar plan..

CANTERBURY BANKSTOWN

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council@cbcity.nsw.gov.au

CITY OF CANTERBURY BANKSTOWN

To: Gavin William Maurer
5 Killara Ave
PANANIA NSW 2213

STORMWATER SYSTEM REPORT
5 Killara Avenue, PANANIA NSW 2213

Date: 15-Feb-2021
Ref: WP-SIA-200/2021
Development type: **Detached Dwelling (Single House)**

NO — FLOOD/OVERLAND FLOW STUDY REQUIRED

The site is affected by the following Council stormwater system components:

- Overland flowpath for excess stormwater runoff from the upstream catchment and associated with the drainage systems located east & south of the site.

The site will be subject to stormwater inundation from this overland flowpath during large storm events. Refer to the attached **"100 Year ARI Flood Extent Maps from Kelso Swamp Catchment Study"** showing the flood contours to m AHD**. Provision should be made on site, and at boundary fences, for this stormwater runoff to pass unobstructed over the site. Stormwater flowing naturally onto the site must not be impeded or diverted.

For this development, a flood /overland flow] study to determine the 100 year ARI* water surface level is not necessary.

The proposed development including floor levels, shall comply with the development controls specified in Part B12 Schedule 5, of Bankstown's Development Control Plan 2015 - Catchments Affected by Stormwater Flooding.

The Development Application submission shall be based on an AHD datum for levels where sites are affected by overland flow / flooding. Refer Bankstown Council's *Development Engineering Standards**.**

Runoff on the site, and naturally draining to it is to be collected and disposed of to Council's requirements detailed in Bankstown Council's *Development Engineering Standards****.

The site is affected by 100 year ARI* Georges River flood levels.
The 100 year ARI* flood level at the site is 3.75m AHD.**

Habitable floor levels are to be at least 500mm above this level at RL 3.75m AHD.**

The site is affected by the probable maximum flood from the Georges River; the level of inundation is RL 10.3 m AHD** **(This level is not any restriction for residential development).**

The Probable Maximum Flood is the largest flood that could occur. It is derived from the maximum amount of atmospheric moisture that can occur in the locality. The 100 year flood is a very large flood. It is derived from a statistical analysis of rainfall records to give a 1 in 100 (ie 1%) chance of occurring, or being exceeded, in any one year. The last 100 year Georges River flood was in 1889.

This report is given without the benefit of development plans or a site survey.

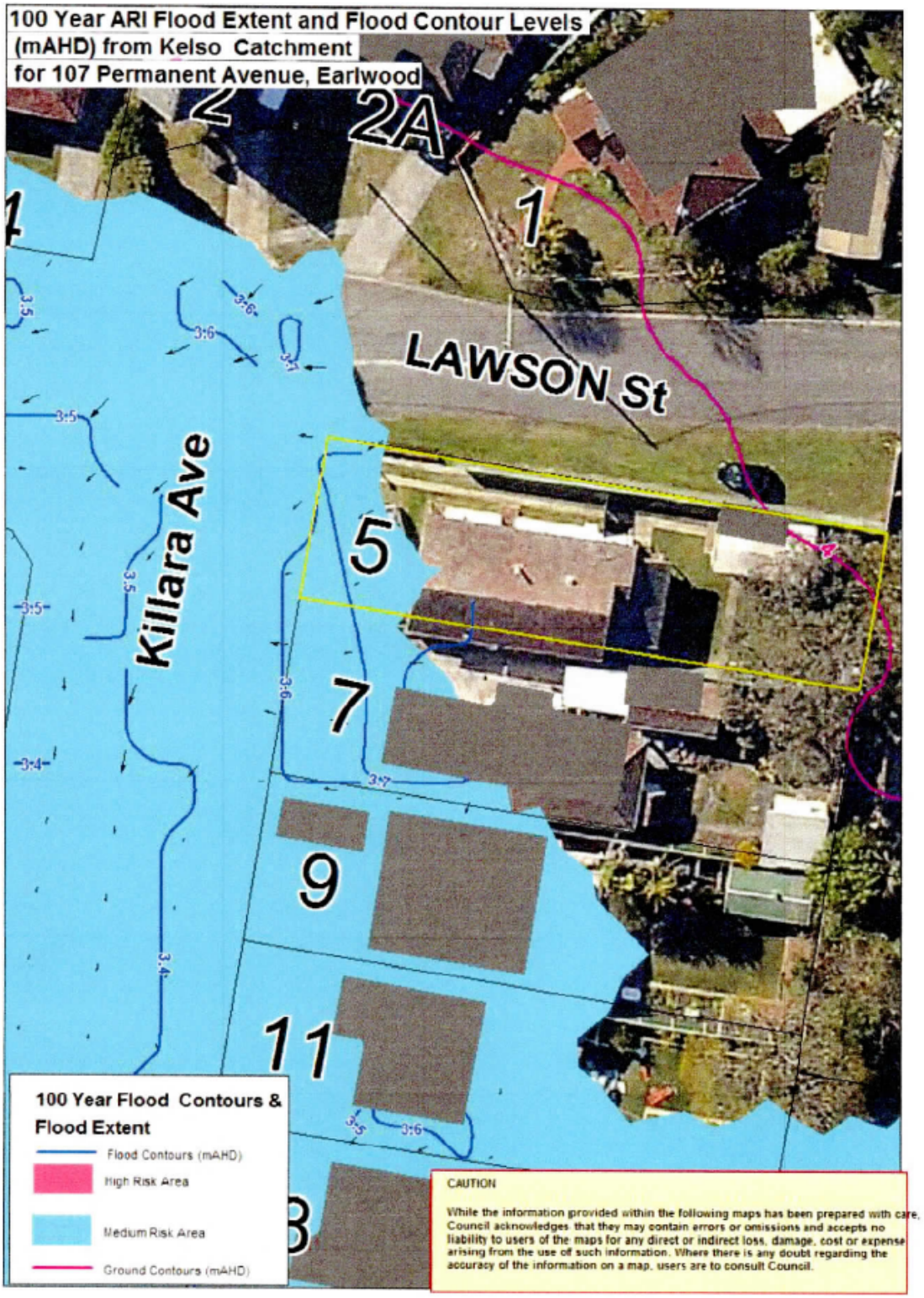
This report relates to the exposure of the subject site to Council's stormwater system, both underground and overland. It does not assess the suitability or otherwise of this site for the proposed development.

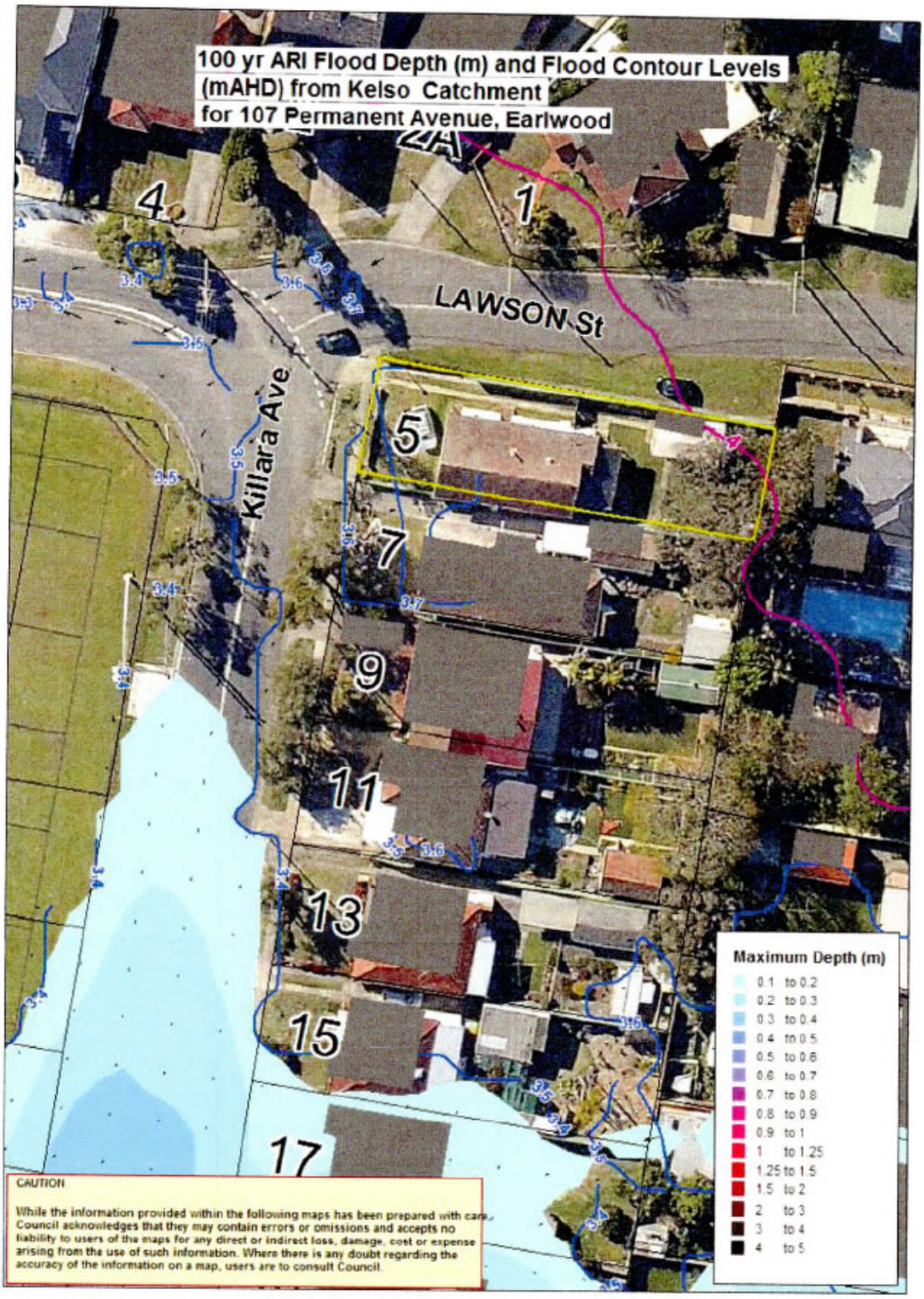
* Average Recurrence Interval

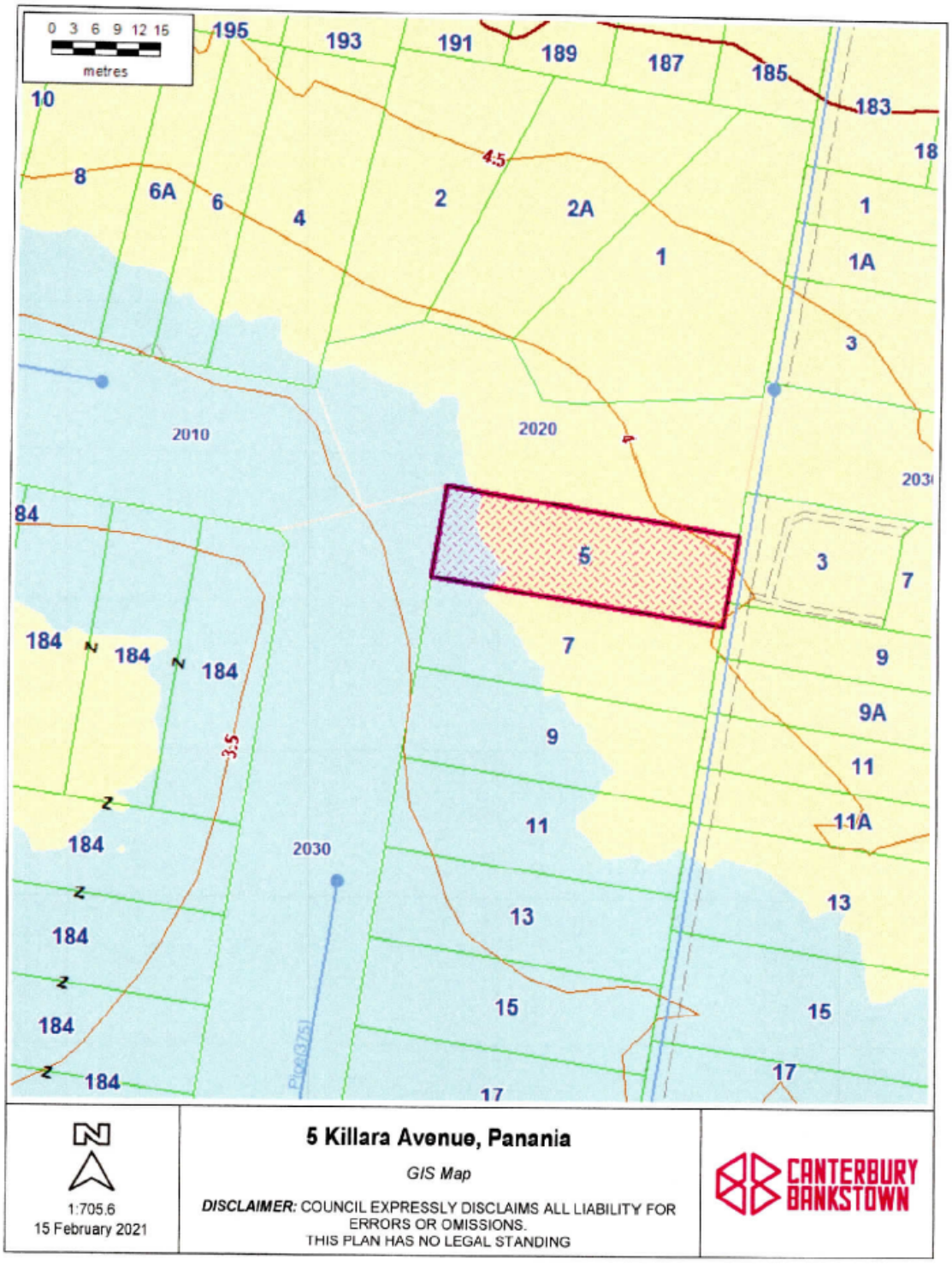
** Australian Height Datum

*** Bankstown Council's *Development Engineering Standards* and *Bankstown's Development Control Plan 2015* is available from Council's Customer Service Centre.

Pushpa Goonetilleke
ENGINEER


100 Year ARI Flood Extent and Flood Contour Levels
(mAHD) from Kelso Catchment
for 107 Permanent Avenue, Earlwood
2
2A
1
LAWSON St
Killara Ave
5
7
9
11
3
3:5
3:6
3:7
3:4
100 Year Flood Contours &
Flood Extent
Flood Contours (mAHD)
High Risk Area
Medium Risk Area
Ground Contours (mAHD)
CAUTION
While the information provided within the following maps has been prepared with care, Council acknowledges that they may contain errors or omissions and accepts no liability to users of the maps for any direct or indirect loss, damage, cost or expense arising from the use of such information. Where there is any doubt regarding the accuracy of the information on a map, users are to consult Council.


100 yr ARI Flood Depth (m) and Flood Contour Levels (mAHD) from Kelso Catchment for 107 Permanent Avenue, Earlwood
LAWSON St
Killara Ave
4
1
5
7
9
11
13
15
17
Maximum Depth (m)
0.1 to 0.2
0.2 to 0.3
0.3 to 0.4
0.4 to 0.5
0.5 to 0.6
0.6 to 0.7
0.7 to 0.8
0.8 to 0.9
0.9 to 1
1 to 1.25
1.25 to 1.5
1.5 to 2
2 to 3
3 to 4
4 to 5
CAUTION
While the information provided within the following maps has been prepared with care, Council acknowledges that they may contain errors or omissions and accepts no liability to users of the maps for any direct or indirect loss, damage, cost or expense arising from the use of such information. Where there is any doubt regarding the accuracy of the information on a map, users are to consult Council.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7
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9A
11
11A
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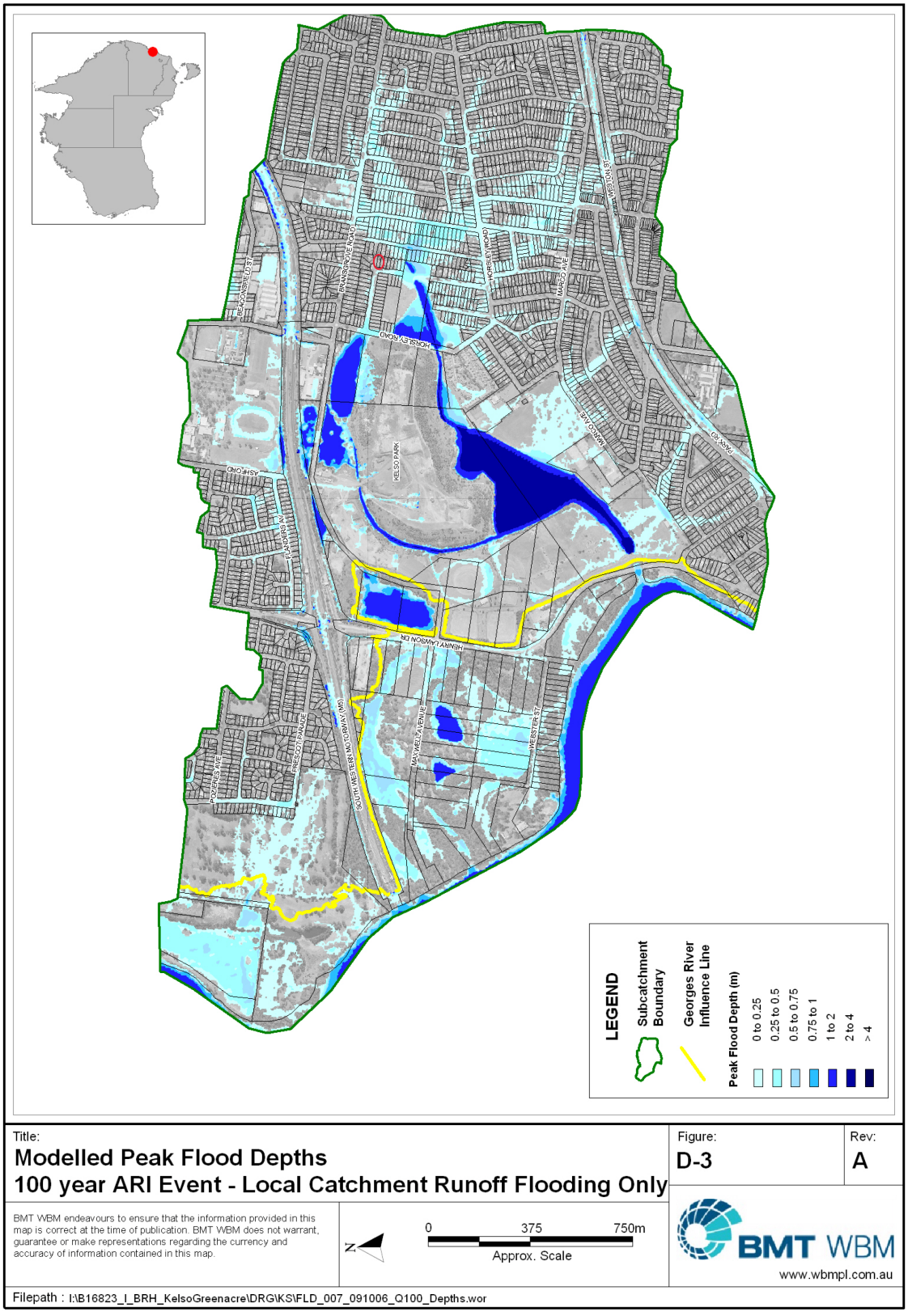
17
184
4.5
3.5
Pipe(375)
1:705.6
15 February 2021
5 Killara Avenue, Panania
GIS Map
DISCLAIMER: COUNCIL EXPRESSLY DISCLAIMS ALL LIABILITY FOR ERRORS OR OMISSIONS.
THIS PLAN HAS NO LEGAL STANDING
CANTERBURY BANKSTOWN



Title:

Modelled Peak Flood Depths
100 year ARI Event - Local Catchment Runoff Flooding Only

Figure: D-3

Rev: A

BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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www.wbmpl.com.au

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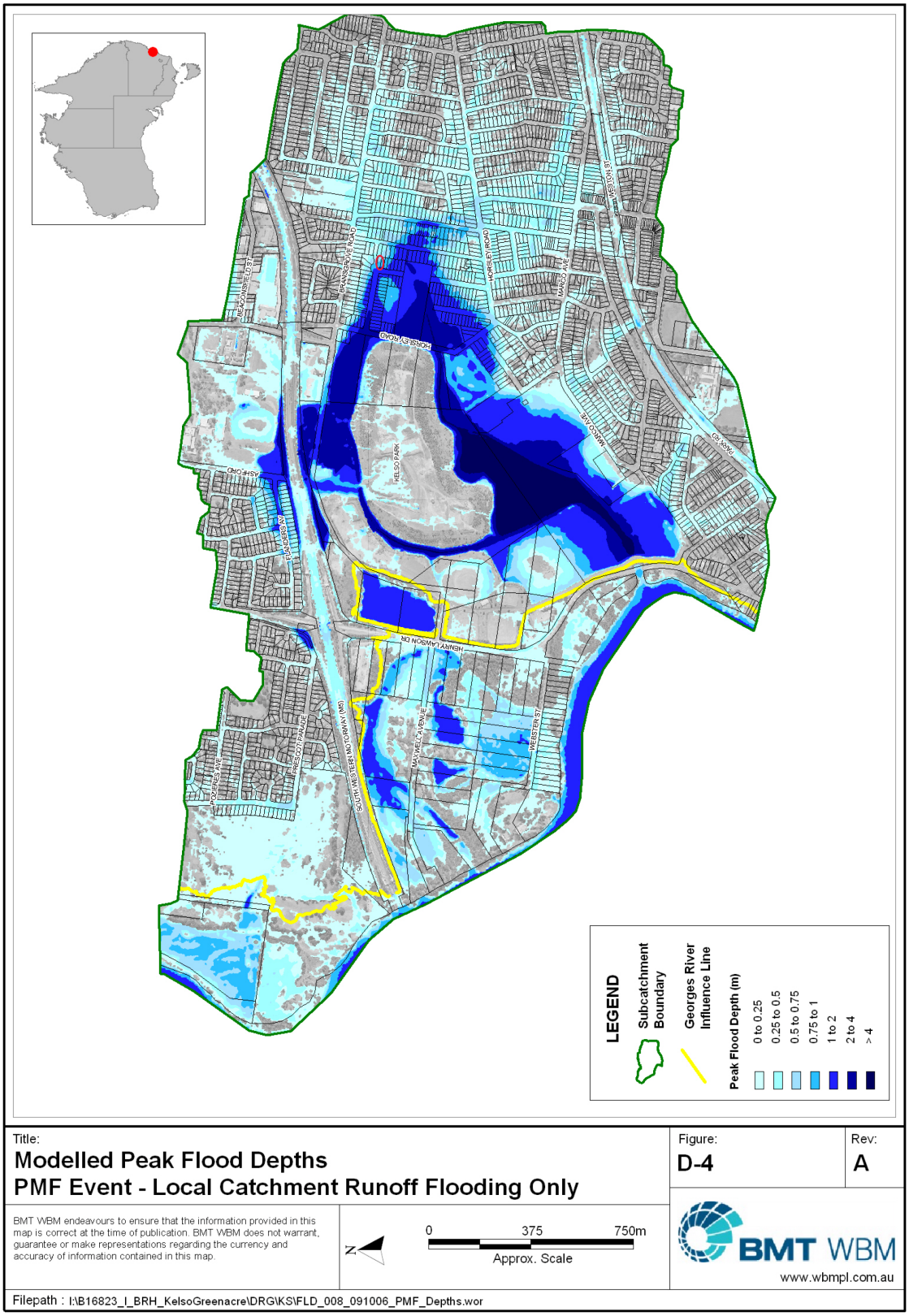


Extracts from the Kelso Swamp Flood study

4 CONCLUSION

The proposed development based on the below design criteria and with relevant D.A. conditioning, will ensure that the current use of the property will not be a hazard to the community in the event of 1 in 100 year storm event.

The proposal to construct a new residence shall adopt the following limitations:

1. A floor level higher than or equal to RL 4.25m relative to the front BM to AHD,
2. A garage level higher than or equal to 3.95m,
3. Flood storage loss will have negligible effect to flood storage in the area. The maintaining of all natural ground levels, (requiring drop edge beams to perimeter of the residence only), including the future paths shall be implemented.
4. Any new fencing to the perimeter of the property being open at the base and up to the 100yr flood level of 3.75m AHD to be provided. Particular attention to the front of the site is required as a separate DA application for fencing may be required by council.
5. All Buildings to be flood compatible building components below the 100yr flood level plus 500mm.
6. Structural engineer to certify that structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus 500mm.
7. Evacuation to Lawson Street to the east should be available if directed by SES to do so early in a storm event. SES stormsafe flyer in Appendix A should be laminated and affixed within the laundry or kitchen and affixed to the Meter Box also.

The proposed development will complement all the design issues raised and provide an extension to any future council flood management proposal.

Name of Engineer: Mark Ibrahim
Qualifications: B.E. Hons, M.I.E. Aust. CPEng,
This is only a design certificate and is not a Part 4A certificate, as only a consent authority, the council or an accredited certifier can issue such.

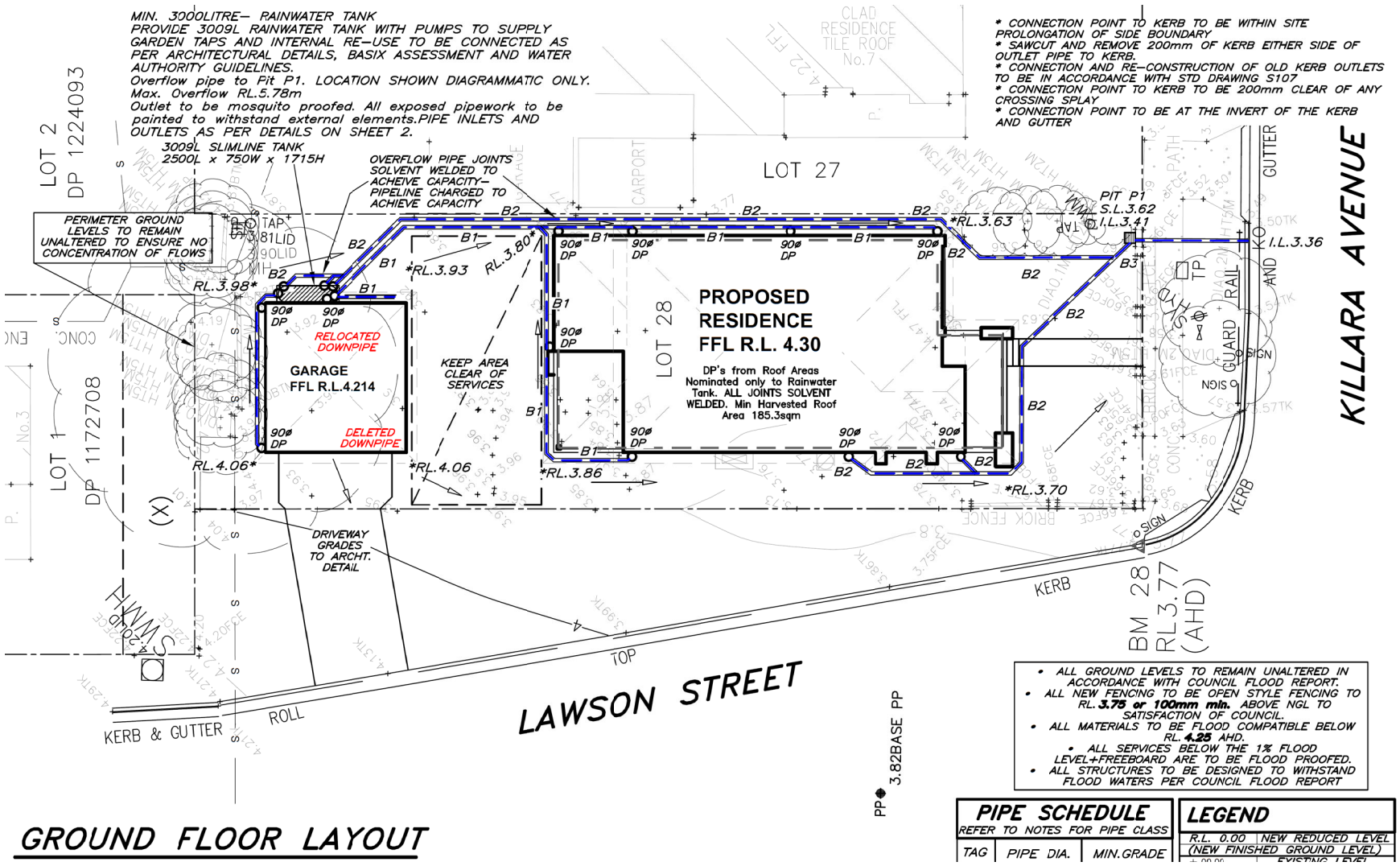
Yours faithfully,

Per Ibrahim Stormwater Consultants
Mark Ibrahim

APPENDIX A

Part 1

Part 1. Site Plan



GROUND FLOOR LAYOUT

Are you at risk?

Storms can happen anywhere, at any time of the year. It is important to prepare your family and property now and stay prepared all year round. Storms are the most costly natural disaster to affect NSW, causing an estimated average of $217 million dollars damage annually (source: Bureau of Transport Economics, 2008).

During storms, it is important to protect your family and property from the major impacts such as high winds, hail, and rising water levels (flash flooding).

- **Damaging winds** can bring down trees, branches, powerlines, remove roofs and blow around outdoor items
- **Hail** can injure people and damage property
- **Heavy rainfall** can cause water to:
  - damage exposed homes and belongings
  - rise rapidly, flooding homes, property and roads
  - drain rapidly making floodwater, drains and other water courses a safety hazard
- **Damaging surf** can be unsafe and flood homes and properties in coastal areas

You may also be indirectly affected by storms; access roads may be blocked or you may have no power or telephone connection.

NEVER ENTER FLOODWATER

Never enter or travel through floodwater, including flash floodwater. This includes walking, driving, riding and playing. Entering floodwater is the leading cause of death during floods.

How the SES can help you

The State Emergency Service (SES) is responsible for responding to storms in NSW. This includes planning for storms and educating people about how to protect themselves and their property.

The SES can give safety advice, place tarpaulins on damaged roofs, remove fallen trees and branches from buildings, roads or property and rescue people trapped or injured by storm activity.

SES volunteers can clear access and carry out temporary repairs to damaged property; however, you will need to engage professional tradespeople to carry out permanent repairs.

NSW GOVERNMENT

SES STATE EMERGENCY SERVICE

Principal Partner
NRMA INSURANCE

FOR EMERGENCY HELP IN FLOODS AND STORMS CALL

132 500

For more information call the SES on 1800 201 000
or visit: www.ses.nsw.gov.au

Find us on: Follow us on: See us on: You Tube

StormSafe

SES STATE EMERGENCY SERVICE

StormSafe

Principal Partner
NRMA INSURANCE

8 TIPS YOU CAN DO NOW TO PREPARE FOR STORMS

There are a few simple things that you can do now to help reduce the potential damage caused by severe storms:

1. Maintain your yard and balcony by securing or putting away items that could blow around in strong winds
2. Clean your gutters, downpipes and drains regularly to prevent blockages
3. Trim trees and branches that could potentially fall on your home or property
4. Fix any damage to your roof including broken or missing tiles
5. Check your insurance policy is current and adequate
6. Make a plan for your family that outlines what you would do in an emergency
7. Put together an emergency kit
8. Listen to your local radio station and other media for weather warnings

When a STORM WARNING is broadcast

Severe Weather Warnings and Severe Thunderstorm Warnings are issued by the Bureau of Meteorology to alert communities to the threat of severe weather.

When a warning is issued for your area (but before the storm arrives), there are a few things you can do to help protect your family and property:

- ✓ Move indoors, bringing children and pets with you
- ✓ Park your car under secure cover and away from trees, powerlines and drains
- ✓ Secure or put away any items from around the house, yard or balcony that could blow around in strong winds
- ✓ Check to see if your neighbours are aware of the warning
- ✓ When flash flooding is likely, leaving low-lying homes and businesses well before flash flooding begins (evacuation) is the best action to take, but only if it is safe to do so. If you are trapped by rising floodwater, seek refuge in the highest part of a sturdy building. Stay there and call '000' (triple zero) if you need rescue
- ✓ Listen to your local radio station and other media for information, updates and advice
- ✓ Unplug and avoid using electrical equipment connected to mains power, landline phones or modems
- ✓ Have your emergency kit handy in case you lose power or need to leave

✓ YOUR EMERGENCY KIT CHECKLIST

Your emergency kit provides items you might need if you lose power or need to leave your home in a hurry. Your emergency kit contents:

- ☐ A portable radio with spare batteries
- ☐ A torch with spare batteries
- ☐ A first aid kit
- ☐ Candles and waterproof matches
- ☐ Important papers including emergency contact numbers
- ☐ Copies of any emergency plans
- ☐ A waterproof bag for valuables

When leaving or evacuating your property, place into your emergency kit:

- ☐ Medications
- ☐ Supplies for your baby
- ☐ Supplies for any other people in your care
- ☐ Appropriate clothing and footwear
- ☐ Food and drinking water

DURING a storm

During a storm, there are simple things you can do to help protect your family:

- ⚠ Never enter or travel through floodwater
- ✓ Stay indoors, clear of windows
- ⚠ Stay clear of creeks, drains, causeways, gutters, streams, fallen trees or powerlines and damaged buildings
- ✓ If driving, put your hazard lights on and pull over to the side of the road keeping clear of drains, causeways, streams, creeks, trees and powerlines
- ✓ If outdoors, seek secure cover away from drains, causeways, gutters, streams, creeks, trees and powerlines
- ✓ Listen to your local radio station and other media for information, updates and advice
- ✓ For emergency help in floods and storms, call the SES on 132 500

AFTER the storm

- ✓ Keep listening to your local radio station for information, updates and advice
- ✓ Check your house or property for damage
- ⚠ Stay clear of creeks, drains, causeways, gutters, streams, fallen trees or powerlines and any damaged buildings
- ✓ Check to see if your neighbours need help
- ⚠ Do not go sightseeing as this may hinder recovery efforts or put yourself and others at risk