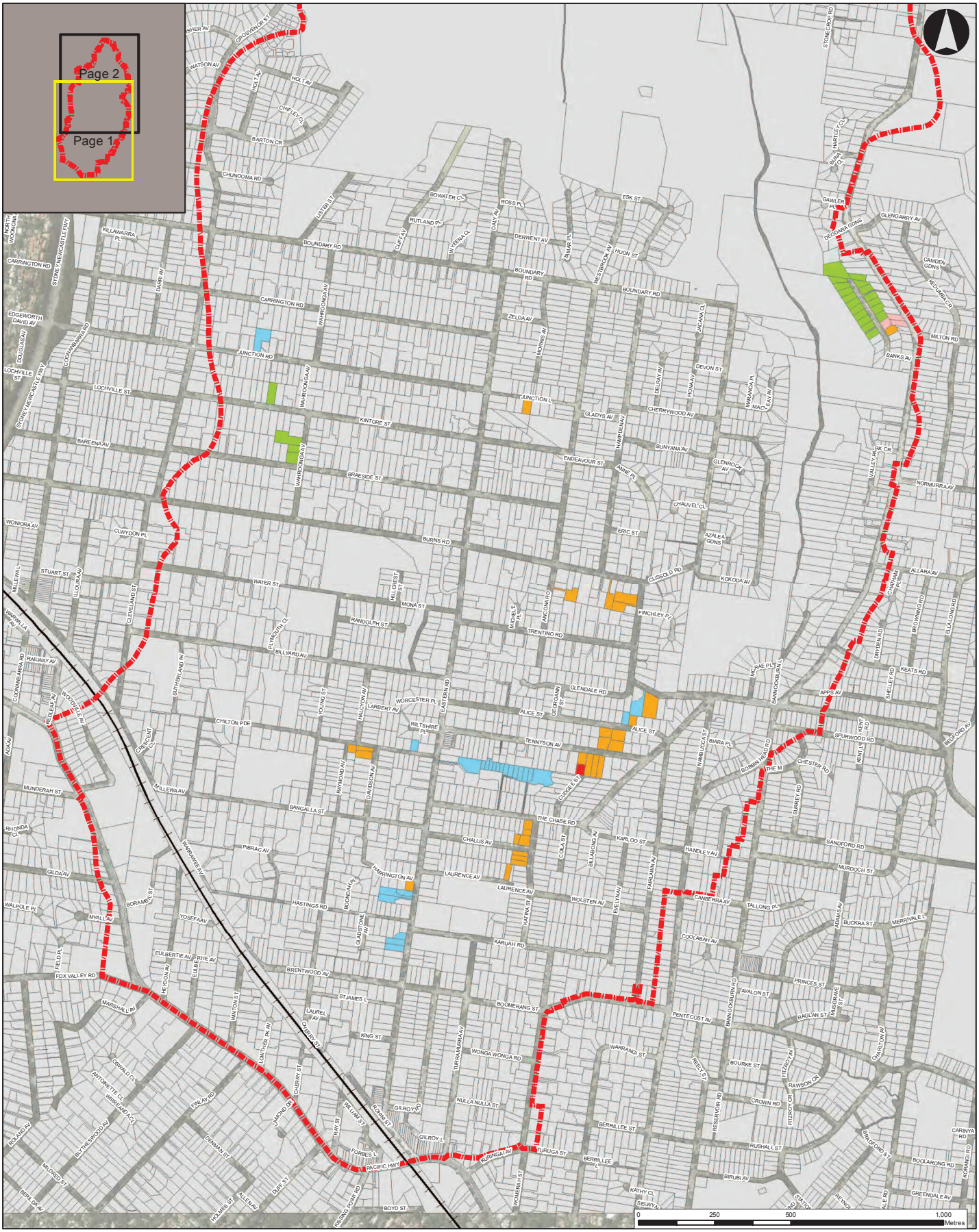
Appendix D. Emergency Response Mapping



Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response
Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
- Overland Escape Route
- Rising Road Access
- Indirectly Affected

JACOBS

SHEET	Page 1 of 2	GDA 1994 MGA Zone 56	
TITLE	20% AEP Event Flood Emergency Response Classification of Communities		
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan		
DRAWN	LC	PROJECT # IA159900	MAP # Map D-1
CHECK	AH	DATE 25/01/2019	REV 1 VER 1
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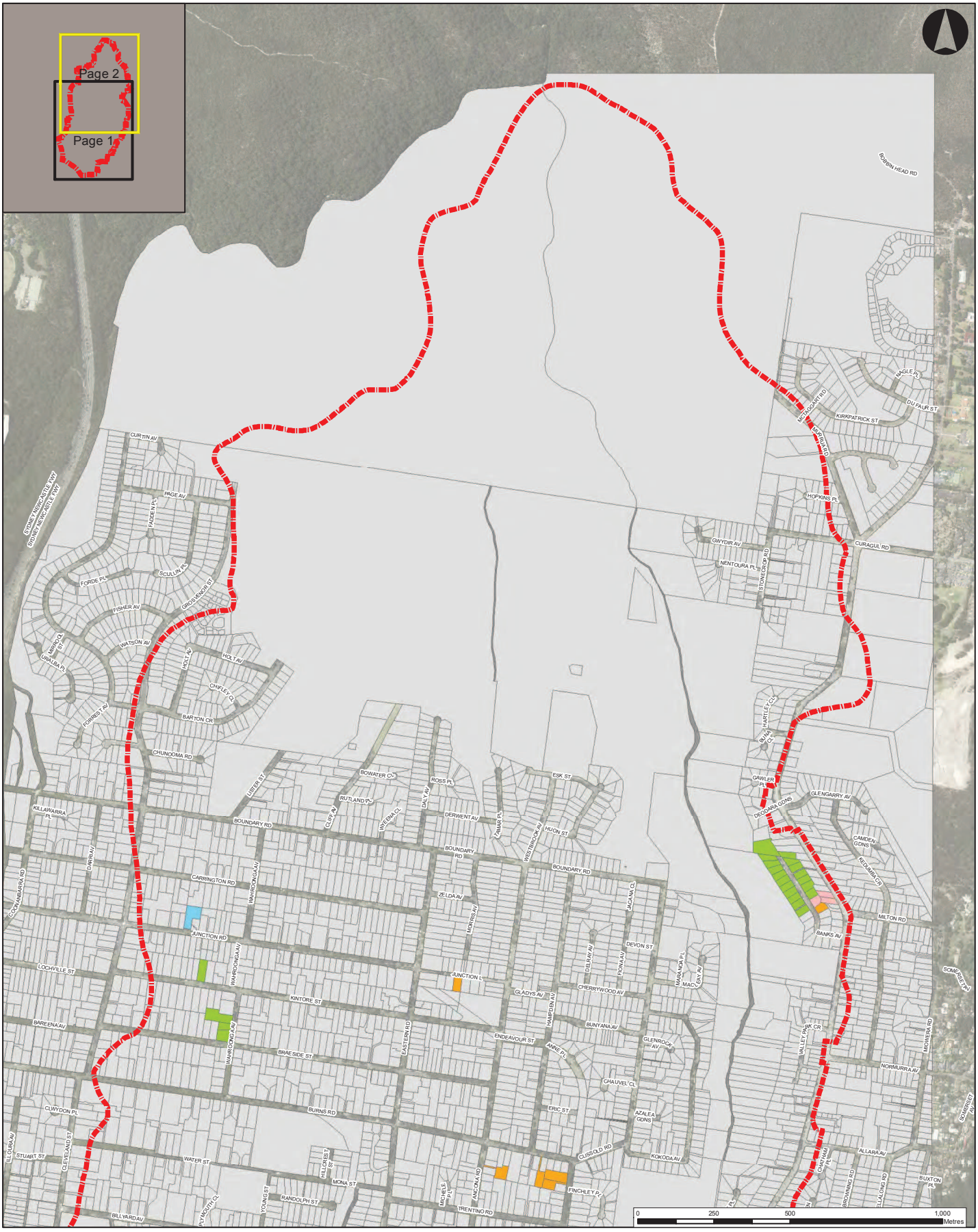

Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response
Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
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JACOBS

SHEET	Page 2 of 2	GDA 1994 MGA Zone 56	
TITLE	20% AEP Event Flood Emergency Response Classification of Communities		
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan		
DRAWN LC	PROJECT # IA159900	MAP # Map D-1	REV VER 1 1
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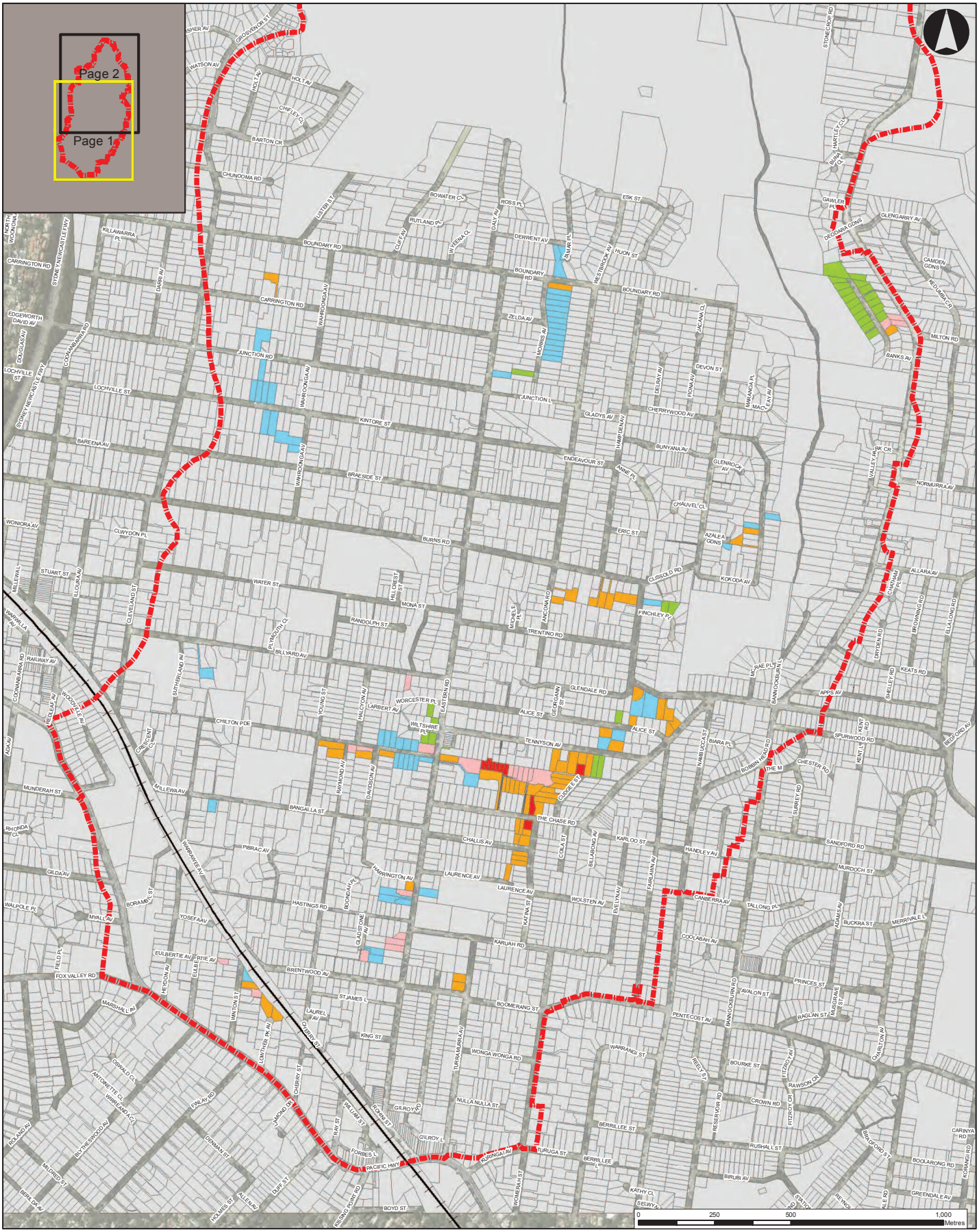

Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response
Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
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- Rising Road Access
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JACOBS

SHEET	Page 1 of 2	GDA 1994 MGA Zone 56	
TITLE	1% AEP Event Flood Emergency Response Classification of Communities		
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan		
DRAWN LC	PROJECT # IA159900	MAP # Map D-2	REV VER 1 1
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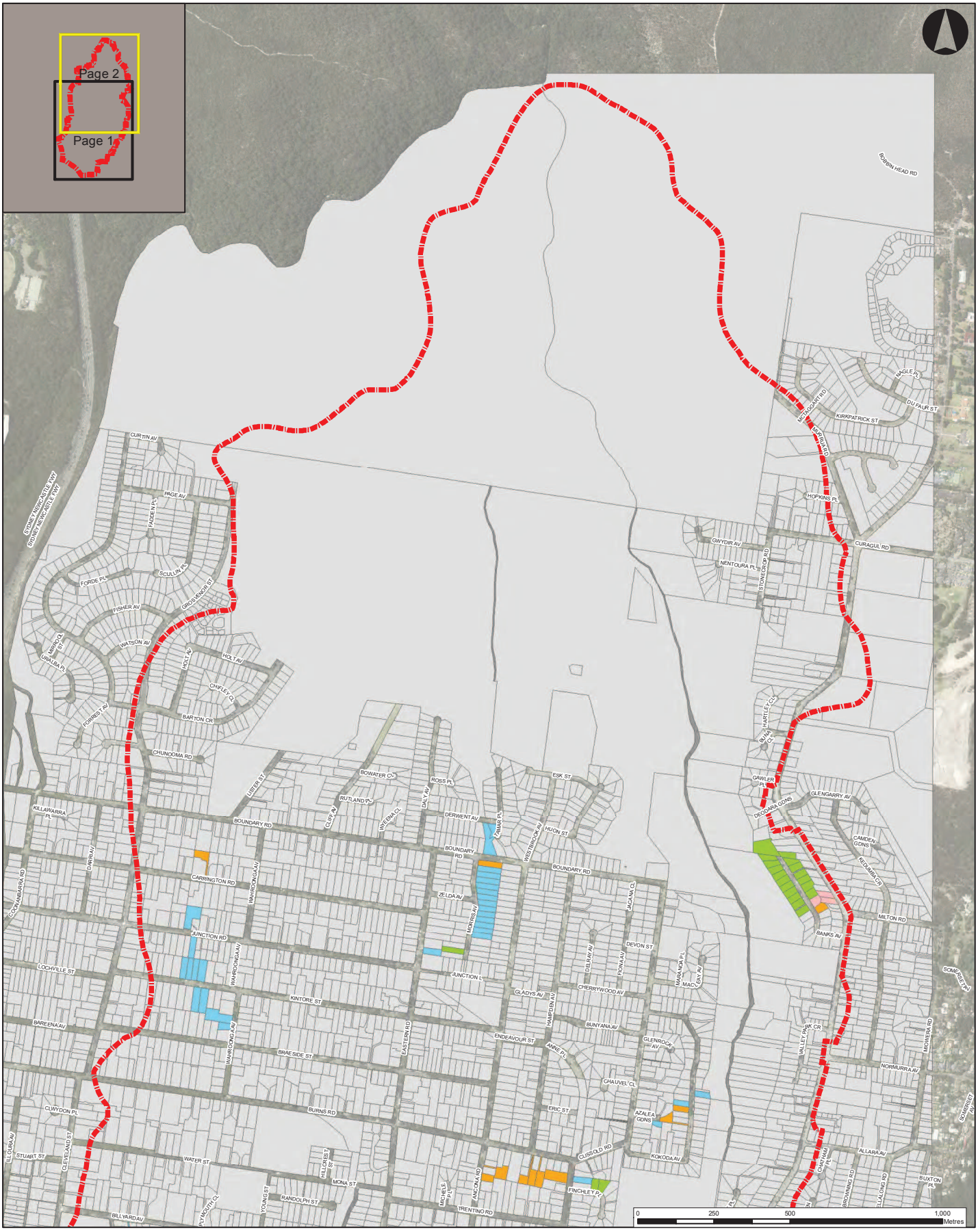

Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response
Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
- Overland Escape Route
- Rising Road Access
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JACOBS

SHEET	Page 2 of 2	GDA 1994 MGA Zone 56	
TITLE	1% AEP Event Flood Emergency Response Classification of Communities		
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan		
DRAWN	LC	PROJECT # IA159900	MAP # Map D-2
CHECK	AH	DATE 25/01/2019	REV 1 VER 1
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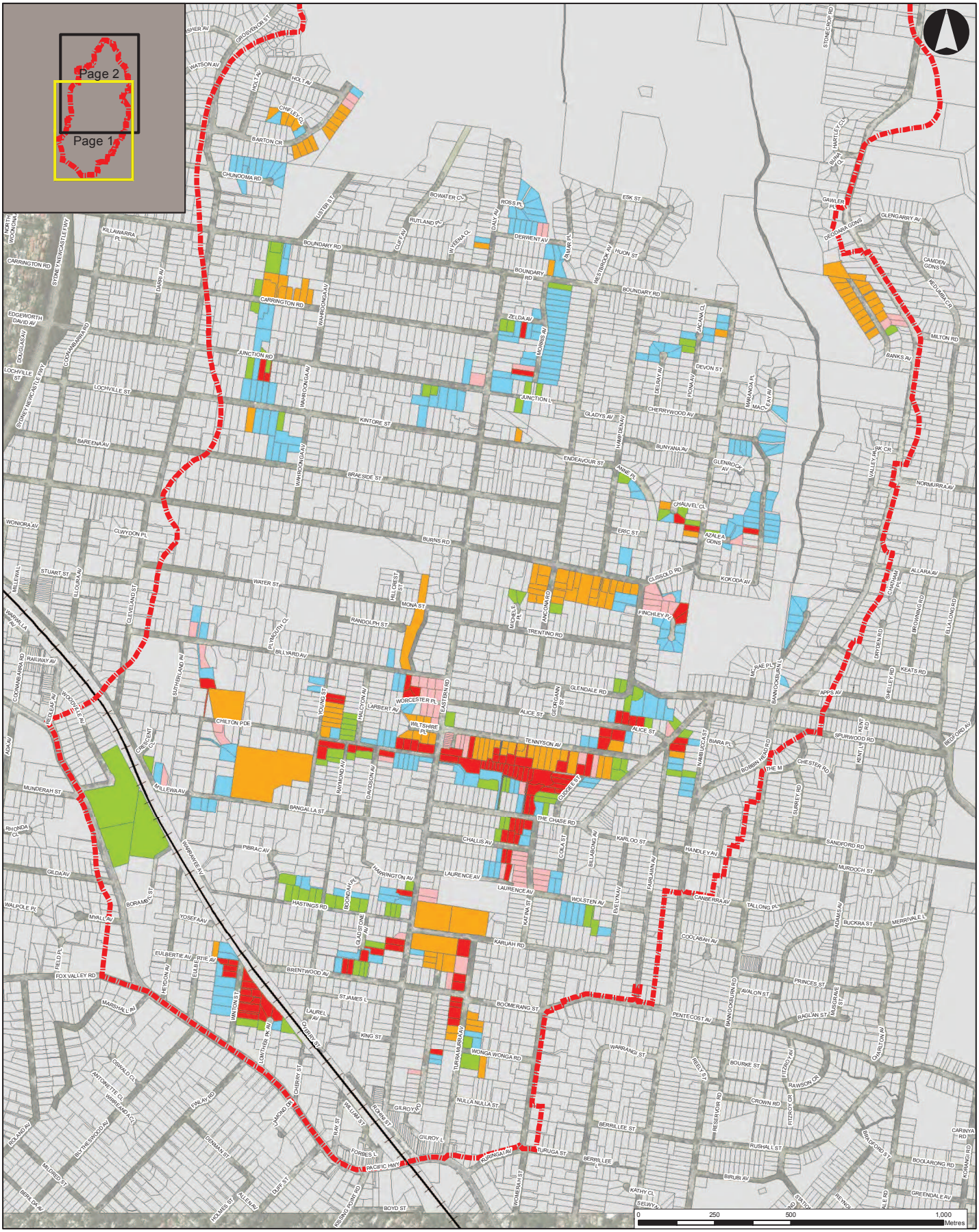

Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response

Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
- Overland Escape Route
- Rising Road Access
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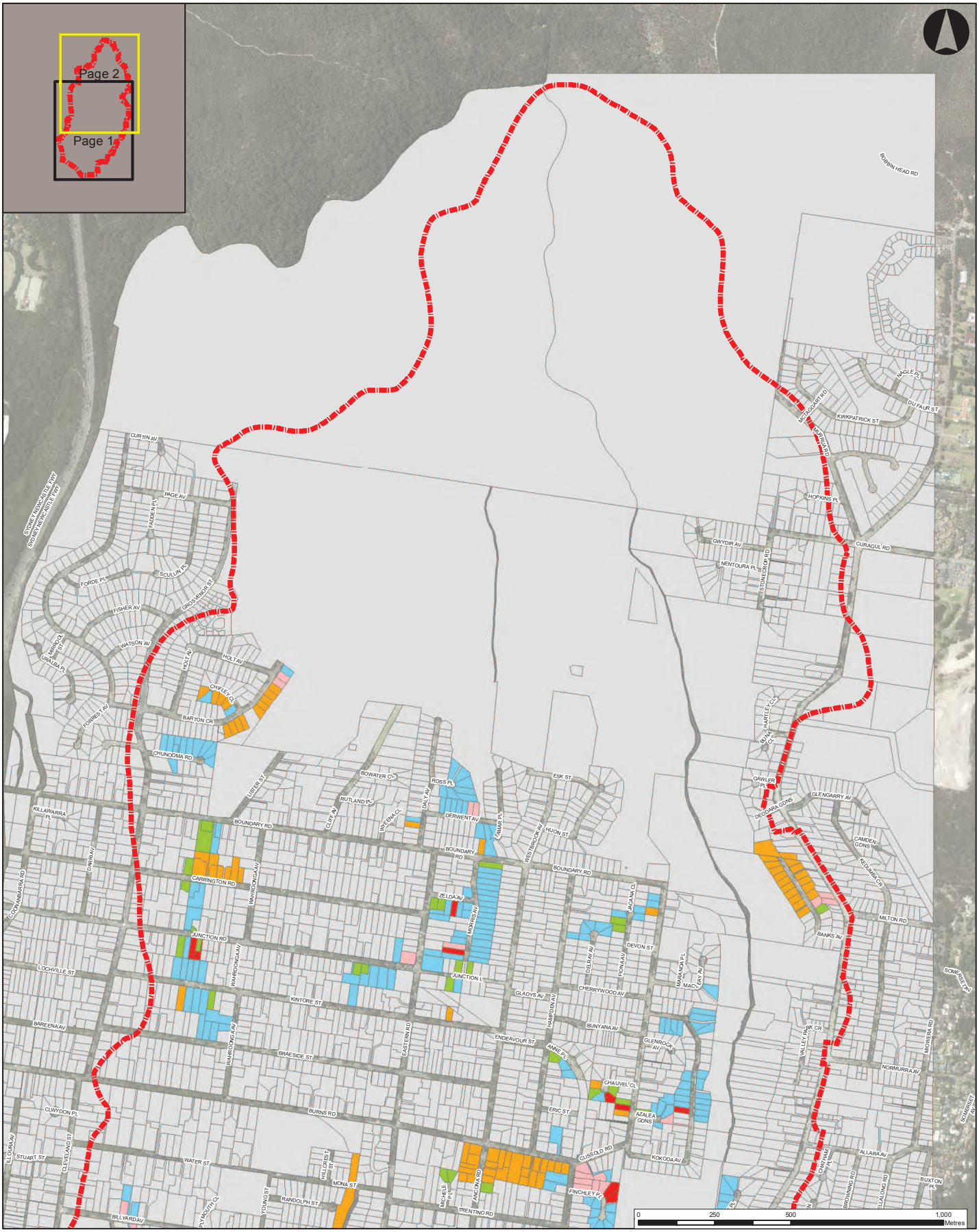
JACOBS

SHEET	Page 1 of 2	GDA 1994 MGA Zone 56	
TITLE	PMF Event Flood Emergency Response Classification of Communities		
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan		
DRAWN	LC	PROJECT # IA159900	MAP # Map D-3
CHECK	AH	DATE 25/01/2019	REV 1 VER 1
			1:12,000 | A3



Legend

- Study area
- Cadastre
- Railway

Flood Emergency Response
Community Classification

- High Flood Island
- Low Flood Island
- High Trapped Perimeter
- Low Trapped Perimeter
- Overland Escape Route
- Rising Road Access
- Indirectly Affected

JACOBS

SHEET	Page 2 of 2	GDA 1994 MGA Zone 56
TITLE	PMF Event Flood Emergency Response Classification of Communities	
PROJECT	Lovers Jump Creek Floodplain Risk Management Study and Plan	
DRAWN LC	PROJECT # IA159900	MAP # Map D-3
CHECK AH	DATE 25/01/2019	REV 1 VER 1
		1:12,000 | A3

Appendix E. Proposed Draft Flood Planning Matrix

Table E-1 Proposed Flood Planning Matrix for Ku-ring-gai – Draft Format

Planning Consideration	Flood Risk Precincts (FRPs) * Refer to available Flood Risk Precinct mapping for spatial applicability of the flood planning controls described below. **Council to be consulted on appropriate flood zoning system for consistency with the flood planning mapping, KDCP, KLEP etc.																							
	Low Flood Risk								**Medium Flood Risk**								**High Flood Risk**							
	Critical Utilities & Uses	Sensitive Uses & Facilities	Subdivision	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Critical Utilities & Uses	Sensitive Uses & Facilities	Subdivision	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Critical Utilities & Uses	Sensitive Uses & Facilities	Subdivision	Residential **	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development
Floor Level		3		2,6,7	5,6,7	2,6,7	1,6	4,7				2,6,7	5,6,7	2,6,7	1,6	4,7							1,6	4,7
Building Components		2		1	1	1	1	1				1	1	1	1	1							1	1
Structural Soundness		3		2	2	2	2	2				2	2	2	2	2							1	1
Flood Effects		2	2	2	2	2	2	2				2	2	2	2	2							1	1
Car Parking and Driveway Access		1,3,5, 6,7		1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,3,4, 6,7	6,7,8				1,3,5, 6,7	1,3,5, 6,7	1,3,5, 6,7	2,3,4, 6,7	6,7,8							2,3,4, 6,7	6,7,8
Evacuation		2,3,4	5	2,3	1 or 2,3	2,3	3,4	2,3				2,3	1 or 2,3	2,3	3,4	2,3							3,4	2,3
Management and Design		4,5	1		2,3,5	2,3,5	2,3,5	2,3,5					2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

Colour Legend — Not relevant — Unsuitable land

** For redevelopment of an existing dwelling refer also to 'Concessional Development' provisions

Refer following pages for notes and conditions.

General Notes

1. *Freeboard* equals an additional height of 300mm in Overland Flood Planning Areas, and an additional height of 500mm in Mainstream Flood Planning Areas.

2. The relevant environmental planning instruments identify development permissible with consent in various zones in the LGA. Refer to Ku-ring-gai Council LEP 2015 and DCP 2016 including future amendments. Notwithstanding, constraints specific to individual sites may preclude Council granting consent to certain forms of development on all or part of a site. This matrix identifies where flood risks are likely to determine where certain development types will be considered “unsuitable” due to flood related risks.

3. Filling of the site, where acceptable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications.

4. Refer to Section xxxx of the KDCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Soundness planning considerations of the applicable land use category.

5. Terms in italics are defined in the glossary of this DCP and Schedule xx in this DCP specifies development types included in each land use category. These development types are generally as defined within Environmental Planning Instruments applying to the LGA.

Floor Level

1. All floor levels to be no lower than the 20 year flood level unless justified by site specific assessment.

2. *Habitable floor* levels to be no lower than the 100 year flood level plus *freeboard*.

3. *Habitable floor* levels to be no lower than the *PMF* level. Non-habitable floor levels to be no lower than the *PMF* level unless justified by a site specific assessment.

4. Floor levels to be no lower than the *design floor level*. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing floor level.

5. The level of *habitable floor areas* to be equal to or greater than the 100 year flood level plus *freeboard*. If this level is impractical for a development in a Business zone, the floor level should be as high as possible.

6. Non-habitable floor levels to be equal to or greater than the 100 year flood level plus *freeboard* where possible, or otherwise no lower than the 20 year flood level unless justified by site specific assessment.

7. A restriction is to be placed on the title of the land, pursuant to S.88 of the Conveyancing Act, where the lowest *habitable floor* level is elevated more than 1.5m above finished ground level, confirming that the undercroft area is not to be enclosed.

Building Components and Method

1. All structures to have flood compatible building components below the 100 year flood level plus *freeboard*.

2. All structures to have flood compatible building components below the *PMF* level.

Structural Soundness

1. 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*, or a *PMF* if required to satisfy evacuation criteria (see below).

2. Applicant to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus *freeboard*, or a *PMF* if required to satisfy evacuation criteria (see below). An engineer's report may be required.

3. Applicant to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a *PMF*. An engineer's report may be required.

Flood Effects

1. Engineer's report required to certify 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 impact of multiple potential developments in the floodplain

2. 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 impact of multiple potential developments in the floodplain. An engineer's report may be required.

Car Parking and Driveway Access

1. The minimum surface level of open car parking spaces or carports shall be as high as practical, and not below: (i) the 20 year flood level; or (ii) the level of the crest of the road at the location where the site has access; (which ever is the lower). In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood level.

2. The minimum surface level of open car parking spaces, carports or garages, shall be as high as practical.

3. 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 equal to or greater than the 100 year flood.

4. The driveway providing access between the road and parking space shall be as high as practical and generally rising in the egress direction.

5. Where the level of the driveway providing access between the road and parking space is lower than 0.3m below the 100 year flood, the following condition must be satisfied. The depth of inundation on the driveway during a 100 year flood shall not be greater than the larger of: (i) the depth at the road; and (ii) 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.

6. *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 level or more than 0.8m below the 100 year flood level, shall have *adequate warning systems, signage and exits*.

7. Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood.

8. Driveway and parking space levels to be no lower than the *design ground/floor levels*. Where this is not practical, a lower level may be considered. In these circumstances, the level is to be as high as practical, and, when undertaking alterations or additions, no lower than the existing level.

Note: (1) A still water flood depth of 0.3m is sufficient to cause a small vehicle to float. (2) *Enclosed car parking* typically refers to carparks in basements.

Evacuation

1. Reliable access for pedestrians or vehicles required during a 100 year flood.

2. Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest *habitable floor* level to an area of refuge above the *PMF level*, or a minimum of 20% of the gross floor area of the building to be above the *PMF level*.

3. The development is to be consistent with any relevant *flood evacuation strategy* or similar plan.

4. The evacuation requirements of the development are to be considered. An engineers report will be required if circumstances are possible where the evacuation of persons might not be achieved within the *effective warning time*.

5. Applicant to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development flowing from the subdivision proposal.

Management and Design

1. Applicant to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.

2. *Site Emergency Response Flood Plan* required where floor levels are below the *design floor level*, (except for single dwelling-houses).

3. Applicant to demonstrate that area is available to store goods above the 100 year flood level plus *freeboard*

4. Applicant to demonstrate that area is available to store goods above the *PMF* level.

5. No storage of materials below the design floor level which may cause pollution or be potentially hazardous during any flood.