

15th March 2018

Level 16,
207 Kent Street,
Sydney,
NSW 2000

For the attention of: - Taya Kirris

Dear Taya,

***Bowral and District Hospital Redevelopment
Flood Analysis***

A State Significant Development Application (SSDA) has been submitted for the redevelopment of Bowral and District Hospital.

Wingecarribee Shire Council have issued a Flood Certificate (File: PN 1704811; FL 18/0010) for the site (Lot 4 DP 858938; 97-103 Bowral St, Bowral) dated 1st March 2018 which is contained with Appendix A of this letter.

As part of the initial site analysis for the Bowral and District Hospital redevelopment, flooding has been considered to mitigate flood risk on site and to ensure no adverse effect was generated by the development on surrounding catchments.

The 2009 Mittagong Creek catchment flood study conducted by Bewsher Consulting Pty Ltd on behalf of Wingecarribee Shire Council models the extent of flooding adjacent to the site.

Figures 1.1 and 1.2 below show that the site is not affected by the 100-year design flood event.

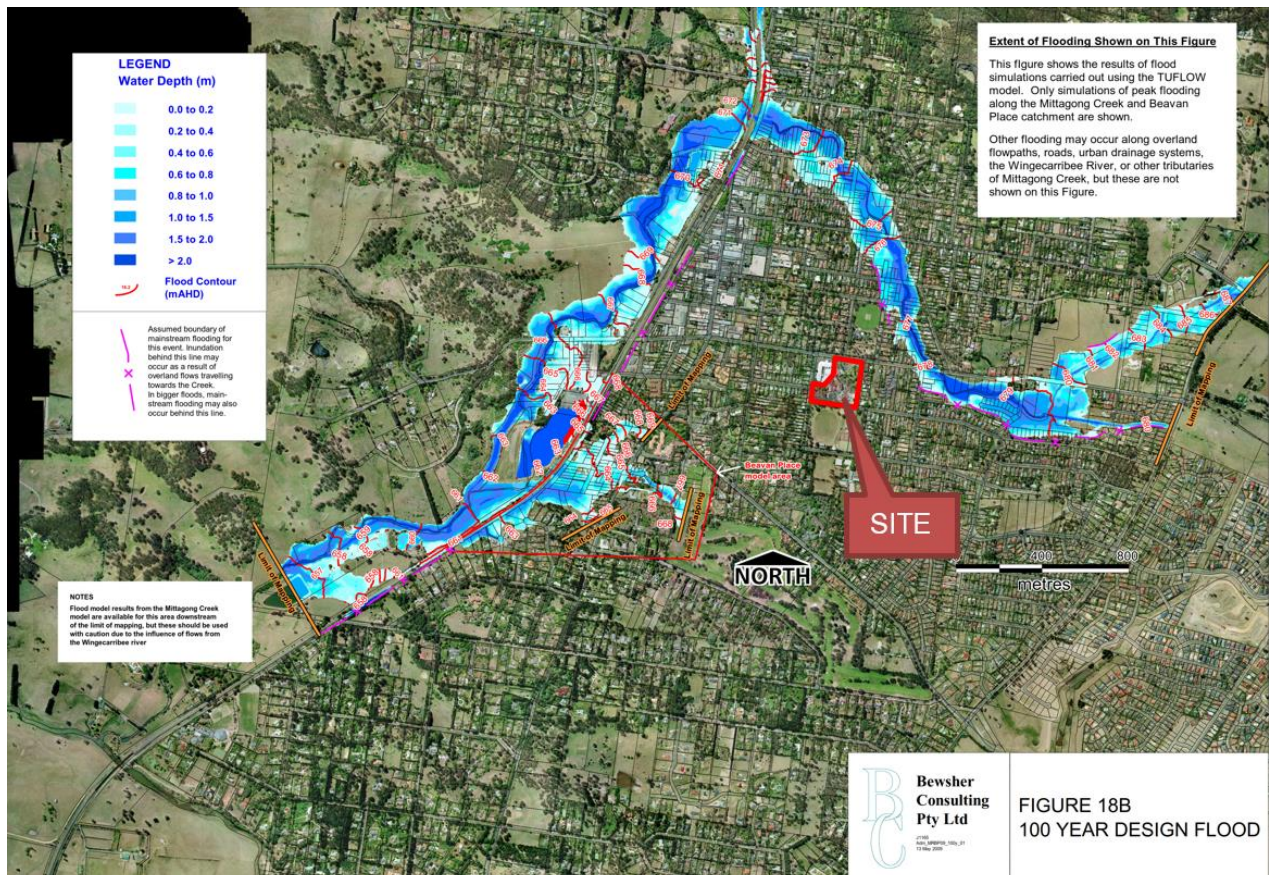


Figure 1.1 – Mittagong Creek 100 Year Design Flood Map (Source: Wingecarribee Shire Council)



Figure 1.2 – Mittagong Creek 100 Year Design Flood Map Extract (Source: Wingecarribee Shire Council)

Figures 2.1 and 2.2 present the extent of flooding produced by the probable maximum flood (PMF) design flood event.

The map shows that the north-east corner of the site is slightly affected by the PMF design flood event.

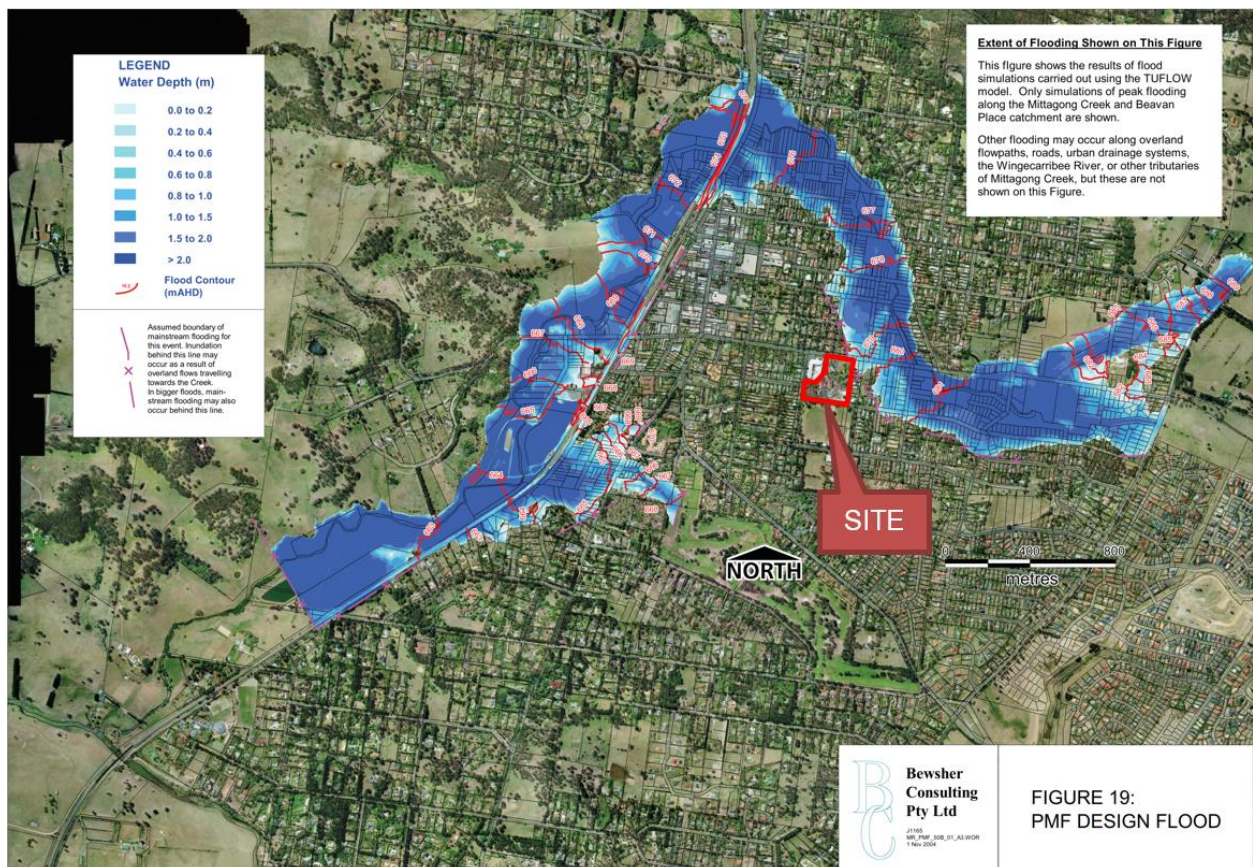


Figure 2.1 – Mittagong Creek PMF Design Flood Map (Source: Wingecarribee Shire Council)

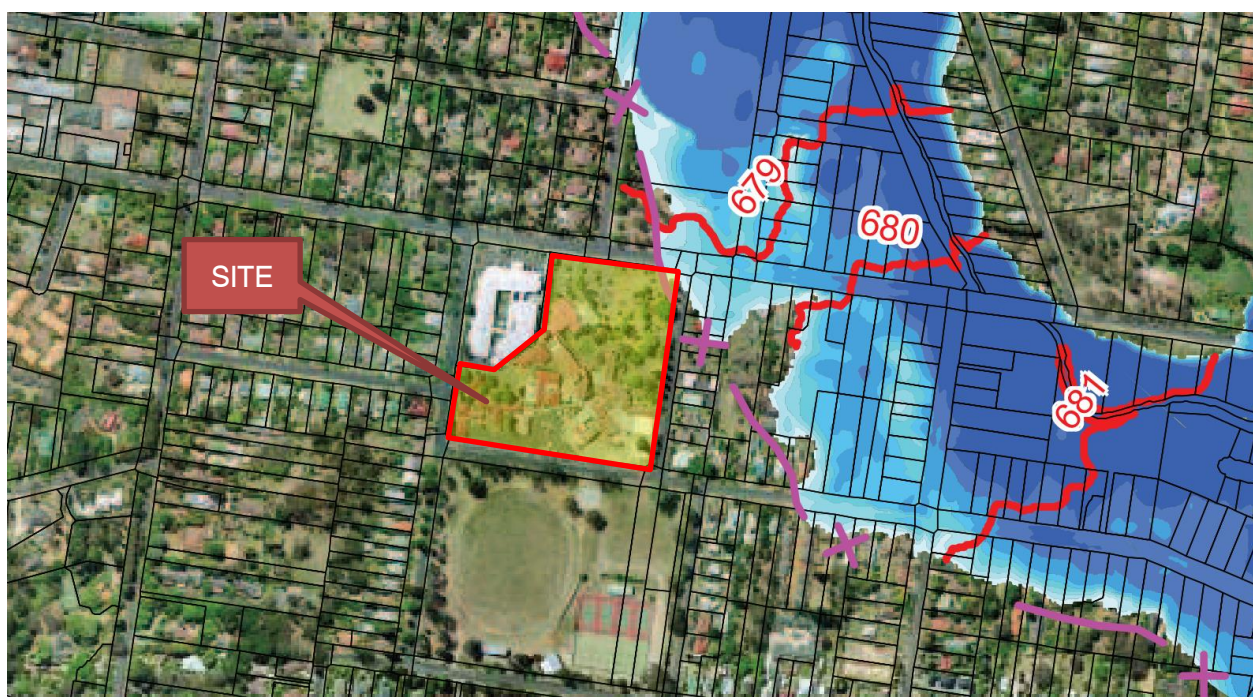


Figure 2.2 – Mittagong Creek PMF Design Flood Map Extract (Source: Wingecarribee Shire Council)

Figure 3 presents the flood risk precincts which have been designated from a combination of the design flood events.

The map shows that a small portion of the north-east corner of the site is classified as a 'Low Flood Risk Precinct'. The classification of a 'Low Flood Risk Precinct' is "Land with a low probability of flooding lying above a level 0.5 m above the 100 year ARI flood and below the probable maximum flood (PMF)".

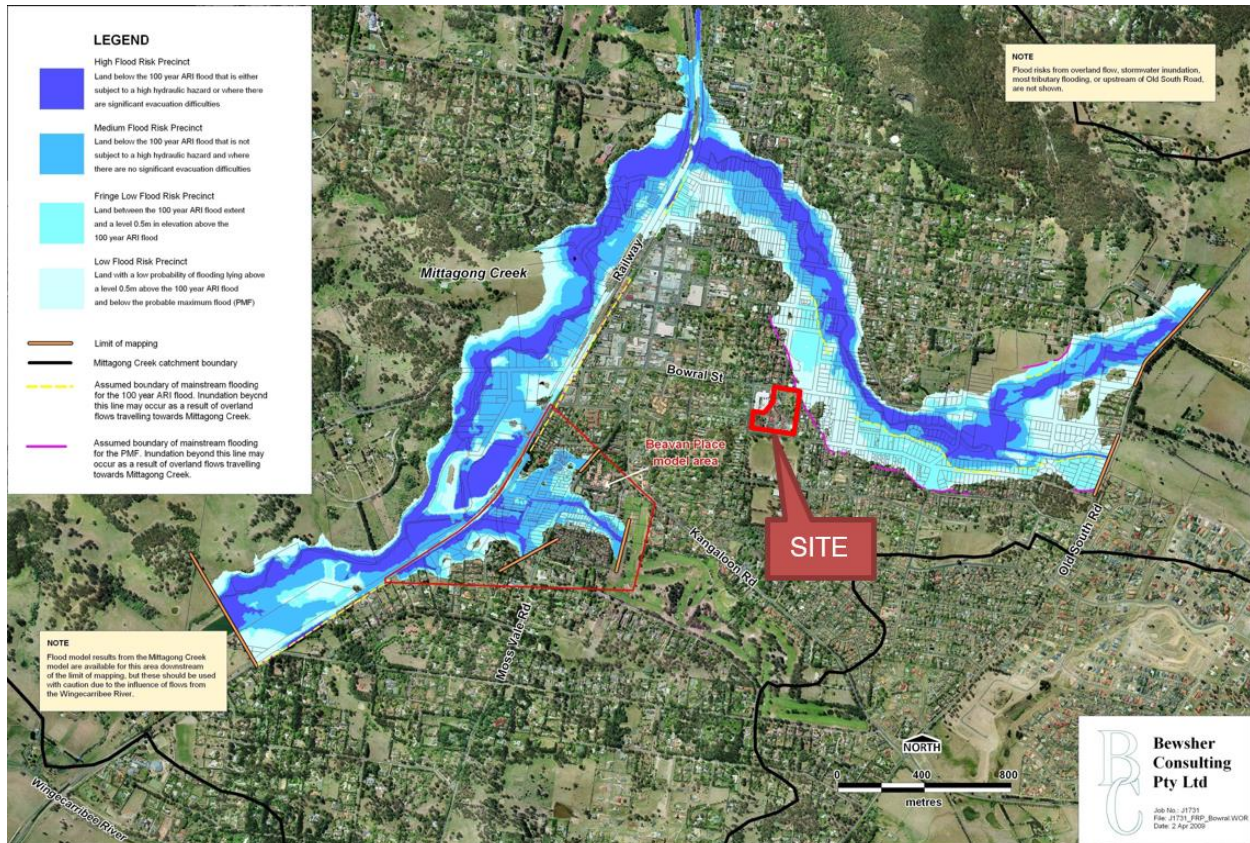


Figure 3.1 – Mittagong Creek Flood Risk Precincts (Source: Wingecarribee Shire Council)



Figure 3.2 – Mittagong Creek Flood Risk Precincts Extract (Source: Wingecarribee Shire Council)

Appendix B contains a site plan of the proposed development produced by MSJ Architects. The site plan shows that the north-east corner of the site which is within the 'Low Flood Risk Precinct' consists of an existing grassed area and vegetation.

To mitigate the risk of flooding on site and to prevent the proposed development from having an adverse effect on surrounding catchments, the 'Low Flood Risk Precinct' area of the site is not to be developed and the existing ground levels are to remain unaltered. Figure 4.1 indicatively shows the extent of flooding during the PMF design flood event in relation to the proposed development.

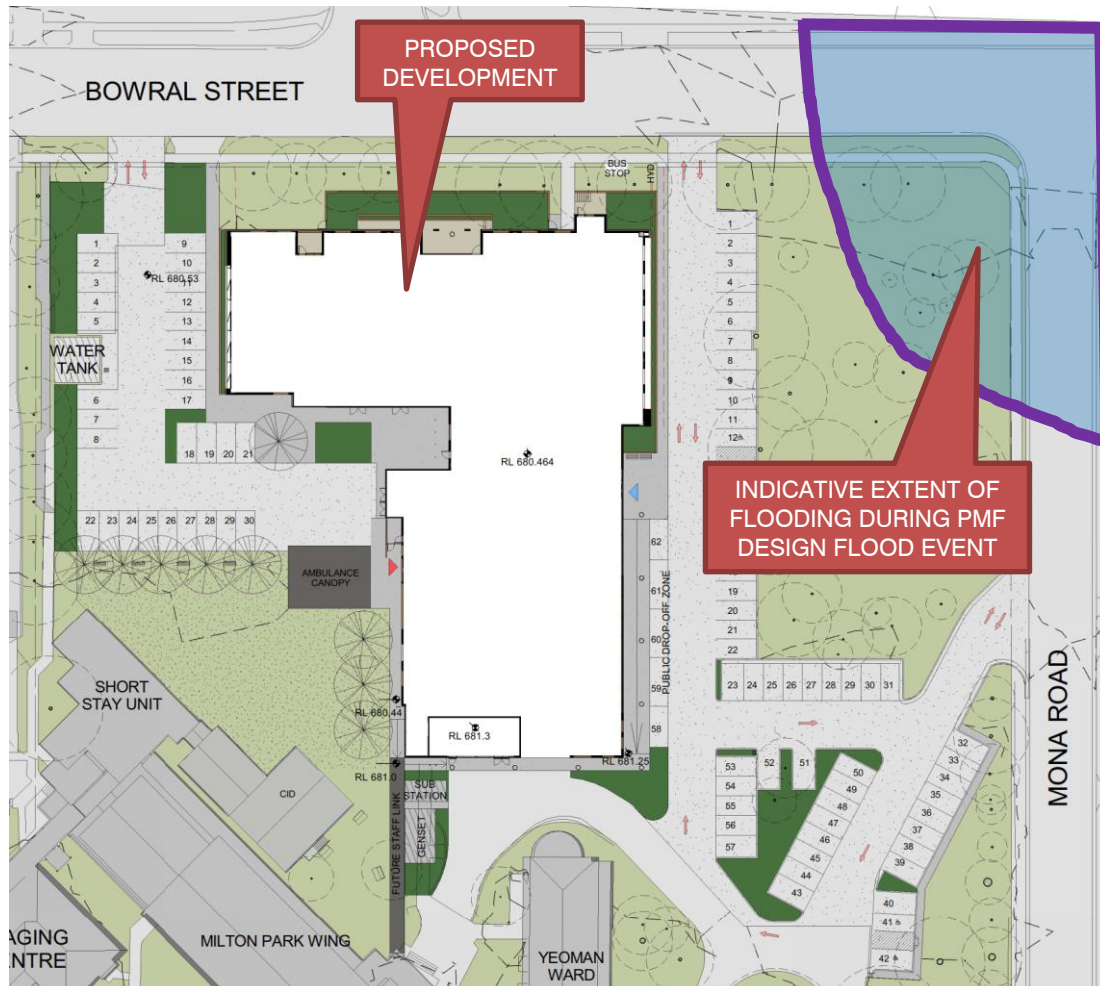


Figure 4.1 – Site Plan Extract with Extent of Flooding During PMF (Source: MSJ Architects)

The plans and scope for the redevelopment have been submitted within the SSDA application and have been reviewed.

The proposed hospital floor level is to be set above the adjacent PMF flood level of 679.30 mAHD. The proposed development will therefore not be impacted by any potential flood risk and will not have an adverse effect on any surrounding areas.

Yours Sincerely,

for
enstruct group pty ltd

William Wright
Senior Engineer

APPENDIX A – COUNCIL FLOOD CERTIFICATE

Wingecarribee Shire Council

Flood Certificate

Certificate Issued for Property: **Lot 4 DP 858938**
97-103 Bowral St Bowral

Requested By: **TSA Management**
Level 15, 207 Kent St Sydney NSW 2000

Bewsher Consulting were engaged by Council to prepare the Bowral Floodplain Risk Management Study and Plan. This plan is dated April 2009 and was adopted by Council in May 2009. The April 2009 study is the latest information that Council has to guide development in the Bowral Floodplain.

Any information regarding flooding in Bowral is provided in good faith but on the basis that the Council of the Shire of Wingecarribee, its agents or employees are not liable to any person for any damage or loss which has occurred or may occur in relation to the person taking or not taking action in respect of the information.

1. Classification of Flood Risk

Council records indicate that the above property is located within the Bowral Floodplain and identified as being **partially within a low flood risk precinct**.

Land that is potentially subject to inundation is classified as low, fringe low, medium and/or high flood risk (refer attached Frequently Asked Questions). Council has prepared a development control plan known as "Managing our Flood Risk" that provides details of flood related development controls that may be applicable. This Development Control Plan will be reviewed.

2. Estimated Flood Levels: Not flooded in a 1% AEP (100 year ARI) event as shown below:



Notes

- Plan NOT TO SCALE
- Aerial Photograph flown **2002**
- 100 year ARI flood levels may vary across a site.
- 100 year ARI flood contours (white) are shown at 0.1metre height interval and to Australian Height Datum
- 100 year ARI flood contours are labelled with heights every 0.2 metre height interval
- Council no longer provides floor level information. The applicant is advised to engage a registered surveyor to determine floor levels.

Sha Prodhan
Floodplain & Stormwater Engineer
1 March 2018



Bowral Floodplain Risk Management Study and Plan

FREQUENTLY ASKED QUESTIONS

Why do flood levels change over time?

There is a chance that floods of various magnitudes will occur in the future. As the size of a flood increases, the chance that it will occur becomes rarer. Because some of these rare floods have never been experienced since European settlement, the height of future floodwaters is normally predicted using computer models. These computer models simulate flood levels and velocities for a range of flood sizes and flood probabilities. Given the importance of estimating flood levels accurately, Councils and the Office of Environment & Heritage engage experts to establish and operate the computer models.

From time to time the computer models are revised and predicted flood levels can change. The resultant change in flood levels however is normally very small. The reasons why the computer models are revised can include:

- ▶ New rainfall or ground topography information becomes available
- ▶ New floods occur which provide additional data from which to fine-tune the models
- ▶ Better computer models become available as the science of flood modelling improves and computer capabilities increase or
- ▶ Flood mitigation works may have been carried out, or development within the catchment may have occurred, that was not previously simulated in the models.

How are these studies funded?

Flood studies and floodplain risk management studies are often carried out under NSW State Government guidelines and are funded on a 1:1:1 basis between the Federal and State Governments and Councils. This funding arrangement is also available for the construction of flood mitigation works.

My property is in a Low Flood Risk Precinct. What does this mean?

The classification of a 'Low Flood Risk Precinct' can differ slightly between Councils. Generally it means that your property would not be inundated in a 100 year flood but still has a very slight chance of inundation from larger (i.e. rarer) floods.

If you are a residential property owner, there will be virtually no change to how you may develop your property. However, there may be controls on the location of critical infrastructure or vulnerable development such as hospitals, evacuation centres, nursing homes and emergency services.

My property is in a Fringe Low Flood Risk Precinct. What does this mean?

The 'Fringe Low Flood Risk Precinct' refers to land that is above the height of the 100 year flood level but not more than 0.5m above it. In this area you are just above the reach of the 100 year flood level but still within the freeboard of 0.5m which Council normally includes when setting minimum floor levels for flood prone properties.

My property is in a Medium Flood Risk Precinct. What does this mean?

The classification of a 'Medium Flood Risk Precinct' can differ slightly between Councils. Generally it means that your property is inundated in a 100 year flood, however conditions are not likely to be hazardous during such a flood. If you are a residential property owner development controls will probably be similar to those that currently exist.

My property is in a High Flood Risk Precinct. What does this mean?

The classification of a 'High Flood Risk Precinct' can differ slightly between Councils. Generally it means that your property will be inundated in a 100 year flood and that hazardous conditions may occur. This could mean that there would be a possible danger to personal safety, able bodied adults may have difficulty wading to safety, evacuation by trucks may be difficult, or there may be a potential for significant structural damage to buildings. This is an area of higher hazard where stricter controls may be applied.

Will my property value be altered if I am in a Flood Risk Precinct?

Any change in a Council's classification of properties can have some impact on property values. Nevertheless, Councils normally give due consideration to such impacts before introducing a system of flood risk classifications or any other classification system (e.g. bushfire risks, acid sulphate soil risk, etc). If your property is now classified as being in a Flood Risk Precinct, the real flood risks on your property have not changed, only its classification has altered. A prospective purchaser of your property could have previously discovered this risk if they had made enquiries themselves.

If you are in a Low Flood Risk Precinct, generally there will be no controls on normal residential type development. Previous valuation studies have shown that under these circumstances, your property values will not alter significantly over the long term. Certainly, when a new system of classifying flood risks is introduced, there may be some short-term effect, particularly if the development implications of the precinct classification are not understood properly. This should only be a short-term effect however until the property market understands that over the long term, the Low Flood Risk Precinct classification will not change the way you use or develop your property.

Ultimately, however, the market determines the value of any residential property. Individual owners should seek their own valuation advice if they are concerned that the flood risk precinct categorisation may influence their property value.

My property was never classified as 'flood prone' or 'flood liable' before. Now it is in a Low Flood Risk Precinct. Why?

The State Government changed the meaning of the terms 'flood prone', 'flood liable' and 'floodplain' in 2001. Prior to this time, these terms generally related to land below the 100 year flood level. Now it is different. These terms now relate to all land that could possibly be inundated, up to an extreme flood known as the probable maximum flood (PMF). This is a very rare flood.

The reason the Government changed the definition of these terms was because there was always some land above the 100 year flood level that was at risk of being inundated in rarer and more extreme flood events. History has shown that these rarer flood events can and do happen (e.g. the 1990 flood in Nyngan, the 1996 flood in Coffs Harbour, the 1998 flood in Katherine, the 2002 floods in Europe, etc.).

Will I be able to get house and contents insurance if my house is in a Flood Risk Precinct?

In contrast to the USA and many European countries, flood insurance is generally not available for residential property in Australia. Following the disastrous floods in Coffs Harbour in November 1996 and in Wollongong in August 1998, some insurance companies are now offering very limited flood cover. The most likely situation is that your insurer does not offer you flood cover. If limited flood cover is offered, the classification of your property within a Flood Risk Precinct is unlikely to alter the availability of cover. Obviously insurance policies and conditions may change over time or between insurance companies, and you should confirm the specific details of your situation with your insurer.

There is some movement in this field of insurance, for example, since 1 July 2008, at least one insurance company offers that all current home and contents insurance policies will cover all types of flood caused by rain.

Will I be able to get a home loan if my land is in a Flood Risk Precinct?

Most banks and lending institutions do not account for flood risks when assessing home loan applications unless there is a very significant risk of flooding at your property. The system of Flood Risk Precinct classification will make clear to all concerned, the nature of the flood risks.

Under the previous system, if a prospective lending authority made appropriate enquiries, they would have identified the nature of the flood risk and considered it during assessment of home loan applications. As a result, it is not likely that the classification of your property within a Flood Risk Precinct will alter your ability to obtain a home loan. Nevertheless, property owners who are concerned about their ability to obtain a loan should clarify the situation with their own lending authority.

How have the flood risk maps been prepared?

Because some large and rare floods have often not been experienced since European settlement commenced, computer models are used to simulate the depths and velocities of major floods. These computer models are normally established and operated by flooding experts employed by local and state government authorities. Because of the critical importance of the flood level estimates produced by the models, such modelling is subjected to very close scrutiny before flood information is formally adopted by a Council. Maps of flood risks (e.g. 'Low', 'Fringe low', 'Medium' and 'High') are prepared after consideration of such issues as:

- ▶ Flood levels and velocities for a range of possible floods
- ▶ Ground levels
- ▶ Flood warning time and duration of flooding
- ▶ Suitability of evacuation and access routes and
- ▶ Emergency management during major floods.

What is the probable maximum flood (PMF)?

The PMF is the largest flood that could possibly occur. It is a very rare and improbable flood. Despite this, a number of historical floods in Australia have approached the magnitude of a PMF. Every property potentially inundated by a PMF will have some flood risk, even if it is very small. Under the State Government changes implemented during 2001, Councils must now consider all flood risks, even these potentially small ones, when managing floodplains. As part of the State Government changes, the definitions of the terms 'flood liable', 'flood prone' and 'floodplain' have been changed to refer to land inundated by the PMF.

What is the 100 year flood?

A 100 year flood is the flood that will occur or be exceeded on average once every 100 years. It has a probability of 1% of occurring in any given year. If your area has had a 100 year flood, it is a fallacy to think you will need to wait another 99 years before the next flood arrives. Floods do not happen like that. Some parts of Australia have received a couple of 100 year floods in one decade. On average, if you live to be 70 years old, you have a better than even chance of experiencing a 100 year flood.

Why do Councils prepare floodplain management studies and plans?

Under NSW legislation, Councils have the primary responsibility for management of development within floodplains. To appropriately manage development, Councils need a strategic plan which considers the potential flood risks and balances these against the beneficial use of the floodplain by development. To do this, Councils have to consider a range of environmental, social, economic, financial and engineering issues. This is what happens in a floodplain management study. The outcome of the study is the floodplain management plan, which details how best to manage flood risks in the floodplain for the foreseeable future.

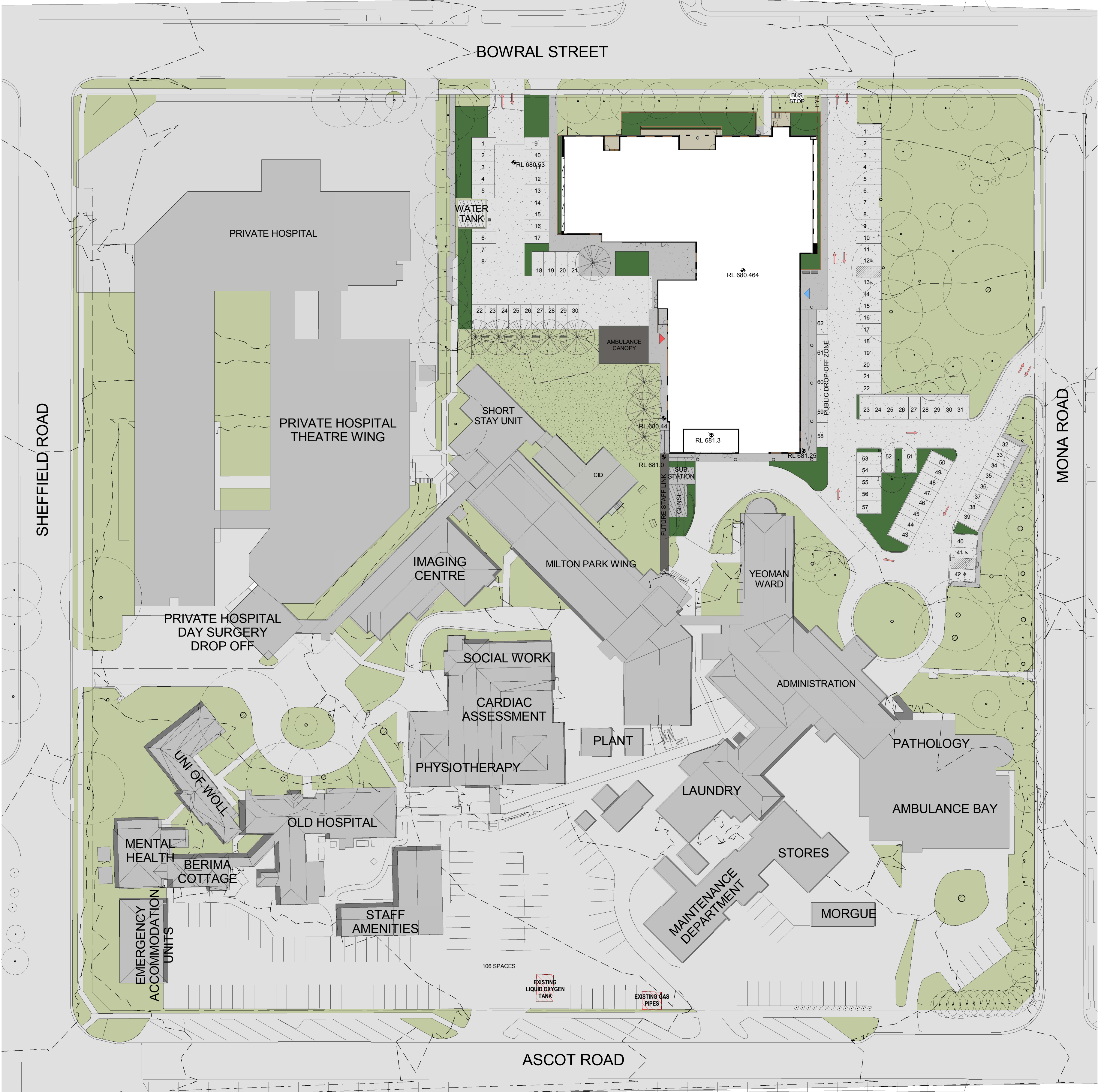
Floodplain management plans normally comprise a range of works and measures such as:

- ▶ Improvements to flood warning and emergency management
- ▶ Works (e.g. levees or detention basins) to protect existing development
- ▶ Voluntary purchase or house-raising of severely flood-affected houses
- ▶ Planning and building controls to ensure future development is compatible with the flood risks and
- ▶ Measures to raise the community's awareness of flooding so that they are better able to deal with the flood risks they face.

Will the Flood Risk Precinct maps be changed?

Yes. All mapping undertaken by Council is subjected to ongoing review. As these reviews take place, it is conceivable that changes to the mapping will occur, particularly if new flood level information or ground topography information becomes available. However, this is not expected to occur very often and the intervals between revisions to the maps would normally be many years. Many Councils have a policy of reviewing and updating floodplain management studies and plans about every five years. This is the likely frequency at which the maps may be amended.

APPENDIX B – MAIN BUILDING SITE PLAN STAGE 3



SITE LEGEND	
	EXISTING CONTOUR
	NEW SPOT LEVEL
	RL 000.000
	NEW DRIVEWAY
	EXISTING DRIVEWAY
	NEW CONCRETE PATH
	NEW LAWN TO MATCH EXISTING
	EXISTING LAWN
	NEW LANDSCAPE PLANTING
	EXISTING TREE
	NEW TREE

MW SITE LEGEND
1:200

AMENDMENTS			
NO.	DATE	SUBJECT	ACTION
1	10/11/17	FOR REVIEW	AC
2	10/11/17	DRAW TO REPORT	AC
3	10/11/17	FOR REPORT	AC



PROJECT

BOWRAL & DISTRICT HOSPITAL REDEVELOPMENT

97-103 BOWRAL ST.,
BOWRAL NSW 2576

DRAWING NUMBER
130443-MSJ-AR-DWG-MW01011

DRAWING NAME
MAIN BUILDING SITE PLAN - STAGE 3

REV

3

0m 10m 20m 30m 40m 50m
SCALE 1:500 @ B1

ISSUE DATE

12/01/18