

Preliminary Flood Assessment Report

Wyong Hospital

Prepared for Colliers / 4 August 2023

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1.0 Introduction

This flood report has been prepared to accompany a Review of Environmental Factors (REF) to assess the local flood conditions and impact of the proposed works for Wyong Hospital Redevelopment Stage 3.

1.1 The site

The development site is part of the existing grounds of Wyong Hospital. The site is approximately rectangular with an east-west longitudinal aspect. The site is zoned SP2 infrastructure on Wyong Council's LEP. The site is bounded by residential areas to the north and west, with bushland to the south. To the east and south, the site is bounded by the Pacific Highway (refer to figure 1).



Figure 1 Site Location

The Wyong Hospital site is approximately 200,000m² (20ha). The topography of the site naturally falls towards two existing creeks; one located in the northeast of the site, and the other located at the south west boundary of the site (refer to Figure 3). Both creeks are tributaries of Porters Creek. An existing channel runs along the southern boundary and into an existing detention basin before connecting to the existing creek at the southwest corner of the site. Figure 2 shows the location of the works, viewed from the north.



Figure 2 Site Location viewed from the north

1.2 Relevant Documents

- Central Coast LEP 2022
- Central Coast Development Control Plan, 2022
- Porters Creek Floodplain Risk Management Study 2011
- Porters Creek Flood Study 2009
- Considering Flooding in Land Use Planning Guideline DPE 2021

2.0 Proposed Development

The Wyong Hospital Redevelopment Stage 3 Refurbishment works comprises adaptive reuse of the existing decanted spaces within both blocks B and C.

Block B will be refurbished to accommodate the following departments:

- Nunyara Aboriginal Health Unit
- Wyong Women's Centre Clinics
- Medical Staff Workspace
- New South Wales Health Pathology

Block C will be refurbished to accommodate the following departments:

- Expanded Cancer Day Unit
- Career Support Unit

The proposed works do not include changing any existing entrances, or any internal levels in the building. The works are all internal, apart from some demolition to the west of the site, where building is to be replaced with pavement. The location of the proposed works is shown in figure below:



Figure 3 Proposed Works

3.0 Flood Planning Requirements

3.1 Requirements of the DCP

The proposed development is for an adaptive reuse of the existing buildings. The objectives of the DCP are to minimise the flood risk to life and property associated with the use of land, to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change, to avoid adverse or cumulative impacts on flood behaviour and the environment, and to enable the safe occupation and efficient evacuation of people in the event of a flood.

The Prescriptive Provisions shown in table 1 below indicate where flood related development controls:

- can be met through the implementation of provisions as indicated (yellow and numbered);
- are not required (shown in green)
- in the view of Council, cannot be met with reasonable development controls and will require further justification.

Proposed Land use	Precinct 1 FPL to PMF	Precinct 2 Below FPL	Precinct 3 Flood Storage and Flow Paths (up to 10% AEP)	Precinct 4 High Hazard (up to 50% AEP)			
1 Single Dwelling Houses		1, 9	2, 5, 7				
2 Agriculture & Recreation		2	2, 5, 7				
3 Sheds / Garages / ancillary Residential		1	2, 5, 7				
4 Commercial and Industrial Uses		2, 6					
5 Medium to High Density Residential							
6 Critical or Sensitive Facilities	3						
7 Land Subdivision	4						
8 Tourist Development							
9 Caravan parks - short-term sites		6	5, 6				
10 Permissible Earthworks		8					
Flood related development controls do not apply							
Flood related development controls apply (refer to numbered prescriptive criteria below)							

If the proposal is to be pursued further, a performance based assessment is to be provided demonstrating that the proposed development is compatible with the flooding characteristics of the site (refer to Section 3.2 and Appendix C).

Table 1Prescriptive Criteria

It is clear that if the proposed works are within the PMF then flood related development controls will apply. This would require a joint report by a professional engineer who specialises in floodplain management and a professional engineer who specialises in civil engineering to certify that the development provides:

(a) Minimum floor levels = PMF level plus mine subsidence allowance, if applicable.

(b) Low flood hazard access and egress for pedestrians during a PMF flood to an appropriate area of refuge located above the PMF.

(c) Low flood hazard emergency vehicle road access (Ambulance, SES, RFS) during a PMF flood event.

(d) Consideration of the impacts of climate change.

The next section will consider whether the proposed works fall within the PMF.

4.0 Existing Flood Conditions

4.1 PMF Flood Extent

The Probable Maximum Flood (PMF) is the largest flood that could conceivably occur at a particular location. It is an extreme event with an estimated Annual Exceedance Probability of at least 1 in 10,000. Council's floodmaps show that the proposed works lie outside the PMF flood extent and the Flood Planning Area (FPA 1% AEP + 500mm).



Figure 4 PMF flood extents

4.2 Flood Planning Level Results



Figure 5 Flood Planning Area



Figure 6 Proposed works and PMF/Flood Planning Area

In figure 6 it can be seen that the proposed works (shaded in yellow) lie outside the PMF and the FPA. The flood mapping is taken from the Council website and based upon the Porters Creek Flood Study 2009.

5.0 **Previous Flood Studies**

A flood study of the entire Porters Creek catchment was undertaken by Willing and Partners in 1990. The model comprised a RAFTS hydrologic model of the entire catchment, with hydraulic routing using the steady state HEC-2 model (for channel reaches) and a quasi-2D model (for the Porters Creek Wetland region). The investigation showed that the maximum flood levels in the Warnervale region were produced by a 2 hour storm event, and were independent of Wyong River tailwater levels, and that flooding in Porters Creek Wetland was affected by both local runoff and by backwater from the Wyong River.

The study was repeated in 2009. The model comprised a RAFTS hydrologic model of the entire catchment, with a hydraulic TUFLOW model including input hydrographs from the RAFTS model. The changes in the catchment topography were included in the TUFLOW model by creation of a terrain model using aerial laser survey data. The flood modelling results from this study were calibrated to achieve similar levels to previous studies in the catchment and to the observed flood levels. It was confirmed in this study that the flood behaviour in the catchment is influenced by inundation of the Porters Creek wetland arriving from Wyong River. As the floodplain has extensive areas of very flat land bounded by steeper slopes, there are only minor variations in flood extent across a range of design storm events. The topography influences the critical event duration where 2 hour design storm duration generally produces peak flows for the upper tributary creek and a 9 hour duration producing the peak for Porters Creek Wetland.

Cardno completed an addendum to the 2009 Flood Study as part of the Flood Plain Risk Management Study. This was achieved by updating the hydrology, roughness, terrain and hydraulic structures according to reflect recent conditions. The grid size was revised to model areas outside of the floodway in greater detail than the 15m grid size. As such the area to the east of the railway was allocated a 5m grid and the area to the west of the railway a 15m grid.

Results were generated for the full range of design storm events together with a climate change assessment that included a 30% increase in rainfall intensity on the 1% AEP. The 2009 flood study and results from the 2010 flood study addendum formed the basis for the Flood Risk Management Study and Plan documented previously. There have been no further changes to the model since this report was issued in 2011.

6.0 Conclusion

This flood report has been prepared to accompany a Review of Environmental Factors (REF) to assess the local flood conditions and impact of the proposed works for Wyong Hospital Redevelopment Stage 3. The Wyong Hospital Redevelopment Stage 3 Refurbishment works comprise adaptive reuse of the existing decanted spaces within both blocks B and C. It is evident from figure 6 that the proposed works lie outside the PMF, and outside the Flood Planning Area. Therefore no flood controls should apply.

No details are available of the location of temporary works, and care should be taken to locate these outside the floodzone. It should also be noted that the flood study on which the flood mapping is based has not been updated since 2011.

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