Flood Impact Assessment

Conder Street Urban Park

Prepared for Burwood Tower Holdings Pty Ltd / 10 February 2023

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Contents

1.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by Burwood Tower Holdings Pty Ltd to prepare a Flood Impact Assessment Report for the proposed Conder Street Urban Park development in Burwood. This Flood Impact Assessment has been prepared to comply with Burwood Council's Development Control Plan and Local Environmental Plan.

1.1 Site

The development site is located at 4 Conder Street in Burwood. The site is shown in Figure 1 and currently serves as a carpark. It is surrounded by Conder Street to the west, Railway Parade to the north, Burwood Library to the south, and the Burwood Place development site to the east, which will be the largest mixed-use complex in Burwood. The site is a mixed-use development on land zoned for Mixed Use Development (B4) under the Burwood Local Environmental Plan 2012. The site is shown in Figure 1.

Figure 1 - Site Location Plan

The land generally falls north towards the railway line with a low point located near the northwest of the Site. The site falls from a reduced level (RL) of 23.14m at the southern centre of the site to an RL of 19.47m at the northeast of the site.

1.2 Reference Documents

- Burwood Council Development Control Plan 2013 – Amended June 2018
- Burwood Council Stormwater Management Code 2004
- Burwood Council Local Environmental Plan 2012
- Architectural Drawings prepared by Chrofi Dated June 2022
- Survey by LTS LOCKLEY Dated August 2015
- Floodplain Development Manual, NSW Government 2005
- Exile Bay, St Lukes and William Street Flood Study (WMA Water, March 2017)

2.0 Proposed Development

The proposed development will include an urban park featuring a public plaza, waterplay features and landscaping including a sloping green lawn area and bosque. It also includes a new multi-purpose community and cultural centre with facilities to accommodate a wide range of communal, cultural, and recreational events, such as performance areas, rehearsal areas and underground public parking.

Figure 2 - 3D Visualisation (Source: Chrofi)

3.0 Existing Flood Conditions

3.1 Existing Flood Study

The Exile Bay, St Lukes and William Street Flood Study (WMA Water, 2017) was completed for Burwood Council. This flood study and report confirms that the development site is located within the St Lukes Catchment.

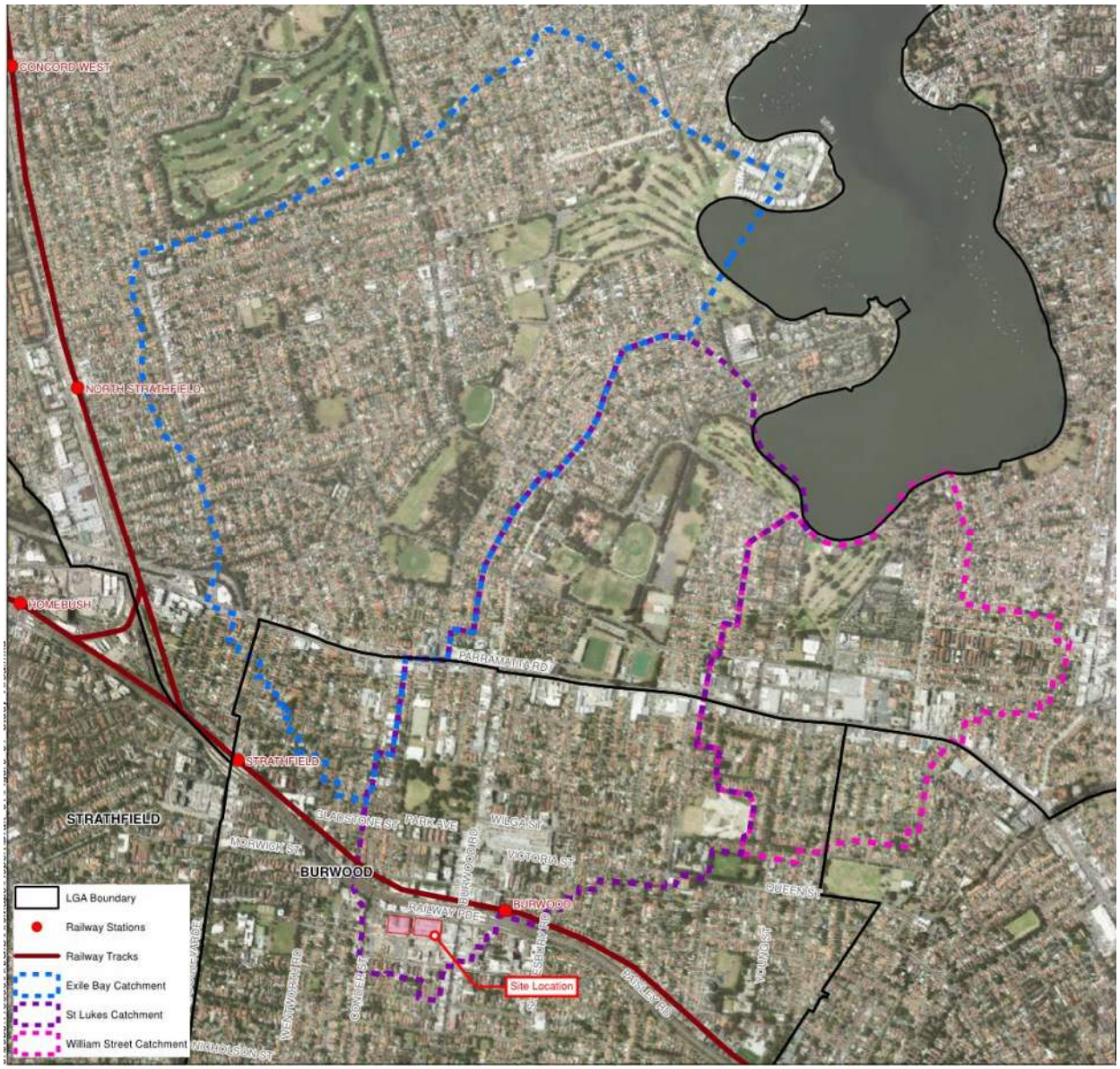

Figure 3 - Extract of Catchment Plan from Figure 1 of Exile Bay, St Lukes and William Street Flood Study (Source: WMA)

The WMA flood study indicates that the development site is affected by shallow (0 - 0.15m) flooding along Conder Street and Railway Parade in the 1% AEP, as shown in figure 4 below. Overland flow travels towards Railway Parade from Wynne Avenue and Conder Street. The existing buildings on the north side of Railway Avenue and the railway embankment beyond prevent overland flows from continuing north. It should be noted that the flood study does not include major stormwater and flood storage upgrades that were completed as part of the 1 Railway Parade Development.

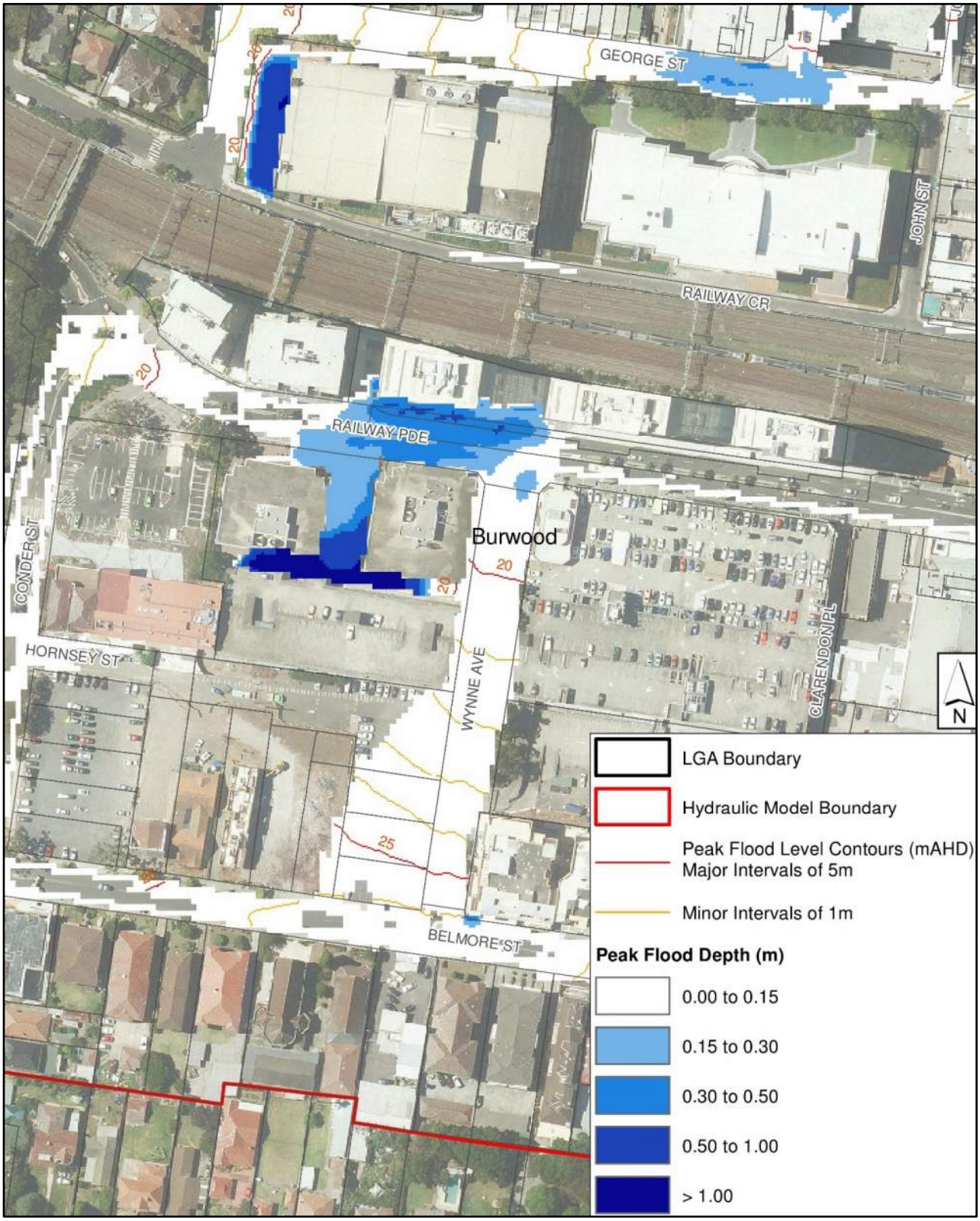

Figure 4 - Extract of 1% AEP Flooding from Figure B15 of Exile Bay, St Lukes and William Street Flood Study (Source: WMA)

3.2 Hydraulic Model Development

TUFLOW software was used to develop a dynamic 1d/2d hydraulic model as part of the study. A time step of 1 second and a grid size of 2 metre were adopted for the 2d domain and was considered to provide a good balance between accuracy and simulation time.

Elevations were assigned to grid cells within the TUFLOW model based on the elevations derived from LiDAR data with 1m resolution and more detailed topographical survey information used in and around the development site. The approved development at 42-60 Railway Parade, Burwood known as “Burwood Place” adjacent to the site has been included in the model.

3.3 Existing 1% AEP Event Results

The TUFLOW model results for the 1% Annual Exceedance Probability (AEP) storm event are shown in Figure 5 below.

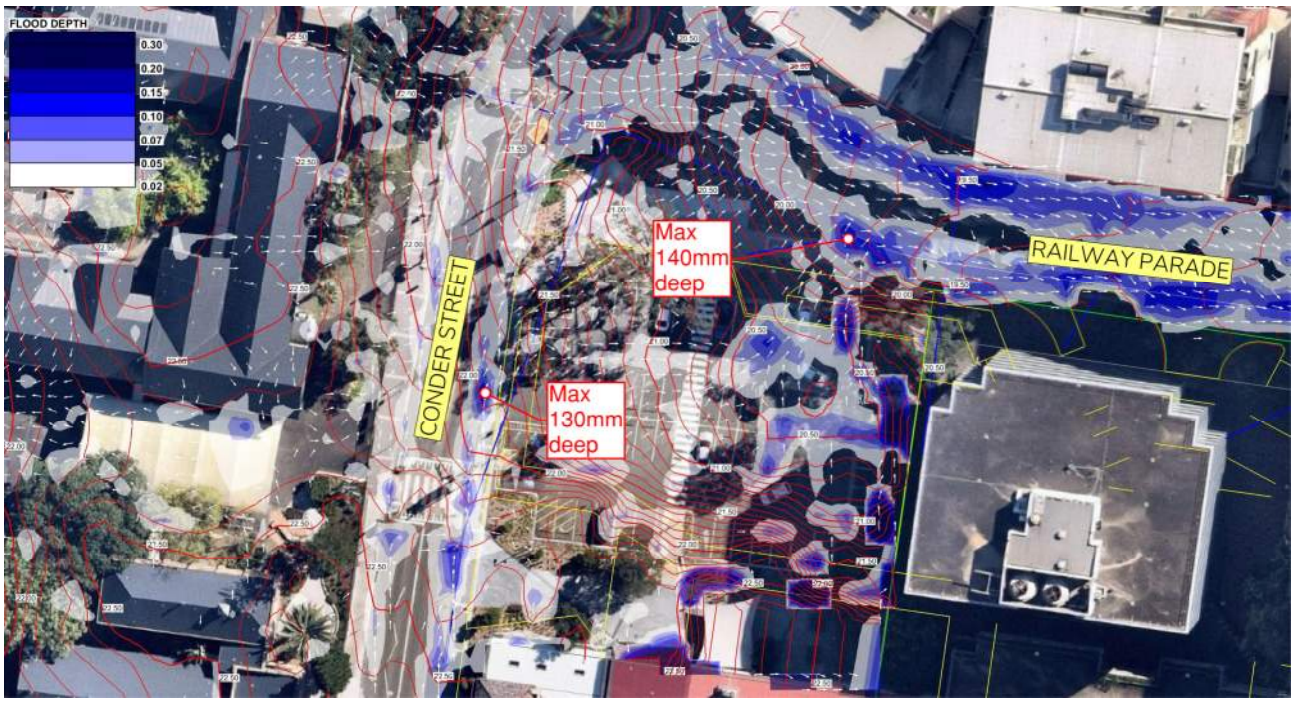

Figure 5 - Existing 1% AEP Flood Levels and Depths

As shown, flood depths are generally shallow in the 1% AEP event, ranging from 0.020m to 0.140m in depth along Conder Street and Railway Parade. The maximum depth of 140mm is along Railway Parade to the north east of the site boundary. The maximum depth along Conder Street is 130mm.

3.4 Existing PMF Event Results

The Probable Maximum Flood (PMF) event was simulated and the results are shown in Figure 6 below.

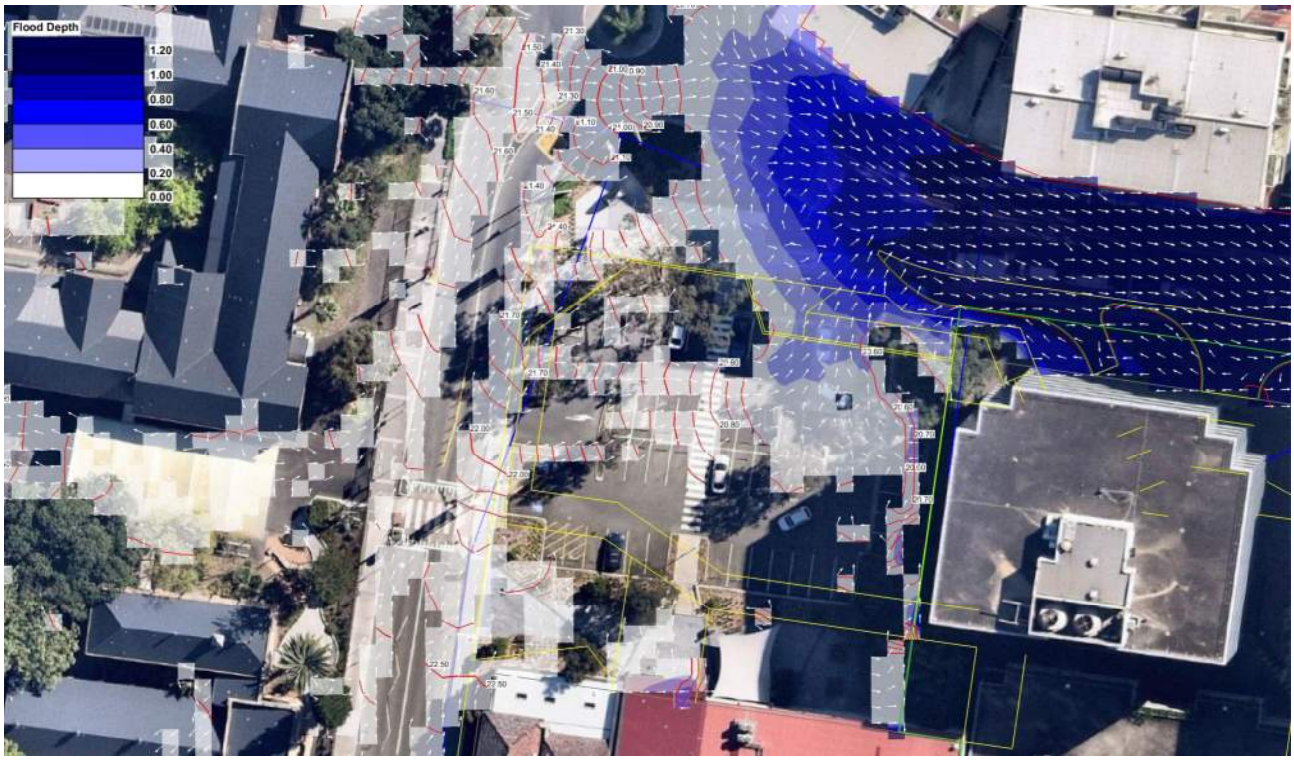

Figure 6 - Existing PMF Flood Levels and Depths

As shown, there are shallow flows that traverse the site towards Railway Parade in the PMF event. Modelling shows that there is ponding between 0.4m to 0.8m in depth to the north east of the proposed development site. There is significant ponding to the east on Railway Parade, downstream of the site.

4.0 Proposed Flood Conditions

The proposed architectural layout was included in the model to determine the proposed flooding conditions surrounding the site.

4.1 Proposed 1% AEP Event Results

The 1% AEP floodwater in Conder Street is generally shallow due to minor overland flows and the steep grade of the road. However, the flooding in Railway Parade is significant in depth and is the critical source of flood levels for the proposed flood planning levels. The 1% AEP flood level in Railway Parade adjacent to the site is approximated to be 19.70mAHD. The flood planning level for the development is to be the adjacent 1% AEP flood level with 500mm freeboard. Therefore, the flood planning level for the building is **20.20mAHD.**

For further Flood Planning advice refer to section 6.0 of this report.

4.2 Proposed PMF Event Results

The results of the proposed development in the PMF scenario are shown in Figure 8 below.

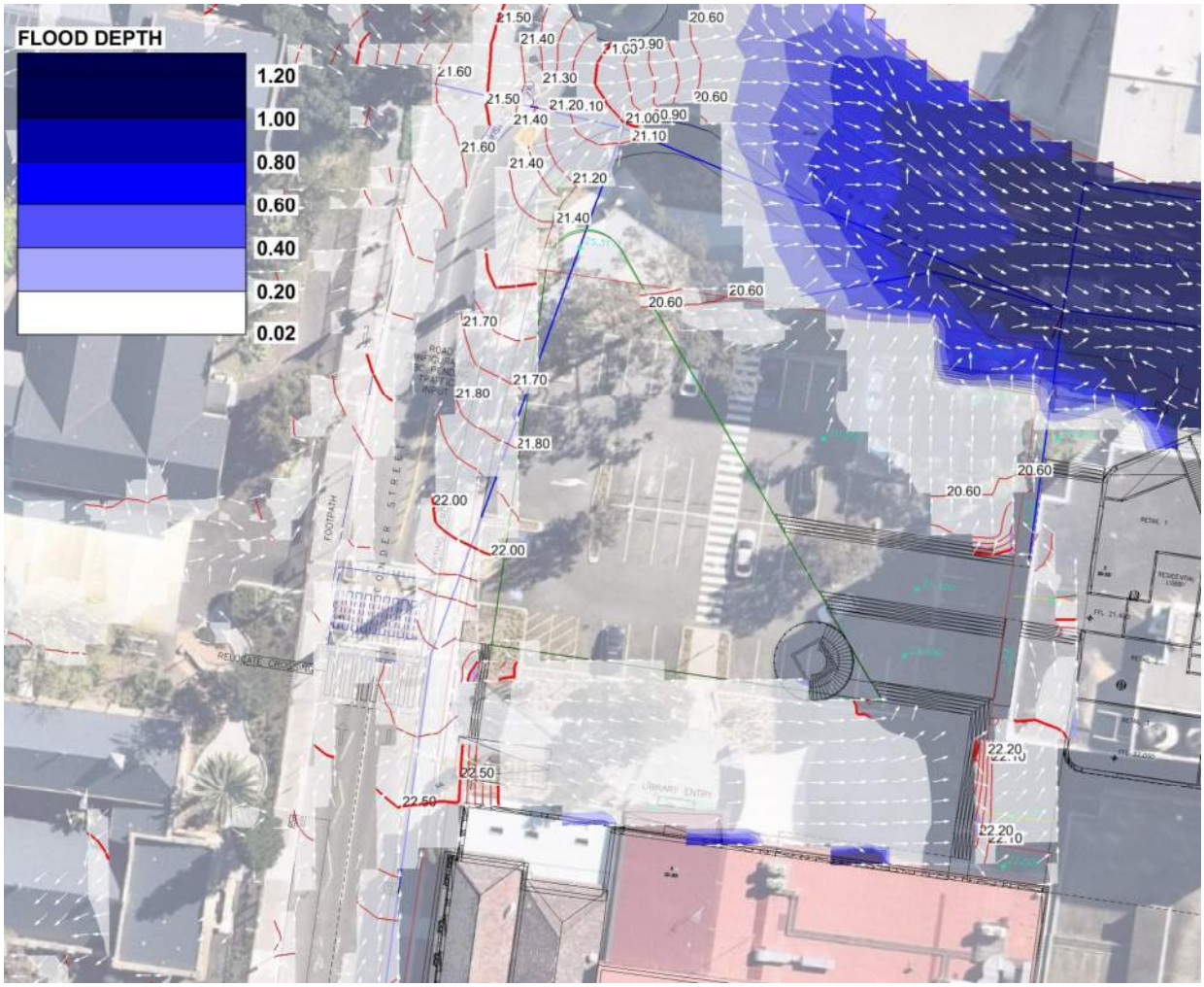

Figure 7 - Proposed PMF Flood Levels and Depths

Modelling shows that the flood level in the PMF event would reach 20.60mAHD on Railway Parade. The results show the flood depths along Conder Street to be between 0.02 and 0.2 m deep, reaching 22.0mAHD adjacent to the western face of the site.

5.0 Climate Change Sensitivity

Climate change is expected to have an adverse impact on rainfall intensities which has the potential to have impact on flood behaviour at specific locations. The existing Exile Bay, St Lukes and William Street Flood Study (WMA Water, 2017), confirms that a 30% increase in rainfall intensity results in a 120mm increase in flood levels at the trapped low point in Railway Parade. The 2010 Hyder Stormwater report confirms that with a 30% increase in rainfall, the 1% AEP flood level in Railway Parade increases by 70mm.

The NSW and ACT Regional Climate Modelling (NARCliM) project current predictions for extreme rainfall are that peak rainfall intensity is likely to increase by up to 10%. Even allowing for a 30% increase in rainfall intensities will still result in flood levels below the Flood Planning Level (300mm above the 1% AEP flood).

6.0 Flood Planning Requirements

In accordance with Burwood Council's Development Control Plan, Stormwater Management Code and LEP requirements, the proposed development must minimise the flood risk to life and property, ensuring development is compatible with flood risk and avoiding significant adverse impacts on flood behaviour.

The flood modelling results for the proposed development confirm that the development complies with Burwood LEP 2012 Clause 6.2. The site is generally surrounded by Low Flood Hazard that would be experienced in the surrounding roads during the 1% AEP event and the development is compatible with the flood hazard of the land.

As shown in Sections 4.1 and 4.2, the proposed flood depth is considered not to be significant (less than top of kerb height of 150mm) at all areas around the site.

In accordance with Council Policy (Stormwater Management Code clause 4.9), the freeboard requirement for significant overland flow is the 1% AEP flood level +500mm.

The entry facing Railway Parade is affected by the both the 1% AEP and PMF flood events. It is noted that floodwater can potentially enter the basement level via the stairs located within the Building footprint. Council requires protection up to the PMF level for basement entrances. As the entry to the proposed development will provide access to the proposed basement carpark, the Finished Floor Level (FFL) has been set to the PMF level of 20.6mAHD. This is more than 500mm above the 1% AEP flood level.

T**he minimum Flood Planning Level (Finished Floor Level of the building) is recommended to be set at 20.60mAHD.**

7.0 Conclusion

In order to protect the proposed site from the flooding risk identified, minimise flood risk to the users of the site and reduce the adverse impact of the proposed development, TTW confirm that:

- Flood levels and depths in the 1% AEP event are considered not significant throughout the site.
- As the proposed basement carpark is accessible via the main entry, the FFL of the proposed development has been set at 20.60mAHD to match the adjacent PMF level.
- The finished floor levels of 22.30mAHD at the Conder Street entry and 20.60mAHD at the Railway Parade entry will protect the building from flood events up to and including the PMF
- The FFL of 20.60mAHD provides more than 500mm freeboard to the 1% AEP flood level.

TTW recommend that the detailed design of the raised pedestrian threshold on Conder Street provides sufficient drainage to allow free flowing of overland flows and not divert overland land flow into the site.

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