

10 March 2023

Ref: SY213791_B01_[A]

King Furniture Australia Pty Ltd

C/- Centric Architects
David Dent
Unit 202/20 Dale Street
Brookvale NSW

Dear David,

Re: Proposed King Living Showroom at, 200-204 Condamine Street, Balgowlah – Response to Council Request for Additional Information

Northrop Consulting Engineers have been engaged by King Furniture Australia Pty Ltd to prepare a Flood Management Report for the proposed King Living Showroom located at 200-204 Condamine Street, Balgowlah, NSW.

In November 2022, a Flood Management Report was prepared and submitted to Northern Beaches Council ("Council") for the purposes the Development Application for the proposed King Living Showroom. The original Flood Management Report has been referred to herein as the "Flood Management Report (Northrop, 2022)".

Following submission of the Flood Management Report (Northrop, 2022) a Request for Information (RFI), dated the 6th of March 2023 (REF: DA2022/2148), was received from Council. The flood related RFI received from Council is summarised below (in part):

".....The impact mapping in the Flood Management Report by Northrop Consultants (dated 23/11/2022) shows localised increases in velocity of 0.4 m/s within the road reserve on Condamine Street and of greater than 1 m/s on neighbouring 206 Condamine Street. The actual velocities have not been provided but it is assumed that these increases are by more than 10%.

The Flood Management Report needs to be updated to provide the actual peak velocities in the PMF and percentage increases in these areas. If the post development velocities are more than 10% higher, the design needs to be amended.

The proposal is therefore unsupported."

This letter has been prepared in response to Council's Request for Information. Contained herein is a summary of the additional information prepared, as well as a review of the potential impact the observed increases may have on the subject site and adjacent properties.

This assessment should be read in conjunction with the aforementioned Flood Management Report (Northrop, 2022).

		Date
Prepared by	LG	10/03/2023
Checked by	LG	10/03/2023
Admin	LG	10/03/2023

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Additional Information and Discussion

Please see overleaf Figures 1 and 2 which present the existing and developed case peak flood velocities at the subject site and vicinity during the PMF design storm event. Similarly, the following Figure 3 presents the modelled change in flow velocities during the PMF design storm event.

Figure 1 shows the peak velocity in Condamine Street, in the vicinity of the observed increase, ranges between approximately 1.5 - 2.5m/s under existing conditions. Similarly, at the increase observed in the Burnt Bridge Creek channel at 206 Condamine Street, adjacent to the north-western corner of the subject site, the peak velocity under existing conditions is expected to be in the order of 3m/s.

During the developed case scenario, Figure 2 and Figure 3 show a slight change in the flow behaviour on Condamine Street during the PMF when compared to the existing case. These changes are expected to be due to the removal of the existing buildings on the subject site and the introduction of the proposed raised building. The results suggest that the removal of the on-site buildings, and introduction of the open undercroft slightly alters the preferential flow paths that pass across Condamine Street and continue onto the subject site.

Although some minor increases are observed on Condamine Street, (approx. 25% as presented in Figure 3) a comparison of Figures 1 and 2 suggests an overall decrease in the peak velocity is expected with a reduction in the peak velocity from 2.5m/s during the existing case, to approximately 1.7m/s during the developed case.

Figure 3 highlights an additional increase in 206 Condamine Street, at the north-western corner of the subject site. Velocities in this location are shown by Figures 1-3 to increase from approximately 3.0m/s under existing conditions to 6.0m/s during the developed case scenario.

This increase is expected to be due to a change in flow behaviour across the corner of the subject site and into the concrete lined, Burnt Bridge Creek channel. Some terrain changes are proposed at this corner of the subject site with the proposal aiming to encourage flows to enter Burnt Bridge Creek as much as possible, rather than pond across Condamine Street, the subject site and the adjacent private properties.

As shown in Figures 2 and 3, the increased velocities are contained along the creek bank which as previously mentioned, is concrete lined. A photo of the bank in its current form is presented in the below Photo 1.

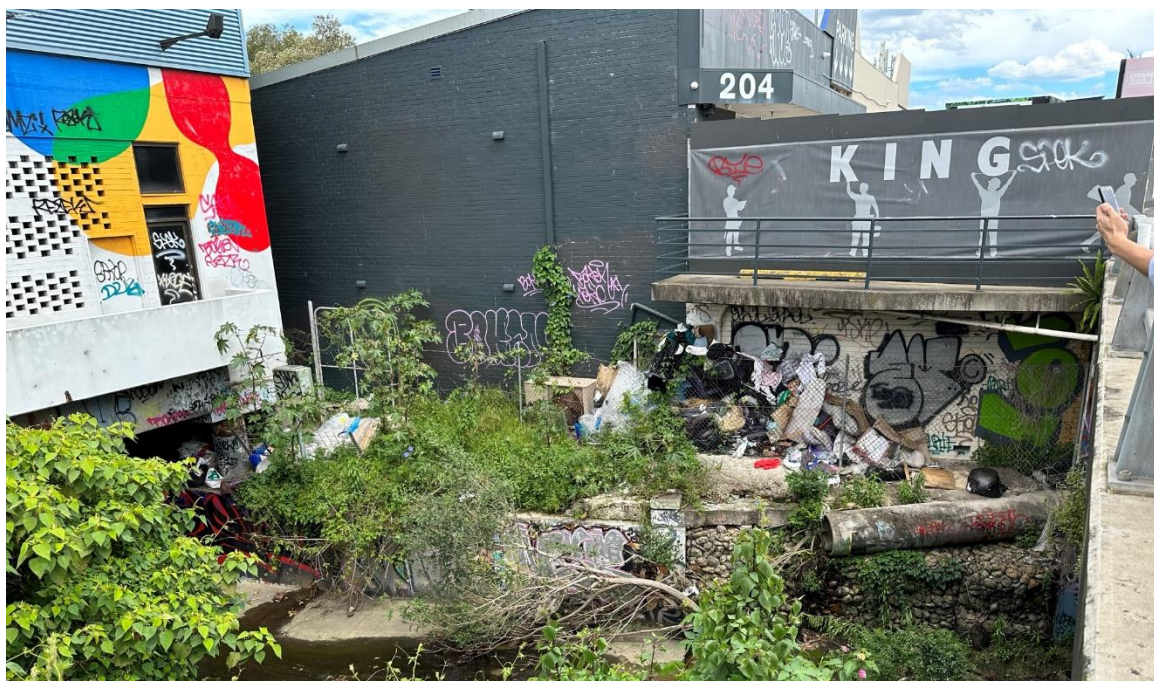
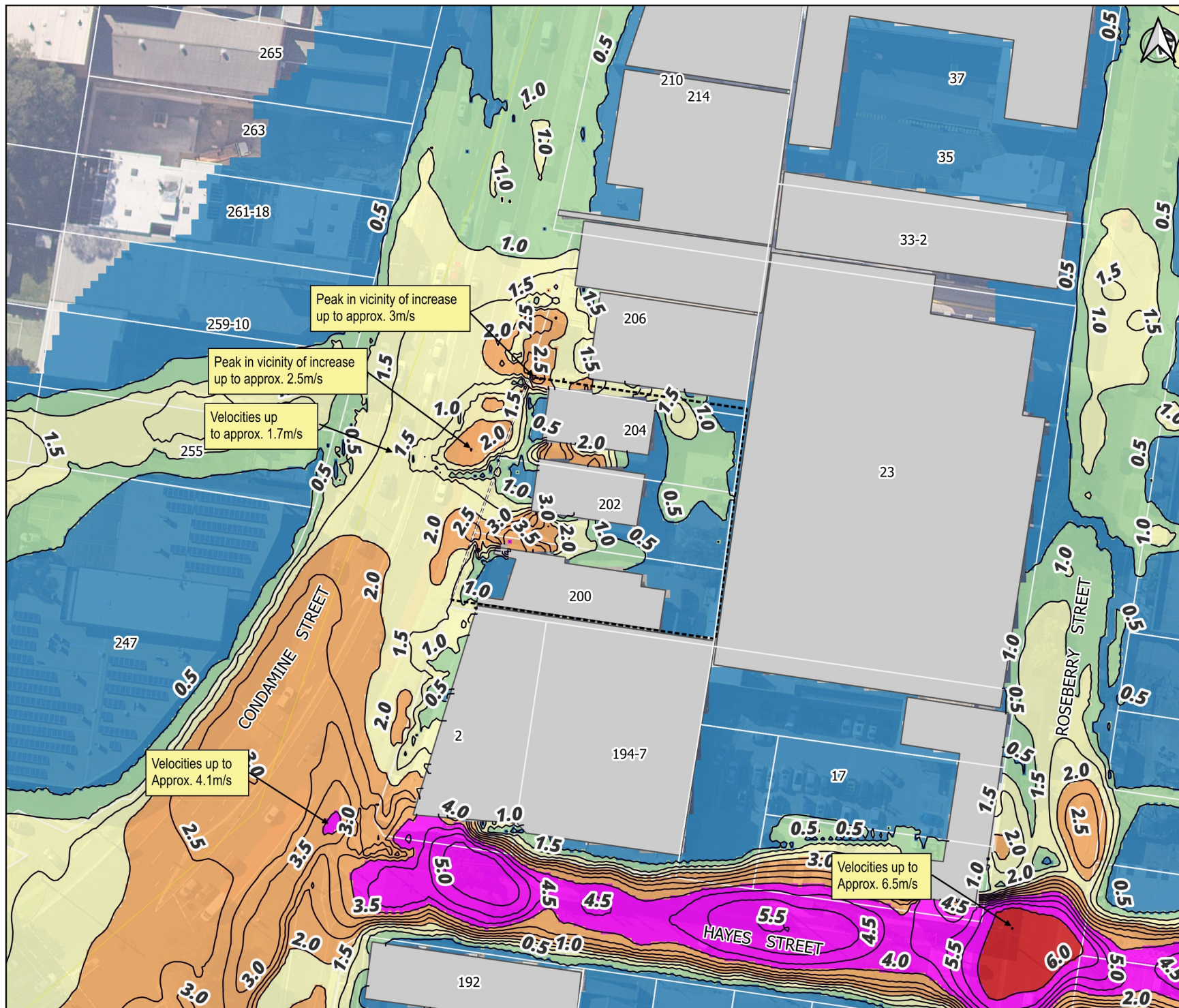


Photo 1 – Burnt Bridge Creek Southern Bank (at NW corner of site)



Legend

- Subject Site
- Buildings
- Velocity Contours (0.5m)

Velocity (m/s)

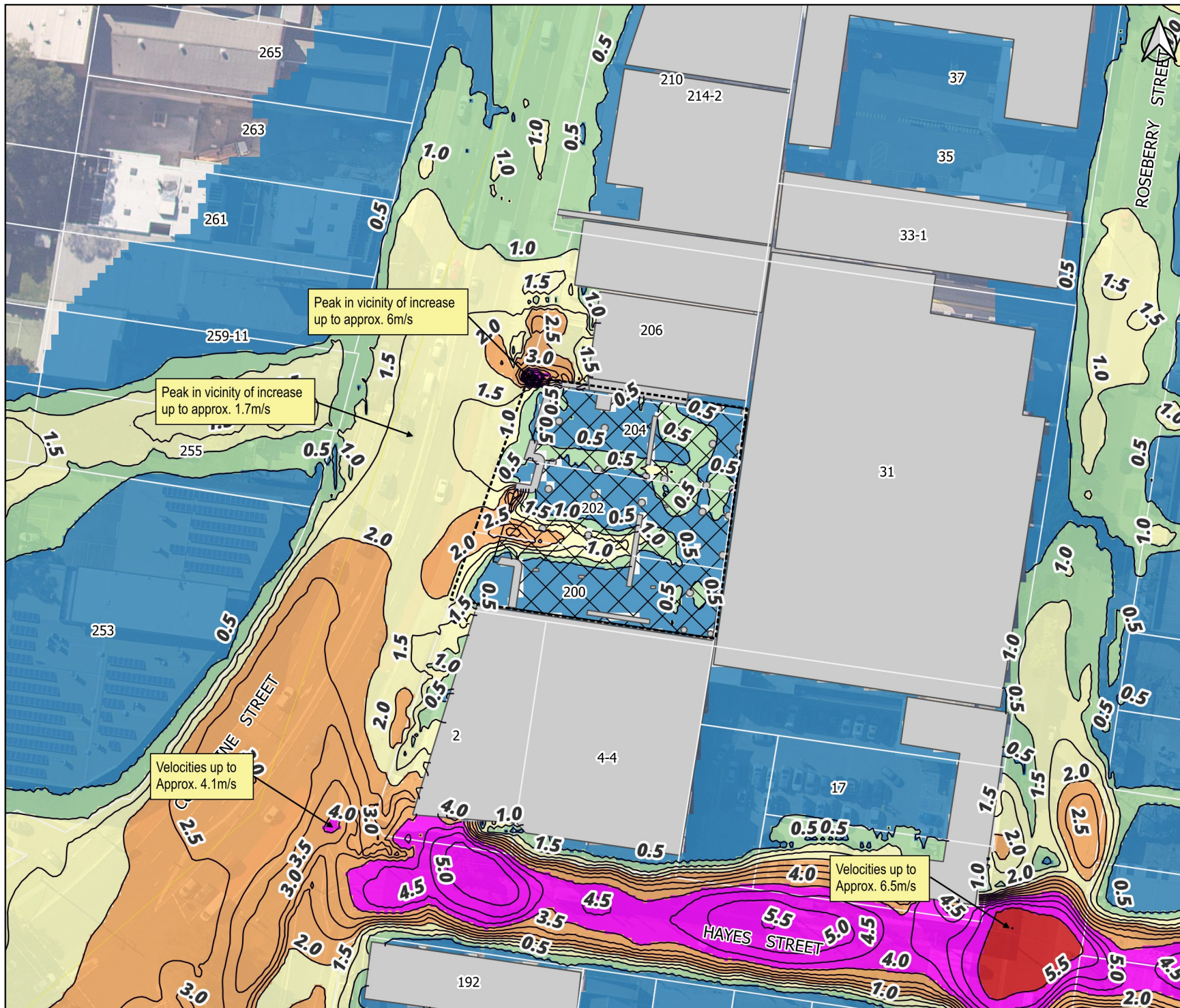
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- 2.0 - 4.0
- 4.0 - 6.0
- > 6.0

0 10 20 Metres
1:1,000

Figure 1
PMF Flood Hazard
Existing Case

200-204 Condamine Street
Balgowlah





- Legend**
- Subject Site
 - Buildings
 - Suspended Slab
 - Velocity Contours (0.5m)

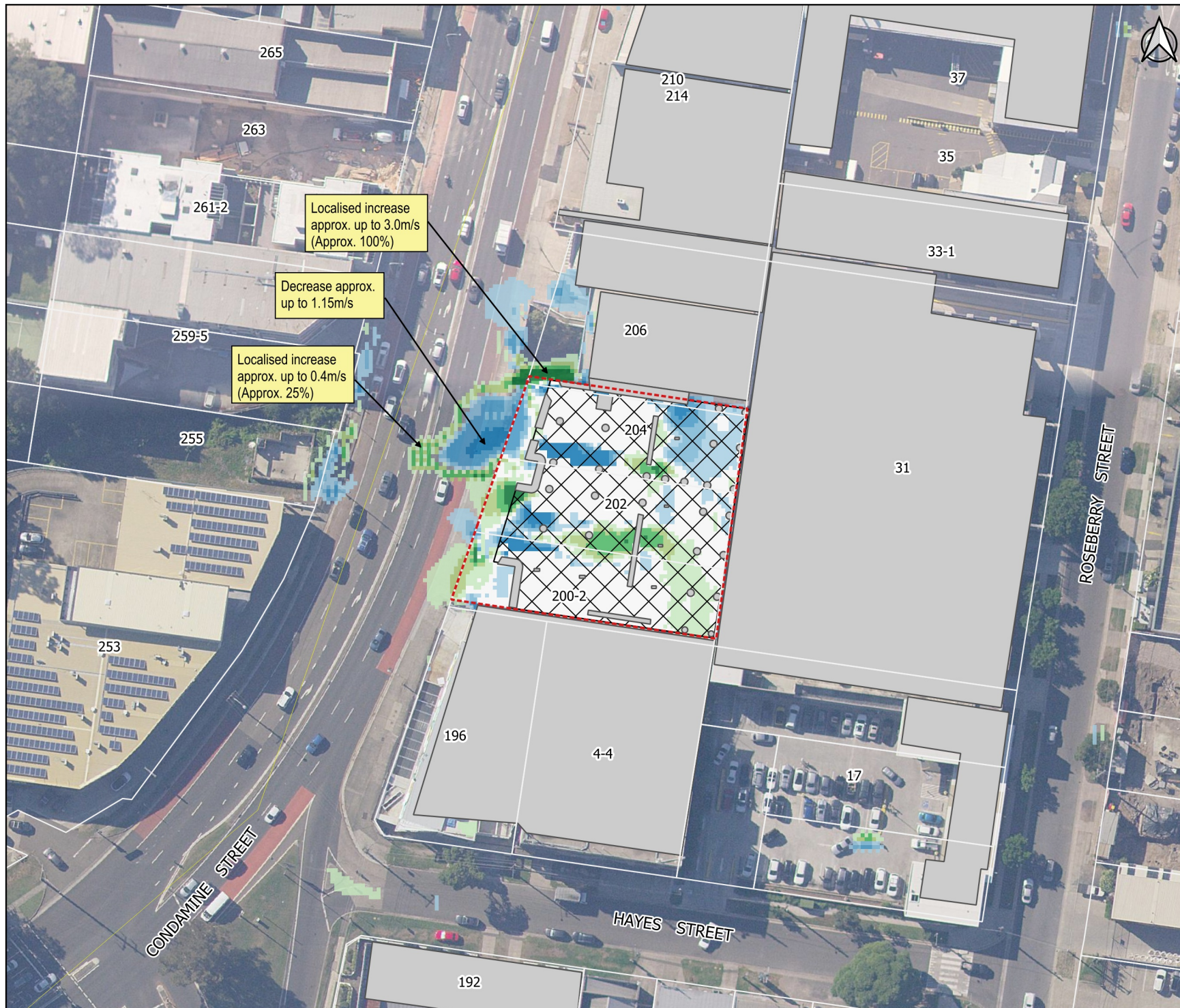
- Velocity(m/s)
- < 0.5
 - 0.5 - 1.0
 - 1.0 - 2.0
 - 2.0 - 4.0
 - 4.0 - 6.0
 - > 6.0

0 10 20 Metres
1:1,000

Figure 2
PMF Flood Velocity
Developed Case

200-204 Condamine Street
Balgowlah





Legend

- Subject Site
- Buildings (Blocked Out)
- Suspended Slab

Difference(m)

- <-1.0
- 1.0 - -0.5
- 0.5 - -0.3
- 0.3 - -0.1
- Less than +/-0.1m/s
- 0.1 - 0.3
- 0.3 - 0.5
- 0.5 - 1.0
- >1.0

0 10 20 Metres

1:1,000

Figure 3
PMF Flood
Velocity Difference
Developed minus Existing

200-204 Condamine Street
 Balgowlah



Some minor amendments to the creek bank are expected as part of the proposed development. The location of the observed increases is the proposed site stormwater legal point of discharge and as such, there is the potential for minor amendments (including scour protection) to be made, to facilitate the connection of site stormwater assets. These works are expected to be reviewed at detailed design phase, prior to Construction Certificate.

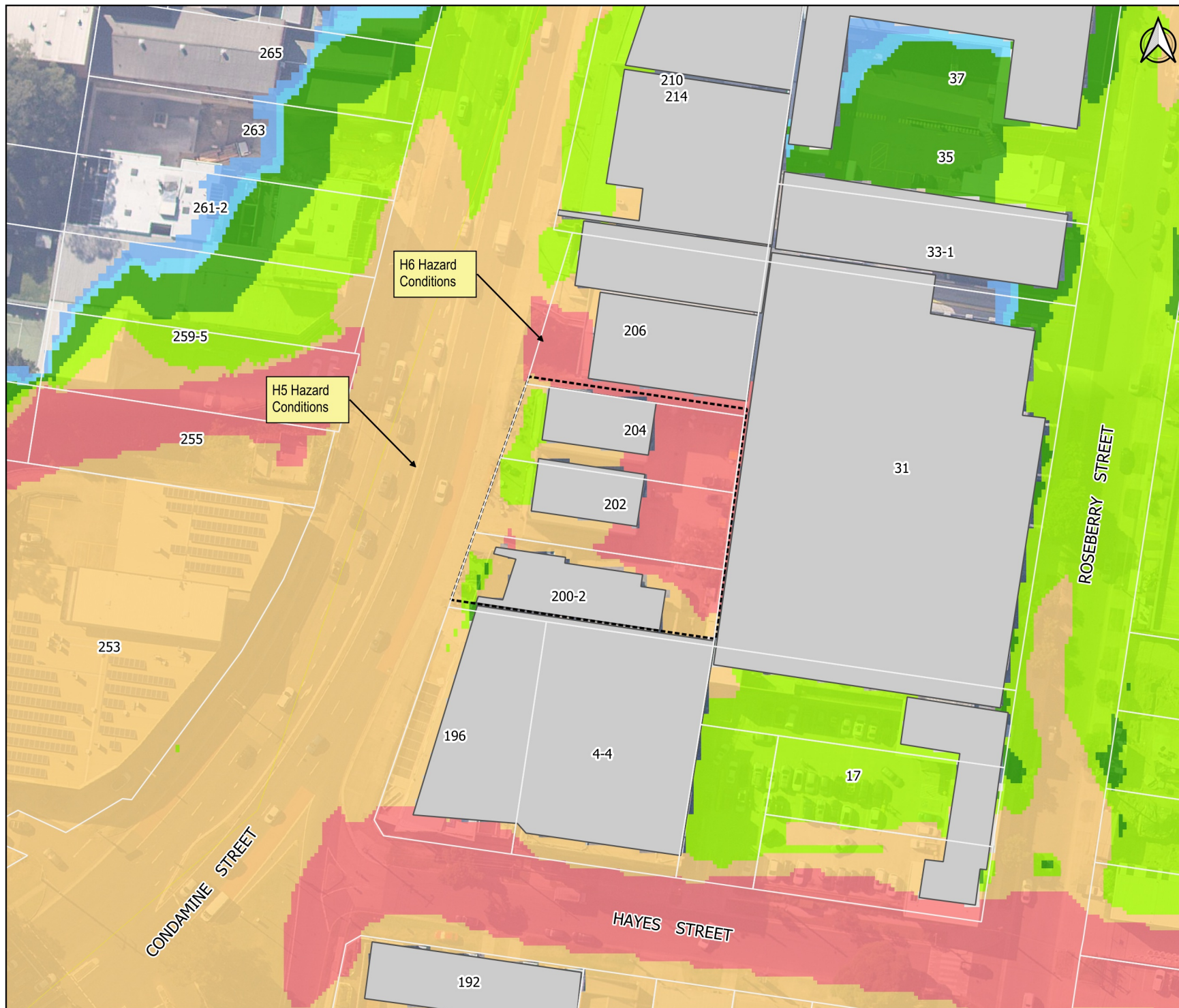
It is important to recognise that the PMF is an extremely rare event with a nominal Annual Exceedance Probability of approximately a 1 in 10 million chance of occurring in any given year. Generally, the greatest concern during an event of this nature is the management of the risk to life.

Review of the following Figures 4 and 5 suggest the observed changes in velocity do not alter the risk to life across the road, or within 206 Condamine Street as H5 and H6 flood hazard conditions are already observed in these areas under existing conditions.

Further to the above, it is also important to recognise the benefits generated by the proposed development with respect to Flood Risk Management on the subject site. As outlined in the FMR (Northrop, 2022) the proposed development is expected to:

- Reduce flood levels by up to approximately 150mm in Condamine Street and the adjacent properties during the 1% AEP design storm event.
- Increase available flood storage on the subject site from approximately 3200m³ under existing conditions to 6000m³ in the developed case, during the 1% AEP design storm event.
- Raise carparking to a level at or above the Flood Planning Level therefore, reducing the risk of property damage on the subject site during major flood events.
- Provide a point of refuge above the PMF and restrict access to areas that may present a risk to life during major and extreme flood events (i.e. the existing carpark).
- Facilitate enhanced public awareness and readiness through the preparation of a Flood Emergency Response Plan (recommended to be prepared prior to Occupation / Construction Certificate phase).
- Facilitate Disaster Risk Reduction mechanisms through the aforementioned points as well as through the design of flood resistant infrastructure (i.e. the proposed building is recommended to be designed to withstand flood forces during events up to and including the PMF)

On this basis, the proposed development is not expected to create a significant adverse impact, rather it is expected to enhance flood management and reduce flood risk on the subject site and vicinity.



Legend

Subject Site

Buildings

Hazard Category

H1

H2

H3

H4

H5

H6

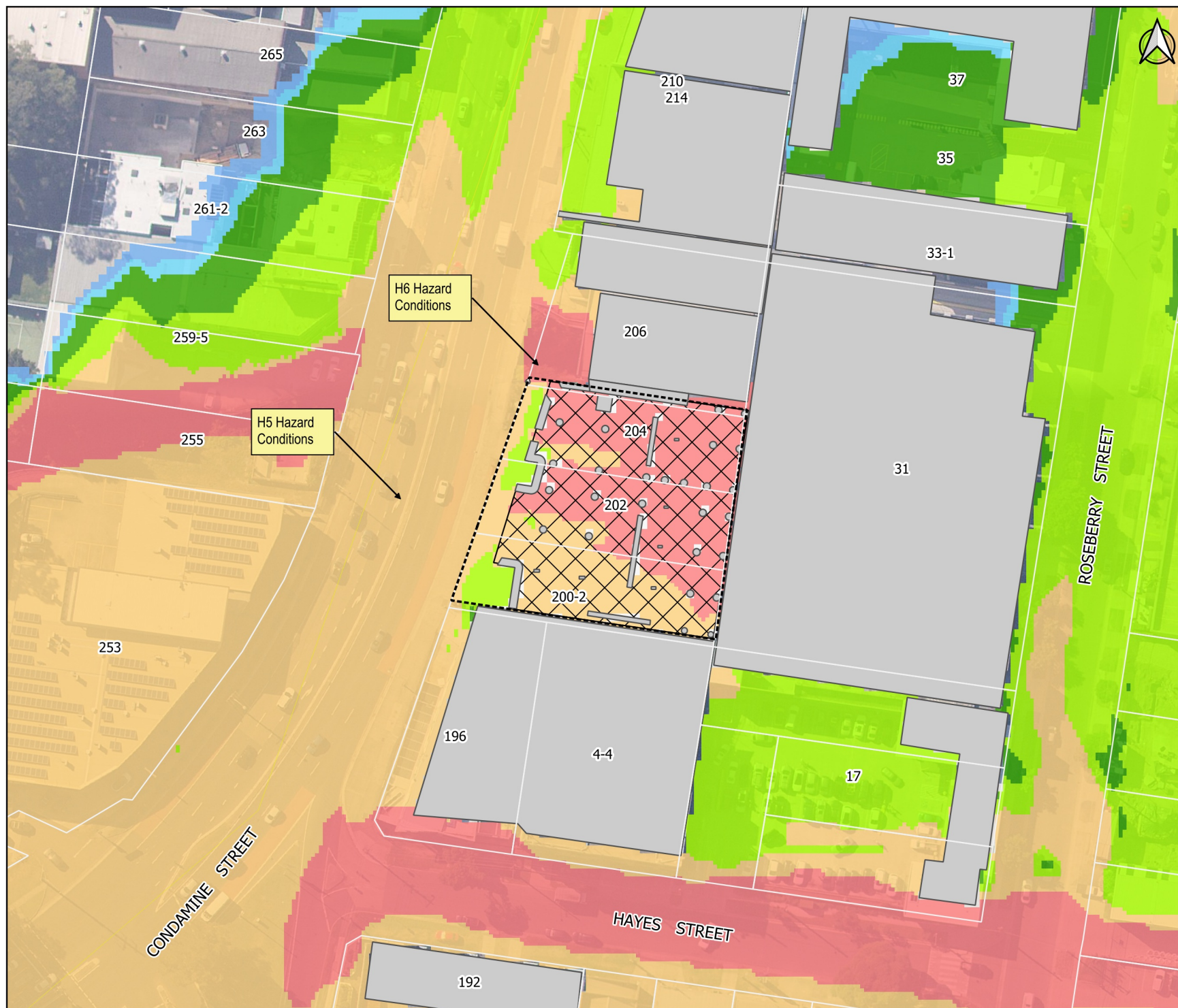
0 10 20 Metres

1:1,000

Figure 4
PMF Flood Hazard
Existing Case

200-204 Condamine Street
Balgowlah





Legend

- Subject Site
- Buildings
- Suspended Slab
- Hazard Category
 - H1
 - H2
 - H3
 - H4
 - H5
 - H6

0 10 20 Metres
1:1,000

Figure 5
PMF Flood Hazard
Developed Case

200-204 Condamine Street
Balgowlah



Conclusion

A response to Council's RFI is presented herein including the preparation of additional flow velocity figures, and additional commentary with respect to the potential adverse flood impacts the proposed development may have on the subject site and vicinity. This assessment concludes that:

- Minor localised increases in velocities, beyond Council's strict definition of adverse flood impacts, are observed during the PMF.
- Although these localised increases are observed:
 - An overall decrease in peak velocities is expected in Condamine Street, in the vicinity of the observed increases, when compared existing conditions.
 - Velocity increases in 206 Condamine Street are contained to the existing bank of the concrete lined Burnt Bridge Creek channel with the potential for additional scour protection at the creek bank to be explored during detailed design phase and prior to issue of Construction Certificate, if required.
 - The velocity increases are not expected to increase the risk to life on the subject site or vicinity during the PMF design storm event.

As such, a merits-based assessment is sought from Council with only negligible impacts expected due to the localised changes in peak velocities.

We commend our findings to Council for review. Should you have any queries regarding the above, please don't hesitate to contact the undersigned on (02) 4943 1777.



Laurence Gitzel

Associate | Flood Engineer
BEng(Env) MProfEng(Env) MIEAust CPEng NER(Civil)

Limitation Statement

Northrop Consulting Engineers Pty Ltd (Northrop) has been retained to prepare this report based on specific instructions, scope of work and purpose pursuant to a contract with its client. It has been prepared in accordance with the usual care and thoroughness of the consulting profession for the use by King Furniture Australia Pty Ltd. The report is based on generally accepted practices and standards applicable to the scope of work at the time it was prepared and was based on information that was available at the time of preparation. No other warranty, express or implied, is made as to the professional advice included in this report.

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