

# NATIONAL STORAGE



## 11-11A Edinburgh Road Marrickville *Flood Assessment*

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## *Flood Assessment*

### Report

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*Cover Photo: Development at 11-11A Edinburgh Road Marrickville (Image courtesy Hayes Anderson Lynch)*

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## Appendices

**Appendix A:** Development Plans

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## 1 Introduction

National Storage is undertaking a project for enhancing the storage facility at 11-11A Edinburgh Road, Marrickville. As part of this project, National Storage is in the process of submitting a Planning Proposal to include an additional clause in Part 6 of the Inner West Local Environmental Plan 2022 that permits:

- building on Lot 1 in DP607677 and Lot 67 in DP4991 to not exceed a maximum floor space ratio of 3.20: if the building is used for self-storage units
- building on Lot 1 in DP607677 and Lot 67 in DP4991 to not exceed a maximum building height of RL34.53 or 30m
- redevelopment on Lot 1 in DP607677 and Lot 67 in DP4991 to provide a minimum of 7.5% of the site area as deep soil area

This report provides a flood assessment of the proposed development and would be part of the scoping report.

## 2 Study Data

The following data for the study was provided by National Storage and the Inner West Council:

- Development Plans prepared by Hayes Anderson Lynch (HAL Architects, National Storage)
- Existing ground survey (National Storage)
- TUFLOW flood model (Inner West Council)

The data was used in the assessment of the proposed development. The relevant development plans are presented in Appendix A.

## 3 Proposed Development

The proposed development is a multi-level development that would retain the majority of the warehouse on the western portion of the site and construction of a multi-level building on the eastern portion of the site. A 7.5m wide landscaping area would be provided on the western side of the development. Two separate vehicle entry and exit points are proposed introducing single direction traffic management. It is proposed to retain the existing Edinburgh Road entrance and construct a new exit point to Smidmore Street.

The location of the proposed development is shown in Figure 1. Additional development details are provided in Appendix A. A complete set of architectural plans will be provided to support the Planning Proposal.

The proposed layout of the building has been adopted after consideration of the Council planning requirements and those specific to the business use, including level access for driveway storage units and drive in/drive out arrangement between the two access points to minimise traffic disruption.



**Figure 1. Location of the Proposed Development**

## 4 Existing Flood Behaviour

The proposed development lies in the flood prone area of EC East Catchment in Marrickville. The land use in the catchment is primarily high-density residential terrace-housing, with commercial/industrial development near the catchment outlet. Along with the Council's street drainage, Sydney Water drainage infrastructure carries the floodwaters through the catchment.

In a major flood event, once the capacity of the pipes is exceeded, overland flow paths develop and generally carry flow along the streets in the catchment. All streets surrounding the proposed development are overland flow paths with Murray Street and Edinburgh Road subjected to significant depth of flooding.

### 4.1 Flood Level

Flood certificates for 11 and 11A Edinburgh Road were obtained from the Council. These flood certificates are presented in Appendix B.

As suggested by the Council, the flood model developed by the Council was used to establish the other relevant flood levels for the development. Figure 2 shows the 1% AEP flood levels and depth for various locations around the site. The flood levels at various entries are

- Existing entry at Smidmore Street 5.78m AHD
- Proposed entry at Smidmore Street (approximate location) 5.52m AHD
- Existing entry at Edinburgh Road 5.25m AHD

The above flood levels are sourced from the Inner West Council flood model. It is noted that the flood modelling is based on the ground survey carried out circa 2009. These flood levels are therefore preliminary in nature and have been updated with further modelling to update the existing conditions.

## 4.2 Updated Existing Conditions

The hydraulic model TUFLOW was updated with the survey undertaken for the proposed development. The survey includes street and footpath levels surrounding the development in addition to the open areas within the development site.

Model runs were undertaken for the 1% AEP event and the design flood levels were compared with the Council models. The comparison indicates that the flood levels do not change with the updated model.

The 1% AEP flood depth is shown in Figure 2.

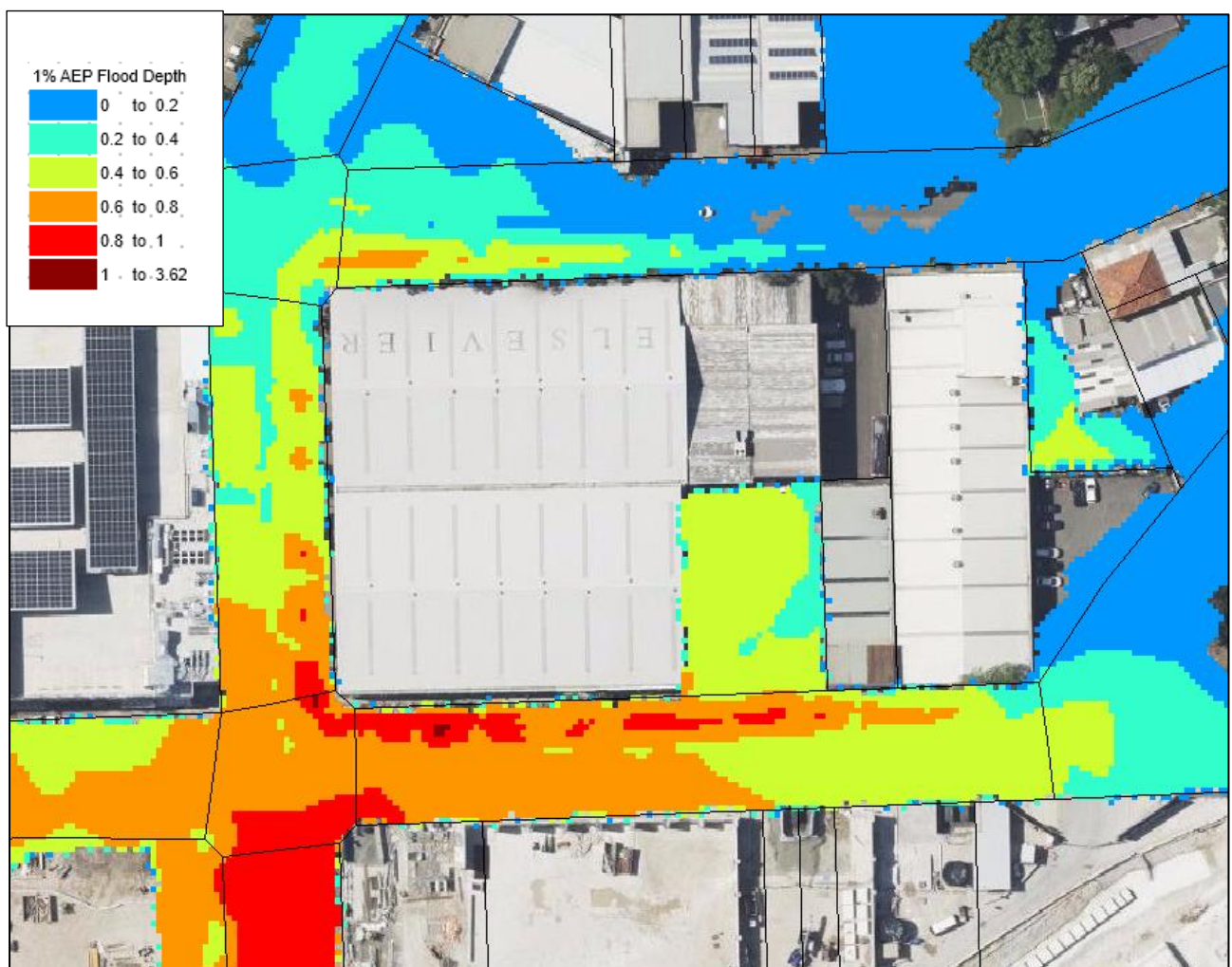


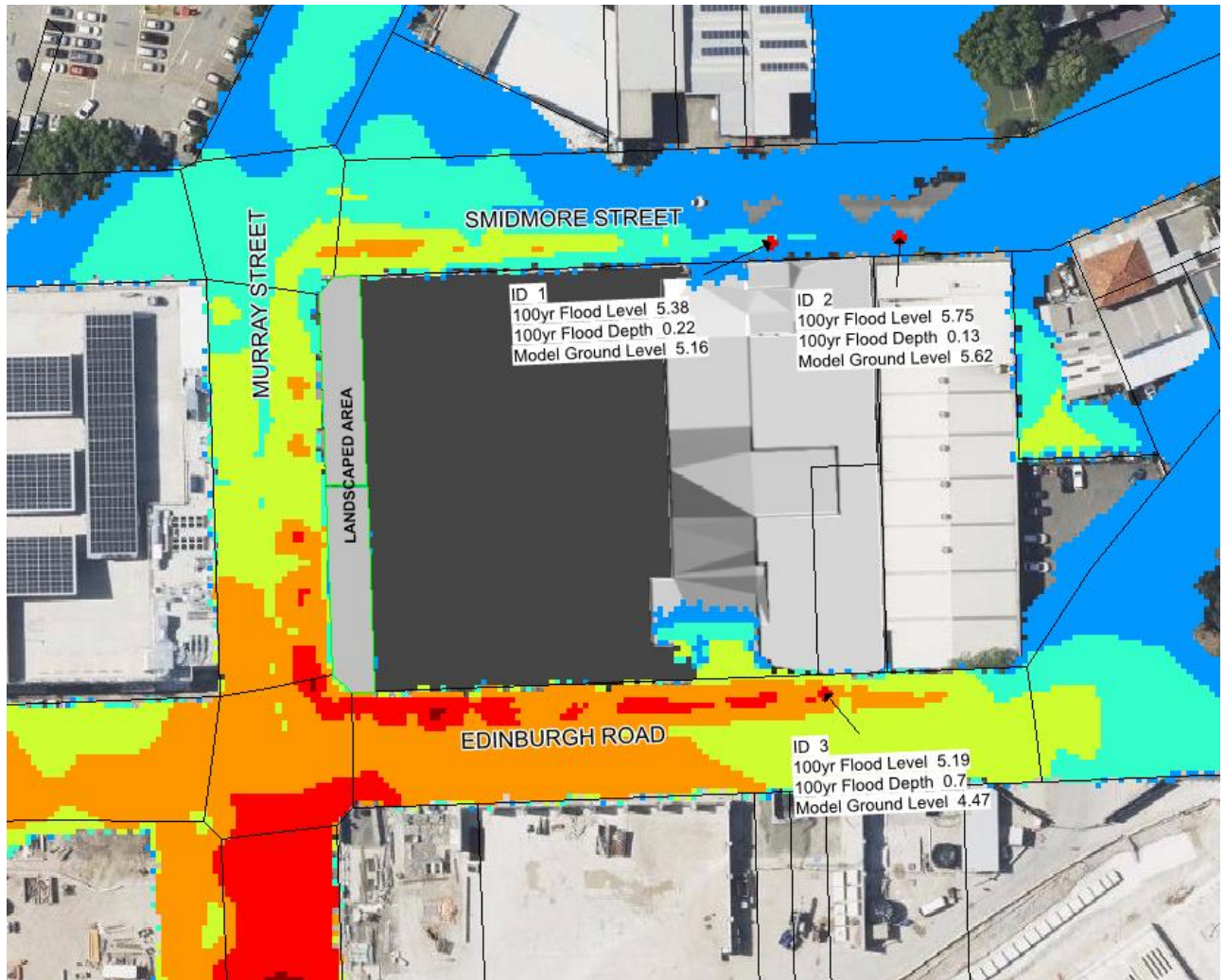
Figure 2. 1% AEP Flood Depth – Existing Conditions

## 5 Proposed Development Modelling

The plans showing proposed development footprint is shown in Appendix A. Part of the existing open area at the Edinburgh Road entrance would be used for providing the vehicular ramp to the proposed building. In addition, a landscape strip, approximately 7m wide, has been incorporated in the design by curtailing the existing building footprint along Murray Street. This strip is provided to satisfy the Council's requirement for the landscape area for the development.

The landscape area would be provided by a hob detail, 0.6m high from the street level. The planting details for the landscape area suggest that any floodwaters in this area would be subject to resistance as per the proposed planting details. The flood model was updated to incorporate the landscaping strip with appropriate roughness.

The proposed development terrain was provided by HAL Architects. The terrain was incorporated in the model and the 1% AEP model run was undertaken. The 1% AEP flood depth along with the terrain of the proposed development is shown in Figure 3.



**Figure 3. 1% AEP Flood Depth – Developed Conditions**

The impact of the proposed development is shown in Figure 4. The proposed development terrain is also shown in this figure.





Figure 4. Impact of the Proposed Development – 1% AEP Event

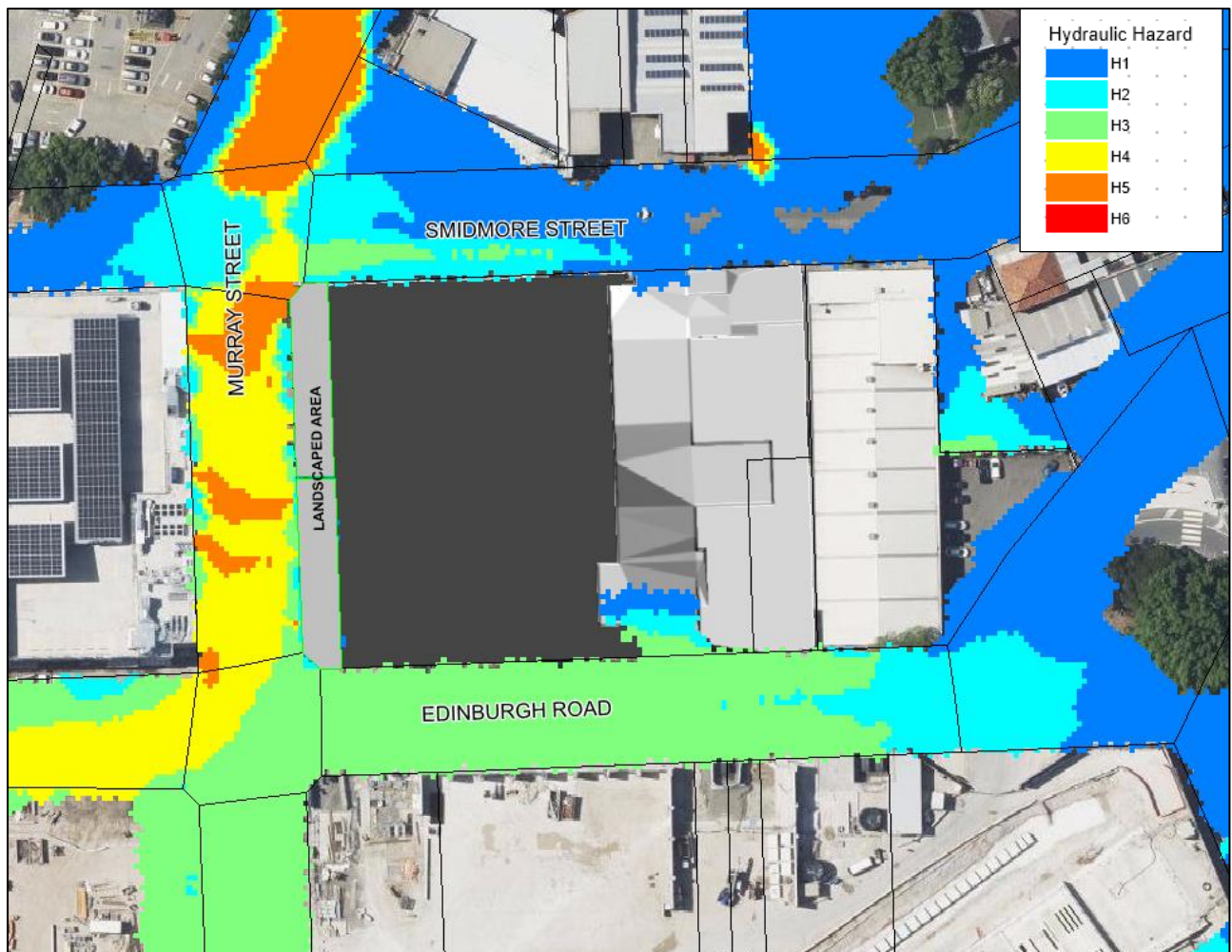
## 6 Hydraulic Hazard

The hydraulic hazard is defined as a product of flood velocity and flood depth. Flooding in urban areas can create high hazard conditions that can affect the potential development of a site in terms of its use and access in a major flood.

Figure 5 shows the hydraulic hazard relevant to the proposed development. The hazard category is based on the latest recommendation of Australian Rainfall and Runoff. Various hazard categories are as follows:

The hazard categories are derived from the AIDR Guideline 7-3 “Flood Hazard”. These guidelines recommend the use of hazard categories as described below:

- H1 – Generally safe for people, vehicle and buildings
- H2 – Unsafe for small vehicles
- H3 – Unsafe for vehicles, children and the elderly
- H4 – Unsafe for people and vehicles
- H5 – Unsafe for vehicles and people. All buildings are vulnerable to structural damage. Some less robust building types vulnerable to failure
- H6 – Unsafe for vehicles and people. All building types considered vulnerable to failure



**Figure 5. 1% AEP Hydraulic Hazard – Developed Conditions**

## 6.1 Loss of Storage

The proposed building footprint encroaches on the flood storage area within the existing footprint along Edinburgh Road Street (Figure 3). The model results indicate that this loss of storage has no adverse impact. However, this loss of storage needs to be compensated on site, as cumulative loss of storage with other future developments can potentially have an adverse impact on the surrounding area. The proposed development therefore includes the mitigation measure of providing onsite flood storage to compensate for the lost storage.

A preliminary estimate suggests that approximately 500 m<sup>3</sup> of onsite storage would be required. This storage is likely to be sufficient for mitigating any adverse impacts, however, would be confirmed through flood modelling at the detailed design stage. The current design has provision for the required storage.

## 7 Flood Planning Level

### 7.1 General

The flood planning level for the proposed development is derived by adding a freeboard to the 1% AEP flood levels. The flood planning level establishes the floor level and other flood related controls for the development.

Inner West Council Development Control Plan (DCP) requires that a freeboard of 500 mm be used for deriving the flood planning level. However, if the depth of flooding is less than 300 mm, Council has advised that a freeboard of 300 mm may be considered on its merit.

### 7.2 Adopted Flood Planning Level

The gradient for the entrance at Smidmore Street becomes too steep if the flood planning level is derived by adding 500 mm freeboard to the 1% AEP flood level. A lower freeboard is therefore needed to achieve an acceptable gradient for this entrance. Since the depth of flooding at Smidmore Street is less than 300 mm, a lower freeboard of 300 mm can be considered to meet this design requirement.

The depth of flooding at Edinburgh Road is greater than 300 mm and therefore a freeboard of 500 mm is required.

Based on the 1% AEP flood levels on the two streets, the following FPLs are required

- Smidmore Street –  $5.78 + 0.3 = 5.83\text{m AHD}$
- Edinburgh Road –  $5.25 + 0.5 = 5.75\text{m AHD}$

The development plans presented in Appendix A show that the proposed floor levels comply with the FPL for the site. The higher FPL of 5.83m AHD has been adopted.

### 7.3 Proposed Development Below the Flood Planning Level

#### 7.3.1 Driveway

The proposed development has a driveway that connects Smidmore Street with Edinburgh Road. The driveway is elevated to prevent flooding but does not comply with the flood planning levels as derived above.

The proposed elevation of the driveway is constrained by the design requirements for the driveway gradients from/to the connecting street/road. As per the Council DCP, areas below the flood planning level would be flood-proofed up to 500 mm above the 1% AEP flood level. This will be achieved at the detailed design stage.

#### 7.3.2 Wine Ark Office and Box Shop

The floor levels do not comply with the flood planning levels for the proposed Wine Ark office along Smidmore Street and Box Shop along Edinburgh Road. This is due to a business use requirement for having entry at the street level. In addition, it would have an adverse impact on the building form and streetscape presence of the future development if the floor level of these two spaces is raised.

As per the Council DCP, areas below the flood planning level would be flood-proofed up to 500 mm above the 1% AEP flood level. A flood management plan would also be prepared to manage the flood risk, such as loss of stock etc. This will be achieved at the detailed design stage.

## 8 Flood Management for Existing Warehouse/Building

The existing warehouse/building floor level is below the FPL and is currently exposed to flood risk from the Edinburgh Road flooding. Under the proposed development, the floodwaters can still enter this building from the proposed driveway from Edinburgh Road. A flood gate is proposed at the entrance of the existing building to manage the flood risk.

The proposed design of the ramp at the Edinburgh Road entry envisages a landing of 5.50m AHD at the entry of the existing warehouse. The flood barrier would be required above this level. Since the FPL at the Edinburgh Road is 5.57m AHD, a flood barrier with a minimum height of 0.3m would be required.

Provision of a flood gate is an addition to the existing building. The Council DCP provides controls for any additions, however, these controls are related to the provision of floor levels below the 1% AEP flood level and therefore not relevant to the provision of flood gates/barrier. However, the Council's response to the preliminary assessment of the proposal has considered the merits and allowed the provision of flood gate/barrier to the existing building.

## 9 Planning Considerations and Assessment of Proposal

The flood related controls applicable to the proposal are provided in the following planning instruments:

- Ministerial Local Planning Direction 4.1 – Flooding
- Inner West Council LEP
- Inner West Council DCP

The relevant planning controls in the above instruments and the assessment of the proposal with regard to these controls is discussed in the following sections.

### 9.1 Local Planning Direction 4.1 – Flooding

The objectives of this planning instrument are to:

*(a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005, and*

*(b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.*

Table 1 provides assessment of the proposal with regard to the Direction 4.1 – Flooding controls.

**Table 1. Local Planning Direction 4.1 – Flooding**

| #   | Direction 4.1 Controls   | Addressed by Proposal  |
|---|--|--|
| <p><b><i>A planning proposal must not contain provisions that apply to the flood planning area which:</i></b></p> |  |  |
| a   | <p><i>permit development in floodway areas</i></p>   | <p>There is no active flow path through the site and hence the proposal is not in a floodway area.</p>   |
| b   | <p><i>permit development that will result in significant flood impacts to other properties</i></p>   | <p>The proposal has been designed to accommodate on-site compensatory storage to offset the loss of storage which may result from redevelopment of the site in accordance with the proposal.</p> <p>There is an increase in 1% AEP flood levels on Murray Street, with majority of the area affected by less than 2 cm. This can be deemed as an insignificant impact.</p> |
| c   | <p><i>permit development for the purposes of residential accommodation in high hazard areas</i></p>  | <p>Not applicable.</p>   |
| d   | <p><i>permit a significant increase in the development and/or dwelling density of that land</i></p>  | <p>The proposal does not seek to change the underlying industrial zoning of the land.</p>  |
| e   | <p><i>permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate</i></p>                       | <p>Not applicable.</p>   |
| f   | <p><i>permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent,</i></p>   | <p>Development consent will be obtained for any future redevelopment of the site in accordance with the proposal.</p>  |
| g   | <p><i>are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities</i></p> | <p>The preliminary investigation has not identified any flood related infrastructure upgrades due to the proposal. Compensatory flood storage is proposed to be accommodated onsite and any additional infrastructure would be identified at the detailed DA stage.</p>  |

| # | Direction 4.1 Controls   | Addressed by Proposal   |
|---|--|---|
| h | <i>permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.</i> | The proposal is able to provide storage of any hazardous material above the flood planning level, if required at the detailed design stage. |

## 9.2 Inner West Council LEP (2022)

Clauses 5.21 and 5.22 of the Inner West Council LEP (2022) relate to flood planning.

### 9.2.1 Section 5.21 - Flood Planning

The objectives of this clause are:

- a) *to minimise the flood risk to life and property associated with the use of land,*
- b) *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,*
- c) *to avoid adverse or cumulative impacts on flood behaviour and the environment,*
- d) *to enable the safe occupation and efficient evacuation of people in the event of a flood.*

Table 2 provides an assessment of the proposal with regard to the provisions of this clause.

**Table 2. LEP (2022) Controls**

| # | LEP Controls   | Addressed by Proposal   |
|---|--|---|
|   | <b><i>Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—</i></b> |   |
| a | <i>is compatible with the flood function and behaviour on the land, and</i>  | The proposal does not intend to change the land use zoning and therefore compatible with the flood function and behaviour as envisioned by the Council's strategic planning for this area.  |
| b | <i>will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and</i>                                   | The proposal has been designed to accommodate on-site compensatory storage to offset the loss of storage which may result from redevelopment of the site in accordance with the proposal.<br><br>There is an increase in 1% AEP flood levels on Murray Street, with majority of the area affected by less than 2 cm. This can be deemed as an insignificant impact. |

| # | LEP Controls   | Addressed by Proposal  |
|---|--|--|
| c | <i>will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and</i> | The safe occupation would be ensured by adopting the flood planning level for the habitable floor areas. Any increase in development and/or dwelling density would be mitigated by preparing a site-specific Flood Emergency Response Plan. Measures such as safe refuge on-site, would be adopted to minimise the flood evacuation burden |
| d | <i>incorporates appropriate measures to manage risk to life in the event of a flood, and</i>   | Flood Emergency Response Plan would be prepared to manage risk to life in a flood event  |
| e | <i>will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.</i>         | The proposal is not likely to affect the environment, as the change in the flood behaviour in the surrounding environment is likely to be insignificant.   |

***In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters—***

|   |   |   |
|---|---|---|
| a | <i>the impact of the development on projected changes to flood behaviour as a result of climate change,</i>   | This will be confirmed through the detailed DA stage.   |
| b | <i>the intended design and scale of buildings resulting from the development,</i>   | This will be confirmed through the detailed DA stage.   |
| c | <i>whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,</i>         | The safe occupation would be ensured by adopting the flood planning level for the habitable floor areas. Any increase in development and/or dwelling density would be mitigated by preparing a site-specific Flood Emergency Response Plan. |
| d | <i>the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.</i> | This will be confirmed through the detailed DA stage.   |

### 9.2.2 Section 5.22 - Special Flood Considerations

The Council has not adopted this clause and therefore does not apply to the proposal.

### 9.3 Inner West Council DCP (2011)

Section 22.2 of the Council DCP provides details of flood management. The objectives of flood management presented in the DCP are:

1. To maintain the existing flood regime and flow conveyance capacity.
2. To enable the safe occupation of, and evacuation from, land to which flood management controls apply.
3. To avoid significant adverse impacts upon flood behaviour.
4. To avoid significant adverse effects on the environment that would cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the riverbank/watercourse.
5. To limit uses to those compatible with flow conveyance function and flood hazard.
6. To minimise risk to human life and damage to property.

The relevant controls are presented in Section 2.22.5 of the DCP. Table 3 provides these controls and how the proposal addresses these controls.

**Table 3. DCP (2010) Controls**

| #   | DCP Controls  | Addressed by Proposal   |
|---|---|---|
| <b>Controls for new non-residential development</b> |   |   |
| C13   | <i>Floor levels (except for access-ways) must be at least 500mm above the 1% AEP flood level, or the buildings must be flood-proofed to at least 500mm above the 1% AEP flood level. For areas of minor overland flow (a depth of 300mm or less or overland flow of 2cum/sec or less) a lower freeboard of 300mm may be considered on its merits.</i> | <p>The depth of flooding at Smidmore Street is less than 300 mm. The habitable/working floor level for the proposal is derived from the 1% AEP flood level at Smidmore Street with a freeboard of 300 mm to comply with the design requirement for access driveway gradient at Smidmore Street. The derived flood planning level is higher than that obtained from adding a 500mm freeboard to the Edinburgh Street 1% AEP flood level.</p> <p>The proposed Wine Ark office along Smidmore Street and Box Shop along Edinburgh Road have floor levels below the 1% AEP flood level. This is due to a business use requirement for having entry at the street level and to prevent an adverse impact on the building form and streetscape presence of the future development. These two areas would be flood-proofed to at least 500 mm above the relevant 1% AEP flood level. The flood-proofing material would be as per Schedule 1 of the Section 22.2 of the Council DCP (2011).</p> |
| C14   | <i>Flood-free access must be provided where practicable</i>   | Flood-free access is not feasible for the proposal as the surrounding roads are flooded in a major flood event.   |



| #   | DCP Controls   | Addressed by Proposal   |
|---|--|---|
| <b>Controls for non-residential development – additions</b> |  |   |
| C15   | <i>Where the proposed development is for an addition to an existing building within the Flood Planning Area, the development may be approved with floor levels below the 1% AEP flood Level if the applicant can demonstrate that all practical measures will be taken to prevent or minimise the impact of flooding. In determining the required floor level, matters which will be considered include:</i><br><i>i. The nature of the proposed landuse;</i><br><i>ii. The frequency and depth of possible flooding;</i><br><i>iii. The potential for life and property loss;</i><br><i>iv. The suitability of the building for its proposed use; and</i><br><i>v. Whether the filling of the site or raising of the floor levels would render the development of the site impractical or uneconomical.</i> | The proposed development is for the provision of a flood gate to prevent flooding of an existing building on site. The floor level of this building is below the 1% AEP flood level.<br><br>The proposed flood gate/barrier would be provided to a height of 1% AEP flood level plus a 500mm freeboard. |
| C16   | <i>Any portion of the proposed addition below the 1% AEP must be built from flood compatible materials</i>   | Not applicable.   |

#### 9.4 2022 NSW Flood Enquiry

The major flooding and the ensuing loss of life and property in February-March 2022 prompted the NSW government to commission an independent inquiry (Inquiry) to examine and report on the causes of, preparedness for, response to and recovery from this catastrophic flood event. The enquiry made twenty eight recommendations to the NSW government. Out of those, six were ‘Supported’ and the rest were ‘Supported in Principle’, requiring further work for implementation.

A major outcome of the Inquiry was to establish the NSW Reconstruction Authority (NSWRA), which is dedicated to disaster recovery, reconstruction and preparedness. The Authority has launched a Get Ready Program for councils to give councils targeted information, resources and support to help their local communities build resilience and prepare for disasters. The proposed development would need to comply with any new requirements that Inner West Council may develop as part of the Get Ready Program.

A key recommendation of the Inquiry is to use a risk-based approach for calculating flood planning level. The recommendation states that:

*to take account of greater knowledge of climate change, Government reinforce its adoption of a risk-based approach to calculating the flood planning level for planning purposes and, through the NSWRA, immediately start a process of revising all flood planning level calculations in the state’s high-risk catchments. Flood planning level re-determinations for all high-risk catchments should be completed within 3 years. These revised flood planning levels will need to be factored into all development applications (in-progress and new) in those high-risk catchments.*

The recommendation is to revise flood planning levels for high-risk catchments. The definition for the high-risk catchment is not provided but likely refers to a catchment where major riverine flooding causes extensive damage. However, in all catchments, including the catchment for the proposed development, the flood risk varies throughout the catchment and areas of high flood risk exist, which can potentially be considered by the Inner West Council for revision of flood planning levels.

In general, the Inquiry recommendations if implemented would help build resilience to major flooding and reduce flood risk for future development in the Inner West Council, including the proposed development.

## 10 Council Review of the Proposal

The Council has provided feedback after review of the proposal. The review comments have been addressed as detailed in Table 4.

**Table 4. Council Review Comments**

| # | Council Comments   | Addressed by Proposal  |
|---|--|--|
| 1 | <i>Any planning proposal submitted to Council must adequately address consistency with the Section 9.1 Ministerial Direction 4.1 Flooding, including:</i><br><ul style="list-style-type: none"> <li>- relevant recommendations of the NSW Government's 2022 Flood Inquiry Report</li> <li>- clearly addressing the requirements of Direction 4.1, providing clear assessment and consideration the level of flood hazard(s) that may impact the proposal.</li> </ul> | The Ministerial Direction 4.1 – Flooding has been addressed in Section 9.1 and relevant recommendations of the 2022 Flood Inquiry have been addressed in Section 9.4 of this report.   |
| 2 | <i>A Flood Certificate must be obtained from Council and the proposed flood modelling must be calibrated to match the flood levels provided in the Flood Certificate;</i>  | The flood certificates for the two lots were obtained from the Council. Also, the Council's flood model was obtained.  |
| 3 | <i>Reliance on flood gates as flood mitigation is not supported for new development. The floor levels should be raised to provide for protection by design to the flood planning level;</i>  | Flood gates are proposed for the existing warehouse, which is proposed to be retained, however new development will be designed to align with Council's DCP requirements.<br><br>The floor levels of the new development have been designed to the flood planning levels, as derived per Council DCP                 |
| 4 | <i>The Flooding at Smidmore Street and Edinburgh Road can be treated as 2 distinct flooding areas;</i>   | The flooding at Smidmore Street and Edinburgh Road has been treated separately to derive the flood planning level  |
| 5 | <i>The proposed flood storage offset may unnecessary– water currently enters the outdoor carpark to a depth of 500mm and maintenance of this storage area is likely to be difficult. The storage area will need to be justified by pre and post flood modelling and if flood storage is required on site then it must be self-draining under gravity;</i>  | Flood modelling of the proposed development has indicated that there is no adverse impact due to loss of storage. However, the loss of storage has been compensated on site by providing flood storage as marked on the development plans.<br><br>The additional flood storage would be self-draining under gravity. |
| 6 | <i>The existing warehouse is below FPL so will require floodproofing works to ensure building remains protected from flooding (flood gate(s) may be acceptable in protecting the existing building and doors); and</i>   | The flood proofing works would be undertaken as per the flood proofing materials presented in Schedule 1 of Section 22.2 of Council DCP (2011)   |

| # | Council Comments  | Addressed by Proposal   |
|---|---|---|
| 7 | <i>Management plan for the box store in order to minimise damage to stock / cost of replacements – may need floor level to be raised, a reduced freeboard may be acceptable for the box store if justified.</i> | <p>A management plan would be prepared to minimise flood risk to the Box Shop and Wine Ark and will be provided with the detailed DA design. The floor levels cannot be raised above the 1% AEP flood level due to design constraints. Appropriate flood proofing would be provided for areas up to 500 mm above the 1% AEP flood level.</p> <p>The flood proofing along with the flood management plan would help minimise the flood risk for these two spaces</p> |

## 11 Summary and Conclusion

A flood study has been undertaken to assess the flood affectation of the proposed development and to determine if the development is likely to comply with the relevant planning controls including Council requirements/guidelines. The assessment suggests that

- The floor levels of the proposed development comply with the required FPL.
- The loss of flood storage is compensated through provision of compensatory storage of equal magnitude onsite.
- Raising the entry to the existing warehouse/building and provision of flood gate at the would lower the flood risk to that building.

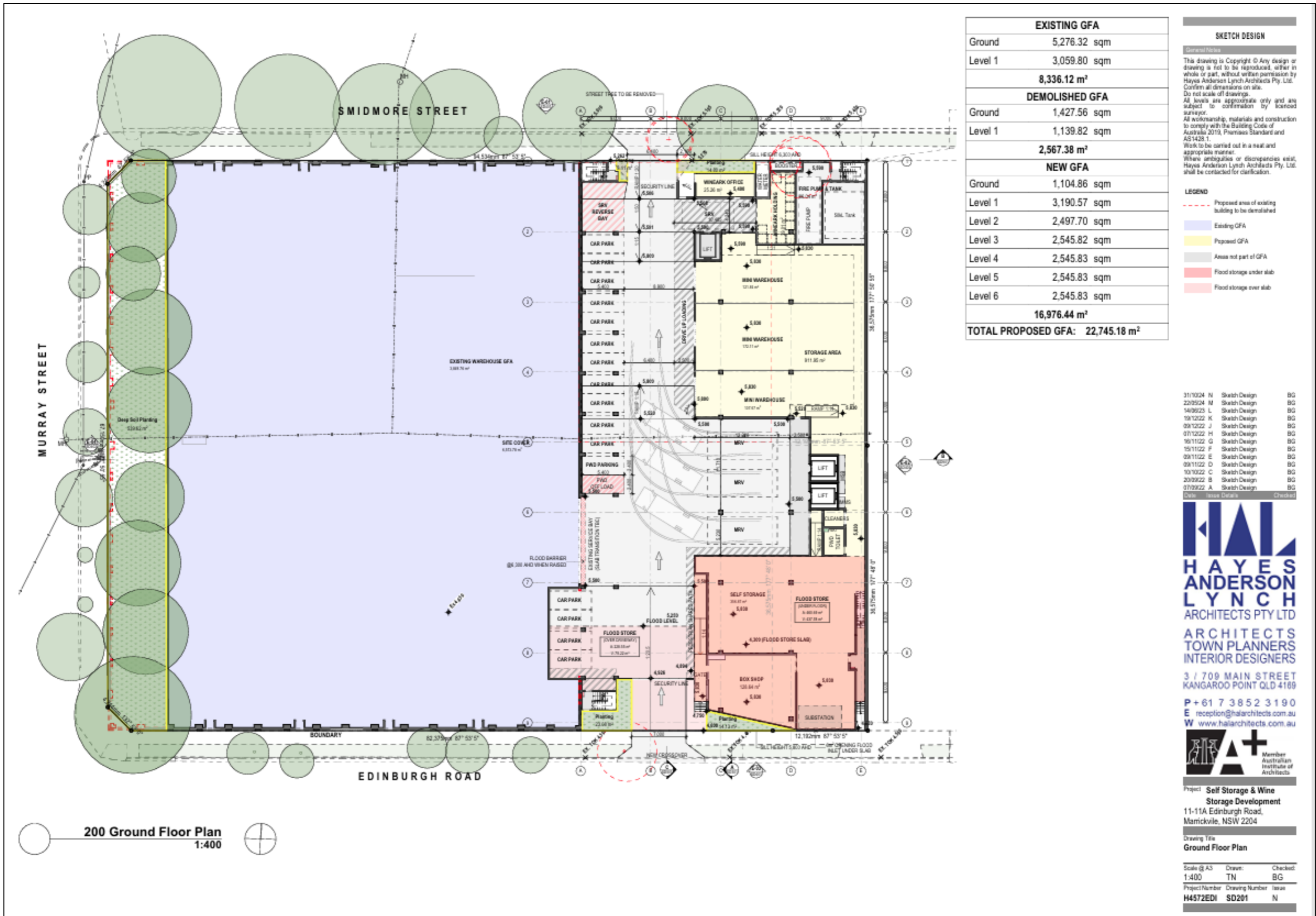
In summary, based on the preliminary investigation, the combination of design detail and flood mitigation measures can be implemented on the site to support the redevelopment of the site in accordance with the proposal.

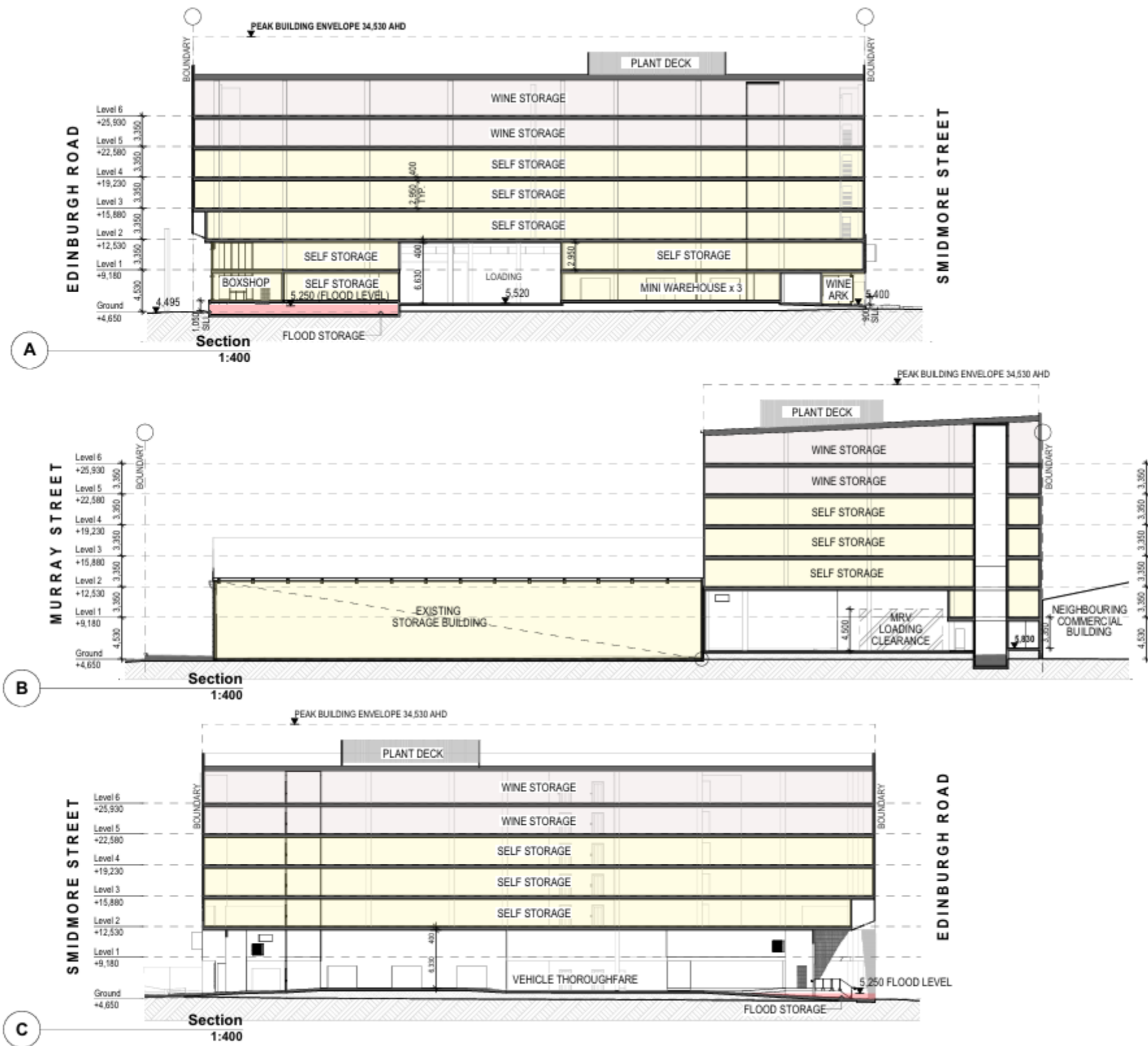
## 12 Qualifications

This report has been prepared for National Storage for the preliminary flood assessment of proposed development at 11-11A Edinburgh Road, Marrickville. The report is subject to following qualifications:

- The flood assessment is based on the Council flood model.
- Flood emergency planning including flood evacuation strategy has not been addressed in this flood assessment. This will be addressed in the future Development Application.
- The flood assessment has been undertaken for the development plans as presented in this report. Modification of development plans may require update of this report.
- This study and its outcomes should not be used for any other purpose than those specified in this report.

# APPENDIX A





**SKETCH DESIGN**

*General Notes*

This drawing is Copyright © Any design or drawing is not to be reproduced, either in whole or part, without written permission by Hayes Anderson Lynch Architects Pty. Ltd. Confirm all dimensions on site. Do not scale off drawings. All levels are approximate only and are subject to confirmation by licensed surveyor. All workmanship, materials and construction to comply with the Building Code of Australia 2019, Premises Standard and AS1428.1. Work to be carried out in a neat and appropriate manner. Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

| Date     | Issue Details   | Checked |
|----------|-----------------|---------|
| 31/10/24 | N Sketch Design | BG      |
| 22/05/24 | M Sketch Design | BG      |
| 14/06/23 | L Sketch Design | BG      |
| 19/12/22 | K Sketch Design | BG      |
| 09/12/22 | J Sketch Design | BG      |
| 07/12/22 | H Sketch Design | BG      |
| 16/11/22 | G Sketch Design | BG      |
| 15/11/22 | F Sketch Design | BG      |
| 09/11/22 | E Sketch Design | BG      |
| 09/11/22 | D Sketch Design | BG      |
| 10/10/22 | C Sketch Design | BG      |
| 20/09/22 | B Sketch Design | BG      |
| 07/09/22 | A Sketch Design | BG      |

**HAYES ANDERSON LYNCH**  
ARCHITECTS PTY LTD

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INTERIOR DESIGNERS

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Member  
Australian  
Institute of  
Architects

Project: **Self Storage & Wine Storage Development**  
11-11A Edinburgh Road, Marrickville, NSW 2204

Drawing Title: **Sections**

| Scale @ A3     | Drawn          | Checked |
|----------------|----------------|---------|
| 1:400          | TN             | BG      |
| Project Number | Drawing Number | Issue   |
| H4572EDI       | SD501          | N       |

# APPENDIX B



Habib Rehman  
373-383 Windsor Road  
BAULKHAM HILLS NSW 2153  
HREHMAN@HYDROSTORM.COM.AU

15 May 2023

**FLOOD CERTIFICATE**  
**11 Edinburgh Road MARRICKVILLE NSW 2204**  
**ENCF/2023/0038**

I am pleased to advise that the Flood Certificate for the above address has been prepared and is attached.

The information contained in the certificate is derived from the Eastern Channel East Flood Study (Golders, 2010).

The information is provided in good faith and in accordance with the provisions of s.733 of the Local Government Act.

Yours faithfully

A handwritten signature in black ink, appearing to read "James Ogg".

James Ogg  
**COORDINATOR – STORMWATER & ASSET PLANNING**





Applicant Name: Habib Rehman  
 Property Address: 11 Edinburgh Road  
 MARRICKVILLE NSW 2204

Certificate No: ENCF/2023/0038  
 Date: 08-May-2023

### About this Certificate

This certificate provides flooding information for the area in the vicinity of the above property. This information can be used to assist in understanding the extent of flooding affecting this property and can be used to assist in preparation of a Flood Risk Management Report to support a development application. It is recommended that the information in this report be interpreted by a suitably qualified professional.

This report includes two pages; this cover page with an explanation of the information provided, and the second page is a figure providing information on the flooding behaviour in the area. The figure includes peak water levels, depths and flow rates for the 100 year ARI and peak water levels for the Probable Maximum Flood event.

The flood levels provided are based on available information including numerical modelling results from flood studies prepared for Council. All flood levels and depths are provided to the nearest 0.05 metres.

### Definitions

The following provides a brief definition of some of the key terms utilised in this report:

|                                   |   |
|-----------------------------------|---|
| Average Recurrence Interval (ARI) | The long-term average number of years between the occurrences of a flood as big as or larger than the selected event. The 100 year ARI flood event can be expressed as having a 1% chance of occurrence in any given year or as the flood that could occur once every 100 years.                    |
| Probable Maximum Flood (PMF)      | The PMF is the largest flood that could conceivably occur at a particular location. This event is used to determine what might occur in events larger than a 100 year ARI.  |
| 100 year ARI Flow Path/Extent     | The area of land expected to be inundated by either a flow path or mainstream flooding during a 100 year ARI flood event. The extents are limited to the areas where depths of flow are greater than 150mm.   |
| 100 year ARI High Hazard          | Areas within the 100 year ARI flood extents where the depth and/or velocity of flow is likely to represent a possible danger to personal safety; evacuation by trucks is difficult; able-bodied adults would have difficulty wading to safety; and/or potential for structural damage to buildings. |
| Flood Planning Level (FPL)        | The Flood Planning Level is calculated by adding freeboard onto the 100 year ARI flood level in accordance with Council's DCP.  |
| Freeboard                         | The freeboard is incorporated into the Flood Planning Level to provide a factor of safety to the flood levels. It accounts for a number of factors, including wave action, localised obstructions to flows, and model uncertainty.  |
| Australian Height Datum (AHD)     | A common national surface level datum approximately corresponding to mean sea level.  |

### Notes

The ground levels shown on the attached figure are based on aerial survey data. The ground levels should be verified by a suitably qualified surveyor.

The location of stormwater pits and pipes on the attached figure are indicative only. The location and dimensions of pipelines should be verified by a suitably qualified surveyor.

The water depths shown are provided at the location shown and are indicative only. They do not necessarily represent the maximum depth in the area. For example, where a point is located on the centreline of a road, the depths will be higher within the road gutter.

The information is provided in good faith and in accordance with the provisions of s.733 of the *Local Government Act*.

**Flood Certificate**

Applicant Name: Habib Rehman  
 Property Address: 11 Edinburgh Road  
 MARRICKVILLE NSW 2204

Certificate No: ENCF/2023/0038  
 Date: 08-May-2023



| A  | B  | C  |
|--|--|--|
| 100 yr ARI Water Level: 5.25m AHD<br>100 yr ARI Flood Depth: 0.62m<br>PMF Water Level: 6.04m AHD | 100 yr ARI Water Level: 5.25m AHD<br>100 yr ARI Flood Depth: 0.67m<br>PMF Water Level: 6.05m AHD | 100 yr ARI Water Level: 5.24m AHD<br>100 yr ARI Flood Depth: 0.84m<br>PMF Water Level: 6.05m AHD |
| D  | E  |  |
| 100 yr ARI Water Level: 5.21m AHD<br>100 yr ARI Flood Depth: 0.48m<br>PMF Water Level: 5.90m AHD | 100 yr ARI Water Level: 5.68m AHD<br>100 yr ARI Flood Depth: 0.17m<br>PMF Water Level: 6.74m AHD |  |

The information provided is in good faith and in accordance with the provisions of s.733 of the *Local Government Act*.

*The aerial photo is historical and may not reflect the current structures and features of this area.*



Habib Rehman  
373-383 Windsor Road  
BAULKHAM HILLS NSW 2153  
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15 May 2023

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**ENCF/2023/0039**

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Yours faithfully

A handwritten signature in black ink, appearing to read 'James Ogg', written over a horizontal line.

James Ogg  
**COORDINATOR – STORMWATER & ASSET PLANNING**



Applicant Name: Habib Rehman  
 Property Address: 11A Edinburgh Road  
 MARRICKVILLE NSW 2204

Certificate No: ENCF/2023/0039  
 Date: 08-May-2023

### About this Certificate

This certificate provides flooding information for the area in the vicinity of the above property. This information can be used to assist in understanding the extent of flooding affecting this property and can be used to assist in preparation of a Flood Risk Management Report to support a development application. It is recommended that the information in this report be interpreted by a suitably qualified professional.

This report includes two pages; this cover page with an explanation of the information provided, and the second page is a figure providing information on the flooding behaviour in the area. The figure includes peak water levels, depths and flow rates for the 100 year ARI and peak water levels for the Probable Maximum Flood event.

The flood levels provided are based on available information including numerical modelling results from flood studies prepared for Council. All flood levels and depths are provided to the nearest 0.05 metres.

### Definitions

The following provides a brief definition of some of the key terms utilised in this report:

|                                   |   |
|-----------------------------------|---|
| Average Recurrence Interval (ARI) | The long-term average number of years between the occurrences of a flood as big as or larger than the selected event. The 100 year ARI flood event can be expressed as having a 1% chance of occurrence in any given year or as the flood that could occur once every 100 years.                    |
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The information is provided in good faith and in accordance with the provisions of s.733 of the *Local Government Act*.

**Flood Certificate**

Applicant Name: Habib Rehman  
 Property Address: 11A Edinburgh Road  
 MARRICKVILLE NSW 2204

Certificate No: ENCF/2023/0039  
 Date: 08-May-2023



| A   | B   | C   |
|---|---|---|
| 100 yr ARI Water Level: 5.25m AHD<br>100yr ARI Flood Depth: 0.68m<br>PMF Water Level: 6.05m AHD | 100 yr ARI Water Level: 5.25m AHD<br>100yr ARI Flood Depth: 0.83m<br>PMF Water Level: 6.05m AHD | 100 yr ARI Water Level: 5.23m AHD<br>100yr ARI Flood Depth: 0.70m<br>PMF Water Level: 5.95m AHD |
| D   | E   | F   |
| 100 yr ARI Water Level: 5.23m AHD<br>100yr ARI Flood Depth: 0.52m<br>PMF Water Level: 5.91m AHD | 100 yr ARI Water Level: 5.39m AHD<br>100yr ARI Flood Depth: 0.41m<br>PMF Water Level: 6.64m AHD | 100 yr ARI Water Level: 5.52m AHD<br>100yr ARI Flood Depth: 0.15m<br>PMF Water Level: 6.73m AHD |
| Note: The peak flow depth through the subject property for the 100 yr ARI flood event is 565mm. |   |   |

The information provided is in good faith and in accordance with the provisions of s.733 of the *Local Government Act*.  
 The aerial photo is historical and may not reflect the current structures and features of this area.